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CONQUERING CANCER

THURSDAY, AUGUST 25, 2022

A BRIGHT FUTURE

Advanced Care Oncology Center combines personalised cancer treatment with leading-edge technology to provide you with the best cancer care

ACOC COMMITS TO PROVIDING PREMIUM ONCOLOGY CARE

The hospital is known for the most technologically-advanced equipment and also for its pool of highly-skilled medical professionals

Advanced Care Oncology Center (ACOC) was established in 2017, and it has been one of the premier centers in providing best oncology services and treatments in Dubai, catering to patients all over the United Arab Emirates. ACOC has been known not only for the most technologically-advanced equipment, but also for its pool of highly-skilled medical professionals who are the best in their fields of Nuclear Medicine, Chemotherapy and Radiation Therapy. The oncology services are the following:

- PET/CT Scan (FDG-18, PSMA, DOTATATE with Gallium 68)
- CT Scan
- Digital Mammography
- QCT (Quantitative Bone Mineral Densitometry)
- Ultrasound
- X-ray
- Laboratory Services
- Chemotherapy
- Oncology Hormonal Therapy
- Targeted Therapy
- Immunotherapy

ACOC employs a highly qualified team with the latest equipment and uses the best medical practices based on relative American standards in order to deliver accurate and proper medical diagnostics and treatments for oncology patients supported by the exceptional reporting of our PET/CT Consultant and Radiologist, Dr Tamer Abdelgawad. To ensure high-standard diagnostics, the facility is now accredited with the prestigious PET/CT EARL Accreditation by European Association of Nuclear Medicine (EANM), which is the only accredited facility in the UAE.

The medical oncologists, Dr Tarek Alkhouri, Dr Medhat Faris and Dr Batool Aboud, are specialists with an outstanding background and experience in the US, Saudi Arabia, Syria and the United Arab Emirates, collectively having a wealth of knowledge, understanding and expertise in the diagnosis and care of patients.

As a provider offering oncology services, ACOC has extended the facility to provide high-quality and advanced Radiation Therapy treatment. The clinical operation already started Radiation Therapy delivery treatment from September 8, 2019. Radiation Therapy is being delivered by experienced Specialist Radiation Oncologists, Dr Abhinav Ahluwalia, Dr Falah Al Khatib, Dr Mohammad Heidari and Dr Georges Farha, using the Elekta Versa HD Linear Accelerator (2019 model) that is capable of high-precision radiation therapy procedures including the following:

- IMRT (Intensity-Modulated Radiation Therapy)
- IGRT (Image-Guided Radiation Therapy)
- VMAT (Volumetric Modulated Arc Therapy)
- 3DCRT (Three-Dimensional Conformal Radiation Therapy)
- SGRT (Surface Guided Radiation Therapy)
- DIBH-RT (Deep Inspiration Breath Hold Radiation Therapy)
- SBRT (Stereotactic Body Radiation Therapy)
- SRS (Stereotactic Radiosurgery)
- Internationally-recognized treatment regimens/fractionation
- Hypo-fractioned Radiation Therapy
- Concurrent Chemo and Radiation Therapy

This state-of-art Radiation Therapy machine has the added benefit of using detection system — Vision RT. To complement the LINAC, ACOC has the latest Canon wide-bore scanner with the biggest bore of 90cm. We are able to scan using 4D gated motion scanning, which allows us to use the Vision RT system to deliver high radiation doses in fewer sessions for certain clinical scenarios with non-inferior or improved clinical outcomes. Therefore, saving money for the insurance company on the final bill as well as reducing the treatment time for certain patients.

Advanced Care Oncology Center has been granted Accreditation — Gold status by the Accreditation Canada surveyors on August 30, 2021 after three years of accreditation process. This is part of the center's journey in meeting international standards of excellence in quality care and service.

ACOC has also been granted the Certificate of Medical Prescription Audit by Bienzobas in Spain in October 2021, in adherence to main regulatory agencies in Europe, such as European Medicines Agency (EMA), as well as alignment with International Medical Oncology Guidelines such as National Institute for Health and Care Excellence (NICE) and National Comprehensive Cancer Network (NCCN).

ACOC commits to providing premium oncology care to patients in the United Arab Emirates, neighbouring GCC countries, as well as East and West Africa countries.

STEREOTACTIC RADIOSURGERY FOR BENIGN INTRACRANIAL TUMORS

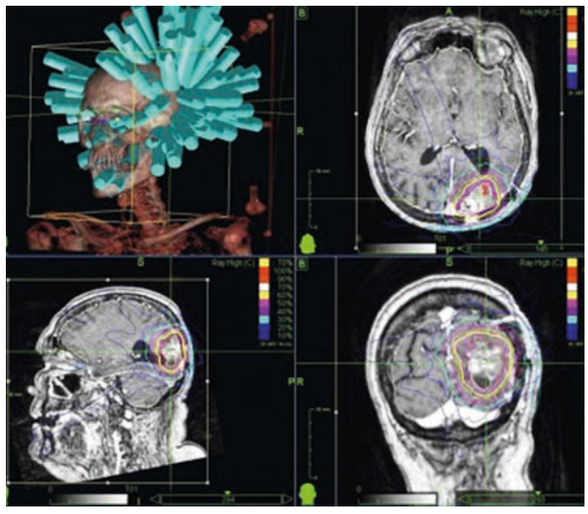
SRS typically refers to the delivery of a high dose of radiation in a single session or fraction

DR ABHINAV AHLUWALIA
Chief Radiation Oncologist and Head of the Department of Radiation Oncology

Stereotactic radiosurgery (SRS) is a radiation technique that uses multiple vantage points, and imaging technology to converge a high dose of radiation on a precisely defined target volume while minimising irradiation to surrounding tissue.

SRS refers to the delivery of a high dose of radiation in a single session or fraction. Fractionated stereotactic radiotherapy (FSRT), may be performed to reduce the dose to adjacent critical brain or spine structures and to provide greater dose homogeneity to the target tissue. In such cases, irradiation is delivered over multiple sessions or fractions, typically at a low dose. A LINAC-based SRS system uses a single radiation source rotated through multiple non-coplanar arcs to achieve the required converge on the target lesion. The systems achieve a target accuracy of 0.1 to 1mm. Benign brain tumors that can be treated by SRS include vestibular schwannomas, pituitary adenomas, meningioma, craniopharyngioma, and hemangioblastoma.

STEREOTACTIC RADIOSURGERY MAY BE A SUITABLE CHOICE FOR PATIENTS WHO DESIRE PRESERVATION OF NEUROLOGICAL FUNCTION (COCHLEAR, FACIAL NERVE) AND A HIGH RATE OF TUMOR GROWTH CONTROL. SRS IS PROPOSED AS A MODALITY TO SLOW OR STOP SCHWANNOMA GROWTH



1 Vestibular Schwannoma (VS), also known as acoustic neuromas, are Schwann cell-derived benign tumors most commonly found in the vestibular portion of the eighth cranial nerve (CN VIII). They account for approximately 8 per cent of intracranial tumors and 80-90 per cent of cerebellopontine angle tumors in adults.

They are generally slow-growing and are unilateral in more than 90 per cent of cases, presenting in right and left sides equally. Progressive unilateral hearing decline is the most common symptom that leads to diagnosis of VS.

SRS is a possible first line of treatment in patients with newly diagnosed small to medium sized vestibular schwannomas, no significant brainstem compression, and reasonably well preserved hearing. SRS may be a suitable choice for patients who desire preservation of neurological function (cochlear, facial nerve) and a high rate of tumor growth control. SRS is proposed as a modality to slow or stop schwannoma growth.

2 Pituitary Adenomas are benign tumors that arise from the cells of the anterior pituitary gland. Pituitary tumors are fairly common in the general population. First-line treatment for pituitary adenomas is typically surgery or pharmacologic treatment. However, when one of these interventions fails or there is a recurrence, radiation therapy using SRS or FSRT can be considered.

3 Meningioma are the most frequent primary brain tumors, originating in the meninges and accounting for about one-third of all primary CNS tumors. Management strategies for meningioma include observation, resection, or radiation therapy. Asymptomatic patients can be managed by observation. If therapy is indicated, standard treatment is gross total surgical resection or radiation therapy. SRS/FSRT may be first option in small meningioma presumed to be WHO grade I.

4 Craniopharyngioma are rare tumors that arise from the residual epithelial cells of Rathke's pouch. The first line of therapy for craniopharyngioma is typically surgical resection; however, aggressive surgery can be associated with complications and neurologic injury. SRS/SRT techniques have been increasingly used as a primary option for small tumors away from critical structures, as secondary treatment for residual tumor following conservative surgery, and as an option for recurrent disease.

5 Hemangioblastoma are rare, highly vascular tumors of the central nervous system most often found in the posterior fossa of brain. Hemangioblastoma can present as sporadic (approximately 75% of cases) or as a manifestation of von Hippel-Lindau disease (VHL).

While sporadic lesions arise primarily in the cerebellum, VHL associated hemangioblastoma can arise in the cerebellum, spinal cord, and brain stem. Treatment options for hemangioblastoma include surgery and radiation therapy. Surgical resection is generally the first treatment of choice for most symptomatic hemangioblastoma; however, SRS can be an appropriate treatment option for patients with multiple tumors and with surgically inaccessible lesions.

VMAT: THE FASTEST AND MOST ACCURATE RADIATION DELIVERY TECHNIQUE

The aim is to give patients access to the most advanced techniques

DR GEORGES FARHA
Specialist,
Radiation Oncology

Since its opening in 2019, ACOC Dubai is committed to delivering the most advanced care to its patients, especially in the radiation therapy department where the state-of-art linear accelerator Versa HD from ELEKTA was installed.

The aim was to give our patients access to the most advanced techniques enabling them to get the best oncologic outcome with the least possible toxicity.

Versa HD is a versatile machine capable of delivering the state-of-art technique developed so far, the intensity modulated radiotherapy (IMRT) with image guidance (IGRT).

WHAT'S IMRT?

IMRT is a specialized form of radiation therapy that allows radiation intensity to be changed (modulated) during treatment to precisely focus the radiation to cover just the tumor, thereby sparing normal surrounding tissue and organs at risk.

HOW IT WORKS?

With IMRT, the radiation beam can be broken up into hundreds of "beamlets," each of which can be adjusted to a different degree of intensity. In some cases, because of its extreme focus, IMRT can safely allow a higher dose of radiation to be delivered to a tumor to stop or slow its growth.

The linear accelerator has a device called a multileaf collimator (MLC), which is made up of thin leaves that move independently and form shapes that fit precisely around the treatment area. This means that the tumor receives a high dose and normal healthy cells nearby receive a much lower dose.

IMRT allows the dose to be shaped to the tumor by modulating (controlling) the intensity of the radiation beam. This allows different doses of radiation to be given across the tumour. It also avoids high radiation doses to structures that would otherwise be damaged by the radiotherapy and reduce the risk of long term side effects.

WHAT'S IGRT?

In order to precisely focus the radiation to the tumor, we need to see what we treat. For this reason the Versa HD is equipped with one of the fastest Cone Bean CT (CBCT) scanner that ensure quick imaging of the treated area and precise focusing of the radiation to that area.

VOLUMETRIC MODULATED ARC THERAPY (VMAT)

VMAT is an advanced form of IMRT in which a single or multiple radiation beams sweep in arcs around the patient rather than remaining static. VMAT delivers a high-powered, targeted dose of radiation with minimal damage to surrounding tissue and critical anatomy, and because of its accuracy is often used for tumors that are adjacent to organs.

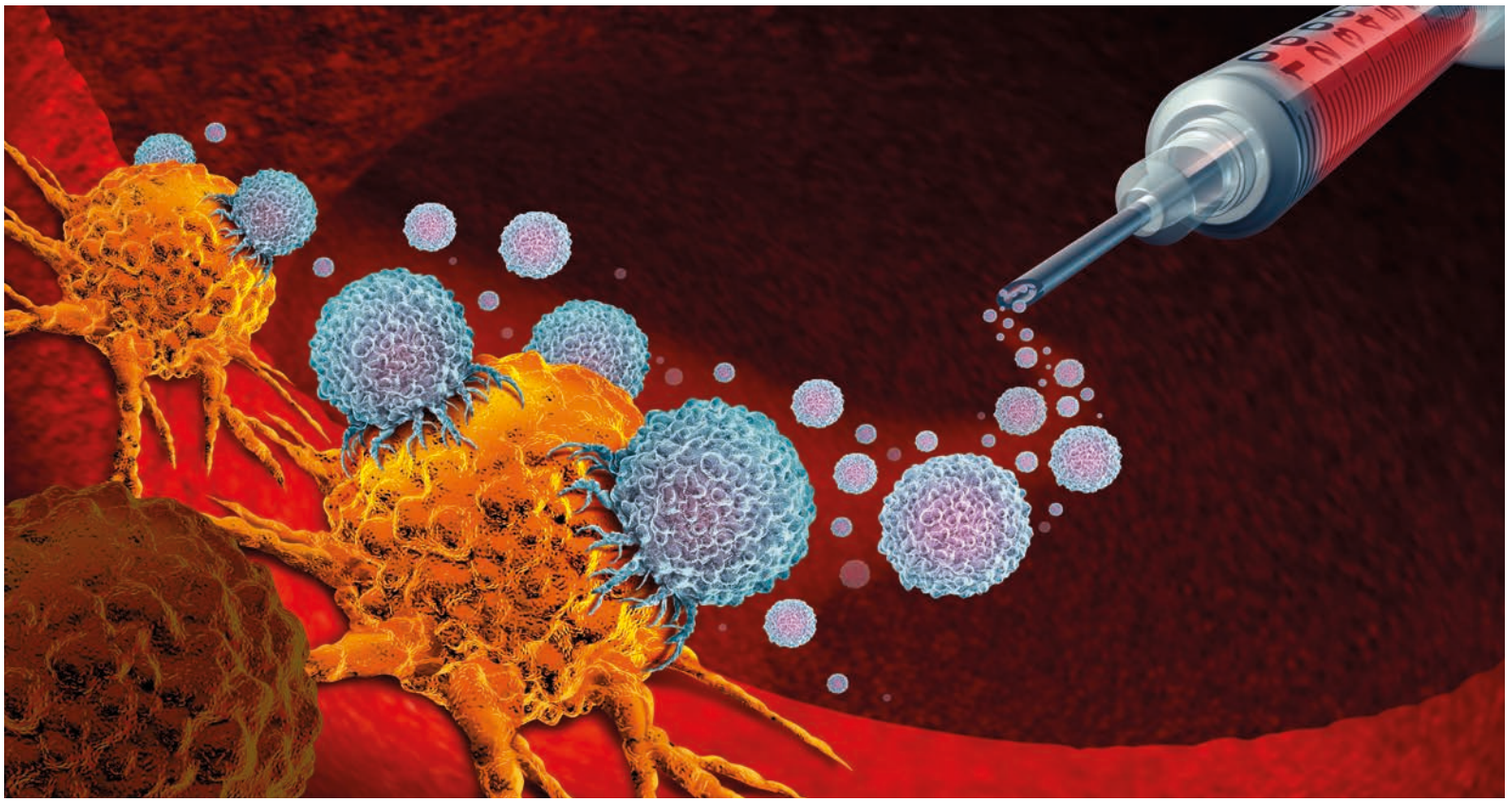
HOW IT WORKS?

VMAT uses 3-D imaging to allow the radiation oncologist to verify the position of the tumor immediately prior to treatment, and to monitor the treatment in real-time to ensure the dose is delivered as prescribed.

BENEFITS

Due to its high speed arc rotation, VMAT cuts treatment time significantly, which both lessens the amount of time patients must remain motionless and reduces the possibility that they will compromise the aim of the radiation by moving.

VMAT USES 3-D IMAGING TO ALLOW THE RADIATION ONCOLOGIST TO VERIFY THE POSITION OF THE TUMOR IMMEDIATELY PRIOR TO TREATMENT, AND TO MONITOR THE TREATMENT IN REAL-TIME TO ENSURE THE DOSE IS DELIVERED AS PRESCRIBED



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IMMUNOTHERAPY AND CANCER

Biological therapy is a type of treatment that uses substances made from living organisms to treat cancer

DR TAREK ALKHOURI
Chief Medical Oncologist and Head of Department of Medical Oncology

Immunotherapy is a type of cancer treatment that helps your immune system fight cancer. The immune system helps your body fight infections and other diseases. It is made up of white blood cells and organs and tissues of the lymph system.

Immunotherapy is a type of biological therapy. Biological therapy is a type of treatment that uses substances made from living organisms to treat cancer.

As part of its normal function, the immune system detects and destroys abnormal cells and most likely prevents or curbs the growth of many cancers. For instance, immune cells are sometimes found in and around tumors. These cells, called tumor-infiltrating lymphocytes or TILs, are a sign that the immune system is responding to the tumor. People whose tumors contain TILs often do better than people whose tumors don't contain them.

Even though the immune system can prevent or slow cancer growth, cancer cells can avoid destruction by the immune system. For example, cancer cells may:

- Have genetic changes that make them less visible to the immune system.
- Have proteins on their surface that turn off immune cells.
- Change the normal cells around the tumor so they interfere with how the immune system responds to the cancer cells.

Immunotherapy helps the immune system to better act against cancer. Several types of immunotherapy are used to treat cancer. These include:

Immune checkpoint inhibitors, which are drugs that block immune checkpoints. These checkpoints are a normal part of the immune system and keep immune responses from being too strong. By blocking them, these drugs allow immune cells to respond more strongly to cancer.

T-cell transfer therapy, which is a treatment that boosts the natural ability of your T cells to fight cancer. In this, immune cells are taken from your tumor. Those that are most active against your cancer are selected or changed in the lab to attack your cancer cells, grown in large batches, and put back into your body through a needle in a vein.

Monoclonal antibodies, which are immune system proteins created in the lab that are designed to bind to specific targets on cancer cells. Some monoclonal antibodies mark cancer cells so that they will be better seen and destroyed by the immune system. Such monoclonal antibodies are a type of immunotherapy.

EVEN THOUGH THE IMMUNE SYSTEM CAN PREVENT OR SLOW CANCER GROWTH, CANCER CELLS HAVE WAYS TO AVOID DESTRUCTION BY THE IMMUNE SYSTEM

Treatment vaccines, which work against cancer by boosting your immune system's response to cancer cells. Treatment vaccines are different from the ones that help prevent disease.

Immune system modulators, which enhance the body's immune response against cancer. Some of these agents affect specific parts of the immune system, whereas others affect the immune system in a more general way. Immunotherapy drugs have been approved to treat many types of cancer (solid tumors and hematologic malignancies). However, immunotherapy is not yet as widely used as surgery, chemotherapy, or radiation therapy.

Immunotherapy can cause side effects, many of which happen when the immune system that has been revved-up to act against the cancer also acts against healthy cells and tissues in the body. Different people have different side effects. The ones patients might have and how they make patients feel will depend on how healthy they are before treatment, and the type of cancer, how advanced it is, the type of immunotherapy, and the dose.

Patients might be on immunotherapy for a long time, and side effects can occur at any point during and after treatment. And the most common organs affected by immunotherapy are lungs, colon, skin, glands, kidneys, and liver.

Currently, hundreds of clinical trials are going on to determine the efficacy and safety of immunotherapy in almost all kinds of cancer, and the list of indications for immunotherapy in so many kinds of cancer is rapidly growing.

RADIOTHERAPY PLAYS A MAJOR ROLE IN THE MANAGEMENT OF BREAST CANCER

It is used after conservative surgery for early breast cancer and post mastectomy with lymph node involvement

DR FALAH ALKHATIB
Specialist,
Radiation Oncology

Breast cancer is the most common cancer in women worldwide. In the UAE the incidence is 25 per cent of all cancers and 40 per cent of all women registered with cancer. Unfortunately the peak is around 50 years old but nearly 25–30 per cent appears in women less than 35 years. Like most developing countries 20–30 per cent is early stage I and II while 70–80 per cent is late stage III and IV disease.

RADIOTHERAPY

Radiotherapy plays a major role in the management of breast cancer. It is used after conservative surgery (CS) for early breast cancer and post mastectomy with lymph node involvement. With the addition of improved survival from systemic therapy (chemotherapy, hormone therapy and target therapy) most breast cancer patients have become long survivors. Hence it is vital to reduce the late side effects of treatment.

The main radiation-related long-term consequences are radiation induced heart disease (RIHD) and lung damage which occurs 10-15 years after treatment. The average heart dose from modern radiotherapy is 5.2Gy for left breast and 3.7Gy for right breast.

The incidence of RIHD is higher in left sided cases and in young women. The risk increases by 4-7 per cent with every extra 1Gy received by the heart especially with women with pre-existing cardiovascular disease. The average dose to ipsilateral lung is around 10 per cent.

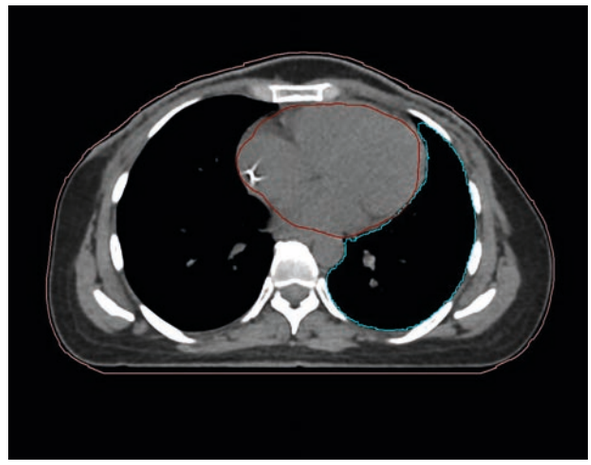
DEEP INSPIRATION BREATH THERAPY

Deep Inspiration Breath Hold (DIBH) is a radiation therapy technique when patients take deep breaths and hold their breath during treatment while the radiation is being delivered. By taking deep breaths the lungs fill with air and the heart is pushed posteriorly and inferiorly away from the chest wall. This will reduce the dose to the heart and to the left anterior descending coronary artery (LDA) by nearly 50 per cent as compared with free breathing (FB) technique. There is significant decreased dose to ipsilateral lung and substantially increase in ipsilateral lung volume. The dose to the contralateral breast showed no difference between FB and DIBH.

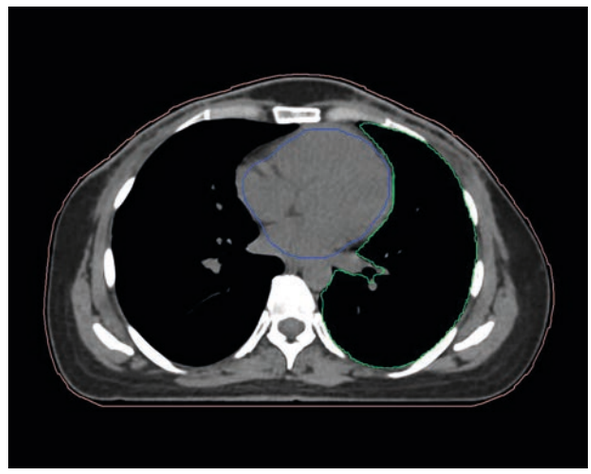
DIBH is used with modern radiotherapy equipment and computerised planning system. It requires the cooperation of radiation oncologist, medical physicist, radiation technician and most important a fit patient who can hold his/her breathing for at least 20 seconds. 3DCR, IMRT and VMAT techniques are necessary to have the intended result. Daily monitoring of the patient during treatment is mandatory.

Patients who are not fit for this DIBH are elderly patients with comorbidities like IHD or chronic lung disease, obese females and patients with short expected survival rates.

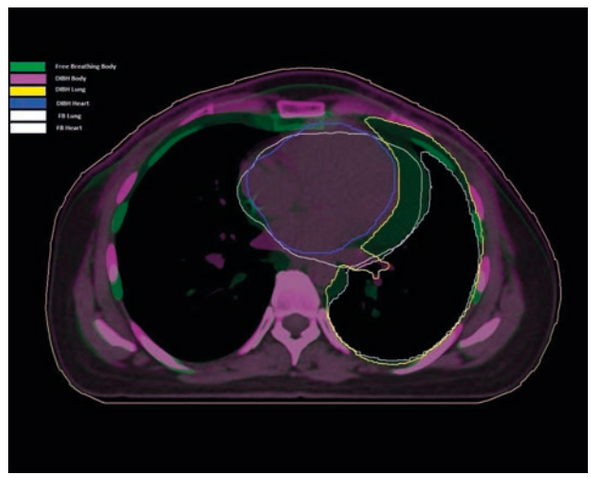
DIBH IS USED WITH MODERN RADIOTHERAPY EQUIPMENT AND COMPUTERIZED PLANNING SYSTEM. IT REQUIRES THE COOPERATION OF RADIATION ONCOLOGIST, MEDICAL PHYSICIST, RADIATION TECHNICIAN AND MOST IMPORTANTLY A FIT PATIENT WHO CAN HOLD HIS/HER BREATHING FOR AT LEAST 20 SECONDS



Free breathing (heart is in direct contact with chest wall)



DIBH (heart is away from chest wall)

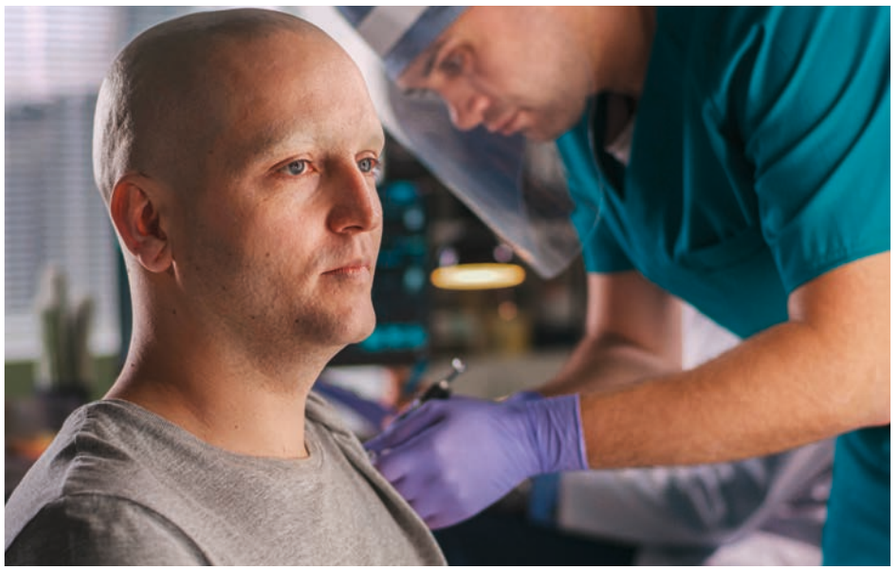


Imposed picture showing amount of heart protected by DIBH

SUCCESSES AND CHALLENGES OF CANCER TREATMENT OVER THE LAST DECADES

In the past few decades, the overall cancer death rate has continued to decline

DR MEDHAT FARIS
Consultant,
Medical Oncology



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Since 1971, the cancer death rate is down more than 25 per cent. Between 1975 and 2016, the five-year survival rate increased 36 per cent.

The arsenal of anticancer therapies has expanded more than tenfold. Mammograms, colonoscopies and other screenings are finding common cancers in early stages more often, when survival odds are as high as 99 per cent. Researchers across the world have made major advances in learning more complex details about how to prevent, diagnose, treat, and survive cancer.

At the forefront of emerging cancer research is the success of the growing role of precision medicine, immunotherapy and targeted therapy, the influence that reducing health disparities can have on cancer outcomes, and the development and use of liquid biopsies and machine learning, which is allowing scientists to make sense of "big data."

HOW TREATING CANCER BECAME MORE PRECISE

Precision medicine is helping move cancer treatment from one-size-fits-all to an approach where doctors can choose treatments that are most likely to successfully treat a person's cancer based on the detailed genetic information of that person's specific cancer. With advances leading to faster and less expensive gene sequencing, precision medicine is starting to be used more often to treat patients, most notably in the treatment of lung cancer.

Over 50 years, we've discovered cancer is not one but many, many hundreds of diseases.

BETTER UNDERSTANDING OF CANCER AND HOW CANCER CELLS' BEHAVIOUR HELPED TO UNDERSTAND

Cancers can spread with help from their neighbours. Until recently, scientists haven't known how much help cancer cells get from other types of cells and substances in their microenvironment. The microenvironment is the immediate area around the tumour. Over the last 10 years, better understanding of features of cancer cells that must be present for metastasis to happen. They also learned more about how cancer cells:

- Send and receive signals that change the microenvironment to "clear a path" to the new site of spread.
- Change to avoid attack from the immune system
- Are able to create new tumour.

Identifying each "helper" in the microenvironment could lead to new targets for novel treatments that can help shut down the cancer's growth and ability to spread.

Better and precise investigations to evaluate tumour extent and presence of any residual disease, like PET CT with different materials for different types of tumours.

PREVENTION AND DETECTION

Finding cancer before it starts is a powerful prevention strategy. An estimated 20 to 40 per cent of cancer cases and half of all cancer deaths could be eliminated with familiar steps like not smoking, exercising, avoiding too much alcohol and maintaining a healthy body weight.

Since the start of the war on cancer, smoking rates are down 63 percent, a major contribution to the overall drop in cancer deaths.

But the epidemic of obesity, which increases risk for 13 types of cancer, according to the National Cancer Institute, could soon overtake smoking as a major cancer trigger. Currently, obesity is responsible for at least 40 perc ent of US cancers – and two-thirds of cancers in people ages 50 to 74 — and rates are rising, even as the number of smoking-related cancers declines.

Meanwhile, a cancer-avoidance strategy called "secondary prevention" — where cancer is found at its earliest, most treatable stages and eliminated — is also getting a boost on another front. Right now, for most people, secondary prevention means getting recommended mammograms, colonoscopies or other colorectal cancer screenings, lung scans for smokers, Pap smears for women and prostate cancer checks for some men. In the future, it could start with a single blood test that looks for floating traces of protein and DNA from a wide range of cancers. Detection at the earliest stages makes halting the cancer's progress far easier.

The best way to decrease cancer's lethality is by not getting it at all.

PALLIATIVE CARE

More attention and understanding of supporting and palliative care early in cancer treatment.

With cancer, there are two modes of care—treatment directed at the disease and treatment, known as palliative care, which is focused on the person with the disease. This type of care helps patients and caregivers manage symptoms from the cancer and side effects from the treatment.

Clinical trials have shown that when people with cancer receive both types of treatment at the same time, their symptoms are controlled better, and they have less anxiety and depression, improved family satisfaction and quality of life, improved use of healthcare resources, and longer survival. Palliative care is one of the fastest growing areas of health care in the US, and it's changing as new treatments emerge, especially for cancer patients.

Patients with metastatic non-small-cell lung cancer who received palliative care early in their treatment had big improvements in their quality of life and mood.

Plenty has changed, but plenty more needs to.

Surface Guided Radiation Therapy (SGRT) makes treatment safer by using a contact-free technique to track a patient's skin surface in real-time with sub-millimetric accuracy and ensures radiation is only delivered when the patient is correctly positioned.
For left breast cases, using SGRT and Deep Inspiration Breath Hold (DIBH) technique helps to reduce exposure to the heart and healthy tissue.
SGRT allows for the use of SRS & SBRT techniques.
SGRT eliminates the need for TATTOOS or SKIN MARKERS.

- *90cm wide gantry CT Scanner Simulator*
- *Digital Contouring capability*
- *4D imaging to sync with SGRT System*

Advanced Care Oncology Center

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