Critical Reviews in Oncology / Hematology 148 (2020) 102861

Contents lists available at ScienceDirect

Critical Reviews in Oncology / Hematology

journal homepage: www.elsevier.com/locate/critrevonc

ECCO Essential Requirements for Quality Cancer Care: Prostate cancer

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ARTICLE INFO

Keywords:
Prostate cancer
Multidisciplinary
Units
Centres
Pathways
Quality

ABSTRACT

Background: ECCO Essential Requirements for Quality Cancer Care (ERQCC) are written by experts representing all disciplines involved in cancer care in Europe. They give oncology teams, patients, policymakers and managers an overview of essential care throughout the patient journey.

Prostate cancer: Prostate cancer is the second most common male cancer and has a wide variation in outcomes in Europe. It has complex diagnosis and treatment challenges, and is a major healthcare burden.

Care must only be a carried out in prostate/urology cancer units or centres that have a core multidisciplinary team (MDT) and an extended team of health professionals. Such units are far from universal in European countries.

To meet European aspirations for comprehensive cancer control, healthcare organisations must consider the requirements in this paper, paying particular attention to multidisciplinarity and patient-centred pathways from diagnosis, to treatment, to survivorship.

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https://doi.org/10.1016/j.critrevonc.2019.102861
Received 1 May 2019; Received in revised form 23 December 2019; Accepted 23 December 2019

1. Introduction: the need for quality frameworks

There has been a growing emphasis on driving up quality in cancer organisations given variations in outcomes in Europe. The European Cancer Concord (ECC), a partnership of patients, advocates and cancer professionals, recognised major disparities in the quality of cancer management and in the degree of funding in Europe in its European Cancer Patient's Bill of Rights, a patient charter that underpins equitable access to optimal cancer control, cancer care and research for Europe's citizens (Højgaard et al., 2017).

This followed an assessment of the quality of cancer care in Europe as part of the first EU Joint Action on Cancer, the European Partnership for Action Against Cancer (EPAAC, http://www.epaac.eu), which reported that there are important variations in service delivery between and within countries, with repercussions in quality of care. Factors such as waiting times and provision of optimal treatment can explain about a third of the differences in cancer survival among countries, while lack of a national cancer plan that promotes clinical guidelines, professional training and quality control measures, may be responsible for a quarter of the survival differences.

The EU Joint Action on Cancer Control (CANCON), which succeeded EPAAC from 2014, also focused on quality of cancer care and published in 2017 the *European Guide on Quality Improvement in Comprehensive Cancer Control* (Albreht et al., 2017). This report recognised that many cancer patients are treated in general hospitals and not in comprehensive cancer centres (CCCs), and explored a model of 'comprehensive cancer care networks' that can integrate expertise under a single governance structure. Further, research shows that care provided by multidisciplinary teams (MDTs) results in better clinical and organisational outcomes for patients (Prades et al., 2015) and that they are the core component in cancer care (Borras et al., 2014).

Countries have been concentrating expertise for certain tumour types in such networks and in dedicated centres, or units, such as those for childhood and rare cancers, and all CCCs have teams for the main cancer types. For common adult tumours, however, at the European level there has been widespread effort to establish universal, dedicated units only for breast cancer, following several European declarations that set a target at the year 2016 for care of all patients with breast cancer to be delivered in specialist multidisciplinary centres. While this target was not met (Cardoso et al., 2017), the view of the ERQCC expert group is that patients with all tumour types should have this dedicated care.

1.1. Prostate cancer

Prostate cancer is perhaps the closest behind breast cancer in terms of establishing a European concept of a tumour-specific cancer unit. Following the publication of a discussion paper by the European School of Oncology (ESO) in 2011 on the requirements of a specialist prostate cancer unit (Valdagni et al., 2011), the Prostate Cancer Unit (PCU) initiative was launched. A position paper in 2015 then set out the first mandatory and recommended standards including requirements for organising and treating prostate cancer in units (Valdagni et al., 2015). The European Association of Urology has also recently put forward a 'centres of excellence' proposal for prostate cancer centres (Wirth et al., 2019). This ERQCC paper sets out essential requirements for the organisation of prostate cancer units in Europe in the context of challenges and resources in European countries.

2. Prostate cancer: key facts and challenges

2.1. Key facts

2.1.1. Epidemiology

- Prostate cancer is a disease of the prostate gland, which is located just below the bladder and surrounds the urethra. It is the second most common cancer in men globally, after lung cancer. The main type of prostate cancer is acinar adenocarcinoma, which develops in the glandular cells of the prostate, and which accounts for about 99 % of cases. Much less common types are ductal adenocarcinoma, urothelial, squamous cell, neuroendocrine (carcinoid) tumours and sarcomas. Prostate cancer is the most common male cancer in Europe and is a substantial disease burden likely to increase due to an ageing population.
- The estimated European incidence of prostate cancer in 2018 was about 460,000 (European Cancer Information System, https://ecis.jrc.ec.europa.eu). Mortality was about 107,000. The estimated incidence was highest in Ireland, Estonia and Norway (Ireland highest at 265/100,000 new European age standardised rate, ASR), and lowest in Romania and Poland (Romania lowest at 80). Mortality was highest in Estonia (73.9/100,000 ASR), Latvia and Slovakia, and lowest in Italy (22.7) (Fig. 1 – European regional figures).
- There are high survival rates for prostate cancer in Europe with increases in recent years. The EUROCARE-5 study (the most recent pan-European survival study) reports 1 year/5 year relative survival in Europe for prostate cancer patients diagnosed between 2000–2007 at 95 % and 83 %, respectively, and notes that the 5-year rate increased from 73 % in 2005–2007 to 82 % in 2005–2007 (Trama et al., 2015). More recent data from England and Wales shows a 84.8 % 5 year survival rate for men diagnosed in 2010/11 (Cancer Research UK, https://bit.ly/2RmmriO). Increases in incidence and survival must be interpreted with caution given the varying prevalence of prostate specific antigen (PSA) testing and consequent biopsy rates, which uncovers a proportion of patients harbouring a disease that would have remained dormant and likely not been subject to further progression. The EUROCARE-5 authors note that incidence varied by more than 7-fold in Europe, and also that in addition to PSA testing, the variability of diagnostic techniques and higher socioeconomic status are factors in increased incidence. In contrast, mortality rates are a better indication of risk, although there are several challenges in the attribution of causes of death in older men. However, incidence of prostate cancer has been rising in Asia (Japan, Singapore and Thailand) where PSA testing has been less common, which may suggest a possible role of

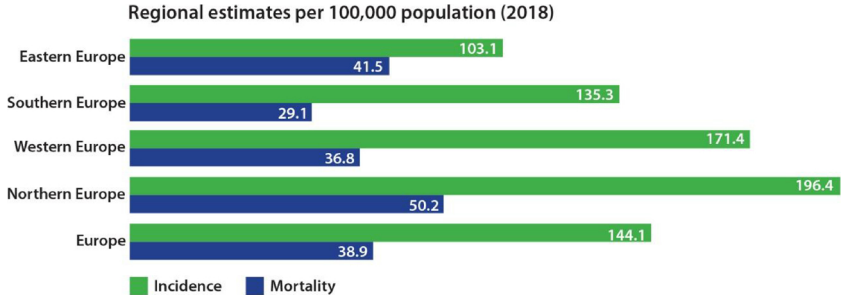

Fig. 1. European regional prostate cancer mortality and incidence. Source: European Cancer Information System (ECIS), https://ecis.jrc.ec.europa.eu.

'westernisation' of lifestyles, leading to globally increasing prostate cancer incidence rates in most countries (International Agency for Research on Cancer (IARC), 2012).

2.1.2. Risk factors

- The main risk factor for prostate cancer is older age (only 25 % of cases in Europe are in men diagnosed before age 65) (Cuzick et al., 2014). Furthermore, men of African-Caribbean and African ethnicity have a higher risk than other groups and about 5–10 % of prostate cancers can be attributed to hereditary factors. Family history and mutations, especially in the *BRCA1* and *BRCA2* genes, increase the risk, and decreases the age at which prostate cancer is detected. There are no clear preventable risk factors; there is limited or probable evidence for factors including anabolic steroids, red meat and obesity, and some industrial and toxic substance exposure. Probable risk factors also include physical inactivity, a diet high in calcium and phosphorus, and smoking, which may be risk factors for more aggressive disease.

2.1.3. Diagnosis

- Most men with early prostate cancer do not have clinical symptoms. Symptoms such as more frequent urination and urgency to urinate are mostly caused by benign prostatic hyperplasia, which is a common enlargement of the prostate in older men. Other symptoms that may lead to diagnosis are visible haematuria (blood in the urine) and haematospermia (blood in semen) when the tumour affects the seminal vesicles or all of the prostate gland. Metastatic prostate cancer can cause a variety of symptoms according to the localisation of metastasis, most usually bone pain.
- Initial investigations for suspected prostate cancer are often a PSA test followed by a digital rectal examination to feel for abnormalities on the gland. A common procedure for diagnosing primary prostate cancer is a transrectal ultrasound (TRUS) guided biopsy followed by staging and grading by pathologists according to the TNM and Gleason systems (Mottet et al., 2017; National Institute of Health and Care Excellence (NICE), 2014). This can be targeted by ultrasound to the area of the prostate identified by multiparametric magnetic resonance imaging (mpMRI) scans, defined as cognitive, in-bore or fusion biopsy, which are the preferred investigations (Ahmed et al., 2017). Transperineal biopsies are preferred to enable correct sampling of the anterior prostate gland. A number of methods are under investigation to reduce the number of unnecessary biopsies, including upfront mpMRI (Kasivisvanathan et al., 2018), analysis of PSA density and kinetics, risk calculators such as the 4Kscore, the Prostate Health Index, and testing for prostate cancer gene 3, *PCA3*.
- Imaging – mpMRI, CT, ultrasound and bone scan – is used for local staging and to determine spread outside the prostate. MpMRI provides a detailed scan of the prostate and can also be taken before a biopsy to see if a biopsy is needed and if so to optimise its location within the prostate.
- New sonographic modalities such as contrast-enhanced ultrasound and sono-elastography are under investigation to detect and stage prostate cancer (Kratzenberg et al., 2018; Kuru et al., 2015). Gallium and fluoride PSMA PET/CT scans are being evaluated in upfront imaging in patients with intermediate and high-risk prostate cancer and in case of biochemical relapse.

2.1.4. Treatment

- There is a wide variety of clinical options in prostate cancer, according to risk factors related to the disease (clinical stage, PSA, Gleason score, International Society of Urological Pathology Grade Groups) and the patient's life expectancy (Mottet et al., 2017).
- Less aggressive disease can be monitored without any active treatment according to active surveillance protocols.
- Possible radical treatments are surgery (open, laparoscopic or robot-assisted), external beam radiation therapy (EBRT) and brachytherapy (BRT). Alternative surgical techniques (focal therapy) or radiation techniques such as stereotactic body radiation therapy (SBRT) are under evaluation.
- More aggressive or locally advanced disease is treated with a multimodal approach (i.e. surgery followed by EBRT and/or androgen deprivation therapy (ADT); EBRT plus BRT and ADT, EBRT plus ADT).
- ADT, chemotherapy, other hormonal treatments (abiraterone and enzalutamide) and radium-223 are treatment options for patients with metastatic and/or castrate resistant prostate cancer (Cornford et al., 2017). Treatment with curative intent of oligometastasis (typically up to 3, recently extending to 5, metastases) is the subject of research (Tosoian et al., 2017; Ost et al., 2018).
- Treatment options can be summarised in risk categories as:
- Very low: active surveillance.
- Low: active surveillance, focal therapy, radiation therapy or prostatectomy.
- Intermediate: radical prostatectomy or radiation therapy.
- High: radical prostatectomy plus post-operative radiation therapy or radical radiation therapy plus hormone therapy.
- Metastatic: medical or radionuclides.

2.2. Challenges in prostate cancer care

2.2.1. Screening and detection

- The use of the PSA test to detect prostate cancer is one of the most controversial topics in current medical practice, with contrasting views in the US and Europe. Two major randomised controlled trials (RCTs) on screening came to opposite conclusions on its merits (Schröder et al., 2009; Andriole et al., 2009), and while a statistical analysis of both has reported a 16 % reduction in prostate cancer mortality of those screened (Tsodikov et al., 2018) there has been no move by health policymakers to introduce population-based screening owing to the PSA test's lack of sensitivity for detecting harmful cancer together with large potential for unnecessary harm in painful biopsies and life-changing interventions for slow-growing tumours that needed no treatment. Indeed, other recent research, for example from the UK, has shown no difference in mortality from men having a one-time PSA test than those who did not (Martin et al., 2018). PSA presents a major dilemma for healthy men and their primary care doctors and urologists as to whether to take a test. Many doctors continue to recommend PSA tests, and a secondary effect of testing is overdiagnosis and overtreatment that skews comparisons in incidence and survival among countries. Guidelines on the PSA test must be used to help inform the patient (as in the EAU-ESTRO-SIOG guidelines) (Mottet et al., 2017).
- Generating awareness of prostate health and symptoms of prostate cancer among men and their partners or carers remains a major challenge given that men tend to ignore or defer health-related changes of all types. Diagnosis of prostate cancer is typically made at a more advanced stage than breast cancer, although 40–50 % of new diagnoses are in low and very low risk cases. The Movember campaign (https://www.movember.com) and testimonies of male celebrities diagnosed with prostate cancer have helped, and the role of advocacy organisations such as Europa Uomo – which unites national prostate cancer support groups – is crucial, although there is still a way to go before matching the progress made in breast cancer.
- There is evidence that despite primary care doctors being alerted to refer people to see specialists for all cancers within certain times, men with suspected prostate cancer wait longer than those suspected of other cancers (Swann et al., 2018). Apart from the possibility of missing treatment time for aggressive disease, this can also exacerbate psychological distress.

2.2.2. Diagnosis

Diagnosing, staging and grading prostate cancer is complex and it is essential that experienced pathologists, radiologists and nuclear medicine specialists determine results from biopsies, surgery samples and imaging. Challenges include:

- The need to be able to detect aggressive, potentially lethal prostate cancers, that must receive treatment (or combined and sequenced treatments) vs. indolent, insignificant cancers that do not cause death and could be followed up in active surveillance programmes.
- The need to develop non-invasive tools to diagnose exclusively clinically significant prostate cancer.

A multidisciplinary approach can be especially important in these early steps; a clinic that evaluated men with newly diagnosed prostate cancer in a timespan of only 1 day, with a meeting where imaging studies and biopsy slides were reviewed with collaboration of urologists, radiation oncologists, medical oncologists, pathologists and radiologists, showed that many men were then given a different risk category or stage as a result (Sundi et al., 2015).

2.2.3. Treatment

- Radical prostatectomy is a procedure that has a wide variation in surgeon volumes and complication outcomes (Schroeck et al., 2013). The specialism of urology, which traditionally cares for urological cancers, requires surgeons who are cancer specialists and who work in prostate units as advocated in this paper, and who have completed sufficient supervised procedures to acquire expertise.
- Radiation therapy can now be delivered by a wide variety of techniques, increasing complexity and treatment choice.
- In addition to treatment complexity, choosing between treatments that have equivalent survival outcomes is a major challenge for patients, as is securing access to appropriate information that will inform their preferred approach. It is important that men have access to balanced and unambiguous information from all appropriate members of the MDT, especially where there are competing choices of treatment. For example, studies have showed:
- Men who consult a radiation oncologist as well as a urologist are more likely to opt for radiation therapy to treat localised cancer (Wallis et al., 2018; Jang et al., 2010).
- A multidisciplinary consultation in the initial management of non-metastatic prostate cancer has been found to give high patient satisfaction, promote active participation and shared decision-making and strongly influenced the final patient decision (Patrikidou et al., 2018).
- A high level of patient satisfaction was reported at a longstanding multidisciplinary clinic, which also reported a survival benefit for advanced disease (Gomella et al., 2010).
- Multidisciplinary care has been found to be associated with increased selection of active surveillance in men with low-risk prostate cancer (Aizer et al., 2012).
- Recent medical therapies are bringing more complexity and costs for non-surgical oncology.
- Decision aids for treatment and diagnosis are a growing area of interest and require support for implementation (Feldman-Stewart et al., 2018; Thurtle et al., 2019).

2.2.4. Support services and survivorship

- A diagnosis of prostate cancer can have a devastating effect on the mental health and wellbeing of men (Chambers et al., 2017) and a range of unmet physical, psychological and information needs have been identified (Paterson et al., 2015).
- As more men are living with the after-effects of prostate cancer treatments, and with advanced disease, there has been an increasing demand for high-quality support services. Up to 75 % of men treated for localised prostate cancer report severe and persistent treatment side-effects including sexual dysfunction, and poor urinary or bowel function (Smith et al., 2009). Treatment complications may be lifelong and have intense psychological impact on masculinity.
- It is a challenge to make support available for not only the range of physical effects of treatment, from incontinence and erectile dysfunction to symptoms of advanced cancer, to effects of hormone therapy, but also psychological and counselling support for issues such as sexuality. It is essential that an extended community of nurses, physiotherapists, psychologists, sexual therapists, social workers and palliative care specialists is in place.

2.2.5. Genetic testing and counselling

Prostate cancer has a substantial heritable component that has been said to be under-appreciated in the urologic community (Giri et al., 2016; Pritchard et al., 2016). It is likely that in future genetic testing and counselling will become important in standards of care, placing pressure on healthcare systems to provide more clinical geneticists and support teams (Zhen et al., 2018; Giri et al., 2018).

2.2.6. Inequalities

- The variation in outcomes for prostate cancer in Europe indicates that there may be inequalities in access to high-quality care, although comparisons are hard to make owing to widely varying incidence and quality of registry information. What is certain is that as with other cancers, some countries in eastern Europe lack access to drugs, radiation therapy and new techniques that may be critical to improving care.
- As prostate cancer is primarily a disease of older men, there are pronounced challenges in caring for a population that has more comorbidities and in making shared and informed treatment decisions. Research from the Netherlands (Vernooij et al., 2019) and Italy (Trama et al., 2016) has also showed that the probability of receiving treatment with curative intent decreases significantly with older age (older than 70), but survival is similar across age groups for intermediate- and high-risk patients who underwent treatment with curative intent. Not age, but patient preferences, together with life expectancy, and comorbidity should be decisive factors when offering treatment.
- While there is evidence that men from higher socioeconomic groups have a higher incidence of prostate cancer, which may be due to increased take up of screening, they are also more likely to receive curative and non-curative treatment than lower socioeconomic groups (Berglund et al., 2012; Aarts et al., 2013).
- The increased incidence in men of African and African-Caribbean ethnicity is a challenge in reaching groups that are often socioeconomically disadvantaged.

2.2.7. Research

The range of research challenges for prostate cancer is wide, extending from risk stratification at diagnosis, to new localised treatment techniques, to individualising medical treatments as new agents become available for advanced disease, to improving quality of life. Funding for prostate cancer research lags behind other cancers in many countries and participation in research and/or research networks is needed.

3. Organisation of care

3.1. Care pathways and timelines

- Care for men with prostate cancer patients must be organised in pathways that cover the patient's journey from their point of view rather than that of the healthcare system, and pathways must

correspond to current national and European evidence-based clinical practice guidelines on diagnosis, treatment and follow-up. The European Pathway Association defines a care pathway as "a complex intervention for the mutual decision making and organisation of care processes for a well-defined group of patients during a well-defined period". This broad definition covers terms such as clinical, critical, integrated and patient pathways that are also often used. See http://e-p-a.org/care-pathways and also the WHO framework on integrated people-centred health services, http://www.who.int/servicedeliverysafety/areas/people-centred-care.

- After a diagnosis, it must be clear to the patient which professional is responsible for each step in the treatment pathway and who is following the patient during the journey (usually called a case manager or patient navigator) (European Partnership for Action Against Cancer (EPAAC), 2014). In some countries, case managers during the main stages of treatment are cancer nurses.
- Follow-up, support and care for long-term survivorship, and palliative care, must be part of a care pathway.

3.2. Prostate cancer units/centres

- The concept of the multidisciplinary prostate cancer unit, as initially set out by the European School of Oncology (ESO), is recent in Europe (and elsewhere) (Valdagni et al., 2011). In that paper, the prostate cancer unit was not put forward necessarily as a single location but departments needed to be in 'reasonable proximity to provide a stable structure for teams of specialists to work together', which was confirmed in the follow-up paper published in 2015 (Valdagni et al., 2015). The ERQCC expert group considers that it is optimal for a unit to be based at a single site for most of the core and extended specialties, in line with the essential requirements for other cancers (and in particular as pioneered in breast cancer). However, it is recognised that some members of the MDT may be based at nearby locations, and that some patients will not live near specialist units, in which case there must be a structure in place to enable discussion of patient management in weekly teleconferences with an expert centre.
- Prostate cancer clinics are likely to be co-located with other urological cancers (bladder, kidney, testicular), but each cancer must have its own MDT and minimum volume, performance and audit requirements. It is likely that prostate cancer units will be established in large hospitals or in cancer centres that cater for a population of more than 300,000 people, and have a MDT and resources that can care for 100 or more newly diagnosed cases a year (both treated and monitored cases). In England, the trend has been to transfer urological services to fewer centres to meet guidance of a minimum of 50 radical prostatectomies and radical cystectomies (for bladder cancer) per year (Jallad et al., 2017) (NICE recommends that robotic surgery should have a minimum of 150 cases a year) (National Institute of Health and Care Excellence (NICE), 2014). The target for certification of a prostate cancer centre in Germany is at least 50 radical prostatectomies/cystoprostatectomies a year (and the last audit reported a median number of 76) (German Cancer Society (DKG), 2019).
- The evidence for a minimum volume of prostatectomies carried out by individual surgeons has been the most extensively studied in prostate cancer treatment:
- A study on case volume reports that the hospital length of stay, rates of perioperative complications, transfusions, incontinence, and erectile dysfunction are higher among patients treated by lower volume surgeons (Almatar et al., 2016).
- A systematic review on the volume-outcome relationship for radical prostatectomy looked at studies by hospital and/or surgeon volume, finding conflicting evidence on their relative contribution to better outcomes (Trinh et al., 2013). The authors also noted that in the US, 80 % of surgeons performed $\leq$10 radical prostatectomies; only 5 % performed $\geq$50 cases
- Another systematic review also found that higher surgical volume was associated with improved outcomes for radical prostatectomy (Leow et al., 2017).
- The ERQCC expert group considers that a volume target of 100 cases (all stages of prostate cancer) and a minimum of 50 prostatectomies a year conducted by two or more urologists is an essential requirement for a prostate cancer unit. This does not include a target for an individual surgeon, but the requirement is also for a urologist to spend at least 50 % of their time on prostate cancer. While the 100/50 target and more has been specified in countries such as Germany and the UK, there are currently lower specifications, such as in the Netherlands, which while listing the same core MDT as this ERQCC paper in a standardisation document, specifies a minimum volume of only 20 radical prostatectomies per year for a hospital (SONCOS, 2017). The 2015 position paper from ESO (Valdagni et al., 2015) also agreed the 100/50 target.

3.3. The MDT for prostate cancer

Treatment strategies for all prostate cancer patients must be decided on, planned and delivered as a result of consensus among a core MDT that comprises the most appropriate members for the particular diagnosis and stage of cancer, patient characteristics and preferences, and with input from the extended community of professionals (Fig. 2). The heart of this decision-making process is normally a weekly or more frequent MDT meeting where all cases are discussed with the objective of balancing the recommendations of clinical guidelines with the needs of the individual prostate cancer patient.

To properly treat prostate cancer, it is essential that the core MDT comprises health professionals from the following disciplines:

- Pathology.
- Radiology.
- Nuclear medicine.
- Urology/surgery.
- Radiation oncology.
- Medical oncology.
- Nursing.

A director who coordinates the work of all these specialists is essential to facilitate meetings and discussions. A multidisciplinary group can be led by urologists, medical oncologists or radiation oncologists.

According to the case, some or all of this core MDT meets to discuss:

- Cases after diagnosis and staging to decide on optimal treatment according to categorisation in low-, intermediate- and high-risk categories.
- Patients with a recurrence, or where changes to treatment programmes are indicated and have multidisciplinary relevance and/or planned deviations from clinical practice guidelines.

Healthcare professionals from the following disciplines must also be available whenever their expertise is required (the 'extended' MDT):

- Oncology pharmacy.
- Geriatric oncology.
- Psycho-oncology.
- Physiotherapy.
- Palliative care.
- Sexual rehabilitation.

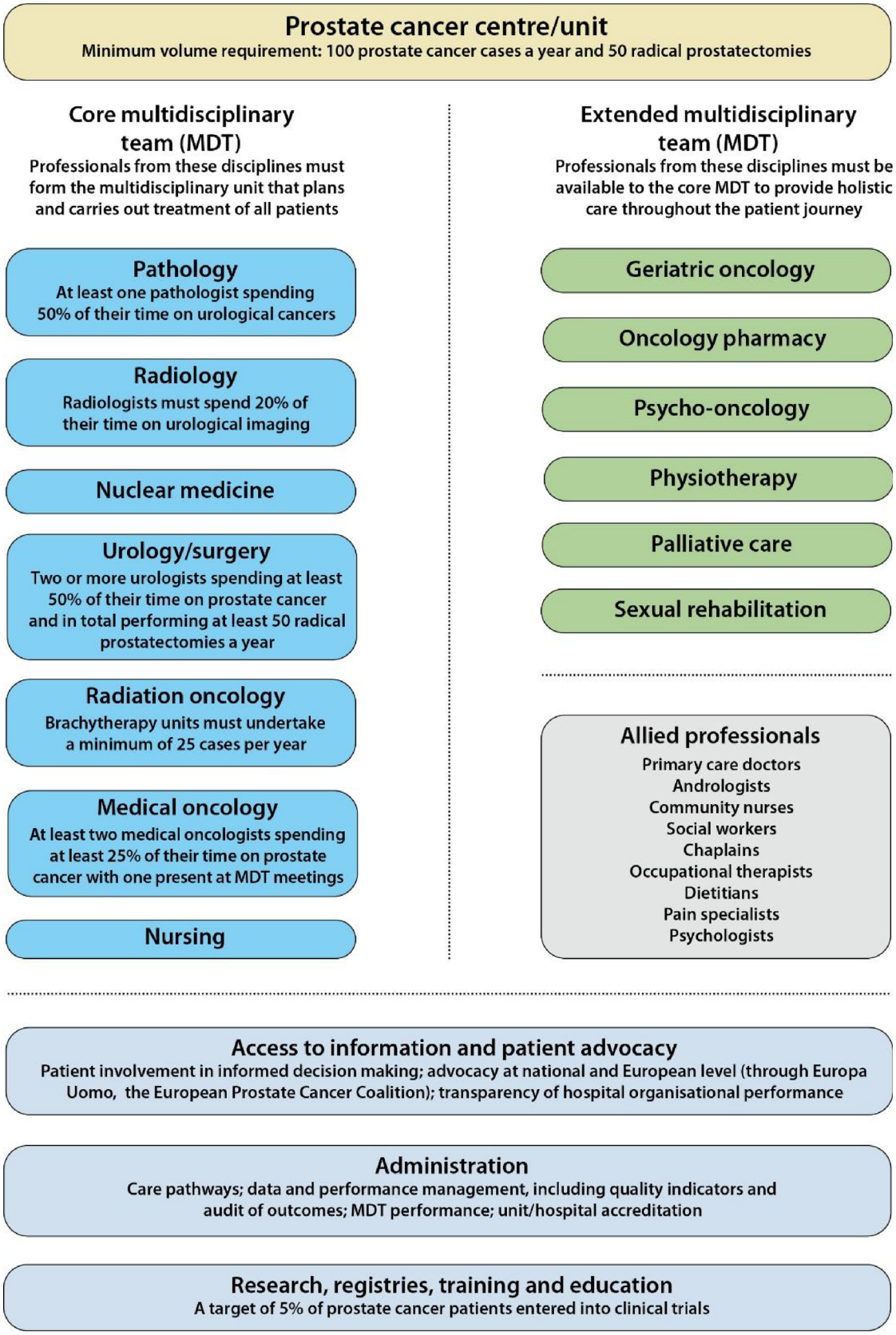

Fig. 2. Schematic of prostate cancer centre/unit.

3.4. Disciplines in the core MDT

General statement: Core MDT members, in particular urologists, radiation oncologists, medical/clinical oncologists and nurses, must have excellent communications skills to engage patients and their family and carers in the benefits and risks of therapies to ensure that treatment options are explained to and are appropriate for the patient, and are not unduly influenced by age but more by medical fitness and choice.

3.4.1. Pathology

Pathologists play a vital role in the MDT in timely diagnosis, staging, prognostic/predictive assessment and clinical decision making for each patient. In prostate cancer the pathologist conducts detailed studies of samples taken from biopsies and resections (surgical samples).

Essential requirements: pathology

- There must be at least one uro-pathologist responsible for prostate cancer who must spend at least 50 % of their time on uro-pathology.
- Pathologists must have expertise in reporting on preoperative prostate biopsies and prostatectomies and must use structured reports that meet internationally standardised and evidence-based datasets for the reporting of cancer pathology (Kench et al., 2017).
- Pathologists must observe the new Grade Group System for prostate cancer endorsed by WHO (Epstein et al., 2016, 2017).
- Pathology submitted from elsewhere must be reviewed by the centre's uro-pathologists.
- There must be expert second opinion available to evaluate the inter-observer reproducibility of pathological diagnosis (i.e. for patients enrolled in active surveillance), but it is not recommended routinely for prostate cancer.

3.4.2. Radiology

Radiology plays a critical role in diagnosing, staging and follow-up of prostate cancer and planning of personalised treatment. The role of the radiologist is to perform radiology procedures for diagnosis, staging and follow-up using the most appropriate imaging test depending on the clinical scenario, and to report the imaging studies in a comprehensive and structured way.

Essential requirements: radiology

- Radiologists must have expertise in prostate imaging and spend at least 20 % of their time on urological imaging, including prostate imaging.
- Radiologists and urologists must know the advantages and limitations of TRUS and mpMRI in diagnosis and in primary staging and must be able to integrate imaging data in the patient's clinical context (Furlan et al., 2018; Brown et al., 2018; Thai et al., 2018).
- As prostate cancer detection and staging is increasingly based mainly on MRI, knowledge of state-of-the-art mpMR-protocols, including T2-weighted imaging, diffusion weighted imaging and dynamic contrast enhanced imaging is essential. Dedicated software tools must be available for quantitative post-processing. Standardised reading of MR studies, preferably based on the PI-RADS v2 classification, must be integrated for reporting and communication with referring doctors (Padhani et al., 2018; Polanec et al., 2018). Expertise in whole body MRI is also essential as it may be needed to detect distant metastases, and in particular bone metastases.
- Radiologists and urologists must be able to perform/participate in targeted biopsies (in-bore biopsies) and to perform and/or assist in the preparation and performance of TRUS-MR fusion biopsies (cognitive fusion, image fusion) (Osses et al., 2018; Das et al., 2018).
- Radiologists must know when to refer a patient to nuclear medicine for PET/CT. State-of-the-art CT, MR and PET/CT, including adequate reporting, must be available to address specific questions for diagnosis and differential diagnosis.
- Radiologists must advise on selecting appropriate imaging strategies for patients with suspected recurrent prostate cancer.
- Radiologists must be aware of the potential of radiomics and radiogenomics in prostate cancer diagnosis.

3.4.3. Nuclear medicine

Nuclear medicine offers a 'theragnostic' approach, integrating diagnostics with therapeutics, to prostate cancer in certain indications by accurately staging the disease (diagnosis with a radiotracer labelled with gamma emitting radionuclides) and applying a non-invasive treatment selectively targeting the disease with the same radiotracer.

There is evidence of the efficacy of PET/CT with prostate-specific radiotracers in these clinical indications (Fendler et al., 2017) in which it has demonstrated higher efficacy than CT or MR:

- Staging of high-risk prostate cancer patients.
- Imaging of biochemical recurrence of prostate cancer patients.
- Imaging of advanced prostate cancer.

In radionuclide therapy, there is evidence of its efficacy in patients with metastatic castration resistant prostate cancer with ^{223}Ra (radium-223) (Poeppel et al., 2018; Delgado Bolton and Giammarile, 2018) and ^{177}Lu-PSMA (Virgolini et al., 2018).

There are other clinical situations with limited evidence, but with promising preliminary results:

- Treatment planning, especially radiation oncology: (a) defining the gross tumour volume (GTV); (b) evaluating candidates for boost in biochemical recurrence; and (c) confirming probable oligometastatic disease in advanced prostate cancer before SBRT (stereotactic body radiation therapy).
- Guiding biopsies with PET/CT, improving the probability of a successful extraction of diagnostic tissue.

The role of the nuclear medicine physician is to oversee all aspects of PET/CT, SPECT/CT and radionuclide therapy for patients who require these procedures, including indications, multidisciplinary algorithms and management protocols.

Essential requirements: nuclear medicine

- PET/CT with prostate-specific radiotracers, SPECT/CT, and radionuclide therapy must be available and must be managed by nuclear medicine physicians with the appropriate expertise.
- Nuclear medicine must be able to perform daily verification protocols and to react accordingly. Quality assurance protocols must be in place. An option for ensuring the high quality of PET/CT scanners is provided by the European Association of Nuclear Medicine (EANM) through EARL accreditation.

3.4.4. Urology/surgery

Radical prostatectomy is carried out by urologists for localised prostate cancer, including locally advanced disease. EAU-ESTRO-SIOG guidelines state that the goal of radical prostatectomy is eradication of prostate cancer while preserving continence and, whenever possible, potency (Mottet et al., 2017). There is no evidence yet that one surgical approach is better than another (open, laparoscopic or robotic).

Surgery for selected patients with oligometastatic and/or recurrent disease is experimental and requires a multidisciplinary approach that includes hormone-chemotherapy and/or radiation therapy. Focal therapies are also in research stages and are not standards of care (Carneiro and Sanchez-Salas, 2018).

To be fully competent to perform open radical prostatectomy unsupervised, a surgeon needs to perform many more procedures than

colleagues performing robotic surgery, which should be taken into account when planning services and considering the high cost of robotic equipment (Brausi, 2017).

Urologists also perform ultrasound and biopsy procedures (see radiology), prescribe hormonal therapy and are often the lead physician for all aspects of care.

Essential requirements: urology/surgery

- Two or more urologists trained in prostate cancer diagnosis and treatment must be part of the MDT. They must spend at least 50 % of their working time on prostate cancer care.
- Urologists must have expertise in performing surgery. Radical prostatectomy can be performed by conventional open surgery or by minimal invasive surgery (laparoscopy or robotics). The urology department must perform at least 50 radical prostatectomies a year.
- Urology departments must have active surveillance protocols.
- Urologists must be responsible for follow-up care relating to side-effects of treatment.

3.4.5. Radiation oncology

Radiation therapy is used as radical primary treatment for all risk groups of prostate cancer alone or in combination with adjuvant ADT. It also has a role in the postoperative setting in the presence of high-risk features (high Gleason score, locally advanced disease or positive margins) or as salvage treatment in case of clinical or biochemical relapse. In patients with metastatic disease, EBRT is also used to prevent or reduce symptoms related to metastatic localisations (e.g. bone fractures or pain).

In oligometastatic or oligorecurrent prostate cancer, radiation therapy to the primary site and/or the metastases can increase progression-free survival. Newer techniques, such as SBRT, especially to metastatic sites, can improve local control while simultaneously shortening the treatment duration and thereby reducing the burden for the patient.

Reported advantages of using current EBRT technologies such as IMRT (intensity modulated radiation therapy) include better sexual function and urinary continence than radical prostatectomy in localised prostate cancer (Barocas et al., 2017); and improved bowel function (Sini et al., 2017).

The role of the radiation oncologist (or clinical oncologist in some countries) is to define the optimal clinical strategy (dose prescription, appropriate delivery technique, target identification and possible association with hormones). Radiation oncologists may also take responsibility for supervising and administering radionuclide therapy in collaboration with the nuclear medicine department.

Essential requirements: radiation oncology

- Radiation therapy must be provided within the prostate cancer centre or at a radiation oncology department via formal agreement.
- Radiation oncologists must have adequate experience in contemporary radiation therapy techniques that are accredited for quality, including the technical aspects of radiation delivery dose.
- Radiation therapy options must include IMRT and IGRT with CT and MR based target volume and organ at-risk definition and contouring.
- EBRT for primary radical treatment must be given in conjunction with ADT except in low risk cases and selected intermediate risk disease.
- Protocols must be in place to define evidence-based dose fractionation schedules for both radical and palliative treatment. Reimbursement issues must be addressed concerning the use of inappropriately protracted radiation schedules.
- There must be access to both low dose rate and high dose rate brachytherapy in the treating centre or by formal agreement with neighbouring centres. A minimum of 25 cases per year must be undertaken by a radiation oncologist performing brachytherapy to maintain expertise (Royal College of Radiologists, 2012).
- The radiation oncologist must be responsible for individualised follow-up to evaluate radiation-affected bowel, urinary and sexual function, with access to specialist teams.

3.4.6. Medical oncology

Medical oncologists, or clinical oncologists in certain countries, deliver medical therapy.

Medical therapy for prostate cancer includes hormonal therapies and intravenous chemotherapy (e.g. docetaxel, mitoxantrone, cabazitaxel). Docetaxel can be used in combination with ADT in patients with 1 st line metastatic castration naive prostate cancer. Chemotherapy is also used later in the disease course (in the castration resistant setting) for the relief of symptoms and the prolongation of survival.

Oral second-generation hormonal therapy (e.g. abiraterone, enzalutamide) is used for patients with metastatic castrate-resistant prostate cancer who have failed on prior hormone therapy or chemotherapy (Attard et al., 2018; Tannock, 2017; Hussain et al., 2018). Recent data suggests that abiraterone may be used increasingly in the initial treatment of patients with hormone-naïve prostate cancer (James et al., 2017). Systemic chemotherapy and second-generation hormonal therapies are often given together with bone protecting agents such as bisphosphonates or denosumab (Vale et al., 2018; Saad et al., 2018). Radium-223 must be available for the treatment of metastatic bone disease.

Essential requirements: medical oncology

- Medical or clinical oncologists must be experienced in the evaluation of patients with prostate cancer, and in the delivery of systemic therapy. They must evaluate patients for their fitness to receive systemic treatment taking account of comorbidity, frailty and patient preference.
- At least two medical or clinical oncologists must be associated with each MDT such that one is present at all team meetings and party to all decisions about appropriate patients.
- A medical or clinical oncologist who is specialised in the management of prostate cancer must spend at least 25 % of their time working on the care of prostate cancer patients or on supporting activities in service development and research that are an important part of prostate cancer care.
- Medical or clinical oncologists must also be familiar with the complex initial investigations of prostate cancer, which underpin decisions that are taken about primary surgery, radiation therapy, combined modality therapy or active surveillance.
- They must know toxicities and long-term adverse effects of treatments, such as osteoporosis, metabolic syndrome, muscle strength impairment, hot flashes, and sexual dysfunction due to castration and engage with the extended MDT to provide supportive care.
- They must be trained in palliative care and experienced in working with specialists in palliative care and pain control.

3.4.7. Nursing

Nurses provide information, care and support to men and their families with prostate cancer throughout the patient pathway. Nurses are a key contact for patients, provide information to facilitate informed decision-making for treatment options (Stacey et al., 2018), undertake holistic needs assessment, and help manage symptoms such as urinary incontinence.

Across Europe there is a wide geographic variation in access to prostate cancer nurses. Some countries have developed specialist nurse roles such as urology, uro-oncology, and prostate cancer nurse specialists, and cancer navigators. Others have advanced nurse practitioner roles who carry out prostate biopsy, caseload management, nurse-led

follow-up, assessment and management of treatment related toxicity including nurse prescribing, survivorship and rehabilitation programmes. However, few nurses in Europe are currently dedicated to prostate cancer care, but it is likely they will at least play a pivotal role as case managers in MDTs (Colasante et al., 2018).

A European study has identified the prevalence of unmet needs of men and the impact that supportive nursing can have (Cockle-Hearne et al., 2013). There is also a role for community prostate cancer nurses who help to look after men who have adverse consequences from their treatment, such as incontinence. Findings from a pilot trial of nurse-led psycho-educational intervention in primary care suggests that it is feasible, acceptable and potentially useful to prostate cancer survivors (Watson et al., 2018).

Essential requirements: nursing

- Nurses must have training to have detailed insight into each patient's experience on the stages of their disease, proposed treatment and side-effects.
- Nurses must conduct holistic assessments to ensure safe, personalised and age-appropriate nursing care, and provide patient information and support that promotes self-efficacy throughout the patient journey. Validated instruments (e.g. a 'distress thermometer') and symptom assessment tools must be used where appropriate and in conjunction with other MDT members.
- Nursing interventions must be optimised to minimise side-effects and to maximise treatment benefit and quality of life, in surgery (e.g. wound healing), radiation therapy (e.g. bowel and urinary effects), chemotherapy (e.g. neutropenia, sepsis), ADT (hot flushes, metabolic syndrome, osteopenia/osteoporosis, erectile dysfunction, loss of libido) and in clinical trials. Fatigue is often mentioned by patients and must be considered by nurses.
- When performing advanced nursing roles (e.g. case manager, nurse navigator, clinical nurse specialist), nurses must coordinate care with healthcare professionals within and outside the core MDT, including with rehabilitation, psychosocial and palliative care services.
- Health systems must consider establishing community prostate cancer care facilities and nurses to ease demands on the acute sector and bring holistic care closer to where men live (Johnson, 2016).

3.5. Disciplines in the extended MDT

3.5.1. Geriatric oncology

The MDT must have access to geriatricians with oncology experience, or specialist geriatric oncologists. Older patients with prostate cancer require special attention to ensure they are not over- or under-treated; guidelines on the management of patients over 70 state that treatment decisions should not be based on chronological age but on patient's general health and patient preference.

The role of the geriatrician is to coordinate recommendations to other specialists about the need for personalised treatment for older patients with increased vulnerability and frailty (Droz et al., 2017a; Monfardini et al., 2017). See also the recommendations of the International Society of Geriatric Oncology (SIOG) (Droz et al., 2017b).

Essential requirements: geriatric oncology

- All older patients (70+) must be screened with a quick, simple frailty screening tool, such as the adapted Geriatric-8 (G8) screening tool (Petit-Monéger et al., 2016).
- Frail and disabled patients must undergo a geriatric assessment (Wildiers et al., 2014). The assessment can be based on self-report combined with objective assessments that can be performed by a specialist nurse in collaboration with a physician (geriatrician/specialist in internal medicine).
- Cognitive impairment affects all aspects of treatment – ability to consent, compliance with treatment, and risk of delirium – and screening using tools such as Mini-Cog (Borson et al., 2003) is essential. A geriatrician or a geriatric psychiatrist or neurologist would preferably be involved with impaired patients.
- For frail and disabled patients, the geriatrician or specialist nurse must be present in the MDT meeting to discuss treatment options aligned with the patient's goals of care.

3.5.2. Oncology pharmacy

The complexity and often low safety profile of oncology drugs together with the high cost of drugs involved in prostate cancer treatment means that it is essential to optimise pharmacotherapy. Oncology pharmacy plays a critical role in the extended MDT in the care of prostate cancer patients, given the importance of systemic treatment.

The role of the oncology pharmacist is to:

- Liaise with the medical oncologist/clinical oncologist/uro-oncologist to discuss cancer specific treatments, including interactions with other treatments.
- Counsel patients about their drug treatment.
- Supervise the preparation of oncology drugs.

Essential requirements: oncology pharmacy

- Oncology pharmacists must have experience with antineoplastic treatments and supportive care; interactions between drugs; drug dose adjustments based on age, liver and kidney function, and toxicity profile; utilisation and monitoring of pharmacotherapy; patient counselling and pharmacovigilance; and knowledge of complementary and alternative medicines.
- Oncology pharmacists must comply with the European Quality Standard for the Oncology Pharmacy Service (QuapoS) (European Society of Oncology Pharmacy, 2018). Oncology drugs must be prepared in the pharmacy and dispensing must take place under the supervision of the oncology pharmacist.
- Oncology pharmacists must provide personalised information for patients on their drug therapy to support adherence, i.e. on the use of new oral drugs such as abiraterone and enzalutamide.
- Oncology pharmacists must work with oncologists on clinical prostate cancer trials.

3.5.3. Psycho-oncology

About 10 %–23 % of prostate cancer patients report clinically significant distress (Chambers et al., 2014); symptoms of distress can continue into survivorship. Common reactions include excessive worry and rumination, difficulty concentrating, insomnia, increased use of alcohol and other drugs, social withdrawal and somatic complaints. There is strong evidence that psychological interventions can improve psychological outcomes; however, in prostate cancer a systematic review of psychosocial interventions did not find sufficiently strong evidence to permit meaningful conclusions, and additional well-executed and transparently reported research studies are necessary (Parahoo et al., 2015).

The role of the psycho-oncologist is to:

- Ensure that psychosocial distress (National Comprehensive Cancer Network, 2003), and other psychological disorders and psychosocial needs, are identified by screening throughout the disease continuum, and are considered by the MDT.
- Promote effective communication between patients, family members and healthcare professionals.
- Support patients and family members to cope with multifaceted disease effects.

Essential requirements: psycho-onchology

- Patients must have access to a self-administered psychological assessment tool ('distress thermometer'). Scores below a certain level must be routinely managed by the primary care team; above that level there must be further clinical interviewing and screening for anxiety and depression, and referral to the most appropriate professional, such as a mental health physician.
- Psychosocial care must be provided at all stages of the disease and its treatment for patients and their partners (Hyde et al., 2018) and families and must be present to ensure comprehensive cancer care.
- Psychosocial interventions must be based on clinical practice guidelines or the NCCN Guidelines for Distress Management (https://www.nccn.org/professionals/physician_gls/default.aspx).

3.5.4. Physiotherapy

Physiotherapy plays a role in interventions that can help to preserve and restore continence after prostatectomy and that address erectile dysfunction. Evidence suggests that urinary incontinence, fitness, fatigue, body constitution and quality of life can all be improved by exercise in patients during and after prostate cancer (Whitney and Islam, 2015; Bernardo-Filho et al., 2014).

Essential requirement: physiotherapy

- A physiotherapist trained in incontinence and erectile dysfunction management in men with prostate cancer must be available to the core MDT when needed before and after radical treatment.

3.5.5. Palliative care

Palliative care, as defined by the World Health Organization, applies not only at end of life, but throughout cancer care (http://www.who.int/cancer/palliative/definition). Palliative care means patient and family centred care that enhances quality of life by preventing and treating physical, psychosocial and spiritual suffering (Haun et al., 2017; Kavalieratos et al., 2016).

There is an increasing need for palliative care services for prostate cancer patients throughout the disease trajectory in conjunction with standard cancer treatments, as a majority of prostate cancer patients are older men. Endocrine treatments for prostate cancer can cause muscle weakness, fatigue and osteoporosis, impairing wellbeing and quality of life. In patients with advanced disease the most common metastases are skeletal with significant symptoms such as pain and fatigue albeit with relatively long survival (Sullivan et al., 2007; Torvinen et al., 2013).

Palliative care services include general palliative care provided by oncology professionals and other clinicians who are responsible for cancer care, and specialised care provided by a multidisciplinary palliative care team (Ferrell et al., 2017; Quill and Abernethy, 2013). Referral to a specialised palliative care team should be offered early in the disease course concurrently with cancer treatment for all patients with newly diagnosed advanced disease and for patients with high symptom burden or unmet physical or psychosocial needs (Hui et al., 2016).

Essential requirements: palliative care

- There must be access to a dedicated palliative care unit with a specialised palliative care team that provides expert outpatient and inpatient care.
- All cancer patients with severe symptoms or suffering, or patients with incurable disease, must be introduced to the specialist palliative care team, irrespective of the cancer-specific treatment plan.
- The palliative care team must include palliative care physicians and specialist nurses, working with an extended team of social workers, chaplains, psychotherapists, physiotherapists, occupational therapists, dieticians, pain specialists and psycho-oncologists.
- The specialised palliative care team must have good knowledge of cancer and its treatment including palliative radiation therapy and isotope therapy of bone secondaries, adverse effects of treatment, i.e. castration related symptoms and rehabilitation needs of patients, to offer holistic care in collaboration with other professionals.
- The palliative care team must have experience of taking care of frail older patients and their families.
- To ensure the continuity of care at home, the palliative care team must work with community/primary care providers.
- Palliative care specialists and oncologists must aspire to meet the standards of the ESMO Designated Centres of Integrated Oncology & Palliative Care (http://www.esmo.org/Patients/Designated-Centres-of-Integrated-Oncology-and-Palliative-Care).

3.5.6. Sexual rehabilitation

Radical prostatectomy, especially, can profoundly affect sexual functioning. Sexual rehabilitation can be provided by specialist therapists and counsellors, who may have a background in medicine, nursing or psychology, and also by urologists and andrologists trained in sex therapy.

Rehabilitation after prostate cancer surgery mainly focuses on restoring erectile function through various means (drugs, gel, intracavernous injection, mechanical devices), but there is a view that more comprehensive sexual rehabilitation should be included that also addresses other side-effects of surgery such as loss of ejaculate, penile shortening, change of orgasmic feeling, alterations in body image, stress incontinence, disturbances in partner relationships and anxiety (Ljunggren and Ströberg, 2015).

Essential requirement: sexual rehabilitation

- There must be a professional specialising in comprehensive clinical sexual rehabilitation available to surgical prostate cancer patients as part of the extended MDT either in the hospital or community.

4. Other essential requirements

4.1. Patient involvement, access to information and transparency

- Patients must be involved in every step of the decision-making process and their satisfaction with their care must be assessed throughout the patient care pathway. Patients and their families and carers must be offered relevant, objective and understandable information, which may include decision support aids, to help them appreciate the process that will be followed with their treatment from the point of diagnosis. They must be supported and encouraged to engage with their health team to ask questions and obtain feedback on their treatment wherever possible.
- It is also essential that prostate cancer patient support organisations are involved whenever relevant throughout the patient pathway. These groups work to:
- Improve patients' knowledge and ability to take decisions.
- Secure access to innovative therapies and improve quality of treatment.
- Support prostate cancer research, such as by being involved in the better design of clinical trials.
- Advocate at national health policy level.

Patient advocacy for prostate cancer has improved greatly in the past 10 years or so. Europa Uomo (Denis, 2011), the European Prostate Cancer Coalition, was established in 2002 and now has 23 member organisations across Europe (https://www.europa-uomo.org). Some member organisations are also federations of support groups in a country – for example, in the UK Tackle Prostate Cancer (http://www.tackleprostate.org) has dozens of local support groups listed on its site, and also partner organisations such as Prostate Cancer UK (https://prostatecanceruk.org).

- Conclusions on each case discussion must be made available to patients and their primary care physician. Advice on seeking second opinions must be supported.
- Cancer healthcare providers must publish on a website, or make available to patients on request, data on centre/unit performance, including:
- Information services.
- Waiting times to first appointment.
- Pathways of cancer care.
- Numbers of patients and treatments available at the centre.
- Number of operated patients at the centre (per procedure).
- Clinical trials.

The ERQCC expert group also recommends that the following are made public:

- Clinical outcomes.
- Patient reported outcomes.
- Incidents/adverse events.

4.2. Performance and quality

The prostate cancer centre must develop:

- Performance measurement metrics/quality indicators based on the essential requirements in this paper and on clinical guidelines.
- Operational policies to ensure the full benefits of a coordinated clinical pathway based on published guidelines.
- Accountability within the governance processes in individual institutions.
- Systems to ensure safe and high-quality patient care and experience throughout the clinical pathway.
- Effective data management and reporting systems.
- Engagement with patients, their carers and support groups to ensure reporting of patient outcomes and experience.

To assess properly the quality of prostate cancer care, three categories of outcomes must be measured and collected in databases at the level of the specialist centre, regionally and/or nationally:

- Clinical outcomes.
- Process outcomes.
- Patient reported outcomes.

This includes national audits where available and national cancer registration/certification.

These approaches can be developed in the context of quality management systems (QMS) depending on the health economy of an individual country. The benefits of such a system include:

- Improving processes to enhance patient safety.
- Setting standards within a clinical pathway.
- Ensuring appropriate resource management including workforce and financial resources.
- Facilitating training opportunities.
- Determining optimal outcomes with appropriate audit.

4.2.1. Audit

Data measured and collected varies among countries, but it is recommended that these outcome metrics are systematically measured and collected for audit:

- % of patients discussed by the MDT prior to treatment.
- % of patients discussed by the MDT after (surgical) treatment.
- % of patients according to clinical stage at time of diagnosis.
- % of patients showing biochemical/clinical failure after radical treatments discussed by the MDT.
- % of patients receiving treatment with curative and palliative intent
- Volume of specific curative procedures, such as radical prostatectomy and radiation therapy.
- Complications and toxicities.
- In-hospital mortality.
- 1 and 5-year overall survival rate.
- Adherence to MDT recommendations.

4.2.2. MDT performance

- All MDT decisions must be documented in an understandable manner, and must become part of patient records. Decisions taken during MDT meetings must be monitored, and deviations reported back to the MDT. It is essential that all relevant patient data, such as pathology reports, meet quality standards and are available at the time of the MDT meeting.
- The core and extended MDTs must meet at least twice a year to review the activity of the previous period based on the audited metrics, discuss changes in protocols and procedures, and improve the performance of the unit/centre. MDT performance must be quality assured both internally and by external review with demonstration of cost-effectives of quality improvements, and MDT guidance must be promoted nationally and written into national cancer plans.
- The ERQCC expert group strongly recommends that further attention must be given to measures of patient reported outcomes, not only to agree which tools should be used, but also to use such outcomes more systematically as part of discussions and evaluation within the MDT.

4.2.3. Accreditation

The ERQCC expert group strongly recommends participation in national or international accreditation programmes, e.g. Organisation of European Cancer Institutes (OECI) accreditation, http://oeci.selfassessment.nu/cms (Wind et al., 2016).

5. Education and training

It is essential that each prostate cancer centre provides professional clinical and scientific education on the disease and that at least one person is responsible for this programme. Healthcare professionals working in prostate cancer must also receive training in psychosocial oncology, palliative care, rehabilitation and communication skills. Such training must also be incorporated into specialist postgraduate and undergraduate curriculums for physicians, nurses and other professionals. An expert group on cancer control of the European Commission has also endorsed a recommendation for multidisciplinary training of cancer specialists to improve the value of MDTs and patient care (Benstead et al., 2017). Nurses should undertake post-qualification education and training about providing holistic care for people being treated for prostate cancer throughout the patient journey.

6. Clinical research and registries

- Centres treating prostate cancer must have clinical research programmes (either their own research or as a participant in programmes led by other centres). The research portfolio should have both interventional and non-interventional projects and include academic research. The MDT must assess all new patients for eligibility to take part in academic and industry sponsored clinical trials at the centre or in research networks. Research must encompass not only advanced prostate cancer but also localised disease and identification of clinically significant prostate cancer.
- The German Cancer Society specifies a minimum accrual rate for clinical trials of 5 % and the OECI requirement for CCCs is > 10 %.

The ERQCC expert group considers that the 5 % target is an important recommendation for all prostate units.

- Collaboration with European academic networks is strongly recommended – see the genito-urinary cancer groups of the European Organisation for Research and Treatment of Cancer (EORTC – http://www.eortc.org), the European Clinical Research Infrastructure Network (ECRIN – http://www.ecrin.org), and the EAU Research Foundation (http://uroweb.org/research/about).
- In countries where clinical trials are less available, centres treating prostate cancer should engage with policymakers to investigate referring patients to other countries (as proposed with European Reference Networks) and should be prepared to participate in clinical trials from an organisational standpoint. Researchers at other centres should be considered as part of the extended MDT for at least annual discussion of clinical trial participation. Generally, pan-European action should be taken to increase participation of prostate cancer patients in clinical trials (both industry-sponsored and academic), and internet access to local clinical trial databases should be developed.
- Older adults are currently underrepresented in cancer clinical trials despite having a disproportionate burden of disease. Strategies to increase the participation of older adults must be implemented and trials designed to take their needs into account.
- Correlative biomarker research is a crucial part of all phases of clinical studies, and requires close cooperation with biobanks such as EORTC's SPECTA programme (http://www.eortc.org/other-research-initiatives/specta).
- Cancer control plans must include high-quality population and specialist cancer registries for prostate cancer to inform both clinical research and to improve the quality of care through indicators. At population level, the Association of Nordic Cancer Registries includes prostate cancer in 50 cancer types in the Nordic countries (https://www.ancr.nu). Sweden's National Quality Registry for Prostate Cancer (NPCR) is notable as it collects data on diagnosis and how tumours were assessed, treatment and waiting times, and patient-reported symptoms up to 5 years after treatment, and is said to be the world's largest clinical database on prostate cancer (http://npcr.se). PcBaseSweden is a research platform based on NPCR (Van Hemelrijck et al., 2013). The TrueNTH Global Registry project has recently been established as an international registry to monitor care provided to men with localised prostate cancer (Evans et al., 2017).

7. Conclusion

The information presented in this paper is a description of the essential requirements for a high-quality prostate cancer service. The ERQCC expert group is aware that it is not possible to propose a 'one size fits all' system for all countries, but urges that access to MDTs and specialised treatments is guaranteed to all patients with prostate cancer in Europe.

Declaration of Competing Interest

The authors declare no conflicts of interest for this paper.

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