

Course 6

- Addressing the risk of cancer
- Immunoprophylaxis
- The periodic health examination

The risk of cancer

- Cancer is an increasingly important factor in the overall morbidity of chronic diseases.
- Cancers are the second leading cause of death in developed countries after cardiovascular disease.

Cancers and screening methods (European Against Cancer - 2003)

MASS SCREENING EFFICIENTLY PROVIDED

- Breast: Mammography
- Cervical: Cervical cytology
- Colon / rectum: Hidden bleeding in the stool

THE VALUE OF UNKNOWN SCREENING (IN WORK)

- Prostate: prostate specific antigen (PSA)
- Stomach: Testing H Pylori. Radiography / Endoscopy
- Colon / rectum: Flexible sigmoidoscopy
- Ovary: CA 125 or ultrasonography
- Breast: Mamografia in women <50, BRCA mutations 1 and 2
- Cervical: HPV testing
- Lung: Computed Tomography (CT)
- Skin cancer (Melanoma): Examination of the nevi
- Oral cavity cancer: Examination of the oral cavity

SCREENING (MASS) INEFFICIENTLY PROVIDED

- Neuroblastoma: Homovanilic acid (HVA) and vanilmandelic acid
- Lung: Lung Rx
- Breast: Self-examination of the breasts

The 7 most common types of cancer - incidence and mortality in 2002 were:

- lung cancer - 50 / 100,000 inhabitants;
- breast cancer - 45 / 100,000 inhabitants;
- colorectal cancer - 23 / 100,000 inhabitants;
- stomach cancer - 18 / 100,000 inhabitants;
- cervical cancer - 16 / 100,000 inhabitants;
- bladder cancer - 15 / 100,000 inhabitants;
- prostate cancer - 14.7 / 100,000 inhabitants.

- Between 2008-2030, an increase of 65% of people diagnosed with cancer is estimated

- Most common locations of cancers by sex (2012)

Male

- Lung
- Prostate
- Colorectal
- Stomach
- Liver

Female gender

- Breast
- Colorectal
- Lung
- Cervix
- Stomach

The risk for breast cancer

Genetic factors correlated with breast cancer risk:

- There are two mutations with AD transmission: the BRCA 1 mutation, which affects a gene on chromosome 17 and the BRCA 2 mutation, which affects a gene located on chromosome 13.

BRCA 1 mutation has a prevalence of 5%;

87% of patients with this mutation develop breast cancer by the age of 70.

Patients at high risk for BRCA

- two first-degree relatives with breast cancer, at least one diagnosed under 50 years of age
- three or more relatives of grade I-II with breast cancer, regardless of age of diagnosis
- the existence of both cancers, breast and ovarian, among the relatives of the 1st-2nd degree
- bilateral breast cancer in a relative
- ovarian cancer in a relative of grade I-II, regardless of age of diagnosis
- relatives of grade I-II with breast cancer and ovarian cancer at any age
- a history of breast cancer in a male from family

The protective factors for breast cancer are:

- first pregnancy at a young age,

- physical activity,
- early natural menopause.

The most prevalent methods of breast cancer screening are mammography, breast ultrasound and breast self-examination.

Mammographic examination - detects tumors in the undetectable clinical stage and reduces breast cancer mortality by 30% (for dense breasts: annually over 40 years)

The sensitivity of mammography ranges from 77% to 95% for cancers diagnosed over the next year, and the specificity ranges from 94% to 97%.

The mammographic population screening strategy recommended in the EU for breast cancer screening involves 2-3 years testing of women aged 50-69, ultrasound being recommended for women with dense breasts, as a first routine investigation and for young women.

The risk for cervical cancer

The risk factors for the development of cervical cancer are:

- Early onset of sexual activity: before the age of 17, the risk increases twice;
- Multiplicity of partners;
- Cervico-vaginal infections;
- HPV
- HPV genome was detected in 90% of the invasive or invasive cancers.
- The risk is multiplied on average 10 times by the presence of HPV.
- The natural evolution of cervical cancer from HPV infection to invasive cancer is on average 10-13 years.
- Genital herpes, Herpes Virus Simplex type 2 (HSV virus) likely cofactor
- Multiparity and socio-economic environment
- Smoking increases the risk of cervical cancer twice, regardless of sexual behavior

Interventions aimed at the risk of cervical cancer

The maximum incidence of cervical cancer is recorded between 45-55 years

- The screening test consists of a cytological examination in all sexually active women after 18 years
 - o The optimal age for starting screening is not clearly established
- It is accepted that screening can be delayed up to 3 years after the onset of sexual life.

- In general, starting screening is recommended from 19-21 years, and discontinuing it at 65, if the last screening was normal.
- Frequency of testing: between 1 and 3 years, on average 2 years.
- After two normal Pap smears it is recommended to repeat the screening at 3 years.
- The sensitivity of the Pap test is 60-80%.

The quality of the vaginal smear is affected by:

- sexual contact in the last 24 hours
- use of cream / disinfectant liquid
- lubricant in the last 24-49 hours
- menstruation

Other interventions

- HPV vaccination
 - there remains a risk of over 20% due to infection with other HPV strains (not included in the vaccine)
 - there is the possibility of an HPV infection already present
 - together with the Pap smear test results in a cumulative reduction of the risk of cervix by 94%
- HPV is responsible for neoplasms with various locations:
 - cervix
 - vulva / vagina
 - anal mucosa
 - penis
 - buccal mucosa
 - vocal cords

Risk for colorectal cancer

Risk factors for colon cancer:

- dietary factors (red meat, fats and animal proteins, low intake of fruits and vegetables, overeating)
- alcohol consumption
- occupation: workers in the textile industry (acrylics)
- sedentary
- family history of colon cancer
- inflammatory bowel disease

Genetic factors

- 20% of colon cancers have genetic determinism
- 1st degree relatives are 2-3 times higher risk
- there are cancers with AD transmission as rectal polyposis
- BRCA 1 carriers

Inflammatory bowel disease

- the risk of cancer increases 20 times after 10 years of evolution

Intestinal polyps

- the risk increases proportionally with the number of polyps, their volume and type (hairy polyps with atypia)

Colon cancer in personal history

- The risk of developing a second cancer in patients diagnosed is 10% in the next 3-5 years
- the risk of developing a second cancer is 3 times higher than in the person without a history of colon cancer
- if the first cancer occurred on a polyp: the risk of cancer is 6 times higher

Gynecological or breast cancers

- increase the risk of colon cancer

Interventions aimed at the risk of colorectal cancer

- Screening for colorectal cancer is recommended for anyone over the age of 50, due to the increased incidence after this age, even at age 45 for those with a family history of colon cancer.
- Colorectal cancer screening options include:
 - occult hemorrhage test (Hemocult);
 - flexible sigmoidoscopy (colonoscopy);
 - double contrast irigoscopy.
- The optimal screening interval depends on the test:
 - the biannual Hemocult test;
 - colonoscopy - at 10 years - according to the natural history of adenomatous polyposis;
 - 5 years for sigmoidoscopy and barium examination with double contrast.

Risk for prostate cancer

The risk factors:

- age over 65 (80% of prostate cancers),
- the African race,
- family history of prostate cancer,
- increased fat consumption.

Interventions for prostate cancer

- Performance-specific antigen (PSA) testing and rectal examination (no evidence of routine screening);
- The most suitable population is represented by men between 50-70 years of age (> 45 years at high risk);
- PSA test is more sensitive than TR for prostate cancer detection;
- PSA screening within the conventional limit of 0.4 ng / ml detects most prostate cancers.

Other oncological risk situations

Skin cancer

The risk factors are

- large number of pigmented nevi;
- immunosuppression;
- history of skin cancer;
- high cumulative sun exposure;
- intense intermittent exposure / severe burns in childhood;
- light hair and skin.

Ovarian cancer

The risk factors are

- nullity after 40 years;
- age at first pregnancy;
- APP for endometrial or breast cancer.

Pancreatic cancer

The risk factors are

- men over 65;
- smoking,
- diabetes mellitus;
- African race.

Lung cancer

The risk factors are

- smoking - risk 3 times higher;
- exposure to asbestos and hydrocarbons.

Thyroid cancer

The risk factors are

- irradiated persons in childhood in the head region;
- female sex;
- neoplastic antecedents.

Testicular cancer

The risk factors are

- men over 70,
- white race,
- smoking,
- exposure to synthetic dyes and substances used in the rubber industry.

Immunoprophylaxis

Vaccinoprophylaxis is performed

- within an organized framework, during the vaccination campaigns included in the mandatory immunization programs in each country,
- during the outbreak of certain infectious-contagious outbreaks whose diseases benefit from an appropriate vaccine.

Schedule of mandatory vaccinations 2016

Recommended age	Type of vaccination	Comments
The first 24 hours	hepatitis B vaccine	in maternity
2-7 days	BCG vaccine	in maternity
2 months	Hexavalent vaccine (DTaP-IPV Hib-HepB) Pneumococcal conjugate vaccine	FD
4 months	Hexavalent vaccine (DTaP- IPV - Hib-HepB) Pneumococcal conjugate vaccine	FD
11 months	Hexavalent vaccine (DTaP- IPV - Hib-HepB) Pneumococcal conjugate vaccine	FD
12 months	Measles-mumps-rubella vaccine	FD
5 years	Vac Measles-mumps-rubella vaccine	FD
6 years	Tetavalent vaccine (DTaP- IPV)	FD
14 years	Td/DTaP	FD

Hepatitis B vaccin

- Vaccination is performed at birth, at 2, 4, 11 months for children, the infection with hepatic B virus being practically endemic in Romania.
- The hepatitis C vaccine given to children with HBs positive mothers has an efficacy of 62-92%
- The efficacy of the vaccine is maintained for a period ranging from 3 to 11-12 years despite the decrease of the antibody level.

DTaP vaccin

- Its effectiveness becomes maximum after a minimum of 3 vaccine doses, and the risk of disease decreases by 96-97% between 1 and 4 years.

IPV vaccin

- IPV has the advantage of developing high local immunity in the intestinal mucosa.
- Efficacy: 3 doses of live attenuated oral poliovirus (IPV) vaccine offer 95-100% protection against the 3 types of poliovirus.
- Side effects are:
 - post-vaccine polio paralysis
 - Guillain-Barre syndrome
 - risk of fatal evolution in immunodeficiency.

Haemophilus influenzae type b vaccin

- The Hib vaccination scheme is administered at 2 months, 4 months, 11 months (since 2009 it is in the mandatory immunization scheme in Romania).
- In children > 15-59 months, a single dose is administered.
- After the age of 59 months (5 years), the vaccine is only recommended for those at risk: asplenic, immunodeficiencies, asymptomatic HIV infection

MMR vaccin

- Vaccines with live attenuated viruses are used.
- Two doses of vaccine are effective against measles, mumps and rubella, its use leading to a significant reduction of the 3 diseases.
- Revaccination prevents measles, even in those who have not been seroconversion at the first vaccination.

Pneumococcal vaccin

- Risk groups for which pneumococcal vaccination is mandatory:
- immunocompetent persons
- the elderly 65 and over,
- patients with chronic cardiovascular disease,
- chronic lung disease or diabetes,
- patients with alcoholism,

- chronic liver disease,
- persons living in disadvantaged social environments or in special environmental conditions,
- persons with anatomical or functional asplenia
- immunocompromised persons
- patients with HIV infection,
- leukemia, lymphoma, Hodgkin's disease, multiple myeloma,
- generalized malignancies,
- chronic renal failure, nephrotic syndrome,
- immunosuppressive chemotherapy,
- marrow or organ transplant

In 2000, the approval of a new heptavalent pneumococcal vaccine (7 polysaccharide pneumococcal antigens) conjugated with the diphtheria protein CRM197 (PREVENAR) was approved, with a efficacy of 94% - recommended for all age groups.

Since 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. It is a vaccine that has a diphtheria CRM 197 protein and Haemophilus influenzae type B nontipable protein.

Antimeningococcal vaccin

- Most infections are produced by five serogroups (A, B, C, Y, W-135), classified by capsular polysaccharide. Serogroups B and C are predominant.
- Disease with serogroup B appears endemic, registering a peak in children under 5 years.
- Disease with serogroup C frequently manifests an epidemic, with peaks in children under 5 years and in adolescents between 15 and 19 years.
- The mortality rate in the case of invasive disease is, on average, 10%, being higher in the case of sepsis (meningococcemia).
- The disease caused by serotype C is associated with a higher rate of septicemia and mortality, especially in adolescents.

Varicella vaccin

- 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.
- Vaccination in childhood, in the first years (12 months-13 years), is more effective, with only one dose of vaccine; adolescents over 13 years of age and

adults have a lower immune response, which is why 2 doses are needed to achieve optimal seroconversion rate.

Seasonal and pandemic influenza vaccination

- There are 2 types of influenza vaccines:
 - some containing (purified) capsid proteins with antigenic potential;
 - others called sub-virion vaccines or split vaccines ("split virus") in which the surface antigen is purified and cleaved by the lipid component of the capsid component. Only these vaccines with purified and cleaved surface antigen can be given to children <13 years of age because they have the least side effects.
- Influenza protection achieved through vaccination is 70-80%.
- Influenza efficacy is apparently lower in children
- Even if the flu occurs in vaccinated people, the chance of developing into complicated forms is much lower.
- Typically, the effectiveness of the vaccination is assessed during an annual influenza season (November 15-March).
- WHO recommends that vaccination be done annually, with priority for high risk groups (starting at 6 months of age).

The periodic health examination

Group 0-10 years

- Screening
 - Weight and height at birth
 - Blood pressure
 - Phenylketonuria level (at birth)
 - T4 / TSH (at birth)
 - For hemoglobinopathy (at birth)
 - For premature retinopathy
 - For hearing loss in newborns at risk (family deafness, prematurity, suffering at birth)
 - Vision testing (3-4 years)
- Diet and exercise
 - Promote breast feeding
 - Formulas enriched with iron
 - Limiting fats and cholesterol
 - Maintaining the caloric balance with emphasis on fruits and vegetables (over 2 years)
 - Regular physical activity
 - Avoid using substances (passive smoking)

Group 11-24 years

- Screening
 - Height Weight
 - Blood pressure
 - Chlamydia test (women <20 years)
 - Pap smear
 - Serology for rubella or vaccination (girls > 12 years)
- Diet and exercise
 - Limiting fat consumption
 - Maintaining a balanced caloric balance
 - Focus on fruits and vegetables
 - Sufficient calcium intake (for women)
 - Regular physical activity

Group 25-64 years

- Screening
 - BP
 - Waist and weight
 - Serum cholesterol (men 35-65 years, women 45-65 years)
 - Pap smear
 - Blood test (> 50 years)
 - Clinical examination of the breasts, mammography
 - Evaluation of alcohol consumption
 - Serology / rubella vaccination (women during fertility)
- Counseling
 - Quit smoking
 - Prohibition of drug use
 - Avoidance / limitation of alcohol consumption
 - Limiting fat consumption, cholesterol and maintaining a balanced caloric balance
 - Focus on the consumption of fruits, vegetables and cereals
 - Adequate calcium intake
 - Regular physical activity

Group over 64 years

- Screening
 - BP
 - Waist and weight
 - Hemocult and / or sigmoidoscopy
 - Mammography ± clinical breast examination (women ≤ 69 years)
 - Pap smear
 - Screening of the view
 - Assessing the problems of alcohol consumption

- Counseling
 - Stopping smoking
 - Avoid alcohol consumption while driving, swimming, etc.
 - Diet: adequate calcium intake (in women) decrease saturated fat and cholesterol intake
 - Regular physical activity