

NATIONAL CANCER INSTITUTE



National Cancer Institute

VILNIUS, 2017

Contents

National Cancer Institute is celebrating its 85th anniversary!	5
Structure and Management	6
NCI scientific activities	8
Cancer Registry	9
Biobank	10
Laboratory of Biomedical Physics	11
Open Access Centre	13
Laboratory of Genetic Diagnostic	15
Laboratory of Molecular Oncology	17
Laboratory of Cancer Epidemiology	19
Laboratory of Immunology	21
Laboratory of Clinical Oncology	23
Clinical trials registration group	25
Participation in Cancer Prevention Programs	27
Attention to the patient	28
Clinic	32
Outpatients Department	34
Emergency Department	37
Thoracic Surgery and Oncology Department	39
ENT, Head and Neck Surgery and Oncology Department	42
Oncourology Department	45
Oncogynecology Department	48
Breast Surgery and Oncology Department	50
Radiology Department	53
Ultrasound Subdepartment	55
Medical Physics Department	56
Nuclear Medicine Department	58
Anesthesiology, Intensive Care and Operating-room Department	60
General and Abdominal Surgery and Oncology Department	62
Endoscopic Intervention Group	64
Medical Oncology Department	66
Radiation Oncology Department	68
Brachytherapy Department	71
External Beam Radiotherapy Department	73
Nursing Administration Department	76
Physical Medicine and Rehabilitation Department	77
Institute's friends	79

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National Cancer Institute is the only specialised oncology institution in Lithuania. The Institute acts as the clinical cancer centre, certified and accredited by the Organisation of European Cancer Institutes.

“We have many challenges and objectives. We strive that advanced science technologies and medical innovations would reach the National Cancer Institute as soon as possible. It is necessary for our patients.”



Director of the Institute
Prof. Feliksas Jankevičius, M.D., Ph.D.

➡ In order to achieve our strategic objectives, we cooperate with colleagues both in Lithuania and in the European research area. The diverse international level researches, related to nano-technologies, molecular biology, genetics and the most advanced immunotherapy are performed in the National Cancer Institute.

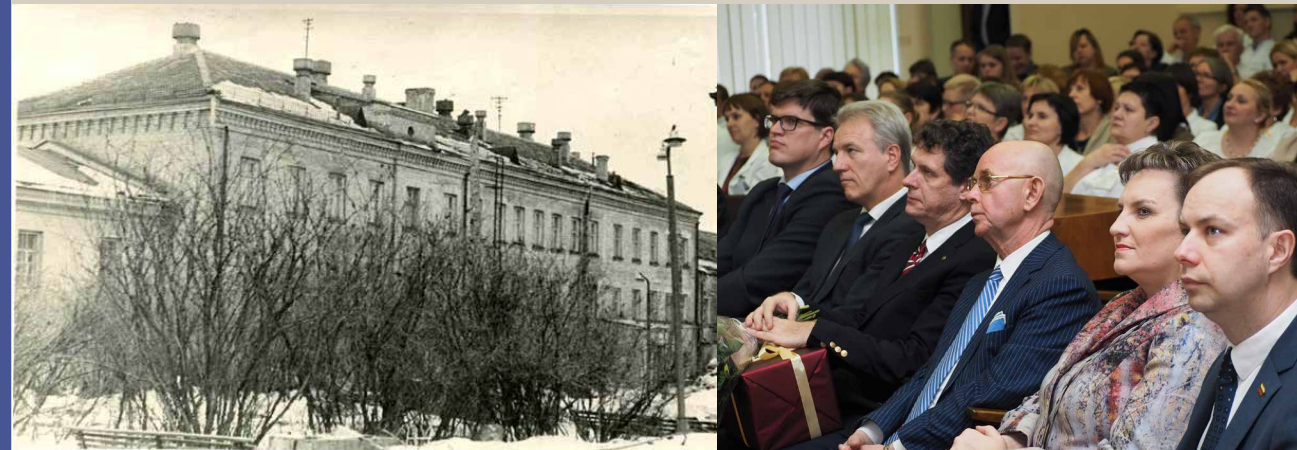
➡ The main challenge of modern oncology is implementation of foundations of individualised precision medicine. This modern approach

includes the early and accurate cancer diagnosis, appropriate treatment strategy selection, active prevention and monitoring programs, palliative medicine.

➡ We have a multidimensional clinic, the foundations of which are divisions of various cancer localizations – breast, lung, gastrointestinal, gynecological and urological, head and neck divisions. The effective treatment using modern technologies is applied in these divisions.

National Cancer Institute is celebrating its 85th anniversary!

1st December 2016



According to initiative of Head of the Department of General and Experimental Pathology of Vilnius University Professor Kazimierz Pelchar the Oncology Hospital and Institute (Polocko St. 6) started functioning in Vilnius, Lithuania together with the first oncology centres in Europe on 1st December 1931. Also, scientific works were performed there, already at that time biological cancer formation problems were deeply analysed.

“Results of treatment of the patients with oncological diseases depend not only on the scientific achievements, the latest technologies, but also on the specialists working in the clinic. It is estimated that during the 85-year period, already the third generation of oncologists has worked at the Institute. The practice of transferring valuable scientific and clinical experience from one generation to the next generation is continuous in the pedagogical activities of the Institute.”

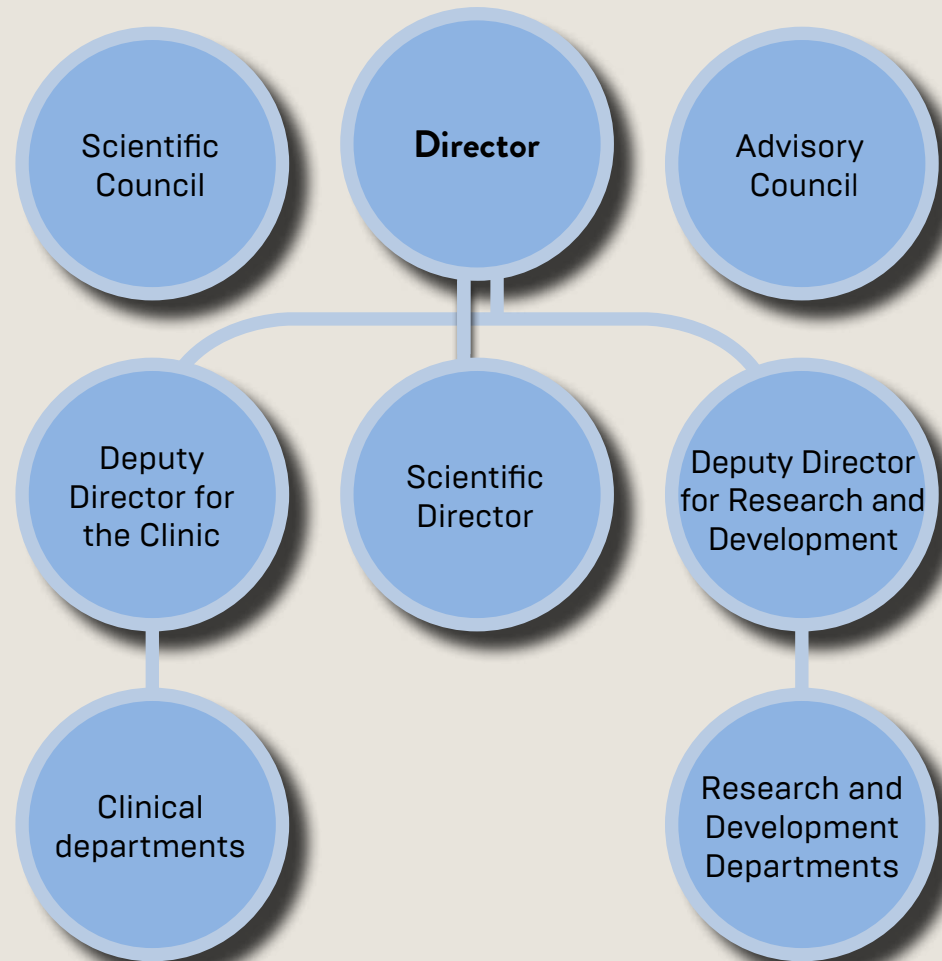
Minister of Health Prof. Aurelijus Veryga



Structure and Management

Restructuring of the National Cancer Institute (Institute, NCI) was prepared and implemented in 2016, management of the Institute was simplified, the nursing administration system was reorganized, the Cancer Registry has been restored, and the Genetic Diagnostics Unit and laboratories of Cancer Epidemiology and Clinical

Oncology were established. We are aiming for licensing of activities of National Cancer Institute Biobank, it will give an opportunity to use patients' biological material not only for scientific research carried out by the Institute, but also for performing of joint research with Lithuanian and foreign scientists and researchers.



Deputy Director for the Clinic
Prof. Saulius Cicėnas, M.D., Ph.D.



Deputy Director for Research and Development
Prof. Sonata Jarmalaitė, Ph.D.

What are the priorities of the NCI Clinic?

Modern therapies focusing on low invasive surgical interventions, innovative anticancer medicines, implementing modern radiotherapy techniques. The purpose of our work is the better quality of life of the patient.

What is important for oncology science today?

It is most important to transfer scientific knowledge and achievements to the clinic as quickly as possible and to hear the main problems of clinicians. Researches in laboratory, especially in NCI, should be performed thinking about the patients.

Our employees

	Staff	
Scientists	59	
Doctors	180	
Nursing specialists	401	
Other medical staff	183	
Other staff	294	
Residents	16	
Total	1133	

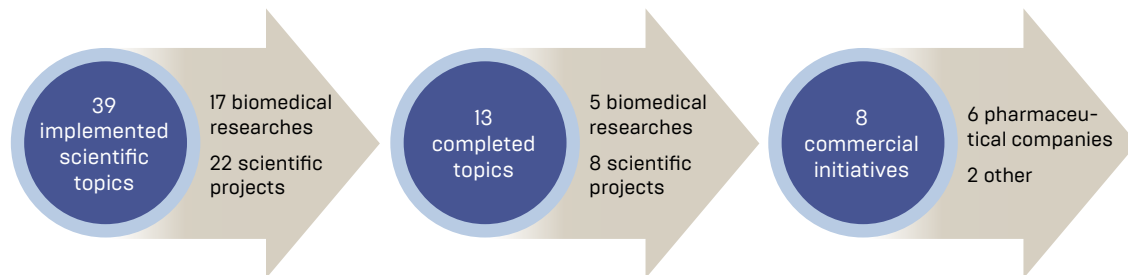
NCI scientific activities

The patient-oriented international level scientific research works are performed at the Institute with help of biotechnology, nanomedicine, genomics, proteomics and other modern technologies in order to achieve the most important goal - to reduce oncological morbidity, mortality from oncological diseases, and increase the life expectancy of pa-

tients, improve their quality of life. The main areas of scientific activity are cancer prevention, based on epidemiological, experimental and laboratory studies, improvement of tumor diagnostic methods, search and implementation of new treatment measures and methods.

Scientific activeness of NCI, 2016

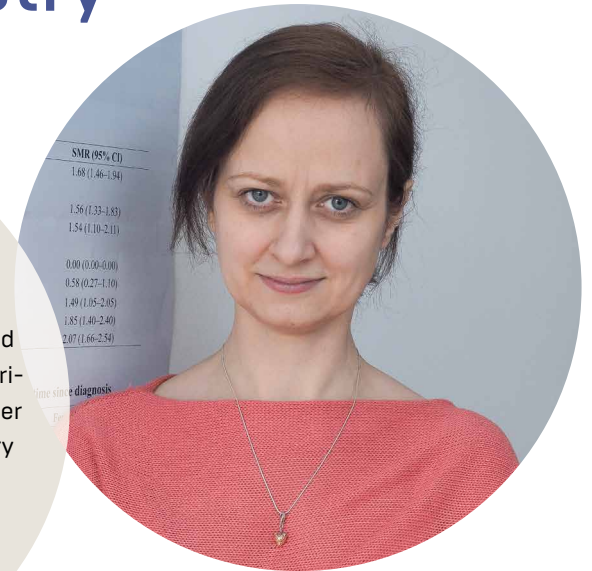
Doctoral theses	4	
Monographs and textbooks	2	
Articles in WoS publications	36	
Articles in international peer-reviewed publications	5	
Articles in LT peer reviewed publications included in international databases	20	
Other articles	11	



The title of Emeritus was given for the first time in NCI - according to the decision of NCI Scientific Council, the title of Scientist Emeritus was granted to Prof. Janina Didžiapetrienė.

Cancer Registry

Head Ieva Vincerževskienė



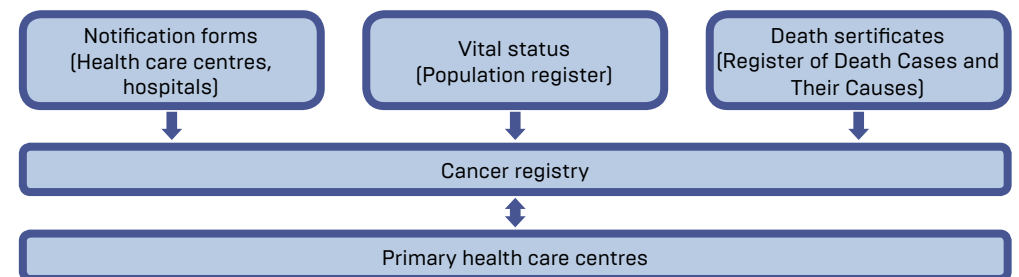
Where is data of NCI cancer registry published?

Annual registry reports on cancer incidence „Cancer in Lithuania“ (in Lithuanian language) have been published since 1994. The Registry data since the period 1988-1992 have been included in „Cancer Incidence in Five Continents“. The registry is also involved in cancer epidemiology research, and has participated in main epidemiological and international comparison studies (EUNICE, EURO CARE, CONCORD, and ICCC).

The Cancer Registry is a population registry, the purpose of which is to ensure registration of malignant tumors throughout Lithuania. Since 1978 information about cancer cases in Lithuania has been accumulated in the Cancer Registry database, and in recent years more than 17 000 new cases of cancer have been reported annually. The Cancer Registry data

are published in the informative publication “Cancer in Lithuania” (“Vėžys Lietuvoje”) from 1994 (the title “The Main Results of Oncological Care in Lithuania” was used until 2006). The Cancer Registry is the member of **International Association of Cancer Registries** and **European Network of Cancer registries**.

How do data come to the Cancer Registry?



Biobank

Head Živilė Gudlevičienė, M.D., Ph.D.

Why does NCI need biobank?

Biobank consists of libraries of new generation, in which biomedical samples and health information of patients that were treated in NCI, are collected, stored and processed. We will accumulate large, well-classified collections of biological samples and health information of oncological patients, and researchers of the new generation will be able to use them, to search, find and receive information, intended for them for performing of high-level scientific researches.



Research areas

- Creation, mastering and transfer for clinical practice of new freezing technologies (cryobiology researches, cell and tissue freezing technologies).
- The search for molecular and genetic cancer markers (gene polymorphisms, gene expression tests in tumors of various localities), researches of carcinogenesis signalling paths.

Main projects

1. Significance of polymorphism of oncogenetic human papillomaviruses types and some genes, causing tumor process in carcinogenesis (2014-2018, Head Ž. Gudlevičienė).
2. Significance of polymorphism of oncogenic types of human papillomaviruses and genes, influencing some tumor processes to efficiency of oncological patient therapy (2013-2017, Heads Ž. Gudlevičienė, A. Stumbrytė).
3. Reducing of the gap between Europe and Africa in the area of bio-banking and biomedical researches (2015-2018, Head Ž. Gudlevičienė).

Laboratory of Biomedical Physics

Head Prof. Ričardas Rotomskis, Ph.D.

What is common in oncology and physics?

Physical energy processes take place in cancer cells, and they are made up of levers, discs, electrical particles, pumps, membranes and other electrical and molecular devices, described in physics. So, without a doubt, help of physicists is necessary in order to fight with cancer illnesses successfully, to diagnose cancer timely and accurately, and to treat it effectively without harm to the entire human organism.



Research areas

- Steady state and time resolved spectroscopy of biologically active molecules, photodrugs, sensitizers, gold-nanoclusters and nanoparticles in aqueous solution, healthy and cancerous cells and experimental animals.
- The primary photophysical, photochemical processes, and nanotoxicity of biologically active molecules, anticancer drugs, sensitizers biomarkers, nanoparticles and nanoplateforms *in vitro* and *in vivo*.
- Pharmacokinetics, accumulation and distribution of sensitizers, photodrugs, nanoparticles in 2D and 3D structures of healthy, cancerous and stem cells, healthy and cancerous tissues by confocal microscopy, spectroscopy and flow cytometry.
- Developing of the new multifunctional diagnostics methods and therapy of cancer by implementing nanotechnological solutions - toward theranostics.

✓ Main projects

1. Research of nanoparticles and heavy metal toxicity mechanisms on fish during ontogenesis (2016-2018, Head R. Rotomskis).
2. Response of mesenchymal stem cells and cancerous stem cells to impact of nanoparticles (2014-2016, Head R. Rotomskis).
3. Modelling of toxicity of nanomaterials (MODENA) TDI204 activities. (2014-2016, Head R. Rotomskis).
4. The European upconversion network – from the design of photon-upconverting nanomaterials to biomedical applications (2014-2018, Head R. Rotomskis).

📖 Selected publications

1. Damalakiene, L., Karabanovas, V., Bagdonas, S. and Rotomskis, R., "Fluorescence-Lifetime Imaging Microscopy for Visualization of Quantum Dots' Endocytic Pathway." *International Journal of Molecular Sciences* 17.4 (2016): 473
2. Jarockyte, G., Daugelaite, E., Stasys, M., Statkute, U., Poderys, V., Tseng, T. C., Hsu, S. H., Karabanovas, V. and Rotomskis, R., "Accumulation and Toxicity of Superparamagnetic Iron Oxide Nanoparticles in Cells and Experimental Animals." *International Journal of Molecular Sciences* 17.8 (2016): 1193
3. Poderys, V., Matulionyte-Safine, M., Rupsys, D., Rotomskis R. "Protein Stabilized Au Nanoclusters: Spectral Properties and Photostability." *Lithuanian Journal of Physics* 56.1 (2016): 55–65.

📅 Event

II International Conference Current Trends in Cancer Theranostics (CTCT) 2016 was held. The Conference Scientific Committee - NanoPhoto Coordinator Dr. V. Sivakov of the Baltic countries network, Leibniz Institute of Photonic Technology, Germany, Coordinator of European

upconverting nanoparticles network Prof. A. Bednarkiewicz, Polish Academy of Sciences, Prof. R. Rotomskis, NCI. Interdisciplinary problems and priority axes of application of nanotechnologies in cancer therapy and diagnostics were discussed.

Open Access Centre

Head of the Centre Vitalijus Karabanovas, Ph.D.

What is the area of treatment of oncological diseases in which breakthrough might happen?

It is believed that regardless of etiology and localization of tumors, specific tumor cells, having stem cell properties, which are able to recreate tumor formations, destroyed during treatment, may cause resistance to medical treatment and radiotherapy. So breakthrough is the most welcome in the area of developing of the methods and measures of detection and destruction of such cancerous stem cells using nanotechnological, genomic, proteomic, cellular and molecular therapies solutions.



✓ Main objectives of OAC

- Provision of services while implementing scientific researches in the areas of biomedical physics, optic biopsy, nanomedicine, participation in Lithuanian and international scientific research programs.
- Ordered scientific researches
- Inter-institutional and scientific business cooperation.
- Upgrading of infrastructure and development of human resources.

✓ Main projects

1. Synthesis, modification and characterization of nanoparticles dedicated to oncology problems, using colloid chemistry synthesis methodologies and methods of atomic force microscopy and dynamic spread.
2. Researches of photosensitization and photothermal properties of nanoparticles, while improving efficiency of photodynamic therapy of different localization tumors.

3. Improvement of optical, MRI and CT methods, while applying the latest nanotechnology solutions.
 4. Creation of selective nanoplatfoms, which transport medicines and researches of their accumulation,
 5. Researches of accumulation of nanostructures, pharmacokinetics, cytotoxicity and embryotoxicity, using experimental animals.
- intracellular transport and effects on tumor cells *in vitro*.

Event

"We believe in progress of science" - The employees of NCI celebrated the World Cancer Day with this slogan tak-

ing part in the international campaign "TALKING HANDS".

Laboratory of Genetic Diagnostic

Head Rasa Sabaliauskaitė, Ph.D.



Can geneticists help oncologists?

Not only hereditary diseases are determined using genetic research, during treatment of oncological patients we perform gene mutation researches, which are important during application of biological targeted therapy. It is a part of an individualised treatment, the possibility to choose the most suitable medicine for treatment of the patient.

The newest genetic analysis methods: a next generation sequencing and real-time PCR. Next-Generation Sequencing allows to perform multiple gene sequencing during one run and to determine the overall gene mutation or gene expression profile. Real-time PCR method allows detecting selected gene mutations precisely, sensitively and rapidly, it is important for the selection of targeted therapies and for predicting of the course of the disease. Cancer DNA and cancer cells, circu-

lating in body fluids, are examined in the laboratory. Researches of *BRCA1/2* and other gene mutations, which help to diagnose familial tumors, are performed. Over 40 immunoassay tests are performed in the laboratory of tumor markers every year; the wide spectrum of examined tumor markers is implemented.

Performed research directions are related to search and detection of non-invasive cancer biomarkers.



✓ Main projects

- LMT SEN 09/2016 “Molecular tools for individualisation of long-term monitoring and treatment of prostate cancer.”
- Study of kidney cancer molecular markers in patients’ urine (ordered research of “Novartis Pharma Services”, sponsored by MITA).

📖 Selected publications

1. Demidenko, R., Daniunaite, K., Bakavicius, A., Sabaliauskaite, R., Skeberdyte, A., Petroska, D., Laurinavicius, A., Jankevicius, F., Lazutka, J. R. and Jarmalaite, S. “Decreased expression of *MT1E* is a potential biomarker of prostate cancer progression.” *Oncotarget* (2017).
2. Stuopelyte, K., Daniunaite, K., Bakavicius, A., Lazutka, J. R., Jankevicius, F. and Jarmalaite, S. “The utility of urine-circulating miRNAs for detection of prostate cancer.” *British Journal of Cancer* 115.6 (2016): 707-15.
3. Stuopelytė, K., Daniūnaitė, K., Jankevičius, F., Jarmalaitė, S. Detection of miRNAs in urine of prostate cancer patients. *Medicina* 52.2(2016):116-24.

Laboratory of Molecular Oncology

Prof. Kęstutis Sužiedėlis, Ph.D.



What are distinctive features of modern molecular cancer researches?

The purpose of performing of molecular cancer researches of the previous era was to deepen the understanding of cancer development. At present the vast majority of molecular cancer researches is designed for development of more effective anti-cancer therapy strategies.

While performing modern researches, cancer researchers accumulate far more data, so the probability increases to obtain clinically significant results of the researches, the implementation of which in the Clinic is also significant.

Experimental and clinical studies are performed in the laboratory. Technologies of total researches are implemented, new generation sequencing technologies, modern modelling sys-

tems (infrastructure of cell cultivation in monolayer and spatial cultures) are applied, and experience of researches using patient biomaterials is accumulated.

🔍 Research areas

1. Search for molecular cancer markers for cancer diagnosis, prognosis, and individualization of treatment, is based on cancer biology knowledge.
2. The objective is a better understanding of molecular processes occurring in cancer cells and in organisms of patients during anti-cancer therapies for development of strategies of more effective anti-cancer therapy.



✓ Main projects

1. Identification of cancer progression associated circulating miRNA for disease prognosis and evaluation of the effectivity of anticancer therapy (2015-2018, Head Prof. N. E. Samalavičius).
2. Development of the molecular tool for determination of thyroid follicular carcinoma. (2017-2019, Head Dr. K. Sužiedėlis)
3. Assessment of brain tumors prognostic factors and early response to treatment by imaging biomarkers (2014-2017, Head Dr. E. Aleknavičius).

📖 Selected publications

1. Usinskiene, J., Ulyte, A., Bjørnerud, A., Venius, J., Vasileios, K., Katsaros, Rynkeviciene, R., Letautiene, S., Norkus, D., Suziedelis, K., Rocka, S., Usinskas, A. and Aleknavicius, E. "Erratum to: Optimal differentiation of high- and low-grade glioma and metastasis: a meta-analysis of perfusion, diffusion, and spectroscopy metrics." *Neuroradiology* 58.7 (2016): 741.
2. Stankevicius, V., Vasauskas, G., Bulotiene, D., Butkyte, S., Jarmalaite, S., Rotomskis, R. and Suziedelis, K. "Gene and miRNA expression signature of Lewis lung carcinoma LLC1 cells in extracellular matrix enriched microenvironment." *BMC Cancer* 16.1 (2016): n. pag.
3. Stankevicius, V., Vasauskas, G., Rynkeviciene, R., Venius, J., Pasukoniene, V., Aleknavicius, E., Suziedelis, K. "Microenvironment and dose-delivery-dependent response after exposure to ionizing radiation in human colorectal cancer cell lines." *Biochemical and Biophysical Research Communications*. 18;484.4 (2017):726-733.

Laboratory of Cancer Epidemiology

Head Giedrė Smailytė, Ph.D.

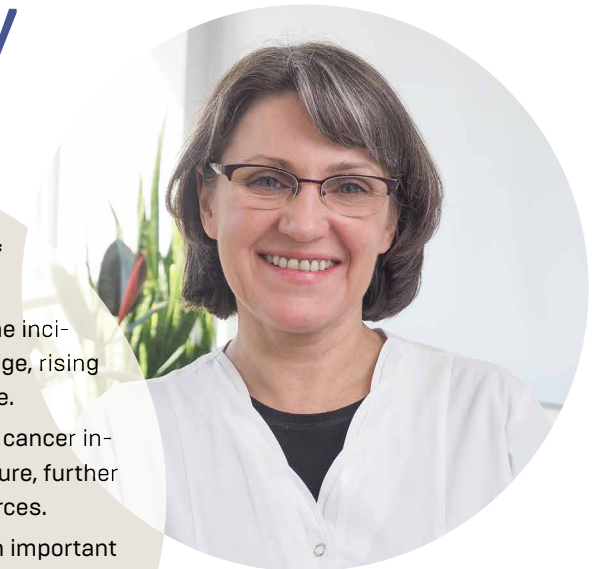
What is the role of cancer epidemiology in developing of health policy?

Cancer is an age-related disease - the incidence of most cancers increases with age, rising more rapidly beginning in midlife.

As part of the epidemiological transition, cancer incidence is expected to increase in the future, further straining limited health care resources.

Descriptive cancer epidemiology holds an important role in influencing policy and research initiatives, from both health systems and scientific perspectives.

Appropriate allocation of resources for cancer prevention, early diagnosis, and curative and palliative care requires detailed knowledge of the local burden of cancer.



🔍 Research areas

- Descriptive studies based on Lithuanian Cancer Registry data (analysis of cancer incidence, mortality, survival).
- Research to identify occupational, environmental, and other factors affecting cancer risk, characterize exposure-response relationships, identify susceptible populations.
- Prevention and screening-based research (analysis of different aspects of screening interventions).

✓ Main projects

1. Surveillance of mammographic screening and prostate cancer early detection programmes (2016–2020, Principal investigator: G. Smailytė). 2019, Principal investigator: Rūta Everatt).
2. Impact of participation in screening programme on the risk of death from cervical cancer in Lithuania (2017–2019, Principal investigator: G. Smailytė).
3. Site-specific cancer risk and mortality risk in the cohort of Chernobyl cleanup workers (2017–2020, Principal investigator: G. Smailytė).

📖 Selected publications

1. Kaceniene, A., Krilaviciute, A., Matuiziene, J., Bulotiene, G., Smailyte, G. "Increasing suicide risk among cancer patients in Lithuania from 1993 to 2012: a cancer registry-based study." *European Journal of Cancer Prevention*. (2017). patients", 2001–2009, *Acta Oncologica* 55.7 (2016): 859–64.
2. Smailyte, G., Jasilionis, D., Vincerzevskiene, I., Shkolnikov, VM. "Education, survival, and avoidable deaths in Lithuanian cancer patients". *Acta Oncologica* 55.7 (2016): 859–64.
3. Gondos, A., Krilaviciute, A., Smailyte, G., Ulys, A. and Brenner, H. "Cancer surveillance using registry data: Results and recommendations for the Lithuanian national prostate cancer early detection programme." *European Journal of Cancer* 51.12 (2015): 1630–637.

📅 Event

International seminar organised – „Persisting burden of alcohol in Central and Eastern Europe: recent evidence and measurement issues“. Seminar was focused on both the estimation of the population level burden of alcohol and newest individual-level evidence on determinants and consequences of harmful alcohol consumption.

Laboratory of Immunology

Head Vita Pašukonienė, Ph.D.

Immunology research news, future?

Scientific progress in the area of immunology and immunotherapy provides more and more opportunities to use the knowledge for treatment of cancer. We have worked for many years in this area, and we are the only group of cancer immunology scientists in Lithuania having the best qualified specialists. We become more relevant to cancer patients and the doctors that treat them.



🔍 Research areas

1. Cancer Immunology:
 - Immunomonitoring of cancer patients.
 - Determination of immune biomarkers and prediction of anti-cancer treatment effectiveness.
 - Researches of immunogenicity and resistance of the tumor microenvironment.
2. Cancer immunotherapy:
 - Research of anti-cancer immunotherapy possibilities.
 - Researches of prognostic and predictive molecular markers with immunotherapy autologous dendritic cell vaccines.
3. Cell technologies:
 - Researches of increasing of the efficiency of dendritic cell vaccines.
 - Development and researches of anticancer vaccines.

✓ Main projects

1. Immunomodulating properties of bacteriophage-derived dsRNA of different size and their use as vaccine adjuvants (2016-2018, Head V. Pašukonienė).
2. We participate in the project "New prodrug activation systems for cancer genotherapies" of the national program "Healthy Aging" as partners. (2015-2018, Head J. Urbonavičius, Vilnius University).
3. Advanced therapies medical preparations, modulating the immune system, for treatment of cancer. (2017 -2019, Head V. Pašukonienė).
4. Research of anti-cancer effectiveness of dendritic cells differentiated *in vitro* and matured using tumor destruction products *in vivo* in the models of experimental animals. (2017 -2021, Head V. Pašukonienė).

📖 Selected publications

1. Kraško, J. A., Žilionytė, K., Darinskas, A., Strioga, M., Rjabceva, S., Zalutsky, I., Derevyanko, M., Kulchitsky, V., Lubitz, W., Kudela, P., Miseikyte-Kaubriene, E., Karaman, O., Didenko, H., Potebnya, H., Chekhun, V., Pašukonienė, V. "Bacterial ghosts as adjuvants in syngeneic tumour cell lysate-based anticancer vaccination in a murine lung carcinoma model." *Oncology Reports* 37.1 (2016): 171-78.
2. Dobrovolskienė, N. T., Cicėnas, S., Kazlauskaitė, S. N., Mišeikytė-Kaubrienė, E., Krasko, J. A., Ostapenko, V., Pašukonienė, V., Strioga M. M. . "CD8(high) CD57(+) T-cell population as an independent predictor of response to chemoradiation therapy in extensive-stage small cell lung cancer." *Lung Cancer* 90.2 (2015) 326-333.
3. Strioga, M. M., Darinskas, A., Pasukoniene, V., Mlynska, A., Ostapenko, V. and Schijns, V. "Xenogeneic therapeutic cancer vaccines as breakers of immune tolerance for clinical application: To use or not to use?" *Vaccine* 32.32 (2014): 4015-024.

📅 Events

1. Annual event dedicated to International Immunology Day (29th April). The event is organized jointly with the Lithuanian Society of Immunologists.
2. Taiwan – Latvia - Lithuania Cooperation Project "Immunomodulating properties of bacteriophage derived dsRNA of different size and their use as vaccine adjuvants" the first year meeting Sept 29 - Oct 2, 2016, Vilnius.

Laboratory of Clinical Oncology

Acting Head Ernestas Janulionis, M.D., Ph.D.

How do you participate in the implementation of the "from bench to bed" principle?

As a link between basic and clinical science, Clinical Oncology laboratory aims to accelerate our ability to translate findings made in basic research into real applications at patient's bedside.



Staff of Laboratory includes representatives from different clinical departments and their task is to collaborate with scientists in order to improve Cancer diagnostics, treatment and Cancer care services. Works are going towards research and investigation of biomarkers in different cancer sites, different radiation treatment/fractionation modalities, combined treatment (surgery/

radiation/medical oncology) variations, effects of treatment response evaluated by MRI, CT and SPECT-CT scanners, tumor/cells radiosensitivity investigation, possible implication of immunotherapy and other methods in order to apply personalised treatment strategy to each patient.

✓ Main projects

- Perspective observation cohortive clinical trial to define resectal length in colon Cancer (2016-2018, Head A. Dulskas).
- Analysis of non -small cell lung cancer immune microenvironment and its prognostic and predictive value (2016-2020, Head S. Cicenias).
- Molecular tools for long term prostate cancer follow-up and treatment individualisation (2016-2018, Head F. Jankevicius).
- Perspective analysis of malignant gliomas multiparametric MRI biomarkers and response to the treatment (2014-2019, Head E. Aleknavicius).

📖 Selected publications

1. Dulskas, A., and Samalavicius, N. E. "A prospective study of sexual and urinary function before and after total mesorectal excision." *International Journal of Colorectal Disease* 31.6 (2016): 1125-130.
2. Everatt, R., Kuzmickiene, I., Davidaviciene, E., and Cicenias, S. "Incidence of lung cancer among patients with tuberculosis: a nationwide cohort study in Lithuania." *The International Journal of Tuberculosis and Lung Disease* 20.6 (2016): 757-63.

Clinical trials registration group

Head of the group Edita Baltruškevičienė, M.D., Ph.D.

What is the importance of clinical trials to our patient?

Clinical trials are the possibilities for our doctors to be involved in research of new possible medical agents and for our patients to take a few steps forward and get the most novel treatment before it becomes available.



Clinical trials is priority oncology area, which ensure the emergence of new effective medicines, biomarker research, and justification of medical methodologies by evidence and science. More than 20 phase II, phase III, and phase IV clinical trials, involving approximately 100 patients and 15% of institute staff, are performed in National Cancer Institute every year. Clinical trials of various localizations solid tumors are performed; but the most common are in the areas of breast, prostate, lung, stomach, pancreas and head-neck tumors. Phase I clinical trials will be started in the near future.

Working in the area of clinical trials for more than 15 years, we managed to create the clinical trials coordination structure involving the professional and skilled staff. This allows us to ensure high quality implementation of clinical trials, following the guidelines for good clinical practice. All implemented clinical trials are approved by the Lithuanian Bioethics Committee and the State Medicines Control Agency.

Currently, 22 clinical trials are performed in the Institute; 8 of them are actively recruiting patients. We have the possibility to carry out trials of all phases, from I to IV, in the Institute.

✓ Active clinical researches

1. An open label, single arm, multicenter, safety study of atezolizumab in locally advanced or metastatic urothelial or non-urothelial carcinoma of the urinary tract.
2. A Phase 3, Randomized, Double-Blind, Placebo-Controlled, Multicenter Study of PEGylated Recombinant Human Hyaluronidase (PEGPH20) in Combination With Nab-Paclitaxel Plus Gemcitabine Compared With Placebo Plus Nab-Paclitaxel and Gemcitabine in Participants With Hyaluronan-High Stage IV Previously Untreated Pancreatic Ductal Adenocarcinoma.
3. Exploratory, Non-Interventional Study For Evaluating The Diagnostic, Prognostic And Response-Predictive Value Of A Multi Biomarker Approach In Metastatic GEP NETs.
4. AZD9291, an Irreversible EGFR-TKI, in Relapsed EGFR-mutated Non-small Cell Lung Cancer Patients Previously Treated With an EGFR-TKI, Coupled to Extensive Translational Studies.
5. A Phase 3 Randomized, Placebo-controlled Trial of Carboplatin and Paclitaxel With or Without Veliparib (ABT-888) in HER2-negative Metastatic or Locally Advanced Unresectable BRCA-associated Breast Cancer.
6. A multinational, randomised, double-blind, placebo-controlled, phase III efficacy and safety study of odm-201 in men with high-risk non-metastatic castration-resistant prostate cancer.
7. A Randomized, Double Blind, Multicenter, Parallel-group, Phase III Study to Evaluate Efficacy and Safety of DCVAC/PCa Versus Placebo in Men With Metastatic Castration Resistant Prostate Cancer Eligible for 1st Line Chemotherapy.
8. A Two-Part, Open-Label, Randomized, Phase II/III Study Evaluating the Efficacy, Safety and Pharmacokinetics of Dinutuximab for Second Line Treatment of Subjects with Relapsed or Refractory Small Cell Lung Cancer

Participation in Cancer Prevention Programs

The second report about *Cancer Screening in the European Union* was published in 2017. In accordance with the data of this report, 35-45% of women undergo medical examination according to the breast cancer prevention program in Lithuania. Also, 35-45% of women un-

dergo medical examination according to the cervical cancer prevention program in Lithuania. The best results are the results of colorectal cancer prevention program - 46-56% of people check their health.

NCI preventive screening programs in 2016

9423 Breast cancer

901 Colorectal cancer

606 Prostate Cancer

73¹ Cervical cancer

The initiator and organizer of cancer prevention in Lithuania, one of the most famous representatives of oncology science in Lithuania, well known in the international arena, Professor Laima Liudvika Griciūtė celebrated the 90th anniversary last year. NCI community celebrated the respectable anniversary. Professor L. L. Griciūtė is the founder and fosterer of Lithuanian experimental oncology, the healthy lifestyle propagator and the tireless fighter against tobacco smoking.



¹ Preventive program tests - smear, cervical biopsy service - are performed at primary and secondary health care institutions. Patients with pathology, identified by the program, are consulted at the Institute.

Attention to the patient

The **Cancer Information Centre** operates in the National Cancer Institute from 2000, in this centre the patients can learn more about -

- cancer prevention and early diagnosis,
- oncological diseases, the methods of their treatment, and side effects.
- possibilities and means for improving of the quality of life,
- possibilities of solving of social problems in Lithuania (sick leave certificates, determination of capacity for work, nursing and supportive care institutions, reimbursement of medicines and medical treatment, etc.).
- possibilities to find additional support for the patient, who is undergoing treatment at home, to provide psychological assistance to the patient and his or her relatives.



The newspaper **"Oncologist's pages"** for patients, their relatives and anyone who is interested in oncology has been published since 2004. The newspaper is published four times a year in 2000 copies. During publication of the newspaper, the cooperation is performed with the Lithuanian Association of Prostate Cancer Patients and the National Association of Breast Diseases.

Major projects with the National Association of Breast Diseases

- Conference "Will science meet the expectations?" Vilnius University Life Sciences Centre Prof. Virginijus

Šikšnys and Deputy Director for Research and Development Prof. Sonata Jarmalaitė talked about

for them to socialize with other people suffering from cancer, to share experiences and hear the professional's opinion, ask specialists.

hereditary altered genes, about the possibility to correct them in the future and correct genetic damage.



- The press conference about breast cancer and prevention of this disease, genetic research opportunities. The young woman, whose beloved mother died from breast cancer and NCI doctors participated in the conference.
- The continuing project "Life node" (together with Vilnius Academy of Arts, LINDEX (Sweden) and OMNITEKSAS (Lithuania) was designed for women who lost their hair during chemotherapy - creative workshops were organized for patients, publications were issued.



- Women's Marathon - Training was conducted how to perform the breast self-exam in the Town of Runners



- The first Lithuanian original educational video clip about the breast self-exam was created.

Cooperation with Oncology Patients Aid Association (POLA)



- POLA organised the workshops of the famous UK scientist and oncologist prof. Robert J. Thomas for medical practitioners and patients together with the National Cancer Institute.

Prostate Cancer Awareness Day together with the Association of Prostate Cancer Patients

- The press conference on the occasion of International Prostate Cancer Awareness Day. Two apple trees, as symbols of life, were planted during the conference. Chef

Luca di Marco cooked healthy food for the participants of the press conference.

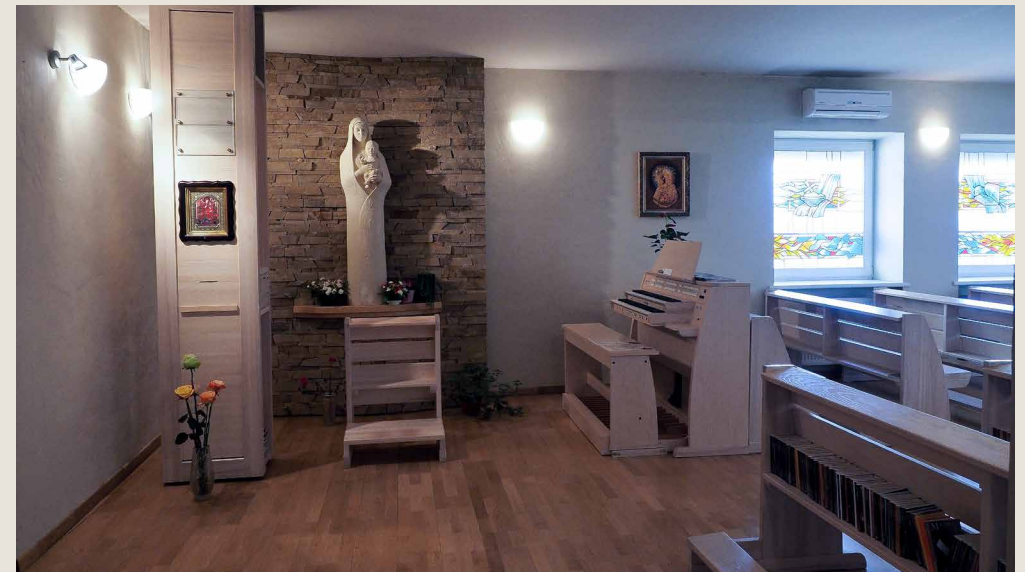


Beauty afternoons

- Beauty afternoons - continuing project at the chemotherapy department. The specifics of make-up, when chemotherapy is applied to women, is demonstrated during the project. Tattoo artists arrive.



Chapel



- Spiritual services are provided in the Chapel of Mother of Mercy in the National Cancer Institute, Mass is celebrated, the chaplain of the Chapel visits patients with serious illnesses, who are treated at the Institute's clinics, volunteers of the Chapel work on weekends, church music concerts are organised.
- If patients want - priests of other confessions communicate with them.
- The patients, who are treated in the National Cancer Institute receive great and sincere attention of the highest church clergy before Christmas, the World Day of the Sick, and other celebrations, Mass is celebrated.

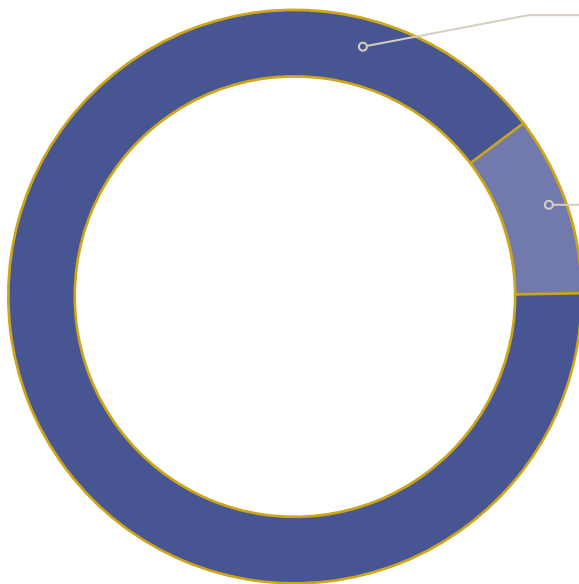
Clinic

Clinical departments of the accredited multi-profile Clinical Cancer Centre implement politics of reducing of morbidity and mortality from oncological diseases, perform scientific researches, develop cancer prevention and control activities, provide health care services in oncology and prepare high-level specialists in cooperation with national and international institutions.

Clinical activity involves multidisciplinary teams, which is particularly important for the success of cancer treatment. All activities focus on individualized patient treatment - the best treatment option is chosen for the patient. Modern and innovative methods of treatment are constantly implemented while improving the quality of provided treatment.

128295 consultations provided

13750 patients treated



Clinic's Departments



Outpatients Department

Head Daiva Kanopienė, M.D., Ph.D.

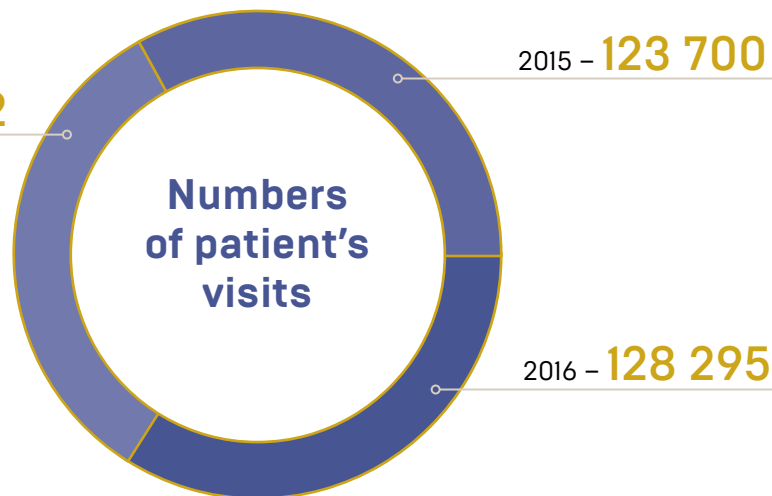


Why is teamwork important?

Teamwork is especially important in the outpatient unit in order to provide patients with a high quality service. It is very important that quality services would be guaranteed at all levels - during registering, the consultation of the doctor or during preparation of the patient for further treatment. It is equally important that the doctors' team would discuss treatment tactics.

Staff

Total	Doctors	Nurses
73	21	30



PROFILES OF CASES

2014		
Diseases of the urinary system organs	19844	
Breast Diseases:	28000	
Skin and soft tissue diseases:	17007	
Consultations of the chemotherapist:	21747	
Other locations of diseases:	58598	

2015		
Diseases of the urinary system organs	19632	
Breast Diseases:	28255	
Skin and soft tissue diseases:	16722	
Consultations of the chemotherapist:	21662	
Other locations of diseases:	58598	

2016		
Diseases of the urinary system organs	20091	
Breast Diseases:	29443	
Skin and soft tissue diseases:	17053	
Consultations of the chemotherapist:	23028	
Other locations of diseases:	38680	

✓ Main projects

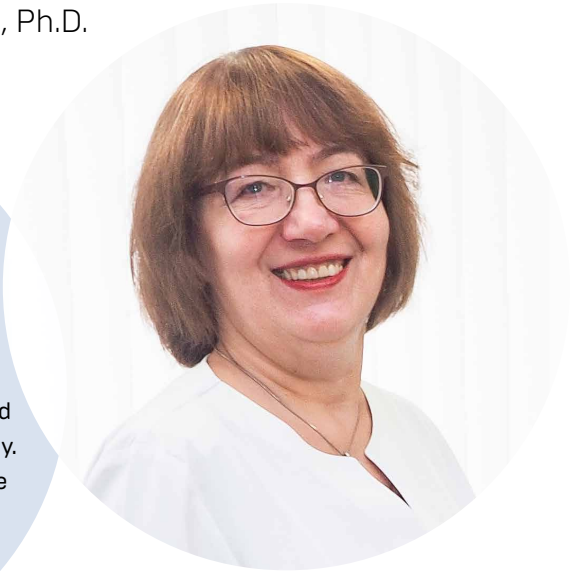
- Research of microsatellite instability of patients with pre-cancerous diseases and cancer of cervix and uterine body cancer (2010-2018, main researches: Dr. D. Kanopienė, Prof. Dr. (HP) Kęstutis Sužiedėlis, and Prof. Dr. (HP) Janina Didžiapetrienė).
- Researches of expression of E3 ubiquitin ligases FBW7 and MDM2 and their substrates in patients' samples of dysplastic nevi and melanomas (2016-202x0, main researcher: K. Bielskienė).
- The NCI, as a partner, together with the coordinator VU, implements the National Health Program's "Healthy Aging" project "Research of application of human carbonic anhydrase IX as the cancer cell marker for diagnosis, imaging and forecasting of oncological diseases" (2015-2018, main researchers: Dr. Daiva Kanopienė, Dr. Jurgita Matulienė).

📄 Selected publications

1. Vaisnorienė, I., Didžiapetrienė, J., Zalgevičienė, V., Laurinavičienė, A., Vaisnoras, T., Kulvietis, V. and Rotomskis, R. "Reflectance confocal microscopy (RCM) and melanocyte-specific immunostaining of histologic skin sections." *Journal of the American Academy of Dermatology* 75.2 (2016): 439-40.
2. Steponavičienė, L., Smailytė, G., Briedienė, R. and Gudavičienė, D. "Opportunistic screening does not improve early breast cancer (BC) detection and does not reduce BC mortality." *The Breast* 32 (2017).
3. Steponavičienė, L., Gudavičienė, D., Briedienė, R., Garnelytė, A., and Petroska, D. "Encapsulated papillary carcinoma: diagnosis, treatment and outcomes. A single institution experience." *The Breast* 32 (2017).

Emergency Department

Head Janina Buterlevičiūtė, M.D., Ph.D.



What is the significance of emergency care in the context of oncological services?

We provide assistance to our patients around the clock, assistance is provided to patients, who have been treated in the Institute in outpatient or inpatient way, and who need urgent help at any time of the day. Knowing that the patient can always come to us reduces patient's tension, stress and fear, which allows expecting better results of combined treatment of cancer.

Staff

Total	Doctors	Nurses
27	9	16

HOSPITALIZATIONS	2016	
Thoracic Surgery and Oncology Department	1 081	
Breast Surgery and Oncology Department	1 246	
General and Abdominal Surgery and Oncology Department	1 516	
Oncourology Department	2 052	
Oncogynecology Department	1 337	
Medical Oncology Department	3 359	
Radiation Oncology Department	895	
Day Surgery Subdepartment (Out-patients Department)	5	
Nuclear Medicine Department	755	
Laser Photodynamic Therapy Subdepartment	512	
ENT, Head and Neck Surgery and Oncology Department	921	
Total	13 679	

Number of patients who were hospitalized in clinical departments / subdepartments

IMMEDIATE HOSPITALIZATIONS	2016 m	
General and Abdominal Surgery and Oncology Department	140	
ENT, Head and Neck Surgery and Oncology Department	78	
Medical Oncology Department	65	
Oncogynecology Department	61	
Oncourology Department	54	
Thoracic Surgery and Oncology Department	28	
Breast Surgery and Oncology Department	8	
Radiation Oncology Department	10	
Total	449	

Thoracic Surgery and Oncology Department

Head Renatas Aškinis, M.D., Ph.D.



What genetic tests are performed for the department patients?

Researches of EGFR the most common gene mutations are performed for all patients with adenocarcinoma. If it is possible to apply biological therapy, the research of EML4-ALK most common fusion transcripts is performed. There is a possibility to examine all palette of genes for lung and colon cancer in the Genetic Diagnostic Laboratory.

Staff

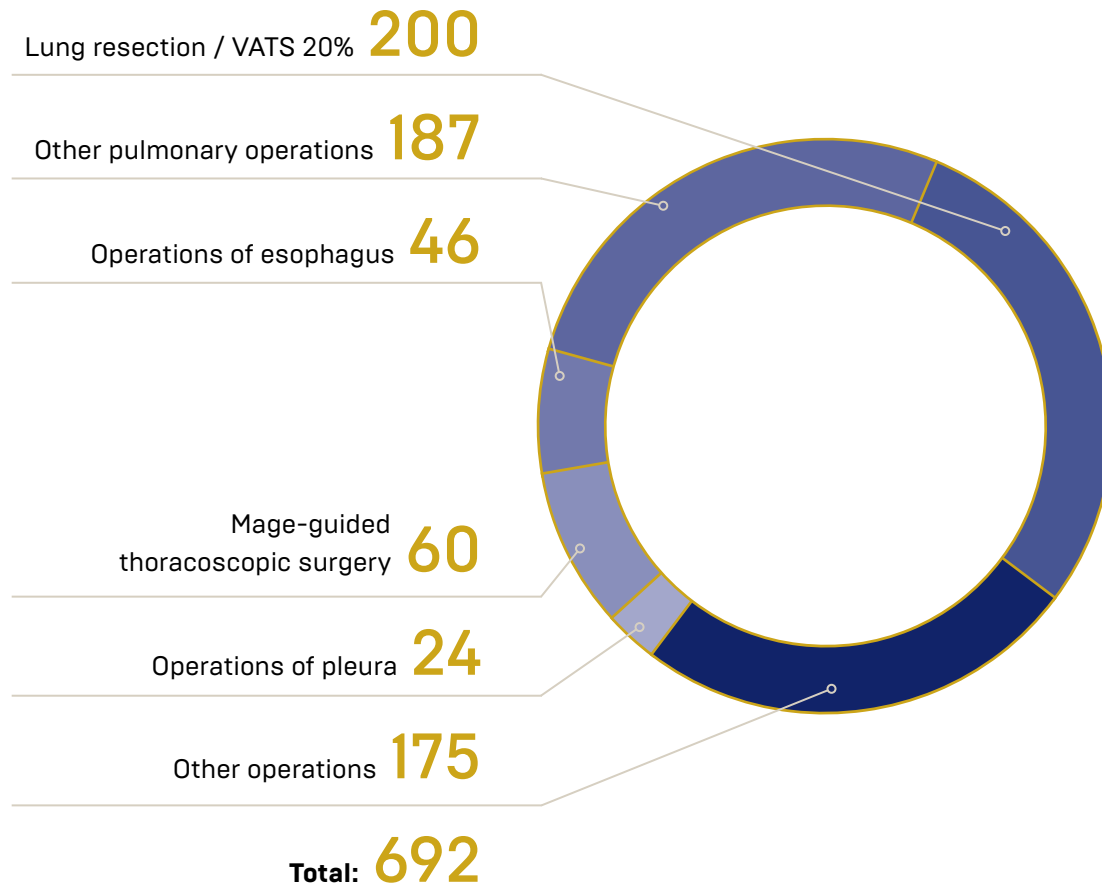
Total	Doctors	Nurses
23	5	11

1095 patients were treated in the department

989 patients were treated for malignant tumor pathology

106 patients were treated for non-malignant pathology

Operational activity, 2016



✓ Main projects

- The analysis of immune microenvironment and exosomes of non-small cell lung cancer (NSCLC) and its prognostic and predictive value (2016 - 2020, Head S. Cicėnas).
- The significance of polymorphism of types of oncogenic human papillomavirus and some genes that influence the tumor process to efficiency of therapy of oncological patients (2014 – 2018, Consultant S. Cicėnas).
- Research of factors, affecting the effectiveness of treatment of women with lung cancer (2013 – 2018, Head A. Krasauskas).

📖 Selected publications

1. Everatt, R., Kuzmickiene, I., Davidaviciene, E. and Cicenias, S. "Incidence of lung cancer among patients with tuberculosis: a nationwide cohort study in Lithuania." *The International Journal of Tuberculosis and Lung Disease* 20.6 (2016): 757-63.
2. Cicėnas, S., Geater, S. L., Petrov, P., Hotko, Y., Hooper, G., Xia, F., Mudie, N. and Wu, Y. L. "Maintenance erlotinib versus erlotinib at disease progression in patients with advanced non-small-cell lung cancer who have not progressed following platinum-based chemotherapy (IUNO study)." *Lung Cancer* 102 (2016): 30-37.
3. Schveigert, D., Krasauskas, A., Didziapetriene, J., Kalibatiene, D. and Cicenias, S. "Smoking, hormonal factors and molecular markers in female lung cancer." *Neoplasma* 63.04 (2016): 504-09.

📅 Event

European Regional Conference on Thoracic Oncology is held every year and, during this Conference, lung cancer diagnostic and treatment news are discussed.

ENT, Head and Neck Surgery and Oncology Department

Head Jolita Gibavičienė, M.D.



How do you avoid aesthetic consequences after operations of removal of tumors of head and neck?

Currently, the operating technique, which saves tissues, is applied during operations of tumors head and neck. Modern methods of plastic and reconstructive surgery are used for tissue defect plastics in order to preserve and restore facial aesthetics and the function of organs. A lot of attention is paid to voice reconstruction and rehabilitation after surgery.

Staff

Total	Doctors	Nurses
29	13	19

1459 patients were treated in the department

1166 patients were treated for malignant tumor pathology

175 patients were treated for non-malignant pathology.

Hospitalizations according to the cancer location, 2016

Laryngeal cancer	135	
Metastases in lymph nodes	35	
Laryngeal and hypopharyngeal cancer	84	
Melanoma	54	
Skin cancer	225	
Lip, mouth cancer	76	
Thyroid cancer	75	
Cancer of nasal sinuses, sinuses and upper jaws	15	
Salivary gland cancer	12	
Lymphoma	5	
Cancer without primary focus	1	



Main projects

- The part of the project "Atlas of cancer tissue genome": Research "The significance of polymorphism of types of oncogenic human papillomavirus and some genes that influence the tumor process to efficiency of therapy of oncological patients" (2014-2018, researchers doctors: A. Bunikis, I. Mackevičienė, V. Čepulis, J. Gibavičienė, L. Pocius).
- Phase III, research of random samples comparing pembrolizumab (MK-3475) with standard treatment of patients with recurrent or metastatic head and neck cancer [researcher J. Gibavičienė].

Selected publications

1. Senkus, L., Gibavičienė, J., Čepulis, V. "Diagnostic peculiarities and difficulties of parapharyngeal space tumours"*Lithuanian surgery* 15.2-3 (2016):72-78.

Event

Our team yearly participates in The Mouth Cancer Month campaign which aims to raise awareness of mouth cancer, early detection and prevention of oral cancer. Throughout February our specialists run a walk-in clinic for cancer screening in patients with the unusual mouth changes, collaborating together with press and media spreading an information about the oral cancer, urging people to visit their health specialist if they found any mouth changes.

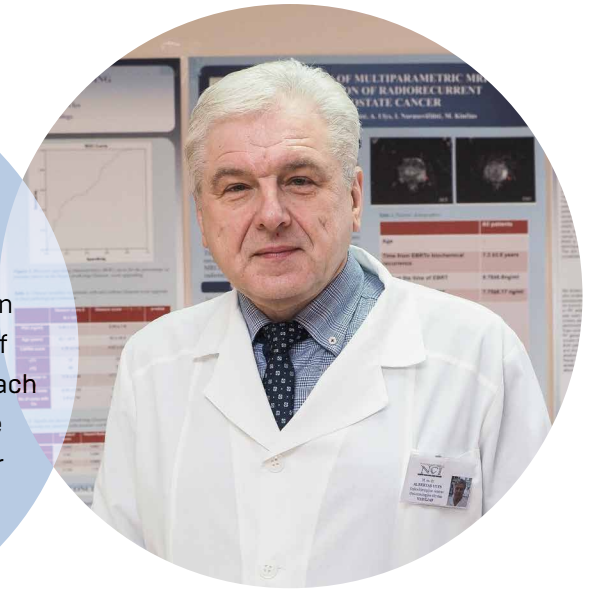


Oncourology Department

Head Albertas Ulys, M.D., Ph.D.

What progress do you expect in diagnosis and treatment?

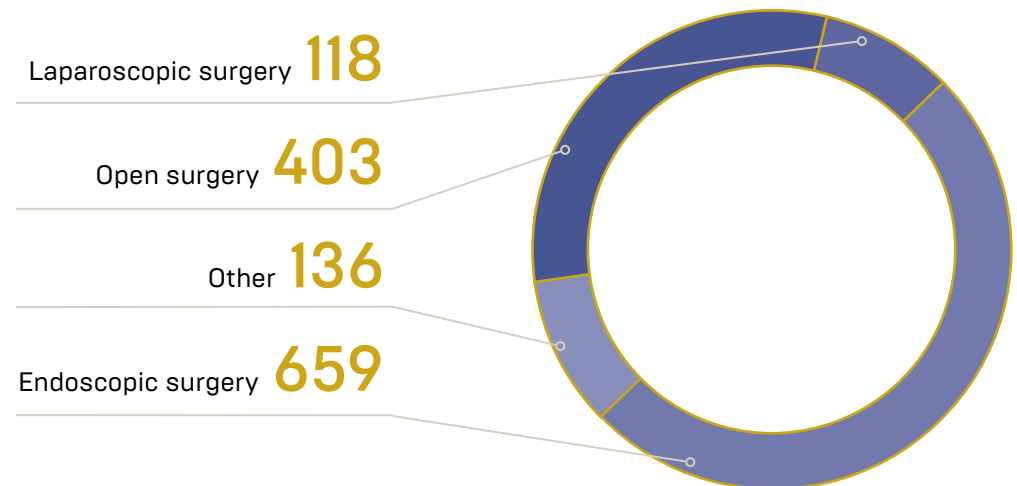
In diagnostics - molecular, genetic diagnostics, image fusion. In treatment - to increase a number of laparoscopic operations. Now they reach about 30% of all operations, but we believe that we can exceed number of laparoscopic operations up to 50% in future.



Staff

Total	Doctors	Nurses
35	8	18

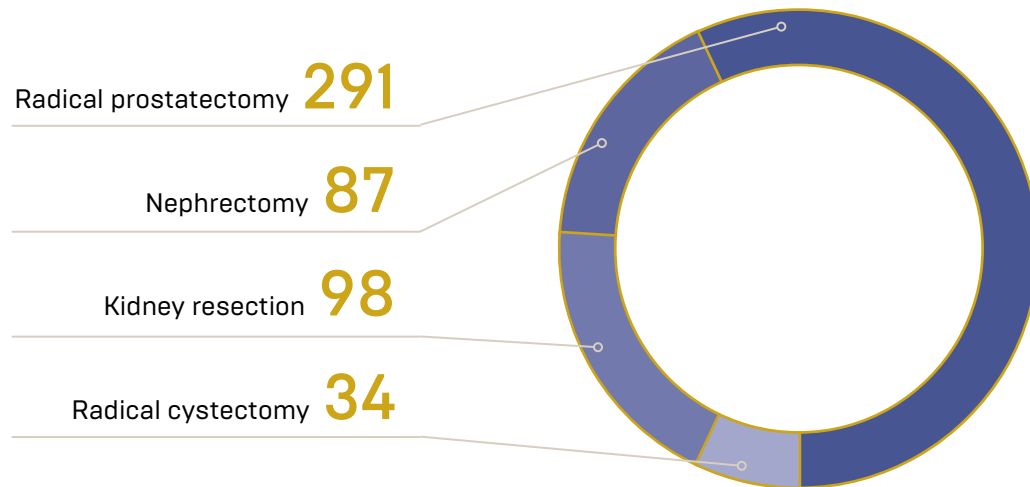
Surgical activity, 2016



2060 patients were treated in the department, 280 patients were treated in day care facility. 1259 patients with malignant tumors of the urogenital system

and 521 patients with non-malignant tumors were among the patients, treated at hospital.

Surgical activity according to localization, 2016



✓ Main projects

- "Molecular tools for individualisation of long-term monitoring and treatment of prostate cancer." (2016–2018, Head F. Jankevičius).
- 3D ultrasound video systems, multiparametric magnetic resonance imaging, transperineal biopsy and molecular markers research, identifying clinically significant prostate cancer (2016–2021, Head A. Vėželis).
- A.S.I.N. - Study of actively monitored kidney tumors (2017-2026, Heads A. Ulys and A. Žalimas).
- I.A.L.P.O.S study - immunological differences of open and laparoscopic prostate cancer surgery (2017–2020, Heads F. Jankevičius, P. Bosas).
- Epidemiological research of genetic diversity and genotype - phenotype correlations of children and adults with tuberous sclerosis complex (2017–2027, Heads – R. Čerkauskienė, A. Ulys).
- Analysis of efficiency of prostate cancer examination (screening), based on PSA test (2017–2022, Heads G. Smailytė, A. Patašius).



Selected publications

1. Daniunaite, K., Dubikaityte, M., Gibas, P., Bakavicius, A., Lazutka, J., R., Ulys, A., Jankevicius, F. and Jarmalaite, S. "Clinical significance of miRNA host gene promoter methylation in prostate cancer." *Human Molecular Genetics* 26.13 (2017): 2451-461.
2. Gondos, A., Krilaviciute, A., Smailyte, G., Ulys, A. and Brenner, H. "Cancer surveillance using registry data: Results and recommendations for the Lithuanian national prostate cancer early detection programme." *British Journal of Cancer* 51.12 (2015): 1630-637.
3. Fizazi, K., Jones, R., Oudard, S., Efsthathiou, E., Saad, F., de Wit, R., De Bono, J., Cruz FM, Fountzilas, G., Ulys, A., Carcano, F., Agarwal, N., Agus, D., Bellmunt, J., Petrylak DP, Lee SY, Webb IJ, Tejura, B., Borgstein, N., Dreicer R. "Phase III, randomized, double-blind, multicenter trial comparing orteronel (TAK-700) plus prednisone with placebo plus prednisone in patients with metastatic castration-resistant prostate cancer that has progressed during or after docetaxel-based therapy: ELM-PC 5." *Journal of Clinical Oncology* 33.7 (2015):723-31.



Event

The Lithuanian Ultrasound Association, together with the NCI and other partners, organises two events per year - the international scientific and practical

conference "Ultrasound Diagnostics" and international scientific and practical conference "Ultrasound Diagnostics Summer School: Theory and Practice".

Oncogynecology Department

Head Rūta Čiurlienė, M.D.



How is fertility of our patients saved?

Fertility preservation program of female cancer patients is carried out, during this program cryopreservation of ovarian tissue is performed and, after the treatment, reimplantation of this tissue is planned. It improves the quality of life of patients.

Staff

Total	Doctors	Nurses
31	5	16

1336 patients were treated in the department

797 patients - for malignant tumor pathology

366 patients - for non-malignant tumor pathology

Treated patients, 2016

Ovarian cancer	256	
Uterine neoplasms	207	
Cervical carcinoma <i>in situ</i>	132	
Cervical Cancer	129	
Vulvar and vaginal cancer	31	
Other malignant tumors	21	
Carcinoma of other genital organs	11	

Surgical activity, 2016

Open surgery / extensive citoreductions, pelvic exenterations	571/40	
Laparoscopic surgery	185	
Hysteroscopic operations	101	
Other gynecological operations	408	

✓ Main project

- Possible prognostic and predictive value of the Notch signalling pathway in case of uterine body cancer (2014–2018, Head - J. Didžiapetrienė).

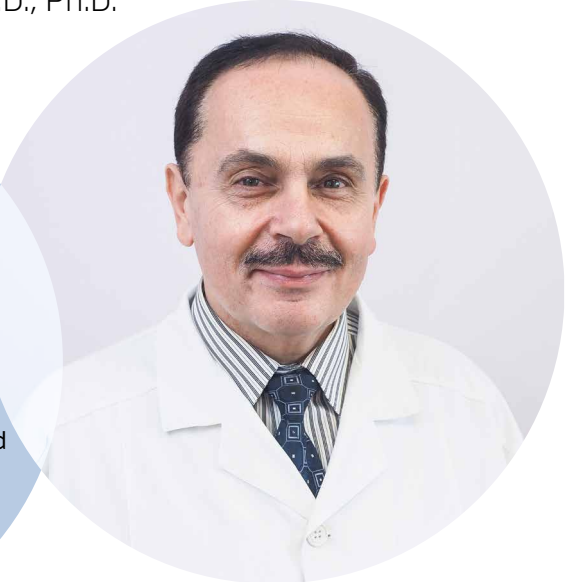
📅 Event

The press conference “Ovarian cancer - insidious disease” was held at the Seimas of the Republic of Lithuania marking World Ovarian Cancer Day. Doctor obstetrician-gynecologist Kastytis Žilinskas,

M.D., Ph.D. from NCI Oncogynecology Department, medical oncologist Lina Daukantienė, M.D., Ph.D. from NCI Medical Oncology Department participated in the conference.

Breast Surgery and Oncology Department

Head Prof. Valerijus Ostapenko, M.D., Ph.D.



What methods do you use for preservation of good-looking women's breasts after surgery?

We work in accordance with the standards; we decide in a multidisciplinary team what kind of breast preservation is best suited. Several methods are possible: standard conserving surgery, oncoplastic surgery and breast reconstruction using implants and patches.

Staff

Total	Doctors	Nurses
30	5	17

1578 patients were treated in the department

1175 patients were treated for malignant tumor pathology

403 for non-malignant pathology.

Surgical activity, 2016

Mastectomy	285	
Conserving surgery quadrenectomy	372	
Breast-conserving surgery with biopsy of the sentinel lymph node	303	
Nonpalpable breast tumors	123	
Biopsy of the sentinel lymph node is performed with double or single contrast (TC 99, tissue dye)	303	
Oncoplastic surgery	53	
Breast reconstruction using implants	4	
Preventive prostatectomy with determined BRCA mutation of patients	4	
Other	115	



Main projects

- Oncology patients fertility preservation program (2014–2019, Heads Ž. Gudlevičienė, V. Ostapenko, A. Ulys).



Selected publications

- Pautier, P., Vergote, I., Joly, F., Melichar, B., Kutarska, E., Hall, G., Lisyanskaya, A., Reed, N., Oaknin, A., Ostapenko, V., Zvirbule, Z., Chetaille, E., Geniaux, A., Shoaib, M. and Green, J. A. "A Phase 2, Randomized, Open-Label Study of Irosustat Versus Megestrol Acetate in Advanced Endometrial Cancer." *International Journal of Gynecological Cancer* 27.2 (2017): 258-66.
- 258-66. Ostapenko V., Cicėnas S., Ostapenko A., Briedienė R., Ostapenko E. "Oligometastatic breast cancer: a case report and literature review." *Lietuvos Chirurgija* 15.2-3 (2016): 117-20.

- Ostapenko V., Ostapenko A., Dasevičius D., Ostapenko E. "Giant breast malignant phyllodes tumor:

a case report and literature review." *Lietuvos Chirurgija* 15.2-3 (2016):121-5.

Event

There were detailed discussions about breast cancer multidisciplinary treatment innovations, actual clinical cases and issues of optimization of high quality

breast cancer care services in the conference "Multidisciplinary Breast Cancer Treatment".



Radiology Department

Head Rūta Grigienė, M.D., Ph.D.



How did digital technologies change your profession?

When the digital technologies were involved in radiologists work three were the main features that have affected clinical practice: easy access to images (also to prior image, that is very important, especially in oncology), new capacity to show the images to clinicians over the Internet, and the 3D tool that has made it possible to interpret and show large image materials in volumes instead of as separate images. Previously, radiologists worked more as individuals in the health care organization; they were not as involved as they are today in the treatment decision of patients.

Staff

Total	Doctors	Nurses	Radiology technologists
48	22	6	15

Main projects

Assessment of brain tumors prognostic factors and early response to treatment by imaging biomarkers (2014-2019, Head E. Aleknavičius).

Imaging equipment		
Echoscopes	10	
Mammographs	3	
MRI (magnetic resonance imaging tomograph)	1	
3D echographs	1	
X-ray machines	5	
CT (computed tomography scanner)	1	

Image tests, 2016		
Mammography	23051	
Chest x-ray	11423	
Computed tomography tests	11757	
Mri studies	1952	
Computed tomography tests	2138	
Breast ultrasound examination	2138	
Total	52459	

Event

Seminar "Clinical and Scientific Application of Brain Imaging and fMRI" was organised in Vilnius on 30th September according to implemented joint Lithuanian-Swiss project, in which specialists of five branches of Lithuanian biomedical and technological sciences

from National Cancer Institute, Vilnius University, Vilnius Gediminas Technical University and Lithuanian University of Health Sciences work.

Ultrasound Subdepartment

Deputy Head Mantas Trakymas, M.D., Ph.D.

What are the benefits of interventional oncology?

Application of interventional oncology methodologies is concentrated at the National Cancer Institute. We perform radiofrequency, cryo, microwave ablations using the possibilities offered by ultrasound, magnetic resonance imaging, computer tomography for almost two decades. The objective is to provide maximum assistance to the patient, conserving vital organs and treating the patient even in cases when the tumor is not operable.



Staff

Total	Doctors	Nurses
19	13	4

Researches controlled by ultrasound

interventional oncology procedures
2939

ultrasound examinations
68646

Event

Chairman of the Committee on Health Affairs of the Seimas of the Republic of Lithuania D. Mikutienė, Chairman of the Lithuanian Society of Chemotherapists A. Česas, NCI Director prof. F. Jankevičius, NCI senior sci-

entist Dr. G. Smailytė, President of the Lithuanian Association "Gyvastis" U. Šakūnienė participated at the press conference, intended for World Kidney Cancer Day at the Seimas on 10th March.

Medical Physics Department

Head Jonas Venius, Ph.D.



What benefits the clinic receives from medical physicists?

Medical physicists are directly involved in the selection of patient's diagnostics and treatment tactics, they are involved in clinical activity during performing of complicated diagnostic and therapeutic procedures. Medical physicists ensure quality of diagnostic and therapeutic procedures - they constantly provide control of quality of the equipment and optimize procedures for reducing of the amount of exposure. They perform the calculation of the prescribed dose and realization planning for each patient individually during the radiotherapy process.

Staff

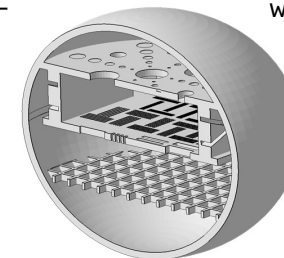
Total	Medical physicists	Radiology technologists
14	12	1

✓ Installed technology

Modulated intensity electrons radiotherapy using the individual bolus, printed using 3D printer, was firstly applied in the clinic in 2016. Critical organs and healthy tissues close to the tumor are protected taking advantage of the unique properties of the formation of electron doses.



Phantom of inspection of MRI equipment quality was designed and printed with 3D printer. Cooperation is conducted with Oslo University Hospital. The patent application was submitted.



Radiotherapy of cancer patients is done quickly and accurately, while applying the latest technologies (CBCT, VMAT) and software (*Smart Adapt*, *EPIQA*) Using functional information, received from SPECT and PET, active tumor focuses are specified and sparing radiation therapy is performed.

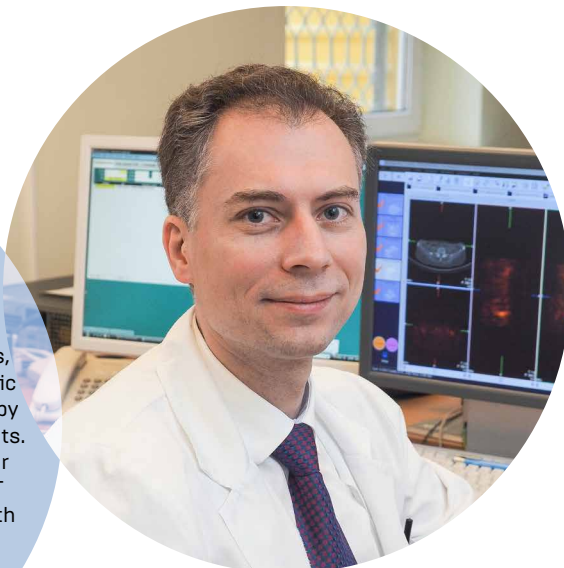
Dosimetry and quality control, 2016		
Patient's dosimetric measurements	855	
Patient's radiotherapy plans	3119	
Radiotherapy equipment quality tests	2711	
Quality tests of nuclear medicine and X-ray machines	901	

📖 Selected publications

1. Usinskiene, J., Ulyte, A., Bjørnerud, A., Venius, J., Vasileios Katsaros, K., Rynkeviciene, R., Letautiene, S., Norkus, D., Suziedelis, K., Rocka, S., Usinskas, A. and Aleknavicius, E. Optimal differentiation of high- and low-grade glioma and metastasis: a meta-analysis of perfusion, diffusion, and spectroscopy metrics." *Neuroradiology* 58.7 (2016): 741.
2. Čeponis T., Gaubas E., Venius J., Cicinas A., Callens F., Kusakovskij J., et al. ESR spectroscopy of alanine impacted by high energy irradiations for wide range dosimetry. *Lithuanian Journal of Physics* 56.1 (2016):49-54.

Nuclear Medicine Department

Head Sigitas Tiškevičius, M.D.



What multimodal imaging technologies are applied to our patients?

So-called multimodal (also called hybrid) imaging became extremely popular in past 10-15 years: SPECT/CT, PET/CT, and PET/MRI. During diagnostic nuclear medicine procedures, which are functional, the distribution of a specific "radioactive contrast" in organs is investigated by imaging receptors or other specific cellular targets. Currently in our department we perform nuclear medicine procedures using hybrid SPECT / CT gamma camera. By combining these studies with CT (computed tomography) or MRI (magnetic resonance imaging), we can precisely localize lesions and the extension of the disease - thus making the examination much more informative.

Staff

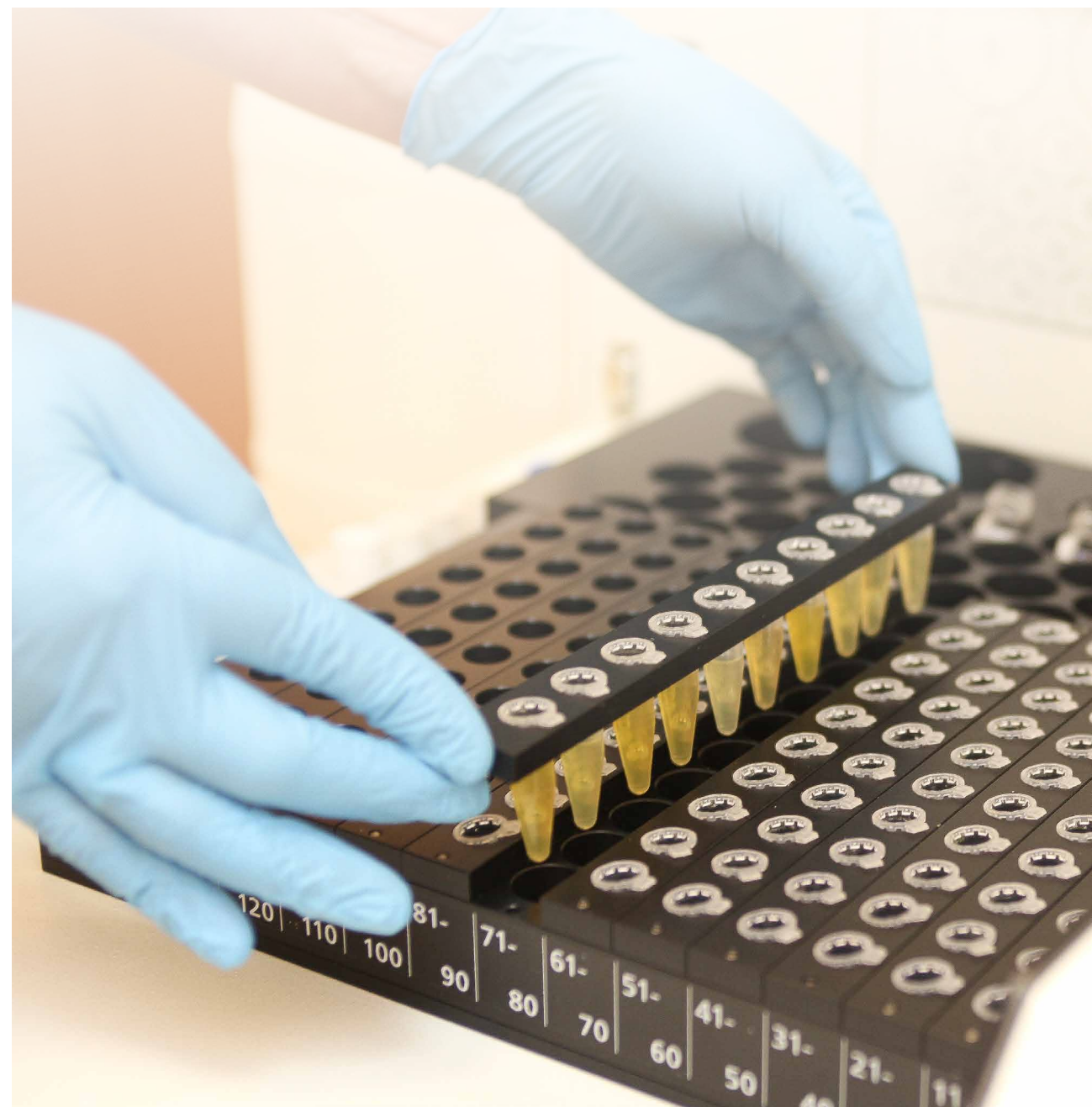
Total	Doctors	Nurses	Radiology Technologists
23	5	6	5

Diagnostic nuclear medicine procedures, 2016

Bone scintigraphy	2799	
Lymphoscintigraphy and sentinel node localisation	202	
Somatostatin receptors scintigraphy	122	
Post-therapy I-131 whole-body scan	870	
Dynamic renal scintigraphy	99	
Other	120	

760 radionuclide therapy procedures were performed in Therapy Section in 2016, the major part of them (746) con-

sisted of thyroid cancer treatment using radioactive iodine I-131.



Anesthesiology, Intensive Care and Operating-room Department

Head Renatas Tikuišis, M.D., Ph.D.



How do you assess the physical condition of patients?

We use the physical status classification, which is proposed by the American Society of Anesthesiologists (ASA), this classification helps to standardize the assessment of the preoperative patient condition irrespective of the planned operation. This classification facilitates a general analysis of anesthesia complications, morbidity and mortality.

Staff

Total	Doctors	Nurses
132	23	67

8560 patients were treated in the department

6142 operations a

8602 anesthetics were performed.

Work is performed in 11 modern operating-rooms of the Anesthesiology, Intensive Care and Operating-room Department, endoscopy and angiography consulting-rooms and in operat-

ing-rooms of Oncourology, Brachytherapy Departments. 12 beds with modern monitoring system operate in the intensive care unit.

✓ Main projects

- Prognostic importance of biological markers and changes of these markers depending on the applied anesthesia in case of triple-

negative breast cancer [2016–2021, Heads V. Lukoševičienė R. Tikuišis, P. Miliauskas]

📖 Selected publications

1. Dulskas, A., N. E. Samalavicius, R. K. Gupta, Kilius, A., Petrulis, K., Samalavicius R. S. , and Tikuisis, R. "Functional and clinical outcomes of hand-assisted laparoscopic colorectal surgery: a single-institution experience in 255 patients." *European Surgery* 47.2 (2015): 75-80.
2. Dulskas, A., Miliauskas, P., Tikuisis, R., Escalante, R. and Samalavicius, N. E. . "The functional results of radical rectal cancer surgery: review of the literature." *Acta Chirurgica Belgica* 116.1 (2016): 1-10. <DOI: 10.1080/00015458.2015.1136482.>
3. Tikuisis, R., Miliauskas, P., Lukoseviciene, V., Samalavicius, N., Dulskas, A., Zabuliene, L., Zabulis, V., and Urboniene, J. "Transversus abdominis plane block for postoperative pain relief after hand-assisted laparoscopic colon surgery: a randomized, placebo-controlled clinical trial." *Techniques in Coloproctology* 20.12 (2016): 835-44.

General and Abdominal Surgery and Oncology Department

Head Eugenijus Stratilatovas, M.D., Ph.D.



What helps to solve complex cases?
 Multidisciplinary discussion, doctors' consultations, the scientific literature and conference data, personal experience.

Staff

Total	Doctors	Nurses
44	10	24

1175 patients were treated in the department

1104 patients were treated for malignant tumor pathology

71 patients were treated for non-malignant pathology

The main localization of operations, 2016

Gastric cancer operations	157	
Colon cancer operations	140	
Colorectal cancer operations	303	
Pancreatic cancer operations	43	
Liver cancer operations	53	
Total	1018	

✓ Main projects

- Comparison of quality of life and postoperative complications of patients with rectal cancer after liquidation of protective ileostomy after 4 or 12 weeks after rectal resection (2016-2018, Head E. Stratilatovas) in case of colon cancer (T-rex study) (2016–2018, Head A. Dulskas).
- Perspective exploratory cohort clinical research for determination of optimal resection length of the colon
- Search of predictive indicators and possibilities of optimization of treatment of early and muscularis propria infiltrating spread of gastric cancer in lymph nodes (2-diagnostics) [(2016-2019, Head R. Baušys).

📖 Selected publications

- Mečkovski A., Baušys A., Maneikytė J., Baušys R., Trakymas M., Stratilatovas E. "Renal cell carcinoma metastases in the pancreas. Clinical case presentation." *Medical theory and practice* 22.1 (2016): 63-6.

📅 Event

25th anniversary of the Lithuanian Society of Coloproctologists was marked by the international conference regarding colorectal problems. More than 100 coloproctologists from various Lithuanian health care institutions par-

ticipated in the event, lecturers from different continents of the world - North and Latin America, Asia, Europe read the reports. Cooperation between Lithuania and Korea was highlighted at the conference.

Endoscopic Intervention Group

Deputy Head Inga Kildušienė, M.D.



What has changed in endoscopy over the last 5 years?

We have completely renewed the used endoscopic equipment in recent years. Currently we work with the latest generation high definition (HDTV) gastroscopes and colonoscopes with the integrated image enhancement system and the possibility of narrow-band imaging (NBI) endoscopy. It is possible to diagnose, treat and then monitor cancer and precancerous diseases more precisely using this equipment.

Staff

Total	Doctors	Nurses
11	5	5

Number of performed procedures, 2016

Gastroscopy	1793	
Colonoscopy	2496	
ERCP (endoscopic retrograde cholangiopancreatography with biliary trast stenting)	30	
Application of OVESCO clip	3	
PEG (percutaneous endoscopic gastrostomy)	28	
Endoscopic balloon dilatation	13	
Stenting of gastrointestinal tract	5	
EMR (endoscopic mucosal resection)	18	
Anorectal manometry	5	
Total	4577	

Events

- Seminar "OVESCO Endoscopy - Ovesco OTSC devices technology in the field of endoscopy" in which Ovesco OTSC (over-the-scope) clip technology was analysed.
- Seminar "Radio Frequency Ablation (RFA) Generator *Barrx Flex* and equipment, used during endoscopic ablation".
- Report "Endoscopic treatment of gastrointestinal tract perforations, anastomotic leakages and fistulas using the Over-The-Scope-Clip System (OVESCO): experience in 2 centres" was presented during United European gastroenterology week (UEGW) in 2016.

Medical Oncology Department

Head Birutė Brasiūnienė, M.D., Ph.D.



What helps to create a positive mood?

To be positive you must learn all your life. My knowledge, my different experiences, histories of my patients can help me keep the positivity and share it with others. Sometimes positive emotions you can get from very simple things: reading an interesting biography, watching a medieval canvas, a ballet dance or listening to the incredible history about old pharmacy. Support of my family also is very important.

Staff

Total	Doctors	Nurses
47	12	17

Outpatient Unit

35 beds

1726 new patients

9019 procedures

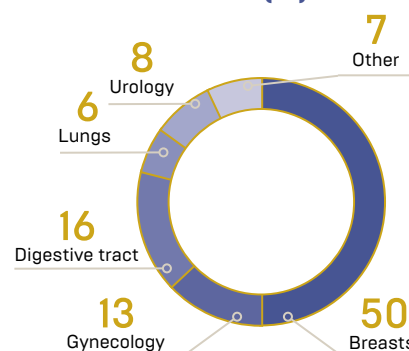
Inpatient Unit

30 beds

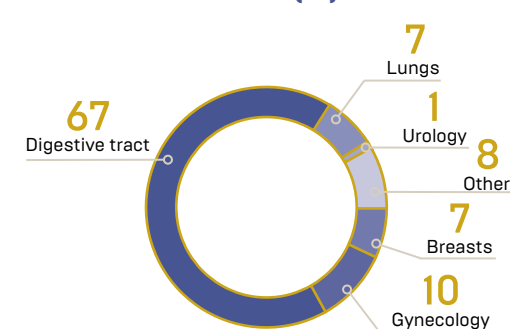
3329 patients

2990 procedures

Day hospital patients, 2016 (%)



Hospital patients, 2016 (%)



Selected publications

- Baltruskeviciene, E., Kazbariene, B., Badaras, R., Bagdonaitė, L., Krikštaponienė, A., Zdanavičius, L., Aleknavicius, E. and Didziapetrienė, J. "Glutathione and glutathione S-transferase levels in patients with liver metastases of colorectal cancer and other hepatic disorders." liver metastases of colorectal cancer and other hepatic disorders." 336-41.
- Samalavicius, N. E., Dulskas, A., Baltruskeviciene, E., Smailyte, G., Skuciene, M., Mikelenaite, R., Venslovaite, R., Aleknavicius, E., Samalavicius, A. and Lunevicius, R. "Asymptomatic primary tumour in incurable metastatic colorectal cancer: is there a role for surgical resection prior to systematic therapy or not? *Videosurgery and Other Miniinvasive Techniques* 4 (2016): 274-82.
- Baltruskeviciene, E., Kazbariene, B., Aleknavicius, E., Krikstaponiene, A., Venceviciene, L., Suziedelis, K., Stratilatovas, E. and Didziapetriene, J. "Changes of reduced glutathione and glutathione S-transferase levels in colorectal cancer patients undergoing treatment." *Tumori Journal* (2017).



Event

The chemotherapists of NCI together with the Lithuanian Oncology Association periodically organize qualification upgrading events and conferences.

"The toxic effect of anti-cancer drugs and treatment of complications, caused by it" took place in March 2017.

Radiation Oncology Department

Head Arvydas Burneckis, M.D., Ph.D.



What factors help the patient to recover?

Positive emotions that arise through mutual contact, understanding and support are the most important factors. Good mood of doctors, finding of relations with relatives of patients helps to maintain good emotions and thus helps the patient to recover.

Staff

Total	Doctors	Nurses
30	8	15

Patients, treated according to localization of diseases in Radiotherapy, 2016

Breast	155	
Gynecology	126	
Male reproductive organs	294	
Urinary organs	14	
Digestive tract	53	
Respiratory / thoracic disorders	48	
Head - neck	93	
Brain	22	
Thyroid	5	
Skin	23	
Bone connective tissue	11	
Other	51	
Total	895	

In the radiotherapy department we deliver a wide range of specialist and cutting-edge treatments that include combination of chemotherapy/ biotherapy with radiotherapy, different fractionations.

Our treatments utilise all aspects of modern radiation technology including On-Board Imaging (OBI), portal imag-

ing, anatomy matching and multi-leaf collimation, MRI/PET/CT image fusion. We provide three dimensional conformal radiotherapy (3D-CRT), Intensity Modulated Radiotherapy (IMRT), Volumetric Modulated Arc Therapy (VMAT), Stereotactic ablative radiation therapy (SABR) - skeletal, lung, brain metastases.

✓ Main projects

- Assessment of the acute skin damage, caused by ionizing radiation based on individual radiosensitivity and in-vivo confocal reflection microscopy (2016–2020, Head J. Kisonas, A. Burneckis).
- Randomized clinical trial of duration after radiotherapy effect pathological response assessment in case of colorectal Cancer (2017–2020, A. Dulskas, A. Burneckis, E. Sileika).

📄 Selected publications

1. Dulskas, A., Kilius, A., Petrusis, K., Norkus, D., Burneckis, A. and Valuckas, K. P., Samalavicius, N. E. "Treatment of hemorrhagic radiation - induced with a 4% formalin application under perianal anesthetic infiltration" *World Journal of Gastroenterology* 19.30 (2013): 4944–4949
2. Liukpetryte, S., Valuckas, K. P., Atkocius, V., Kuzmickiene, I., Aleknavicius, E., Ostapenko, V. "Second malignancies following conventional or combined ²⁵²Cf neutron brachytherapy with external beam radiotherapy for breast Cancer" *Journal of Radiation Research* 54.5 (2013): 872–879
3. Burneckis A., Ridgway D., Sopata M., Jespersen L., Andersen C "Clinical Efficacy and Safety of Once-Daily Dosing of a Novel, Prolonged-Release Oral Morphine Tablet Compared With Twice-Daily Dosing of a Standard Controlled-release Morphine Tablet in Patients with Cancer Pain: A Randomized, Double-Blind, Exploratory Crossover Study" *Journal of Pain and Symptom Management* 39.4 (2010) :712-20

Brachytherapy Department

Head Ernestas Janulionis, M.D., Ph.D.



What is the perspective of brachytherapy?

Perspectives of brachytherapy are related with team work (radiologists, urologists, nuclear medicine specialists and others) in order to improve treatment results and better outcome, giving the patients better quality of life and hope.

Staff

Total	Doctors	Nurses
22	6	8

Patients, treated according to localization, 2016

Cervix uteri	86	
Corporis uteri	104	
Other	10	
Skin	13	
Prostate (LDR)	42	
Prostate (HDR)	83	

✓ Main projects

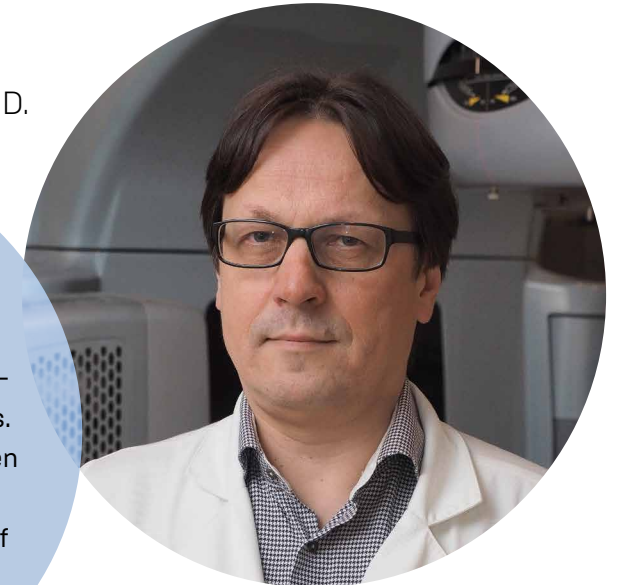
- Medium risk prostate cancer high dose rate brachytherapy and combined radiotherapy treatment efficacy and safety comparison: a randomised prospective sufficiency study (2016-2018, Head E. Janulionis).
- Medium risk prostate cancer High Dose Rate brachytherapy as monotherapy and combined treatment efficacy and safety comparison: a randomised prospective study (2017-2021, Head Ernestas Janulionis)

📖 Selected publications

1. Ulinskas, K., Janulionis, E., Valuckas K. P., Samerdokiene, V., Atkocius, V. and Rivard, M.j. "Long-term results for Stage IIIB cervical cancer patients receiving external beam radiotherapy combined with either HDR 252Cf or HDR 60Co intracavitary brachytherapy." *Brachytherapy* 15.3 (2016): 353-60.
2. Janulionis, E., Atkočius, V. and Valuckas, K. P. "Second primary malignancies after radiotherapy including HDR (252) Cf brachytherapy for cervical cancer." *Radiotherapy and Oncology* 14.6 (2015): 898-904. Web. <doi: 10.1016/j.brachy.2015.06.006>.
3. Janulionis, E., Valuckas, K. P., Liukpetryte, S., Samerdokiene, V. and Atkocius, V. "Californium versus cobalt brachytherapy combined with external-beam radiotherapy for IIB stage cervical cancer: long-term experience of a single institute." *Journal of Contemporary Brachytherapy* 5 (2015): 346-51.

External Beam Radiotherapy Department

Head Darius Norkus, M.D., Ph.D.



Can outpatient radiotherapy treatment be applied to all patients?

Outpatient radiotherapy can be applied to a large majority of patients. Inpatient treatment is required when some invasive radiotherapy techniques (brachytherapy) are used, if the patient's general anesthesia is required.

Staff

Total	Doctors	Nurses	Technologists
37	8	2	20

Localization	2016	
Breast tumors	601	
Prostate tumors	495	
Gynecological tumors	232	
Gastrointestinal tumors	162	
Head-neck tumors	201	
Lung tumors	162	
CNS tumors	60	
Non-cancerous diseases	81	
Skin tumors	41	
Lymphomas	35	
Genitourinary tumors	45	
Soft tissue tumors	9	
Myeloma	6	
Other	38	
Total	2062	

Implemented technology

Stereotactic ablative oligometastatic malignant tumor radiation therapy (SABR) – skeletal and soft tissue me-

tastases, treated using radiosurgery along with radical radiation therapy of primary prostate cancer.

Selected publications

1. Norkus, D., Karklelyte, A., Engels, B., Versmessen, H., Griskevicius, R., Ridder, M. De, Storme, G., Aleknavicius, E., E. Janulionis and Valuckas, K. P. "A randomized hypofractionation dose escalation

trial for high risk prostate cancer patients: interim analysis of acute toxicity and quality of life in 124 patients." *Radiation Oncology* 8.1 [2013]: 206.

2. Norkus, D., Miller, A., Kurtinaitis, J., Haverkamp, U., Popov, S., F. J. Prött and Valuckas, K. P. "A randomized trial comparing hypofractionated and conventionally fractionated three-dimensional external-beam radiotherapy for localized prostate adenocarcinoma : a report on acute toxicity." *Strahlentherapie und Onkologie* 185.11 (2009): 715-721.

3. Rades, D., Segedin, B., Conde-Moreno, A. J., Garcia, R., Perpar, A., Metz, M., Badakhshi, H., Schreiber, A., Nitsche, M., Hipp, P., Schulze, W., Adamietz, I. A., Norkus, D., Rudat, V., J. Cacicedo and S. Schild, E. "Radiotherapy With 4 Gy x 5 Versus 3 Gy x 10 for Metastatic Epidural Spinal Cord Compression: Final Results of the SCORE-2 Trial (ARO 2009/01)." *Journal of Clinical Oncology* 34.6 [2016]: 597-602.



Nursing Administration Department

Chief Nursing Administrator Nijolė Zadoreckaitė

What new challenges are nursing professionals facing in recent years?

Doctors are the brain of the clinic; nurses are the heart of the clinic. Nursing specialists must meet not only high professional requirements, constantly raising and improving their qualifications, they must meet public expectations in the context of preparation and activities of a professional nurse. During the patient's nursing, it is important to take into account his / her individual needs while leaving his / her right to self-determination, take care of him / her and to provide all possible support.



Job title	Number of posts	
Senior Nursing Administrator	17	
Senior Radiology Technologist	4	
Senior biomedical technologist	1	
Biomedical technologist	6	
Clinic's technician	12	
Radiology technologist	41	
Nurse	289	
Nurse's assistant	95,5	
Nutritionist	1	
Total	466,5	

Event

Republican scientific-practical conference "The role of the nurse in the

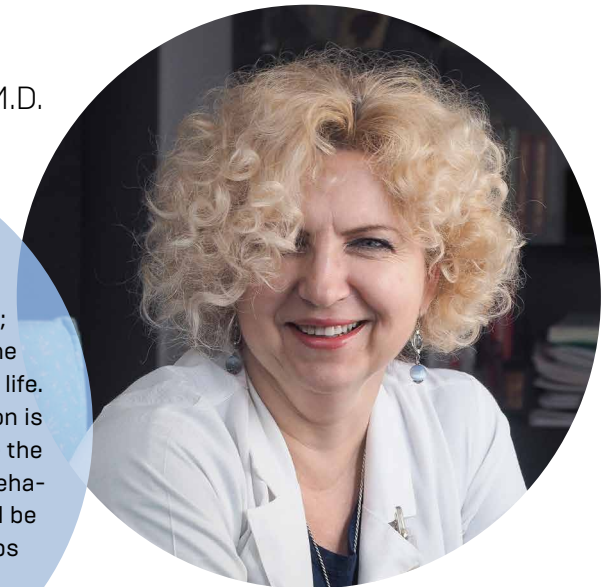
management of hospital-acquired infections" (November 2016)

Physical Medicine and Rehabilitation Department

Head Nomeda Vaitiekūnaitė, M.D.

What is on-cological rehabilitation?

A person is not only a collection of arms, feet, tissues, bones or organs; he is more than entirety of organs. The human has emotions, social and family life. It does not matter what disease a person is suffering from, it is possible to improve the quality of his life using help of various rehabilitation specialists. Rehabilitation will be effective and meaningful when it helps to solve not only physical problems of a patient, but also those that are not physically defined.



Staff

Total	Doctors	Nurses	Physio-therapists	Psycho-logists	Psycho-therapists
23	2	1	5	3	1

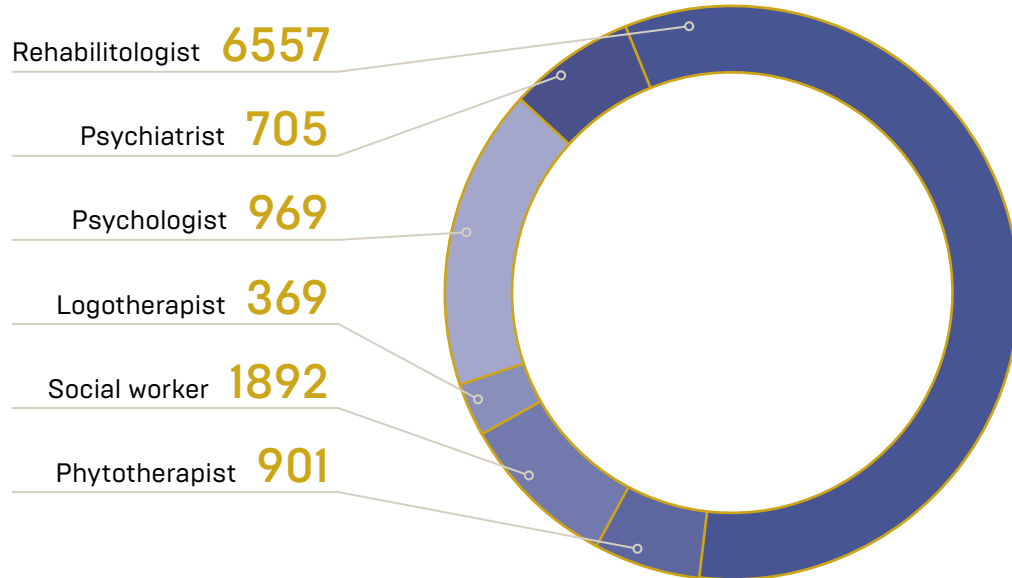
Rehabilitation procedures were performed

12979 physiotherapy

9748 massage

2622 physiotherapy

Consultation according to the specialist, 2016



Selected publication

Sutkeviciute, M., Stanciukaite, M., Bulotiene, G. "Individual Meaning-Centered Psychotherapy for palliative cancer pa-

tients in Lithuania. A case report." *Acta Medica Lituanica* 24.1 (2017): 67-73.

Event

NCI with its partners the University of Bern, the Association for Psychosocial Oncology and the Lithuanian Oncology Association organised the international conference "Psychological Assistance

to Oncological Patients: New possibilities". Researcher S. Birbilaitė presented a new unique online psychological therapy program for oncological patients.

Institute's friends



National Cancer Institute joined the global campaign "Talking Hands" on 4th February, the World Cancer Day (2016). The purpose of the campaign is to spread the message "We can. I can" and take actions to prevent cancer.



Ministry of Health, visited the Institute. Students were acquainted with NCI clinical departments, scientific laboratories.



We traditionally support campaigns of the World Health Organization - "Support through sport" 2017.

Participants of the project "Students - to the Government", who worked at the



Members of *International Women's Association of Vilnius* traditionally handed to the Institute means, used for modern breast cancer diagnostics, these means were bought using funds, collected in the charity party.



Former basketball player Rimantas Kaukėnas and his name support and charity fund regularly support the Chemotherapy department.

National Kaunas Drama Theatre and "Tiketa" continue the community action, launched on 1st November, 2014,

buying a ticket to the play "Barbora", viewers have the opportunity to contribute to the supplement of the first in Lithuania vacuum biopsy equipment - 1 litas from each ticket sold is given for assurance of successful work of vacuum breast biopsy equipment.



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