



## Review Article

# An Overview of Diagnosis to Survivorship of Prostate Cancer after Experiencing Radiotherapy



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### Abstract

Prostate cancer is virtually the most common type of cancer, leading to multiple complications within the male gender worldwide. However, prostatic complications have been increasing recently due to probable changes in lifestyles. Affected patients try every treatment technique to confront their cancer. Thus, radiation therapy has been demonstrated to be one of the most efficient lanes of long-term survivorship in men with malignant prostatic cancer. Although radiotherapy has the potential to seem irritating, due to the studies, metastasis-free survival, biochemical recurrence-free survival, and prostate cancer-specific survival have experienced a major increase in various cases of the disease. Subsequently, still, radiation therapy has revealed the superlative approach to avoiding the risk of cancer relapse and case mortalities. This manuscript would radically discuss novel approaches that could probably increase the lifespan and survivorship of patients owning to previous examinations.

### Introduction

Prostate cancer is considered the highest communal cancer analysis in male patients, with above 160,000 new-fangled circumstances per year in the United States. It still holds the third-place source of cancer mortality in male people worldwide.<sup>1</sup> Prostate cancer has been a communal malignancy amongst men in recent decades. Radical prostatectomy is a surgical treatment that could cure prostate cancer when it has no extent outdoor of the prostate gland.<sup>2</sup> A radical prostatectomy is a form of surgery that eliminates the whole prostate gland, consisting of the seminal vesicles and lymph nodes.<sup>3</sup> Radical prostatectomy aims to get rid of all cancer cells, in addition to reducing the adverse effects, concluding blood clots, infections, and other organ injuries.<sup>4</sup> Despite all the risks and side effects, a radical prostatectomy could increase life expectancy as well as the rate of survivors.<sup>5</sup> As medical therapies for prostate cancer progress, the effectiveness of surgery may appear less appropriate since it could be fatal as well.<sup>6</sup> Nevertheless, the various categories and mutations of prostate cancer could be the main reason that radical prostatectomy, which has a various spectrum of indications, will persist as a significant and appropriate selection for most men.<sup>7</sup> Likewise, considering the desire of human beings for survivorship, radical prostatectomy might be called one of

the most efficient procedures to treat prostate hyperplasia and, in general, could maintain great control of the cancer nowadays.<sup>8,9</sup> Overall, there are various types of radical prostatectomy, such as robotic surgery and open surgery.<sup>10</sup> The robotic prostate operation has a shorter recovery duration, with total recovery taking weeks. However, some side effects might remain for months.<sup>11,12</sup> A 2019 survey proved that robotic and laparoscopic radical prostatectomy would seem more operative and purposeful and found more convenient by patients.<sup>13</sup> Besides that, robotic and laparoscopic approaches might have fewer oncological consequences than open radical prostatectomy, which exhibits more delight and survivorship.<sup>14</sup> Moreover, a 2020 experiment established that robotic radical prostatectomy is more successful with fewer complications.<sup>15</sup> Anyhow, the treatment selection depends on individual preferences and the stage of the cancer. Between 1992 and 2008, 175 men experienced radical prostatectomy (experimental phase  $\geq$ T2c, biopsy Gleason mark 8–10, or prostate-exclusive antigen  $>20$  ng/m). The biochemical reappearance-free survival rate was 68%, metastasis-free persistence was 84%, and prostate cancer-explicit existence was 92%. The rate of clearance from any hormonal psychoanalysis was 71% over 10 years (Table 1).<sup>16–20</sup> In another investigation, in 11,521 patients from 1987 to 2005 to forecast prostate cancer death (Primary and secondary Gleason rating 4–5 (each  $P < 0.001$ ), the death rate of men with organ-narrowed, pathological Gleason score 6 or a lesser amount of 6 was only 0.3% (Table 1).<sup>17</sup> Patients who experienced radical prostatectomy for their prostate cancer without lymph node involvement but distributed beyond the prostate capsule into the seminal vesicles are at risk of cancer reappearance,<sup>21</sup> and radiotherapy with peripheral X-rays aiming at the pelvis, killing any prostate cancer cells and developing the chance of therapy, could be an appropriate option in these cases.<sup>22</sup>

**Keywords:** Prostate; Cancer; Radiotherapy; Survivorship; Prostatectomy; Relapse.  
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**Table 1. Therapeutic role of radiation therapy in patients**

Type of experiment	Length of follow-up time	CI	Gleason	Target group	Rate of survivorship	References
Radical prostatectomy(positive-specific-antigen)	16 years	68%	8–10	175 men	71%	16
Organ-defined radiotherapy	18 years	50%	4–5	11,521 men	99.7%	17
Local-restricted prostatectomy	5 years	31.5–38.5%	2–4	About 8000 men	97%	19
Organ-confined local radiotherapy	5 years	27.9–58.4%	8–10	About 2,500 men	95%	20
Cox model of radical prostatectomy specimen	10 years	3.53–3.66%	4–5	486 men	83–85%	18

CI, confidence interval.

In this review, a comprehensive analysis of survivorship in various aspects of prostate cancer following radiotherapy has been done. Due to the novelty of the article's main idea in the era of cancer survivorship, it would be a solid reference for researchers.

### Factors associated with prostate cancer survivorship

There are four necessary constituents of survivorship in cancer care: 1. Investigation of the recognition and cure of further malevolent relapse; 2. inhibition of misbehavioral way of life and making alterations to decline the symptoms of cancer; 3. intercession for concerns of cancer and its cure, containing medical and psychosocial influences; and 4. harmonization between experts and supporters to fulfill the entire survivorship procedure of cancer. Of course, this depends on the facing of patients with cancer complications and the scheme of the survivorship platform. However, prostate cancer is not an exception. Survivorship offers a series of complications, conferring to Joanne Lester, Ph.D., CRNP, ANPBC, AOCN®, an exploration researcher and oncology nurse consultant at the Ohio State University Comprehensive Cancer Center in Columbus. The complications are discomfort, distress, mental variations, skin and appearance switches, bone trauma, neuropathies, cardiomyopathy, exhaustion, sleeping disorders, gastrointestinal and genital irritations, sexuality and reproductive matters, and lymphedema. Patients might experience nervousness, strain, depression, and suicide. Also, there must be multiple plans for patients to select their desired approach. On the other hand, a treatment-specific clinic would focus on the cancer treatment steps, providing a sufficient background of survivorship inspiration. What makes a survivorship program convenient is determining which model would work for each type of cancer in different people. Also, the possibility of contracting prostate cancer increases as men age, specifically after 50 years old. Meanwhile, geography is also determining. White people and Asian people are at higher risk than others. Family history is essential too. Additionally, some genetic mutations are risk factors. Cancer survivorship is a multifaceted issue and requires several aspects of care. Survivorship overhaul provided for patients with prostate cancer necessitates multifunctional determination and teamwork.<sup>23</sup> For example, medical personnel can analyze cancer supportive care programs with patients, inform them about the suitable time to visit the medical center, inspire behaviors that do not cause cancer, and improve the welfare of cancer survivors.<sup>24</sup> Throughout an intermission from the earliest phases up to the most severe stages of prostate cancer cure, survivorship can last for four years, with sexual, urinary, and bowel dysfunction remaining. The early diagnosis of the malignancy is the most essential factor in increasing survivorship.<sup>25</sup> In 18 men within six months of experiencing prostate cancer, the obstacles of survivorship are less physi-

cal activity, lack of self-assurance during treatment, comorbidities, older age, and lack of motivation. The medical staff could provide guidance on exercising to maximize the number of survivors.<sup>26</sup> Among 13,507 cases in the first year of diagnosis, the primary care provider visits both throughout the treatment and for long-standing survivors were the most necessary for receiving preventive care.<sup>27</sup> A collection of 43 records and pieces of evidence from experiments prove that keeping a diet low in fat and high in fiber could be protective against cancer relapse and evolution, thus extending the rate of survivorship.<sup>28</sup> The data from 2,499 men gathered from the Michigan Prostate Cancer Survivor Study, with long-term prostate cancer survivors displaying severe symptoms, showed that more supportive care from their relatives and medical care center would lead to better outcomes for survivors.<sup>29</sup> Moreover, it is obligatory to follow up on the post-treatment signs of prostate cancer survivors in detail and accurately to maintain survivorship.<sup>30</sup> Notably, every cancer carries a significant financial burden for patients. Prostate cancer, which is common in men, involves double pressure since it not only causes financial stress but also unemployment, leading to financial hardship. Consequently, feeling inconvenienced about money will decrease survivorship.<sup>31</sup> Factors such as personality, primary treatment, each person's behavior through the problematic procedure and managing approach are predictors determining the amount of survivorship in prostate cancer.<sup>32</sup> Additionally, the role of the presence of spouses and partners is not negligible in the efficacy of survivorship. Those who had the company of their partners had more chances to survive.<sup>33</sup>

### Factors associated with prostate cancer survivorship after radiotherapy

Although operatives dealing with prostate cancer with radiotherapy and hormones raise survival, there are several features involving survivorship for the rest of their lives. Sexual activity under the supervision of an expert, current smoking, obesity, and living alone without any companions had negative effects ( $P < 0.001$ ). Overall health, social functioning, and the health of the treated hormonal domain have positive scores on survivorship after radiotherapy.<sup>34</sup> The long-standing survival of patients with high-risk prostate cancer was compared after two approaches: radical prostatectomy and external beam radiation therapy with or without adjuvant androgen-deprivation therapy. The survival rate was 92% after radical prostatectomy plus external beam radiation therapy and androgen deprivation therapy, and 88% after external beam radiation therapy alone ( $P < 0.001$ ). The choice of treatment was an essential factor in survivorship.<sup>35</sup> The degree of survivorship is associated with using salvage radiotherapy at lower prostate-specific antigen stages, containing cutbacks in breakpoint cluster region, Diabetes mellitus,

**Table 2. Recompenses and weaknesses of radiotherapy**

Advantages	References	Disadvantages	References
Complete cure by cell-targeting	49	No chance of other essential surgeries	61
No Pain	52	The compulsion of bladder evacuation	58
Dominant choice of most patients	51,52	Exhaustion	59
Less Invasive	50	The long process of efficacy	60
Less major side effects	55,56	Genital and sexual issues	59
Prevention of tumor growth	8,9	Damage to the surroundings	61
Increase in life quality and expectancy	51	Need for backup agenda	61
More procedure control	49	Only one chance of trial	61
Time-saving	53,54	Time-wasting	57

and cancer signaling and microenvironment, which reduces fatal issues during treatment.<sup>36</sup> Salvage radiotherapy performed for two years had a noticeable escalation in prostate cancer–precise survival among patients with a prostate-specific antigen doubling period of under six months, independent of other prophetic aspects like the Gleason score.<sup>37</sup> The severity of items like pain, fatigue, depression, and comorbidities, in addition to lifestyle factors, are the keys that must be monitored after radiotherapy to observe the chance of survivorship.<sup>38</sup> In a survey between 1991 and 2000 in 207 men, after monitoring for four years, external beam radiation therapy enhanced biochemical control in men with favorable features, resulting in a high survival percentage of 92% with low toxicity.<sup>39</sup> However, poor local control of the radiation-targeted area increases the chance of metastases and reduces survivors. Besides that, longer radiotherapy seems to provide more survivorship than short-course.<sup>40</sup> Overall survival after radiation therapy for prostate cancer can be extraordinary lasting for five years after biochemical failure. A prodigious survival ratio occurs even if men with biochemical failure have poorer than average pre-radiation predicting features.<sup>41</sup>

### Performing radical therapy for prostatic cancers

There are various methods and steps to implement the techniques which are mentioned below.

#### Localized prostate cancer radiotherapy

To treat local prostate cancer with energy rehabilitation, it is necessary to use hormone treatment intended for several months earlier and throughout radiation methodology.<sup>42</sup> Hormone therapy during radiotherapy is called adjuvant therapy. However, physicians recommend that cancer patients undergo adjuvant therapy between 4 months and 3 years.<sup>43</sup> The use of hormone therapy might condense the prostate and the cancerous gland to make cancer treatment smoother. The process of hormone therapy can start six months before the main treatment.<sup>44,45</sup> Essentially, 78.5% of high-risk men who received long-standing hormonal therapy were still alive after 10 years, compared to 67% of those who were tested with hormone technique for four months (Table 1).<sup>46</sup>

In a trial in men clinically confined to a small area of adenocarcinoma of the prostate with hormonal sequencing through the radiation field, improved survival was observed.<sup>47</sup> The initial analysis of experiments specifies that patients receiving only radiation therapy may hold a higher degree of positive biopsies at 12 and 24 months after the completion of radiation therapy compared to

those treated with complete anti-androgen obstruction and radiation therapy (Table 2).<sup>8,9,48–61</sup>

#### Advanced localized prostate cancer radiotherapy

Locally progressive prostate cancer is illustrated as cancer that has evolved from side to side in the container of the prostate gland. It could extend into the fleshy tissue near the prostate or to the tubes that convey semen.<sup>62</sup> Anyhow, radiation therapy is the selected therapy that utilizes high-energy waves or elements to extinguish cancer cells. It is frequently used to treat locally advanced prostate cancer.<sup>63</sup> Radiotherapy for advanced local prostate cancer is usually specified together with hormone therapy, owing to the synergistic efficacy of treatment.<sup>64</sup> External radiation remedy added to the combination of external beam radiotherapy and hormone treatment, is one of the ordinary treatments for patients with locally advanced prostate cancer (Table 1).<sup>65</sup> In people with advanced prostate cancer, additional adjuvant radiotherapy with radiotherapy will decrease the chance of PSA recurrence, with a tiny increase in the rate of survivorship.<sup>66</sup> The reviews accumulate that exerting post-operative radiotherapy to the prostatic zone would significantly increase the number of survivors of advanced local prostate cancer.<sup>67</sup> Through experimental piloting with external irradiation in addition to Goserelin to men with prostate cancer, high survivorship, and cure were observed after experiencing advanced prostate cancer (Table 2).<sup>68</sup>

#### Radiation therapy after prostate surgical procedure

The main aim of adjuvant radiotherapy after the post-prostatectomy operation is to drop the risk of cancer relapse, which in most cases, eliminates the risk.<sup>69</sup> In a survey lasting for ten years, the percentage of prostate cancer survivors undergoing radiation therapy after surgery was 89%, which clearly indicates that post-operation radiotherapy is beneficial.<sup>70</sup> In cases where surgery is needed to treat prostate cancer, radiotherapy can be used before or after surgery.<sup>49</sup> Radiation therapy is used before surgery to shrink the size of the tumor, making it easier for the surgeon to remove it.<sup>71</sup> Furthermore, positive surgical margins in prostatectomy specimens are consistently recognized as an opposing consequence pointer concomitant with an amplified threat of biochemical relapse, local sickness reappearance, and the necessity for secondary cancer treatment.<sup>72</sup> Radiotherapy after prostate surgery is used to ensure that no cancer cells remain in the body after surgery, minimizing the chance of cancer returning (Table 2).<sup>73</sup>

### Benefits and drawbacks of external beam radiation therapy in survivorship

Prostate cancer can significantly impact a man's entire life, particularly their physical and emotional well-being, relationships, and societal lifecycle.<sup>50</sup> Anyhow, an optional situation for someone might be inconsequential to another person. It all depends on several factors, including the preferences of the patients and suggestions from medical staff. In this regard, knowing some of the advantages and disadvantages of radiotherapy can be very helpful.<sup>74</sup> In some experiments, they have discussed the opportunities and challenges due to the accumulative accessibility of magnetic resonance-channelled radiotherapy, leading to multiple findings (Table 2).<sup>75</sup>

#### Advantages

If prostate cancer is localized, radiotherapy can almost entirely cure it by targeting cancer cells.<sup>76</sup> Many men prefer to be capable of continuing their regular life and daily activities throughout the treatment. Fortunately, external beam radiation therapy makes this possible (Table 2).<sup>51</sup>

Radiotherapy can be a very good treatment decision for men who do not require surgery.<sup>50</sup> Radiotherapy does not hurt, which is the most vital criterion for every patient.<sup>52</sup>

Moreover, the length of the radiotherapy sessions will be about 10 minutes, including the time of arrival, preparation, and departure from the center, taking the patient a maximum of one hour per day. Consequently, it is time-saving.<sup>53</sup> Besides that, radiotherapy is defined as less invasive and less painful than other treatments.<sup>54</sup> Electron beam radiation therapy progresses the control of the situation by increasing biologically equivalent doses. Although radiation cures are attendant with acute and chronic adverse effects, the risk of developing a secondary malignancy is negligible.<sup>55</sup> Even in some severe cases, when it is considered non-treatable, radiation therapy is capable of avoiding the excessive growth of the tumor or decelerating its progress.<sup>8</sup> Meanwhile, radiation therapy might have fewer side effects than surgery, including leaking urine and erection complications.<sup>56</sup> Additionally, open major surgery has its issues with unpredictable side effects, yet it is better to be reserved until necessary since there is a chance of the need for other surgeries.<sup>77</sup> The list of benefits of utilizing radiotherapy in prostate cancer patients has been summarized (Table 2).

#### Disadvantages

In most cases, though considered simple but vital, the patient has to visit the radiotherapy center five days a week, perhaps for several weeks, making regular planning difficult (Table 2).<sup>57</sup>

It has compulsions, like emptying the bladder before each session, or taking several medications to force the bladder to empty, which is irritating.<sup>58</sup> Prostate cancer radiotherapy can cause obstacles such as on the bladder, urination, and erection. On the other hand, it will probably cause lethargy and tiredness. But then, fortunately, there are options and strategies to guide patients in coping with their complications.<sup>59</sup> Meanwhile, it may take some time to recognize exactly if the remedy was effective or not. If a patient has used radiotherapy as their initial treatment, and cancer returns or spreads, they can no longer use surgery afterward. The explanation for this phenomenon is that radiation therapy may have injured the prostate and neighboring tissues, causing complications to extract only the cancer cells.<sup>61</sup> The complications of radiotherapy in men with prostate cancer are listed below in the following table. Furthermore, the table below summarizes all the details of the advantages and disadvantages of new radiation therapy (Table 2).

Just about half of patients with persistent prostate cancer after radical prostatectomy have a continuing prostate-specific antigen reaction to salvage radiation therapy once the remedy is overseen at the most primitive indication of relapse.<sup>78</sup> As widespread prostate-specific antigen methodology has been presented, the occurrence of prostate cancer has enlarged intensely worldwide.<sup>79</sup> The Scandinavian Prostate Cancer Group Study Number 4, which principally encompassed patients whose prostate hyperplasia was not distinguished by prostate-specific antigen transmission,<sup>80</sup> was the earliest randomized experimental to illustrate that radical prostatectomy decreases the risk of prostate cancer death and the risk of the progress of metastases.<sup>81</sup> Observing in the Cox model, the average indicant tumor capacity was 4.16 cm,<sup>3</sup> dropping to 0.63–0.5 cm after the radical prostatectomy specimen,<sup>3</sup> exhibiting the same hazard rates.<sup>18</sup> Besides that, in another experiment, benign prostate cancer and prostate hyperplasia patients experiencing sexual and urinary dysfunctions, low quality of life, the Mental Health Index,<sup>82</sup> and the General Health Index were examined after undergoing the process of radiotherapy prostatectomy<sup>83</sup>; meanwhile, the patients were validated by mail, telephone, and personal interviews, reporting their feelings about their treatment process, with 89% claiming that they would choose radiotherapy again.<sup>84</sup> Although radical prostatectomy is frequently used for localized cancer, the growing prevalence of consuming any extra cancer management within about 8,000 patients after prostatectomy continuing around 5 years stretches to 34.9% (95% confidence interval (CI) = 31.5–38.5%).<sup>19</sup> For patients with immunologically organ-limited cancer, collective occurrence between approximately 2,500 patients within 5 years was 24.3% (95% CI = 20.0–29.3%) overall and fluctuated from 15.6% (95% CI = 9.7–24.5%) for well-segregated cancer (Gleason scores 2–4) to 41.5% (95% CI = 27.9–58.4%) for weakly discerned cancer (Gleason scores 8–10).<sup>85</sup> The equivalent data for biochemically indigenously cancer were 22.7% (95% CI = 12.0–40.5%) and 68.1% (95% CI = 58.7–77.1%).<sup>20</sup> Meanwhile, Table 1 will discuss the various categories and their properties of radiation therapy.

### Discussion

Radiation therapy is one of the well-known remedies arrangements for prostate malignancies. It uses high-energy waves to abolish cancer cells. Radiotherapy can be administered externally, for example, using a device outside of the body, or internally, using a device located inside the body. Additionally, radiotherapy is applicable for treating cancer that has spread beyond the prostate gland and genital region, which is called advanced cancer.<sup>86</sup> Besides that, radiotherapy could diminish the menace of cancer recurrence after surgery with hormone-blocking drugs (adjuvant therapy). Likewise, it could alleviate cancer symptoms such as pain in the bottom (inguinal) area of men. Radiation therapy is one of the new and effective techniques for cancer treatment. However, to assess the success rate of radiation therapy, we must have a correct understanding of this method. Radiation therapy primarily destroys cancer cells utilizing X-rays.<sup>87</sup> The achievement rate of radiation therapy depends on its type. For example, external radiation therapy involves using a device outside the body to deliver radiation, which can be moderately effective for moderate cancers. However, if the cancer has advanced significantly, the patient may need internal radiotherapy. The success rate of internal radiation therapy is regularly much higher than external therapy, but it also comes with many side effects that must be illustrated to patients. For instance, those who choose internal radiation therapy for their prostate cancer may experience rapid shortness of breath and hor-

monal issues. It has also been widely observed to cause skin effects and lesions in men. In both treatment methods, whether chemotherapy or radiation therapy, the medical team aims for a cure with minimal adverse effects and irritation for the patient. On the other hand, radiotherapy is typically performed on an outpatient basis, and the patient will rarely need hospitalization. The success rate of radiotherapy, specifically in prostate cancer, is higher than that of chemotherapy. Radiotherapy usually reduces the probability of metastasis and relapse of prostate cancer. Yet, most men prefer radiation therapy due to its advantages and fewer complications compared to other treatments, as it can halt tumor growth in the genital area. Radiation therapy is a type of local treatment where cancer cells in a specific area are targeted and destroyed. The success rate of this treatment is higher than other methods because it carries fewer risks of damaging other tissues in the genital area. In chemotherapy, drugs are used that gradually enter the bloodstream and reach all parts of the body to destroy cancer cells. Radiation therapy, however, targets cancer cells specifically in the prostate region, leaving other areas untouched. The success rate of radiotherapy is higher when cancer cells have not spread extensively throughout the body. Even if certain parts of the body are affected by prostate cancer, radiation therapy can still be more effective and is considered the best option. Chemotherapy's side effects are more pronounced than those of radiation therapy. For example, a notable side effect of chemotherapy is hair loss, which can be distressing for many men and cause a loss of self-confidence. Moreover, chemotherapy can affect male sexual function, libido, and hormones, leading to reduced hope for survival. Additionally, radiation therapy does not contain skin lesions such as spots, sagging, or wrinkles. Therefore, the success rate of radiotherapy is very high. Evaluating the success rate of radiation therapy indicates that it is often beneficial to administer it during surgery. This way, once the tumor tissue is removed, high-dose radiation therapy can be applied to the surgical site, reducing the risk of recurrence and increasing survival rates. Despite some side effects, radiation therapy remains a great choice for men seeking to treat their cancer and improve their quality of life. To better gauge the success rate of radiation therapy, it is done using alpha, beta, and gamma rays to precisely target and destroy the cancerous zone. This method initially shrinks the cancerous tissues and ultimately eradicates them. In summary, less extensive and more restricted treatment procedures in male patients with prostate cancer can lead to a higher survival rate with fewer complications. Sometimes, radiation therapy is combined with chemotherapy for severe metastatic cancer cases. However, further research and projects are needed to achieve significant progress in this area.

## Conclusion

Briefly, the use of radiotherapy in various stages of different cancers has an adventurous history in recent decades as a treatment phase in cancer survivorship. Based on multiple experiments and studies on this issue, it has been proven that although radiation X-ray might pose complex problems and consequences, it remains one of the primary choices for physicians and patients due to its numerous benefits. In concluding the data of this manuscript, a dramatic gap is evident among prostate cancer patients in comparison to their condition before radical therapy. Not only does it improve men's situations, but also the shreds of evidence exhibit a noticeable increase in survivorship. Compared to open surgery, the mortality rate has immensely decreased because high-efficacy radiotherapy improves the accuracy of lesion targeting on MR im-

ages. Moreover, there is a convenient contrast of the prostate on MR images with the elimination of the least errors. However, given the current results of previous procedures, the subject of cancer survivorship is the most essential content, considering it is on top of the list of fatal diseases in the technological era. Enormous trials have been conducted to minimize deaths, although it may seem nearly impossible for cancer patients to survive each method. Yet, although prostate malignancy is a leading lethal illness globally among men, a precise treatment mechanism is crucial to increase their survivorship with minimal side effects and without the risk of relapse when exiting the medical center. To sum up, the entrance of the radiation therapy scheme offers a magnificent window of hope for improved survivorship and life expectancy in treated men owing to the efforts of scientists. However, extensive investigations and practical evidence are still obligatory.

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## Author contributions

NHM is the sole author of the manuscript.

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