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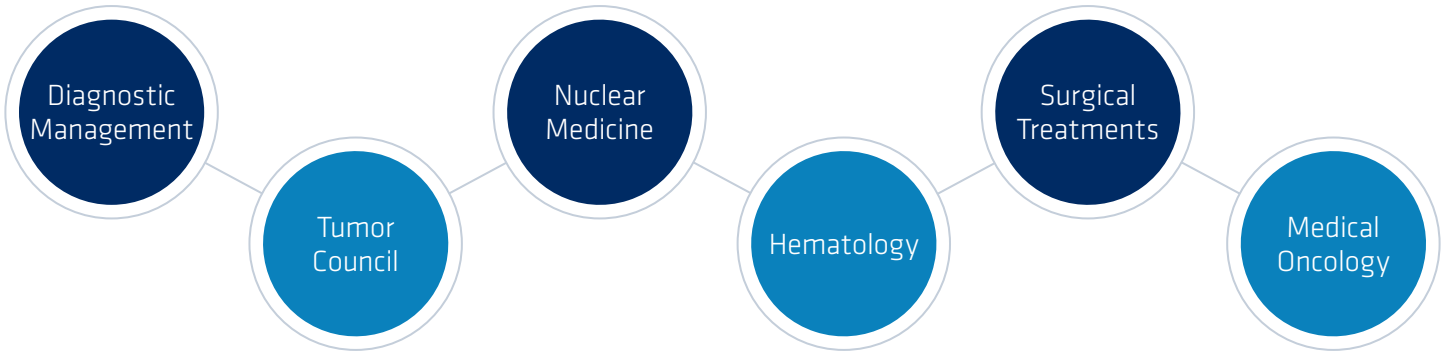
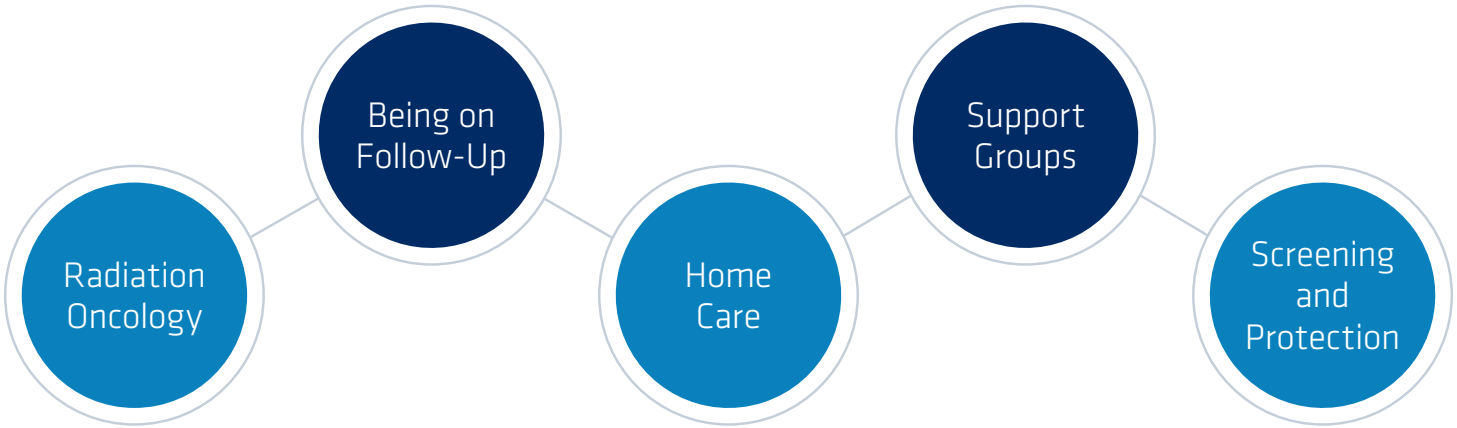


INDIVIDUALIZED TREATMENT and ROADMAP



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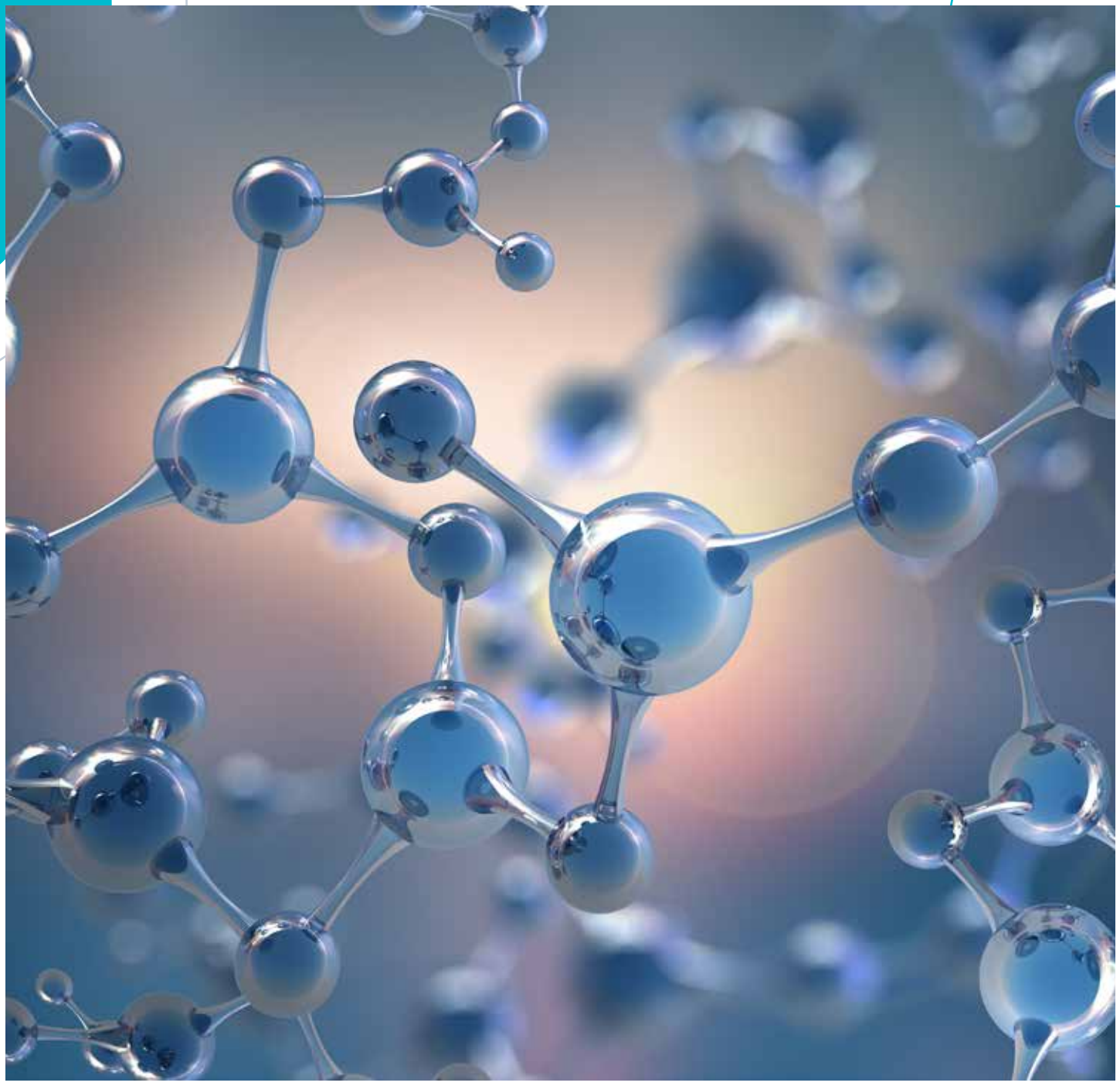
Take a step for yourself and take your measures.

Cancer is the second leading cause of death after cardiovascular diseases worldwide and in Turkey. However, it is possible to achieve successful results with early diagnosis. One of the most important things to do is detect cancer as early as possible with regular health check-ups.

Cancer cases at Liv Hospital are handled with a multidisciplinary perspective and by specialists in different fields. The treatment protocol is also applied as a result of a co-decisions. Thus, the treatment of the patient is approached with a holistic understanding.

In Liv Hospital Ulus, where cancer surgery is located, great importance is given to intensive care support. With the physician competence and appropriate technology, the patient is discharged in a short time.

Here you will find a lot of information about all of our medical and technological equipment in this field, from early diagnosis of cancer to its treatment, from cancer prevention to disease psychology.



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TUMOR COUNCIL

The success rate in cancer today depends on the patient, the type of cancer and the treatment approach applied. Personalized miscellaneous diagnosis and treatments are the most important step in this subject. Therefore, it is of vital importance for cancer patients to come together with physicians from different disciplines to decide the most appropriate treatment for the patient in the presentation of treatment options.

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What are the Branches in the Tumor Council?

- Medical Oncology
- Radiation Oncology
- Nuclear Medicine
- Hematology
- Radiology
- Pathology
- Gastroenterology
- General Surgery
- Gynecological Oncology
- Urology
- Brain Surgery
- Head and Neck Tumors
- Thoracic Surgery
- Chest Diseases
- Genetics
- Algology
- Dietician
- Psychiatry

* According to the cases, the participation of different disciplines is realized.

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DIAGNOSTIC METHODS

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DIAGNOSTIC METHODS

NUCLEAR MEDICINE

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PET/CT: PET / CT, the most up-to-date cancer screening technology, is an imaging device consisting of a combination of PET (Positron Emission Tomography) and CT (computed tomography). PET can provide information about the benign or malignant differentiation of a mass through the metabolism of cancer cells, as well as providing very important information about the distribution of a cancer in the body.

FDG – PET: PET imaging system is used to determine the prevalence of the disease in many cancer types in the field of oncology, to detect relapse, to evaluate treatment options and treatment response.

Gallium 68 Marked Compounds:

a) Ga-68 PSMA PET-CT in Prostate Cancer: PSMA has become an important option in imaging and treatment due to the high presence of prostate specific membrane antigen (PSMA) in prostate cancers. Ga-68 PSMA PET-CT enables the detection of more lesions than other methods used in the detection of relapses and metastases after treatment in the staging of the disease. Better results are obtained in detecting recurrence after radical treatment, even at very low PSA blood values.

PET-CT with Ga-68 DOTA peptides:

PET-CT study performed with Gallium-68 labeled DOTA peptides in the diagnosis and staging of neuroendocrine tumors is an advanced imaging method with high accuracy in lesion detection. It is a guide for diagnosis and treatment planning. After the waiting period for the injected substance to dissolve in the body, the whole body is scanned with a PET-CT device.

Scintigraphy

Scintigraphic examinations are imaging methods that are based on physiological principles, create low radiation exposure, and can be used safely in both adults and pediatric age groups without any risk of toxicity. In addition to visual evaluation, quantitative programs can also provide numerical data that provide objective evaluation. For example, it is possible to calculate values such as estimated post-op FEV 1 value with quantitative lung perfusion scintigraphy, total perfusion defect as% value in myocardial perfusion scintigraphy, ejection fraction, hepatopulmonary shunt rate, differential kidney functions, half-life time, gastric emptying time.

Intraoperative Gamma Probe:

The gamma probe used intraoperatively is a portable radiation detector that detects low amount of radiopharmaceutical uptake given to the patient before the operation and gives audible and numerical warning. It has found widespread use for sentinel lymph node detection in oncological surgery, especially in breast cancer and malignant melanoma. This method, which is also used in the marking and removal of non-palpable occult lesions and in parathyroid surgery, enables the lesion to be detected more easily, thus shortening the procedure time and even making the surgery minimally invasive.

Genetic tests

Liv Hospital Ulus Genetic Diseases Diagnosis Clinic provides high quality and reliable polyclinic and laboratory services for the diagnosis, follow-up and treatment of all kinds of hereditary diseases with modern up-to-date devices. Genetic tests applied in cancer patients can provide a definitive diagnosis in the presence of unclear clinical findings. With the determination of biomarkers suitable for cancer therapy, effective immunotherapy studies can be achieved in 20% to 40% of cancer cases. Routine cancer screening tests are recommended for individuals at risk of developing cancer. This was, patients are detected at an early stage and appropriate treatment is provided.

The same cancer or similar or different types of cancer can be seen in more than one person in a family. More than one gene associated with the disease can be examined at once for the diagnosis of the type of cancer related to cancer screening test panels.

In which cases should it be done?

In which cases should it be done?

- If the same type of cancer occurs in more than one case in the family
- In the event that cancers, usually seen in older ages, occur in young individuals (colon cancer in a 20-year-old individual)
- Coexistence of more than one cancer type in a person (patients diagnosed with both breast and ovarian cancer)
- More than one childhood cancer in siblings (such as sarcoma diagnosis in two siblings)
- Cancer development in both organs (For example, in both kidneys or both breasts)
- Seeing a certain type of cancer in unusual cases (such as breast cancer in men)

Genetic Tests Determining Treatment

- Non-Small Cell Lung Cancer (EGFR, EML4-ALK, KRAS, ROS1)
- Colorectal Cancer Mutation Panel (KRAS, BRAF, NRAS)
- Breast Cancer (Her2/Neu FISH Analysis)
- Papillary Thyroid Cancer (BRAF)
- Melanoma (BRAF)

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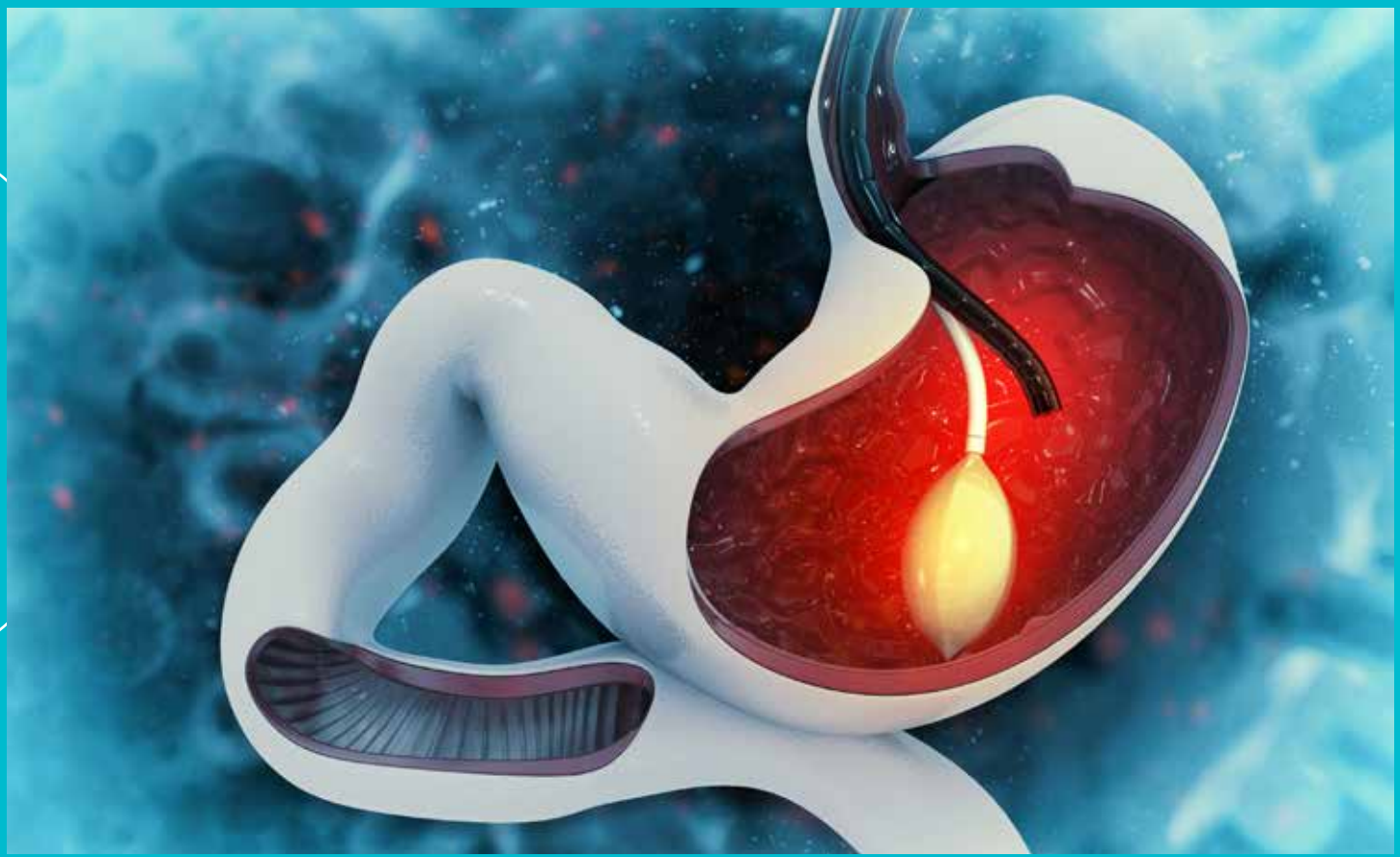
DIAGNOSTIC METHODS
ENDOSCOPIC INTERVENTIONS



Colonoscopy

Colon cancers are preventable cancers. It is an effective diagnosis and treatment method to detect and remove polyps, which are the leading signs of colon and rectal cancers, and thus prevent cancer development. It is a great advantage that enables biopsy and some invasive treatment methods. The entire large intestine and the last part of the small intestine can be examined by entering from the anus with a colonoscope, which is a light, camera and a soft device with a diameter of about 1 cm. During the examination, if necessary, samples (biopsy) can be taken for pathological examination in places that appear unusual, and polyps that may cause cancer development can be removed. In addition, early stage cancers, which we define as "intramucosal", which have transformed from polyp stage in the large intestine to early stage cancer and are located in the colon but do not pass into deeper layers in the intestinal wall, can be removed by endoscopic mucosectomy method without the need for surgical intervention.

Gastroscopy

Gastroscopy is an examination method that allows you to see the inside of the esophagus, stomach and duodenum. A device with a camera tip, called a gastroscope, is then advanced very carefully into the stomach. In this way, it is determined whether there is any disease in the stomach; By taking biopsy when necessary, it is possible to diagnose stomach diseases and stomach cancers. In addition, early stage stomach cancers (in cancers that have attached to the stomach lining and have not progressed deeper into the stomach wall) can be removed by endoscopic method, by raising the base of the tumor tissue and using special endoscopic knife methods. On the other hand, in patients who are diagnosed at the stage of very advanced gastric or esophageal cancer, who are not suitable for surgical treatment options, who cannot be fed and are vomiting due to the development of a tumor in the esophagus or stomach, while systemic chemotherapy and/or radiotherapy continues, endoscopic stenting by opening the area and placing the apparatus that allows the passage of food) or endoscopic gastric feeding tube placement (Percutaneous Endoscopic Gastrostomy: PEG). Endoscopic Ultrasonography

Endoscopic Ultrasonography

Endoscopic ultrasound (EUS) provides the opportunity to examine the organs around this cavity that are not directly accessible by making use of the digestive system cavity. With this method, organs in the chest cavity, lymph nodes, pancreas, spleen, kidney, adrenal gland, gall bladder, bile ducts, cancers that involve the rectum can be viewed in detail. When any mass is seen here, sampling can be done with a special catheter. Although it is not directly located around the digestive system, many cancers may have spread to the lymph nodes located in the chest cavity or abdomen, and the detection of this spread will change the cancer stage and will also change the type of treatment to be selected. Therefore, EUS has an important place in determining the correct cancer staging. Accurate and reliable staging at the beginning of cancer diagnosis will determine the most accurate treatment map for the patient.

With EUS, not only can we characterize masses and sampling when necessary, we can provide many other benefits. One of the most important problems that reduces the comfort of the patient in pancreatic cancer or colon cancer is abdominal pain. Morphine derivatives, which are given for controlling the pain, can also weaken their effects in the long term or make the situation more difficult with constipations. In such cases, the nerve nodes that carry the sensation of pain to the brain are destroyed under the guidance of EUS and a pain treatment procedure called "celiac neurolysis" is performed. Tumor tissue can be burned by applying radiofrequency under the guidance of EUS to pancreatic tumor patients who are not suitable for surgery or patients with small pancreatic neuroendocrine tumors. The procedure is usually performed daily without hospitalization. However, hospitalization may be required if there is an underlying severe disease. The patient is put to sleep by intravenous drug administration method called sedation. It is basically no difference from other endoscopy procedures. It is enough to come on an empty stomach, no additional medication is necessary.

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INTERVENTIONAL BRONCHOSCOPY and EBUS (Endobronchial Ultrasonography)

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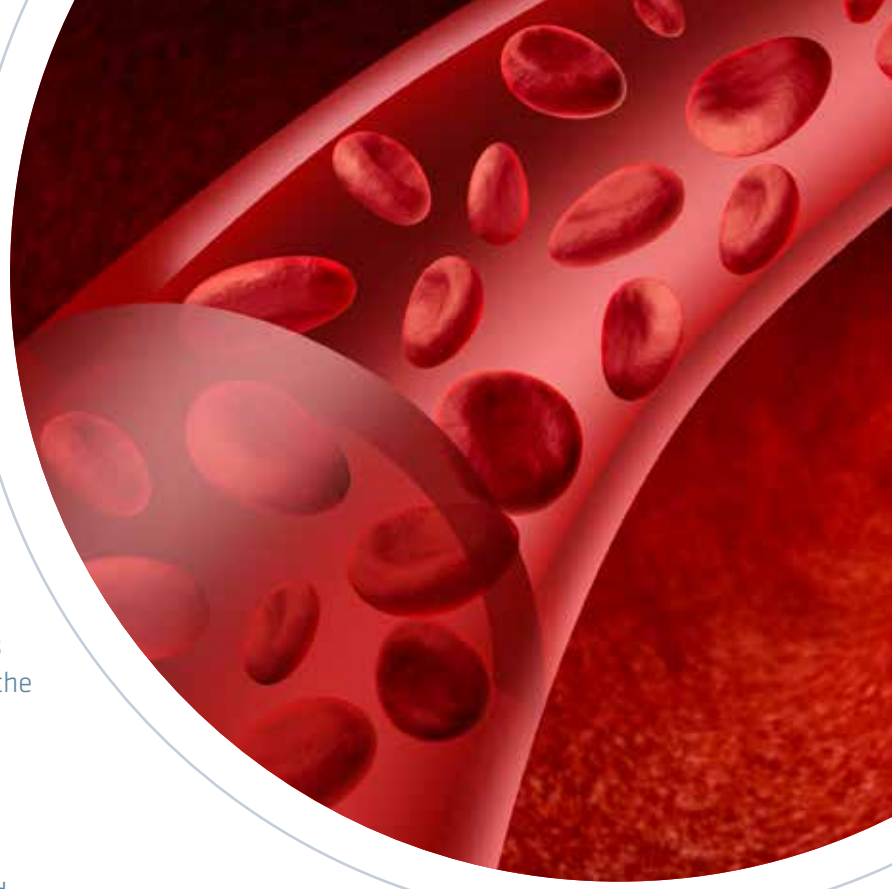


With bronchoscopy, disease findings within the airways can be directly observed and biopsy can be taken from the diseased areas for pathological examination.

In cases where the disease is not in the bronchus, the diagnostic value of bronchoscopy decreases because the possibility of obtaining biopsy from the diseased area that is not visible in the bronchus with this method is limited. However, this problem has been overcome with ultrasonography integrated into the bronchoscopy in recent years. With this method, Endobronchial Ultrasonography (EBUS) method, many lesions such as enlarged lymph nodes or tumors adjacent to the bronchus, which cannot be diagnosed by classical bronchoscopy, can be easily and visually accessed and materials for diagnosis can be obtained from these.

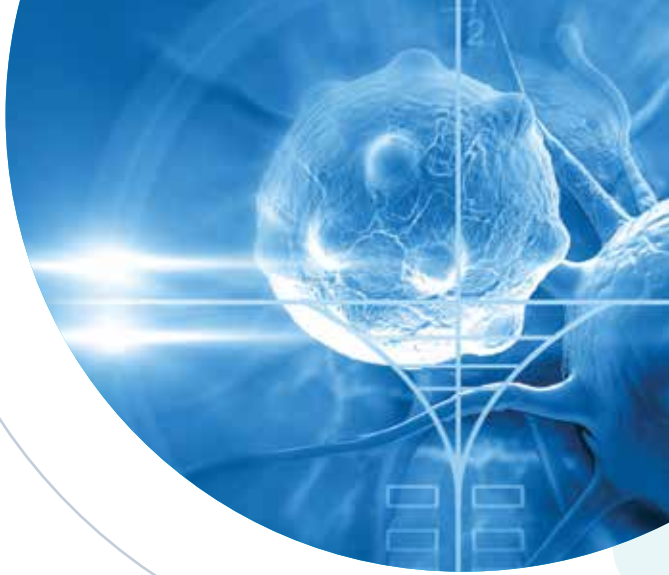
taken by seeing and reaching the target is definitely possible. The second advantage is that the blood vessels can be viewed by ultrasonography, thus eliminating the risk of vascular injury.

This method causes growth in lymph nodes adjacent to the airways; It is used in the diagnosis of many diseases such as cancer, lymphoma, sarcoidosis, tuberculosis and infectious diseases.

When examining the bronchus with a bronchoscope, the probe at the end of the bronchoscope rests against the wall of the bronchus and the tissue and blood vessels behind this wall can be viewed very clearly. After the lymph node or tumor mass to be biopsied is seen by ultrasonography, a specially produced fine needle in the bronchoscope is sent to the end of the bronchoscope and material can be taken from this lymph node or mass under the ultrasonographic image. The first advantage of the method is that it enables biopsy to be

The success of this method is also very high in determining the stage of the disease in cancer patients besides the diagnosis.

With the use of this method, many patients get rid of unnecessary surgeries.



CANCER SURGERIES

At Liv Hospital Cancer Center, patients are evaluated with a versatile expert perspective.

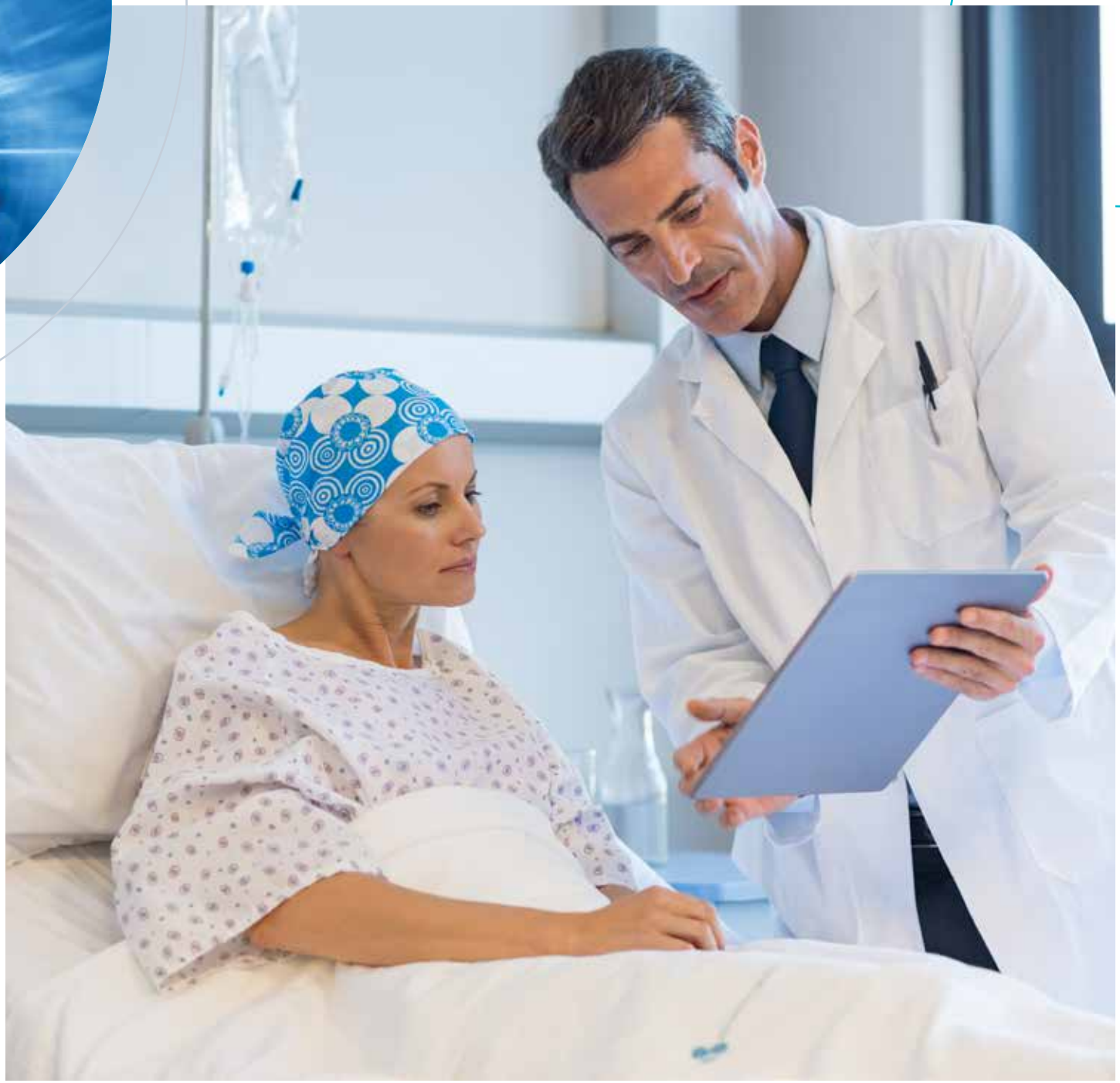
Appropriate surgical and post-surgical approach is evaluated by physicians from different disciplines and individualized cancer treatment is adopted.

Experienced Expert Staff and Superior Technology

Liv Hospital uses a powerful diagnostic technology based on the vital importance of early diagnosis in cancer. Experienced surgeons, experts from different departments such as medical oncology, radiation oncology and psychology, decide on the treatment together using the latest technological treatment methods.

Personalized Cancer Treatment

Every aspect of the patient such as patient's genetic characteristics, tumor characteristics, age and gender are of great importance for the treatment. At Liv Hospital, the patient is evaluated considering all these features and a personalized treatment protocol is applied. Liv Hospital adopts a customized treatment approach with customized cancer treatment. Genetic research studies make the most important contribution to cancer treatment. Liv Hospital aims at early intervention by developing the gene map of the persons with preventive medicine service.



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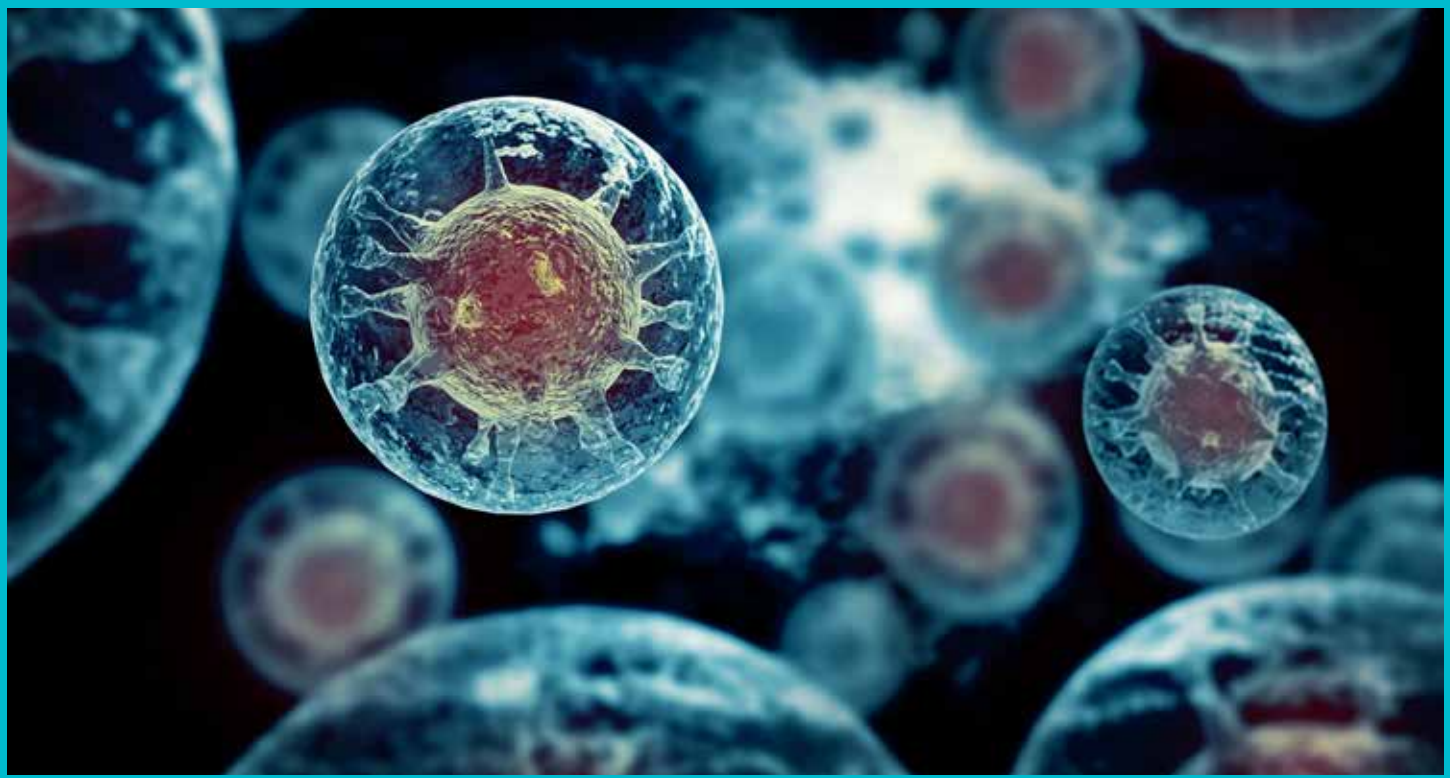
DIGESTIVE SURGERY & BREAST SURGERY & THYROID SURGERY



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Colorectal Cancers

Minimally invasive surgical procedures (laparoscopic and robotic surgery), which are called digestive system cancers, provide the patient with the advantage of high life comfort and rapid recovery when applied with correct and skillful hands.

Post-operative radiation therapy techniques and chemotherapy applications allow the patient to maintain her/his daily life as healthy and comfortable as possible.

Colorectal cancer treatment may vary depending on whether the tumor is located in the colon or rectum, or whether it is the result of an inherited genetic factor. Complication rates are minimized with laparoscopic and robotic surgery applied in colorectal cancers. In addition, the rate of tumor presence is significantly reduced with the permanent bag.

Stomach Cancer

The stomach is the digestive organ located between the esophagus and small intestines where food is digested. Stomach cancer arises from the lining of the stomach and can spread through the lymph channels. Endoscopy is performed for patients with complaints such as dysphagia, anemia, weight loss and abdominal pain, and biopsy can be taken by seeing the mass in the stomach. During surgery, these vascular structures should be carefully preserved and the lymph nodes should be widely removed. Disease-free survival increases significantly with the quality of the surgery performed. Extended lymphadenectomy is performed with robotic surgery, which is a modern treatment method. For this reason, gastric cancer surgery requires a very high surgical experience and skill..

Breast Cancer

The most important part of breast cancer treatment is the surgical approach. The aim of the surgery is to completely remove the tumor from the body. In our hospital, which targets early diagnosis with screening programs, reconstructive (corrective) surgical treatment is applied along with cancer surgery. The best cosmetic result and organ preserving surgery are aimed in the treatment. With the evaluation of the underarm lymph nodes and advanced technological devices to protect them from unnecessary surgery, the surgery can be decided instantly and it is aimed to protect the health of the patient. Aiming to preserve cosmetic results in the postoperative period, the Breast Clinic aims to achieve the best results in radiotherapy and chemotherapy.

Liver and Biliary Tract Cancer

Early diagnosis is of great importance in liver, gallbladder and bile duct cancers. It is possible to say that alcohol and hepatitis are the main factors in liver cancer. With a multidisciplinary approach, liver surgeries can be performed with high success rates, as well as advanced technological procedures such as interventional radiological procedures (angioembolization, radioembolization, radiofrequency), tumor-focused radiotherapy, and chemotherapy can be performed successfully. Surgery of patients scheduled for surgical treatment can also be performed with laparoscopic and robotic methods, thus patients gain advantages such as less pain, quicker recovery, shorter hospital stays, and better cosmetic results. Gallbladder and bile duct cancers are more common in older ages, in those with some familial inflammatory diseases and in people with stones and cysts in the bile duct. Gallbladder and bile duct cancers, currently the most effective treatment method is surgery; In Liv Hospital Cancer Center, where we serve with advanced technology, multidisciplinary and personalized treatment methods are successfully treated. All kinds of interventions can be successfully performed in our radiology and gastroenterology clinics, which use advanced technological devices for the treatment of jaundice in the disease that occurs with jaundice. Multidisciplinary approach such as chemotherapy and radiotherapy determined according to the needs of the patient after surgery increases the chance of success.

Pancreatic Cancer

Early diagnosis is vital for pancreatic cancers, which are known to be aggressive. Liv Hospital Cancer Center, which provides service with personalized treatment methods and advanced technology in the pre and post-operative period for pancreatic cancers, for which is surgery the most appropriate treatment method; Versatile approaches such as surgery, chemotherapy and radiotherapy increase the chance of success. Surgery of patients scheduled for surgical treatment

can also be performed with laparoscopic and robotic methods, thus patients gain advantages such as less pain, quicker recovery, shorter hospital stays, and better cosmetic results.

Esophageal Cancer

The diagnosis of esophageal cancer, which often occurs with swallowing difficulty, is made by endoscopy. Surgical intervention is the most effective treatment method in esophageal cancers. In the procedure called esophagectomy, it is aimed to remove the entire tumor in order to prevent the re-growth and spread of the tumor. Esophagectomy (complete removal of the esophagus) can be performed using open surgical methods or minimally invasive techniques (laparoscopic - robotic). A new esophagus is made by making a stomach tube or using the patient's own large intestine. In esophageal cancers, for which is surgery the most appropriate treatment method, personalized treatment methods in the pre and postoperative period are of great importance.

Thyroid Cancer

There are rare subtypes of thyroid cancers with poor prognosis at a rate of 90-95%. When the common types such as papillary thyroid cancer and follicular thyroid cancer are treated appropriately and radioactive iodine therapy is added to the necessary patients, it is possible to get rid of the disease completely. What is meant by appropriate treatment is a correct operation, complete removal of the thyroid tissue and if there is disease in the lymph nodes, they are completely cleaned. A correct surgical intervention is very important in the treatment of thyroid cancer, in preventing secondary operations and in the follow-up of postoperative thyroid cancer.

Adrenal Gland Cancer

Depending on the spread and size of the cancer, the kidney, surrounding fatty layers and adrenal gland may be removed. Benign adrenal tumors called adenomas or nodules are common. A single treatment or combination of treatments, including surgery, hormone therapy, chemotherapy, radionuclide therapy, and minimally invasive therapies, can be used to ensure that patients with all types of adrenal tumors receive the best available treatment. Surgery is a standard approach in the treatment of large or rapidly growing malignant tumors as well as most benign functional tumors. The surgical approach depends on the type of adrenal tumor, the location and size of the tumor, and whether it has spread to neighboring lymph nodes or distant organs.

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GYNECOLOGICAL CANCERS

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Uterine Cancer

85% of patients with uterine cancer do not experience any problems due to this disease. Generally, only surgery is sufficient.

Radiotherapy (radiation therapy) or chemotherapy may be required in a small group of patients.

In the operation, the uterus, ovaries, surrounding lymph nodes and abdominal adipose tissue are removed. Uterine cancer surgeries can be performed from the abdomen as open or endoscopic (laparoscopic or robotic) methods. It is rarely possible to treat uterine cancer with medication when it is diagnosed very early and in young women who want a child.

Cervical Cancer

In microscopic cervical cancer, treatment is possible only by removing the cervix. In young women who want to have children, surgery can be performed by protecting the body of the uterus by vaginal or abdominal open or endoscopic (laparoscopic or robotic) methods in tumors smaller than 4 cm that have not spread around. Surgery is possible with high success rates in cervical cancer that has not spread to the sides. These surgeries are very radical operations and can be performed either openly or endoscopically. In addition, by protecting the abdominal nerves, early urinary complaints can be avoided.

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Ovarian Cancer

The gold standard in the treatment of ovarian cancer is the first surgery to be performed by gynecologist oncologists who have been trained in this field and will not leave any visible tumor behind. The success rate in this surgery in many European centers does not exceed 50 percent. The success rate of the operation performed by the Liv Hospital Gynecological Oncology team without leaving a tumor behind reaches 93%.

This surgery involves a comprehensive procedure involving the removal of the uterus, both ovaries, fallopian tubes, surrounding lymph nodes, abdominal adipose tissue and some of the organs from which ovarian cancer has spread.

If the tumor is at an early stage, small and limited to the ovary, laparoscopy or robotic surgery can be performed to remove the uterus, ovaries, abdominal fat tissue and lymph nodes.

If ovarian cancer is detected at a very early stage, or in some types of ovarian cancer seen at a young age, other ovaries and uterus can be left in the operation to preserve the ability to have children and hormone production in women or young girls who have not yet given birth.

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UROONCOLOGICAL CANCERS

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Prostate Cancer

Prostate cancer, one of the most common types of cancer in men, is a disease that develops with age. Despite significant findings in recent years that molecular, genetic, environmental and nutritional factors contribute to prostate cancer development and progression, the causes of cancer are not yet fully known. The purpose of prostate cancer screening is diagnosing the disease when it is limited to the organ. 10-year survival rate is almost 100 percent when the disease is diagnosed at a time when it is only limited to the prostate.

There are multiple effective treatment options for prostate cancer. Cure can be provided by open, laparoscopic and robotic prostatectomy operations in patients with early disease (constituting 80-90%).

Testicular Cancer

Testicular cancer accounts for 1% of all male cancers and is the most common type of cancer between the ages of 15 and 35. No causes of the disease related to personal habits, lifestyle and activities are known. However, there is a significant risk of cancer in those who are called undescended testicles and when the testicles cannot fully descend into the bag and those with cancer in the other testicle. The most important symptoms are pain, swelling or stiffness in the ovary. Testicular cancer is approached in a versatile way at Liv Hospital. Common diagnosis and treatment planning are made by urology, medical oncology, radiation oncology, pathology and radiology clinics. After the operation performed by experienced urologists, early testicular cancer can be cured; radiation therapy and chemotherapy can be applied with the most modern devices, when necessary.

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Kidney Cancer

Kidney cancers originating from the kidney's own cells constitute 2-3% of all body cancers. However, it is extremely important because it is a life-threatening type of urological cancer.

Kidney cancer is seen in 2 women for every 3 men. Although it is mostly a disease of the 60s and 70s, it can also be seen in young people. Smoking is the most important risk factor for kidney cancer. It has been established that between 20% and 30% of those affected have been exposed to any of the tobacco products. In addition, excessive weight loss and high blood pressure are two other important factors.

Since the kidneys are located in the back of the abdomen, many kidney tumors can grow without symptoms.

The disease can manifest itself with bleeding in the urine, pain or spreading to other organs after the tumor grows. In addition, weight loss, fever, nausea and weakness can be seen.

Surgical intervention with early diagnosis of kidney cancer is very important because it provides full cure for the disease. Bleeding in a simple urine test examination, ultrasonography, computed tomography (CT) or magnetic resonance (MRI) imagining may sometimes help diagnose the disease.

The most appropriate treatment method for patients diagnosed with kidney cancer in Liv Hospital is selected by joint boards formed by physicians from urology, medical oncology and radiation oncology clinics. Patients who are diagnosed early can be treated with robot-assisted laparoscopy or direct laparoscopic method by removing only the tumor in that kidney.

Bladder Cancer

Bladder cancer is the most common cancer related to the urinary system in both men and women. Smoking is seen as one of the most important risk factors. 50 percent of patients with bladder cancer are smokers.

The risk of bladder cancer increases as many toxic substances in tobacco are excreted from the kidneys after entering the blood. In addition, it is seen as an occupational disease in people working in the paint, metal and oil industry. Again, serious carcinogenic substances have been detected in some permanent hair dyes.

If bladder cancers are only in the mucosa of the bladder, recovery can be achieved with TUR operations and drug therapy performed through the urinary tract, but if it has spread deeper, that is, to the muscle of the bladder, complete removal of the bladder operation, radiation therapy or chemotherapy may be required.

Intestinal bladder (the artificial bladder) method is an operation that enables patients to urinate through the normal urinary meatus for a more comfortable life. The most important advantage is that it does not lower quality of life and is socially acceptable.

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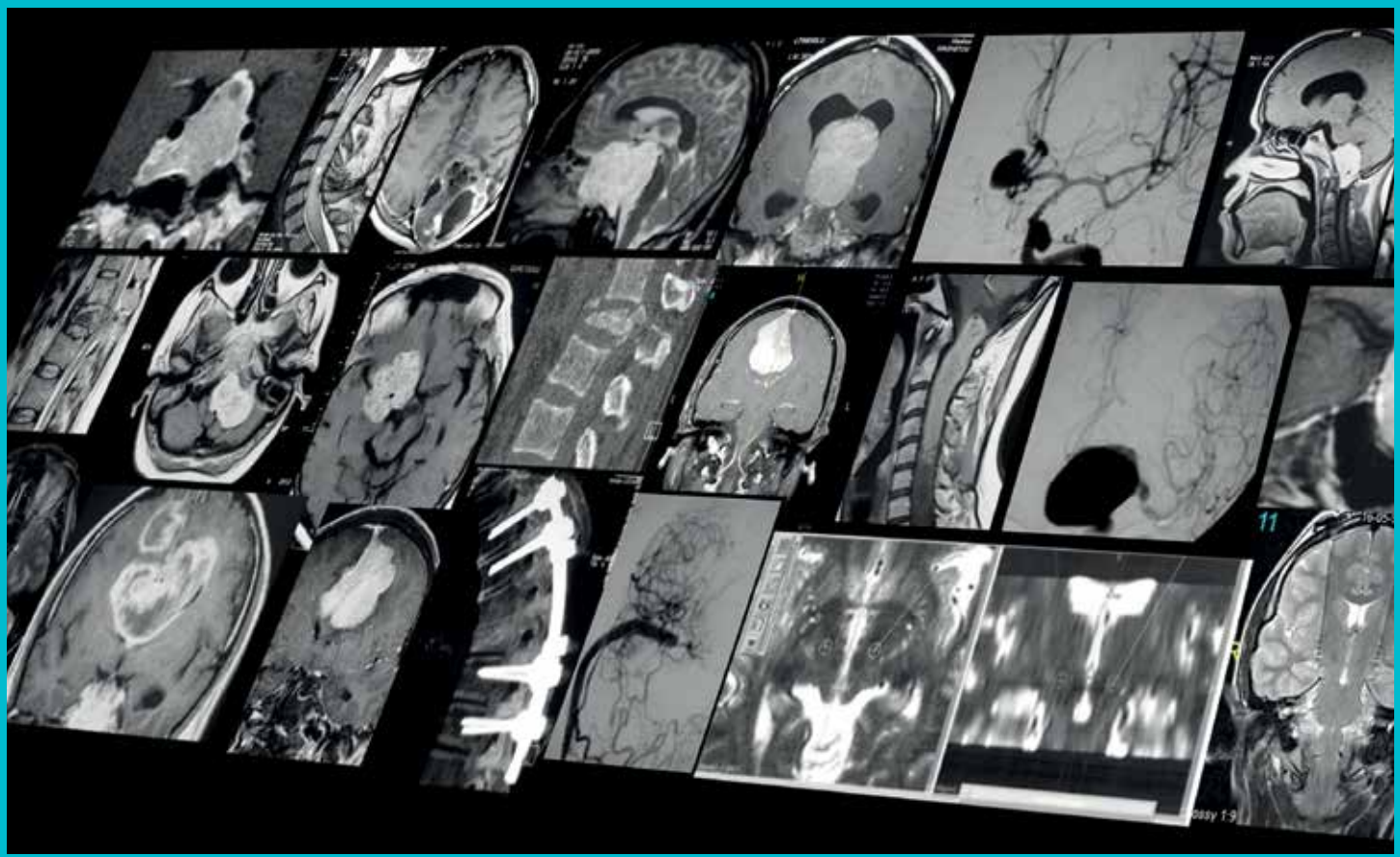
BRAIN TUMORS



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In general, the primary treatment of tumors located in the brain and cerebellum or compressing these organs, tumor type, location, age, general condition of the patient and whether there are additional systemic problems that may affect the operation decision are important factors.

If most of the brain tumors can be completely surgically removed, adjunctive treatment methods such as radiotherapy and / or chemotherapy are not required. On the other hand, some tumors with a high probability of recurrence may require radiotherapy and chemotherapy in the following period, although they seem to be completely removed surgically.

The main purpose of tumor treatment is to destroy the tumor without compromising the quality of life of the patient or at least to extend the healthy and quality life span as much as possible.

Fluorescence Guided Method

Fluorescence-guided brain tumor surgery may be considered as a kind of neurochemical navigation. Normally, tumors originating from brain tissue, some metastases and tumors such as lymphoma may not be fully distinguished from brain tissue during surgery. Thanks to the Fluorescent Guided Method (Fluorescent Guided Method), hard-to-reach tumors are easily cleaned and the damage to the brain tissue is minimized.

Neuronavigation System

Tumors can be removed by mini/micro interventions without damaging normal tissues thanks to the Neuronavigation system, which guides the surgeon by determining the location of the tumor with millimetric accuracy during surgery. Our operating room equipment park has one of the latest models of this system. An advanced neuro ultrasonography device is also used during brain tumor surgeries. In this way, it can be determined whether the tumors have been completely removed or not. Computed tomography and magnetic resonance imaging can be performed in any case.

Most Common Tumors

- Metastatic brain tumors
- Glial tumors
- Meningioma
- Hypophysis Adenomas
- Spinal cord tumors

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HEAD AND NECK TUMORS

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Head and neck cancers are among the types of cancer that can be treated when diagnosed early.

Most of the head and neck cancers show symptoms in the early period. It is possible to treat head and neck cancers without losing the quality of life with the correct surgical intervention in the early period.

Head and neck cancers include oral cavity lips, inner part of cheeks, gums, palate, tongue, floor of the mouth, skin of the nostrils and nasal lining, nasopharynx cancers seen at the top of the throat, the air around the nose in the facial bones called sinus, paranasal sinus cancers that develop within the cavities, oropharynx cancers in the area connecting the back of the nose to the throat, hypopharynx cancers in the lower part of the throat, and laryngeal cancers in the area below it, auricle and external auditory canal cancers, and salivary gland cancers.

The branches of otorhinolaryngology, head and neck surgery and radiation oncology, which are progressing in parallel with today's technological developments, enable the treatment of head and neck cancers with a rational treatment.

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LUNG CANCER

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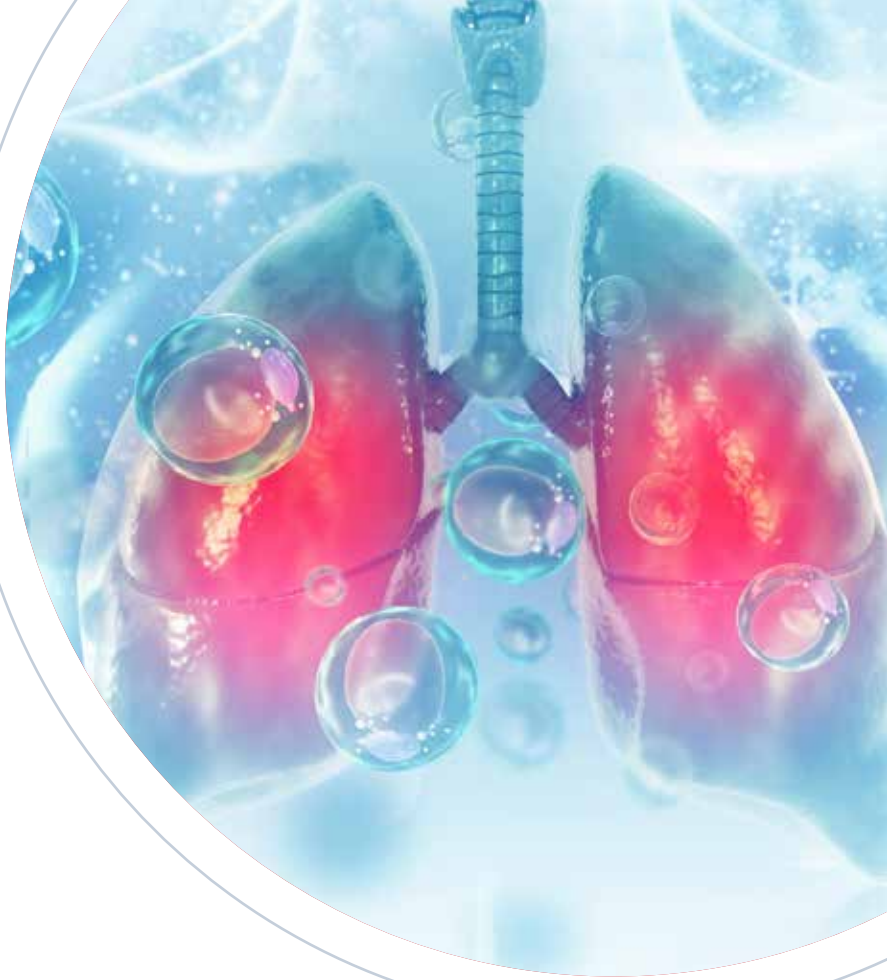

Lung cancer occurs as a result of uncontrolled proliferation of lung tissues, especially the cells that line the airways. It can be seen after examination with chest x-ray and computed tomography (CT). Biopsy is required for definitive diagnosis. Biopsy is usually done with bronchoscopy or CT-assisted needle biopsy. Treatment is planned according to the stage. In staging, the size and spread of the tumor, regional lymph node involvement and presence of distant metastasis are evaluated. While chemotherapy and radiotherapy are preferred in the treatment of small cell lung cancer, surgery is the first choice in non-small cell cancers. In the presence of tumors that cause obstruction in the trachea and bronchi, interventional bronchoscopy is included in the treatment. Interventional bronchoscopic methods may require electrocautery, APC and stent applications.

In the treatment of lung cancer, which ranks first among cancer deaths in the world, new developments in both surgical and drug treatments contribute to the recovery of patients.

Lung cancers are the type of cancer that kills the most in both men and women today. When lung cancer is suspected, diagnosis is made by radiological and interventional methods. Then, staging is done to determine the prevalence of the disease and to determine treatment options. Staging is done with computerized chest tomography (CT), whole body PET/CT, brain MRI and, if necessary, biopsies. If the patient is eligible for surgery, the next step is to evaluate whether the patient can handle this surgery. The patient is evaluated in terms of respiratory functions, heart reserve and other accompanying diseases.

With **videothoracoscopic** methods and **robotic surgery**, lung cancer surgeries are now less traumatic and safer. With these methods, patients can tolerate larger surgeries better than open surgery and recover more easily.

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SKIN CANCERS

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Skin cancers are the most common cancer types encountered in the community. There are many types of skin cancer, and each of these cancers may differ in appearance. If skin cancer is detected as a result of biopsy, further treatment may be required.

Surgical treatment may be sufficient thanks to early diagnosis. In the advanced stages of cancer (in cases where it has spread to different organs), the treatment protocol changes. Treatment varies according to the type, size and area of the skin cancer or the needs of the patient.

Long-lasting wounds on the skin are the most important finding of skin cancer. Skin cancer can arise from the intact skin area. However, some skin cancers may develop over existing skin diseases. In other words, some formations seen on the skin may be the leading sign of cancer. Those who are frequently exposed to the sun and light-skinned people have thin scabs on their skin and these crusted wounds are called “actinic keratosis”. These crusted wounds can turn into malignant cancer on the skin after many years.

Those most at risk of skin cancer are people with light skin, those who have been professionally exposed to the sun for a long time (farmers, seafarers, construction workers, etc.), radiation treatments, and those who have been exposed to certain chemicals such as arsenic. Genetic factors are important. People with skin cancer in their family have a higher risk of developing cancer than the normal population.

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PEDIATRIC ONCOLOGY

Decisions are taken by the Pediatric Oncology Council.

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Drawing attention to the importance of multidisciplinary approach in childhood cancers, Liv Hospital adopts a 360-degree approach and team solidarity in treatment. Liv Hospital has a Pediatric Oncology Council established exclusively for childhood cancer cases.

The decisions taken by the Council are put into practice immediately without wasting time, and treatment protocols are determined. The Pediatric Oncology Council seeks to ensure that chemotherapy, surgery, or radiotherapy are performed at the right time and algorithm for the family and the child as part of the modern treatment, and that the patient's compliance with the treatment is maximized. Child oncology is a team work that also affects the family. The pediatric oncologist plans, organizes and implements the drug part. Once the patient is cured, he/she assures necessary organizations so that the diseases does not relapse. Pediatric surgery plays a key role in this council's stages of surgical removal, biopsy, and catheter insertion for treatment. The approach to the mass and the decision of surgical removal are discussed considering the interaction of the surrounding organs and the tumor mass, and surgical treatment is planned before or after chemotherapy/ radiotherapy. In cases selected and approved by the council, intraoperative Radiotherapy (IORT) is given to the tumor area removed during surgery by a radiation oncologist during surgery. With IORT, a high dose that cannot be delivered with standard radiotherapy can be applied to the area with risk of recurrence. This increases the possibility of local control of the mass and provides significant benefits in terms of protecting the surrounding tissue.

Who Takes Part in Pediatric Oncology Council?

Formed by the participation of specialist physicians from Pediatric Surgery, Brain Surgery, Otorhinolaryngology, Nuclear Medicine, Radiology, Pediatric Hematooncology, General Pediatrics, Orthopedics, Radiation Oncology departments.

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MINIMALLY INVASIVE SURGERY

(Laparoscopic - VATS (Video Assisted Thoracoscopic Surgery) - Robotic Surgery)

Laparoscopic - VATS - Robotic, or in other words, minimally invasive technique or closed method surgery as popularly known is a special application area of surgery.

With these techniques, which have been used in gall bladder, pancreas, lung, liver, stomach and intestinal surgeries and are becoming increasingly common in the world because they cause less pain, less blood loss and less infection develop compared to traditional open operations.

Robotic surgery provides recovery in a short time. In open surgery, an incision covering the abdomen must be made to reach the inside of the abdomen, while in the laparoscopic - robotic (closed) technique, operations can be completed with a few incisions of 0.5-1 cm in size.

The robotic surgery system, thanks to its 3-dimensional image feature, allows even complex interventions to be performed with closed surgery method. Again, with the video-assisted thoracoscopic surgery technique, lung and esophagus cancers can be treated. It also enables biopsy and sampling from the pleural membrane, lung nodules, mediastinal masses and pleural fluid that fills this space by providing visualization of the chest cavity.

Gynecological oncology, urology, thoracic surgery and general surgery use robotic surgery in cancer surgery.

What are the advantages of robotic surgery?

In addition to the classic advantages of laparoscopic surgery, the most important benefits of robotic surgery are as follows:

- **Less Pain:** Minimal trauma to the skin and muscle means less pain and discomfort after surgery.
- **Lower risk of infection:** The minimal contact of the abdominal organs with air in the operating room means a significantly lower risk of infection compared to open surgery.
- **Safer surgery:** Three-dimensional and magnified images provide better vision, protecting blood vessels and nerves. For example, blood loss during the operation is greatly reduced.
- **Smaller wounds:** Wound sizes are minimal with 1-1.5 cm incisions against 20-25 cm incisions in open surgeries.
- **Fast recovery:** After the operation, the patient's recovery is faster as the movement and oral nutrition start earlier.
- **Shortening of hospital stay:** Most of the patients are discharged 3 or 4 days after the operation.
- **Quicker return to work and daily life:** Thanks to rapid recovery, patients can regain their normal lives more quickly.

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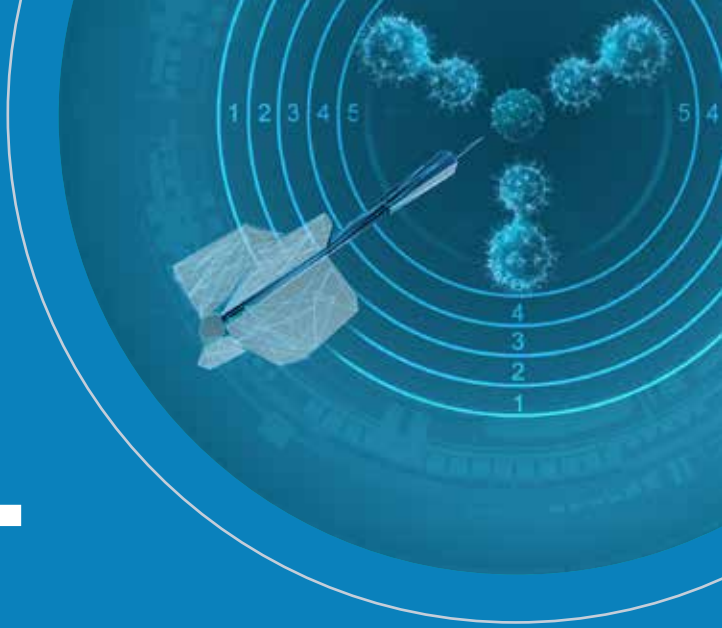

TREATMENT METHODS

Cancer, which everyone has followed with curiosity in all the details in recent years, generally progresses in silence. Environmental, genetic and unfavorable conditions in lifestyle constitute risk factors for cancer in our age. With the increase in diagnosis and treatment opportunities, the recovery rate of cancer patients increases. One of the most important things to do for early diagnosis of cancer is to undergo regular health checks and participate in screening programs. In Liv Hospital Ulus.

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RADIATION ONCOLOGY

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Radiation oncology uses ionizing rays called radiation in the treatment of cancer disease. The main principle of radiation therapy is to allow cells to die or to prevent them from dividing.

The main purpose of radiotherapy is to provide and protect the normal healthy tissues around the tumor to receive as little dose as possible while giving the planned high lethal dose to the tumor.

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ADVANCED TECHNOLOGY IN CANCER TREATMENT

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Advanced Technology in Cancer Treatment:

One of the important factors that ensure success in radiotherapy is the device technology used. Linear accelerator, one of the latest technologies, is used in Liv Hospital Ulus Radiation Oncology Clinic.

Maximum Protection in Intact Tissues

During the treatment, while rapid dose administration is applied to the tumor at the desired intensity, with almost complete accuracy; Maximum protection is provided to surrounding intact tissues.

In All Cancers

Thanks to its synchronized movement tracking feature, it is used in the treatment of all types of cancer that require radiotherapy, making a big difference in the treatment of lung, breast, prostate and spinal region cancers.

Correct Dose Calculation

Apart from the features of the device in radiotherapy, another important issue is the correct calculation of the treatment dose to be given in radiotherapy.

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1.5 TESLA MR LINAC

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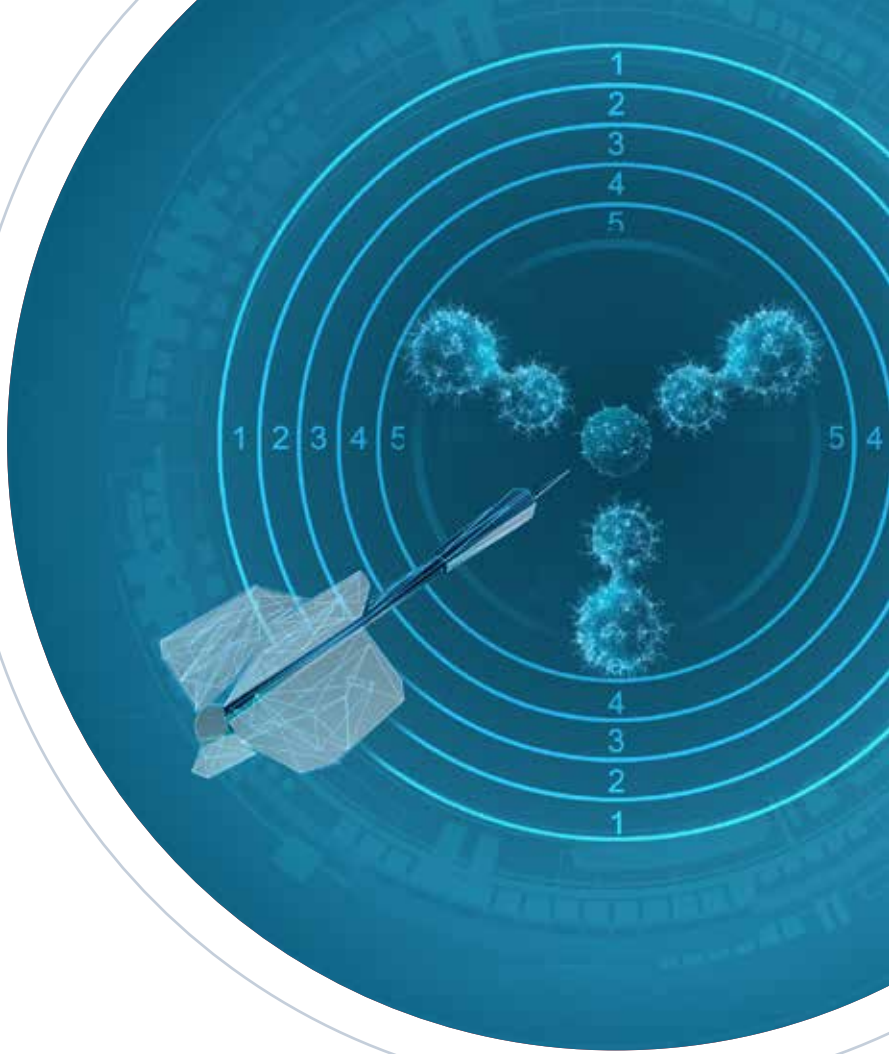

1.5 Tesla MR Linac

Unity-MR Linac, which is very few in the world in 2020, is being used in Liv Hospital Ulus Radiation Oncology Clinic. Unity-MR LINAC radiotherapy, which is called smart radiotherapy and is the latest technology; It is applied when the patient is under the MR image, allowing the tumor to be hit at exactly 12. The first 1.5 Tesla Unity-MR Linac in Istanbul, which can detect even mobile tumors, take a fast and clear image during treatment, and ensure position accuracy, irradiates damaged cells without damaging healthy tissues. Not only the brain, lung tumors; it offers proven image advantages to existing systems especially in areas where soft tissues such as the pancreas, adrenal, liver, prostate, lymph nodes in the abdomen are concentrated.

Where Is It Used?

- Brain
- Lung Tumors
- Pancreas
- Adrenal
- Liver
- Prostate
- Lymph nodes
- Rectum cancers

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BRACHYTHERAPY

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Brachytherapy is a form of treatment by bringing radioactive sources (radiation source) close to the tumor. It can be applied in 3D with imaging methods based on section anatomy such as computed tomography and magnetic resonance. The widespread use of 3-dimensional brachytherapy improves success while reducing side effects.

In Prostate Cancer

Radiotherapy, which is used in patients who are not suitable for surgery during phases limited to the organ of prostate cancer, becomes more effective with the addition of brachytherapy for selected patients. Like external radiotherapy, the tumor is effectively destroyed with minimal side effects. With prostate brachytherapy, cancerous tissue in the prostate is irradiated through the prostate, not from the outside. Thus, the tumor is closely targeted, at high doses and without damaging the surrounding tissues.

In Gynecologic Tumors

Brachytherapy can be used as the only treatment method in patients with uterine cancers (endometrium), cervical cancers and vaginal cancers after surgery or together with external irradiation in patients not suitable for surgery. While 3D brachytherapy applications contribute to the successful treatment of gynecological cancers, appropriate protection of surrounding intact tissues (such as bladder, rectum, sigmoid) can be achieved.

Skin Brachytherapy (with Leipzig Applicator)

It is used successfully in the treatment of early stage skin squamous and basal cell cancers with suitable surface and depth. Cosmetic damages that may occur with surgery in tumors located around the face are generally less common in the use of brachytherapy. Patients with early stage skin cancer, especially those with facial localization, who are deemed appropriate by a plastic surgery physician can be treated with brachytherapy.

Intro Operative Brachytherapy in Soft Tissue Cancers

It is a special form of treatment applied by means of catheters placed in the tumor bed, which has been removed surgically, in cancers that have recurred or without treatment, and benign conditions such as keloid.

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MEDICAL ONCOLOGY

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Medical oncology is the branch that manages all the applications of cancer with drugs. Chemotherapy is a term that generally refers to drug applications.

In cancer treatment, drugs can be administered intravenously, via the hip, orally in pill form or sometimes regionally into the abdomen. Chemotherapy is an important treatment option that increases the chance of success in almost all types of cancer today, especially breast, lung, intestine, ovarian cancers in men or women, lymphoma and leukemias.

While chemotherapy is used alone in some cancers, it is used in combination with other treatment methods such as surgery and radiotherapy. In some types of cancer, chemotherapy aims to prevent the spread of cancer by completely destroying it, while in some types it aims to increase the chance of recovery by killing the remaining cancerous cells after surgery and by strengthening the effect of radiotherapy in others. In some cases, it prevents its spread and extends the life.

Medical oncology physicians, who are specialized in their field, take the necessary precautions to ensure that healthy tissues suffer the least damage from this treatment and to protect the quality of life, as well as determining the most appropriate treatment method specific to the patient.

Immunotherapy, in other words activation of one's own immune system, is now used frequently in cancer. Immunotherapy is used alone or in combination with chemotherapy in many cancers and generally in advanced stages, and satisfactory results are obtained with few side effects. Likewise, very good answers are obtained when targeted therapies are given to suitable patients. In Liv Hospital Ulus Medical Oncology Clinic, which is very experienced in this field, current immunotherapy and targeted therapies are applied.

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SAFER APPROACH WITH DIGITALLY SUPPORTED ARTIFICIAL INTELLIGENCE

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Liv Hospital Ulus attaches great importance to the time, safety and professional follow-up of its patients. Therefore, it incorporates the latest technologies. With the “Artificial Intelligence” applications implemented in Liv Hospital Ulus Oncology Clinic, the efficiency and treatment success of chemotherapy in cancer treatment increases.

What are the advantages of artificial intelligence applications?

- The doctor can automatically create the patient’s chemotherapy or oncological treatments, such as other smart drug treatments, in a few clicks. Later, after being checked and approved, all days that the patient will come for treatment are automatically calculated and presented to the doctor, nurse and patient. Thus, patients and other health care workers gain tremendous speed.
- The training information of the treatment is automatically prepared by the system. Thus, the patient is more comfortable about which subjects he should have knowledge about.
- The holistic structure of the system unites doctors, nurses, secretaries, robotic chemotherapy system and pharmacy around a single common circle. And patients here are treated in the safe circle in the middle of all these structures.
- The changing characteristics of the patient (weight, side effects, etc.) that have changed during the chemotherapy process and entered into the system are automatically monitored by artificial intelligence and the dose calculations are instantly presented to the doctor.

How does the system flow?

- The treatment plan recommended by artificial intelligence is presented to the doctor. The doctor confirms the appropriate dose to the patient through the system.
- The nurse in charge of the chemotherapy unit sees the dose the patient needs to be administered on the screen.
- Which drug should be prepared in which dose is transmitted to the chemotherapy robot unit through the system.
- When the prepared drug reaches the chemotherapy unit, the system tells the practitioner to check whether the drug is a drug for this patient. The practitioner nurse cannot administer the medication without performing this check. Therefore, with this system, patient safety is at the top level.
- A side effect or a level of side effect that develops during or after treatment is easily recorded in the system. Thus, the doctor decides what to do with the next treatment (stopping the drug, reducing the dose, etc.) with the support of the system.

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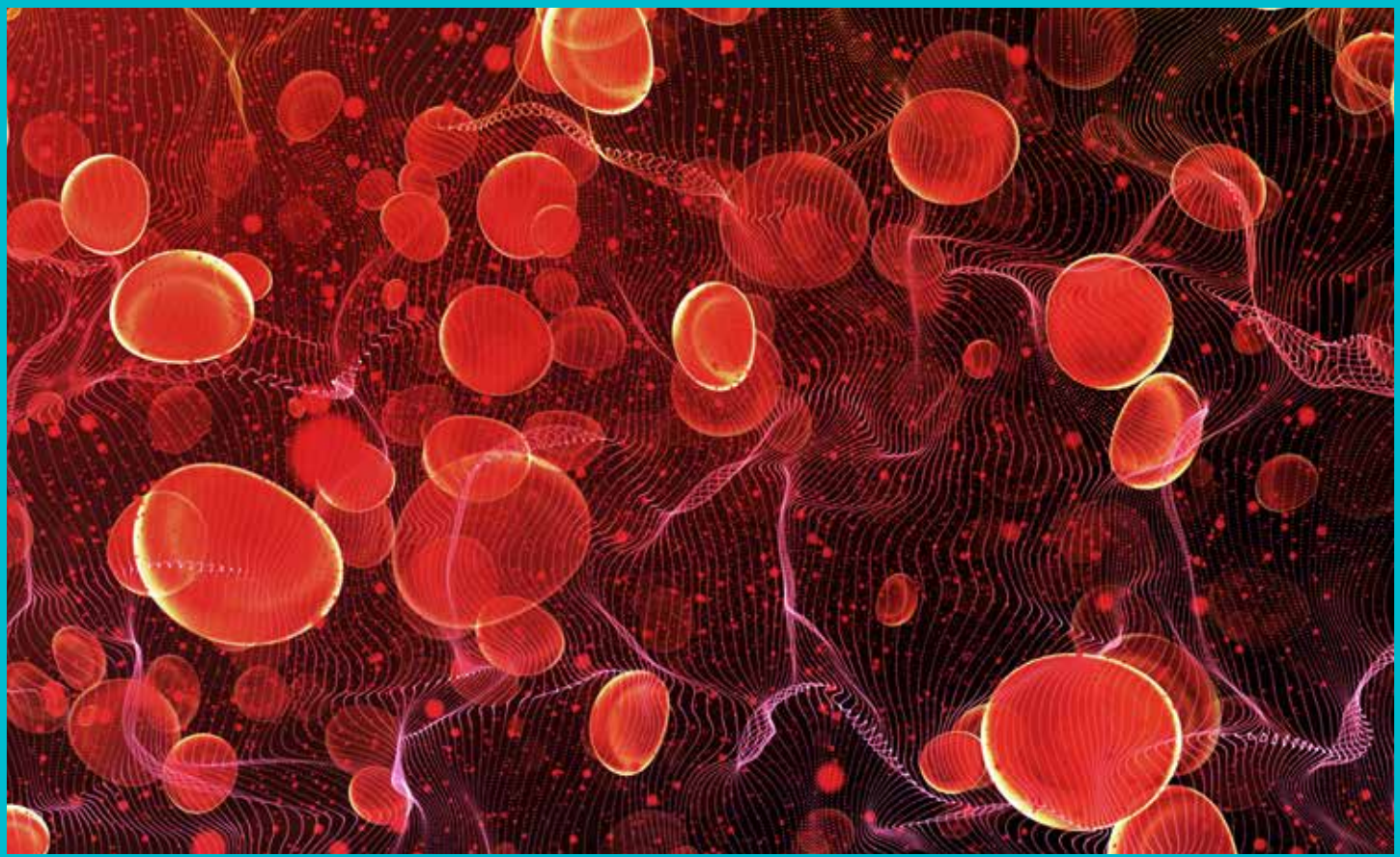
HEMATOLOGY



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Hematology is the scientific branch investigating vital diseases associated with bone marrow, lymphatic system and blood such as; lymphoma, multiple myeloma, acute and chronic leukemia. Liv Hospital Ulus Hematology Clinic works in close cooperation with other branches such as medical and radiation oncology.

World Class Health Care Service

Our Hematology Clinic provides world class quality and safe health service with its experienced physician and fully-equipped infrastructure.

Main Diseases Treated

- Hodgkin Lymphoma and Non-Hodgkin lymphomas
- Multiple Myeloma
- Chronic Leukemias (CLL, CML)
- Acute Leukemias (ALL, AML)
- Myeloproliferative Diseases
  - Polycythemia Vera
  - Essential Thrombocytosis
  - Myelofibrosis
- Myelodysplastic syndrome (MDS)
- Anemia
- Thrombocytopenia
- Bleeding Disorders

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INTERVENTIONAL RADIOLOGICAL PROCEDURES

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Opening of Bile and Urinary Obstruction

Bile and urinary tract obstructions during tumor treatment can be life-threatening. This may cause chemotherapy to be interrupted. In this case, interventions that will remove the obstructions increase the patient's compliance with the treatment and the quality of life.

Biopsy

The diagnosis of cancer is confirmed by the evaluation of the suspected tissue in the pathology laboratory. It is a reliable method to take samples from suspicious tissue with imaging methods such as tomography and ultrasound.

Radiofrequency Ablation

Radiofrequency ablation (RFA) is a local cancer treatment that removes cancerous cells by heating them with high energy radio waves.

During radiofrequency ablation, a needle-thin stylet / shaft (probe) is inserted through a very small section of the skin with the help of ultrasound or CT Scan guidance. The heated electrodes are released through the stylet / spindle to destroy cancer cells.

TAKE / Chemoembolization

Chemoembolization minimizes the exposure of healthy tissue to chemotherapy, while delivering chemotherapy drugs directly to the tumor. This method of direct delivery reduces side effects such as nausea and vomiting while maximizing the cancer-killing properties of drugs as much as possible.

During chemoembolization, chemotherapy is injected directly into the tumor using image / picture guidance via catheter. Chemotherapy drugs are mixed with particles called microspheres that block blood flow to the tumor. The tumor cannot find oxygen and nutrients to grow without blood flow.

Chemoembolization ensures that high doses of chemotherapy drugs act on the cancerous tissue for longer periods of time and the body is not exposed to the effects of chemotherapy drugs. This method of chemotherapy is primarily used for liver cancer and cancers that have spread to the liver.

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INTERVENTIONAL BRONCHOSCOPY

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In lung cancer, the clinical picture caused by the local growth of the tumor and distant metastases affect life. The direct effect of the mass caused by the local growth of the tumor and / or the narrowing of the airway due to the compression of this tumor causes serious complications. Interventional bronchoscopy is used to prevent these situations.

Argon Plasma Coagulation and Electrocoagulation:

Heating the tissue by using electric current is called electrocautery or diathermy. Electrons pass as a result of the voltage difference between the probe used and the tissue. Electrons provide heat coagulation caused by high resistance in the target tissue. Argon plasma coagulation provides ionized flow without contact with tissue in these systems. This is called the lightning effect. In electrocautery, direct contact is required between the probe and the tissue. It is one of the hot techniques that are easy to apply and allow the mechanical removal of the tumor. While enabling the mechanical removal of the tumor obstructing the airway, it also reduces bleeding by providing coagulation. This method is considered as the first approach for emergency recanalization. Emergency symptomatic treatment is also considered to be very effective. The success rate is considered to be 70-80%.

Stent:

In patients with malignant airway obstruction, an effective palliation of their findings is achieved by stenting the airway. Stents applied to the airways can act as a barrier by preventing the tumor from growing towards the lumen, as well as showing a support effect by applying to the area with external compression.

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NUCLEAR MEDICINE TREATMENTS

a) Radioactive Iodine Therapy

Radioactive iodine therapy is used in cases of hyperthyroidism and in the treatment of differentiated thyroid cancers. It is usually administered orally in capsule form.

In the treatment of hyperthyroidism, it is mostly applied in low doses that do not require hospitalization. It is applied in higher doses in thyroid cancer, and is used to remove the remaining thyroid tissue after the operation or to treat metastatic patients. High doses require hospitalization in an isolated treatment room. The length of stay is usually between 1-3 days.

b) MIBG Treatment

I131 MIBG is a radioactive substance used for the treatment of malignant neuroectodermal tumors (pheochromocytoma, paraganglioma, carcinoid tumors, medullary thyroid cancer, neuroblastoma). I131 treatment is administered by intravenous infusion.

c) Microsphere Treatment in Liver Tumors

It is a targeted treatment method in primary or metastatic tumors of the liver. Thanks to the itrium-90 (Y-90) labeled microparticles, tumor tissue is directly targeted without damaging other body organs. Procedures of patients who are deemed suitable for microsphere treatment are performed together with Interventional Radiology and Nuclear Medicine physicians with angiography.

d) Treatment with Lutetium-177 (Lu-177) Labeled Compounds

Lu-177 labeled PSMA is an agent used in the treatment of prostate cancer. In advanced prostate cancer, it is preferred in people whose disease progresses despite other treatments. It has strong data in terms of its contribution to life span and quality. If recurrence and metastatic foci are detected in PSMA PET-CT imaging in patients with metastatic castrate-resistant prostate cancer, radionuclide treatments with Lu-177 labeled PSMA ligands are targeted treatment options that are easily tolerated by patients.

Lu-177 labeled DOTA peptides prolong the life span and improve the quality of life in the group of patients who cannot be treated surgically in neuroendocrine tumors.

PET-CT imaging with Ga-68 labeled compounds is a guide when making a decision to be eligible for treatment.

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Treatment of Metastatic Bone Patients

Radyum 223 (Ra-223) Treatment

Radium 223 is a radioactive agent used in bone metastases in prostate cancer. It has been used in patients who are resistant to castration, who have not benefited from other treatments, or who have progressed despite treatment; It has been shown to contribute to the quality of life and benefit in terms of survival. Decrease in bone pain of patients, decrease in use of painkillers, decrease in PSA levels and improvement in daily activities of patients are observed.

Other Radionuclide Agents

In patients with diffuse bone metastasis, palliative systemic therapy with Samarium-153, Strontium-89, Rhenium-186 or Rhenium-188 can be used to relieve pain. The main goal is to control pain in patients who are analgesic and morphine resistant with osteoblastic (sclerotic) and mixed type pain and with multiple bone metastases.

Radionuclide Synovectomy-Isotopes Used in Arthritis Treatment

Yttrium-90 (Y-90) is used for the treatment of arthritis in colloid forms, Rhenium-186 (Re-186) in the wrist or Erbium-169 (Er-169) for the treatment of swelling or inflammation in the knee, wrist and finger joints. The most commonly used isotope is Y-90. Care is taken to avoid contamination during application. It can be easily applied as an outpatient treatment.

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ALGOLOGY CLINIC

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Algology (Pain Therapy)

While the probability of pain in cancer patients is 38% in the early period, as the disease progresses, this rate can reach up to 85%, and this increase can impair the quality of life.

Although the pain complaint is directly related to invasion and compression of the tumor, it occurs due to the treatment of the tumor at 17%, tumor disease in 9% and non-tumor (migraine, diabetes) causes at a rate of 9%.

Both somatic pain and neuropathic pain can be seen in tumor patient. Cancer pain appears as either continuous, intermittent or sudden exacerbations (sudden increasing pain-breakthrough pain).

In our algology clinic, our patients, oncology team, algology team and patient relatives work in cooperation for a successful pain treatment in cancer patients.

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SUPPORT PROGRAMS

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Journey With Cancer Program

Different negative reactions and feelings may develop in patients diagnosed with cancer.

As with all other chronic diseases, patients may experience mental distress as well as physical distress when they receive this diagnosis. This process can be divided into shock, overreaction, resistance and adaptation. These mental distress may reflect on the family and relatives of the patient over time.

Clinical psychologists, who are experts in the field of psycho-oncology, serve patients and their relatives with their approaches specific to each stage. They support patients and their relatives in matters such as adapting to changing roles, coping with emotions, and increasing their skills to learn their strengths and borders.

If Your Relative Has Cancer...

Being diagnosed with cancer means the beginning of a difficult process for the relatives as well as the patient. The relatives of the patients are trying to keep their own morale high and to support the patient financially and morally. Most of the time, in addition to providing emotional support, being in a caregiver position can wear off the relatives. This situation can be very emotional for them. Especially when the patient's negative feelings increase or as the patient's treatment process progresses, relatives may feel tired, helpless and hopeless.

Our team is aware that it makes a significant difference if even one of the relatives gets support, even when the patient does not receive psychological support. In our department, within the scope of Journey with Cancer Program, individual psychotherapy, family and couple therapy, sharing groups and support services for their children are provided.

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