Inpatient Treatment

Outpatient Center

Innovations and Scientific Research

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Fighting cancer starts HERE and NOW!
Outpatient Center

The Outpatient Center at City Clinic Cancer Center provides access to leading diagnostic and screening techniques. Patients will receive information related to their diagnosis and further management. It has the following departments:

- Medical Oncology
- Radiation Oncology
- Nuclear Medicine
- Diagnostic Imaging
- Pathology
- Medical Genetics
- Gastroenterology
- Obstetrics and Gynaecology
- Respiratory Medicine

Ultrasound facilities
- Diagnostic Ultrasound
- Echocardiography

Additional services provided
- Program for monitoring and follow up of cancer patients
- Second opinion on diagnosis and management

City Clinic Cancer Center has introduced leading medical practices. The clinic encourages the participation of family members in the patient’s management. Relatives and friends will be educated to provide subsequent care at home. An additional Social Services Center ensures physical and emotional support to patients and their families.

Specialized Hospital Services

City Clinic Cancer Center is a modern world class medical facility. Our mission is to implement the latest scientific developments in fighting cancer, using individualised approach.

The following departments provide further specialised care and treatment:

- Medical Oncology
- Radiation Oncology
- Nuclear Medicine
- Diagnostic Imaging
- Medical Genetics
- Clinical Pathology
- Gastroenterology

The concept of building City Clinic Cancer Center has been developed along the model of the one of the world’s leader in cancer care - M. D. Anderson Cancer Center in Houston, TX, USA.

Many leading Bulgarian specialists work in the hospital and our ambition is to further recruit established and well-known Bulgarian doctors from prestigious international hospitals back to Bulgaria.

The Cancer Center combines high-tech diagnostic facility with advanced treatment and professional care for the cancer patients from Bulgaria and Southeast Europe.
Multidisciplinary approach

Medical Oncology is a very broad area of oncology, which encompasses not only the medical treatment, but also cancer prevention and screening. The approach to the patient case is planned at multidisciplinary meetings due to the complexity and the broad expertise needed. Each and every patient case is discussed on these Tumor Council meetings where all the specialists of City Clinic can give their personal input regarding the current situation and the future treatment of patients. Thanks to this approach, he or she does not need to visit specialists one by one, but can have their advices and professional support in handling the disease.

The Department of Medical Oncology offers diagnosing, staging, treatment and follow-up for patients with all types of solid tumors. The patient management planning is conducted via Tumor Boards and Planning Conferences, where all individual cases are discussed. The department has modern infusion day-ward and in-patient facilities. The Medical Oncology department is also equipped with an outpatient unit.

The Department of Medical Oncology provides:

- Diagnostic and management planning
- Chemotherapy
- Targeted treatment
- Endocrine therapy
- Centralised robotic chemotherapy compounding

The Department provides the most modern chemo, hormonal, immuno and targeted therapy. The hospital has a day-ward and inpatient chemotherapy facilities, aimed at efficient and safe chemotherapy administration. The robotic chemotherapy compounding, ultrasound vein finding, infusion pumps (devices used for automatic computer controlled intravenous infusion) are all ensuring optimal quality control of drug administration.

Targeted therapy

Targeted therapy is a treatment, which utilises anti-cancer drugs, directed at specific molecular tumor targets. A genetic analysis is required in order to find those specific target molecules. This type of treatment reduces the side effects dramatically. It is highly efficient in tumours having the specific target molecules.

Chemotherapy mostly is administered intravenously through a vein in the hand or using the so-called port-a-cath systems, small devices placed under the skin, allowing the inflow of drugs without continuously traumatizing the patient’s veins. Other anticancer drugs are taken orally, and in some cases using subcutaneous injections or drugs are administered in the form of pads (wafer) with a special structure – thus the medication enters through the skin into the bloodstream. Preparation of infusion drugs is done by a robot in the Hospital Pharmacy using specialized software. This ensures speed and optimum use of anti-cancer drugs.

Infusion Center

The infusion center consists of 14 chemotherapy chairs. There is an individual access to medical gases and aspiration. An additional place for a support person is provided. There is an access to TV and Wi-Fi Internet. Patients with advanced cancers or severe disabilities could use private rooms, where they can receive the same procedures as in the infusion center and have the privacy to maintain their tracheostomy, gastrostomy, colostomy, etc. The infusion center is specially equipped with nursing desks for quick assistance by the nurses and junior physicians. The pneumatic mail delivers the blood samples and other specimens to our clinical laboratory within seconds.

Chemotherapy mostly is administered intravenously, either through a vein of the hand or using the so-called port-a-cath systems. These are small devices placed under the skin and connected to a catheter implanted in a large vein. These allow the administration of drugs without continuously traumatizing the patient's veins. Other anti-cancer drugs are taken orally, as subcutaneous injections or in the form of transdermal patches. The compounding of infusion drugs is done by a robot in the Hospital Pharmacy using specialized software. This ensures the safety for the patients and the personnel, speed and optimum use of the drugs.
Radiotherapy
Radiotherapy is one of the main anticancer treatment modalities, together with chemotherapy, surgery, immunotherapy and targeted therapy. The radiotherapy uses X-rays very similar to the ones we make pictures with. The radiotherapy X-rays are much more powerful, they go through the skin and deliver dose deep into the human body at the place of the tumour. As the beams come from outside of the body – the treatment is called external beam radiotherapy. Normally several X-ray beams are needed; they enter the body under different angles. The process of calculation of the exact angles and doses is called “radiotherapy planning”.

The modern radiotherapy techniques use computer based modeling of the intensity of the beams. These are calculated and delivered in such way that, when combined the doses from the different beams, the composite dose draws a smooth line around the tumor at the same time avoiding the normal tissues. The computer based modeling of the doses defines the Intensity Modulated Radiotherapy (IMRT). IMRT is the basis of the modern external beam radiotherapy.

The classic fractionated radiotherapy relies on the small differences in the radiosensitivity and abilities to repair between the normal and cancer cells. These differences have to be amplified by using relative low dose radiation on a daily basis over 4 to 8 weeks.

Radiosurgery
With radiosurgery very high doses of radiation are used in one single treatment or in only few fractions. These high doses of radiation are much more effective in killing the tumour, compared to the relatively low daily doses of the classic radiotherapy. Unfortunately, the same applies to the normal cells around the tumour. Therefore, these high doses are feasible only if the tumour could be separated well from the surrounding tissues and providing that the tumour does not contain a sensitive organ (e.g. an important nerve or blood vessel). The positioning and precision of the radiotherapy machine (linear accelerator - linac) are very important as the tumour is targeted with accuracy of less than 1mm. Not only tumours could be treated with stereotactic radiosurgery, but also some functional disturbances (usually in the brain). The principle of stereotactic radiosurgery could be applied both to tumours in the brain and to tumours elsewhere in the body.

Brachytherapy
Brachytherapy is a type of radiotherapy where the source of radiation is introduced directly into the tumour with special applicators. In other words - the radiotherapy gets delivered from inside out. This allows very high doses radiation to be inserted directly into the tumor, sparing the normal tissues.

The Department of Radiation Oncology is an integral component of the City Clinic Cancer Center. It is equipped with two Varian® linear accelerators, one of which with STX specifications. These are the most advanced linacs in the world at the moment. The department also has a HDR (high dose rate) brachytherapy system for some specific indications.

Fighting cancer starts HERE and NOW!
Modern nuclear medicine requires an entirely new approach, based on strict quality criteria. By using the latest generation of hybrid high-tech equipment, SPECT/CT and PET/CT, it ensures optimal analytical and diagnostic imaging. With this equipment, it is possible to obtain unique images combining structural and functional changes, impossible with the older generation machines. The modern scanners at City Clinic help physicians achieve significantly shortening the examination time of patients, reducing both the needed activity of the injected radiopharmaceutical and the radiation dose. The result is a high quality image, which is the first step in accurate diagnosis and subsequent adequate therapy.

Deparment of Nuclear Medicine

Modern PET/CT-scanner is available at City Clinic. It combines the strength of PET (Positron Emission Tomography) and CT (Computed Tomography) in order to provide the most accurate diagnostic imaging. The unique technology and all the features of PET/CT allow doctors to distinguish the cancerous from noncancerous lesions. It is also possible to determine whether cancer has spread to other internal organs - a process called “staging of the cancer”.

SPECT/CT

SPECT/CT is another technology we use at City Clinic. Single photon emission computed tomography (SPECT/CT) type of scan can be of particular importance in certain clinical situations, when the interpretation of an area of interest may change depending on its location. It provides the ability to merge or combine the images often allowing the nuclear medicine specialist to more accurately determine the site of any abnormality and whether the abnormality lies in the bone or the adjacent joints.

Nuclear medicine finds its application in the visualization and monitoring of a number of benign diseases affecting the cardiovascular system, endocrine system, musculoskeletal system, lungs, kidney function, etc. The nuclear medicine is essential due to its ability to establish the diagnosis early, stage the disease accurately and assess the response to treatment. Nuclear medicine scans also allow the early detection of cancer recurrence and metastasis.

At City Clinic we believe every patient should have an access to world class high-tech diagnostic imaging. The most effective imaging techniques available today will help our patients have personalised therapy programs. This ultimately improves the cancer outcomes and reflects in the patient’s overall quality of life.
Department of Diagnostic Imaging

The Department of Diagnostic Imaging is equipped with state-of-the-art technology and a team of specialists, ensuring the highest quality and accuracy of the diagnostic process.

The department has a full range of the most modern digital imaging equipment:

- Digital X-ray machine
- Unique 3D digital mammography unit with tomosynthesis providing the opportunity for contrast enhanced mammography
- 128-slice CT
- 1.5T MRI scanner

1.5 Tesla MRI Scanner

The latest magnetic resonance uses magnetic field force of 1.5 T (tesla). The electromagnetic field stimulates some of the atoms in the human body, and using a method of complex computer calculations it converts the signals into two- and three-dimensional images, analyzed then by specialists at the Department of Diagnostic Imaging.

Musculoskeletal system

The MRI is often used for medical imaging of knees, ankles, shoulders, elbows and wrists. The MRI evaluates in detail the soft tissues, cartilages and ligaments, joints, etc. It has high sensitivity and specificity and it is able to detect even the slightest pathological changes. The MRI is very useful in diagnosing diseases of the spine such as a herniated intervertebral discs, spinal stenosis and tumors of the spine.

Diagnosis and staging of tumors

The organs of the chest and the abdomen (liver, pancreas, adrenals, kidneys, etc.) could be examined in detail. The MRI is used extensively in diagnosing and staging of tumors of the male and female reproductive organs and the rectum.

3D Mammography with tomosynthesis

The latest advance in breast imaging is digital three-dimensional mammography, also known as the digital breast tomosynthesis (DBT). This method is now available to patients of City Clinic Cancer Center. It images each breast from several different angles achieved by the X-ray machine rotating in a 30-degree arc. The result is a detailed view, determining the precise location of any tumor or microcalcifications (these small deposits of calcium are frequently associated with premalignant and malignant breast lesions).

128-slice Computed Tomography (CT) Scan

City Clinic Cancer Center has the latest generation of a 128-slice Computed Tomography Scanner. The scanner directs a specially shaped fan of X-ray beams at the body from rapidly rotating X-ray source. Powerful computers process the information, producing images of “cross-sections” of the body. This state-of-the-art machine is equipped with modern software, enabling fast and accurate diagnosis. The 128 slices CT Scanner allows a conduction of single breath, low-dose screening examinations of lungs for patients at risk (e.g. smokers). It allows modern imaging as virtual colonoscopy. CT is a method of choice for diagnosis and staging of cancer patients. It is also very useful as follow up imaging modality. This fast scanner allows also angiography of the vessels of the whole body and their three-dimensional image reconstruction.

3D Mammography with tomosynthesis

City Clinic Cancer Center offers you a complete range of diagnostic and interventional imaging services. We are continuously working to provide patients with the most up-to-date technological advances and innovative options in diagnostic testing. Using state-of-the-art equipment, a skilled team of specialists provide our patients with caring, safe and efficient imaging services that are fully coordinated with comprehensive medical care. Following this direction, we have implemented a specialised system for control and reduction of the patient’s radiation exposure. Each patient has an individual radiation “passport”, tracking the levels of received radiation. This way we ensure a reduction of the radiation risk and maintain minimum levels of radiation exposure.

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HEAD OF DIAGNOSTIC IMAGING DEPARTMENT
Chair of the Society of Radiology
Member of the European Society of Radiology Oncology
Board Member of the Bulgarian Society of Cardiac-Thoracic Radiology
Member of the European Society of Radiology Imaging (ESOR)
Member of the European Society of Radiology (ESR)
Member of the European Society of Gastroenterology (ESGAR)

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The Department of Medical Genetics offers an integrated process for diagnosing and selecting the proper therapeutic approach for City Clinic’s patients. The hospital facility provides services to patients who require:
- genetic risk assessment,
- genetic research
- genetic diagnostics
- genetic counseling
- management of genetic diseases.

We implemented the latest methods in genotyping various solid tumors. This is done in order to refine and individualize the treatment of each patient. The personalized medicine is the main priority of the Department of Medical Genetics.

The laboratory offers:
- DNA isolation from histological and cytological specimens. For patients with non-small cell lung cancer as an alternative method, it is possible to use the so-called liquid biopsy (isolation and genotyping circulating tumor cells from venous blood).
- Personalised therapy is available for patients having:
  - non-small cell lung cancer – EGFR / ALK mutations
  - colorectal cancer – KRAS / NRAS / BRAF mutations
  - melanoma – BRAF mutations

The validity of the results is guaranteed by both the highly qualified team and by the precision, of the state-of-the-art equipment. The genome sequencing allows determining the tumor mutations and direct the therapy. It also identifies the candidates for clinical trials with novel treatments. Such tests give a comprehensive molecular analysis of all solid tumors.

The Department of Clinical Pathology is responsible for pathological studies of different specimens. It is the basis of the accurate diagnosis and subsequent individualizing of the treatment process for the patients at City Clinic Cancer Center. These tissue and cytological specimens are normally taken during biopsy procedure or surgery. The Department of Clinical Pathology processes:
- routine reporting on all pathological specimens
- specimens (or biopsies) taken during surgery, could be tested immediately by a cryosection for rapid diagnosis. This frequently determines the extent of the surgery intraoperatively.
- endoscopic biopsies, taken during various endoscopic procedures
- cytology reporting of effusions in the abdominal and thoracic cavity, bronchoalveolar lavage, fine needle aspirations biopsies and vaginal smears.

Liquid-based cytology is extensively utilized. Immunohistochemistry stainings are used routinely for cell and tissue typing.

Our pathologists use state-of-the-art technology and the most advanced diagnostic techniques available to analyze thousands of tissue samples each year. Pathologists are key members of the disease management teams, collaborating with other medical specialists to customize each patient’s treatment based on his or her individual disease. Newer technologies and precision medicine have enabled improved diagnostic accuracy that can further classify cancers and identify specific genetic and epigenetic alterations that drive tumor growth. Precise histologic and cytologic classification and testing for clinically useful mutations in patients’ tumors allow us to match individual patients with the targeted therapies that are mostly likely to benefit them.

The hospital runs Multidisciplinary Clinic, including Medical and Radiation Oncologists, Radiologists and Pathologists who discuss all unusual and challenging cases. This allows a combined clinical decisions to be made. The complete set of immunohistochemistry tests allows diagnosing the metastases from unknown primaries. This also allows tissue typing of poorly differentiated tumours.

PCR is only one of the latest technologies that our laboratory uses to let geneticists and pathologists make a precise diagnosis of cancer findings in the human body as well as present information on the most suitable therapy for each and every patient - the so called targeted therapy. The latter aims aggressively at cancer cells while patients suffer much less side effects in comparison to the standard therapy.
The Department of Gastroenterology provides specialized medical care in gastroenterology, hepatology and the pancreas diseases. This includes specialized consultations, outpatient and inpatient treatment as well as emergency medical activities, covering general and internal medicine.

The Clinic of Gastroenterology treats patients with:
- Gastroenterological and liver diseases
- Inflammatory and functional disorders of the intestines
- Abdominal pain
- Diseases of the biliary-liver tree and the pancreas.

Assoc. Prof. Stoyan Handjiev, MD, PhD
HEAD OF GASTROENTEROLOGY DEPARTMENT
Member of the European Federation for Ultrasound in Medicine and Biology (EFSUMB)
Member of the European Association of the Study of the Liver (EASL)
Member of the Bulgarian Association of Ultrasound in Medicine (BAUM)
Member of the Bulgarian Society of Gastroenterology (BSGE)

The Department of Gastroenterology is a separate highly technological endoscopic and ultrasound sector (both outpatient and inpatient care) where the following are performed: mini-invasive endoscopic diagnostic and therapeutic procedures as well as percutaneous diagnostic and therapeutic interventions under ultrasound monitoring, solely or combined with X-ray navigation; biliary drainage, drainage of the liver, peritoneal and retroperitoneal fluid collections, biopsies of the liver, pancreas, peritoneal and retroperitoneal tumors, local radiofrequency and alcohol therapy of liver tumors, liver biopsies in diffuse hepatopathy.

In cooperation with the Department of Diagnostic Imaging, we have developed a program of early diagnosis and prevention of colon and stomach diseases. Patients willing to participate in the prevention program undergo risk factor and family history assessment. If necessary, our specialists appoint further screening tests of the respective range (laboratory, imaging, and endoscopy).

The Gastroenterology department has highly trained professionals for diagnosis, treatment and long-term follow-up of patients with IBD (inflammatory bowel disease, and GI Crohn’s disease, ulcerative colitis, chronic hepatitis, caused by Hep B and C viruses, autoimmune hepatitis, primary biliary cirrhosis, and primary liver cancer as a complication of liver cirrhosis). All physicians have specialty, qualification training and certification in the highest level of expertise in endoscopic and ultrasonic profiles, enabling them to carry out some of the most complex gastroenterology and hepatology procedures.

The endoscopic department has a fully equipped team with high-tech endoscopic ultrasound and x-ray devices for endoscopic retrograde cholangiographic procedures for biliary gastroesophageal and colonic stenting with plastic and metal self-expanding stents. The team is well-experienced in management of biliary duct obstructions /malignant and benign/ as well as a good control of bleeding from upper gastrointestinal tract finalized with endoscopic local hemostasis.

LEADING EXPERTS TEAM UP WITH YOU AGAINST CANCER
City Clinic has gathered a team of leading experts in their fields dedicated to apply the latest high-tech methods in cancer treatment. Using the most effective medical techniques applied in Western Europe and the USA we will help patients have individual treatment programs, reflecting and improving the overall quality of their lives.
CITY CLINIC PROVIDES WORLD CLASS CANCER TREATMENT

The Cancer Center combines the possibilities of Medical Oncology (Chemotherapy), Radiotherapy and Radiosurgery, Nuclear Medicine and Genetics in order to provide an efficient medical care in cancer treatment. City Clinic offers to its patient’s multidisciplinary medication therapy consisting of both classic anti-tumor medication and numerous biological, targeting medications.

INTERNATIONAL PATIENT CENTER

City Clinic meets the special needs and concerns of international patients. Our International Patient Center is dedicated in assisting you before, during, and after your stay in Bulgaria. We can ensure you will be treated with uttermost care, attention and professionalism. From the time you contact us, our specially trained patient representatives ensure effective communication between you and our doctors. We offer assistance in several languages including English, Arabic and Russian. Our highly qualified staff will refer each inquiry to the appropriate department and schedule the earliest appointment. We also provide support for medical visa applications, traveling and accommodation arrangements for you and your family members.