

# Understanding Secondary Bone Cancer

**A guide for people affected by cancer**

**This fact sheet has been prepared to help you understand more about secondary bone cancer. It includes basic information about how secondary bone cancer is diagnosed and treated.**

## The bones

A typical healthy adult has over 200 bones, which:

- support and protect internal organs
- are attached to muscles to allow movement
- contain bone marrow, which produces and stores new blood cells
- store proteins, minerals and nutrients, such as calcium.

The bones are made up of different parts, including a hard outer layer (known as cortical or compact bone) and a spongy inner core (known as trabecular or cancellous bone). Cartilage is the tough material at the end of each bone that allows one bone to move against another. This meeting point is called a joint. Bones have two types of cells – osteoblasts and osteoclasts. Osteoblasts create new bone and osteoclasts destroy old bone.

## What is secondary bone cancer?

Bone cancer can start as either a primary or secondary cancer. The two types are different, and this fact sheet is only about secondary bone cancer.

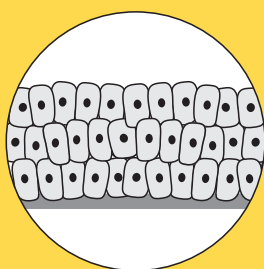
**Primary bone cancer** – This means that the cancer starts in the bone. For more information, download our *Understanding Primary Bone Cancer* fact sheet from your local Cancer Council website.

**Secondary bone cancer** – This means the cancer started in another part of the body, but has now spread (metastasised) to the bone. It may also be called bone metastases or bone mets.

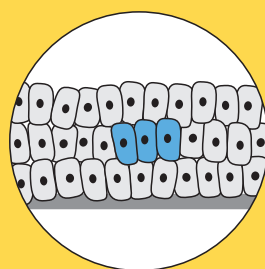
Cancer cells often spread from the original (primary) cancer, through the bloodstream or lymph vessels, to bones in the spine, ribs and pelvis, or to the upper bones of the arms and legs.

Secondary cancer in the bone keeps the name of the original cancer. Because the cancer has spread, it is considered advanced or stage 4 cancer. You may find it useful to read the Cancer Council booklet about the primary cancer type.

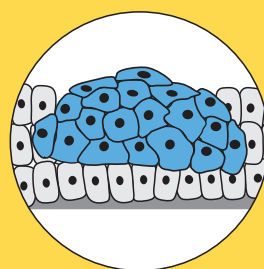
### How cancer starts



Normal cells

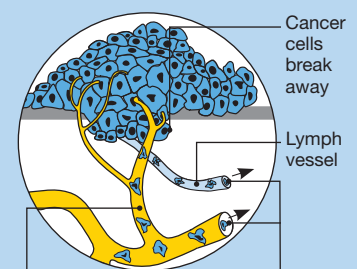


Abnormal cells



Abnormal cells multiply

### How cancer spreads



Blood vessel

Cancer cells travel to lymph nodes and other parts of the body (metastasis)

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### Which cancers spread to the bone?

Any type of cancer can spread to the bone. The cancers most likely to spread to the bone include prostate, breast, lung, kidney, thyroid and myeloma, a type of blood cancer.

### What types are there?

There are two main types of secondary bone cancer:

- **Osteolytic** – This means the bone has become damaged. In some cases, small holes form in the bone. These are known as lytic lesions, and can weaken the bone and increase the risk of breakage or other problems.
- **Osteoblastic** – This means new bone is formed, but it grows abnormally, causing the bone to become weak and deformed.

Most people develop either osteolytic or osteoblastic changes, but some have both.

### How common is secondary bone cancer?

Secondary bone cancer is much more common than primary bone cancer in Australia. It is more common in adults than children.

The bone is one of the most common sites cancer spreads to, along with the lymph nodes, liver and lungs.

### What are the risk factors?

Secondary bone cancer is always caused by cancer cells spreading to the bone from a primary cancer. It is not fully understood why some people develop secondary bone cancer and others don't.

### Diagnosis

Secondary bone cancer is sometimes found at the same time as the primary cancer. It can also be found months or years after the primary cancer has been treated.

Sometimes, secondary bone cancer is diagnosed before the primary cancer is located. When tests can't find where the cancer started, this is known as cancer of unknown primary (CUP).

### What are the symptoms?

If you notice any of these symptoms, see your cancer specialist.

<b>Bone pain</b>	This is often the first, and most common symptom. The pain may be a dull, persistent ache. It can get worse with movement and is often worse at night.
<b>Fractures</b>	Cancer cells can weaken the bones and cause them to break more easily, often with little or no force (pathological fracture).
<b>High calcium levels in the blood (hypercalcaemia)</b>	As the bone breaks down, it releases calcium into the bloodstream. When calcium builds up in the blood, it may cause fatigue, nausea and vomiting, constipation, thirst or confusion.
<b>Pressure on the nerves in the spine (spinal cord compression)</b>	Abnormal bone growth or fractures can press on the nerves in the spine. This can cause back pain, muscle weakness, tingling or numbness of the limbs, difficulty walking, or loss of bowel or bladder control.

If your doctor is concerned that the cancer has spread to the bones, you may have some of the following tests:

- **blood tests** – including a full blood count and a check of your calcium levels
- **bone x-rays** – scans of the chest and bones to show bone damage, fractures or creation of new bone
- **bone scan** – a small amount of radioactive dye is injected into a vein; it collects in the bone and any abnormal changes are detected by a scanning machine
- **CT or MRI scans** – a specialised computer is used to scan and create pictures to highlight any bone abnormality; these scans take between 30 and 90 minutes to perform

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- **PET scan** – an injection of a small amount of radioactive glucose solution highlights any cancerous areas on the scan; a PET scan takes around 90 minutes to perform
- **bone biopsy** – removal of some cells and tissues from the affected bone for examination under a microscope. The biopsy may be done in one of two ways. In a core needle biopsy, a local anaesthetic numbs the area, then a thin needle is inserted under CT guidance to remove a sample of bone. An open or surgical biopsy is done under general anaesthesia, and a surgeon removes a small section of the bone.

### Prognosis

Prognosis means the expected outcome of a disease. You may want to discuss your prognosis and treatment options with your doctor.

Factors that affect prognosis include whether the cancer has spread to other parts of your body, how quickly it is growing, and how it responds to treatment. It is not possible for any doctor to predict the exact course of your disease, but they can provide you with general information on the expected outcomes of patients in a similar situation to you. It is difficult to know exactly what will happen, and this uncertainty can be hard to deal with.

Although secondary bone cancer cannot be cured, treatment can reduce symptoms and improve quality of life. In some cases, treatment can keep secondary bone cancer under control for many years.

### Treatment

The aim of treatment for secondary bone cancer is to control or shrink the cancer and relieve symptoms. It is possible that treatment may make you feel better. This is called palliative treatment.

Treatment options will depend on:

- the type of primary cancer
- the treatment you have already had
- how many bones are affected by cancer
- whether the cancer has spread to other parts of the body
- your symptoms and general health.

You may have treatment that affects the whole body (systemic) or is focused on a particular bone (local). Treatments can be given on their own or in combination.

### Hormone therapy

Hormone therapy, also called endocrine therapy, may be used to treat breast or prostate cancer that has spread to the bone. The aim of this treatment is to lower the levels of hormones in the body or stop hormones reaching cancer cells. This starves cancer cells that need hormones to grow.

Hormone therapy may be given as tablets or injections.

**Side effects** – May include hot flushes, mood changes and sweating in both men and women.

### Chemotherapy

Chemotherapy uses drugs to kill or slow the growth of cancer cells, while causing the least possible damage to healthy cells.

Generally, chemotherapy is given through a vein (intravenously) over several hours. Most people have several treatment cycles with rest periods in between. The number of sessions varies depending on the combination of drugs prescribed by your oncologist.

**Side effects** – These will depend on the drugs you receive. Some people have few side effects; others have more. Common side effects include tiredness, nausea, diarrhoea, appetite loss, hair loss, and increased risk of infections.

### Targeted therapy

Targeted therapy uses drugs that attack specific features of cancer cells, known as molecular targets, to stop the cancer growing and spreading.

To find out more about the treatments discussed in this fact sheet, visit your local Cancer Council website or call **13 11 20** for free information on targeted therapy, immunotherapy, chemotherapy, surgery and radiation therapy.



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This treatment can only treat cancers that are growing in response to certain proteins in our cells. The type of drugs you have will vary depending on the primary cancer.

Targeted therapy drugs can be given in different ways, including:

- by mouth (orally)
- by injection under the skin (subcutaneously)
- by injection into a vein (intravenously).

**Side effects** – These will vary depending on the drugs used and how your body responds. Targeted therapy drugs can cause skin rashes, fever, diarrhoea and headaches. Talk to your doctor about managing side effects.

### Immunotherapy

Immunotherapy works by stimulating the body's own immune system to attack the cancer. The most widely used form of immunotherapy is checkpoint inhibitor drugs. Some cancers create "checkpoints" to block the immune system. Checkpoint inhibitors allow the immune system to bypass these checkpoints. Several checkpoint inhibitor drugs are approved to treat lung cancer that has spread to the bones. Clinical trials are testing checkpoint immunotherapy for other types of cancer.

**Side effects** – These will vary depending on the type of immunotherapy you receive and how your body responds. Common side effects include fatigue, skin rash and diarrhoea.

### Radiation therapy

Also known as radiotherapy, radiation therapy is the use of targeted radiation to kill or damage cancer cells. The radiation is usually in the form of x-ray beams. Radiation therapy is commonly used to reduce pain in the bone. It is usually given from outside the body and is aimed at the particular bone causing pain.

The most common type of radiation therapy used for secondary bone cancer is external beam radiation therapy (EBRT). You will lie on a treatment table and a machine will deliver radiation to the affected area of the body. You may have one radiation therapy treatment, or several over a few weeks.

A type of EBRT called stereotactic body radiation therapy (SBRT) may also be used for secondary bone cancer. For SBRT, you will lie on an examination table and a machine will precisely deliver a few high doses of radiation to the bones. SBRT is offered in some specialised centres.

If the cancer has spread to more than one bone, you may be injected with a small amount of radioactive liquid. This is known as radionuclide therapy and it aims to destroy the cancer cells. The material spreads throughout the body but particularly targets cancer cells. Your treating team will let you know of any safety measures to follow.

**Side effects** – These relate to the type of cancer and the part of the body treated. You may experience fatigue, skin problems, appetite loss and nausea.

### Surgery

Cancer can weaken a bone and cause fractures. Surgery to insert metal rods, plates, screws, wires, nails or pins can help strengthen a bone. Surgery may also be used if the cancer is pressing on the spinal cord and showing signs of damage.

**Side effects** – After surgery some people develop an infection at the wound site. Your specialist will discuss ways to prevent this happening.

### Vertebroplasty

If the cancer is causing severe back pain and damage to the bones in the spine, you may have an injection of bone cement into the bones to stabilise and strengthen them, and to relieve pain. This is called vertebroplasty and is done in the x-ray department. It usually takes about an hour and you can go home later the same day.

### Taking part in clinical trials

New treatments are constantly becoming available. Clinical trials test new treatments to see if they're better than current methods. Getting access to new treatments is an important consideration in your care. Talk with your doctor about the latest developments and whether you're a suitable candidate.

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### Bone-strengthening drugs

Your doctor may prescribe medicines to help strengthen your bones, reduce bone pain, and control high calcium levels in the blood – a condition known as hypercalcaemia.

There are two options for bone-strengthening drug treatment:

- **bisphosphonates** – a class of drugs that can be given as an injection into a vein (intravenously) or as a tablet (orally)
- **denosumab** – given as an injection into the skin (subcutaneously).

**Side effects** – These will vary depending on how the drugs are taken. Bisphosphonates taken intravenously can cause muscle and joint pain, fatigue, nausea, or flu-like symptoms such as shivering and fever. Bisphosphonates taken orally may make your throat sore, or cause indigestion or nausea. Occasionally, bisphosphonates can cause kidney damage. Your kidney function will be monitored with regular blood tests.

All bone-strengthening drugs can lower calcium levels, so your doctor may advise you to take calcium and vitamin D supplements.

A rare but severe side effect of bone-strengthening drugs is the breakdown of bone tissue in the jaw called osteonecrosis or ONJ. To reduce the risk of osteonecrosis, it is recommended that you see a dentist before you start taking bone-strengthening drugs, and then every six months while taking these drugs. If you need dental work during treatment, let your dentist know that you have been taking bisphosphonates or denosumab and ask your oncologist whether you can have a break in treatment.

See your doctor if you experience mouth ulcers or jaw problems while taking bisphosphonates.

“ There is still a life to be lived and pleasures to be found and disappointments to be had. Living with advanced cancer is a different life, not just a journey towards death. ” Julie

### Complementary therapies

These therapies are used alongside conventional medical treatments. Therapies such as relaxation and acupuncture can increase your sense of control, decrease stress and anxiety, and improve your mood. Let your doctor know about any therapies you are using or thinking about trying, as some may not be safe or evidence-based. For more information, call **13 11 20** for a free copy of the *Understanding Complementary Therapies* booklet, or download a copy from your local Cancer Council website.

### Palliative treatment

Because secondary bone cancer is advanced cancer, your doctor is likely to discuss palliative treatment for symptoms caused by the cancer. Palliative treatment aims to manage symptoms without trying to cure the disease.

Palliative treatment is one aspect of palliative care, in which a team of health professionals aim to meet your physical, practical, emotional, spiritual and social needs. The team also provides support to families and carers. For more information, visit the Cancer Council website or call 13 11 20 for a free copy of *Understanding Palliative Care*.

### Managing symptoms

For many people with secondary bone cancer, managing symptoms may make you feel better.

**Pain** – Your doctor may prescribe pain-relieving medicines to reduce the pain. These may be mild, like paracetamol; moderate, like non-steroidal anti-inflammatory drugs (NSAIDs); or strong and opioid-based, like morphine. If the treatment shrinks the bone tumours or reduces the pressure on nerves and surrounding tissues, your doctor may be able to adjust the dose of the pain-relieving medicines.

**Fatigue** – Many people experience extreme or constant tiredness known as fatigue. This may be because the cancer is affecting your bone marrow. You'll have blood tests to monitor your blood cell counts. If your red blood cell level is low (anaemia), you might have a blood transfusion.

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### Living with secondary bone cancer

People diagnosed with secondary bone cancer can feel well and have long periods of time without symptoms. However, after finding out that you have advanced cancer you may feel a range of emotions. At times you may feel overcome by fear, anxiety, sadness, depression or anger.

The uncertainty of living with secondary cancer can often leave you feeling emotionally up and down. Your doctor, nurses, a social worker or counsellor can help you and your family find ways to cope with how you're feeling.

You can also call Cancer Council 13 11 20 and ask for a copy of the *Living with Advanced Cancer* booklet, or download it from your local website.

### Question checklist

- Which bones has the cancer spread to?
- What treatment do you recommend, and why?
- What is the aim of the treatment?
- If I don't have treatment, what can I expect?
- What is my prognosis? How long am I likely to live?
- How will I know if the treatment is working?
- Can I do my normal activities while having this treatment?
- Will I have a lot of bone pain? What will be done about this?
- What can I do to prevent broken bones?
- What will we do if a bone breaks?
- Are there any clinical trials or research studies I can join?
- Can I access palliative care?

### Useful websites

The internet has many useful resources, although not all websites are reliable. The websites listed below are good sources of information.

- American Cancer Society  
[cancer.org](http://cancer.org)
- Macmillan Cancer Support (UK)  
[macmillan.org.uk](http://macmillan.org.uk)
- National Cancer Institute (US)  
[cancer.gov](http://cancer.gov)
- Palliative Care Australia  
[palliativecare.org.au](http://palliativecare.org.au)

### Where to get help and information

Call Cancer Council **13 11 20** for more information about secondary bone cancer. Trained health professionals can listen to your concerns, provide information, and put you in touch with local services and support groups. Ask for free copies of booklets that may be relevant to you, or download digital versions from your local Cancer Council website:

ACT..... [actcancer.org](http://actcancer.org)  
 NSW ..... [cancercouncil.com.au](http://cancercouncil.com.au)  
 NT ..... [nt.cancer.org.au](http://nt.cancer.org.au)  
 QLD ..... [cancerqld.org.au](http://cancerqld.org.au)  
 SA ..... [cancersa.org.au](http://cancersa.org.au)  
 TAS ..... [cancertas.org.au](http://cancertas.org.au)  
 VIC ..... [cancervic.org.au](http://cancervic.org.au)  
 WA ..... [cancerwa.asn.au](http://cancerwa.asn.au)  
 Australia..... [cancer.org.au](http://cancer.org.au)

### Acknowledgements

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### Note to reader

Always consult your doctor about matters that affect your health. This fact sheet is intended as a general introduction and is not a substitute for professional medical, legal or financial advice. Information about cancer is constantly being updated and revised by the medical and research communities. While all care is taken to ensure accuracy at the time of publication, Cancer Council Australia and its members exclude all liability for any injury, loss or damage incurred by use of or reliance on the information provided in this fact sheet.



For information and support on cancer-related issues, call Cancer Council **13 11 20**. This is a confidential service.