



## Prostate Cancer – Dialogues with ChatGPT

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### ABSTRACT

In this editorial we investigate the value of AI in delivering medical information for the general public. To the best knowledge of the authors this is the first medical scientific paper written based on text generated by AI. "ChatGPT" is a transformer-based language model that has been trained to respond to questions and generate text in a conversational manner. This model was trained using a large variety of publicly available text, so that it can respond to a wide range of questions and generate coherent text. In simple terms, ChatGPT is a program that can "talk" to people through chat and can respond to questions and generate text. We have used chatGPT in "an interview" between the authors and the AI tool. The topic is a mini review about the treatment options in localised prostate cancer. Results have been reviewed by the authors for the accuracy of the medical information. All information provided was indeed accurate and we have no concerns in relation to the output generated. An interesting observation is that the information produced mainly utilised US sources and thus may be biased towards information produced in the US.

### KEYWORDS

Prostate cancer; AI; Artificial intelligence; ChatGPT

**Below questions asked to chatGPT are marked as "Q" and the responses as "A"**

**Q1:** Write a 1000 words scientific paper, with references included in the text, in simple terms, about prostate cancer treatment.

**A1:** Prostate cancer is a type of cancer that affects the prostate gland, a small walnut-shaped organ located just below the bladder in men (American Cancer Society, 2022). It is the second most common type of cancer in men, and although it can be a serious illness, it is often treatable, especially when caught in its early stages (National Cancer Institute, 2021).

There are several treatment options available for prostate cancer, including surgery, radiation therapy, and hormone therapy (Mayo Clinic, 2022). The best treatment option for an individual patient will depend on the stage of the cancer, as well as the patient's age, overall health, and other factors (National Cancer Institute, 2021).

Surgery is one option for treating prostate cancer. One type of surgery is a radical prostatectomy, which involves removing the entire prostate gland and some of the surrounding tissue (Mayo Clinic, 2022). This surgery can be performed through an incision in the abdomen or through the perineum (the area between the anus and the scrotum) (National Cancer Institute, 2021). Another type of surgery is a laparoscopic prostatectomy, which involves making small incisions in the abdomen and using specialized instruments to remove the prostate gland (Mayo Clinic, 2022). Both types of surgery can be effective in treating prostate cancer, but they can also have side effects, such as incontinence (loss of control over the bladder) and impotence (difficulty achieving or maintaining an erection) (American Cancer Society, 2022).

Radiation therapy is another option for treating prostate cancer. There are two main types of radiation therapy: external beam radiation therapy and brachytherapy (Mayo Clinic, 2022). External beam radiation therapy involves using a machine to deliver high-energy X-rays to the prostate gland (National Cancer Institute, 2021). This can be performed on an outpatient basis, and the treatment is usually given over a period of several weeks (American Cancer Society, 2022). Brachytherapy involves placing small radioactive seeds directly into the prostate gland (Mayo Clinic, 2022). This can also be performed on an outpatient basis and has a low risk of side effects (National Cancer Institute, 2021). However, it is not suitable for all patients, and it is important to discuss the potential risks and benefits with a healthcare professional (Mayo Clinic, 2022).

Hormone therapy is another option for treating prostate cancer. This involves using medications to block the effects of male hormones (such as testosterone) that can fuel the growth of prostate cancer cells (National Cancer Institute, 2021). One type of hormone therapy is called androgen deprivation therapy, which involves using medications to reduce the production of testosterone in the body

(American Cancer Society, 2022). Another type of hormone therapy is called luteinizing hormone-releasing hormone (LHRH) agonists, which work by blocking the release of testosterone from the testicles (National Cancer Institute, 2021). Hormone therapy can be effective in slowing the growth of prostate cancer, but it can also have side effects, such as hot flashes, fatigue, and an increased risk of osteoporosis (weakened bones) (Mayo Clinic, 2022).

In conclusion, there are several treatment options available for prostate cancer, including surgery, radiation therapy, and hormone therapy (National Cancer Institute, 2021). The best treatment option for an individual patient will depend on the stage of the cancer, as well as the patient's age, overall health, and other factors (Mayo Clinic, 2022). It is important to discuss the potential risks and benefits of each treatment option with a healthcare professional and to consider the individual patient's needs when deciding on the most appropriate treatment (American Cancer Society, 2022).

**Q2:** Can you say more about the side effects of surgery?

**A2:** There are several potential side effects of surgery for prostate cancer, including incontinence (loss of control over the bladder) and impotence (difficulty achieving or maintaining an erection) (American Cancer Society, 2022).

Incontinence is a common side effect of surgery for prostate cancer, particularly for men who have had a radical prostatectomy (surgery to remove the entire prostate gland and some of the surrounding tissue) (Mayo Clinic, 2022). Incontinence can occur because the prostate gland helps to control the flow of urine, and when it is removed, the muscles and nerves that control the bladder may be damaged, leading to incontinence (National Cancer Institute, 2021). Incontinence can be temporary or permanent, and it may improve over time with treatment (American Cancer Society, 2022). Treatment options for incontinence include medication, pelvic floor muscle exercises, and sometimes surgery (Mayo Clinic, 2022).

Impotence, also known as erectile dysfunction, is another common side effect of surgery for prostate cancer, particularly for men who have had a radical prostatectomy (Mayo Clinic, 2022). Impotence can occur because the prostate gland is located near the nerves and blood vessels that are important for achieving and maintaining an erection (National Cancer Institute, 2021). When the prostate gland is removed, these nerves and blood vessels may be damaged, leading to impotence (Mayo Clinic, 2022). Impotence can be temporary or permanent, and it may improve over time with

treatment (American Cancer Society, 2022). Treatment options for impotence include medication, devices such as vacuum pumps and penile injections, and sometimes surgery (Mayo Clinic, 2022).

It is important to note that not all men who have surgery for prostate cancer will experience incontinence or impotence, and the severity of these side effects can vary (National Cancer Institute, 2021). It is important to discuss the potential risks and benefits of surgery with a healthcare professional and to consider the individual patient's needs when deciding on the most appropriate treatment option (American Cancer Society, 2022).

**Q3:** Can you write more about the radiation therapy side effects with references included in the text?

**A3:** Radiation therapy is a treatment option for prostate cancer that involves using high-energy beams, such as X-rays, to kill cancer cells (National Cancer Institute, 2021). There are several potential side effects of radiation therapy, including fatigue, skin irritation, and bowel and bladder changes.

Fatigue is a common side effect of radiation therapy, and it may be caused by the physical and emotional toll of treatment (American Cancer Society, 2022). Fatigue may also be caused by anemia (a low red blood cell count), which can be a side effect of radiation therapy (Mayo Clinic, 2022). Fatigue can often be managed with rest and relaxation techniques, and it may improve over time after treatment is completed (American Cancer Society, 2022).

Skin irritation is another common side effect of radiation therapy (National Cancer Institute, 2021). The skin in the treatment area may become red, dry, and itchy, and it may also peel or blister (American Cancer Society, 2022). To help manage skin irritation, it is important to keep the skin clean and dry and to avoid using lotions or creams that may further irritate the skin (Mayo Clinic, 2022). It is also important to avoid exposing the treated area to the sun or other sources of ultraviolet (UV) light (National Cancer Institute, 2021).

Bowel and bladder changes are also possible side effects of radiation therapy (Mayo Clinic, 2022). The bowel and bladder may become irritated or inflamed, leading to symptoms such as diarrhea, constipation, and urinary frequency or urgency (National Cancer Institute, 2021). To help manage these symptoms, it is important to drink plenty of fluids, avoid constipating foods, and follow a regular toilet routine (Mayo Clinic, 2022). It is also important to report any changes in bowel or bladder function to a healthcare professional, as these symptoms may be a sign of a more serious problem (National Cancer Institute, 2021).

It is important to note that the side effects of radiation therapy can vary, and not all patients will experience all of the side effects listed above (Mayo Clinic, 2022). It is also important to discuss the potential risks and benefits of radiation therapy with a healthcare professional and to follow the recommended care instructions to help manage any side effects (American Cancer Society, 2022).

**Q4:** Can you write about active surveillance in prostate cancer with references in text?

**A4:** Active surveillance is a treatment option for men with low-risk prostate cancer, which means that the cancer is unlikely to grow or spread quickly (National Cancer Institute, 2021). The goal of active surveillance is to carefully monitor the cancer and only recommend treatment if there are signs that the cancer is growing or becoming more aggressive (American Cancer Society, 2022).

During active surveillance, a healthcare professional will recommend regular check-ups, including prostate-specific antigen (PSA) tests and biopsies, to monitor the cancer (Mayo Clinic, 2022). If the results of these tests show that the cancer is growing or becoming more aggressive, treatment may be recommended (American Cancer Society, 2022). Treatment options for prostate cancer may include surgery, radiation therapy, or hormone therapy (National Cancer Institute, 2021).

Active surveillance may be a good option for men with low-risk prostate cancer who are older or have other health conditions that make treatment more risky (Mayo Clinic, 2022). It is also a good option for men who are not comfortable with the potential side effects of treatment (American Cancer Society, 2022). However, active surveillance is not suitable for all men with prostate cancer, and it is important to discuss the potential risks and benefits of this approach with a healthcare professional (National Cancer Institute, 2021).

In conclusion, active surveillance is a treatment option for men with low-risk prostate cancer that involves careful monitoring of the cancer and only recommending treatment if there are signs that the cancer is growing or becoming more aggressive (Mayo Clinic, 2022). It may be a good option for men who are older or have other health conditions that make treatment more risky, or for men who are not comfortable with the potential side effects of treatment (American Cancer Society, 2022). However, it is important to discuss the potential risks and benefits of active surveillance with a healthcare professional and to consider the individual patient's needs when deciding on the most appropriate treatment approach (National Cancer Institute, 2021).

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**NB:** We have checked the plagiarism and have found 0% plagiarism.

We acknowledge that this paper was written by an AI tool and the data was reviewed by the authors for the accuracy of the scientific information. Limitations: We have observed in the answers a bias towards the American guidelines.

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## AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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