Evaluation of risk factors and prevention of bronchopulmonary cancer

Bronchopulmonary cancer represents the most severe current form of cancer, being in the first place in Romania as incidence and mortality.
According to the data provided by the Oncology Institute of Bucharest
over 70% of patients are diagnosed late, and 90% survive less than a year after diagnosis.
Smoking, active or passive, is the major risk factor for the onset of bronchopulmonary cancer.

Evaluation of risk factors and prevention of bronchopulmonary cancer

Other risk factors involved are:
- exposure to carcinogenic substances from the environment and diet
- (polycyclic aromatic hydrocarbons, aluminum, ionizing radiation, arsenic, beryllium, nickel, cadmium or lead), occupational exposure,
- family history,
- genetic susceptibility,
- overweight
- inactivity.

The risk of developing lung cancer increases with age, incidence maximum is between 40 and 75 years, being higher in industrialized countries. Nearly 90% of lung cancers develop in smokers. Smoking is considered the main cause of them, and people who stop smoking significantly reduce the risk of developing this disease, as well as other cancers (of the lips,larynx, esophagus, bladder, stomach or pancreas, leukemia). It is considered that the risk of developing bronchopulmonary cancer increases in individuals with packages year-over index (the number of packages smoked daily multiplied by the number of years of smoking). Risk factors for the onset of bronchopulmonary cancer they can be influenced by actions at individual and population level, by national and international public health policies.

Directive 2001/37 / EC was introduced in Romania regarding the application of visual warnings on cigarette packets, since July 1, 2008. Smoking was also banned in public spaces and means of public transport . Counseling centers for smoking cessation were established, where, on basis of assessment of smoker status (through questionnaires); applies psycho-behavioral and pharmacological therapy programs.

The family doctor plays an important role in identifying smokers, directing them to specialized centers and subsequently in monitoring the application of their anti-smoking programs and therapies.

Other regulations of the Parliament and the European Commission refer to the prohibition of the excessive use of chemicals in agriculture (insecticides, pesticides, fertilizers) and the control of exposure to other food carcinogens or from other sources.

Evaluation of risk factors and prevention of cervical cancer

In Romania, approximately 2,800 new cases occur annually , 1,500-1,600 deaths and more than 15,000 patients registered with cervical cancer. The incidence of cervical cancer places Romania in the place two in Europe. At the same time, Romania ranks first in Europe regarding mortality due to cervical cancer.
Factors favoring cervical cancer are:

- Existence of multiple sexual partners
- The beginning of adolescent sex life
- Multiple pregnancies and births
- HPV viral infection (oncogenic serotypes 16, 18, 31, 45.51, 52, 53- with higher frequency 16 and 18)
- Hormonal factors - studies are controversial, it is considered that prolonged hormonal activity may promote the development of cervical cancer (menopause in old age).
- Age of onset - cervical cancer can occur from 20-29 years, with a maximum in the decade 45-54 years, after which there is a decrease.
- Smoking, independent of sexual behavior, may be the cause of cervical cancer.
- Low socioeconomic status

Screening with Babeş-Papanicolau cervical-vaginal cytology test, performed annually on all sexually active women or over 18 years of age, reduces cervical cancer mortality significantly. If at 3 annual determinations the cytological test was negative, it is recommended to perform the Pap smear screening every 3 years. Pap smear is 90-95% effective in detecting early lesions. It is also recommended to vaccinate against HPV, from 12-13 years, of all girls.

Babeş-Papanicolau cervico-vaginal cytology test

The emergence and widespread implementation of routine cervical cancer screening have greatly enhanced the ability to detect cancerous and precancerous changes in the cervix, leading to decreased incidence and mortality from cervical cancer. The Pap test was implemented in countries around the world as a screening strategy and further reductions in cervical cancer rates of 50% or more were observed.

The Pap test now involves collecting samples from the transformation area at the cervix level using a spatula or brush .

The results can be used to treat abnormalities that may require additional diagnostic tests , including colposcopy and biopsy of suspicious lesions.

The Pap test is considered a screening test, not a diagnostic test.

Theoretically, the liquid medium test should have the advantage over conventional collection due to the lower incidence of the fixing device, the lower incidence of the drying device and the lower masking of the cellular components.

However, the studies comparing the two techniques did not provide consistent evidence that the liquid medium test provides significant improvements in sensitivity or specificity, both of which are considered acceptable.

The Bethesda system
Pap smears are typically reported in accordance with the Bethesda system. It was introduced in 1988 and revised in 2001 and 2008, with the hope of standardizing pathology reports and improving their usefulness. The most recent system update was made in 2014 and is described below.

HPV (Human Papilloma Virus) testing
Because high-risk HPV has been implicated in more than 90% of cervical cancer cases , virus testing has been used as a screening method either alone or in accordance with the Pap test.
High-Risk HPV DNA , which aims to identify the presence of 14 types of high-risk HPV present in cervical samples. This test has been approved for use in conjunction with a Pap smear. It is intended to assist in the sorting of mild cytological abnormalities that may indicate HPV infection requiring further investigation.

Ages 30-65 years
Women between the ages of 30 and 65 and older can be screened using cytology alone or accompanied by cytology / HPV.
Women who had negative results on both tests should not be re-examined before 3 years. These results are in agreement with tests that show that, at 4-6 years after the original screening, women with HPV and negative cytology have a very low rate of cervical intraepithelial neoplasia, grade 2 or higher.
Assessment at 5-year intervals is a reasonable option for women in this age group who prefer a longer screening interval.

Stop screening once a woman is 65, as long as she was
- 3 or more consecutive negative cytology tests ,
- 2 consecutive negative results are negative over the last 10 years and
- no history of CIN 2 or greater, or cancer at the age of 20 years.

Women who have a history of CIN-2 or CIN-3 need continuous screening for at least 20 years .
The guidelines recommend discontinuing all cervical cancer screenings for women of any age who have had a total hysterectomy and have no history of CIN2 or greater.

Human Papilloma Virus (HPV)
Globally, human papillomavirus (HPV) has been detected in more than 90% of cervical carcinomas and 99.7% of cervical neoplasms.
HPV is now known as a small DNA virus that infects epithelial cells and causes a variety of skin lesions.
To date, more than 100 types have been identified different from HPV, of which 40 may involve lesions of the anogenital area.
Subtypes of the virus can generally be divided into those which it infects the stratified squamous epithelium and those that infect the epithelium mucosa.

Almost all precancerous and cancerous lesions are associated with persistent long-term HPV infection.

Fortunately, 90% of HPV infections are considered to heal within 2 years due to a cellular mediated immune response.

The virus enters through a disrupted epithelial barrier and infects it basal keratinocyte replication. The virus replicates only during the terminal differentiation of superficial keratinocytes, which allows it to be released into the lumen of the mucosa. Finally, superficial keratinocytes are removed by the stratum corneum.

Viral integration in the host cell genome is a hallmark of malignant progression.

Risk factors

Many risk factors, including age, race or ethnicity, climate, randomized biopsy performance, number of years of sexual activity, age of sexual onset, number of lifetime partners, duration of hormonal contraception, incidence of sexually transmitted diseases, the incidence of bacterial vaginitis, condom use, shower practices and cigarette use.

The only identified factor associated with the regression of HPV infection, however, is the presence of a low-risk HPV type.

These findings contributed to the screening guidelines currently recommended for cervical cancer.

Assessment of risk factors and prevention of breast cancer

The risk factors involved in the etiology of breast cancer are:

Genetic factors
- germline mutations of the p53 tumor suppressor gene
- BRCA-1 (located at locus q21 of chromosome 17)
- BRCA-2 (located on chromosome 17).

Endogenous factors
- the age of the first task completed
- the age of menopause installation
- nulliparity or first pregnancy after 30 years
- breastfeeding is considered a protective factor
- obesity, especially postmenopausal
- benign breast tumors (fibroadenoma, juvenile adenoma)
- endocrine disorders (hypo-, hyperthyroidism, estrogenic excess)

Environmental factors
- irradiation before 30 years
- diet rich in animal protein, fats and sweets
- small, repeated, mammary traumas
- alcohol, stress .

Recommendations for early detection of nodules:
- monthly breast examination performed by all women over 20 years
- Clinical examination of the breast performed annually, for all women over 40 and once every 3 years for women between 20 and 40 years .
- ultrasound examination of the breast performed annually, to all women over 40 years and once every 3 years to women between 20 and 40 years , after a first ultrasound examination did not show suspected oncogenic lesions
- mammographic breast examination performed annually, to all women over 50 and once in 1-2 years women between 40 and 49 years old, with FR present.

Evaluation of risk factors and prevention of colorectal cancer

The risk factors for colorectal cancer are:
- the presence of adenomatous polyps in the mucosa of the large intestine (familial adenomatous polyposis) - inflammatory colonic diseases
- existence in heredocolateral history of colon cancer
- diet rich in animal fats, cholesterol and bile acids
- poor nutrition in dietary fiber, fruits and vegetables, excessive consumption of alcohol, smoking, increased consumption of animal fats, red meat, refined carbohydrates, insufficient calcium intake; excessive caloric intake
- constipation
- irradiation
- obesity
- sedentarism

Prophylaxis of colorectal cancer consists of a change in diet, in the sense of increasing dietary fiber and reducing fat in the diet . It is recommended to increase the consumption of fruits, vegetables, nuts, cereals, with an increased content of phenols, flavones, food fibers with protective role .
Clinical trials for the prevention of colorectal cancer are being carried out using preparations containing calcium and non-steroidal anti-inflammatory substances .

For early detection of colorectal cancer, screening of persons with one or more risk factors presented is recommended .
Screening tests include testing for occult bleeding in the stool, colonoscopy or rectosigmoidoscopy.
Annual testing to discover occult bleeding in the chair, using hydrated tests, can reduce cancer mortality colorectal by one third.
Annual screening by colonoscopy is recommended for all persons over 50 years of age with FR present, members of families with genetic predisposition to colorectal cancer 10 years earlier than the 1st degree relative detected with colorectal cancer.

Evaluation of risk factors and prevention of prostate cancer

The risk factors incriminated for prostate cancer are:
- over 65 years of age **80% of prostate cancers)** ,
- the African race,
- **family history** of prostate cancer,
- increased fat consumption.

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

Assessment of risk factors and prevention of chronic hepatitis B and C infection
In Romania, chronic hepatitis B virus and C virus are a public health problem.
In Romania, the prevalence of chronic infection with hepatic C virus is 4.9%; over 1 million Romanians could be chronically infected with the hepatic C virus.
The severity of the chronic infection with the hepatic virus B and C is not only due to the very high prevalence of the infection, but also to the fact that people who present risk factors for this disease do not know it and are not evaluated.

The early detection and diagnosis of these diseases are necessary for the early and correct treatment, in order to **avoid the evolution towards liver cirrhosis or liver cancer.**

Risk factors for chronic infection with hepatic B and C virus
- **blood transfusions or blood products**
- performing a **surgery before 1992**
- **professions** exposed to the production of artificial wounds or to
accidental contact with other people's blood
- performing **renal dialysis**
- shared use of syringes or needles by **users of drugs**
- practicing **tattoos or piercings** made under conditions of inefficient sterilization
- **sexual partner infected with the hepatic virus B and C, contacts unprotected sexual events.**

Vaccination against the hepatic B virus is introduced in the national vaccination scheme from birth:
* 4 doses of vaccine are given, at birth, at 2 months, 4 months and 11 months, with a booster at 9 years.

Prevention of chronic infection with the hepatic virus B and C can be does by knowing and observing the following rules:
- the **objects of individual hygiene** (razors, shaving brushes, toothbrushes, tools used for manicure) should be individual.
- **Avoid sharing of needles or syringes** in the unwanted use of drugs
- **use only single-use syringes** and sterilized correctly in the same line
- performing the **tattoos or piercing only under authorized conditions** , which guarantees the use of the properly sterilized instrumentation
- **avoiding unprotected sexual contacts**
- the **personnel involved in the occupations** at risk should be protected with gloves, to avoid accidental injury or puncture with used needles, syringes or surgical instruments and nesteril. If patients have one or more risk factors presented, have normal transaminase levels (**ALT, AST**) or have liver abnormalities on **abdominal ultrasound, it** is indicated to perform tests for the detection of hepatic B or C infection: **AgHBs, AgHBe, Atc anti HBe, Atc anti HCV.**

If the test results are positive, then the patient is referred to the gastroenterologist, internist or infection doctor for further investigation for treatment.