- **Intensity Modulated Radiation Therapy (IMRT)**
  IMRT involves varying (or modulating) the intensity of the radiation being delivered during treatment. Compared to 3DCRT, this technique can deliver more tightly focused radiation beams to cancerous tumours while reducing the amount of radiation to surrounding healthy tissues.

- **Stereotactic Body Radiation Therapy (SBRT)**
  SBRT makes use of precise positioning, immobilisation devices and multiple treatment beams delivered in different planes to achieve highly focused radiation therapy targeting suitable tumours. This allows larger radiation doses to be delivered during each treatment, thereby shortening the treatment duration without compromising safety.

WHAT ARE THE POTENTIAL SIDE EFFECTS?

This may depend on the specific area of treatment and can include:

- Fatigue
- Change in texture of skin
- Nausea and vomiting
- Diarrhoea
- Abdominal colic

Many of these side effects can be controlled with medication. Please inform your doctor or nurse if you are experiencing any discomfort so that they can help you feel better. Late side effects, such as chronic diarrhoea can occur months to years after treatment in some patients. There are other rare side effects, such as bleeding and obstruction of the intestine, damage to the liver and kidneys which may affect less than five percent of our patients.

CARING FOR YOURSELF DURING AND AFTER RADIATION THERAPY

- **Be careful caring for the affected area**
  Avoid hot or cold packs and only use lotions and ointments after checking with your doctor or nurse. Clean the affected area with lukewarm water and mild soap.

- **Rest well**
  Get plenty of rest during treatment.

- **Check your medications**
  Inform your doctor if you are taking medications, to make sure that they are safe to use during radiation therapy.

- **Stop smoking**
  Immediate benefits of less airway irritation with less cough and shortness of breath.

- **Eat well**
  Makes you feel better, have less side effects and allows you to fight infections better.

- **Stay active (even gentle short bouts of activity helps!)**
  Improves mood, reduces fatigue and helps with appetite.

- **Enlist support**
  Mental and emotional health is as important as physical health. It might be helpful to talk to counsellors or join a cancer support group.

- **Have a caregiver who can manage your care**
  It is good to have someone who can help to keep track of hospital appointments and medications prescribed.

Informed Consent
Informed consent is an important process before the start of radiation therapy. Your doctor will explain to you the benefits and risks of the recommended therapy in detail during consultation, before the initiation of the treatment.

Information in this brochure is given as a guide only and does not replace medical advice from your doctor. Please seek advice from your doctor if you have any questions related to the treatment, your health or medical condition.

CONTACT INFORMATION

Nearest MRT Station: Kent Ridge Station (Circle Line)

Commuters can alight at the Kent Ridge Station, right at the doorstep of the NUH Medical Centre. Please exit the station via Exit C. NCIS is located on levels 8, 9 and 10 which are accessible via Lift Lobby B.

National University Cancer Institute, Singapore (NCIS) Radiation Therapy Centre (RTC)

NUH Medical Centre, Level 8
Opening Hours : 8.30am – 5.30pm
(Mon – Fri, except Public Holidays)
Appointment Line : (65) 6773 7888
(8.30am – 5.30pm, Mon – Fri,
except Public Holidays)
Email : CancerApptLine@nuhs.edu.sg

For all other general enquiries

National University Cancer Institute, Singapore (NCIS)
Email : ncis@nuhs.edu.sg
Website : www.ncis.com.sg

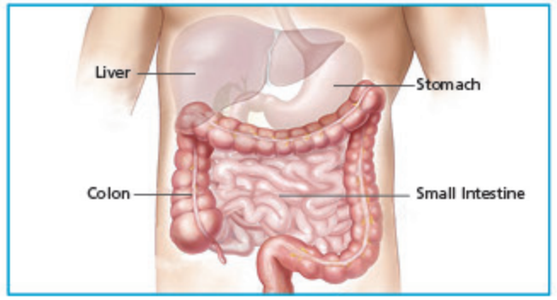
NUH National University Hospital
National University Hospital
5 Lower Kent Ridge Road, Singapore 119074
Tel: 6779 5555 Fax: 6779 5678
Website: www.nuh.com.sg

National University Cancer Institute, Singapore
A member of the NUHS

Radiation Therapy for ABDOMINAL CANCERS

WHAT ARE ABDOMINAL CANCERS?

The abdomen, commonly called the belly, is the part of the body that is between the chest and the pelvis. It contains most of the organs of the digestive tract. Common cancers in the abdomen that can occur are: colon cancer, gastric cancer, kidney cancer, liver cancer and pancreatic cancer.



WHAT ARE THE SIGNS AND SYMPTOMS?

Colon Cancer:
- Change in bowel habits (e.g: diarrhoea, constipation or stool consistency)
- Rectal bleeding
- Persistent discomfort in the abdomen (e.g: cramps, pain or bloatedness)

Gastric Cancer:
- Poor appetite
- Weight loss
- Abdominal pain
- Nausea and vomiting

Liver Cancer:
- Upper abdominal pain
- General weakness and fatigue
- Yellow discolouration of skin and white of eyes
- Nausea and vomiting

Pancreatic Cancer:
- Loss of appetite
- Yellow discolouration of skin and white of eyes
- Change in bowel habits (pale stools)
- Nausea and vomiting

Kidney Cancer:
- Blood in urine
- Lump in the abdomen
- Extreme tiredness
- Pain in the back of the side

HOW ARE ABDOMINAL CANCERS DIAGNOSED?

This depends on the type of cancer that you have been diagnosed with, but typically the following tests or procedures will be involved:

- Blood tests
- Imaging tests (e.g: CT scan, MRI, PET scan, Ultrasound)
- Biopsy
- Laparascopy (for Liver and Gastric cancer)
- Faecal Occult Blood Test (for Colon cancer)
- Colonoscopy (for Colon cancer)

WHAT ARE THE DIFFERENT TYPES OF TREATMENT?

Treatment depends on the stage of cancer, as well as the general medical condition of the patient.

Colon Cancer – Surgery is the main treatment for early stages. Chemotherapy is required for more advanced stages.

Gastric Cancer – Surgery is the main treatment for early stages. In more advanced stages, chemotherapy and radiation therapy may be required. Radiation therapy can also be given to palliative localised symptoms such as pain, bleeding and obstruction.

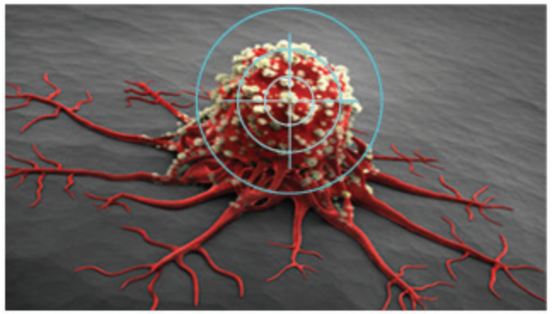
Kidney Cancer – Surgery is the main treatment for localised cancer. Chemotherapy is used in patients with advanced cancer. Radiation therapy can be given to palliate symptoms such as pain and bleeding.

Liver Cancer – Surgery is the main treatment for early stages. Chemotherapy is required for advanced stages. Radiation therapy techniques such as stereotactic body radiation therapy (SBRT) or intensity modulated radiation therapy (IMRT) can be used in selected patients to treat lesions that are not suitable for chemotherapy or surgery.

Pancreatic Cancer – Surgery is the main treatment for localised cancer. Chemotherapy is used in patients who are not suitable for surgery. Radiation therapy is given together with chemotherapy for patients who have unresectable disease and for selected cases after surgery. It can also be given to palliate symptoms such as pain and bleeding.

WHAT IS RADIATION THERAPY?

Radiation therapy treats cancer by using high-energy X-rays generated from a radiation therapy machine to destroy the cancer cells. It inhibits cancer cells from multiplying by delivering ionising radiation to destroy cancer cells whilst sparing normal tissues. When these cancer cells die, the body naturally eliminates them. Healthy tissue is then able to repair itself in a way cancer cells cannot, and this leads to a much higher proportion of tumour cell death compared to normal cells.



HOW IS RADIATION THERAPY DONE?

1. Consultation: The Radiation Oncologist determines the most appropriate method and discusses with you the treatment intent, schedule, risks and side-effects.
2. Mark-Up and Simulation: A CT scan of the treatment area will be obtained, while three small full-stop size marks are made to ensure accurate positioning during your daily treatment.
3. Treatment Planning: A multidisciplinary team produces a customised treatment plan for you.
4. Treatment: Radiation therapy for abdominal cancers is delivered daily (Mondays to Fridays) for two to seven weeks. Each treatment session lasts 10 to 15 minutes.

5. Follow-up: Your first follow-up appointment varies depending on how you do during treatment, and is usually about four to six weeks after you have completed the course of radiation therapy.

WHAT ARE THE TYPES OF RADIATION THERAPY AVAILABLE FOR ABDOMINAL CANCERS?

- 3-Dimensional Conformal Radiation Therapy (3DCRT)
  3DCRT delivers very precise doses of radiation to the affected area and spares surrounding normal tissue through a machine called a linear accelerator.