What is Prostate Cancer? Let us explain it to you.

ESMO Patient Guide Series based on the ESMO Clinical Practice Guidelines
Prostate cancer

An ESMO guide for patients

Patient information based on ESMO Clinical Practice Guidelines

This guide has been prepared to help you, as well as your friends, family and caregivers, better understand prostate cancer and its treatment. It contains information on the causes of the disease and how it is diagnosed, up-to-date guidance on the types of treatments that may be available and any possible side effects of treatment.

The medical information described in this document is based on the ESMO Clinical Practice Guideline for prostate cancer, which is designed to help clinicians with the diagnosis and management of prostate cancer. All ESMO Clinical Practice Guidelines are prepared and reviewed by leading experts using evidence gained from the latest clinical trials, research and expert opinion.

The information included in this guide is not intended as a replacement for your doctor’s advice. Your doctor knows your full medical history and will help guide you regarding the best treatment for you.

Words highlighted in colour are defined in the glossary at the end of the document.

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Prostate cancer: A summary of key information

Introduction to prostate cancer
- Prostate cancer forms in the cells of the prostate gland. Many prostate cancers grow slowly and are not likely to spread, but some can grow more quickly.
- The exact causes of prostate cancer are not known, and in its early stages, prostate cancer often has no symptoms.
- Prostate cancer is the second most common cancer in men worldwide and mostly affects older men – more than half of prostate cancers occur in men over the age of 70 years.

Diagnosis of prostate cancer
- Early prostate cancer typically has no symptoms. Symptoms that may appear as the cancer progresses are often caused by the cancer pressing on the urethra, such as increased frequency in passing urine, and difficulty or urgency in passing urine.
- A diagnosis of prostate cancer is usually based on the results of clinical examination of the prostate, a blood test to check levels of a protein called prostate-specific antigen (PSA) and a biopsy.
- Further investigations can help to determine how advanced the cancer is. For example, scans called magnetic resonance imaging (MRI), positron emission tomography (PET) and computed tomography (CT) scans may be used to see how far the cancer has spread. Lymph nodes in the pelvis may also be removed and examined to check if they contain cancer cells.
- Prostate cancer is ‘staged’ according to tumour size, whether it has spread to the lymph nodes and whether it has spread into the bones or to other parts of the body. This information is used to help decide the best treatment.

Treatment options for prostate cancer
- Treatment for prostate cancer depends on the size, location and stage of the tumour.
- Patients should be fully informed and involved in decisions about treatment options.
- For some patients, especially elderly men with slow-growing prostate cancer, treatment may not be appropriate or necessary – this is because they are more likely to die from old age or causes other than prostate cancer, and therefore the negative side effects from treating the cancer may outweigh any benefits in life expectancy.
- Treatment approaches for prostate cancer include active surveillance (in which the cancer is closely monitored and then treated as soon as it progresses), surgery, radiotherapy, hormone therapy (e.g. androgen deprivation therapy, anti-androgens or testosterone synthesis blocker) and chemotherapy.
Localised prostate cancer

- **Localised prostate** cancer is defined as low risk, intermediate risk or high risk.
- Patients with low-risk disease might receive **active surveillance**, **radical prostatectomy** (surgical removal of the prostate gland) or **radiotherapy**, which is given either as **external beam radiotherapy** or **brachytherapy**.
- Patients with intermediate-risk disease might receive **active surveillance**, **radical prostatectomy** or **radiotherapy** with or without **neoadjuvant** and **concurrent androgen deprivation therapy**.
- Patients with high-risk disease might be treated with **radical prostatectomy** with **pelvic lymphadenectomy** (removal of the pelvic lymph nodes) or **radiotherapy** to the prostate and lymph nodes with **neoadjuvant** and **concurrent androgen deprivation therapy** and adjuvant androgen deprivation therapy too.

Locally advanced prostate cancer

- **Locally advanced** disease is usually treated with a **radical prostatectomy** plus **pelvic lymphadenectomy** or **radiotherapy** with neoadjuvant androgen deprivation therapy and possibly adjuvant androgen deprivation therapy too.

Metastatic prostate cancer

- **Metastatic** disease is typically treated with **androgen deprivation therapy**, either alone or in combination with the **testosterone** synthesis blocker **abiraterone** or **chemotherapy**.
- If the cancer continues to grow despite treatment with **androgen deprivation therapy** (also referred to as **castration-resistant prostate cancer** [CRPC] or **hormone-refractory prostate cancer** [HRPC]), then **chemotherapy**, the **anti-androgen** drug **enzalutamide** or **abiraterone** may be used.
- **Radium-223**, **denosumab**, **zoledronic acid** or **palliative radiotherapy** can be used to treat complications from bone metastases.

Recurrent prostate cancer

- Radiotherapy, **androgen deprivation therapy** or **radical prostatectomy** may be used to treat a recurrence.

Follow-up during/after treatment

- The timings of follow-up appointments vary between regions and practices. Typical follow-up appointments include a blood test to monitor **PSA** levels, clinical examination and scans.
- Patients receiving long-term **hormone therapy** may have **MRI scans** to monitor the cancer and bone scans to check for osteoporosis.
- The treatments for **prostate** cancer can have long-term side effects that may impact the patient’s life for years after diagnosis.
- Support groups can help patients and their families to better understand **prostate** cancer, and to learn how to cope with all aspects of the disease, from diagnosis to long-term physical and emotional effects.
What is the prostate?

The prostate is a small, walnut-sized gland that lies at the base of the bladder in men. It consists of two symmetrical lobes and surrounds the first part of the tube (the urethra) that carries urine from the bladder to the penis. The urethra also carries semen, which is the fluid containing sperm.

The prostate is coloured orange in the diagram.
What is prostate cancer?

Prostate cancer is a cancer that forms in the cells of the prostate gland. Most prostate cancers begin in the cells that line the prostate gland – these cancers are known as acinar adenocarcinomas. Many of these cancers grow extremely slowly and are not likely to spread, but some can grow more quickly.

Prostate cancer is often a slow-growing cancer with few symptoms

What are the different types of prostate cancer?

There are five main categories of prostate cancer:

- Acinar adenocarcinoma: This is the most common type of prostate cancer, accounting for around 90% of cases. Acinar adenocarcinoma develops in the outer gland cells of the prostate.
- Ductal adenocarcinoma: This type of prostate cancer develops in the cells that line the ducts (or tubes) of the prostate gland. Ductal adenocarcinoma tends to grow more quickly than acinar adenocarcinoma.
- Transitional cell (or urothelial) cancer: This cancer develops in the cells of the urethra. It typically begins in the bladder and spreads to the prostate, but rarely it can begin in the prostate and spread into the bladder and nearby tissues.
- Squamous cell cancer: This type of cancer develops from flat cells that cover the prostate, and tends to grow more quickly than adenocarcinomas.
- Small cell cancer: This is a type of neuroendocrine cancer made up of small round cells, which is also sometimes called oat cell cancer. Small cell prostate cancer is very rare, accounting for less than 2% of all cases of prostate cancer.
Prostate cancer is classified by how advanced the disease is:

**Localised prostate cancer**

Localised prostate cancer means that the cancer is completely contained within the prostate gland and has not spread anywhere else in the body. Localised prostate cancer is further divided into three risk groups, depending on how likely it is that the cancer will grow and spread:

- Low-risk prostate cancer: Unlikely to grow or spread for many years.
- Intermediate-risk prostate cancer: Unlikely to grow or spread for a few years.
- High-risk prostate cancer: Might grow or spread within a few years.

**Locally advanced prostate cancer**

Prostate cancer is described as locally advanced if the cancer has spread beyond the prostate gland. For example, the cancer may have spread into the tissue around the prostate, the seminal vesicles, nearby organs such as the rectum, or nearby lymph nodes.

**Metastatic prostate cancer**

Metastatic prostate cancer means that a cancer that began in the prostate has spread to another part of the body. Tumours found in other parts of the body away from the prostate are called metastases. Prostate cancer most commonly spreads to lymph nodes in other parts of the body or to the bones, but can also spread to other organs.

Prostate cancer is also classified according to its grade. The grade of a cancer tells us how much the cancer cells look like normal cells, and can give the doctor an idea of how aggressive the cancer is and what treatment is needed.

The Gleason score system is used to grade prostate cancer. Several samples of cells (biopsies) from the prostate are examined and a pathologist grades each sample from 1 to 5. Grades 1 and 2 are normal prostate cells, with grade 5 being the most abnormal. The pathologist works out an overall Gleason score by adding together the two most common Gleason grades in the samples. For example, if the most common grade is grade 3, and the second most common is grade 4, then the overall Gleason score is 7. Typical Gleason scores in prostate cancer range from 6 to 10. The higher the Gleason score, the more likely it is that the cancer will grow and spread quickly.

The Gleason score indicates how aggressive the prostate cancer is
What are the symptoms of prostate cancer?

In its early stages, prostate cancer often has no symptoms. As the cancer progresses and the prostate becomes enlarged, symptoms that may be experienced include:

- Passing urine more frequently during the day and/or night.
- Difficulty passing urine.
- Urgency to pass urine.
- Leaking urine.
- Blood in the urine or semen.
- Erection problems.

You should see your doctor if you experience any of these symptoms. However, it is important to remember that these symptoms are common in people who do not have prostate cancer; they may also be caused by other conditions. For example, benign prostatic hyperplasia is caused by enlargement of the prostate gland. Benign prostatic hyperplasia does not usually develop into cancer, but can have similar symptoms to prostate cancer as a result of the enlarged prostate gland pressing on the urethra.

Screening for prostate cancer

Prostate-specific antigen (PSA) is a protein that is produced by normal cells and by cancerous prostate cells. It is normal for all men to have some PSA in their blood, but a high level of PSA can be a sign of prostate cancer. Routine testing (or screening) of PSA levels in men who do not have any symptoms of prostate cancer is not recommended. This is because large studies have shown that although this type of screening can reduce the number of deaths from prostate cancer, it also leads to many men being falsely diagnosed and treated for prostate cancer. However, PSA testing may be useful in certain groups of people, for example men who have a family history of prostate cancer.

There is currently no routine screening programme for prostate cancer in the general population.
How common is prostate cancer?

Prostate cancer is most common in older men

Prostate cancer mostly affects older men – more than half of prostate cancers occur in men over the age of 70 years. Prostate cancer is the second most common cancer in men worldwide. The highest incidences of prostate cancer are reported in Australia/New Zealand, North America, and Northern and Western Europe. The lowest incidences are in Eastern and South Central Asia and Northern Africa. The large geographic variation in prostate cancer rates is probably due to differences in the availability of testing and diagnosis (Ferlay et al., 2013).
The map shows estimated numbers of new cases of prostate cancer diagnosed in 2012 (the most recent statistics available) per 100,000 people of each region’s population (Ferlay et al., 2013).
What causes prostate cancer?

The causes of prostate cancer are not known, but several risk factors for developing prostate cancer have been identified. It is important to remember that having a risk factor increases the risk of cancer developing but it does not mean that you will definitely get cancer. Likewise, not having a risk factor does not mean that you definitely won’t get cancer.

The precise causes of prostate cancer are not known

FACTORS THAT MAY INCREASE RISK

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<thead>
<tr>
<th>Factor</th>
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<tr>
<td>Increasing age</td>
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<tr>
<td>Ethnicity – prostate cancer is more common in Black-African men than in White men, and least common in Asian men</td>
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<tr>
<td>Family history of prostate cancer</td>
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<tr>
<td>Being overweight</td>
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<td>Being tall</td>
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<tr>
<td>Hormone levels – a high level of a hormone called insulin-like growth factor 1 (IGF-1) is associated with an increased risk of prostate cancer</td>
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<tr>
<td>Inflammation of the prostate</td>
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<td>Exposure to cadmium</td>
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There are various risk factors associated with developing prostate cancer although each factor may not apply to every man who develops the disease.
How is prostate cancer diagnosed?

A diagnosis of prostate cancer is based on the results of the following examinations and tests:

Clinical examination

If you have symptoms of prostate cancer, your doctor may carry out a clinical examination to feel your prostate gland. This examination is called a digital rectal examination. He/she will put a gloved finger into your rectum in order to feel the prostate gland and check for any abnormalities.

PSA blood test

Your doctor may recommend that you have a PSA test to check the levels of PSA in your blood; however, it is important to understand that high levels of PSA can also be caused by non-cancerous conditions, and a PSA test on its own cannot diagnose prostate cancer.

Clinical examination and a PSA test can indicate if prostate cancer might be present, but further tests are needed for a definite diagnosis

Biopsy

Based on the results of the digital rectal examination and PSA tests, your doctor may recommend that you have a biopsy. This involves taking samples of tissue from the prostate gland to look for cancer cells.

A procedure called transrectal ultrasound scan guided (TRUS) biopsy is typically used to diagnose prostate cancer. Local anaesthetic is injected into the rectum to make the procedure as comfortable as possible. A small ultrasound scanner is inserted into the rectum and produces sound waves to create a clear picture of the prostate gland. A fine needle is then used to take at least 10–12 samples of tissue from the prostate gland. If you undergo a TRUS biopsy, your doctor will give you antibiotics to prevent infection developing after the biopsy (Parker et al., 2015).

If the TRUS biopsy shows no signs of cancer but your doctor still suspects that you may have cancer, he/she may recommend that you have a magnetic resonance imaging (MRI) scan, which uses magnetic fields and radio waves to produce detailed images of the inside of the body, or additional biopsies via the perineum (the skin behind the testicles).

A prostate biopsy is carried out to confirm the presence of prostate cancer
How will my treatment be determined?

Your treatment will depend on the staging of your cancer and risk assessment.

Staging

Staging of the cancer is used to describe its size and position and whether it has spread from where it started. To gather this information, your doctor may wish to carry out an MRI scan, a positron emission tomography (PET) scan, a computed tomography (CT) scan, pelvic node dissection and/or a bone scan (Parker et al., 2015).

- MRI scan: MRI uses magnetic fields and radio waves to produce detailed images of the inside of your body.
- PET scan: PET uses a radioactive substance injected into a vein and can help find areas of cancer that an MRI or CT scan may miss. Most PET scans are now performed along with a CT scan.
- CT scan: This is a type of x-ray technique that lets doctors see your internal organs in cross-section.
- Pelvic node dissection: This is a procedure to remove pelvic lymph nodes to check if they contain cancerous cells.
- Bone scan: This is a scan to look for bone metastases and involves a small amount of radioactive substance injected into a vein to allow doctors to see abnormal areas of bone across your whole body, as abnormal bone absorbs more radioactivity than healthy bone.

After diagnosis, imaging scans can show how far advanced the prostate cancer is

Staging to determine the size and spread of the cancer is described using a sequence of letters and numbers. For prostate cancer, there are four stages designated with Roman numerals I to IV. Generally, the lower the stage, the better the outcome (or prognosis) for the patient. The TNM staging system considers:

- How big the cancer is, or tumour size (T).
- Whether the cancer has spread to lymph nodes (N).
- Whether it has spread to distant sites, or metastases (M).

Staging helps to determine the most appropriate treatment for prostate cancer
The stage grouping system for prostate cancer is described in the table below (Parker et al., 2015). This may seem complicated but your doctor will be able to explain which parts of this table correspond to your cancer.

Stage grouping system for prostate cancer.

<table>
<thead>
<tr>
<th>Stage I.</th>
<th>T</th>
<th>N</th>
<th>M</th>
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<tr>
<td>Cancer is confined to half of one side of the prostate, or less (T1-N0-M0 or T2a-N0-M0)</td>
<td>• Clinically inapparent tumour neither palpable nor visible by imaging (T1)</td>
<td>• No regional lymph node metastasis (N0)</td>
<td>• No distant metastasis (M0)</td>
</tr>
<tr>
<td></td>
<td>Tumour involves one half of one lobe or less (T2a)</td>
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<th>Stage II.</th>
<th>T</th>
<th>N</th>
<th>M</th>
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<tr>
<td>Cancer is in more than half of one side of the prostate, but is still contained within the prostate gland (T2b-N0-M0 or T2c-N0-M0)</td>
<td>• Tumour involves more than one half of one lobe but not both lobes (T2b)</td>
<td>• No regional lymph node metastasis (N0)</td>
<td>• No distant metastasis (M0)</td>
</tr>
<tr>
<td></td>
<td>Tumour involves both lobes (T2c)</td>
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<th>Stage III.</th>
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<th>M</th>
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<tr>
<td>Cancer has broken through the covering of the prostate gland and may have spread into the seminal vesicles (T3-N0-M0)</td>
<td>• Tumour extends through the prostate capsule (T3)</td>
<td>• No regional lymph node metastasis (N0)</td>
<td>• No distant metastasis (M0)</td>
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<th>Stage IV.</th>
<th>T</th>
<th>N</th>
<th>M</th>
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<tr>
<td>Cancer has spread into nearby body organs, such as the rectum or bladder (T4-N0-M0), to nearby lymph nodes (any T-N1-M0), or to other parts of the body outside the pelvis (any T-any N-M1)</td>
<td>• Tumour is fixed or invades adjacent structures other than seminal vesicles, such as external sphincter, rectum, bladder, levator muscles, and/or pelvic wall (T4)</td>
<td>• Metastasis in regional lymph node(s) (N1)</td>
<td>• Distant metastasis (M1)</td>
</tr>
</tbody>
</table>

The table provides a structured overview of the stage grouping system for prostate cancer.
What are the treatment options for prostate cancer?

Your treatment will depend upon the size, location and stage of the tumour, as well as your general health and level of fitness. The choice of treatments will be discussed with you and your preferences will be taken into account. Your treatment will be discussed by a multidisciplinary team, which means that experts in different areas of cancer treatment (e.g. surgeons, urologists, oncologists, radiotherapists and nurses) come together to share their expertise in order to provide the best patient care.

It is important that patients are fully involved in the treatment decision-making – when there are several treatments available, doctors should involve patients in making decisions about their care so that the patients can choose the care that meets their needs and reflects what is important to them. This is called ‘shared decision making’.

When discussing treatment options for your prostate cancer, your doctor will want to weigh up the benefits to your health and life expectancy against the side effects of treatment. This is very important in prostate cancer, as many patients can live a normal life with a slow-growing prostate cancer for a number of years. For these patients, the side effects from treating the cancer may outweigh any benefits in terms of prolonging life – they are much more likely to die from old age or causes other than prostate cancer.

Your doctor will be happy to answer any questions you have about your treatment. Three simple questions that may be helpful when talking with your doctor or any healthcare professional involved in your care are:

- What treatment options do I have?
- What are the possible advantages and disadvantages of these options?
- How likely am I to experience these advantages and disadvantages?

Your doctor may recommend one or more of the following approaches for managing prostate cancer.
Active surveillance

Active surveillance involves close monitoring of the cancer, with no immediate treatment. Active surveillance aims to avoid unnecessary treatment, which may cause unpleasant side effects, and is an option for men with low- or intermediate-risk localised prostate cancer (Parker et al., 2015). During active surveillance, doctors may regularly check your blood PSA levels and carry out prostate biopsies or MRI scans. If the cancer starts to grow, your doctor will recommend a suitable curative treatment.

Watchful waiting

In watchful waiting, your doctor will monitor your cancer with no immediate treatment, but this involves fewer tests than with active surveillance. Typically, treatment will start if you develop symptoms that need to be controlled. Watchful waiting is an option for men with low-risk localised disease and for men with localised or locally advanced disease who are not suitable for curative treatments (Parker et al., 2015). The aim of watchful waiting is to manage, rather than cure, the cancer.

There is often no immediate treatment for prostate cancer, especially if the cancer is slow-growing

Surgery

Some men with prostate cancer will have an operation to remove the prostate gland – this operation is called a radical prostatectomy. The aim of a radical prostatectomy is to cure the cancer by completely removing the tumour. The surgeon removes the prostate gland as well as the surrounding tissues, lymph nodes and seminal vesicles. This is usually done by making a cut into your abdomen, but some patients may be offered keyhole surgery.

Nerve-sparing prostatectomy is a type of surgery that involves the removal of the prostate tissue without removing the nerves that control erections. This type of surgery can reduce the risk of erection problems after surgery, but is only possible when the cancer is not growing close to the nerves.

Radical prostatectomy is a curative treatment option for patients with localised or locally advanced prostate cancer (Parker et al., 2015). It is important to understand that radical prostatectomy is major surgery with many possible side effects. This type of surgery may not be suitable for men with slowly growing prostate cancer as they may be more likely to die of old age or causes other than prostate cancer.

Other types of surgery may also be used in the treatment of prostate cancer. For example, removal of the inner part of the prostate (also called transurethral resection of the prostate) or removal of the testicles can relieve symptoms or help control the spread of the cancer. However, these types of surgery are not curative.
Radiotherapy
Radiotherapy uses ionising radiation to damage the DNA of cancerous cells, causing them to die. Two types of curative radiotherapy may be used to treat prostate cancer:

- **External beam radiotherapy** directs radiotherapy to the cancer from a machine outside the body.
- **Brachytherapy** directs radiotherapy to the cancer from a radioactive source placed inside the prostate gland.

Radiotherapy is a recommended treatment option for men with localised or locally advanced prostate cancer.

Surgery to remove the prostate gland or radiotherapy can cure prostate cancer

Hormone therapy
Testosterone is a hormone made mainly by the testicles. Prostate cancer needs testosterone to grow, so hormone therapies that block the actions of testosterone are used to reduce the risk of prostate cancer coming back after treatment with surgery or radiotherapy, and to slow the growth of advanced prostate cancer. On its own, hormone therapy is not a curative treatment.

There are three main types of hormone therapy used in the treatment of prostate cancer:

- **Androgen deprivation therapy** works by stopping the testicles from producing testosterone. These drugs are given by injection or implant. There are two types of androgen deprivation therapy: luteinising hormone-releasing hormone agonists (e.g. leuprorelin, goserelin, buserelin, triptorelin) and gonadotrophin-releasing hormone antagonists (e.g. degarelix)
- **Anti-androgens** (e.g. bicalutamide, flutamide, enzalutamide) are tablets that prevent testosterone from reaching the cancer cells.
- **Abiraterone** is a new type of hormone therapy tablet that blocks testosterone synthesis. A steroid is taken alongside abiraterone to lower the risk of side effects.

Hormone therapy can effectively manage prostate cancer but is not a curative treatment
Chemotherapy

Chemotherapy destroys cancer cells. Chemotherapy (e.g. docetaxel, cabazitaxel) may be used to treat some patients with metastatic prostate cancer (Parker et al., 2015). A steroid is taken alongside chemotherapy to make it more effective and lower the risk of side effects.

Other therapies

Other treatments for prostate cancer include drugs to treat the effects of bone metastases, including radium-223, denosumab and zoledronic acid (Parker et al., 2015).
What are the treatment options for localised prostate cancer?

Localised prostate cancer is categorised into three risk groups, which are defined by the size of the tumour (T), the grade of the cancer (Gleason score) and PSA levels. Your doctor will be able to tell you which risk group applies to you. This is important because the treatment for localised prostate cancer varies according to the risk group.

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Criteria</th>
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<tr>
<td>Low risk</td>
<td>T1–T2a and Gleason score ≤6 and PSA ≤10</td>
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<tr>
<td>Intermediate risk</td>
<td>T2b and/or Gleason score 7 and/or PSA 10–20</td>
</tr>
<tr>
<td>High risk</td>
<td>≥T2c or Gleason score 8–10 or PSA &gt;20</td>
</tr>
</tbody>
</table>

It is important to understand that there is no single standard treatment for localised prostate cancer. A number of treatment options are available for each risk group, and your doctor will fully discuss these with you.

Active surveillance

Active surveillance is an option for men with low- or intermediate-risk localised disease (Parker et al., 2015). The cancer is closely monitored and further treatment is considered if the cancer progresses.

Surgery

The aim of surgery is to remove the cancer as well as a healthy margin of tissue around it. After the operation, the removed tissue is examined under a microscope to check that all of the cancer was removed. Radical prostatectomy may be used to treat low- or intermediate-risk localised disease. If there is evidence that the cancer may have spread to the lymph nodes, then pelvic node dissection might also be carried out. High-risk localised disease may be treated with radical prostatectomy plus pelvic lymphadenectomy, in which the lymph nodes are removed from the pelvis (Parker et al., 2015).
Radiotherapy

Men with low- or intermediate-risk localised disease may receive external beam radiotherapy or brachytherapy. High-risk localised disease may be treated with external beam radiotherapy in combination with hormone therapy (Parker et al., 2015).

Hormone therapy

Hormone therapy alone is not recommended as the main treatment for localised prostate cancer, but it may be used in combination with radiotherapy as neoadjuvant and/or adjuvant therapy for intermediate- or high-risk disease. Neoadjuvant therapy is a treatment that is given before the main treatment, and adjuvant therapy is a treatment given after the main treatment.

Hormone therapy may be used in addition to radiotherapy for some patients with localised disease

In patients with intermediate-risk localised prostate cancer, neoadjuvant and concurrent androgen deprivation therapy for 4–6 months may be used in combination with external beam radiotherapy.

In men with high-risk localised disease, neoadjuvant and concurrent androgen deprivation therapy is recommended for 4–6 months in combination with external beam radiotherapy, and adjuvant androgen deprivation therapy may also be administered for 2–3 years after the radiotherapy treatment if the doctor thinks there is a high risk of death from the cancer (Parker et al., 2015).

Flowchart showing curative treatment approaches for low-risk localised prostate cancer.
Prostate cancer

Flowchart showing curative treatment approaches for intermediate-risk localised prostate cancer. ADT, androgen deprivation therapy.

Flowchart showing curative treatment approaches for high-risk localised prostate cancer. ADT, androgen deprivation therapy.
Watchful waiting
Some men with localised disease are not suitable for, or may choose not to undergo, the curative treatments described above. In these patients, watchful waiting may be an appropriate approach, followed by hormone therapy to treat symptoms if/when they arise.
What are the treatment options for locally advanced prostate cancer?

Surgery
Radical prostatectomy plus pelvic lymphadenectomy to remove lymph nodes from the pelvis is a treatment option for men with locally advanced prostate cancer (Parker et al., 2015).

Radiotherapy
As an alternative to surgery, locally advanced disease can be treated with external beam radiotherapy in combination with hormone therapy (Parker et al., 2015).

Locally advanced prostate cancer is typically treated with surgery or radiotherapy

Hormone therapy
Neoadjuvant and concurrent androgen deprivation therapy is typically administered for 4–6 months in combination with external beam radiotherapy in the treatment of locally advanced prostate cancer, and adjuvant androgen deprivation therapy may be given for 2–3 years in patients who are thought to be at high risk of dying from their cancer (Parker et al., 2015).
Locally advanced prostate cancer

Radical prostatectomy + pelvic lymphadenectomy

Neoadjuvant + concurrent ADT

Radiotherapy (external beam)

Adjuvant ADT in patients at high risk of death

Flowchart showing curative treatment approaches for locally advanced prostate cancer. ADT, androgen deprivation therapy.

Watchful waiting

Some men with locally advanced disease are not suitable for, or may choose not to undergo, the curative treatments described above. In these patients, watchful waiting may be an appropriate approach, followed by hormone therapy to treat symptoms if/when they arise.
What are the treatment options for metastatic prostate cancer?

The main aims of treatment for metastatic prostate cancer are to relieve symptoms and improve quality of life.

**Metastatic prostate cancer is treatable**

**Hormone therapy**

Androgen deprivation therapy is usually the initial treatment given to men with metastatic prostate cancer. This may be given alone, in combination with the testosterone synthesis blocker abiraterone or in combination with chemotherapy (Parker et al., 2015; ESMO Guidelines Committee, 2018).

If the cancer continues to grow despite treatment with androgen deprivation therapy (also referred to as castration-resistant prostate cancer [CRPC] or hormone-refractory prostate cancer [HRPC]), then the anti-androgen drug enzalutamide or abiraterone may be used in men with no or few symptoms (Parker et al., 2015).

**Chemotherapy**

Docetaxel is a chemotherapy drug that may be given alongside androgen deprivation therapy in men with metastatic prostate cancer who are fit enough to tolerate chemotherapy. Docetaxel is also recommended for use in men with metastatic disease that has continued to grow despite treatment with androgen deprivation therapy. If the cancer continues to progress after docetaxel treatment, then the chemotherapy drug cabazitaxel may be considered, as well as abiraterone, enzalutamide and Radium-223 (Parker et al., 2015).
Other therapies

Radium-223 is a radioactive liquid that is sometimes used to treat patients with bone metastases. Denosumab and zoledronic acid are drugs that can reduce the bone-related complications of metastatic disease (e.g. bone pain, bone fracture), and may be recommended for some patients with bone metastases. External beam radiotherapy can also be used to treat pain from bone metastases (Parker et al., 2015).

Flowchart showing treatment approaches for metastatic prostate cancer. ADT, androgen deprivation therapy.
What are the treatment options for prostate cancer that returns after treatment?

Despite the best possible treatment at diagnosis, there is still a possibility that your cancer may return. Cancer that comes back is called a **recurrence**.

**Radiotherapy**

Following **radical prostatectomy**, **PSA** levels are monitored closely. If the **PSA** levels rise, then **radiotherapy** may be given in the **prostate** area *(Parker et al., 2015)*.

**Hormone therapy**

**Androgen deprivation therapy** may be given to men who have signs of **recurrence** following **radical prostatectomy** or **external beam radiotherapy** *(Parker et al., 2015)*. In men who have previously been treated with **radiotherapy**, **radical prostatectomy** may be a treatment option.

**Recurrent prostate cancer can be treated with radiotherapy, surgery and/or hormone therapy**
Prostate cancer in younger patients

Prostate cancer diagnosed in men younger than 55 years often grows more rapidly than prostate cancer in patients diagnosed at an older age. The reasons for this difference are not clear, but we know that patients who are diagnosed at a younger age are less likely to survive the cancer. If you are a younger man diagnosed with prostate cancer, your doctor will guide you through all of your treatment options.

Prostate cancer in younger men can spread more quickly than in older patients

Prostate cancer treatment can affect fertility – following a radical prostatectomy you will not be able to ejaculate semen, and radiotherapy and hormone therapy can reduce semen and sperm production. If you plan to have children in the future, your sperm can be collected and stored before your cancer treatment begins.
Clinical trials

Your doctor may ask you whether you would like to take part in a clinical trial. This is a research study conducted with patients in order to (ClinicalTrials.gov, 2017):

- Test new treatments.
- Look at new combinations of existing treatments or change the way they are given to make them more effective or reduce side effects.
- Compare the effectiveness of drugs used to control symptoms.
- Find out how cancer treatments work.

Clinical trials help to improve knowledge about cancer and develop new treatments, and there can be many benefits to taking part. You would be carefully monitored during and after the study and the new treatment may offer benefits over existing therapies. It’s important to bear in mind, however, that some new treatments are found not to be as good as existing treatments or to have side effects that outweigh the benefits (ClinicalTrials.gov, 2017).

Clinical trials help to improve knowledge about diseases and develop new treatments – there can be many benefits to taking part

Several new drugs for the treatment of prostate cancer are now entering clinical trials, including immunotherapy agents, which stimulate the body’s immune system to fight cancer cells.

Pembrolizumab, an immunotherapy drug which blocks a protein called programmed cell death protein 1 (PD-1) on the surface of some immune cells, has shown encouraging results in some patients with metastatic prostate cancer (Hansen et al., 2018; de Bono et al., 2018).

Olaparib is a drug that blocks the actions of an enzyme involved in DNA repair. Olaparib is already used to treat some types of cancer, especially those that have mutations in genes called BRCA1 and BRCA2. Olaparib has shown encouraging results in patients with metastatic prostate cancer, both on its own and in combination with abiraterone (Mateo et al., 2015; Clarke et al., 2018).

You have the right to accept or refuse participation in a clinical trial without any consequences for the quality of your treatment. If your doctor does not ask you about taking part in a clinical trial and you want to find out more about this option, you can ask your doctor if there is a trial for your type of cancer taking place nearby (ClinicalTrials.gov, 2017).
Supplementary interventions

Patients may find that supplementary care helps them to cope with their diagnosis, treatment and the long-term effects of prostate cancer.

Over the course of disease, anti-cancer treatments should be supplemented with interventions that aim to prevent the complications of disease and treatment, and to maximise your quality of life. These interventions may include supportive, palliative, survivorship and end-of-life care, which should all be coordinated by a multidisciplinary team (Jordan et al., 2018). Ask your doctor or nurse about which supplementary interventions are available; you and your family may receive support from several sources, such as a dietician, urinary incontinence nurse, lymphoedema nurse, social worker, priest or occupational therapist.

Supportive care

Supportive care involves the management of cancer symptoms and the side effects of therapy. This is particularly important for men with prostate cancer, as many will live with the disease for a long period of time.

Palliative care

Palliative care is a term used to describe care interventions in advanced disease, including the management of symptoms as well as support for coping with prognosis, making difficult decisions and preparation for end-of-life care. Palliative care in men with metastatic prostate cancer often includes treatment for pain, diarrhoea, urinary incontinence, nutritional problems, leg swelling and bedsores.

Survivorship care

Support for patients surviving cancer includes social support, education about the disease and rehabilitation. For example, psychological support can help you to cope with any worries or fears. Psychosocial problems impacting your quality of life may include concerns about sexual, urinary or bowel functioning. Patients often find that social support is essential for coping with the cancer diagnosis, treatment and the emotional consequences. A survivor care plan can help you to recover wellbeing in your personal, professional and social life. For further information and advice on survivorship, see ESMO’s patient guide on survivorship (http://www.esmo.org/Patients/Patient-Guides/Patient-Guide-on-Survivorship).
End-of-life care

End-of-life care for patients with incurable cancer primarily focuses on making the patient comfortable and providing adequate relief of physical and psychological symptoms, for example palliative sedation to induce unconsciousness can relieve severe pain, dyspnoea, delirium or convulsions (Cherny, 2014). Discussions about end-of-life care can be very distressing, but support should always be available to you and your family at this time.
What are the possible side effects of treatment?

As with any medical treatment, you may experience side effects from your anti-cancer treatment. The most common side effects for each type of treatment are highlighted below, along with some information on how they can be managed. You may experience side effects other than those discussed here. It is important to talk to your doctor about any potential side effects that are worrying you.

Doctors classify side effects from any cancer therapy by assigning each event a ‘grade’, on a scale of 1–4, by increasing severity. In general, grade 1 side effects are considered to be mild, grade 2 moderate, grade 3 severe and grade 4 very severe. However, the precise criteria used to assign a grade to a specific side effect varies depending on which side effect is being considered. The aim is always to identify and address any side effect before it becomes severe, so you should always report any worrying symptoms to your doctor as soon as possible.

It is important to talk to your doctor about any treatment-related side effects that are worrying you.

Fatigue is very common in patients undergoing cancer treatment and can result from either the cancer itself or the treatments. Your doctor can provide you with strategies to limit the impact of fatigue, including getting enough sleep, eating healthily and staying active (Cancer.Net, 2017). Loss of appetite and weight loss can also arise due to the cancer itself or the treatments. Significant weight loss, involving loss of both fat and muscle tissue, can lead to weakness, reduced mobility and loss of independence, as well as anxiety and depression (Escamilla and Janett, 2016). Your doctor may refer you to a dietician, who can look at your nutritional needs and advise you on your diet and any supplements that you might need.

Surgery

Following surgery for prostate cancer, you may experience erection problems. This is likely if the surgeon had to remove nerves during the operation. Some men will be able to have an erection after undergoing surgery, but this will depend on whether or not the surgeon was able to avoid removing the nerves, whether or not you were able to have erections before the procedure, and your age. You may need to take a drug such as sildenafil to help you get an erection.

You may also have problems controlling the flow of urine (urinary incontinence) after your operation, resulting in leakage of urine. This can last up to a year after the operation, by which time most men have no problems or wear a small pad. Your doctor or nurse can refer you to a specialist urinary incontinence clinic if urine leakage continues to be a problem.
Lymphoedema can occur in the legs if lymph nodes have been removed. You can reduce your risk of lymphoedema in several ways:

- Maintain a healthy body weight to reduce the strain on your lymphatic system.
- Exercise regularly to encourage lymphatic drainage.
- Protect your skin to avoid infection.

If you notice any signs of swelling or infection, tell your doctor as soon as possible.

Radiotherapy

The immediate side effects of external beam radiotherapy are usually due to the effects of radiation on the organs surrounding the prostate gland. Common side effects of radiotherapy include fatigue, skin irritation, bladder inflammation, diarrhoea and loss of pubic hair. The main side effects associated with brachytherapy include bladder irritation, blood in the urine and blood in the semen.

It is important to look after your skin during radiotherapy treatment to prevent infection and reduce pain. Let your doctor or nurse know of any symptoms as he/she may be able to help.

Hormone therapy

The common side effects in patients treated with hormone therapy often relate to the reduced action of testosterone (e.g. loss of sex drive, erection problems, hot flushes, decreased body hair and loss of muscle bulk). Many of the side effects from hormone therapy can be prevented or managed effectively. Always tell your doctor or nurse as soon as possible if you notice any side effects from taking hormone therapy. The table below lists the most common side effects of hormone therapy drugs that may be used in the treatment of prostate cancer.

<table>
<thead>
<tr>
<th>THERAPY</th>
<th>POSSIBLE SIDE EFFECTS</th>
<th>HOW THE SIDE EFFECTS MAY BE MANAGED</th>
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<tbody>
<tr>
<td>Abiraterone</td>
<td>• Diarrhoea</td>
<td>• Let your doctor know if you experience diarrhoea or fluid retention/swelling (oedema) — they will help you to manage these side effects</td>
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<tr>
<td>(Zytiga SPC, 2017)</td>
<td>• Hypertension</td>
<td>• Your liver function, potassium levels and blood pressure will be monitored before, during and after treatment</td>
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<td></td>
<td>• Hypokalaemia</td>
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<td></td>
<td>• Increased liver enzymes</td>
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<td></td>
<td>• Peripheral oedema</td>
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<td></td>
<td>• Urinary tract infection</td>
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<tr>
<td>Bicalutamide</td>
<td>• Abdominal pain</td>
<td>• Let your doctor know if you experience dizziness, asthenia or fluid retention/swelling (oedema) — they will help you to manage these side effects</td>
</tr>
<tr>
<td>(Bicalutamide SPC, 2017)</td>
<td>• Anaemia</td>
<td>• Gastrointestinal effects such as constipation, nausea and abdominal pain should be reported to your doctor</td>
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<td></td>
<td>• Asthenia</td>
<td>• Your doctor may be able to help you cope with hormonal effects such as hot flushes and breast tenderness</td>
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<tr>
<td></td>
<td>• Breast tenderness</td>
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<td>• Constipation</td>
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<td>• Dizziness</td>
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<td>• Haematuria</td>
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<td></td>
<td>• Hot flushes</td>
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<td>• Nausea</td>
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<td>• Oedema</td>
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<tr>
<td>Buserelin (Suprefact SPC, 2015)</td>
<td>Abdominal pain, Arthralgia, Blood pressure changes, Bowel changes, Breast swelling, Fatigue, Heart palpitations, Hot flushes, Loss of sex drive, Myalgia, Nausea, Nose irritation, Oedema, Rash, Weight gain</td>
<td>Your cardiac function and blood pressure will be monitored before, during and after treatment. Let your doctor know if you experience arthralgia, myalgia, rash or fluid retention/swelling (oedema) – they will help you to manage these side effects. Gastrointestinal effects such as constipation, nausea and abdominal pain should be reported to your doctor. Your doctor may be able to help you cope with hormonal effects such as hot flushes, breast swelling and loss of sex drive.</td>
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<tr>
<td>Degarelix (Firmagon SPC, 2017)</td>
<td>Hot flushes, Injection site reactions</td>
<td>Let your doctor know if you experience any burning or skin changes at the injection site, so that they can decide how to manage these. Your doctor may be able to help you cope with hormonal effects such as hot flushes.</td>
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<tr>
<td>Enzalutamide (Xtandi SPC, 2018)</td>
<td>Fatigue, Headache, Hot flush, Hypertension</td>
<td>Your blood pressure will be monitored before, during and after treatment. Let your doctor know if you experience fatigue or headaches – they will help you to manage these side effects. Your doctor may be able to help you cope with hormonal effects such as hot flushes and headaches.</td>
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<tr>
<td>Flutamide (Flutamide SPC, 2017)</td>
<td>Breast pain, tenderness and production of milk, Diarrhoea, Erection problems, Hot flushes, Loss of sex drive, Nausea/vomiting</td>
<td>Gastrointestinal effects such as constipation, nausea and vomiting should be reported to your doctor. Your doctor may be able to help you cope with hormonal effects such as hot flushes, breast symptoms and sexual problems.</td>
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<tr>
<td>Goserelin (Zoladex SPC, 2017)</td>
<td>Acne, Erection problems, Hot flushes, Increased sweating, Injection site reactions, Loss of sex drive</td>
<td>Let your doctor know if you experience any burning or skin changes at the injection site, so that they can decide how to manage these. Your doctor may be able to help you cope with hormonal effects such as hot flushes, sweating, acne and sexual problems.</td>
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continued overleaf
### THERAPY

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<tr>
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<td>Leuprorelin</td>
<td>Bone pain&lt;br&gt;Erection problems&lt;br&gt;Fatigue&lt;br&gt;Hot flushes&lt;br&gt;Injection site reactions&lt;br&gt;Loss of sex drive&lt;br&gt;Myalgia&lt;br&gt;Testicular atrophy&lt;br&gt;Weight changes</td>
<td>Let your doctor know if you experience any burning or skin changes at the injection site, so that they can decide how to manage these&lt;br&gt;Let your doctor know if you experience <strong>fatigue</strong>, <strong>myalgia</strong> or pain – they will help you to manage these side effects&lt;br&gt;Your doctor may be able to help you cope with hormonal effects such as hot flushes, sweating, <strong>testicular atrophy</strong> and sexual problems</td>
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<td>Triptorelin</td>
<td>Loss of sex drive&lt;br&gt;Lower limb <strong>paraesthesia</strong>&lt;br&gt;Hot flushes&lt;br&gt;Increased sweating&lt;br&gt;Back pain&lt;br&gt;Erection problems&lt;br&gt;<strong>Asthenia</strong></td>
<td>Let your doctor know if you experience <strong>asthenia</strong>, <strong>paraesthesia</strong> (a prickling sensation) or pain – they will help you to manage these side effects&lt;br&gt;Your doctor may be able to help you cope with hormonal effects such as hot flushes, sweating and sexual problems</td>
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</table>

**Important side effects associated with individual hormone therapy drugs used in the treatment of prostate cancer.** The most recent Summary of Product Characteristics (SPC) for any individual drug can be located at: [http://www.ema.europa.eu/ema/](http://www.ema.europa.eu/ema/).

**Chemotherapy**

Side effects from chemotherapy vary depending upon the drugs and the doses used – you may get some of those listed below but you are very unlikely to get all of them. You may also experience some side effects that are not listed below. The main areas of the body affected by chemotherapy are those where new cells are being quickly made and replaced (bone marrow, hair follicles, the digestive system, the lining of your mouth). Some patients find that their sense of taste is affected – changes in enzymes in your mouth can lead to a metallic taste and blisters. Reductions in your levels of neutrophils (a type of white blood cell) can lead to neutropenia, which can make you more susceptible to infections. Most side effects of chemotherapy are temporary and can be controlled with drugs or lifestyle changes – your doctor will help you to manage them (Macmillan, 2016). The table below lists the most common side effects of chemotherapy drugs that may be used in the treatment of prostate cancer.
<table>
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<tr>
<th>CHEMOTHERAPY DRUG</th>
<th>POSSIBLE SIDE EFFECT</th>
<th>HOW THE SIDE EFFECTS MAY BE MANAGED</th>
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<td><strong>Docetaxel</strong></td>
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<td>(Taxotere SPC, 2016)</td>
<td>Alopecia</td>
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<td>Anaemia</td>
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<td>Anorexia</td>
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<td>Asthenia</td>
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<td></td>
<td>Diarrhoea</td>
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<td></td>
<td>Extravasation-related tissue damage</td>
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<td></td>
<td>Increased infections</td>
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<td></td>
<td>Nail disorders</td>
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<td>Nausea</td>
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<td>Neutropenia</td>
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<td>Oedema</td>
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<td>Peripheral neuropathy</td>
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<td>Skin reaction</td>
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<td>Stomatitis</td>
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<td>Thrombocytopenia</td>
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<td>Vomiting</td>
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<td></td>
<td><strong>Your blood cell counts will be monitored frequently throughout your treatment in order to detect any neutropenia, anaemia or thrombocytopenia</strong> – your doctor may adjust your treatment according to test results and will advise you on how to prevent infections</td>
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<td><strong>Report any signs of peripheral neuropathy to your doctor, who will help you to manage this side effect</strong></td>
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<td><strong>Effects on the gastrointestinal system (nausea, vomiting, diarrhoea) and stomatitis may result in loss of appetite (anorexia) or feelings of weakness (asthenia). Your doctor will be able to help you to prevent or manage these side effect</strong></td>
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<td><strong>Let your doctor know if you experience any nail changes, skin reactions or fluid retention/swelling (oedema) – they will help you to manage these side effects</strong></td>
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<td></td>
<td><strong>Alopecia can be upsetting for many patients; your doctor will provide you with information on how to cope with this side effect. Some hospitals can provide cold caps to reduce hair loss</strong></td>
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<td><strong>Let your doctor know if you experience any burning or skin changes at the injection site, so that they can decide how to manage these. Many extravasations cause very little damage, but you may need to be treated with an antidote and apply compresses to the area for a few days (Pérez Fidalgo et al., 2012)</strong></td>
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<td><strong>Cabazitaxel</strong></td>
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<td>(Jevtana SPC, 2017)</td>
<td>Abdominal pain</td>
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<td>Arthralgia</td>
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<td>Asthenia</td>
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<td>Back pain</td>
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<td>Constipation</td>
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<td>Cough</td>
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<td>Diarrhoea</td>
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<td>Dyspnoea</td>
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<td>Fatigue</td>
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<td>Fever</td>
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<td>Haematuria</td>
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<td>Leukopenia</td>
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<td></td>
<td>Nausea/vomiting</td>
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<td></td>
<td>Neutropenia</td>
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<td></td>
<td>Taste changes (metallic, salty or bitter tastes)</td>
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<td>Thrombocytopenia</td>
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<td><strong>Effects on the gastrointestinal system (constipation, nausea, vomiting, diarrhoea, taste changes) may result in loss of appetite (anorexia) or feelings of weakness (asthenia). Your doctor or nurse will be able to help you to prevent or manage these side effects</strong></td>
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<td><strong>Let your doctor or nurse know if you experience a persistent cough. Troublesome dyspnoea can be treated with drugs called opioids or benzodiazepines, and in some cases, steroids are used (Kloke and Chemy, 2015)</strong></td>
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<td></td>
<td><strong>Let your doctor or nurse know if you experience arthralgia or pain and they will help you to manage these side effects</strong></td>
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Prostate cancer

Other treatments

Supportive therapy with bisphosphonates such as zoledronic acid can result in side effects including flu-like symptoms, renal toxicity and low calcium levels. Bisphosphonates can also occasionally lead to osteonecrosis (death of bone tissues) in the jaw. Although this is very rare, it is important that you clean your teeth regularly and carefully and report any oral problems to your doctor and dentist. Denosumab therapy can also potentially lead to osteonecrosis of the jaw, as well as low calcium levels and skin infections. It is very important that you inform your doctor or nurse well in advance of any planned dental treatments, as bisphosphonates and denosumab therapy will have to be temporarily stopped.
What happens next?

Follow-up appointments

You will be able to discuss any concerns you have at your follow-up appointments

Whether you have had curative treatment or are receiving long-term hormone therapy, your doctor will arrange follow-up appointments. During these appointments, you will typically have a blood test to monitor your PSA level. Depending on your PSA level, you might also have a digital rectal examination. Patients who are on long-term hormone therapy may have scans to check for osteoporosis – your doctor will discuss this with you.

Your doctor will let you know how often you need to return for further follow-up appointments, but a typical follow-up schedule after curative treatment would involve check-ups every 6 months in the first 2 years after treatment, then every 12 months after that.

Looking after your health

After you have had treatment for prostate cancer, you may feel very tired and emotional. Give your body time to recover and make sure you get enough rest, but there is no reason to limit activities if you are feeling well. It is important to take good care of yourself and get the support that you need.

- **Take plenty of rest when you need it**: Give your body time to recover. Complementary therapies, such as aromatherapy, may help you relax and cope better with side effects. Your hospital may offer complementary therapy; ask your doctor for details.

- **Eat well and keep active**: Eating a healthy diet and keeping active can help improve your fitness. It is important to start slowly, with gentle walking, and build up as you start to feel better. Vitamin D, which the body needs to absorb calcium, is very important for men having hormone therapy because of the risk of osteoporosis. We mainly get vitamin D from sunlight and some foods, but your doctor may also recommend that you take a daily supplement.
The following eight recommendations form a good foundation for a healthy lifestyle after cancer (Wolin et al., 2013):

- Don’t smoke.
- Avoid second-hand smoke.
- Exercise regularly.
- Avoid weight gain.
- Eat a healthy diet.
- Drink alcohol in moderation (if at all).
- Stay connected with friends, family and other cancer survivors.
- Attend regular check-ups and screening tests.

Regular exercise is an important part of a healthy lifestyle, helping you to keep physically fit and avoid weight gain. This is particularly important for men with prostate cancer, as studies have shown that an exercise training programme can reduce the side effects of long-term androgen deprivation therapy and improve quality of life (Bourke et al., 2018). It is very important that you listen carefully to the recommendations of your doctor or nurse, and talk to them about any difficulties you have with exercise.

Long-term effects

After completing treatment for prostate cancer, you may experience some long-term side effects, depending on the treatment you have received.

Long-term side effects of surgery for prostate cancer may follow on from the short-term effects, including permanent erection problems and urinary incontinence. The long-term effects of hormone therapy for prostate cancer can include weight gain, loss of stamina, mood swings, osteoporosis and heart problems. Radiotherapy for prostate cancer may cause irritation of the rectum (proctitis) or the bladder (cystitis), leading to more frequent toilet visits and possibly bleeding (Deamaley et al., 2007). There may also be an increase in erection problems from 1–2 years after radiotherapy treatment. There is a theoretical possibility that radiotherapy could cause cancers in other organs around the treatment area, however this has not been proven in men treated for prostate cancer.

The long-term effects of prostate cancer treatment on your sex life can be difficult to come to terms with. Talking to your partner about your sexual difficulties can help, or it may help to talk to a close friend if you are not
in a relationship. A penile rehabilitation programme can provide ways to adapt to the changes in your sexual function, and counsellors or therapists can help with anxiety about your sex life – talk to your doctor or nurse to find out what help is available in your area.

The long-term effects of prostate cancer and its treatment can be managed so it is important that you tell your doctor or nurse about any persistent or new symptoms. Your doctor or nurse will also work with you to develop a personalised survivorship care plan.

For further information and advice regarding how to regain your life as far as possible after treatment for cancer, see ESMO’s patient guide on survivorship (http://www.esmo.org/Patients/Patient-Guides/Patient-Guide-on-Survivorship).

### Emotional support

It is common to be overwhelmed by your feelings when you have been diagnosed with cancer and when you have been through treatment. If you feel anxious or depressed, talk to your doctor or nurse – they can refer you to a specialist counsellor or psychologist who has experience of dealing with emotional problems of people dealing with cancer. It may also help to join a support group so that you can talk to other people who understand exactly what you are going through.
Support groups

In Europe, there are patient advocacy groups, which help patients and their families to navigate the prostate cancer landscape. They can be local, national or international, and they work to ensure patients receive appropriate and timely care and education. These groups can provide you with the tools you may need to help you better understand your disease, and to learn how to cope with it, living the best quality of life that you can.

Europa Uomo is a European coalition of patient support groups for prostate cancer. It was established in 2004 and works to increase awareness of prostate cancer in Europe.

For further information about Europa Uomo visit: https://www.europa-uomo.org/
References


## Glossary

**Abiraterone**  
A hormone therapy that inhibits testosterone synthesis by blocking an enzyme called cytochrome p17.

**Active Surveillance**  
A treatment plan that involves closely watching a patient’s condition but not giving any treatment unless there are changes in test results that show the condition is getting worse.

**Adenocarcinoma**  
Cancer that begins in glandular (secretory) cells.

**Adjuvant (Treatment)**  
Additional treatment given after the primary treatment to reduce the chance of the cancer coming back.

**Alopecia**  
Hair loss.

**Anaemia**  
A condition in which there is a shortage of red blood cells or haemoglobin (a protein in red blood cells that carries oxygen throughout the body).

**Androgen Deprivation Therapy**  
Treatment to suppress or block the production or action of male hormones.

**Anorexia**  
A lack or loss of appetite.

**Anti-androgen (Therapy)**  
Treatment with drugs that block the action of male hormones in the body.

**Antibiotic**  
A type of drug used to treat and prevent bacterial infections.

**Arthralgia**  
Joint pain.

**Asthenia**  
Abnormal feeling of weakness or lack of energy.

**Benign Prostatic Hyperplasia**  
A benign (not cancerous) condition in which an overgrowth of prostate tissue pushes against the urethra and the bladder, blocking the flow of urine.

**Bicalutamide**  
An anti-androgen drug that prevents testosterone from reaching cancer cells.

**Biopsy**  
A medical procedure in which a small sample of cells or tissue is taken for examination under a microscope.

**Bisphosphonates**  
Drugs that help prevent, or slow down, osteoporosis, and prevent broken bones and other bone problems caused by bone metastases; also used in adjuvant treatment.

**Bone Marrow**  
A spongy tissue found inside some bones (e.g. hip and thigh bones). It contains stem cells, which are cells that can develop into red blood cells, white blood cells or platelets.

**Brachytherapy**  
A type of radiotherapy in which the radioactive source is placed directly into or near a tumour.

**BRCA1**  
A gene that normally controls tumour growth but when mutated has the opposite effect.

**BRCA2**  
A gene that normally controls tumour growth but when mutated has the opposite effect.

**Buserelin**  
A luteinising hormone-releasing hormone agonist that blocks the production of testosterone in the testicles.

**Cabazitaxel**  
A type of chemotherapy that is administered through a drip into a vein in your arm or chest.

**Cadmium**  
A metal that is a by-product of zinc refining and is used to make batteries, pigments and plastics. It is also found in tobacco and tobacco smoke.

**Castration-Resistant Prostate Cancer (CRPC)**  
Prostate cancer that is no longer responsive to castration treatments (i.e. reduction of androgen/testosterone by surgical or medical treatment).

**Chemotherapy**  
A type of cancer treatment using medicine that kills the cancer cells by damaging them, so that they cannot reproduce and spread.

**Clinical Trial**  
A study that compares the effects of one treatment with another.

**Cold Cap**  
A cap that cools the scalp before, during and after treatment to reduce the effects of the treatment on hair follicles.
GLOSSARY

COMPUTED TOMOGRAPHY (CT) SCAN
A scan using x-rays and a computer to create detailed images of the inside of your body.

CONCURRENT
At the same time.

CURATIVE (TREATMENT)
A treatment that is intended to cure the cancer.

CYSTITIS
Inflammation of the lining of the bladder.

CYTOCHROME P17
An enzyme that the testicles need to produce testosterone.

DEGARELIX
A gonadotrophin-releasing hormone antagonist that blocks the production of testosterone in the testicles.

DENOSUMAB
A drug used to treat osteoporosis and prevent broken bones and other bone problems caused by bone metastases.

DIGITAL RECTAL EXAMINATION
An examination in which a doctor or nurse inserts a lubricated, gloved finger into the rectum to feel for abnormalities.

DNA
Deoxyribose nucleic acid, the chemical that carries genetic information in the cells of your body.

DOCETAXEL
A type of chemotherapy that is administered through a drip into a vein in your arm or chest.

DUCTS
Tubes or vessels in the body that fluids pass through.

DYSPNOSA
Shortness of breath.

ENZALUTAMIDE
An anti-androgen drug that prevents testosterone from reaching cancer cells.

ENZYME
A protein that speeds up chemical reactions in the body.

EXTERNAL SPHINCTER
A muscle encircling the outside wall of the anal opening.

EXTRAVASATION
Leakage of fluid, such as an anti-cancer drug, from a blood vessel or tube into the tissue around it.

FATIGUE
Overwhelming tiredness.

FLUTAMIDE
An anti-androgen drug that prevents testosterone from reaching cancer cells.

GASTROINTESTINAL (SYSTEM)
The system of organs responsible for getting food into and out of the body and for making use of food to keep the body healthy — includes the oesophagus, stomach and intestines.

GENES
Pieces of DNA responsible for making substances that the body needs to function.

GLAND
An organ that makes one or more substances, such as hormones, digestive juices, sweat, tears, saliva or milk.

GLENOSCON
A system of grading prostate cancer tissue based on how it looks under a microscope. A low Gleason score means the cancer tissue is similar to normal prostate tissue and the tumour is less likely to spread; a high Gleason score means the cancer tissue is very different from normal and the tumour is more likely to spread.

GONADOTROPHIN-RELEASING HORMONE ANTAGONIST
A drug that blocks the pituitary gland from making hormones called follicle-stimulating hormone and luteinising hormone. In men, this causes the testicles to stop making testosterone.

HAEMATURIA
Blood in the urine.

HAIR FOLLICLE
A small sac in the skin from which hair grows.

HORMONE
A substance made by glands in the body. Hormones circulate in the bloodstream and control the actions of certain cells or organs.
# GLOSSARY

**HORMONE-REFRACTORY PROSTATE CANCER (HRPC)**
Prostate cancer that is no longer responsive to castration treatments (i.e. reduction of androgen/testosterone by surgical or medical treatment). This term has now been replaced by *castration-resistant prostate cancer* or *CRPC*.

**HORMONE THERAPY**
Treatments that block the actions of testosterone.

**HYPERTENSION**
Abnormally high blood pressure.

**HYPOKALAEMIA**
An abnormally low level of potassium in the blood.

**IONISING RADIATION**
Any type of particle or electromagnetic wave that carries enough energy to ionise or remove electrons from an atom (e.g. x-rays).

**IMMUNOTHERAPY**
A type of cancer treatment that stimulates the body’s immune system to fight the cancer.

**INSULIN-LIKE GROWTH FACTOR 1 (IGF-1)**
A protein that stimulates the growth of many types of cells.

**KEYHOLE SURGERY**
Minimally invasive surgery carried out through a very small incision, with special instruments.

**LEUKOPENIA**
A decrease in the number of leukocytes (a type of white blood cell) in the blood, which places individuals at increased risk of infection.

**LEUPRORELIN**
A luteinising hormone-releasing hormone agonist that blocks the production of testosterone in the testicles.

**LUTEINISING HORMONE-RELEASING HORMONE AGONIST**
A drug that keeps the testicles from making testosterone by blocking other hormones that are needed to make it.

**LEVATOR MUSCLES**
Muscles on either side of the pelvis.

**LOCAL ANAESTHETIC**
A medication that causes reversible absence of pain sensation around the site of administration.

**LOCALISED (PROSTATE CANCER)**
Cancer that is completely contained within the prostate gland and has not spread anywhere else in the body.

**LOCALLY ADVANCED (PROSTATE CANCER)**
Cancer that has spread from where it started to nearby tissue or lymph nodes.

**LYMPHATIC SYSTEM**
A network of tissues and organs that help rid the body of toxins, waste and other unwanted materials. The primary function of the lymphatic system is to transport lymph, a fluid containing infection-fighting white blood cells, throughout the body.

**LYMPH NODES**
Small structures throughout the lymphatic system that work as filters for harmful substances, such as cancer cells or bacteria.

**LYMPHOEDEMA**
Swelling caused by a build-up of lymph fluid in the tissues of the body. This may result from damage to the lymphatic system because of surgery or radiotherapy to the lymph nodes in the pelvis.

**MARGIN**
The edge or border of the tissue removed in cancer surgery. The margin is described as negative or clean when no cancer cells are found at the edge of the tissue, suggesting that all of the cancer has been removed. The margin is described as positive or involved when cancer cells are found at the edge of the tissue, suggesting that all of the cancer has not been removed.

**METASTASES**
Cancerous tumours that have originated from a primary tumour/growth in another part of the body.

**METASTATIC (PROSTATE CANCER)**
A cancer that has spread from its (primary) site of origin to different parts of the body.

**MAGNETIC RESONANCE IMAGING (MRI) SCAN**
A type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.

**MULTIDISCIPLINARY TEAM**
A group of healthcare workers who are members of different disciplines (e.g. oncologist, nurse specialist, physiotherapist, radiologist) and provide specific services to the patient. The activities of the team are brought together using a care plan.
GLOSSARY

MUTATION
A permanent alteration in the DNA sequence that makes up a gene, such that the sequence differs from what is found in most people

MYALGIA
Muscular pain

NEOADJUVANT (TREATMENT)
Treatment given as a first step to shrink a tumour before the main treatment is given

NERVE-SPARING PROSTATECTOMY
Removal of prostate tissue without removing the nerves that control erections

NEUROENDOCRINE CANCER
Cancer that forms from cells that release hormones into the blood in response to a signal from the nervous system

NEUTROPENIA
An abnormally low level of neutrophils in the blood, which increases risk of infection

NEUTROPHILS
A type of white blood cell that play an important role in fighting off infection

OEDEMA
A build-up of fluid in the body which causes the affected tissues to become swollen

OLAPARIB
A drug used to treat some types of cancer caused by mutations in the BRCA1 and BRCA2 genes

OSTEONECROSIS
Loss of blood flow to bone tissue, causing the bone to die

OSTEOPOROSIS
A decrease in the amount and thickness of bone tissue, which causes the bones to become weak and break more easily

PALLIATIVE (CARE)
The care of patients with advanced, progressive illness. It focuses on providing relief from pain, symptoms and physical and emotional stress, without dealing with the cause of the condition

PALPABLE
Can be felt by touch

PALPITATIONS
A rapid or irregular heartbeat

PARAESTHESIA
An abnormal sensation, such as burning or prickling

PELVIC LYMPHADENECTOMY
Surgery to remove lymph nodes in the pelvis

PELVIC NODE DISSECTION
A procedure to remove pelvic lymph nodes to see if they contain cancerous cells

PEMBROLIZUMAB
A type of immunotherapy that blocks a protein called PD-1 on the surface of certain immune cells called T-cells; this activates the T-cells to find and kill cancer cells. It is administered through a drip into a vein in your arm or chest

PENILE REHABILITATION PROGRAMME
A programme of treatment for sexual problems following prostate cancer treatment, including counselling and sex therapy, medication and lifestyle advice

PERINEUM
The area of skin between the anus and scrotum in males

PERIPHERAL NEUROPATHY
Damage to the nerves in the extremities of the body. Symptoms may include pain, sensitivity, numbness or weakness in the hands, feet or lower legs

POSITRON EMISSION TOMOGRAPHY (PET)
An imaging test that uses a dye with radioactive tracers, which is injected into a vein in your arm

PROCTITIS
Inflammation of the lining of the rectum

PROGNOSIS
The likely outcome of a medical condition

PROGRAMMED CELL DEATH PROTEIN 1 (PD-1)
A cellular protein thought to be involved in helping the tumour to evade detection by the body’s immune system

PROSTATE
A gland in the male reproductive system. The prostate surrounds the part of the urethra just below the bladder, and produces a fluid that forms part of the semen

PROSTATE-SPECIFIC ANTIGEN (PSA)
A protein made by the prostate gland and found in the blood

RADICAL PROSTATECTOMY
Surgery to remove the entire prostate and some of the tissue around it
GLOSSARY

RADIOACTIVE/RADIOACTIVITY
A material that is unstable and spontaneously emits energy (radiation)

RADIOTHERAPY
Treatment involving the use of high-energy radiation, which is commonly used to treat cancer

RADON
A radioactive liquid used to treat prostate cancer that has spread to the bone

RECURRENCE
Return of a cancer

RECTUM
Back passage

RENSAL
Relating to the kidneys

RISK FACTOR
Something that increases the chance of developing a disease

SCROTUM
The external sac that contains the testicles

SEMEN
The fluid that is released through the penis during ejaculation. Semen is made up of sperm from the testicles and fluid from the prostate and other sex glands

SEMINAL VESICLES
Glands that help produce semen

SILDENAFIL
A drug used to treat erection problems

STEROID
A type of drug used to relieve swelling and inflammation. Some steroid drugs also have anti-tumour effects

STOMATITIS
Inflammation of the inside of the mouth

TESTICULAR ATROPHY
A condition in which the testicles become smaller

TESTOSTERONE
A hormone made mainly in the male reproductive system that is needed to develop and maintain male sex characteristics

THROMBOCYTOPENIA
A decrease in platelets in the blood. This causes bleeding into the tissues, bruising, and slow blood clotting after injury

TRANSRECTAL ULTRASOUND SCAN GUIDED (TRUS) BIOPSY
A procedure used to diagnose prostate cancer. An ultrasound scanner is inserted into the rectum to produce a clear picture of the prostate gland and a needle is used to take samples of tissue from the prostate gland

TRANSURETHRAL RESECTION OF THE PROSTATE
Removal of the inner part of the prostate gland

TRIPTORELIN
A luteinising hormone-releasing hormone agonist that blocks the production of testosterone in the testicles

TUMOUR
A lump or growth of abnormal cells. Tumours may be benign (not cancerous) or malignant (cancerous). In this guide, the term ‘tumour’ refers to a cancerous growth, unless otherwise stated

ULTRASOUND
A type of medical scan where sound waves are converted into images by a computer

URETHRA
The tube through which urine leaves the body

URINARY INCONTINENCE
Inability to control the flow of urine from the bladder

URINARY TRACT
The organs of the body that produce and discharge urine, including the kidneys, ureters, bladder and urethra

WATCHFUL WAITING
Closely watching a patient’s condition but not giving treatment unless symptoms appear or change

X-RAY
An imaging test, using a type of radiation that can pass through the body, which allows your doctor to see images of inside your body

ZOLEDRONIC ACID
A type of bisphosphonate used to treat cancers that have spread to the bone
This guide has been prepared to help you, your friends and your family better understand the nature of prostate cancer and the treatments that are available. The medical information described in this document is based on the clinical practice guidelines of the European Society for Medical Oncology (ESMO) for the management of prostate cancer. We recommend that you ask your doctor about the tests and types of treatments available in your country for your type and stage of prostate cancer.
We can help you understand prostate cancer and the available treatment options.

The ESMO Guides for Patients are designed to assist patients, their relatives and caregivers to understand the nature of different types of cancer and evaluate the best available treatment choices. The medical information described in the Guides for Patients is based on the ESMO Clinical Practice Guidelines, which are designed to guide medical oncologists in the diagnosis, follow-up and treatment in different cancer types.

For more information, please visit www.esmo.org