
Prostate cancer - androgen deprivation therapy

Summary

- Both normal and cancerous cells in the prostate gland rely on male hormones such as testosterone.
 - The aim of ADT is to control cancer growth by reducing the level of male hormones. Potential side effects include impotence, reduced sex drive, fatigue and an increased risk of osteoporosis.
 - Men should take calcium and vitamin D while undergoing ADT to reduce the risk of osteoporosis.
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Prostate cancer can be treated with androgen deprivation therapy (ADT), sometimes called hormone therapy. Male hormones (androgens) such as testosterone can stimulate the growth of cancerous cells in the prostate gland. ADT aims to manage prostate cancer by reducing levels of these male hormones or blocking the effect of androgens on the cells and tissues. ADT may have undesirable side effects.

Prostate gland

The prostate gland is an organ of the male reproductive system. It is about the size of a walnut and is found at the base of the bladder. This gland produces fluid that nourishes sperm in the ejaculate (semen).

Prostate cancer is common in older men

Prostate cancer is common in men aged over 65 years and affects one in seven Australian men up to the age of 75. Around 4,000 men are diagnosed with prostate cancer each year in Victoria. The cause remains unknown.

How prostate cancer spreads

At first, the cancer is confined to the prostate gland. As the disease progresses, cancer cells enter the lymphatic and vascular (blood) systems, and move beyond the prostate gland. Secondary tumours may then develop in other areas of the body (particularly the bones).

ADT helps control cancer cells

Both normal and cancerous cells in the prostate gland rely on male hormones (such as testosterone) for growth. Hormones are chemical messages secreted by glands in the endocrine (hormonal) system. These hormones travel in the blood to affect cells in other organs.

Male hormones encourage the growth of cancerous cells in the prostate gland. They also stimulate cancer cells that have migrated to other sites in the body. ADT controls cancer cells by reducing the levels of androgens in the body. This suppression has a direct effect on cancer cells themselves. It also affects new blood vessels that the cancer cells develop to support their growth. ADT is used increasingly to shrink prostate tumours before radiotherapy. For non-localised disease (disease that has spread to other areas), ADT is also used to control the cancer after it has spread beyond the prostate. ADT is usually injected into muscle or delivered via implants under the skin. The most common form of ADT used today is a group of medicines called gonadotrophin-releasing-hormone (GnRH) agonists. These medicines stop the pituitary gland from making luteinising hormone (LH). Without this 'messenger' hormone, the testicles produce less testosterone. Each injection is effective for one to four months.

Alternatives to ADT for prostate cancer

Several other techniques can reduce the level of male hormones in the body, including:

- orchidectomy – the surgical removal of the testicles. About 95 per cent of male hormones are made by the testicles. Their removal causes testosterone levels to plummet, so that medications to block hormone production are not necessary. The scrotum itself is not removed
 - subcapsular orchidectomy – in this surgical procedure, only the parts of the testicles that make testosterone are removed, leaving the exterior skin and the scrotum
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- anti-androgen medication (oral) – called anti-androgens, are often used in low doses to treat distressing symptoms such as hot flushes, which result from the injections or surgical removal of the testicles. They may also be used with other treatments to stop the production of male hormones. They may affect liver function and cause other adverse effects, so liver function tests are monitored closely during treatment.

There are different types of anti-androgens in use such as flutamide and bicalutamide – these are often used in low doses. Enzalutamide and abiraterone have recently become available in Australia and may be offered to some men. They have a very strong anti-androgen action that improves survival and quality of life.

Side effects of ADT with prostate cancer

Some men may need to make lifestyle changes because of the side effects of ADT. It is important to discuss these issues with your doctor and your partner before choosing ADT. Disturbing the body's balance of sex hormones can lead to undesirable and upsetting side effects.

Side effects of ADT may include:

- erectile dysfunction (impotence), usually as a result of surgery and other treatments
- infertility
- low sex drive
- changes in hair growth
- fatigue
- depression
- hot flushes
- reduced bone substance (increasing the risk of osteoporosis) and muscle mass
- increased body fat (and possibly an increased risk of developing diabetes and cardiovascular disease)
- changes to breast tissue
- cognitive (thinking-related) changes, such as reduced concentrating ability
- anaemia.

Men should discuss with their doctor appropriate monitoring of their bones with a bone density study, and the need to take calcium and vitamin D supplements to reduce the risk of osteoporosis. Because ADT may increase the risk of developing diabetes or heart disease, it is important that men speak with their doctor about their own health profiles, including blood pressure, cholesterol and blood glucose levels.

All men should be encouraged to stop smoking, and to maintain a healthy diet. Regular exercise is important to maintain muscle and bone health, and to keep body weight within the healthy range.

When to start ADT for prostate cancer

There is no clear evidence that starting ADT as soon as the cancer is detected, rather than later, improves survival rates. Men should discuss the issue of when to begin ADT with their doctor so that the most appropriate time to start ADT is determined for each person.

Monitoring prostate cancer

Cancer activity in the body can be monitored by your doctor using a blood test that checks the levels of a substance called prostate-specific antigen (PSA). Rising PSA levels usually indicate the cancer has progressed. Many doctors use the PSA test as a trigger to start ADT. Other doctors prefer to wait until the potential benefits of androgen deprivation outweigh the possible negative effects.

When ADT fails to successfully treat prostate cancer

Prostate cancer recurs within 12 months of ADT in around 20 per cent of men. Other treatment options then include:

- radiotherapy – precisely targeted x-rays are used to control the symptoms of secondary cancers in other parts of the body (for example, to help manage bone pain)
- other forms of ADT – using types of ADT other than gonadotrophin-releasing-hormone agonists may slow

- cancer growth for a limited time
- chemotherapy – recent evidence indicates some men respond to chemotherapy. The chemotherapy medicines docetaxel or cabazitaxel can improve survival and quality of life
 - corticosteroids – shrink the cancer and help manage pain
 - pain-relieving medication – includes morphine
 - lifestyle changes – improved diet, regular exercise and stress management have been shown to improve quality of life and even prolong survival of men on ADT
 - palliative care – is used to manage pain and discomfort, including treatments to prevent bone fracture and bone pain.

Where to get help

- Your **GP (doctor)**
- Urologist
- **Cancer Council of Victoria** Tel. **13 11 20**
- **Androgen deprivation therapy** - Healthymale (Andrology Australia)

This page has been produced in consultation with and approved by:

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