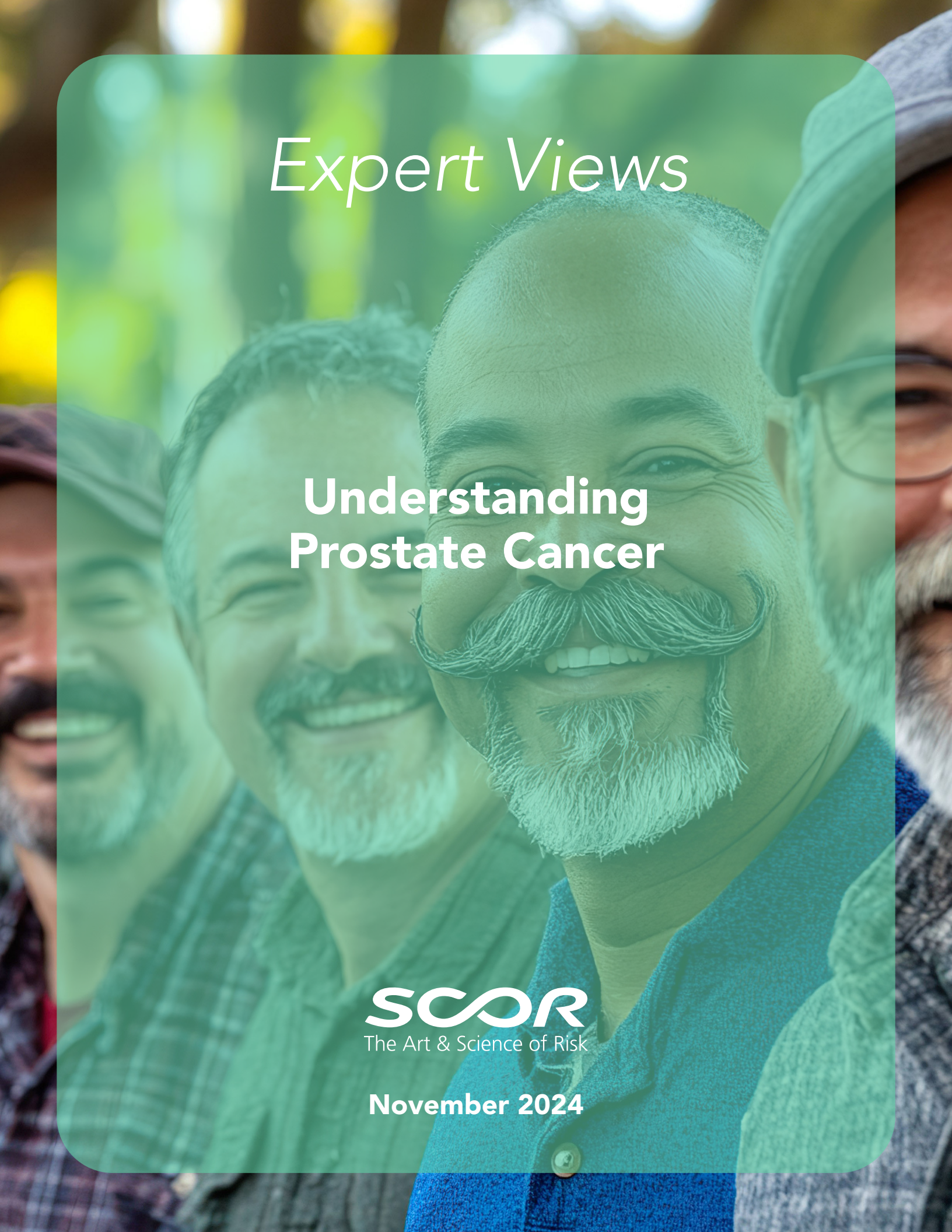


Expert Views

Understanding Prostate Cancer

SCOR
The Art & Science of Risk

November 2024

Introduction

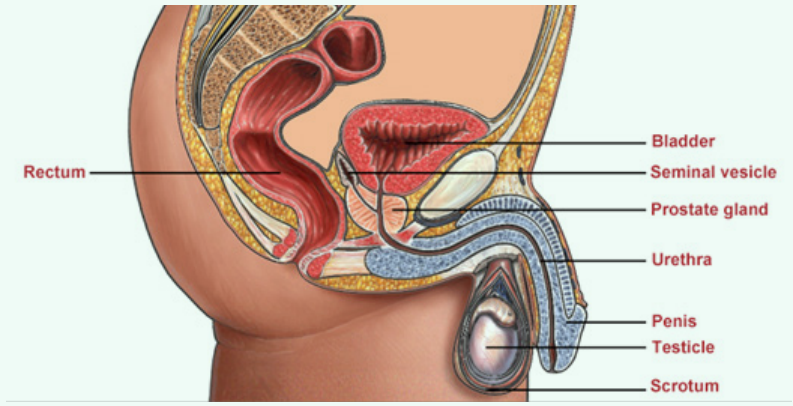
Prostate cancer is the 4th most common cancer worldwide, which is significant because it only occurs in men. It is more likely to occur in older ages and is very rare in men under the age of 50. In fact, over 50% of men diagnosed with prostate cancer are aged 70 or above, and, therefore, are outside the insured population.

Despite this, it still features quite high in claims statistics. The UK has an established market for Critical Illness (CI) insurance and during the past five years, prostate cancer is still the third highest cancer diagnosis seen in the UK claims experience.

The Prostate Gland

The prostate gland is only found in men, and it lies just beneath the bladder and surrounds the urethra, as seen in Figure 1. It is normally about the size of a walnut and is divided into two lobes, to the left and the right of a central groove.

Figure 1: Anatomy of prostate



The prostate produces a thick, white fluid that mixes with sperm produced by the testicles to make semen. It also produces a protein called prostate-specific antigen (PSA), which is a protein produced by cells of the prostate gland and by most forms of prostate cancer. PSA is also produced at low levels in the normal parotid and other salivary glands.[1]

The prostate gland is surrounded by a sheet of muscle and a fibrous capsule. The growth of prostate cells and the way the prostate gland works is dependent on the male sex hormone testosterone, which is produced in the testicles.

Although there are different kinds of prostate cancer, approximately 95% are adenocarcinomas, which is a generic name for cancers that originate from the glandular cells of your body. These cells are responsible for producing and releasing substances like mucus, digestive juices, and other fluids. The most common site of origin of prostate cancer is in the peripheral zone (the main glandular zone of the prostate).

Although rare, other types of prostate cancer include small cell carcinoma, which is a type of cancer that is made up of small round cells and typically forms at nerve cells. Small cell carcinoma is very aggressive. Unlike the more common adenocarcinoma, it does not lead to an increase in PSA and, therefore, can be somewhat harder to detect. As a result, the cancer has usually reached an advanced stage at detection.

Squamous cell carcinoma is a non-glandular cancer and, like small cell carcinoma, there is no increase in PSA when this is present. Squamous cell carcinoma is also very aggressive.

Signs and symptoms

Men with early-stage prostate cancer may not exhibit any symptoms at all. Symptoms tend to occur when the tumor puts pressure on the urethra or the bladder. However, despite being asymptomatic, prostate cancer can be detected.

For patients that experience symptoms, the most common are:

- difficulty passing urine
- urinary frequency (especially at night)
- pain when passing urine
- haematuria (blood in the urine).

Prostate cancer tends to be a slow-growing cancer and so the symptoms described above are relatively typical. However, for the more advanced prostate cancer, typical metastatic sites are in the bones. When this is the case, the patient may experience pain in the back, hips, pelvis, or other bony areas.

Investigations

The PSA test measures the level of this protein in the blood, and the results are usually reported as nanograms of PSA per milliliter (ng/mL) of blood.

A small amount of PSA is present in the serum of men with healthy prostates, but the level can slightly increase with age or be elevated in the presence of prostate cancer or other prostate disorders, such as prostatitis (inflammation of the prostate) or benign prostatic hyperplasia (BPH, enlargement of the prostate). Thus, a high PSA level does not necessarily indicate prostate cancer.

There is no one PSA reading that is considered 'normal'. The reading can vary from man to man and the average level tends to increase the older a man gets. However, the following values are a rough guide.

- 3 ng/ml or less is in the normal range for a man under 60 years old
- 4 ng/ml or less is normal for a man aged 60 to 69
- 5 ng/ml or less is normal if you are aged over 70.

The most common reason for a reading higher than the values quoted above, but less than 10 ng/ml, is benign prostatic hypertrophy (BPH). A reading higher than 10 ng/ml may also be caused by benign prostate disease, but the higher the level of PSA, the greater the probability of cancer. PSA is not a definitive test but is part of the clinical picture used by doctors when establishing a diagnosis.

If a GP or specialist suspects a patient has prostate cancer, they will test PSA levels via a blood test but also perform a digital rectal examination (DRE). During a DRE, the doctor will insert a gloved finger into the rectum. The rectum is close to the prostate gland, so the doctor can check to feel if the surface of the prostate has changed and if there are any other abnormal signs.

However, the DRE allows a doctor to feel only part of the prostate gland. Early-stage tumors or those located in areas beyond the reach of the examining finger may not be detected. Also, the accuracy of a DRE can depend heavily on the skill and experience of the physician conducting the examination. Interpretation of what is felt can be subjective. That said, when a prostate tumor is palpable on DRE, it can make the gland feel hard and bumpy.

A DRE and PSA test are the initial investigations a doctor will undertake when trying to establish a diagnosis of prostate cancer. However, Magnetic

Resonance Imaging (MRI) scans are being used with increasing frequency, more so in Western countries.

An MRI scan is a non-invasive diagnostic tool used to create detailed images of the prostate gland and surrounding tissues, which can assist in building the clinical picture before biopsies are undertaken. It is endorsed in European guidelines, including the National Institute of Clinical Excellence (NICE) and the European Association of Urology (EAU). In the USA, it is also encouraged by the National Comprehensive Cancer Network (NCCN).

An MRI can show areas within the prostate that look suspicious and may need further testing via biopsy. It is particularly useful for identifying areas that might have been missed by other tests like a DRE.

The PI-RADS (Prostate Imaging-Reporting and Data System) scale is a standardised framework for interpreting MRI scans of the prostate, to assess the likelihood of clinically significant prostate cancer. This classifies MRI lesions on a scale from 1 to 5, which reflects their level of suspicion from least to most suspicious.

Each lesion in the prostate is assigned a score from 1 to 5 based on a combination of imaging findings from T2-weighted imaging (T2W), diffusion-weighted imaging (DWI), and dynamic contrast enhancement (DCE). The scores predict the probability of a cancer that is clinically significant (explained further below), which is defined by criteria such as a Gleason score ≥7, volume >0.5 mL, or extra prostatic extension.

The scoring for each lesion is influenced by its location within the prostate, whether it is in the transition zone or peripheral zone, as the dominant sequence for assessment differs between these zones. For example, in the transition zone, the T2W score is primarily considered, while in the peripheral zone, the DWI score is more influential.

Generally, a biopsy is considered for lesions scored as PIRADS 4 or 5 but not for those scored as PIRADS 1 or 2. The decision to proceed with a biopsy also depends on other factors such as PSA levels, clinical history, local expertise, and patient preferences, and so PI-RADS 3 lesions will often be biopsied also.

Here's a breakdown of the PI-RADS scoring system:

PI-RADS Score	Significance
1	Very unlikely to have prostate cancer that needs treatment
2	Unlikely to have prostate cancer that needs to be treated
3	Impossible to tell whether there is prostate cancer that needs to be treated
4	Likely to have prostate cancer that needs to be treated
5	Very likely to have prostate cancer that needs to be treated

If the MRI scan reveals any abnormalities, it can help guide a biopsy. The detailed images allow doctors to target specific areas within the prostate from which to take tissue samples for further analysis.

MRI scans can also help determine whether prostate cancer has spread beyond the prostate gland, which is crucial for staging the cancer and planning treatment.

If cancer is proven, the MRI scan can be used to plan the appropriate course of treatment, as it provides information about the size and location of the tumor. It will also be used to monitor the effectiveness of treatment for prostate cancer and check for signs of recurrence.

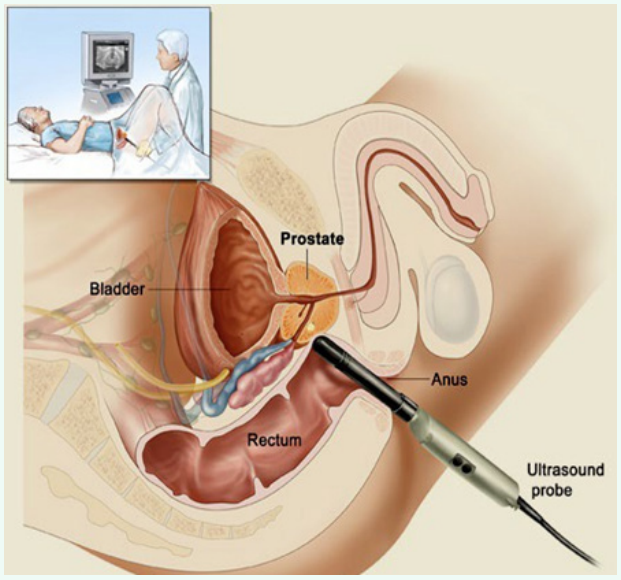
Other tests include may include a Trans-rectal ultrasound scan (TRUS), as shown in Figure 2. This is specifically designed to visualise the entire prostate gland. The ultrasound probe used in TRUS provides detailed images of the prostate by emitting sound waves that bounce off the prostate tissue and create echoes. These echoes are then converted into real-time images.

The proximity of the rectum to the prostate allows the TRUS probe to get close to the gland, which results in high-resolution images of the prostate. This enables the healthcare provider to examine the entire prostate, including the:

- **Peripheral zone:** Where most prostate cancers begin
- **Central zone:** Typically less involved in cancer but can have other conditions
- **Transition zone:** Where benign prostatic hyperplasia (BPH) usually occurs

The TRUS scan is particularly useful for assessing the size and shape of the prostate and detecting abnormalities within the gland. It can also be used to guide a needle during a prostate biopsy.

Figure 2: TRUS scan



Cancer staging

Although prostate cancer follows the traditional Tumor, Nodes, Metastases (TNM) staging system, it also has its own grading system called the Gleason Pattern Scale. A key component of staging prostate cancer is the grade of the cells. While the stage of the cancer looks at where the cancer is present in your body (how it is behaving at the macro level), the grade describes what the actual cancer cells look like under a microscope (deriving from the morphological aspect how cancer cells are behaving at microscopic level).

Gleason Score

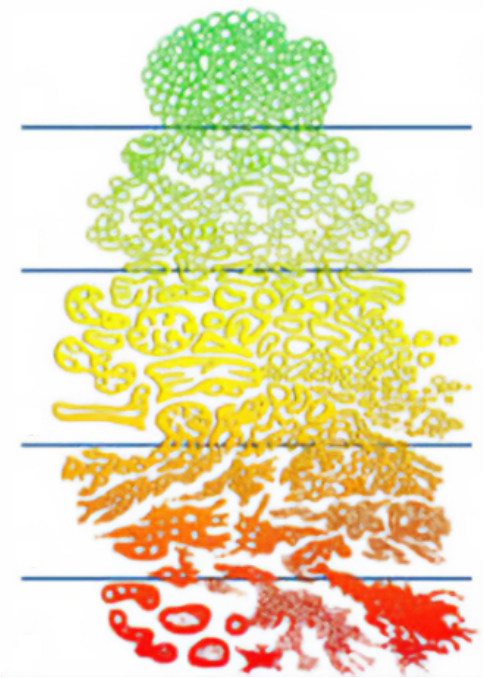
The Gleason grading system (Figure 3) is a method allowing doctors to estimate the prognosis of men with prostate cancer based on samples from a biopsy. It is a histopathological grading system that assesses the architectural pattern of cancer cells in the prostate tissue.

The doctor will usually take around 12 biopsies spread across both lobes, although one may take up to 25 in order to identify if more than one grade of cancer exists in the tumor.

A pathologist examines the biopsy samples under a microscope and assigns two grades based on the most common (primary) and second most common (secondary) patterns of cells observed. Each pattern is graded on a scale of 1 to 5, with 1 being the most similar to normal prostate tissue and 5 being the most abnormal.

The primary and secondary grades are then added together to give a Gleason score. The higher the Gleason score, the more aggressive the cancer is considered to be.

Figure 3: Gleason's Pattern Scale



1. Small, uniform glands.
2. More space (stroma) between glands.
3. Distinctly infiltration of cells from glands at margins
4. Irregular masses of neoplastic cells with few glands
5. Lack of or occasional glands, sheets of cells

Well differentiated

Moderately differentiated

Poorly differentiated
Anaplastic

- Pattern 1: The cancerous prostate closely resembles normal prostate tissue, with small, well-formed, and tightly packed glands.
- Pattern 2: The tissue still has well-formed glands, but they are larger and have more tissue between them.
- Pattern 3: The tissue still has recognizable glands, but the cells are darker and beginning to invade surrounding tissue.
- Pattern 4: The tissue has few recognizable glands, and many cells are invading the surrounding tissue.
- Pattern 5: The tissue does not have recognizable glandular structures and has the most abnormal cells.

It's important to note that the Gleason grading system has been refined over time, and the current system no longer uses the lowest scores (2, 3, or 4), as these patterns are rarely seen in biopsies. The lowest score typically reported now is 6. A Gleason score of 6 is low grade, 7 is intermediate grade, and a score of 8 to 10 is high-grade cancer.

It's also important to know whether any cells rated at Gleason grade 5 are present, even in just a small amount, and most pathologists will report this. Having any Gleason grade 5 in a biopsy puts men at a higher risk of recurrence.

Grade Groups

The International Society of Urological Pathology (ISUP) Grade Group is a system used to classify the aggressiveness of prostate cancer. It's an update to the traditional Gleason scoring system, making it simpler and more straightforward for patients and doctors to understand.

The Gleason score (Figure 4) is often used in conjunction with Grade Groups, which range from 1 to 5. Grade Group 1 corresponds to a Gleason score of 6 (3+3), indicating slow-growing cancer. Grade Group 5 corresponds to Gleason scores of 9 or 10 (4+5, 5+4, 5+5), indicating very aggressive cancer.

Figure 4: The Gleason Score

Gleason score	Grade Group	What it means
Gleason score 6	Grade Group 1	The cells look similar to normal prostate cells. The cancer is likely to grow very slowly, if at all
Gleason score 7 (3+4=7)	Grade Group 2	Most cells still look similar to normal prostate cells. The cancer is likely to grow slowly
Gleason score 7 (4+3=7)	Grade Group 3	The cells look less like normal prostate cells. The cancer is likely to grow at a moderate rate
Gleason score 8 (or 4+4=8)	Grade Group 4	Some cells look abnormal. The cancer might grow quickly or at a moderate rate
Gleason score 9 or 10 (or 4+5=9, 5+4=9 or 5+5=10)	Grade Group 5	The cells look very abnormal. The cancer is likely to grow quickly

Prostate Cancer Staging

The AJCC (American Joint Committee on Cancer) and UICC (Union for International Cancer Control) cancer staging manuals are both authoritative guides used worldwide to classify the extent of cancer spread. However, there are some differences between them.

Clinical (T) Staging Based on DRE: Although T1 and T2 are considered the same in prognostic staging systems, the AJCC 8th edition specifies that clinical staging should be based on a DRE only. The UICC does not make such an explicit statement. For example, a non-palpable prostate cancer with bilateral positive biopsies and extra-prostatic extension (EPE) on an MRI scan would be categorized as cT1c with a separate report of MRI findings according to the UICC.

Clinical versus pathologic TNM staging: Males with newly diagnosed prostate cancers are assigned a clinical prognostic stage group, which is based on information from the prostate biopsy, DRE, and in some cases, imaging studies.

Patients who subsequently undergo radical prostatectomy are assigned a pathologic prognostic stage group based on histologic examination of the surgical resection specimen. Males who do not undergo prostatectomy are not assigned a pathologic stage, and treatment decisions are based on the clinical stage.

Clinical staging can underestimate or overestimate the extent of disease when compared with results based on pathologic examination of a resection specimen. The limitations of clinical staging and its implications for risk stratification are discussed separately.

TNM Classification: The UICC uses the TNM classification for staging of prostate cancer, which is also used by the AJCC. However, the UICC 8th edition has published only an anatomic stage grouping, whereas the AJCC 8th edition has included prognostic stage groups with the incorporation of TNM classification, PSA, and grade group.

The UICC TNM classification for staging prostate cancer is used globally. It's a standardized system that allows for consistent classification and comparison of cancer stages across different countries and healthcare systems. The UICC's TNM system is used by healthcare professionals worldwide to stage prostate cancer, ensuring that patients with similar stages of cancer can be compared and treated accordingly.

For example, the European Association of Urology (EAU) guidelines use the UICC 8th edition TNM classification for staging of prostate cancer. This system is also recommended for use in the UK for all tumors diagnosed after January 1, 2018. Additionally, data collection and research organizations, such as those compiling cancer

statistics, often rely on the UICC's TNM system for accurate and uniform data reporting.

The widespread adoption of the UICC TNM classification underscores its importance in the global effort to understand, treat, and manage prostate cancer effectively. Figure 5 is the UICC TNM 8th edition for classifying prostate cancer.

Figure 5: The UICC TNM (8th edition)

Primary Tumor	
Tx	Primary tumor cannot be assessed
T0	No evidence of primary tumor
T1*	Clincally inapparent tumor not palpable or visible by imaging
	T1a* - Tumor incidental histological finding in 5% or less of tissue resected
	T1b* - Tumor incidental histological finding in 5% or more of tissue resected
	T1c* - Tumor identified by needle biopsy (e.g. because of elevated PSA) **
T2	Tumor confined within prostate
	T2a - Tumor involved one half of one lobe
	T2b - Tumor involves more than one half of one lobe, but not both lobes
	T2c - Tumor involves both lobes
T3	Tumor extends through the prostate capsule***
	"T3a - Extraprostatic extension (unilateral of bilateral) including microscopic bladder neck involvement"
	T3b - Tumor invades seminal vesicle(s)
T4	"Tumor is fixed or invades adjacent structures other than seminal vesicles external sphincter, rectum, levator muscles or pelvic wall"

** The pT and pN categories correspond to the T and N categories. However, there is no pT1 category because there is insuficient tissue to assess the highest pT category.*

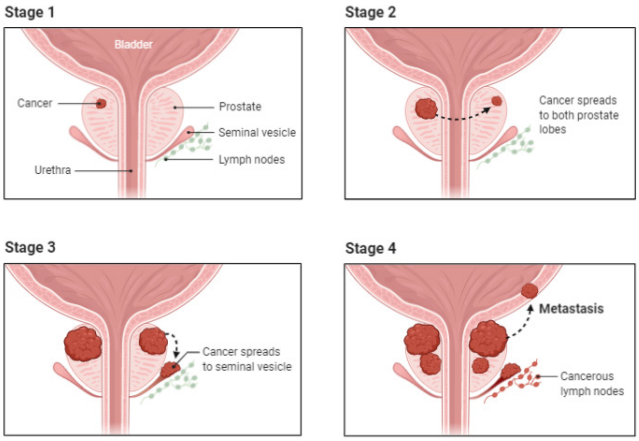
*** Tumor found in one or both lobes by needle biopsy, but not palpable or visible by imaging, is classified as T1c*

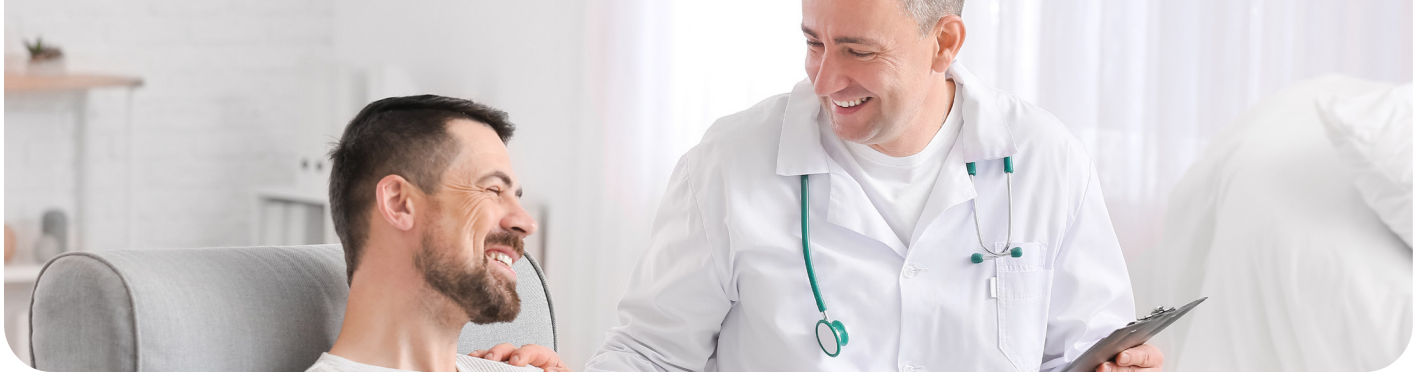
**** Invasion into the prostatic apex or into (but not beyond) the prostatic capsule is not classified as T3, but as T2*

As described earlier, prostate cancers are staged using a combination of physical examination, blood tests, medical imaging and tissue analysis following biopsy or surgery. Unlike most other cancers, there are separate staging criteria for prostate cancer under the TNM classifications depending on whether it is a clinical (pre-surgery) staging or pathological (post-surgery) staging. Also, as the T1 classifications only apply to clinical findings, any prostate cancer which is surgically removed will have a minimum staging of T2a.

Generally, the difference between a prostate cancer being staged as T1 or T2 is whether it is palpable by DRE or visible by imaging. If the tumor is palpable, it will be classified as T2. To be reliably visible on an MRI scan, it should be PIRADS 4 or greater. This is of great importance, particularly from an insurance point of view. As can be seen in Figure 6, tumors found in one or both lobes by needle biopsy, but not palpable or visible by imaging, are classified as T1c.

Figure 6: Stages of Prostate Cancer





Treatment

Treatment for prostate cancer varies depending on a number of factors. Since prostate cancer is most often discovered in the elderly, the underlying health status plays a significant role. Those whose life expectancy due to other medical conditions is less than five or 10 years are often treated less aggressively.

The Cambridge Prognostic Groups (CPG) system (Figure 7) is a classification method used in the UK to categorize localized and locally advanced prostate cancer into five distinct risk groups. This system helps doctors determine how likely it is that the cancer will grow quickly or spread, which in turn informs the treatment approach. It uses the Grade group or Gleason score, the PSA levels, and the tumor stage.

Figure 7: The Cambridge Prognostic group (CPG) System

CPG	ISUP	PSA	T
1	1 AND	<10 And	T1 or T2
2	2 Or	10-20 And	T1 or T2
3	2 And 3 And	10-20 And Any PSA	T1 or T2 T1 or T2
4	4 Or	>20 Or	T3
5	4 5 Any	>20 Any Any	T3 Any T4

Low-grade cancers, i.e., those graded as T1c or less, are described as CPG1.

Most low-grade prostate cancers tend to be quite slow-growing and, therefore, do not require any immediate treatment. In many cases, the patient remains asymptomatic or any identifiable symptoms are relatively mild. In these cases, the specialist may decide that simply monitoring the disease is the best approach. Radical surgery has risks of impotence and incontinence and watchful waiting is associated with good outcomes.

Monitoring a person with low-grade prostate cancer includes frequent DREs to ensure the tumor does not change or grow. Such patients will have regular blood tests to ensure the PSA does not significantly rise, indicating progression of the disease. If the disease does show signs of progression, then other treatments will be considered.

When treatment is necessary, the aim is to control or even cure the disease so that it does not shorten the patients' life expectancy and minimize its effects on their everyday life. When prostate cancer has already spread, the aim of treatment is not to cure it but to prolong life and delay symptoms.

If surgery is required to treat prostate cancer, there are a few options. A radical prostatectomy is an operation to remove the entire prostate gland and is quite common. The procedure entails the removal of the prostate via an incision made into the abdomen or perineum. Keyhole surgery, also known as laparoscopic prostatectomy, is also an option. Whilst similar to a radical prostatectomy, the wound site is much smaller.

Other options include a transurethral resection (TUR) of the prostate. This is a partial removal of the prostate and aims to relieve symptoms, such as being unable to pass urine due to the tumor compressing the urethra. However, this is not a curative procedure.

There are both advantages and disadvantages to having surgery for prostate cancer, particularly for low-grade tumors. Therefore, significant consideration is required before proceeding.

Advantages of surgery include stopping the disease from spreading and, in some cases, even curing the disease. However, disadvantages include problems such as bleeding or infections (a risk with any surgery). There is also the risk of some long-term side effects, such as incontinence and/or impotence, which carries a significant stigma for men.

External beam radiotherapy is also frequently used to treat prostate cancer. In many countries,

radiotherapy is becoming a standard of care and tends to compete with surgery for prostate cancer treatments. Modified forms of radiotherapy called brachytherapy can be used. Used for early prostate cancers, two different types of internal radiotherapy for prostate cancer are as follows:

- Low-dose rate (LDR) brachytherapy - This procedure uses small, radioactive seeds that are inserted into the tumor using a fine needle via the rectum. The seeds release radiation slowly into the tumor. The seeds are not removed but the radiation eventually ceases after approximately six months. The radiation stays relatively close to the tumor and so has little impact on tissue surrounding the prostate. There is also no risk of the radiation affecting other people.
- High-dose rate (HDR) brachytherapy - This form of radiotherapy is done in tandem with the more traditional external methods and involves placing tiny catheters into the prostate gland via the perineum. Radioactive seeds are inserted into the catheters for a set period of time, to allow the appropriate dosage and are then removed. After the treatment, the catheters are easily removed and no radioactive material is left in the prostate gland.

Proton Beam Radiation Therapy can be used in some countries where it is more widely available. This is more targeted than traditional radiotherapy and limits radiation exposure to healthy tissue, minimizing side effects and future risks. As a more targeted therapy, doses may be higher. Further information can be found in SCOR's inFORM publication PRBT from 2016.

In the recent paper published online, "A Focus on Focal Therapy for Prostate Cancer", physicians maintain that offering treatments such as cryoablation or high-intensity focused ultrasound (HIFU) can offer a "middle ground" to those who may be at one end of the spectrum and be suitable for active surveillance versus those who may require prostatectomy or radiotherapy. They even go further to say that 'the use of focal therapy for prostate cancer is likely to become routine in the next five years. Further information can be found in our December 2021 SCORacle newsletter

Hormone therapy historically began by doing bilateral orchidectomy (or orchiectomy). The purpose of this castration was to significantly reduce the production of testosterone by the testis. Testosterone is the male sex hormone produced by the testicles and can promote prostate cancer growth. Removing the testicles was shown to shrink a locally advanced prostate cancer or stop it from growing any further. As this is an extreme surgery, this is nowadays replaced by chemical castration using LHRH analogs that block the production of testosterone by inhibiting the gonadotrophin (GnRH).

Other drugs can act directly by blocking the interaction of testosterone with its receptors in cancer cells and are mainly given orally for prolonged periods of time as tablets. Chemotherapy may be proposed in case of extended and metastatic diseases of aggressive behaviours in combination with hormonotherapy.

Chemotherapy can also be used to treat prostate cancer, but this tends to be only for more advanced cancers which have spread.

Risk factors

Understanding risk factors associated with prostate cancer is crucial for prevention, early detection, and effective management. It is also crucial from an underwriting and claims perspective.

Age - As we have already mentioned in the introduction, age is a significant risk factor. Prostate cancer primarily affects older men, with the majority of diagnoses occurring after the age of 50. The risk increases significantly after 70 years old. Regular screenings are essential for early detection in this age group.

Family history - A family history of prostate cancer raises the risk. If a close relative (father or brother) has been diagnosed, your risk increases. Moreover, if the relative was diagnosed before the age of 60 or if multiple close relatives have had prostate cancer, your risk is even higher. Genetic factors play a role in familial clustering.

Race and ethnicity - Race also influences risk. Statistically, black men have a higher incidence of prostate cancer compared to other ethnicities. They are at a higher risk of developing aggressive forms of the disease. Asian and Hispanic men have a lower risk, but early detection remains crucial for all racial backgrounds.

Whilst the reason for certain ethnic groups to be at greater risk than others is not completely understood, it is believed that this could be due to a mixture of inherited genes and environmental factors.

Genetics and inherited mutations - Certain inherited gene mutations contribute to prostate cancer risk. Notably, mutations in the BRCA1 and BRCA2 genes, known for their association with breast and ovarian cancers, also increase prostate cancer risk.

Lifestyle factors - Several lifestyle factors affect prostate cancer risk, such as diet, physical activity, obesity and smoking.

Recent innovations in research and treatment

As the population is aging in several countries, nearly 1.5 million people are diagnosed with prostate cancer each year across the world, causing a significant burden on healthcare systems. Therefore, it is not surprising that a great deal of research has been conducted in this area.

Artificial Intelligence (AI) has significantly impacted healthcare, particularly in the field of prostate cancer. It has the potential to revolutionize how cancers are diagnosed and influence subsequent treatment.

AI algorithms have the ability to analyze medical data, including imaging scans and patient records, to detect prostate cancer at an early stage. By identifying subtle patterns and anomalies, AI assists doctors in making accurate diagnoses sooner, leading to timely interventions and improved outcomes.

One of the major milestones is the Food and Drug Administration (FDA)'s approval of Paige prostate AI for a second review of prostate cancer diagnosed using core needle biopsies.[2]

AI can also help in reducing the need for invasive biopsies and scans. By analyzing existing data, AI can predict the likelihood of cancer, sparing patients unnecessary procedures. Ongoing research aims to refine AI algorithms, enhance accuracy, and expand their applications in prostate cancer management before they become the norm.

Life expectancy

Survival rates for prostate cancer have continued to improve for approximately 30 years. This is largely attributed to the early detection of prostate cancer due to PSA testing and transurethral resection of the prostate to treat benign prostatic enlargement. As with all cancers, prognosis can be largely dependent on the stage of the disease once detected and treatment commences. In addition, survival is also likely to have improved over the years due to treatment becoming more effective.

Prostate cancer is often relatively indolent and manageable. For lower grade cancers, treatment sometimes isn't even necessary. It is very rare for prostate cancer to present at an advanced stage, and this has a positive impact on survival, which is demonstrated in Figure 8.

Figure 8: General Survival Statistics of Prostate Cancer

General survival statistics	
1-year survival	More than 95% of men diagnosed with prostate cancer survive at least one year
S-year survival	Approximately 90% of men survive for five years or more after diagnosis
10-year survival	Nearly 80% of men live beyond ten years post-diagnosis

As with all cancers, the stage at which it is diagnosed (Figure 9) is a good indicator of survival and will impact life expectancy.

Figure 9: Stages of Prostate Cancer

Stage 1:	Cancer confined to half of one side of the prostate gland. Almost 100% survival for five years or more.
Stage 2:	Cancer in more than half of one side of the prostate but still contained within the gland. Almost 100% survival for five years or more.
Stage 3:	Cancer has broken through the prostate capsule or spread to seminal vesides. About 95% survival for five years or more.
Stage 4:	Diverse scenarios, including spread to nearby organs or distant sites (e.g., lungs, liver). Approximately 50% survival for five years or more

Implications for Protection insurance

Due to its commonality, it is imperative that both underwriting and claims professionals have a good understanding of prostate cancer. It can seem complex because of the various tests, investigations, and diagnostic criteria, with many variables requiring consideration before offering terms on a protection product or admitting a claim.

Underwriting

As with the majority of conditions, if a possible diagnosis of prostate cancer is suspected, then terms cannot be offered. Usually, a period of postponement is required until such time as the diagnosis is understood. There are, of course, some uninsurable risks, which include the following:

- Metastatic cancer
- Recurrence of a previous prostate cancer
- Lymph node metastases
- Inoperable tumors
- Carcinoid of the prostate
- If the past PSA value following prostatectomy exceeds 1.5ng/ml

For all products, there are many variables to consider when deciding whether or not terms can be offered. These will include the age of the applicant, the stage, the Gleason score, the PSA levels, and the term of the policy. For all products, SCOR's underwriting manual SOLEM, regretfully cannot currently offer terms for any products that are T3 or greater.

Life insurance

Terms for life insurance policies are certainly possible - the lower the grade, the better the terms are. As previously described, early-stage prostate cancers are fairly indolent and do not often progress. Therefore, SCOR is keen to offer terms where possible.

For a T1a tumor, where the Gleason grade is less than seven, and the PSA was below 10 ng/ml at diagnosis, terms can be offered with a temporary loading of five per mille for three years for diagnosis made within one year. It is possible to be offered standard rates three years after being diagnosed.

However, for T2 tumors, the terms will obviously be more significant. For T2 tumors where the Gleason grade was greater than seven or the PSA was greater than 30 ng/ml at diagnosis, terms would not be available until at least four years post-diagnosis. Even then, it will incur a significant temporary loading of 25 per mille for six years. Standard terms could not be offered until an applicant is cancer-free for longer than 10 years.

It is important to note that in the US, we don't put specific rating guidance in publications due to anti-trust considerations/concerns.

Full details of SCOR's rating grids for prostate cancer can be found in our underwriting manual SOLEM.

Critical Illness

Terms for a Critical Illness product are possible. However, prostate cancer would itself be excluded, irrespective of the stage and grade. SCOR's recommended exclusion wording is as follows:

> No payment of the benefit shall be made under any of the Critical Illness covers for any claim arising as a result of prostate cancer, or carcinoma in-situ of the (insert specific site e.g. breast or ovary), including any metastases and any complication arising from the condition or it's treatments.
>
> Any tumor that has not been confirmed by biopsy as being a new primary tumor, or any tumor that has not been, cannot or will not be biopsied is also specifically excluded together with complications arising from any treatment of such tumors.

With the exclusion, terms can be offered up to T2 tumors where the Gleason score is less than seven and the PSA was less than 10 ng/ml at diagnosis. However, there are some permutations where terms cannot be offered for lower stage cancers if the Gleason score or PSA is still high.

Income Protection

Terms for income protection are also possible, following a diagnosis of prostate cancer. Most policies will be issued at standard rates, when terms are possible, assuming there are no other co-morbidities caused by treatment, such as radiotherapy and surgery. However, how long after diagnosis terms can be offered will depend on the stage, the Gleason score and the PSA at diagnosis.

Claims

For Critical Illness across the globe, most policies will require prostate cancers to be of at least moderate severity to qualify for payment, i.e. T2 or greater and having a Gleason score of seven or greater. However, in some markets, insurers have enhanced their cover that will include T1 tumors with a Gleason score of six. Insurers in the Australian market that have "A" rated policies are an example of this.

When assessing claims, it is important to understand that prostate cancers are staged using a combination of physical examination, blood tests, medical imaging, and tissue analysis following biopsy or surgery. Unlike most other cancers, there are separate staging criteria for prostate cancer under the TNM classifications depending on whether it is a clinical (pre-surgery) staging or pathological (post-surgery) staging. Also, as the T1 classifications only apply to clinical findings, any prostate cancer which is surgically removed will have a minimum staging of T2a.

The key point is that tumors detected solely by elevated PSA levels that are neither palpable on DRE or are reliably visible on MRI but subsequently confirmed following core biopsies are still considered to be clinical stage T1c, which is consistent with the staging classification set out by the UICC.This is an important consideration because most Critical Illness definitions require at least a T2 stage to qualify for payment.

Conclusion

Prostate cancer is one of the most common of all cancers, and with an aging population, increased awareness and screening programs, the number of men diagnosed is likely to increase. While insurers are protected to a degree due to the profile of the insured population, we should continue to learn about prostate cancer. From underwriting and claims standards to product design and robust pricing, it is something we will continue to see on an almost daily basis.

Due to the number of tests and investigations that are used, coupled with the various grading and staging methods, diagnoses can be extremely complex. For claims managers, the definitions have evolved over the years to keep pace with the medical community and staging criteria, as our understanding of the condition has improved. Therefore, it is fundamental to ensure that the correct definition is being considered when reviewing claims.

We hope this report serves as a useful reference guide for underwriters and claims assessors. SCOR strongly advocates for always obtaining histology reports when collecting evidence. It is also advisable to obtain the hospital reports as they are likely to add extra details in the claimant's history, initial presentation, and investigations, which help build a picture of the individual patient. For all claims that are outside the norm, a Chief Medical Officer's opinion should always be sought to ensure the correct decision is being made.

Sources

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This article was written by:

Paul Blyth
Head of UW & Claims Proposition

Please feel free to visit us at scor.com

SCOR SE
5 avenue Kléber - 75795 PARIS Cedex 16
France

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