

# METASTATIC BOWEL CANCER

## SURGERY & TREATMENT



Bowel Cancer  
AUSTRALIA

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## Brent's Bowel Cancer Story

*"When my wife was first diagnosed, we really had to consider how to break it to our adult children and more importantly, to our grandchildren. After some research we sat down with our children, told them what we knew, and left it up to them to tell their little ones when they felt the timing was right, and in the way they felt it would be best handled."*

*"We also decided to refrain from using any military style language when discussing cancer. Therefore we did not use the words like 'beating', 'battling' or 'fighting' cancer. We decided we were 'living' with cancer – we wanted to adopt a total lifestyle that would allow us to get on with life and that would hopefully lead to healing. It meant we planned and did fun things, just as we had before the disease."*



# WHEN BOWEL CANCER SPREADS

When bowel cancer spreads outside the bowel to other distant parts of the body, these areas of spread are called 'metastases' or 'secondary cancers'.

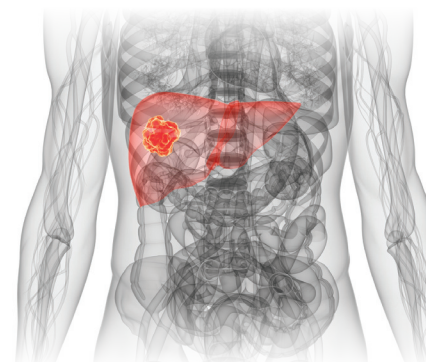
Metastases or secondary cancers are made up of bowel cancer cells and behave in the same way as the primary cancer that originated in your bowel.

Cancer that has spread to other parts of the body is described as being advanced. You may need the experience and skills of a number of specialists to help you manage the symptoms and find the best treatment pathway for your individual circumstances.

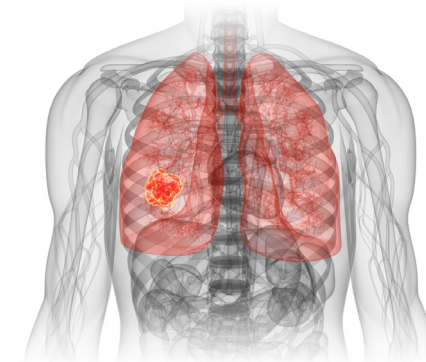
This booklet provides information about what is possible, so that you can begin to think about what you want for yourself (or your loved one) from the treatments currently available.



Primary bowel cancer in the colon or rectum



Secondary bowel cancer in the liver



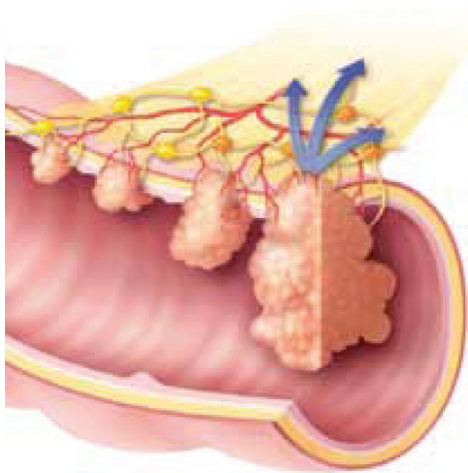
Secondary bowel cancer in the lung

# UNDERSTANDING ADVANCED DISEASE

Bowel cancer can spread through the body in a number of different ways.

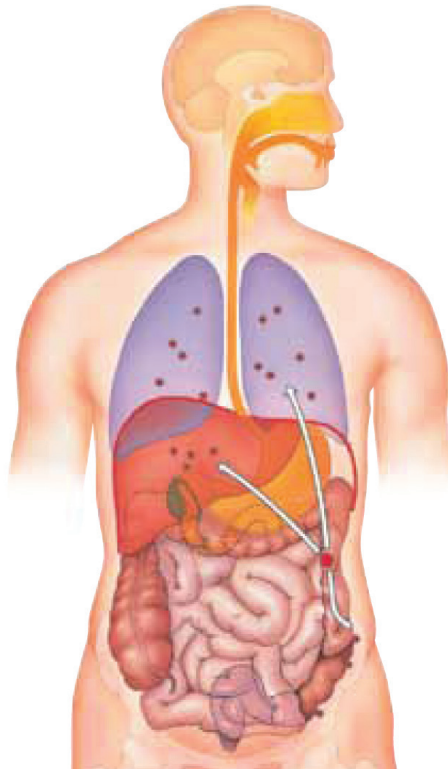
When cancer cells break away from the primary tumour in the bowel, they can travel around in the blood stream or in lymph fluid, getting caught up in other organs, lymph glands or on the lining of the abdominal cavity, called the peritoneum.

We know that there is a common pattern in the way bowel cancer spreads in the body. The name given to this kind of bowel cancer is 'metastatic' and each new area of growth away from the primary tumour is known as 'metastasis'.



*As tumours grow in the bowel, the chances of them spreading to the blood and lymph fluid are increased.*

Advanced bowel cancer commonly causes metastatic spread to the liver and/or the lungs. Sometimes, it can also spread locally into the abdomen. Less commonly, it may spread to the bones and brain.



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*Bowel cancer can spread to other organs in the body.*

# THE TREATMENT PATHWAY

The multi-disciplinary team (MDT) is a group of specialists, nurses and other healthcare professionals who work together to investigate, treat and support you.

You will start off in the care of the colorectal team, but if you have been diagnosed with cancer that has spread to another part of your body, then it is likely your case will be referred to other specialist multi-disciplinary teams for their expert opinion, so that all possible treatment options can be considered.

They may include a liver (hepato-biliary) specialist team, a lung (thoracic) specialist team, or other specialist surgeons or oncologists who can offer professional insight and experience.

This process can take several weeks, and you may need additional scans and other tests before a decision is made about possibilities and timelines.





# PLANNING THE RIGHT TREATMENT FOR YOU

Everyone diagnosed with cancer will go on to have a series of tests which are used to work out if the cancer is likely to spread.

These might include a series of blood tests to check your liver function (LFTs) and your CEA level (a tumour marker), and a CT scan of your chest and abdomen. If you have suspected liver metastases, you will also need to have an MRI scan that looks specifically at your liver, and most importantly the blood vessels that supply it. If the results of these tests suggest there may be active disease hidden elsewhere in the body, then you may also have a PET scan.

These scans are looked at carefully by the specialist team(s) responsible for those particular parts of your body, to see if you would be a good candidate for surgery. This might be possible straight away, or perhaps could be considered later, after some initial oncology treatments to shrink the tumours and make them easier to remove.

Biomarker testing should be done by analysing biopsies to identify gene mutations. Molecules may be obtained from your blood, body fluids, or tissue.

Even if your bowel cancer is not curable by surgery, tailored treatment can prolong survival and improve quality of life.

After a biopsy is taken, a pathologist analyses it and looks for abnormalities, then reports back to your treatment team.

The type of test(s) done may be limited to looking at a few genes or involve

a multi-gene panel test or NGS (Next Generation Sequencing).

New knowledge and improved testing has shown that additional mutations are also implicated in cancer resistance to certain treatments and responsiveness to others.

Certain biomarkers can also indicate progression of disease, so it's important to discuss biomarker testing as an ongoing part of your treatment plan.

Personalising (or tailoring) medical treatment according to your biomarkers can help you to avoid potential adverse effects and unnecessary costs related to treatments shown to be ineffective, or avoid delay in seeking alternative treatments which may be effective.

Knowing your biomarker status can also help your treatment team identify the best treatment options available, based on your tumour's genetic makeup, and can help determine if you're eligible for any clinical trials.

In bowel tumours, the most common mutations occur in the APC, KRAS, PIK3CA, SMAD4 and TP53 genes.

The most frequent predictive biomarkers currently used for bowel cancer treatment are the BRAF and RAS (KRAS and NRAS) gene mutations, but less frequent mutations can also inform treatment decisions.

# SPECIALIST REFERRALS AND SECOND OPINIONS

Referral to the specialist teams will normally happen automatically as part of the multi-disciplinary team process. If you have not been told who will be involved in your care, and which other specialist teams have reviewed your case, ask your specialist.

If your case has not been referred to another specialist team for an opinion on your metastatic disease, it is important to ask why.

If you are not sure that your specialist has acted in your best interests, or you want reassurance that you have been offered the best possible treatment plan, you have the right to ask for a second opinion from another specialist at a different hospital.

Getting a second opinion may provide peace of mind, but it is important to remember that it may not change your outcome in terms of which treatment you are given. It may also delay the start of treatment if you have to wait for an appointment to see a new specialist. A second opinion may not necessarily change the outcome in terms of which treatment you have. It may also delay the start of your treatment, while you wait for an appointment with the new specialist.



## LIMITATIONS AND SIDE-EFFECTS OF TREATMENT

There are always going to be some risks associated with any cancer treatment. Your specialist will be able to explain what each treatment might involve and will help you understand what short-term side-effects to expect.

Before signing your consent form, ask your specialist about any long-term problems that could develop as unintentional consequences of treatment. Take time to consider all your options and explore the things that may affect your recovery and your quality of life in the future.

It is also worth considering what you are hoping to achieve by having the treatment, as this will give you the focus and motivation to cope. For a small number of people with metastatic disease that is confined to just a small area in the body, it is possible to talk about 'curative' treatment plans and the possibility of a life free from bowel cancer.

For the majority of people however, the most likely scenario is that their treatment will be described as 'palliative' – a treatment plan which provides relief from symptoms and aims to enhance quality of life for as long as possible. This does not necessarily mean that time is short.

In fact, it is becoming increasingly possible to actively treat bowel cancer patients with metastases for as long as they remain well enough to cope with the treatments, and want to do so.

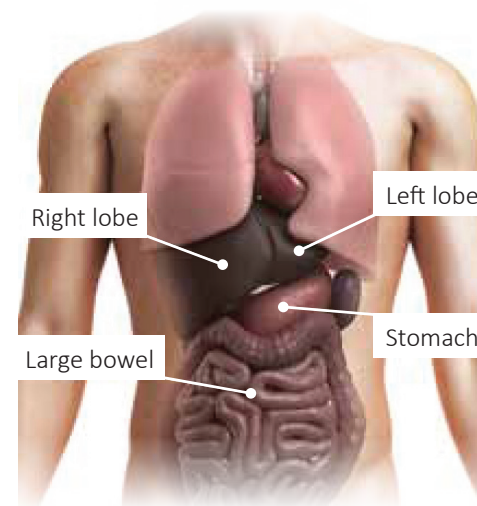
## WHEN BOWEL CANCER SPREADS TO THE LIVER

When bowel cancer spreads to the liver, you should be referred to a liver specialist. Their opinion will be taken into account by your multi-disciplinary team when considering your treatment options.

### Where is the liver?

If you place your right hand over the area under your ribs on the right side of your body, it will just about cover the area of your liver.

The liver is connected to the first part of the small bowel (duodenum) by a tube called the bile duct. This duct takes the bile produced by the liver to the intestine.



### What does the liver do?

The liver is the largest gland in the body and has many functions, which include processing digested food and producing bile which is an important digestive juice. The liver breaks down the body's waste products, which would otherwise build up to toxic levels. Many medicines are modified in the liver or, having had their desired effect, are broken down and removed.

Additionally, the liver has an amazing ability to repair itself in a way that most organs (the heart, lungs and kidneys for example) do not. Following surgery, it will re-grow to its original size in about three months.

The liver is made up of the larger right lobe and a smaller left lobe. It can also be thought about as eight different segments, based on its internal blood supply.

Liver metastases are very common in people with advanced bowel cancer, but they are also becoming increasingly easier to treat. This is done using a combination of treatment options which can in some cases provide a real chance of long-term survival from bowel cancer. The outcomes of treatment will depend on the pattern of spread of the disease, the number of metastases found and their position.

# WHEN BOWEL CANCER SPREADS TO THE LIVER

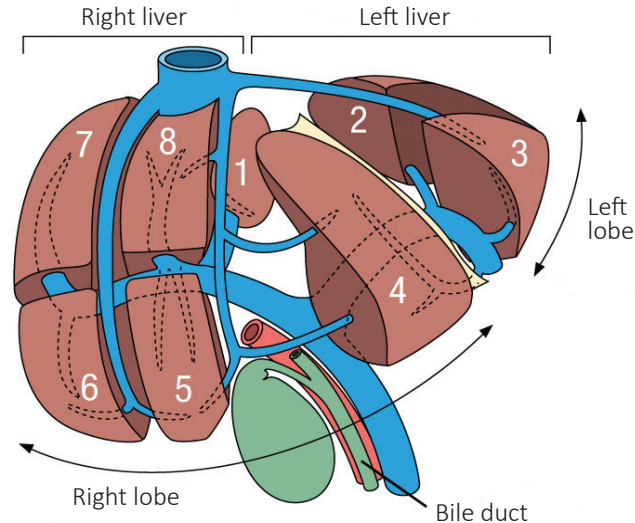
Conditions that can make liver metastases more difficult to treat include:

- Tumours that sit close to major blood vessels
- Lots of small metastases scattered across both lobes of the liver
- Underlying problems with the general condition of the liver, including changes as a result of previous treatment.

## The liver multi-disciplinary team

In addition to your specialist colorectal team, the specialist members of your liver multi-disciplinary team are likely to include:

- Hepato-biliary surgeons: surgeons who specialise in operations on the liver
- Hepatologists: specialists in diagnosing and treating liver disease
- Hepato-biliary nurse specialists:
  - nurses who have specialised skills in caring for patients with liver cancer and/or liver disease.



# WHEN BOWEL CANCER SPREADS TO THE LUNGS

If you are diagnosed with lung metastases, your case should be referred to a specialist multi-disciplinary team for thoracic conditions as part of your treatment plan.

The lungs are the organs which allow us to breathe. As blood passes through the lungs oxygen is replenished and carbon dioxide is cleared. All the blood in the body (about five litres) passes through the lungs in about a minute. Bowel cancer cells in the blood stream are likely to lodge in the lungs.

Metastases from bowel cancer can grow as one or two isolated tumours or scattered across both lungs. The options for treatment of lung metastases will depend on the size and position of these tumours, especially in relation to how close they are to the large blood vessels that supply the lungs.

## Specialists and tests

Metastases in the lungs are usually diagnosed using a combination of CT and PET scans. This combination of specialist imaging techniques can identify where the cancer is active and which structures in the lung are involved. On its own, the CEA tumour marker blood test is not an accurate test for active metastases in the lungs.

If the bowel cancer has metastasised to the lungs, it may be possible to remove it surgically. The treatment is likely to involve a range of different techniques, and will depend on your general health and circumstances.

If you are diagnosed with lung metastases, you should be referred to a specialist multi disciplinary team for thoracic conditions, to ensure you are offered the best possible treatment options.

This specialist team might include:

- Thoracic surgeon
- Clinical oncologist
- Interventional radiologist
- Lung clinical nurse specialist
- Respiratory physician

## WHEN BOWEL CANCER SPREADS TO THE PERITONEUM

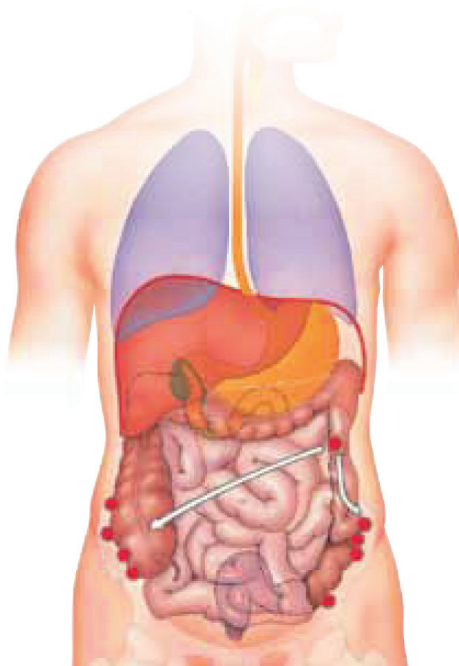
All the organs in the abdomen are contained inside a big sac or membrane called the peritoneum. Bowel cancer can spread through blood and lymph circulation, or it can spread directly inside this sac if a tumour grows through the bowel wall before it is diagnosed.

The symptoms of local spread of bowel cancer can be vague, but are likely to include unexplained pain, tenderness over the area, or unusual discharges, changed appetite or unexpected weight loss. Bloating and weight gain can be caused by fluid collecting in the abdomen as a result of cancer cells that have spread there.

Cancer cells can break off from the main tumour and escape into the abdomen, lodging between the lining (the peritoneum) and the other organs or tissues that are contained there. When this happens, they can either be reabsorbed into the lymph system, becoming caught up in the lymph nodes, or they can become embedded and start to grow on the outside of other organs in the abdomen or pelvis.

Recurrent bowel cancer that has spread into the abdomen or pelvis is most likely to be diagnosed via your routine blood tests and CT scans, especially in the early days following your initial treatment.

Investigations may include an ultrasound scan of the area, an abdominal MRI scan or a PET scan.



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## WHEN BOWEL CANCER SPREADS TO THE BRAIN

While it is much less common, it is possible for bowel cancer to spread from the bowel via the blood stream or lymphatic system to other parts of the body such as the brain or bones.

Cancer cells embed themselves into the surrounding tissue in the same way as in other areas of the body, causing swelling which then starts to press on other sensitive areas. This can lead to unexplained symptoms, including pain, restricted movement and/or changes in levels of energy and how well you feel generally.

Brain metastases are rare in bowel cancer patients. They develop later in the course of the disease and usually do not occur without previous spread elsewhere in the body. Due to improved treatment, more and more people are living with spread of bowel cancer to the more common areas, such as liver and lungs. This may explain why there appears to be an increasing incidence of brain metastases from bowel cancer.

Current chemotherapy drugs are not particularly effective for treating tumours in the brain, and so other treatments are usually considered first. Surgery to remove the tumour/s (neurosurgery) or radiotherapy to shrink them may be a possibility, depending on their number and position.

If you are diagnosed with brain metastases, your case should be forwarded on to the neurology multi-disciplinary team so that the best treatment options can be considered for you.

### What matters to you?

You will continue to have regular follow-up appointments and tests to monitor your condition and see how you are feeling. Use these appointments to share how you are coping and to discuss any concerns or issues you may be having.

At any time in your treatment pathway, you can say “stop” and have a ‘treatment holiday’ if you feel that you need a break. This will not be held against you, and you will still be monitored regularly by your specialist team who will work together with you and your family, to support your wishes, making sure that any new symptoms are investigated and treated as they arise. It may be that you are ‘living with’ your bowel cancer and there is little likelihood of a cure, but this does not mean you cannot have a good quality of life for as long as is possible.



## TREATMENT OPTIONS: LIVER SURGERY

The liver is an amazing organ and has the ability to re-grow safely, even if a large part of it is removed.

For some people, the operation is straightforward and can be done immediately. Other people may need to have chemotherapy or other treatments first to try and shrink the tumours, making them easier to remove. Portal vein embolisation is a procedure which encourages a new healthy segment of liver to grow and is sometimes performed before surgery, in order to avoid having too much of the liver removed in one operation.

In some cases, it may be possible to have surgery which will remove both sides of a diseased liver, one lobe at a time. This can be done in two separate operations scheduled several weeks apart, provided you are well enough to have the surgery and there are no other signs of active disease in your body.

Specialists schedule the surgery in this way in order to improve chances of a successful outcome in terms of long-term survival and quality of life following surgery.

It is also possible to have repeat surgery for liver metastases that recur, provided the same assessment criteria are met at the time the new metastases are discovered.

### The operation

Liver resections are usually performed during 'open' surgery through an incision in your abdomen, and can take between three and seven hours. Keyhole (laparoscopic) surgery may be an option in cases that are not complicated by the size and/or number of tumours present. In some instances, surgeons may find they need to perform open surgery to ensure they remove all visible cancer cells, and will transition from keyhole surgery to open surgery to ensure the best outcome.

This is a major operation and you will normally be admitted to an intensive care unit for a day or so following surgery. This allows you to be monitored closely immediately after the operation. Following surgery, you can expect to stay in hospital between five and seven days.

## TREATMENT OPTIONS: LUNG SURGERY

Thoracic surgeons are now able to use advances in keyhole (thoroscopic) surgery techniques, as well as more traditional 'open' surgery procedures to remove lung metastases successfully.

They are also becoming increasingly skilled in using specialist new equipment that can improve the safety and precision of the surgery, minimise bleeding and post-operative complications, and speed up recovery time for patients.

Surgery may be an option for you, if the size, position and grouping of the tumours are in a part of the lung that is easily accessible, and where the surgeon can reach them safely without damaging any major blood vessels or the main airways into the lung.

For example, it may be possible to take a small section of lung tissue – called a wedge – from the affected lung to remove one or two isolated metastases without losing too much of the function of the remaining lung. If your metastases have affected a larger area of the lower parts of the lung, it may be that your surgeon recommends removing a larger part of the lung – this is known as a partial lobectomy.

### When metastases affect both lungs

If you have metastases in both lungs, it may also be possible to treat them, one lung at a time. A combination of treatments may be used to ensure that the disease is treated as effectively as possible. You may be given the choice to explore chemotherapy options, with or without

targeted therapies, or you may be offered a combination of chemotherapy and specialist radiotherapy or heat treatments. The aim of these treatments is to reduce the size and/or number of active tumours in the lungs prior to surgery, to make them easier to remove.

### What to expect after surgery

After surgery, you will have one or more drains in your chest to drain away any blood or fluid collecting around the lung and to help the lung to re-inflate again.

You may have a cough or some shortness of breath initially, but this should settle as your wounds heal. It is likely that you will have some pain. This can be managed effectively with a combination of painkillers, regular deep breathing and gentle exercise.

If you are having keyhole surgery to remove the metastases in your lung, you are likely to be in hospital for two to four days. Open surgery tends to be a bigger operation and you are likely to be in hospital for up to seven days, with at least another few weeks at home to recover. You will be advised to avoid any strenuous exercise or heavy lifting for at least six weeks.



## TREATMENT OPTIONS: PERITONEUM

Abdominal (peritoneal) metastases can be more difficult to treat because of the way in which the cancer cells become attached to the outside of other organs and tissues in the abdomen.

The treatment options available will depend on many factors, including which organs are involved and what other complicating factors might be present as a result of previous surgery (if this is recurrent disease).

If there are just one or two isolated metastases in an easily accessible position, your oncology team is likely to ask a general surgeon with specialist experience and training to review your case and give an opinion on whether an operation to remove them might be successful. They may also ask other specialists to become involved if the metastases are affecting the bladder or kidneys or the reproductive system in women (ovaries or uterus).

### **Hyperthermic Intraperitoneal Chemotherapy (HIPEC)**

When bowel cancer spreads to the lining surfaces of the abdominal (peritoneal) cavity, it can be more difficult to treat successfully with traditional chemotherapies. However, if there is no other evidence of spread outside the abdomen, then a novel treatment, called hyperthermic intraperitoneal chemotherapy (HIPEC), may become an option for some patients.

The treatment is usually given during surgery when the surgeon will first remove all the visible cancer in the abdomen. While you are still under anaesthetic, this heated (hyperthermic) chemotherapy fluid is introduced directly into your abdomen (intraperitoneal), bathing all the organs and surfaces in the fluid for a maximum of two hours. The HIPEC procedure is designed to attempt to kill any remaining cancer cells that may be left behind, but that cannot be seen.

This procedure is reserved for selected suitable patients.

## TREATMENT OPTIONS AND CLINICAL TRIALS

Your oncologist will recommend a treatment plan that is most likely to provide a balance between having the greatest benefits and the fewest risks or side-effects.

### **Treatment options**

First-line treatment is usually based on what worked best in clinical trials for patients with the same type and stage of cancer. You will be closely monitored during your treatment. If your first-line treatment does not work, stops working, or causes serious side-effects, your oncologist may recommend a second-line treatment, which is a different treatment that may be effective. In some cases, you may be a candidate for third-line therapy; this will depend on your fitness and what treatment has been given previously.

### **Clinical trials**

At any point during your treatment, you may consider asking your oncologist whether a clinical trial is an option. A clinical trial is a research study that tests a new treatment to prove it is safe, effective, and possibly better than the standard treatment you may already have had. Because many clinical trials require that you have had few or no previous treatments, it is best to ask about clinical trials early in the treatment pathway. Your healthcare team can help you review all clinical trial options available to you.



## TREATMENT OPTIONS: CHEMOTHERAPY

Sometimes your multi-disciplinary team will decide that surgery is unlikely to be an option for you, or that it could be an option at a later date but other treatment is needed first.

Combinations of chemotherapy, targeted and novel (new) therapies are increasingly becoming successful ways of treating a greater number of patients with bowel cancer metastases in the liver and elsewhere. The purpose of these types of treatments (described later in this booklet) is to kill the cancer cells and shrink the tumours bringing them to a point where they can be removed with surgery, or safely targeted with other kinds of treatment.

The standard chemotherapy drugs for metastases are the same as the ones used to treat cancer in the bowel (colon or rectum). They can be given on their own, in different combinations at the same time, or given one after the other, depending on your particular circumstances.

You may recognise some of the names of the individual drugs: oxaliplatin, irinotecan, 5FU and capecitabine.

These are some combinations currently being used:

- FOLFOX – 5FU and leucovorin with oxaliplatin
- FOLFIRI – 5FU and leucovorin with irinotecan
- FOLFOXIRI – 5FU and leucovorin with both oxaliplatin and irinotecan
- CAPOX or XELOX – capecitabine with oxaliplatin
- CAPIRI or XELIRI – capecitabine with irinotecan

Raltitrexed may be prescribed for people who cannot tolerate 5FU or who have a previous history of coronary heart disease.

Leucovorin (folinic acid) is not a chemotherapy drug, but when used in combination with 5FU it has been shown to increase its effectiveness.

- **Lonsurf (trifluridine and tipiracil)**  
chemotherapy tablets are used to treat advanced bowel cancer by slowing down the growth and spread of cancer cells.  
Lonsurf may be recommended if you have already received chemotherapy and/or targeted therapies and they are no longer effective, or when no other currently available treatment is considered suitable.

Typically, Lonsurf is taken for five days, followed by two days of rest, repeating the cycle for two weeks. The cycle is followed by a two week break and then repeated, for as long as recommended.

Almost all patients who take Lonsurf experience side effects at some stage. Common side effects include: tiredness, nausea, vomiting, decreased appetite, diarrhoea, abdominal pain and fevers.

Lonsurf may also cause a decrease in white blood cells which can make you more prone to infection. Taking Lonsurf following morning and evening meals may help lessen this effect.

## TREATMENT OPTIONS: TARGETED THERAPIES

Targeted therapies are treatments that act on cell processes.

The development of targeted therapies, also known as biological therapies, is an exciting step forward in the treatment of cancer as it may be possible to destroy cancer cells without damaging other healthy cells.

Targeted therapies are usually given in combination with other standard chemotherapy treatments.

These new drugs may:

- Stop cancer cells from dividing and growing
- Seek out cancer cells and kill them
- Encourage the immune system to attack cancer cells
- Alter the growth of blood vessels into the tumour.

Some drugs are grouped according to the effect they have, for example: drugs that block cancer cell growth (called EGFR inhibitors) or drugs that block the growth of new blood vessels to the tumour (VEGF inhibitors) and drugs that target specific proteins on cancer cells are called monoclonal antibodies..

In addition, new drugs are being developed which have multiple modes of actions. For example, a drug that works as a monoclonal antibody and blocks cancer cell growth.

Treatment with the most appropriate targeted therapy may depend on the results of specific genetic tests, called biomarkers, on the tumour tissue.

Below are the most commonly used targeted therapies for treatment of bowel cancer metastases:

- **Bevacizumab (Mvasi, the biosimilar brand of Avastin)** is PBS-subsidised as a first- and second-line treatment option for patients with metastatic bowel cancer.

Side-effects associated with Mvasi can include tiredness, diarrhoea, nausea and increased pain, for example. It can increase your blood pressure which can lead to nose bleeds and complications with wound healing. For this reason, Mvasi should not be used for at least 28 days before or after surgery and until surgical wounds are fully healed.

- **Cetuximab (Erbix)** is PBS-subsidised as a first- and second-line treatment option for patients with RAS wild type metastatic bowel cancer.

Side-effects associated with cetuximab include an acne-like skin rash which can affect the face and chest. Your oncologist can prescribe creams / tablets to control the rash. There is a very small chance of severe allergy (anaphylaxis) when first treated with cetuximab.

## TREATMENT OPTIONS: TARGETED THERAPIES

- **Panitumumab (Vectibix)** is PBS-subsidised as a first- and second-line treatment option for patients with RAS wild type metastatic bowel cancer. Side-effects associated with panitumumab can include diarrhoea; fatigue; skin reactions such as acne type spots, itching, redness, rash, flaking skin, dry skin; vomiting or feeling sick; swollen runny eyes; sore mouth; hair loss; and excess sweating, for example.
- **Encorafenib (Braftovi)** is PBS-subsidised in combination with cetuximab (Erbix) as a treatment option for people with metastatic bowel cancer who have a particular change (mutation) in the gene that produces a protein called BRAF and who have previously been treated with other anti-cancer medicines.

Less serious side-effects of encorafenib can include tingling and numbness, neurological changes such as headaches and fatigue, anaemia, blood clots, high blood pressure, visual impairment, gastrointestinal related problems including nausea, diarrhoea, liver, pancreas, kidney and colon inflammation. Muscle and joint pain, itching dry skin, abnormal hair loss and potential skin tumours.

Serious side-effects can include dizziness, shortness of breath, swelling of extremities, headache, coughing up blood and allergic reaction to encorafenib. Encorafenib may also cause skin cancers. Usually these can be removed with surgery.

- **Regorafenib (Stivarga)** is used for the treatment of people with metastatic bowel cancer in the third-line setting, after the cancer has progressed or has recurred after multiple treatments.

Regorafenib is TGA approved but is not a PBS-subsidised treatment.

Side-effects associated with regorafenib can include nosebleed; anaemia; decreased appetite; high blood pressure; diarrhoea; painful or dry mouth; hand-foot skin reactions; hair loss; dizziness; stiffness of the muscles or joints; loss of balance; fever; headache; nausea, vomiting; weight loss; heartburn; and stomach pain.

## TREATMENT OPTIONS: IMMUNOTHERAPY

Immunotherapy is treatment that uses the patient's immune system to fight cancer.

An important part of the immune system is its ability to keep itself from attacking the body's normal cells. To do this, it uses 'checkpoint' proteins on immune cells, which act like switches that need to be turned on (or off) to start an immune response.

Cancer cells sometimes use these checkpoints to keep the immune system from attacking them.

PD-1 (programmed cell death protein 1) is a protein found on the surface of immune system cells called T cells. It normally helps keep these cells from attacking 'good' cells in the body.

When PD-1 attaches to another protein called PDL-1 on a cancer cell, it stops the T cell from killing the cancer cell. PD-1 inhibitors attach to PDL-1 and allow the T cells to kill cancer cells.

**Pembrolizumab (Keytruda)** blocks a cancer cells' ability to attach to PD-1, so, the immune system can then 'see' the cells as 'bad'. This boosts the immune response against the cancer cells and can shrink some tumors or slow their growth.

Pembrolizumab can be used for people whose bowel cancer cells have tested positive for specific gene changes, such as a high level of microsatellite instability (MSI-H), or changes in one of the mismatch repair (MMR) genes.

It is PBS-subsidised as a treatment option for patients with previously untreated unresectable or metastatic deficient mismatch repair (dMMR) bowel cancer.

Less serious side-effects of pembrolizumab can include infections of the upper respiratory tract, decreased white cell count (white cells fight infection), hair loss, fatigue, diarrhoea, rash, gastrointestinal related problems including nausea, constipation, vomiting and weight loss.

Other common side effects include blisters on the skin, including the mouth and nose.

Serious side-effects can include shortness of breath, coughing or chest pain; black, tarry, sticky stools that may have mucus; liver problems including nausea, vomiting skin or eyes which looks yellow. Rapid heart rate and changes to the amount you urinate.



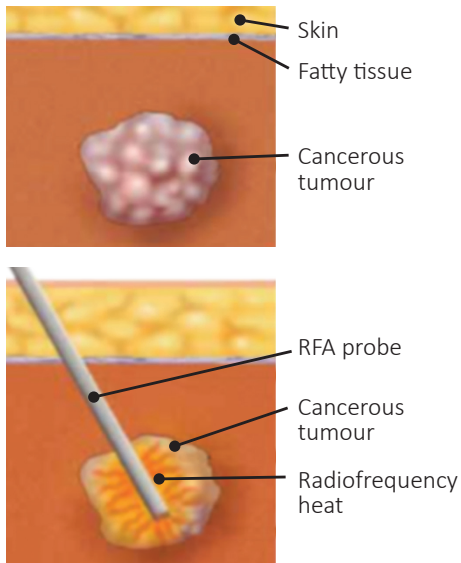
# TREATMENT OPTIONS: RFA

## Radiofrequency ablation (RFA) for liver or lung metastases

Radiofrequency refers to the high frequency electrical currents; ablation means destroying.

You may be prescribed RFA for the following conditions:

- If you have more than one tumour in your liver
- If the position of a tumour makes it difficult to operate (for example near a major blood vessel)
- If you have other conditions that make surgery difficult.



Research shows that RFA works best on tumours less than 3cm across, but it can be used on larger tumours. You can have RFA treatment more than once.

The treatment is given under general anaesthetic. The surgeon/radiologist uses specialist scanning equipment (ultrasound/CT) to guide a probe (1-2mm across) into the tumour, where high frequency electrical currents are passed. This creates heat that destroys the cancer cells. The heat can be varied depending on the size of the tumour, and the time taken to treat each tumour is usually about 10-15 minutes.

Some patients experience side-effects after treatment, which can include:

- Discomfort/pain where you've been treated (for up to two weeks)
- Feeling generally unwell for a few days, perhaps with a raised temperature
- Infection, bleeding or organ damage (this is rare).

Most people go into hospital the night before the treatment, and go home the day after. You will be given painkillers to take home and you will usually have another CT scan six to eight weeks later to see how effective it was.

## Microwave ablation

This is a newer ablative technique that uses microwave radiation to heat and destroy cancerous tissue. The indications for its use are similar to radiofrequency ablation. The advantages are that the technique is quicker than RFA: it only takes three minutes on average to treat a small tumour. This technique therefore allows multiple lesions to be treated in the same session.

This treatment is still experimental.

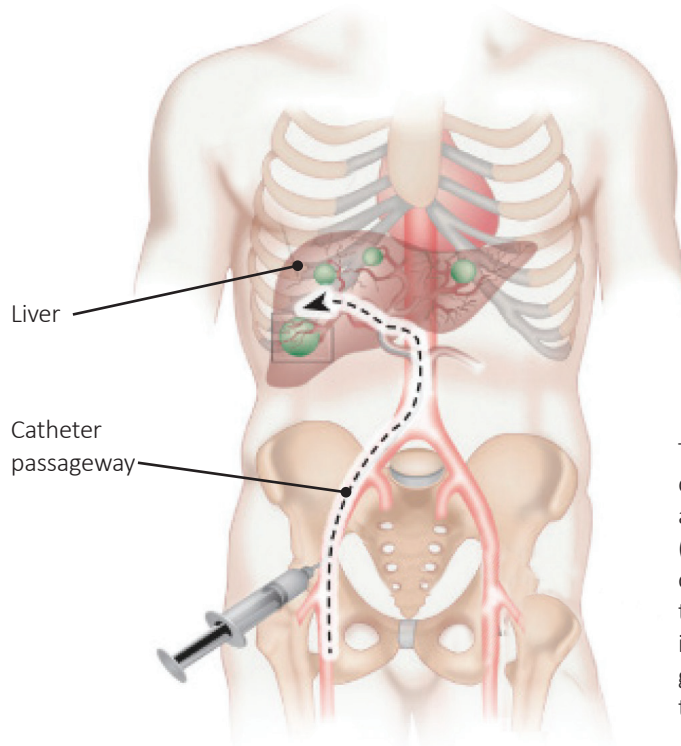


# TREATMENT OPTIONS: SIRT

## Selective internal radiation therapy (SIRT) for liver metastases

This is a novel treatment which involves millions of very tiny resin 'beads' (microspheres) being injected into the major blood vessel that supplies liver tumours with oxygen and nutrients. Each bead is small enough to reach the tiny blood vessels in and around the active tumours, where they give out concentrated doses of radiation. The treatment is then active within the liver for about two weeks of effective, continuous treatment.

SIRT is suitable for patients where either the liver is the only site of disease or the major site of disease. There are a number of other factors that have to be considered before it can be offered as a treatment option. Most importantly, your liver needs to be otherwise in good condition and working properly. This is usually determined by simple blood tests.



The microspheres are delivered through a soft, flexible tube (catheter). The catheter is inserted through an incision in the groin area, and guided to the liver via the femoral artery.

Selective internal radiation therapy is done in two stages. The first step is to prepare the liver for the treatment and involves having a fine tube (catheter) inserted into a blood vessel in your groin and passed up to the blood vessel which carries blood to the liver.

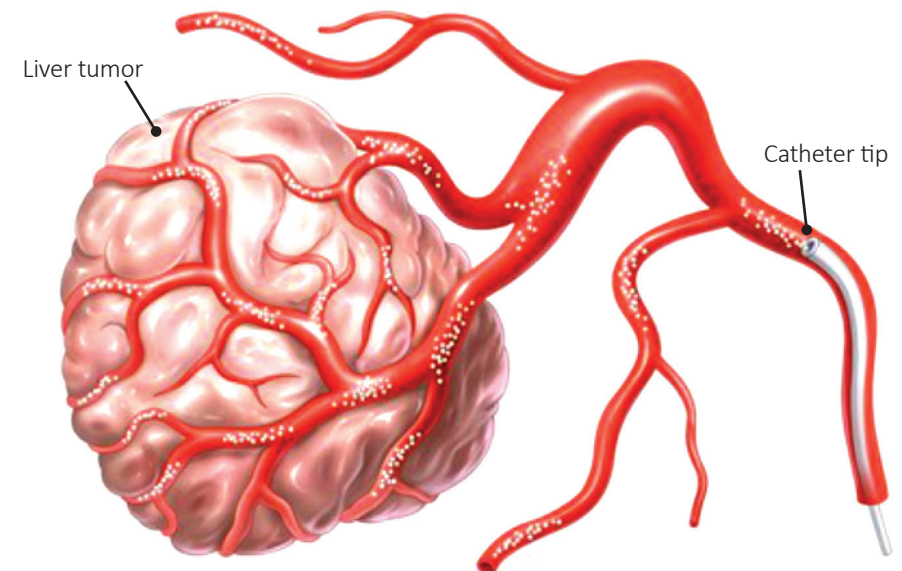
You would also receive a small amount of radioactive dye to check the blood flow between your liver and lungs. The vessels in your liver will be blocked to stop the microspheres travelling elsewhere in your body.

This treatment involves staying in hospital for one to four days. The second step involves receiving the microspheres, also done via the tube in your groin area- usually one to two weeks later.

Side-effects of the treatment may include:

- Abdominal pain and/or nausea, which normally eases after a short time, with or without medication
- Mild fever for up to a week
- Feeling tired for several weeks following an infusion.

You may need to take painkillers or other medication to prevent or reduce these side-effects.



Tiny resin beads are guided into the blood vessels supplying the tumour.



# TREATMENT OPTIONS: NOVEL

There are some new treatments becoming more widely available in Australia. Although evidence regarding their long-term benefits is limited, you may wish to discuss them with your medical team.

## **Stereotactic radiotherapy (cyberknife or gammaknife) for liver, lung or brain metastases**

Sometimes referred to as radiosurgery, this treatment works by delivering concentrated, high doses of radiation directly into the metastasis using many individual beams of low dose radiation. These are aimed very precisely, to deliver the treatment from all sides at the same time.

Unlike conventional radiotherapy, this treatment can be delivered in just a few, longer treatment sessions, or even in one single treatment. The technique spares the surrounding healthy tissue, reducing the risk of long-term damage or complications making it a safer alternative for patients otherwise unable to have surgery to remove tumours, and for those who might not respond to other, conventional treatment options.

## **Lung laser**

The lung laser uses beams of light to deliver precise, powerful treatments to very small areas of the tumour. It allows surgeons to perform complicated surgery on the delicate lung tissue efficiently and effectively. This treatment benefits patients by:

- Using ultra-high temperatures to destroy even deep-seated and multiple metastases. The laser effectively seals the edges of the wound so that the surgeon does not have to remove large sections of the lung (lobectomy). This protects the lung function, and can reduce the risk of breathlessness after surgery.
- Increasing the speed at which multiple metastases can be removed, reducing the time that patients spend under general anaesthetic.
- Destroying the cancer cells at the same time as sealing the surrounding lung tissue, reducing the risk of internal bleeding or air leak from the lung which can lead to post-operative complications.

# QUESTIONS TO ASK

## **You may wish to consider asking your specialist team some of these questions:**

- Where are the metastases in my body, and can you draw me a picture to help me understand what this looks like?
- If the metastases are only in my liver (liver limited), has my case been discussed by the specialist liver multi-disciplinary team?
- Has my RAS status been checked to determine suitability for targeted therapy?
- What treatment options are available to me?
- Is the treatment I am being offered the only option or are there other treatment options available to me?
- Where might I go to get a second opinion?
- Am I eligible to participate in a clinical trial?
- What other treatment options could I consider if I were a private patient?
- When will the treatment start?
- How will I be followed up, and how often?
- How will I know if the treatment has worked?
- What are the common side-effects of the treatment I am being offered, including any that may become a long-term problem?
- Who will be my primary contact for this part of my treatment, and how will I be able to keep in touch with him/her?
- Who do I contact if I have any problems as a result of my treatment, and how do I do that?
- What happens if I decide not to have treatment?





NOTES

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# SUPPORT FOR YOU WHAT MATTERS MOST

Bowel Cancer Australia provides practical and emotional support for the growing number of Australians affected by bowel cancer.

## Bowel Care Nurses

With expertise in intensive care, oncology and stomal therapy, Bowel Cancer Australia's friendly nurses assist patients, family, friends, and concerned members of the community.

Whether your questions relate to bowel symptoms, treatment options, or how to support someone you love affected by the disease, we're here to help.

Our medically trained nurses serve as a constant, dedicated point of contact throughout a patient's care. Offering support during and after treatment, they add an extra layer of support to the trusted relationship patients have with their treating medical team.

## Stoma Nurses

Bowel Cancer Australia's Stoma Nurses are experienced in caring for people who have had surgical treatment for their bowel cancer and require a temporary or permanent ileostomy or colostomy.

Fear of living with 'a bag' is common in bowel cancer patients but can be significantly eased with the right advice and practical support. Our Stoma Nurses can provide pre- and post-operative support and advice on what to expect if this operation is being considered. They can also assist with questions regarding stoma care and management, and stoma reversal.

## Bowel Care Nutritionists

A diagnosis of bowel cancer requires major changes to diet and lifestyle. Bowel Cancer Australia's Bowel Care Nutritionists are uniquely qualified to help with practical advice on food choices during treatment and in recovery. Specific nutritional advice, recipes, menu planning and cooking tips are provided to patients, carers, families and friends.

To speak with any of our Bowel Care Nurses or Nutritionists, please call our Helpline on **1800 555 494** during business hours, Monday to Friday (AEST), or send your questions using our online form at **[bowelcanceraustralia.org/nurse](http://bowelcanceraustralia.org/nurse)**

## Peer-to-Peer Support Network

Bowel Cancer Australia's Peer-to-Peer Support Network connects patient's and loved ones on a one-to-one buddy basis that enables members to give and receive advice about their bowel cancer experience in an informal and mutually beneficial way.

The Network helps to reduce feelings of isolation and allows buddies to learn firsthand from the experiences of someone in a very similar circumstance.

The Network is Australia's only national support group for bowel cancer patients and loved ones and is particularly beneficial for those who have recently learnt of their bowel cancer diagnosis as the guidance is not theoretical, but practical, personal, and relevant.

## Patient Publications & Resources

Bowel Cancer Australia has developed a range of publications covering bowel cancer prevention, diagnosis, treatment, recovery and care for people affected by bowel cancer. Offering information and real patient experiences, our range of booklets and fact sheets can be ordered by calling our Helpline on **1800 555 494**, or downloaded from our website, **[bowelcanceraustralia.org](http://bowelcanceraustralia.org)**, where you will also find comprehensive information about bowel cancer which is unmatched.





Bowel Cancer  
AUSTRALIA



Bowel Cancer Australia is a 100% community-funded national charity dedicated to prevention, early diagnosis, quality treatment and the best care for everyone affected by bowel cancer.

We are committed to championing what matters most to people affected by bowel cancer and determined to have an everlasting impact where no Australian dies from bowel cancer and all those diagnosed receive the support they need.

**\$25**

can provide a newly diagnosed patient with **an empowering Resources Pack**.

can help put **a patient or loved one in touch** with our free Helpline.

**\$50**

**\$100**

can help **connect two patients or loved ones** through our Peer-to-Peer Support Network.

can fund a part-time **Bowel Care Nurse** per week.

**\$1000**



**NGO of the  
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*PRIME  
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[bowelcanceraustralia.org](http://bowelcanceraustralia.org)

Helpline: 1800 555 494

