

## EARLY DETECTION OF PULMONARY CANCER AMONG THE POPULATION: CONCEPTION AND MODEL

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Pulmonary cancer has 12.8% in the structure of oncological diseases. Annually lung tumors diagnosed in approximately 1.2 million people in the world, more than 1 million of them die of cancer [1].

At the basis of our investigations of the rate of mortality from cancer pathology (in Ukraine it has 56.1%) author made the conclusion that there are some risk factors led patients to this disease: smoking, chronic obstructive diseases of pulmonary system, industrial hazard factors, ionizing radiation, and last, but not the least – low level of physical activity of a person. We have to underline that nearly 1/3 of pulmonary cancer patients in Ukraine die because of smoking (in other countries – less than 1/4). In spite of anti-nicotine campaigns the number of smokers is increasing. Over the past five years, the share of basic nosological forms of malignant tumors in the structure of mortality has not changed. It means that there are not preventive measures and a system of early diagnosis of pulmonary cancer is not effective [2].

Experts recognize that many kinds of cancers are curable today, but the success of treatment depends on the stage of the disease the patient is diagnosed and the amount of money allocated to treatment by local health care authorities. The chances of complete cure increasing at the early detection of disease [3].

In Ukraine there is not unified model of perfect early diagnosis of lungs cancer, acceptable to the urban and rural population. This is not just a medical problem and requires cross-sectoral approach to its solution.

There are some main goals of an optimized system for early detection of pulmonary cancer: the diagnosis in the early stages of disease, improvement and promotion of healthy lifestyle, increasing healthy social and active longevity and life expectancy of people by improving the quality of health care and address the causes and conditions of disease and mortality.

Author of this article offer the system of optimization of medical and social approaches for early detection of oncological diseases for different age groups including the key points. More than that author:

- developed the main principles of cross-sectoral approach to the formation of system of early detection of pulmonary cancer among the population;
- substantiated the necessity of scientific investigation and providing of programmes of healthy lifestyle programmes;
- proved that the formation of developed and effective infrastructure for popularization of healthy lifestyle, motivation of its following for risk group people are the important components of successful health care;
- had shown the necessity of sanitary-hygiene education of the population since the childhood;
- mentioned that doctors, who are working with risk groups have to have high qualification and should be well-prepared for the detection of disease at the early stages;
- offered the reorientation of health care institutions to preventive direction both in urban and rural areas;
- substantiated the idea of formation and promotion of the principles of healthy lifestyle with the involvement of local community;
- noted that there is a quite need for the creation of psychological support for cancer patients;
- has found the direct connection of non-solved social problems (low level of social protection and unemployment) with the emergence of a large number of diseases.

Development and study of optimal model was conducted from a position of systematic approach and includes the following components:

## **1. Resources**

### *1.1. Stuff*

1. Doctors of all specialties and levels of health care, and teachers of medical high educational enterprises have to: develop standards for the doctors' training in the field of early detection of lungs cancer at the senior courses of medical universities and post-graduate levels of education; non-stop post-graduate training devoted to the ways of prophylaxis of oncological diseases; non-stop improvement of medical care in accordance with the advances in medical science and quality standards; improve the

quality of preventive examinations, treatment and clinical supervision, exclusion of “pending cases of preventive examination”; identify risk factors at all stages of medical care, followed by correction of primary care physicians and cancer centers; changes to the regulatory framework cancer centers; development of standards prevention of cancer and risk factors of non-contagious diseases [4].

2. Heads of educational institutions, teachers of all levels of education have to help: in the development of educational programmes devoted to the prophylaxis, main principles of healthy lifestyle, life safety; constant improvement of teacher training in higher medical educational institutions in accordance with the development of medical science in the field of early detection of disease at the level of population health; creation the conditions for sports.

3. Heads of local self-government.

4. Heads of non-governmental organizations and youth movements can: form the teams and realize the projects aimed the promotion of prophylaxis of cancer pathology, its detection at the early stages of disease and popularization of healthy lifestyle.

5. Heads and stuff of social service have to: support the activity of leaders and members of non-governmental organizations and youth movements, co-operate with health care enterprises.

6. Heads of factories and plants of all forms of ownership, decision-makers should: organize safe and appropriate sanitary conditions of labour; the annual medical preventive examinations; provide compensation in cases of health problems and necessity of its recovery for the working stuff; provide official employment; to form a favorable climate in labour collectives; provide the certification of knowledge in safety conditions of labour for all workers; and motivate them for healthy lifestyle [5].

7. Heads of mass-media and decision-makers have the chance: to propagandize the ideas of health and prevention of disease risk factors, form greeting behavior and motivate the audience to lead a healthy lifestyle; promote health centers.

### *1.2. Material-technical basis*

1. Health care enterprises must: realize the restructure of health centers; expand the number of day-care clinics in the structure of medical enterprises; promote them by

the basic diagnostic and laboratory equipment; create conditions for the prevention and treatment according to the standards of quality; monitor the sanitary and technical state institutions; create conditions for the introduction of electronic cards of patients.

2. Mass-media have to give: necessary technical equipment and communications.

3. Medical high educational enterprises have to offer: training basis; methodical recommendations, text-books, audio- and video- technical means; scientific guidelines devoted to the early detection and prevention of oncological diseases.

4. High medical educational enterprises have to: write and publish text-books and manuals with methodical advices; visual aids of the training process; educational audio-visual materials; give the sport equipment; realize the sanitary monitoring of technical basis of educational classrooms, and provide the equipment of medical rooms.

5. Industrial enterprises have to have: the appropriate sanitary conditions of workrooms; working and safe equipment and cleaning equipment and facilities.

6. At the level of local community there is a chance to: form the available conditions for the healthy lifestyle; “free zones” from smoking; expanding of the network of “healthy cities” [6].

7. Non-governmental organizations can give: office equipment and stationeries.

8. Social services can offer: technical communication equipment.

## **2. Results**

Among the main principles of optimized model is the unity of action at all levels of care for early detection of pulmonary cancer there should be complexity and system implementation. The early detection of pulmonary cancer disease, prevention of risk factors affect, morbidity and mortality are the priority points of optimal model. Unity of prophylaxis among the population, strategy of prevention of risk factors, and the secondary individual level of prophylaxis (individual prevention) undoubtedly lead to better health of the whole population.

Optimal system of early detection of pulmonary cancer among adults has to coordinate the activity of all services and departments in the solution of a big variety of problems related to the priority funding of early detection of oncology and distribution of funds between different structures of system.

It is necessary to involve into the optimized model of early detection of pulmonary cancer among adults such structures:

- Enterprises of all forms of ownership, which have to be responsible for the health care and prevention of disability, morbidity and mortality of cancer pathology, creating appropriate hygienic conditions, facilitating relationships in work teams, providing active cooperation between employers and healthcare providers in the decision for early detection of risk factors for disease, preserve jobs for workers who are ill.

According to Laws of Ukraine on Labour and Social Security, it is advisable to encourage workers to a healthy lifestyle, provide them with formal employment with full social package, as well as to create conditions for the timely passage of medical examination of workers, prohibit smoking and promote Web site with materials on early detection of cancer pathology and risk factors [7].

It is necessary to underline that usually the major part of workers does not call for medical help, severe pathology in most cases becomes chronic, leading to accumulation of risk factors impact on the body and the formation of favorable conditions for the development of lungs cancer, disability and premature death;

- Educational enterprises. Culture, behavior, outlook, also bad habits and hypokinesia, all of these points affect human beings and are formed by social surrounding. Educational enterprises should examine the health level of the working stuff, coordinate primary prevention of chronic pathologies. It is necessary to work out the educational subject devoted to main principles of healthy lifestyle and minimizing of risk factors influence with compulsory attestation of students; there should be also the elective course devoted to the prophylaxis of oncological pathology; there should be the high level of sanitary conditions and hygiene norms for educational process; medical rooms should be well-equipped; all the stuff has to make regular medical examination; it is necessary to organize the conditions for physical training;
- Local community, which can help to create conditions available for healthy lifestyle, organization of “areas” free from tobacco, expanding of the network of “healthy cities”;
- Mass-media and Regional Department of Health, which are planning and coordinate an activity directed onto the formation of greeting behavior and motivation of healthy

lifestyle in frames of health programmes, on the radio, in the newspapers, social advertising, an advertisement of health centers, popularization of the Internet-site with the information of risk factors and early detection of pulmonary cancer, and description of the main means of its prevention [8];

- Non-governmental organizations and youth movements, which can realize the actions for prevention of this severe disease, overcoming of risk factors and popularization of healthy lifestyle, and formation of the “health fashion”;

- Social services have to employ the working population, reducing unemployment, interacting with health care issues in the employment of people with chronic pathologies;

- An Internet-site with the detail information about the risk factors and early detection of pulmonary cancer, with the modern statistic of morbidity and mortality from this kind of oncology among the adult population, includes medical information and recommendations for prevention or decreasing of risk factors influence, social advertising devoted to healthy way of life, propaganda of physical activity, questionnaire of visitors about risk factors and health state of adults with conclusions and recommendations, quiz of the quality of medical aid (these results should be sent to the mentioned regional hospitals and clinics);

- Medical educational enterprises of the 4<sup>th</sup> level of accreditation have to ensure of continuous training for doctors in pre- and postgraduate levels for primary, secondary and tertiary prevention of disease, risk factors and early detection of developed pathology. There should be special additional courses for postgraduate doctors devoted to all those problems. Health care managers have to offer the lectures with detail information about principles of organization of prophylactic system in all fields of medicine, and especially in early detection of oncological pathology.

It is necessary to solve such problems at the planning period:

- clinics have to realize the programmes directed onto the early detection of pulmonary cancer, decreasing of risk factors influence, treatment of alcoholic and tobacco dependencies and putting it to the general list of medical services;

- scholars and teachers have to develop educational standards and methods in the field of early detection of oncological pathology for hospital workers at different levels increasing doctors' qualification;
- medical educational institutions have to work out the standard of doctors' pre- and postgraduate training in the field of early detection of pulmonary cancer (at primary, secondary and tertiary levels of medical aid);
- Ministry of Public Health should provide basic diagnostic and laboratory equipment in hospitals and clinics, especially at primary level of medical aid;
- it is necessary to introduce functional reconstruction of health centers according to modern technologies of prophylactic activities, and develop legal basis of their cooperation with medical enterprises;
- improve the selection of staff of applicants based on readiness to use new technologies for diagnosis and medical care;
- ensure the implementation of electronic patient cards and online resource materials that can detect lung cancer risk factors and information directed onto the help to patients based on free hosting;
- establish an interagency interaction between all the links of the proposed model for early detection of cancer pathology.

Optimized model includes new elements directed onto the early detection of pulmonary cancer among adults at the earliest period, when a patient does not feel any symptoms of disease; this model is available, provides integrated, phasing, continuity. Realization of these innovations will help to get the following results:

- *Medical expected effect:* reducing of oncological pathology in difficult conditions and the number of hospitalizations; extension of the contingent of adults covered by targeted preventive examinations (completeness of follow-up); shortening of treatment terms; improvement of the quality of health care; reducing of disability; factor improvement of a positive outcome;
- *Expected social effect:* an increasing of the life expectancy; improvement of the quality of life; reducing the impact of risk factors, including smoking and drug addiction; access to health care; satisfaction by the quality of care; reducing of disability;

- *Expected economic effect:* GDP growth; reducing of payments for temporary and permanent disability; reducing of losses from lower productivity of adults, weakened by oncological diseases; reducing of losses on additional training workers who replaced sick, disabled or died people; reducing of costs for health care due to the decreasing of the number of patients with severe pulmonary cancer.

Offered innovations and their effectiveness are corresponding to European Action Plan 2020. This model will have medical, social and economic effects by reducing of morbidity, disability and mortality.

Thus, the results indicate the goal and objectives of the study and can be recommended for implementation in Ukraine's health system.

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