



Benign Prostatic Enlargement

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This leaflet is part of EAU Patient Information on BPE. It contains general information about benign prostatic enlargement. If you have any specific questions about your individual medical situation you should consult your doctor or other professional healthcare provider.

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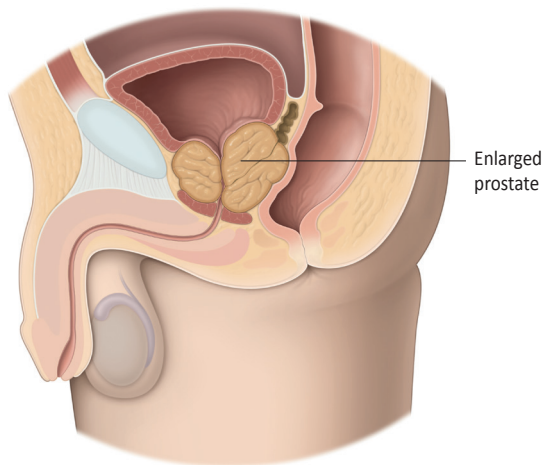
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Benign Prostatic Enlargement

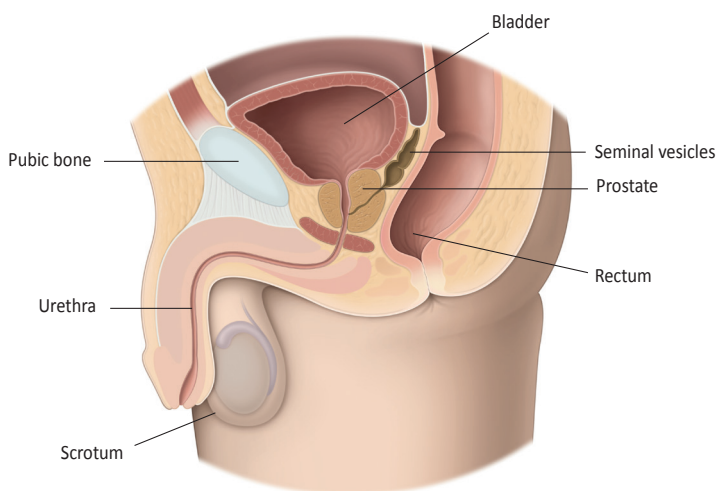
Prostate diseases are usually associated with older age. They can cause bothersome symptoms in the lower urinary tract in men over the age of 50. These symptoms may be caused by an enlargement of the prostate, a condition which is known as benign prostatic enlargement (BPE) (Fig. 1). Other conditions can also cause these symptoms and your doctor will take this into account.

Benign prostatic enlargement is a common condition. It is related to hormonal changes which happen as men



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Fig. 1: An enlarged prostate compressing the urethra and bladder.



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Fig. 2: A healthy prostate in the lower urinary tract.

grow older. Prostate diseases can be very worrying but it is important to know that BPE is not prostate cancer. BPE does not become prostate cancer, even if it is left untreated. However, both benign prostatic enlargement and prostate cancer may develop with age. Some people may have both diseases. You should consult your doctor to discuss any of your concerns.

What is the prostate?

The prostate is a gland located in the lower urinary tract, under the bladder and around the urethra (Fig. 2). Only men have a prostate. It produces the fluid which carries semen. The prostate has smooth muscles which help to push out the semen during ejaculation.

A healthy prostate is about the size of a large walnut and has a volume of 15-25 millilitres (ml). The prostate slowly grows as men grow older.

What are BPH, BPE, and BPO?

Benign prostatic hyperplasia (BPH) is a common benign (non-cancerous) condition which happens to some extent in all men. This condition is related to hormonal changes which happen as men grow older. In about half of these men, BPH may result in benign prostatic enlargement (BPE). In turn, this enlargement may obstruct the flow of urine, a condition which is called benign prostatic obstruction (BPO). BPO happens in about half of men with a benign prostatic enlargement. Your doctor may be referring to your condition by using either of the three terms.

Symptoms

Benign prostatic enlargement (BPE) can affect the way you normally urinate. This happens because the enlarged prostate puts pressure on the urethra at the outlet of the bladder (Fig. 2).

Sometimes the symptoms are mild. For example, you may need to urinate more often or find it more difficult to empty your bladder completely. These mild symptoms are a normal part of the ageing process – just like decline in mobility, memory, or flexibility. It is possible that your doctor will not recommend treatment for mild symptoms.

Sometimes the symptoms are very bothersome and can have a negative effect on your quality of life. In this case you may benefit from treatment.

The symptoms which are often called lower urinary tract symptoms (LUTS) may be caused by BPE and may be due to other conditions which affect the urinary system.

Types of symptoms

In men with BPE, the symptoms can affect urination in different ways:

- The way you hold the urine in the bladder (storage)
- The way you urinate (voiding)
- How you feel after you urinate (post-micturition)

Storage symptoms include:

- The need to urinate more often than usual
- The need to wake up at night to urinate
- The sudden need to urinate and having trouble holding it
- Any involuntary loss of urine (incontinence)

Voiding symptoms include:

- A weak stream of urine
- Splitting or spraying of the urine stream
- The flow of urine starts and stops (intermittent)
- Straining when urinating
- It takes a while before the urinary flow starts
- It takes longer to finish urinating
- In rare cases acute or chronic urinary retention

Post-micturition symptoms include:

- The feeling that the bladder is not completely empty
- Involuntary loss or dribbling of urine into your underwear shortly after leaving the toilet

Diagnosis

The doctor and nurses do a series of tests to understand what causes your symptoms. This is called a diagnosis.

The symptoms listed in the previous section can point to many diseases and not only BPE. This is why you may need to take several tests before the doctor can make a diagnosis.

First, the doctor or nurse will take your medical history and do a physical examination. Then they may do urine and blood tests, take images of your bladder and prostate, and perform other tests if needed.

This section offers general information about diagnosis and situations can vary in different countries.

Medical history

The doctor will take a detailed medical history and ask questions about your symptoms. Your doctor will also ask questions about your erectile function. You can help your doctor by preparing for the consultation:

- Make a list of any previous surgeries
- Make a list of the medication you are taking
- Mention other diseases you suffer from
- Describe your lifestyle (exercising, smoking, alcohol, and diet)
- Describe your current symptoms
- Note how long you have had the symptoms for

The doctor may also ask you to fill out a questionnaire to understand your symptoms, how often they happen, and how much they affect your quality of life. There are several questionnaires available including IPSS, ICIQ Male LUTS the Danish Prostate Symptom Score (DAN-PSS). The most-used questionnaire is the International Prostatic Symptom Score (IPSS). It consists of seven questions about your symptoms which can be scored between 0 and 5, from mild to severe.

Physical examination

Your doctor or nurse will do a general physical examination.

They will be looking for:

- A distended bladder (your bladder may stretch if it does not empty completely)
- Skin damage on the penis and scrotum (the pouch of skin that contains your testes), this can be a sign of urinary incontinence
- Discharge from the urethra, at the end of the penis (a sign of infection)
- Abnormalities in the penis, scrotum, and testicles

In addition, your doctor will do a rectal examination with a finger to feel the size, shape, and consistency of the prostate (**Fig. 3**). This test is known as digital rectal examination (DRE).

Urine test

You will need to give some of your urine for testing. The test will show if you have a urinary tract infection or if there are traces of blood in the urine. It may also show glucose which could be a sign of diabetes mellitus.

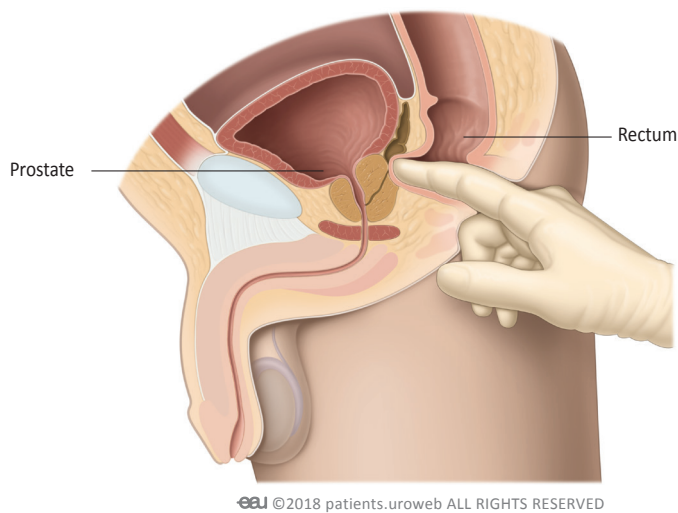


Fig. 3: Digital rectal examination to feel the size, shape, and consistency of the prostate.

Blood test

As part of making the diagnosis your doctor may do a blood test to check your kidney function. The doctor may also recommend to check if your blood has higher levels of prostate-specific antigen (PSA). PSA is a protein produced by the prostate and it may increase in men with a benign prostatic enlargement, prostatic inflammation, or prostate cancer. The doctor will explain the possible consequences of this test before making this recommendation.

Bladder diary

Your doctor may ask you to keep a bladder diary for the duration of at least three days. Here you will note down how much you drink, how often you urinate, and how much urine you produce by measuring the volume of urine at home with the help of a measuring jug. The bladder diary is important because it helps your doctor to understand your symptoms better.

You may use a stopwatch to record the time it took you to urinate. Note down the amount of urine (in millilitres) and the time (in seconds) (Fig. 4).

Uroflowmetry

This is a simple test which electronically records the flow of urine. It is easily done in privacy at the hospital or clinic. You will urinate in a container, called a uroflowmeter (Fig. 5). This test helps your doctor to check if the enlarged prostate causes a blockage in the lower urinary tract.

What measuring your urine flow rate at home can tell you:

- Normal urine flow is above 15 millilitres per second.
- If your flow of urine is 10 millilitres per second or less and you experience symptoms, you should see your urologist.

Measuring at home is never as accurate as at the hospital or clinic. Make sure to consult your doctor about your urine flow rate if you have any concerns.

Imaging of the urinary tract

You may get an ultrasonography (also known as ultrasound), which uses high-frequency sounds to create an image of your bladder and your prostate.

The doctor or nurse will scan your bladder using ultrasound to check how much urine is left in the bladder after urinating. This information helps to see if your symptoms are caused by chronic urinary retention, which can occur in men with BPE.

An ultrasound may also be used to measure the size of prostate volume. This may help to select the best treatment option for you.

Urodynamic evaluation

A urodynamic test is done to get more information about your urination cycle and how your bladder muscles work. During the test, your doctor or nurse inserts catheters in your urethra and rectum to measure the pressure in your bladder and abdomen.

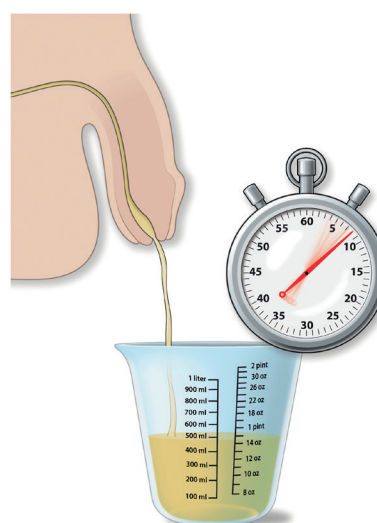


Fig. 4: Measuring urine flow rate at home.



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Fig. 5: A common type of uroflowmetry container for men and women.

The bladder is slowly filled with sterile fluid through the catheter in the urethra. In this way, the filling of the bladder with urine is simulated. When the bladder is full, you will urinate into a uroflowmeter.

The test results are shown on a screen which is connected to the catheters. Sometimes the test has to be repeated to get accurate results but the catheters will already be in place for the second test.

Your doctor may decide to give you this test if:

- You have a neurological dysfunction
- You have had pelvic or prostate surgery
- You have too much urine left in the bladder after urination
- BPE is uncommon in your age group
- More information is needed to understand the cause of your symptoms

Treatment options

Watchful Waiting

If you have benign prostatic enlargement (BPE) with mild/moderate bothersome lower urinary tract symptoms (LUTS), you may not need drugs or surgery for your condition. Instead, the urologist will explain your condition to you, how it can develop, and how you can adjust your lifestyle to reduce your symptoms and cope with them. The urologist will closely observe your condition over the following months or years and will start active treatment when needed. This is called Watchful Waiting.

Watchful Waiting is a good option if your symptoms are mild/moderate and if you feel that your quality of life has not declined. Despite how it may feel, this is not a passive approach because it includes regular check-ups to make sure your condition does not get worse.

Most men with BPE are offered a period of watchful Waiting before starting any treatment. It is widely recommended because severe complications during this time are very rare. In fact, some symptoms can improve on their own while others may remain stable for years.

A Watchful Waiting programme includes:

- Evaluation of your symptoms
- A physical examination
- Blood and urine tests
- Education about your condition
- Support and reassurance
- Lifestyle and self-management advice

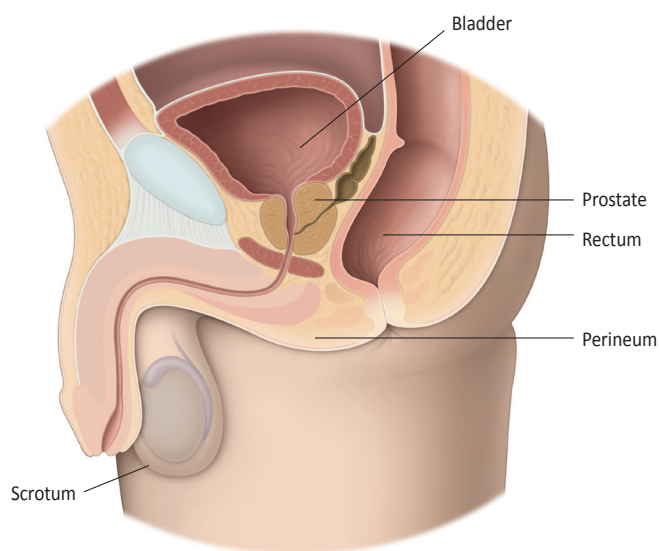
Lifestyle advice

- Drink at least 1 litre every day and discuss with your doctor if you can drink more
- Drink more if you live in a hot climate or do a lot of physical exercise
- Drink less before and during long trips
- Drink less in the evening to avoid getting up at night to urinate
- Avoid alcohol and caffeine because they increase urine production and irritate the bladder
- Try to exercise 2 or 3 times a week. Lack of movement can make it more difficult to urinate and cause urinary retention
- Have a balanced and varied diet
- Always try to keep your lower abdomen dry and warm. If you go swimming, bring an extra set of dry clothes and change as soon as you are out of the water. Dampness and cold may increase the need to urinate and can cause a urinary infection
- Sometimes urine sprays and it can wet the toilet seat or the bathroom floor. Some men prefer to sit down when urinating to avoid this, while others prefer to urinate in a cup and empty it in the toilet

Self-management

Apart from following general lifestyle advice you can actively manage the symptoms caused by BPE in your everyday life. Self-management can reduce symptoms and keep your condition stable.

- Completely empty your bladder each time you urinate. It may help if you sit down.
- If you feel your bladder is not empty after urinating, try again after 5 minutes
- Use a small pad to catch involuntary urine loss
- After urinating, press under the scrotum with your fingers onto the urethra and then slide your fingers from the base to the tip of the penis to squeeze out the last drops of urine. This will help to avoid wetting your underwear.
- Use breathing exercises to distract yourself from the feeling of urgency
- Apply pressure to your penis or perineum (**Fig. 6**) to divert your attention from urination
- Encourage yourself to “hold on” longer when you feel the urgency to urinate. This will train your bladder to keep more urine so that you will urinate less often.
- Avoid constipation by adapting your diet
- Avoid sudden exposure to cold weather and always try to keep your lower abdomen warm
- Keep a bladder diary



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Fig. 6: The male lower urinary tract.

Treatment for LUTS in men with BPE

Drug treatment

You have been diagnosed with benign prostatic enlargement (BPE) and your doctor recommends drug treatment. This treatment is advised when the symptoms are bothersome and affect your quality of life. This section describes different drug treatments, which you should discuss with your doctor. Together you can decide which approach is best for you.

Factors which influence this decision include:

- Your symptoms
- The size of your prostate
- Your medical history
- Drugs available in your country
- Your personal preferences and values

There are several groups of drugs to treat the symptoms caused by BPE:

- Beta-3 agonist
- Alpha-blockers
- 5alpha-reductase inhibitors (5ARIs)
- Muscarinic receptor antagonists (MRAs)
- Phosphodiesterase 5 inhibitors (PDE5Is)
- A combination of drugs
- Herbal drugs

Each group of drugs works in a different way and can have different results and side effects.

Beta- 3 agonist

Beta-3 adrenoceptors are the most common beta receptors which can be found in the smooth muscle cells of the bladder wall and their stimulation is thought to induce bladder relaxation. Mirabegron is the first available beta -3 agonist with approval for use in patients with overactive bladder symptoms. Mirabegron can improve overactive bladder symptoms due to BPE. Your doctor may advise mirabegron in combination with other drugs. Mirabegron can cause high blood pressure. Your blood pressure should be checked before you start treatment and regularly monitored while you are taking this medication.

Alpha-blockers

Alpha-blockers are a group of drugs which improve the symptoms and the flow of urine by relaxing the smooth muscles of the prostate. This is the most commonly recommended group of drugs for men with BPE.

Currently, five main types of alpha-blockers are used. They all achieve similar results but differ in their side effects:

- Alfuzosin
- Doxazosin
- Tamsulosin
- Terazosin
- Silodosin

Usually the drugs are fully effective within a couple of weeks, but some men will notice an improvement within hours or days after starting treatment. Alpha-blockers do not reduce the size of the prostate or prevent it from growing. Some men will eventually need surgery to relieve their symptoms.

Side effects of alpha-blockers are mild and most men do not experience any side effects, even if they use them for a long time. Men who have side effects report loss of strength (asthenia), dizziness, and slightly lower blood pressure (hypotension).

A few alpha-blockers may also cause dry orgasm also known as ejaculatory dysfunction. This is an uncommon side effect and it will disappear when the treatment is stopped.

Alpha-blockers may affect the muscles in your eyes. This side-effect is not harmful but if you are scheduled to have cataract surgery you should inform your surgeon about the treatment with alpha-blockers.

5alpha-reductase inhibitors

5alpha-reductase inhibitors (5ARIs) are a group of drugs which prevent the prostate from growing and may even shrink it. These drugs work better in prostates larger than 40 millilitres and are only prescribed when the prostate enlargement causes bothersome symptoms. 5ARIs will improve the symptoms 6 to 12 months after starting treatment. These drugs may reduce the risk of urinary retention and the need for surgery. 5ARIs take a long time to improve the symptoms, so they are only advised for treatment which lasts over a year. 5ARIs reduce prostate size with 18 to 28% and decrease the level of PSA with approximately 50% after 6-12 months of treatment.

There are 2 types of 5ARIs, and they achieve similar results:

- Dutasteride
- Finasteride

The side effects of these drugs are mainly related to sexual function. They may include reduced sexual drive, erectile dysfunction, and problems with ejaculation. However, incidence of sexual dysfunction is low in these patients and

even decreased with treatment duration. About 1-2% of men experience breast enlargement or nipple tenderness. Side effects are not very common and disappear when the treatment is stopped.

5ARIs are generally recommended for men with moderate or severe symptoms because of the possible side effects.

These drugs are most often used in combination with other types of drugs. Possible combinations of drugs are discussed later in this section.

Muscarinic receptor antagonists

Muscarinic receptor antagonists (MRAs) are a group of drugs which reduce the abnormal contractions of the bladder. These drugs are usually prescribed for the treatment of overactive bladder symptoms (OAB). They can also help men with urgency symptoms caused by BPE. They are generally not prescribed if the bladder does not empty completely and there is much urine left in the bladder after urination.

There are several types of MRAs:

- Darifenacin
- Fesoterodine
- Oxybutynin
- Propiverine
- Solifenacin
- Tolterodine
- Trospium chloride

Side effects of MRAs are usually mild. They may include dry mouth and eyes, constipation, difficulties urinating, symptoms of the common cold, blurred vision, and dizziness.

Phosphodiesterase 5 inhibitors

Phosphodiesterase 5 inhibitors (PDE5Is) are a group of drugs used for the treatment of erectile dysfunction. These drugs can also improve some symptoms caused by BPE.

There are three types of PDE5Is:

- Sildenafil
- Tadalafil
- Vardenafil

Only tadalafil 5 mg (daily dose) has been approved for the treatment of men with BPE. The cost is usually not covered by insurance companies or national health services.

Men with erectile dysfunction as well as BPE may benefit from treatment with daily use PDE5Is.

* The erectile dysfunction terms are listed in the glossary.

PDE5Is can cause side effects such as headache, back pain, dizziness, and indigestion. PDE5Is should not be used in combination with several drugs, including the alpha-blockers doxazosin or terazosin. They should also not be used in men who have specific heart problems. Men who have problems with their blood pressure or who have kidney failure should also not take PDE5Is. If you experience loss of vision when taking PDE5Is, you should go to your doctor.

Make sure to discuss any of your concerns about the side effects or contraindications of PDE5Is with your doctor.

Combinations of drugs

Your doctor can also advise a combination of drugs. The most common combinations are:

- Alpha-blockers with 5ARIs
- Alpha-blockers with MRAs

The aim of such treatment is to combine the benefits of both drugs. When used together, these drugs can be more effective but they may cause side effects more often. The side effects of each drug are described earlier in this section. Combination treatment is generally recommended for men with moderate or severe symptoms.

Alpha-blockers with 5ARIs

The combination of alpha-blockers with 5ARIs is recommended if:

- The prostate is larger than 40 millilitres (ml)
- PSA values are 1.5 ng/ml or higher
- Your symptoms are severe
- You have slow flow of urine

This combination of drugs is only advised for long-term treatment.

Alpha-blockers with MRAs

The combination of alpha-blockers and MRAs is recommended if:

- You have storage symptoms
- Your symptoms have not improved when taking one drug

Herbal drugs

Herbal drugs are made of plant extracts. Many types of roots, seeds, pollen, bark, or fruits can be used alone or in combination to make these drugs. The most widely used extracts in herbal drugs are taken from:

- Pumpkin seeds (*Cucurbita pepo*)
- South African star grass (*Hypoxis rooperi*)
- Bark of the African plum tree (*Pygeum africanum*)
- Rye pollen (*Secale cereal*)

- Berries of the American dwarf palm (*Serenoa repens*)
- Roots of the stinging nettle (*Urtica dioica*)

It is not entirely clear how these herbal drugs work to relieve symptoms caused by BPE. It is also not clear how efficient they are. The quality of herbal drugs can vary greatly. Because there are so many herbal drugs available, no specific recommendation about their use can be made. Inform your doctor during consultation if you take any herbal drugs to relieve your symptoms.

Side effects of herbal drugs are mild and many men do not experience any side effects at all. Gastro-intestinal discomfort (for instance bloating or constipation) is the most common complaint.

Surgical treatment of LUTS in men with BPE formation

You have been diagnosed with benign prostatic enlargement (BPE) and your doctor recommends surgery. This section describes different treatment options, which you should discuss with your doctor. Together you can decide which approach is best for you.

Factors which influence this decision include:

- Your symptoms and quality of life
- The size of your prostate
- Your medical history
- The kind of treatment available at your hospital and the expertise of your doctor. Ask your urologist about his or her experience with the recommended treatment option. You have the right to know the complication rate of the surgeon who will do the operation.
- Your personal preferences and values. There is no single treatment which is ideal for all patients.

When should I consider surgery?

- When your symptoms get worse, even if you already receive drug treatment
- When you have complications of BPE or if you are at risk of getting them. Complications include:
 - Kidney failure
 - Dilatation of your kidneys
 - Inability to urinate (urinary retention)
 - Recurring urinary tract infection
 - Recurring blood in the urine
 - Bladder stone

* The underlined terms are listed in the glossary.

- If you do not tolerate drug treatment very well
- If you prefer surgery over drug treatment
-

During surgical treatment the doctor will remove the enlarged part of your prostate (also known as adenoma).

There are different types of surgical procedures, but all of them aim to relieve your symptoms and improve the flow of urine.

The main procedures are:

- Transurethral resection of the prostate (TURP)
- Transurethral incision of the prostate (TUIP)
- Open prostatectomy
- Laser treatment
- Prostate stents
- Transurethral needle ablation (TUNA)
- Transurethral microwave therapy (TUMT)

This section also discusses ethanol and botulinum toxin injections. Research on the effects of these procedures is still on-going and their use is experimental. Each procedure has its own advantages and disadvantages. The choice of treatment depends on your individual situation and preference.

This section offers general information about surgical treatment and situations can vary in different countries.

Transurethral resection of the prostate (TURP)

TURP is the standard surgery for BPE. The aim is to remove the part of the prostate which causes the symptoms. The procedure is done through the urethra without making an incision in your lower abdomen (**Fig. 7**). This type of surgery is known as minimally invasive treatment.

How is TURP performed?

For TURP you will receive general or spinal anaesthesia. Once you are under anaesthesia, the doctor uses a resectoscope to enter the bladder through the urethra. This is a type of endoscope with a wire loop which uses a high-frequency

! Interesting Fact

TURP has been performed since the 1930s and it has become the standard treatment option in the last 40 years. It has greatly improved in the past decade because of new technologies.

! Interesting Fact

In the early days, the doctor had to look directly into the endoscope to see the prostate. Nowadays, the camera projects a magnified image onto the video monitor in front of the doctor. Because of high-definition technology, the doctor can see even the smallest details.

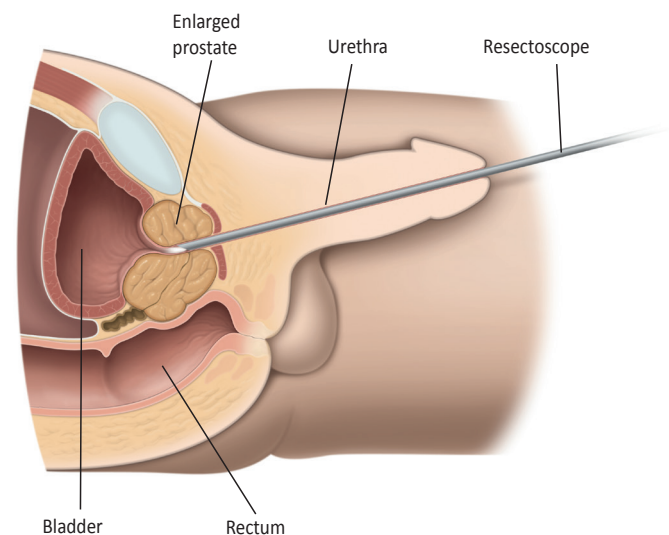
electrical current to cut the prostate tissue. The resectoscope also has a camera which allows the doctor to see a high-quality image of the prostate on a video monitor.

During the procedure, the doctor removes the adenoma in small parts with the wire loop (**Fig. 8**). The doctor then flushes the cut tissue out of the bladder and the urethra through the resectoscope.

After the operation a catheter is placed in your bladder to drain urine. It is also used to continuously flush your bladder and urethra with sterile solution to prevent blood clots. You will need the catheter for 1-3 days until the urethra is healed and you can urinate on your own.

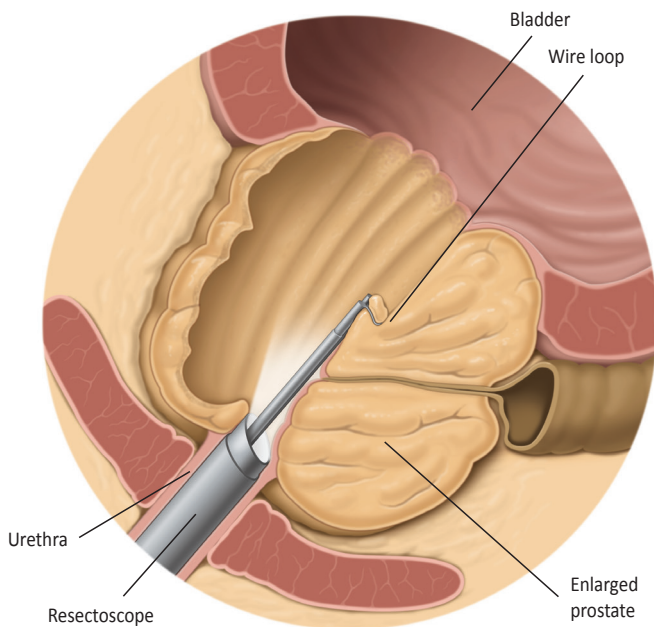
When should I consider TURP?

Today, TURP is the preferred surgical option for men with moderate to severe symptoms caused by BPE. It is most suited for men with prostates between 30-80 millilitres (ml).



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Fig. 7: Surgery through the urethra.



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Fig. 8: The resectoscope removes parts of the prostate tissue during TURP.

You need to go to the doctor or go back to the hospital right away if you:

- Develop a fever
- Are unable to urinate on your own
- Have heavy blood loss or pain

Advantages of TURP

- The procedure is safe and widely used
- Optimal and long-lasting improvement of the symptoms
- Short hospital stay

Disadvantages of TURP

- Risk of bleeding
- Risk of retrograde ejaculation
- Risk of urethral stricture
- Risk of urinary retention
- Low risk of urinary tract infection and urgency
- Very low risk of incontinence

How do I prepare for the procedure?

Your doctor will advise you in detail about how to prepare for the procedure. You must not eat, drink, or smoke for 6 hours before surgery to prepare for the anaesthetic. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it several days before surgery.

How long will it take me to get back to my daily activities?

Usually, you can leave the hospital 2 or 3 days after surgery. The length of hospital stay can vary in different countries. There may be some blood in your urine for several days. You may also suffer from urgency and feel pain when you urinate, which can last up to several weeks.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms (kg)
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. After TURP, you may suffer from retrograde ejaculation. This is a chronic condition where semen can no longer leave through the urethra during orgasm. Instead it goes into the bladder and later leaves your body during urination.

Transurethral incision of the prostate (TUIP)

TUIP is effective in men with prostates smaller than 30 millilitres (ml) who do not suffer from severe obstruction. This procedure is rarely used for the treatment of BPE because it has the same results as drug treatment. TUIP is recommended if you cannot tolerate drugs for BPE symptoms.

During TUIP, the doctor cuts into the prostate through the bladder neck with a resectoscope to improve the flow of urine. After the operation a catheter is placed in your bladder to drain urine. The catheter is also used to continuously flush your bladder and urethra with sterile solution to prevent blood clots.

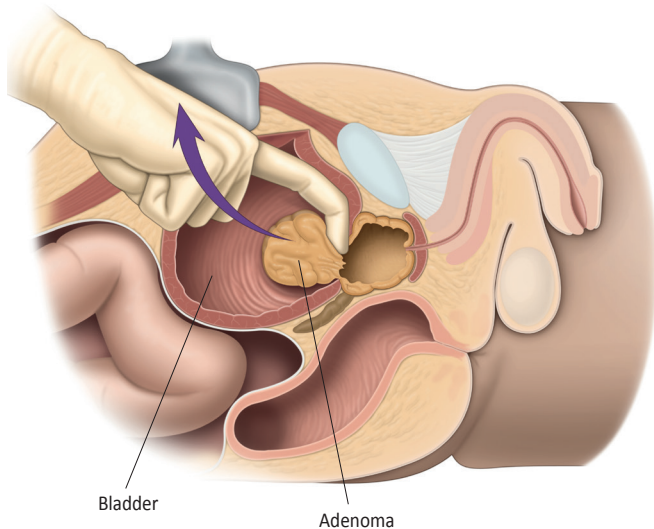
Open prostatectomy

Open prostatectomy is an operation which is done by making an incision in the lower part of the abdomen. Because TURP has similar or better results, open prostatectomy is now only done in selected situations.

How is open prostatectomy performed?

For open prostatectomy you will receive general or spinal anaesthetic. During the operation the surgeon cuts into the lower abdomen to reach the bladder and the prostate. The

surgeon then uses his finger to remove the adenoma (**Fig. 9**). After the operation a catheter will drain the urine. It is also used to continuously flush your bladder and urethra with sterile solution to prevent blood clots. You will need the catheter for several days until the wound is healed and you can urinate on your own.



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Fig. 9: The surgeon removes the adenoma during open prostatectomy.

When should I consider open prostatectomy?

Open prostatectomy is recommended if your prostate is larger than 80 millilitres (ml) because other types of surgery would take more time to achieve the same result. Your doctor may also recommend open prostatectomy if you have bladder stones or a condition called bladder diverticulum.

How do I prepare for the procedure?

Your doctor will advise you in detail about how to prepare for the procedure. You must not eat, drink, or smoke for 6 hours before surgery to prepare for the anaesthetic. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it several days before surgery.

! Interesting Fact

Open prostatectomy was a major breakthrough in early 1900s when prostate surgery was first pioneered. Although it has been replaced by TURP as the gold standard treatment, open surgery is still recommended for the treatment of very large prostates.

How long will it take me to get back to my daily activities?

Usually you can leave the hospital 5 to 7 days after surgery. The length of hospital stay can vary in different countries. There may be some blood in your urine for several days. You may also suffer from urgency and feel pain when you urinate. It will take several weeks to completely recover from the surgery.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. After open prostatectomy, you may suffer from retrograde ejaculation. This is a chronic condition where semen can no longer leave through the urethra during orgasm. Instead it goes into the bladder and later leaves your body during urination.

Advantages of open prostatectomy

- Optimal and long-lasting improvement of the symptoms

Disadvantages of open prostatectomy

- Will leave a scar
- Longer hospital stay
- Longer use of catheter
- Significant bleeding may occur
- Risk of urinary retention, urinary tract infection and urgency
- Risk of bladder neck stricture
- Very low risk of urinary incontinence

Laser treatment

Laser treatment is a common treatment option for BPE. The laser uses intensive light to cut or vaporise the prostate tissue. At the same time, the heat from the laser is used to close blood vessels. This is why only a small amount of blood is lost during this type of surgery.

There are two main types of laser surgery for BPE:

- Laser vaporisation of the prostate
- Laser enucleation of the prostate

These types of surgery can be done with different laser systems. The choice of the laser depends on the expertise of your doctor and what is available in your hospital.

Laser vaporisation of the prostate

How is laser vaporisation performed?

For laser vaporisation you will receive general or spinal anaesthetic. Once you are under anaesthesia, the doctor uses a resectoscope to enter the bladder through the urethra without making an incision in your lower abdomen (**Fig. 7**). The resectoscope has a laser for vaporisation and a small camera. The camera allows the doctor to see a high-quality image of the prostate on a video monitor.

During the procedure, the laser heats up a small part of the prostate. When the tissue reached boiling point it starts to vaporise. In this way, the whole prostate can be treated (**Fig. 10**). After the operation a urinary catheter will be placed in your bladder to drain urine. It is also used to continuously flush your bladder and urethra with sterile solution to prevent blood clots. You will need the catheter for some days until the urethra is healed and you can urinate on your own.

When should I consider laser vaporisation of the prostate?

Vaporisation may be an option if your prostate is smaller than 80 millilitres (ml). Because vaporisation causes very little blood loss, it is recommended for men who need to take blood-thinning medication for other conditions.

How do I prepare for the procedure?

Your doctor will advise you in detail about how to prepare for the procedure. You must not eat, drink, or smoke for 6 hours

before surgery to prepare for the anaesthetic. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it before surgery.

How long will it take me to get back to my daily activities?

Usually you can leave the hospital 1 or 2 days after surgery. The length of hospital stay can vary in different countries. There may be some blood in your urine and you may feel pain when you urinate. This can last up to several weeks.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms (kg)
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. Your semen may be stained with blood for a few weeks. After laser vaporisation, you may suffer from retrograde ejaculation. This is a chronic condition where semen can no longer leave through the urethra during orgasm. Instead, it goes into the bladder and later leaves your body during urination.

You need to go to the doctor or go back to the hospital right away if you:

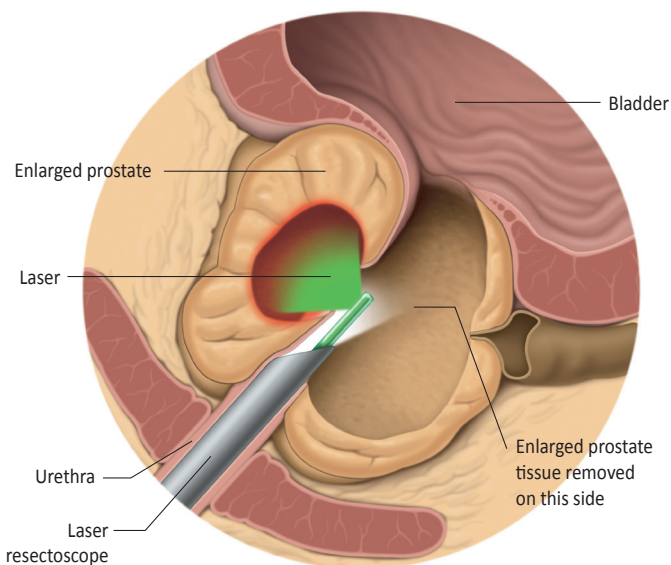
- Develop fever
- Are unable to urinate on your own
- Have heavy blood loss or pain

Advantages of laser vaporisation

- Immediate improvement of the urine flow
- Short hospital stay
- Shorter period of using a catheter
- Low risk of complications
- No need to stop blood-thinning medication

Disadvantages of laser vaporisation

- Less effective for very large prostates
- Painful urination for some time after the surgery
- May need another surgery after several years because the prostate continues to grow
- It is not possible to analyse the prostate tissue after the surgery
- Risk of urinary retention, urinary tract infection and urgency
- Very low risk of urinary incontinence



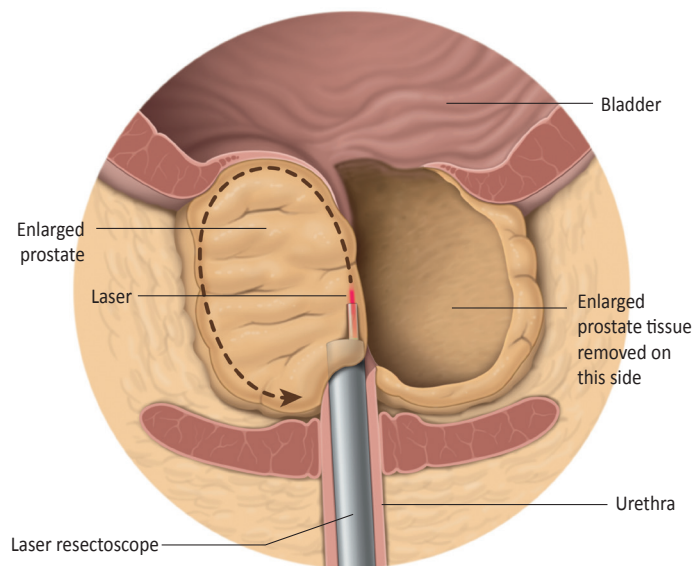
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Fig. 10: The heat from the laser vaporises parts of the prostate tissue.

Laser enucleation of the prostate

How is laser enucleation performed?

For laser enucleation you will receive general, spinal, or intravenous anaesthetic. Once you are under anaesthetic, the doctor uses a resectoscope to enter the bladder through the urethra without making an incision in your lower abdomen (Fig. 7). The resectoscope has a small camera through which the doctor can see the prostate. During laser enucleation the doctor uses the laser to cut prostate tissue and in this way the whole prostate can be treated (Fig. 11). The doctor then uses an instrument known as morcellator to flush the cut tissue out of your body through the bladder and the urethra.



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Fig. 11: The laser cuts out parts of the prostate tissue during laser enucleation.

After the operation a urinary catheter is placed in your bladder to drain urine. It is also used to continuously flush your bladder and urethra with sterile solution to prevent blood clots. You will need the catheter for some days until the urethra is healed and you can urinate on your own.

When should I consider laser enucleation of the prostate?

If your prostate is over 80 millilitres (ml), laser enucleation may be the best option for you, because it removes the whole adenoma. This type of surgery is also a good option for men with smaller prostates.

Laser enucleation is suitable for men who take blood thinning medication such as warfarin, heparin, aspirin, and clopidogrel for other conditions. It is important to discuss your individual situation with your doctor.

How do I prepare for the procedure?

Your doctor will advise you in detail about how to prepare for the procedure. You must not eat, drink, or smoke for 6 hours before surgery to prepare for the anaesthetic. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it before surgery.

How long will it take me to get back to my daily activities?

Usually you can leave the hospital 1 or 2 days after surgery.

The length of hospital stay can vary in different countries.

There may be some blood in your urine and you may feel pain when you urinate. This can last up to several weeks.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms (kg)
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. Your semen may be stained with blood for a few weeks. After laser enucleation, you may suffer from retrograde ejaculation. This is a chronic condition where semen can no longer leave through the urethra during orgasm. Instead it goes into the bladder and later leaves your body during urination.

You need to go to the doctor or go back to the hospital right away if you:

- Develop a fever
- Are unable to urinate on your own
- Have heavy blood loss or pain

Advantages of laser enucleation

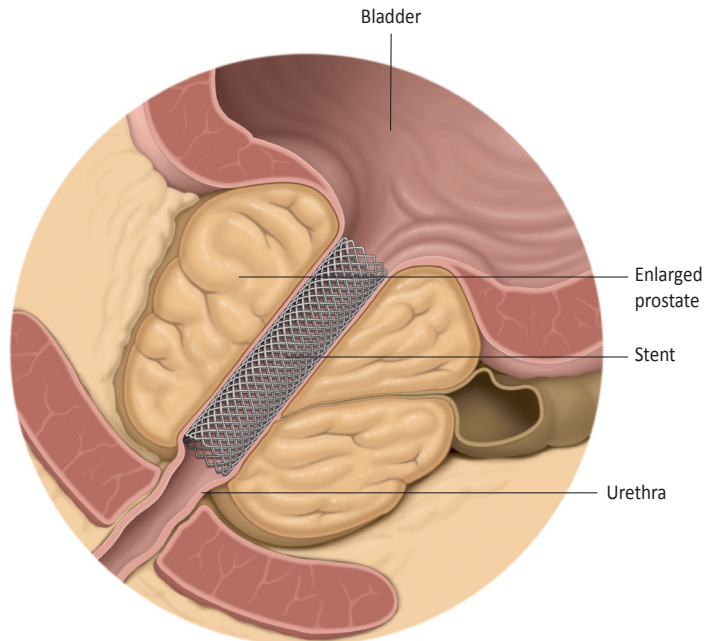
- Immediate improvement of the urine flow
- Short hospital stay
- Shorter period of using a catheter
- Low risk of complications
- Effective for all prostates, especially for large ones
- It is possible to analyse the prostate tissue after the surgery

Disadvantages of laser enucleation

- Surgery may take longer for small prostates
- Painful urination for some time after the surgery
- Risk of urinary retention, urinary tract infection and urgency
- Very low risk of urinary incontinence

Prostate stents

Prostate stents are used to keep the urethra open which improves the flow of urine (**Fig. 12**). Stents are mainly recommended for men who are not fit for surgery but who are still able to empty the bladder on their own. They are used instead of an indwelling catheter.



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Fig. 12: A prostate stent improves the flow of urine.

How is the stent inserted?

The stent can be placed in the doctor's office or a clinic under local anaesthetic. It is inserted into the urethra until the tip reaches the bladder (**Fig. 7**). The correct position is checked with an ultrasound or a cystoscope.

When should I consider getting a stent?

Today, stents are not recommended as a permanent treatment option. You should consider stents only if you cannot tolerate anaesthetic which is needed for surgery.

How do I prepare for the procedure?

Your doctor will advise you in detail how to prepare for the procedure. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it before the procedure.

How long will it take me to get back to my daily activities?

Usually, you can go back to your daily activities on the day of the procedure. There may be some blood in your urine and

you may feel pain when you urinate. This can last up to several weeks.

You need to go to your doctor or the hospital right away if you:

- Develop a fever
- Are unable to urinate on your own
- Have heavy blood loss or pain

Advantages of stents

- Can be used instead of an indwelling catheter
- No hospital stay
- Local anaesthetic

Disadvantages of stents

- The stent may shift
- Painful urination for some time after the procedure
- May fail to improve the flow of urine
- Low risk of urinary incontinence
- Risk of stone formation on the stent

Transurethral needle ablation (TUNA)

Transurethral needle ablation (TUNA) of the prostate is a minimally invasive treatment which uses heat to harden parts of the prostate tissue. This process is called coagulation. The treated part of the prostate is either absorbed by the body or it passes with urine after the procedure. The aim of TUNA is to reduce the prostate volume and to improve the symptoms.

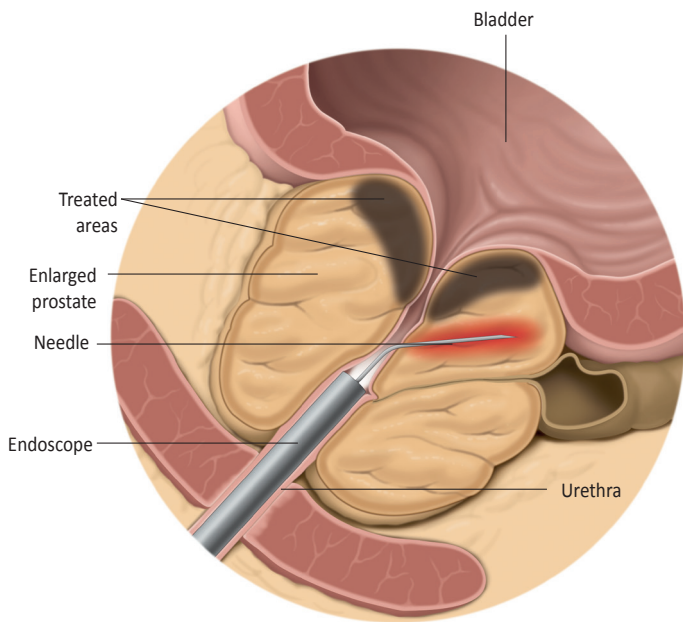
How is TUNA performed?

For TUNA you will receive intravenous, spinal, or local anaesthetic. Once you are under anaesthesia, the doctor uses a resectoscope to enter the bladder through the urethra. The doctor uses an endoscope which has two needles and a camera. The needles are used to puncture the prostate and to heat up the tissue with radiofrequency energy (**Fig. 13**). This is done 4 to 8 times to treat the whole adenoma. The camera allows the doctor to see a high-quality image of the prostate on a video monitor.

You will need a catheter for some days until the urethra is healed and you can urinate on your own. The catheter is removed by the urologist at the hospital or clinic.

When should I consider having TUNA?

TUNA is advised for men with a prostate between 30 to 80 millilitres (ml), who prefer minimally invasive treatment or who are not fit to have surgery because of other medical conditions.



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Fig. 13: The needle heats up the prostate tissue with radiofrequency energy.

You need to go to the doctor or go back to the hospital right away if you:

- Develop a fever
- Face problems with the catheter
- Cannot urinate on your own after the catheter is removed

Advantages of TUNA

- No hospital stay in most cases
- Low risk of complications
- No need to stop blood-thinning medication

Disadvantages of TUNA

- Less effective for large prostates and in case of severe obstruction
- Use of catheter at home for several days after the procedure
- Slow improvement of symptoms and the flow of urine
- May need another treatment after several years because the prostate continues to grow

How do I prepare for the procedure?

Your doctor will advise you in detail about how to get ready for the procedure. To prepare for the anaesthetic you should not eat, drink, or smoke for 6 hours before the procedure. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it.

How long will it take me to get back to my daily activities?

Usually, you can leave the hospital or clinic a few hours after TUNA. Do not drive a car when leaving the hospital because you may still be drowsy after the anaesthetic. Make sure you get enough rest on the day of the procedure.

With the catheter still in your urethra, you can start getting back to your daily activities the next day. Your urine may contain traces of blood which can last up to several weeks.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms (kg)
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. Your semen may be stained with blood for a few weeks.

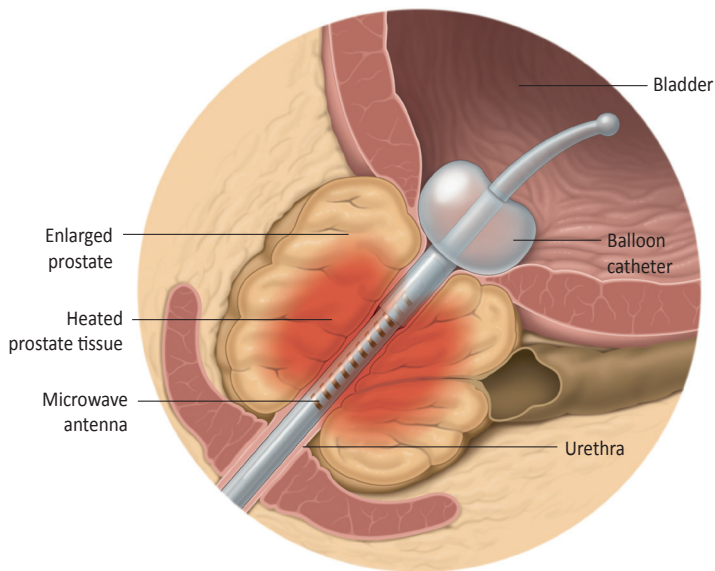
Transurethral microwave therapy (TUMT)

Transurethral microwave therapy (TUMT) of the prostate is minimally invasive treatment which uses microwave energy to harden parts of the prostate tissue. This process is called coagulation. The treated part of the prostate is either absorbed by the body or it passes with urine after the procedure. The aim of TUMT is to reduce the prostate volume and to improve the symptoms.

How is TUMT performed?

For TUMT you will receive local anaesthesia which is sometimes combined with intravenous anaesthetic. Once you are under anaesthetic, the doctor uses a resectoscope to enter the bladder through the urethra which has a microwave antenna and a balloon. The antenna heats up the prostate tissue with microwave energy and the balloon keeps the antenna in place inside the prostate (Fig. 14). After the procedure a different catheter will be placed in your bladder to help you urinate.

You will need this catheter for some days until the urethra is healed and you can urinate on your own. The catheter is removed by the urologist at the hospital or clinic.



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Fig. 14: The heat generated by the microwave antenna coagulates parts of the enlarged prostate tissue.

When should I consider TUMT?

TUMT is recommended for men with a prostate between 30 to 100 millilitres (ml) who prefer minimally invasive treatment or do not wish to have surgery because of other medical conditions.

How do I prepare for the procedure?

Your doctor will advise you in detail about how to get ready for the procedure. To prepare for the anaesthetic you should not eat, drink, or smoke for 6 hours before the procedure. If you are taking any prescribed medication, discuss it with your doctor. You may need to stop taking it before TUMT.

How long will it take me to get back to my daily activities?

In most cases you can leave the hospital a few hours after TUMT. Do not drive a car when leaving the hospital because you may still be drowsy after the anaesthetic. Make sure you get enough rest on the day of the procedure.

With the catheter still in your urethra, you can start getting back to your daily activities the next day. Your urine may contain traces of blood which can last up to several weeks.

For 4-6 weeks after the surgery:

- Drink 1-2 litres every day, especially water
- Do not lift anything heavier than 5 kilograms (kg)
- Do not do any heavy exercise and avoid bike riding
- Do not take thermal baths or go to the sauna
- Prevent constipation by adapting your diet
- Discuss any prescribed medication with your doctor

Avoid having sex for 2-3 weeks. Your semen may be stained with blood for a few weeks.

You need to go to the doctor or go back to the hospital right away if you:

- Develop a fever
- Face problems with the catheter
- Are unable to urinate on your own after the catheter has been removed

Advantages of TUMT

- Is performed under local anaesthesia
- No hospital stay in most cases
- Low risk of complications
- No need to stop blood-thinning medication

Disadvantages of TUMT

- Less effective for large prostates and in case of severe obstruction
- Use of catheter at home for several days after the procedure
- Slow improvement of symptoms and the flow of urine
- May need another treatment after several years because the prostate continues to grow

Intra-prostatic ethanol and botulinum toxin injections

Today, ethanol and botulinum toxin injections are explored as possible treatment options for BPE. They may become accepted in the future, but today they are still experimental and are usually used in clinical trials.

Intra-prostatic ethanol injections

Ethanol, which is pure alcohol, is injected through the urethra or the rectum into the prostate tissue. The aim is to reduce the size of the prostate and improve the flow of urine.

Intra-prostatic botulinum toxin injections

Botulinum toxin is widely known by one of its trade names Botox. It is a strong toxic substance which is used in cosmetic surgery. In BPE treatment it blocks nerve endings and relaxes the smooth muscle in the prostate.

Botulinum toxin reduces the size of the prostate and improves the flow of urine. It can be injected through the urethra, the rectum, or the perineum. Recent studies do not support the use of botulinum toxin for the treatment of lower urinary tract symptoms in men with BPE.

Living with BPE

Many men with BPE have to deal with lower urinary tract symptoms (LUTS) as they grow older. For some, this causes a lot of unhappiness and bother, while others experience only mild discomfort.

What's more, different people can experience the same symptoms differently. For example, one man can suffer greatly from waking up at night to urinate while another may hardly be affected by it. That is why your personal experience and your quality of life should not be underestimated. They are as important as diagnostic tests and treatment results.

Quality of life involves both physical and psychological health. It is important not only to feel healthy but also to feel free of the psychological pressure of living with BPE. There are many ways to keep the symptoms under control. They should not stop you from being happy in your relationships and participating in all aspects of your life. Seek help if your symptoms bother you: consult your family doctor, general practitioner, or a urologist.

Effects on your social life

Symptoms associated with BPE, such as urgency or the need to urinate often, can have a negative effect on your social life. Some men suffer so much from these symptoms that they avoid all social activities. They are afraid to find themselves in a situation where there is no toilet nearby. Furthermore, losing sleep because of the need to urinate at night may lower energy levels and make it more difficult to maintain daily activities.

Avoiding social activities may seem the easiest way to deal with the problem, but it can lead to isolation and prevent you from fully enjoying your social life. Get professional advice from your urologist, who can help you to deal with your symptoms.

Personal relationships and sex

Symptoms caused by BPE can have a negative effect on your personal relationships and sex life. It can be difficult to feel attractive and confident or be intimate with your partner

when you do not always feel in control of your body. Episodes of incontinence or urgency can be embarrassing and lower your self-esteem. Side effects of drug treatment such as lack of sexual drive or erectile dysfunction can also add to these feelings.

These changes can be very difficult to deal with because for most men sexuality remains important throughout their whole life. Some men may even go into denial or suffer from depression. That is why the effect of BPE on the quality of life should not be underestimated.

Living with BPE is not only challenging for you but also for your partner. Your intimacy as well as your daily interaction may be affected. Your partner may suffer without saying much, so it is very important that you openly discuss the best way to cope with this condition.

It may be uncomfortable to discuss your sex life with a urologist, but it is the most effective way to deal with your concerns. Together with your partner and your urologist you can identify what is important in your sex life and choose the best treatment option. There are many ways to relieve your symptoms and improve your sex life, which will make it easier to live with BPE.

Seeking help

Lower urinary tract symptoms (LUTS), especially if they are very bothersome, are a very intimate and private condition. Many men choose not to discuss it with anybody or not to go to their doctor because they:

- Are afraid they may have an incurable disease
- Are worried about a wrong diagnosis
- Do not have easy access to a doctor
- Have had a negative experience in the hospital
- Have friends or relatives who had a negative experience when treated for a similar condition
- Do not know about possible treatment options
- Have financial issues
- Feel isolated because of their age or condition

While these reasons may seem convincing, they should not prevent you from seeking help and improving your quality of life. Do not let a prostate condition rule your life.

Questions to ask your doctor

You may have a lot of questions about your condition. EAU Patient Information on BPE covers many of these questions but it does not deal with your personal situation. Your

* The underlined terms are listed in the glossary.

urologist is the best person to discuss this with and you should not feel embarrassed about addressing any of your concerns.

Here are some of the questions you may ask your doctor:

- What are my test results and what do they mean?
- Do I have cancer?
- Why is this happening to me?
- What will happen in the next months and years if I don't get treatment?
- What will happen in the next months and years if I do get treatment?
- Why do you recommend this treatment option for me?
- What can I expect from that treatment?
- Will it cure my condition?
- How long will I need to be treated for?

Glossary of terms

Adenoma

The enlarged part of the prostate (see also Prostate)

Anaesthesia (general, spinal, or local)

Before a procedure you will get medication to make sure that you don't feel pain. Under general anaesthesia you are unconscious and unaware of what is happening to you. Under spinal or local anaesthesia you will not feel pain in the part of your body where the procedure is done. Anaesthesia wears off gradually after the procedure.

Bladder

Organ which collects urine from the kidneys

Contraindications

Symptoms or conditions which makes a certain treatment option undesirable

Cystoscope

A type of endoscope which is used in the urethra (see also Endoscope, Urethra)

Endoscope

A tube-like instrument to examine the inside of the body. Can be flexible or rigid.

Erectile dysfunction

The inability to get or keep an erection

Indwelling catheter

A tube placed in the urethra and bladder to help you urinate

LUTS

Lower urinary tract symptoms. A term used for the symptoms caused by BPE which can also point to other diseases affecting the urinary tract (see also Urinary tract).

Micturition

Urination

Minimally invasive procedure

A surgical procedure where there is no need to make an incision in the body. An endoscope is used to reach the part of the body that needs to be treated through the urethra (see also endoscope).

Physical

Having to do with or affecting the body

Prostate

The gland which produces the fluid which carries semen. It is located in the male lower urinary tract, under the bladder and around the urethra (see also Bladder, Lower urinary tract, Urethra).

PSA (prostate-specific antigen)

A protein produced by the prostate which may increase in men with a benign prostatic enlargement, prostatic inflammation, or prostate cancer

Psychological

Having to do with or affecting the mind

Resectoscope

A type of endoscope used for minimally invasive treatment of BPE

Retrograde ejaculation

A condition when semen can no longer go through the urethra during orgasm but goes into the bladder instead. The semen later leaves the body during urination.

Ultrasonography

Imaging technique that uses high-frequency sounds to make an image of the inside of the body

Ultrasound

see Ultrasonography

Urethra

The tube which carries urine from the bladder and out of the body

Urgency

The sudden need to urinate

Urinary incontinence

Involuntary loss of urine

Urinary retention

When you are unable to urinate. This condition can be chronic.

Glossary of terms

Urinary tract

The organ system which produces and transports urine through and out of the body. It includes two kidneys, two ureters, the bladder and the urethra. The urinary tract is similar in men and women, only men have a longer urethra.

Urination

Urination is the release of urine from the urinary bladder through the urethra to the outside of the body.

Urologist

A doctor specialised in health and diseases of the urinary tract and the genitals

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