INTERNATIONAL CONTINENCE *SOCIETY (ICS) REPORT ON THE TERMINOLOGY FOR SEXUAL HEALTH IN MEN WITH LOWER URINARY TRACT (LUT) / PELVIC FLOOR (PF) DYSFUNCTION – VERSION 15*

Ervin Kocjancic, Omer Acar, Eric Chung, Bernard Haylen, Valerio Iacovelli, Jorge Jaunarena, Jennifer Locke, Alexandra Millman, Irmina Nahon, Samuel Ohlander, Ran Pang, Mauricio Plata*

Standardization Steering Committee ICS,*
ICS Working Group on Sexual Health in men with LUT/PF dysfunction

Ervin Kocjancic: Department of Urology, University of Illinois at Chicago, College of Medicine, Chicago, Illinois, US. ervkoc@gmail.com

Ömer Acar: Department of Urology, University of Illinois at Chicago, College of Medicine, Chicago, Illinois, US. oacar2@uic.edu

Eric Chung: Department of Urology, Greenslopes Private Hospital, Brisbane, Australia. ericchg@hotmail.com

Joaquin Alvarez Garzon: Department of Urology, Hospital Privado Universitario de Córdoba, Argentina. joacoalvarezgarzon@gmail.com

Bernard Haylen: Department of Gynaecology, University of New South Wales, Sydney, Australia. bernard@haylen.co

Valerio Iacovelli: Department of Urology, Tor Vergata University of Rome, San Carlo di Nancy General Hospital - GVM Care and Research, Rome, Italy. valerio.iacovelli85@gmail.com

Jorge Jaunarena: Centro de Urologia CDU, Instituto Alexander Fleming, Buenos Aires, Argentina. jorgejaunarena@gmail.com

Jennifer Locke: Department of Urology, University of Toronto, Sunnybrook Health Sciences Centre, Toronto, Canada. jennlocke@gmail.com

Alexandra Millman: Department of Urology, University of Illinois at Chicago, College of Medicine, Chicago, Illinois, US. alexi.millman@gmail.com

Irmina Nahon: Discipline of Physiotherapy, Faculty of Health, University of Canberra, Australia. irmina.nahon@canberra.edu.au

Samuel Ohlander: Department of Urology, University of Illinois at Chicago, College of Medicine, Chicago, Illinois, US. sohlande@uic.edu

Ran Pang: Department of Urology, Guang An Men Hospital, Beijing, China. pangran2002@gmail.com

Mauricio Plata: Department of Urology, Fundación Santa fe de Bogotá University, Universidad de los Andes School of Medicine, Bogotá, Colombia. mauricio.plata@fsfb.org.co

Correspondence to:

Dr. Ervin Kocjancic
University of Illinois at Chicago,
College of Medicine,
Department of Urology
Chicago, IL, US
E-mail: ervkoc@gmail.com
Phone: 312-996-9330
Fax: 312-413-0495

ABSTRACT

Introduction: The terminology for sexual health in men with lower urinary tract (LUT) and pelvic floor (PF) dysfunction has not been defined and organized into a clinically based consensus Terminology Report. The aim of this Terminology Report is to provide a definitional document within this context that will assist clinical practice and research.

Methods: This Report combines the input of the members of Sexual Health in Men with LUT and PF Dysfunction working group of the International Continence Society (ICS), assisted at intervals by external referees. Appropriate core clinical categories and a sub-classification were developed to give coding to definitions. An extensive process of ... rounds of internal and external review was involved to exhaustively examine each definition, with decision-making by collective opinion (consensus). The Committee retained evidence-based definitions, identified gaps, and updated or discarded outdated definitions. Expert opinions were used when evidence was insufficient or absent.

Results: A Terminology Report for sexual health in men with LUT and PF dysfunction, encompassing 223 (201 *NEW*) separate definitions, has been developed. It is clinically based with the most common diagnoses defined. Clarity and user-friendliness have been key aims to make it interpretable by practitioners and trainees in all the different specialty groups involved. Conservative and surgical managements are major additions and appropriate figures have been included to supplement and clarify the text. Emerging concepts and measurements, in use in the literature and offering further research potential, but requiring further validation, have been included as an appendix. Interval (5-10 year) review is anticipated to keep the document updated.

Conclusion: A consensus-based Terminology Report for sexual health in men with LUT and PF dysfunction has been produced to aid clinical practice and research. The definitions that have been adopted are those that are most strongly supported by the literature at this time or are considered clinical principles or consensus of experts' opinions.

DISCLOSURES:

Ervin Kocjancic: Neomedic (Speaker honorarium), NexHand (Patent owner), Allergan (Consultant), Pfizer (Speaker honorarium), Astellas (Consultant), Boston Scientific (Consultant)

Ömer Acar: No disclosures

Eric Chung: No disclosures

Joaquin Alvarez Garzon: No disclosures

Bernard Haylen: No disclosures

Valerio Iacovelli: No disclosures

Jorge Jaunarena: No disclosures

Jennifer Locke: No disclosures

Alexandra Millman: No disclosures

Irmina Nahon: No disclosures

Samuel Ohlander: No disclosures

Ran Pang: No disclosures

Mauricio Plata: Astellas (Speaker), Neomedic (Speaker), Pfizer (Speaker)

WORDS: ABSTRACT: 309 words; **TEXT:** … words

FIGURES: 3

TABLES: 7

INTRODUCTION

Currently there is no comprehensive document addressing all elements required for diagnoses applicable to sexual health in men with lower urinary tract (LUT) and pelvic floor (PF) dysfunction. The term "diagnosis" is defined by "the determination of the nature of a disease" by clinical symptoms and signs and laboratory investigations.[1] Such a specific report requires a full outline of the terminology for all symptoms, signs, diagnostic tools, and therapeutic options for sexual health in males with LUT and PF dysfunction. Sexual dysfunctions are a large group of conditions that have been classified by the International Classification of Diseases, 10th Edition (ICD-10) by the World Health Organization as organic or as non-organic even though a multifactorial etiology is often presumed.[2]

This Terminology Report is inherently and appropriately a definitional document, collating the definitions of terms, that is, words used to express a defined concept in a particular branch of study; sexual health in men with LUT and PF dysfunction. Emphasis has been on comprehensively including terms in current use in the relevant peer-reviewed literature. The aim is to assist clinical practice and research. Explanatory notes on definitions have been referred, where possible, to the "Footnotes section." Table 1 lists the number of definitions: (i) new; (ii) changed; (iii) total by section, compared with the previous male-inclusive reports.[3,4,5,6]

As in earlier ICS Reports, qualities for a male-specific terminology report should be:

(A) User-friendly: It should be able to be understood by all clinical and research users.

(B) Clinically-based: Symptoms, signs, validated investigations and imaging should be presented for use in forming diagnoses.

(C) Origin: Where a term's existing definition (from one of multiple sources used) is deemed appropriate, that definition will be included and duly referenced.

(D) Able to provide explanations: Where a specific explanation is deemed appropriate to explain a change from earlier definitions or to qualify the current definition, this will be included as an addendum to this paper (Footnote [FN] 1,2,3 . . . .). Wherever possible, evidence-based medical principles will be followed.

A previous "backbone" terminology ICS paper on adult male lower urinary tract and pelvic floor symptoms and dysfunctions[5] has been previously published lacking the analysis of sexual male aspects. Disorders in functional urology often overlap with sexual dysfunctions,

168 therefore we needed to promote this update in order to focus on male sexual health features.
169 Dysfunctions in sexual health have been defined in section 1 and their anatomical relation has
170 been reported in section 2. Clinical and diagnostic aspects of sexual dysfunctions have been
171 discussed in sections 3 to 6. According to diagnosis, 7 sections have been developed to define
172 conservative and surgical treatments of male sexual dysfunctions as primary conditions or as
173 secondarily related to benign prostatic obstruction (BPO), urethral stricture disease,
174 overactive bladder (OAB), chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) and
175 prostate cancer.
176 Commonly accepted terminology is needed given its influence on clinician approach
177 to clinical conditions, their studies and investigations of analyses, and for a proper
178 communication with the patients. Thus, this Terminology Report has a crucial role as it is able
179 to provide definitions which are critical in facilitating research, enabling clinicians to
180 communicate accurately to each other, to their patients, and health care systems. This work
181 also enhances the training of future clinicians.
182

Section	New definitions/descriptions	Changed definitions/descriptions	Total
Possible definitions and dysfunctions	38	8	46
Anatomical definitions	15	0	15
Symptoms and questionnaires	20	2	22
Signs, examination, and investigations	33	9	42
Conservative and pharmacological treatment	17	0	17

Surgical treatment	6	0	6
BPO treatment and sexual health	9	0	9
Urethral stricture disease and sexual health	8	0	8
Overactive bladder and sexual health	11	2	13
Chronic prostatitis / chronic pelvic pain syndrome and sexual health	11	1	12
Prostate cancer and sexual health	29	0	29
Treatments that warrant further investigation	4	0	4
Total	201	22	223

Table 1: Total, new, and changed definitions. BPO: Benign prostatic obstruction.

SECTION 1: OUTLINE OF POSSIBLE DEFINITIONS AND DYSFUNCTIONS IN SEXUAL HEALTH

1.1 Erectile function: Complex mechanism of involuntary, neuropsychological, hormone-mediated vascular event that occurs when blood rapidly flows into the penis and becomes trapped in its spongy chambers. ***(NEW)***

1.2 Sexual dysfunction: Difficulty experienced by an individual or a couple during any stage of normal sexual activity; including desire, arousal, and orgasm. Sexual dysfunction requires a person to feel significant distress and interpersonal strain for at least 6 months.[5] ***(NEW)***

1.3 De-novo (postoperative) sexual dysfunction symptoms: Symptoms related to sexual dysfunction that were not reported before surgery.[7] ***(NEW)***

1.4 Erectile function recovery: Return to baseline erectile function after treatment. ***(NEW)***

1.4.1 Erectile function after treatment for prostate cancer: Ability to have successful intercourse by patient self-report after any treatment for prostate cancer. ***(NEW)***

1.5 Erectile dysfunction (ED): Consistent or recurrent inability to attain and/or maintain a penile erection sufficient for sexual satisfaction and/or sexual intercourse.6 (CHANGED)

1.5.1 Vasculogenic ED: Erectile dysfunction which is secondary to a problem with arterial inflow (e.g. atherosclerosis) or venous outflow (e.g. venous leak). **(NEW)**

1.5.2 Neurogenic ED: Erectile dysfunction which is secondary to pathology of the central (e.g. spinal cord injury) or peripheral (e.g. diabetic neuropathy) nervous system. **(NEW)**

1.5.3 End-organ ED: Erectile dysfunction which is due to pathology within the penis itself (e.g. Peyronie's disease). **(NEW)**

1.5.4 Situational ED: Erectile dysfunction which only occurs in certain circumstances (e.g. with a partner but not during masturbation). Generally understood to be due to psychological factors. **(NEW)**

1.5.5 Endocrine ED: Erectile dysfunction secondary to an endocrine pathology, most commonly hypogonadism, but may also be due to hyperprolactinemia, thyroid dysfunction and diabetes mellitus. **(NEW)**

1.5.6 Mixed ED: Erectile dysfunction which has an organic cause as well psychogenic factors (e.g. anxiety or depression) playing a role. **(NEW)**

1.6 Male hypoactive sexual desire disorder: Persistent or recurrent deficiency or absence of sexual or erotic thoughts or fantasies and desire for sexual activity.[FN1.1][6] ***(NEW)***

1.7 Sexual aversion disorder*:* Persistent or recurrent extreme aversion to, and avoidance of, all or almost all, genital sexual contact with a sexual partner which causes distress or interpersonal difficulty.[8] ***(NEW)***

1.8 Hypogonadism: A term introduced to signify low testosterone levels associated with infertility, sexual dysfunction, and systemic alterations (such as decreased muscle mass, depressed mood, sleep disturbances, loss of body hair, lethargy). It has more recently been used interchangeably with the idea of low testosterone production alone.[9] ***(NEW)***

1.8.1 Low testosterone: Serum total testosterone level being less than 300 ng/dL. [FN1.2][9] Threshold for low testosterone in the International System of Units: 11 nmol/l (US), 12 nmol/l (Europe). ***(NEW)***

1.8.2 Testosterone deficiency: A state of low testosterone production combined with symptoms and/or signs that are associated with low serum total testosterone.[9,10] ***(NEW)***

1.9 Libido: A person's overall sexual drive or desire for sexual activity. ***(NEW)***

1.9.1 Altered libido: Complaint of change in interest in sexual activity.[5]

1.9.2 Decreased libido: Complaint of decreased interest in sexual activity in comparison with previous experience.[5]

1.9.3 Increased libido: Complaint of increased interest in sexual activity in comparison with previous experience.[5]

1.10 Ejaculatory function

1.10.1 Ejaculation: Process related to semen expulsion from the urethra.[11] ***(NEW)***

1.10.2 Orgasm: Sensation of pleasure that accompanies sexual climax.[11] ***(NEW)***

1.10.3 Emission: Process in which semen is deposited from the vas deferens in the urethra.[11] ***(NEW)***

1.10.4 Ejection: Synchronic contractions of the bulbospongiosus and ischiocavernosus muscles and external urethral sphincter that allows semen to be expelled antegrade through the urethra.[11] ***(NEW)***

1.11 Ejaculatory dysfunction (EjD): Complaint of alteration of the emission or expulsion of seminal fluids during ejaculation.[5]

1.11.1 Anejaculation: Complaint of absence of seminal fluid emission or expulsion. May be associated with the absence of the sensation of orgasm or anorgasmia.[5]

1.11.2 Delayed ejaculation: Primary or acquired complaint of an increase in the time taken for ejaculation to occur.[5] **(*CHANGED*)**

1.11.2.1 Primary delayed ejaculation: A lifelong experience of delayed ejaculation in all or almost all (75%-100%) occasions of coital activity, which causes distress.[6] ***(NEW)***

1.11.2.2 Acquired delayed ejaculation: A distressing lengthening of ejaculatory latency that occurs in most (>50%) coital experiences after a period of normal ejaculatory function and/or a clinically meaningful change that results in distress.[6] ***(NEW)***

1.11.3 Premature ejaculation (PE): Complaint of a persistent or recurrent pattern of too rapid achievement of ejaculation during partnered sexual activity, that is, before

the individual wishes it.[5] It is accompanied by negative personal consequences, such as distress, bother, frustration, and/or the avoidance of sexual intimacy.[6] **(*CHANGED*)**

1.11.3.1 Lifelong (primary) premature ejaculation: Ejaculation that always or nearly always occurs prior to or within about 1 minute of vaginal penetration from the first sexual experience.[12] ***(NEW)***

1.11.3.2 Acquired premature ejaculation: A clinically significant and bothersome reduction in latency time, often to about 3 minutes or less.[12] ***(NEW)***

1.11.4 Retrograde ejaculation: Expulsion of seminal fluid into the bladder because of bladder neck dysfunction and/or disturbances involving the peri-montanal area in the presence of otherwise normal emission and expulsion. There can be no or small amounts of antegrade ejaculation. Retrograde ejaculation is defined independently from the sensation of orgasm.[6] ***(NEW)***

1.11.5 Anhedonic ejaculation: Ejaculation without the pleasurable sensation of orgasm.[6] ***(NEW)***

1.11.6 Hematospermia: Complaint of the appearance of visible blood in the seminal fluid. Color of the seminal fluid may be red or brown.[14]

1.12 Orgasmic disorder: Presence of either of the following on all or almost all (75% - 100%) occasions of sexual activity; marked delay in, marked infrequency of, or absence of orgasm; markedly reduced intensity of orgasmic sensations.[7]

1.12.1 Anorgasmia (male): The inability to reach orgasm despite adequate and prolonged sexual stimulation leading to adequate sexual arousal which might or might not lead to personal distress.[6] ***(NEW)***

1.12.2 Hypohedonic orgasm: Lifelong or acquired decreased or low level of sexual pleasure with orgasm.[6] ***(NEW)***

1.13.3 Dysorgasmia: Painful orgasm. ***(NEW)***

1.13 Post-orgasmic illness syndrome: Flu-like incapacitating physical and mental symptoms occurring within a few minutes to a few hours after an ejaculation, which usually lasts 3 to 7 days.[6] ***(NEW)***

1.14 Sexual arousal disorder: Lack of, or significantly reduced, sexual interest or arousal.[FN1.3][7]

1.15 Post-5-Alpha reductase inhibitor syndrome: Persistent sexual, neurological, physical, and mental adverse reactions in patients who have taken 5-alpha reductase enzyme inhibitors (finasteride and dutasteride).13 **(NEW)**

1.16 Benign prostatic hyperplasia (BPH): A term that is used exclusively to describe the histologic changes related to benign prostatic growth.FN1.4, FN1.5 [14] ***(NEW)***

1.17 Benign prostatic enlargement (BPE): A term describing increased volume of the gland usually secondary to BPH. The precise volume that determines the lower limit of BPE remains to be defined; 20 mL has been suggested.[14] ***(NEW)***

1.18 Benign prostatic obstruction (BPO): A term used to describe bladder outlet obstruction (BOO) secondary to BPE and, therefore, usually due to BPH.[14] ***(NEW)***

1.19 Prostatitis: An inflammatory disease of the prostate generally affecting younger men and causing pain and discomfort mostly in the perineal and scrotal region which can be associated with LUTS and/or sexual dysfunction.[15] Prostatitis covers a wide range of clinical conditions including acute bacterial prostatitis, chronic bacterial prostatitis, chronic pelvic pain syndrome (inflammatory and noninflammatory), and asymptomatic inflammatory prostatitis. ***(NEW)***

1.20 Overactive bladder (OAB) syndrome: Urinary urgency, usually accompanied by increased daytime frequency and/or nocturia, with urinary incontinence (OAB-wet) or without (OAB-dry), in the absence of urinary tract infection or other detectable disease.FN1.6 [16]

1.21 Sexual activity urinary incontinence or coital urinary incontinence: Complaint of urinary incontinence associated with or during sexual activity and sexual arousal.[7,17] ***(CHANGED)***

1.22 Climacturia: Involuntary loss of urine at the time of orgasm. ***(NEW)***

1.23 Sexual arousal incontinence or foreplay incontinence: Complaint of involuntary loss of urine during sexual arousal, foreplay and/or masturbation.[18,19] ***(NEW)***

1.24 Penile pain with intercourse (Male dyspareunia): Complaint of any penile discomfort occurring during intercourse. May be caused by penile disease, vaginal anatomy (eg, vaginal tightening, scarring, or exposed mesh) and/or may relate to various positions with intercourse.[5]

1.24.1 Hispareunia: male partner pain with vaginal intercourse after female reconstructive surgery.[7] ***(CHANGED)***

1.25 Chronic sexual pain disorder: Sexual activity may induce a central sensitization process characterized by hypersensitivity or hyperalgesia before, during or after sexual activity.[20] ***(CHANGED)***

1.26 Pain: A subjective phenomenon described as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain should be characterized by site, type, frequency, duration, precipitating and relieving factors. The word pain comes from the Latin "poena" meaning a fine or a penalty.[21]

1.26.1 Acute pain: Pain related to acute trauma, infection or other well-defined disease process.[93]

1.26.2 Chronic pain: Persistent or continuous/recurrent pain for at least 6 months. If non-acute and central sensitization pain mechanisms are well documented, then the pain may be regarded as chronic, irrespective of the time period.[93]

1.26.3 Pelvic pain syndrome: Occurrence of persistent or recurrent episodic pelvic pain associated with symptoms suggestive of lower urinary tract, sexual, bowel or gynecological dysfunction. There is no proven infection or other obvious disease.[22]

1.26.4 Perineal pain syndrome: Perineal pain syndrome is the occurrence of persistent or recurrent episodic perineal pain, which is either related to the micturition cycle or associated with symptoms suggestive of urinary tract or sexual dysfunction. There is no proven infection or other obvious disease.[22]

1.26.5 Scrotal pain syndrome: Scrotal pain syndrome is the occurrence of persistent or recurrent episodic scrotal pain which is associated with symptoms suggestive of urinary tract or sexual dysfunction. There is no proven epididymo-orchitis or other obvious disease.[22]

1.26.6 Male chronic genital pain syndromes: Male genital pain syndromes are often associated with symptoms suggestive of lower urinary tract and sexual dysfunction. Common complaints: genital pain, uncomfortable urination, dysuria, sensation of residual urine, increased daytime frequency, slow stream, urgency, dyspareunia. Absence of infection, previous operations, or other obvious disease.[21]

1.26.6.1 Chronic (persistent or recurrent) epididymal pain syndrome: Pain is specific/localized to the epididymis. i. Persistent or recurrent episodic pain. ii. Spontaneous, or reproduced by digital pressure and physical activities. iii. Lower urinary tract symptoms or sexual dysfunction.

1.26.6.2 Chronic (persistent or recurrent) penile pain syndrome: Pain within the penis that is not primarily in the urethra and may be: i. Persistent or recurrent. ii. Spontaneous, or reproduced by digital pressure and physical activities. iii. Lower urinary tract symptoms or sexual dysfunction.

1.26.6.3 Chronic (persistent or recurrent) prostate pain syndrome: see 1.30.

1.26.6.4 Chronic (persistent or recurrent) scrotal pain syndrome: Chronic scrotal pain (generic term used when the site of pain is not clearly in the testis or epididymis). i. Persistent or recurrent episodic pain, unilateral or bilateral. ii. Spontaneous, or reproduced by digital pressure and physical activities. iii. Pain is not in the skin of the scrotum but perceived within its contents. iv. Lower urinary tract symptoms or sexual dysfunction.

1.26.6.5 Chronic (persistent or recurrent) testicular pain syndrome: i. Persistent or recurrent episodic pain. ii. Spontaneous, or reproduced by digital pressure and physical activities. iii. Lower urinary tract symptoms or sexual dysfunction.

1.26.7 Chronic prostatitis / Chronic pelvic pain syndrome (CP/CPPS): Persistent or recurrent prostate and/or pelvic pain, associated with symptoms suggestive of urinary tract and/or sexual dysfunction. No proven infection or other obvious pathology is present to account for the symptoms. Pain may be referred to the bladder, perineum, testicles, penis and/or groin.[21] ***(CHANGED)***

1.26.7.1 Symptoms of CP/CPPS: Intermittent pain. Persistent or recurrent pain. Dyspareunia and/or erectile dysfunction. Voiding and post micturition symptoms (for example: hesitancy, intermittency, feeling of incomplete emptying, dysuria). ***(CHANGED)***

1.26.7.2 National Institutes of Health (NIH) prostatitis classification system. Prostatitis is classified as acute bacterial prostatitis (category I), chronic bacterial prostatitis (category II), chronic prostatitis (CP)/chronic pelvic pain syndrome (CPPS, category III) and asymptomatic inflammatory prostatitis (category IV).[FN1.7, FN1.8] [23,24]

1.26.7.2.1 Acute bacterial prostatitis: Characterized by severe symptoms of prostatitis, systemic infection and acute bacterial urinary

tract infection, requires hospitalization and parenteral fluid-antibiotic therapy.[15]

1.26.7.2.2 Chronic bacterial prostatitis: Caused by chronic bacterial infection of the prostate with or without symptoms of prostatitis. It is usually associated with recurrent urinary tract infections caused by the same bacterial strain.[15]

1.26.7.2.3 Chronic pelvic pain syndrome: Characterized by chronic pelvic pain and lower urinary tract symptoms in the absence of urinary tract infection. It is subdivided into inflammatory (3A) and noninflammatory (3B) categories depending on the presence/absence of leukocytes in expressed prostatic secretion.[15]

1.26.7.2.4 Asymptomatic inflammatory prostatitis: Characterized by histopathological evidence of prostatic inflammation in the absence of genitourinary symptoms. This is usually an incidental finding during evaluation for other conditions such as elevated PSA.[9]

Footnotes for section 1

1.1: History should include duration of symptoms, identification of disorder, impact on quality of life, and partner relationship. Partner interviews may be very helpful as erectile dysfunction, delayed or premature ejaculation in males with hypoactive sexual desire disorder result in a 4–30 times increased risk of female partner desire, arousal or orgasmic disorder.

1.2: The diagnosis of low testosterone should be made only after two total testosterone measurements taken on separate occasions with both conducted in the morning (until 10 am).9

1.3: This disorder should include 3 of the following: (i) Absent/reduced interest in sexual activity; (ii) Absent/reduced sexual/erotic thoughts or fantasies; (iii) No/reduced initiation of sexual activity and unreceptive to partner's attempts to initiate; (iv) Absent/reduced sexual excitement/pleasure during sexual activity in almost all or all (75% - 100%) sexual encounters; (v) Absent/reduced sexual interest/arousal in response to any internal or external sexual/erotic cues (written, verbal, visual); (vi) Absent/reduced genital or non-genital sensations during sexual activity in almost all or all (75% -100%) sexual encounters.

1.4: Epidemiological studies have demonstrated consistent evidence for an association between lower urinary tract symptoms (LUTS)/benign prostatic hyperplasia (BPH) and sexual dysfunction, regardless of age, other comorbidities and various lifestyle factors.[25]

1.5: Several possible pathophysiological mechanisms exist, including NOS/NO (the nitric oxide synthase) and the Rho-kinase activation pathways, autonomic hyperactivity, pelvic ischemia and microvascular dysfunction, inflammatory pathways, sex hormones, iatrogenic and psychological factors.[26]

1.6: According to the EpiLUTS study, patients with ED had 3 times more storage LUTS, 2.6 times more voiding LUTS and 4 times more voiding and storage LUTS.[27,28] In this study, both OAB wet and OAB dry were associated with worse sexual health, reduced sexual activity, and diminished enjoyment of sex ($P < 0.0001$) when compared with patients without OAB.[27,28] Coyne et al. conclude that the impact of OAB in sexual health is evident in both men and women, and sexual health should be assessed in patients presenting with OAB.[29] This was also shown by a nested case-control study, where not only was ED more frequent in OAB patients, but this group had significantly reduced sexual activity and sexual enjoyment because of urinary symptoms[30] (including first void after waking up from sleep and last void before sleep).[5]

1.7: Several factors have been proposed to establish a connection between chronic pelvic pain and sexual dysfunction, including vasculogenic, endocrine, neurogenic and psychological determinants. Shoskes et al. established that patients with chronic pelvic pain are more likely to have nitric oxide-mediated vascular endothelial dysfunction compared to asymptomatic controls, which could contribute to sexual dysfunction.[31] Psychological factors including anxiety have been described by Mo et al. and Cortes et al.[32,33], and depression is more frequent in men with chronic pelvic pain and SD.[32,34]

1.8: CP/CPPS patients are more likely to present with sexual dysfunction or depression.[35] Lee et al. found that SD was present in 72% of patients with CP/CPPS and most of them (42%) had both ED and ejaculatory dysfunction.[36] Also, patients with SD and CP/CPPS had significantly worse symptoms and quality of life. Another study designed to estimate the prevalence of CP/CPPS in Austria found that IIEF-5 was significantly worse in patients with moderate or severe symptoms, thus showing a negative impact of CP/CPPS on sexual function.[37] These patients are also more likely to present with erectile dysfunction and premature ejaculation.[23]

SECTION 2: ANATOMICAL DEFINITIONS RELATED TO SEXUAL DYSFUNCTION

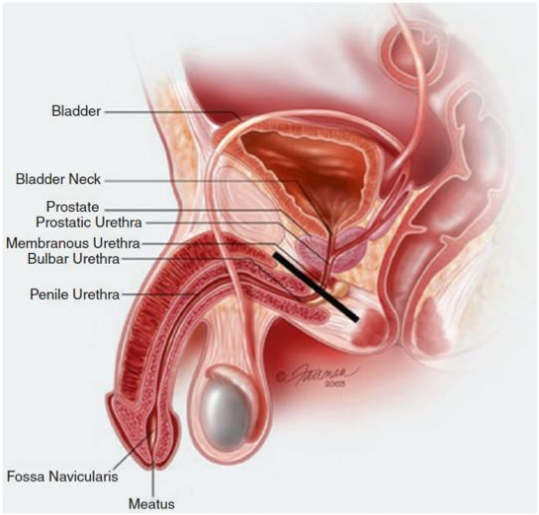


Figure 1: Sagittal view of the male urethra. The bold line delineates the anterior from posterior urethra. Furr J., Gelman J. (2020) Functional Anatomy of the Male Urethra for the Reconstructive Surgeon. In: Martins F., Kulkarni S., Köhler T. (eds) Textbook of Male Genitourethral Reconstruction.

2.1 Urethral meatus: The distal termination of the urethra. An orthotopic urethral meatus is a vertically-oriented slit-like opening located on the glans penis.[38] ***(NEW)***

2.2 Fossa navicularis: The distal portion of the penile urethra, located within the glans penis, just proximal to the urethral meatus.[FN2.1] [38] ***(NEW)***

2.3 Penile urethra: The portion of the urethra extending from the urethral meatus to the distal part of the bulbocavernosus muscle. The lumen is centered in and completely invested by the corpus spongiosum.[FN2.2, FN2.3] [38] ***(NEW)***

2.4 Bulbar urethra: The portion of the urethra between the distal membranous urethra until the conjunction of the left and right corpus cavernosum. The lumen is surrounded by and sits eccentrically toward the dorsal portion of the bulbospongiosus of the corpus spongiosum.[38] ***(NEW)***

2.5 Membranous urethra: The portion of the urethra which traverses the perineal membrane and is surrounded by the striated external urethral sphincter.[38] ***(NEW)***

2.6 Prostatic urethra: The portion of the urethra extending from the bladder neck to the proximal edge of the membranous urethra.[38] ***(NEW)***

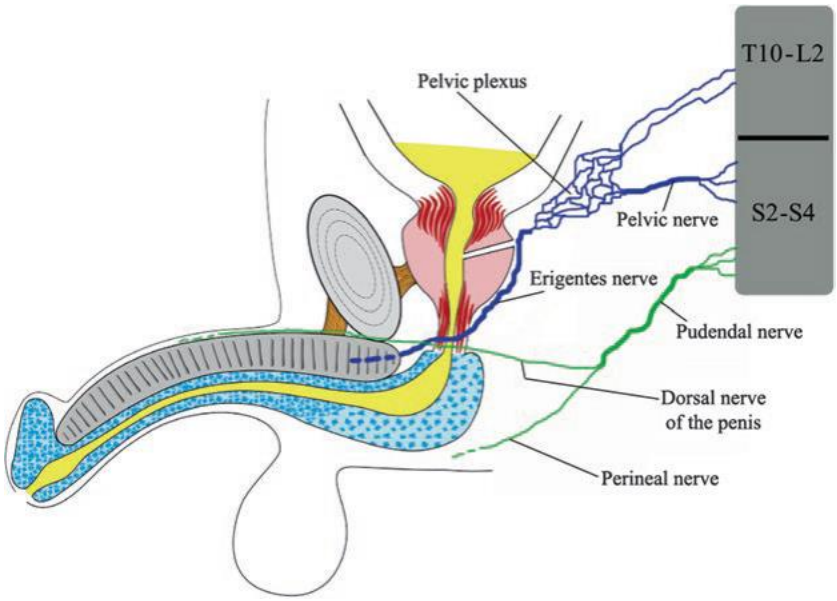
2.7 Bladder neck: The most proximal part of the urethra, creating its connection with the bladder. ***(NEW)***

2.8 Cavernous nerves ("Nervi Erigentes"): These nerves are formed from the distal end of the pelvic plexus and supply sympathetic and parasympathetic innervation to the corpora cavernosa. The cavernous nerves are located at 3 and 9 o'clock positions at the level of the membranous urethra and at 2 and 10 o'clock positions at the level of the proximal bulbar urethra. These nerves are at risk during PFUI (and its repair) as well as bulbar urethroplasty.[39] ***(NEW)***

2.9 Pudendal nerves: These nerves arise from the S2-S4 spinal nerves and provide somatic innervation to the pelvis and perineum. The pudendal nerve travels with the pudendal vessels in Alcock's canal, before giving off the inferior rectal nerve and perineal nerve, and then terminating as the dorsal nerve of the penis.[39,40(chap109)] ***(NEW)***

2.10 Perineal nerves: Branches of the pudendal nerves (7.14), the perineal nerves supply motor innervation to the bulbocavernosus and ischiocavernosus muscles as well as sensory innervation via the posterior scrotal and bulbourethral nerves.[39,41(chap5)] ***(NEW)***

2.11 Dorsal nerves of the penis: These nerves are the terminal branches of the pudendal nerves. They travel through the deep perineal pouch, exiting just inferior to the pubic symphysis and then run along the dorsal surface of the corpora to reach the glans. The supply sensory innervation to the penis and in particular the glans.[39,41(chap5)] ***(NEW)***

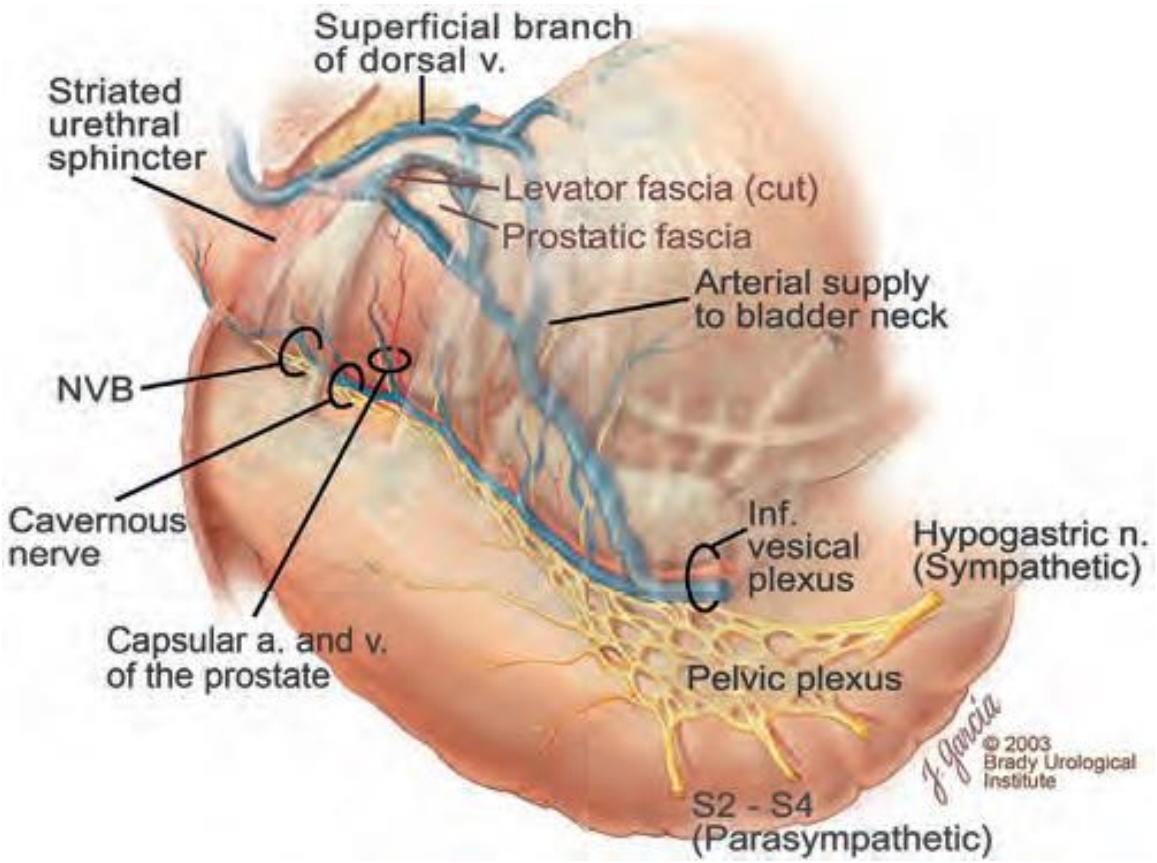


485

486 **Figure 2:** Relationship of the nerves to the urethra. From: Palminteri E, Lumen N, Preto M, Waterloos M. Impact
487 of Urethral Reconstruction on Sexual Function. In: Martins FE, Kulkarni SB, Köhler TS, eds. *Textbook of Male*
488 *Genitourethral Reconstruction*. Cham: Springer International Publishing; 2020:427-435.

489

490



491

492 **Figure 3:** Anatomical landmarks related to prostatic neurovascular bundle (NVB).40

493

2.14 Neurovascular bundle (NVB): Concentration of nerves that are situated posterolaterally and symmetrically to the prostate that are important in preservation of erectile function. The nerves running through the NVB travel outside the capsule of the prostate and Denovilliers fascia until branches perforate the capsule where they enter the prostate.[42] ***(NEW)***

2.15 Cavernous nerve: Postganglionic parasympathetic nerves that facilitate penile erection. They arise from cell bodies in the inferior hypogastric plexus where they receive the preganglionic pelvic splanchnic nerves (S2-S4).[42] ***(NEW)***

Footnotes for section 2:

2.1: An older term "glanular urethra" should not be used.[38]

2.2: The term pendulous urethra is no longer used.

2.3: As per the 2002 Stockholm WHO conference and according to the 2010 International Consultation on Urethral Strictures, the terms "anterior" and "posterior" urethra should not be used.38

SECTION 3: SYMPTOMS AND QUESTIONNAIRES

A-) SYMPTOMS

3.1 Symptom: Any morbid phenomenon or departure from the normal in structure, function, or sensation, possibly indicative of a disease or health problem. Symptoms are either volunteered by, or elicited from the individual, or may be described by the individual's partner or caregiver.[3,4]

3.2 Complaint: The description of the symptom.[1]

3.3 Main (Chief) Complaint: The symptom that a patient states as the main reason for seeking medical advice.[1] The degree of "bother (worry, concern)" for other symptoms can be variable.[43]

3.4 Lower urinary tract symptom (LUTS): A symptom related to the lower urinary tract; it may originate from the bladder, prostate, urethra, and/or adjacent pelvic floor or pelvic organs, or at times be referred from similarly innervated anatomy, for example, lower ureter. FN3.1 [5] ***(CHANGED)***

3.5 Urgency: Complaint of sudden, compelling desire to pass urine which is difficult to defer.[5,44,45]

3.6 Urinary incontinence (UI): Complaint of involuntary loss of urine.[5]

3.7 Urgency urinary incontinence (UUI): Complaint of involuntary loss of urine associated with urgency.[5]

3.8 Daytime (urinary) frequency: Number of micturitions during daytime (awake hours).

3.9 Nocturia: The number of times urine is passed during the main sleep period. Having woken to pass urine for the first time, each urination must be followed by sleep or the intention to sleep. This should be quantified using a bladder diary.[5]

3.10 Ejaculatory pain: Complaint of pain, pressure, or discomfort felt in the perineum, suprapubic region and/or penis during ejaculation, but may continue for a time afterwards.[5]

3.11 Decreased (low) semen volume: Complaint of smaller amount of seminal fluid than normal or previously experienced.[5]

3.12 Increased (high) semen volume: Complaint of higher amount of seminal fluid than normal or previously experienced.[5]

3.13 Semen sequestration: Trapping of ejaculate in the bulbar urethra, resulting in a decreased force and volume of emission; often secondary to damage to the perineal nerves and/or bulbospongiosus muscle. Manual pressure on the perineum at the level of the bulbar urethra may be required to expel sequestrated semen.[39] ***(NEW)***

3.14 Penile shortening: A subjective or objective decrease in penile length. Well known to be associated with plication procedures for Peyronie's disease, it is also associated with penile revascularization procedures, anastomotic and augmented urethroplasty, hypospadias repair, and prostate cancer treatment such as radical prostatectomy.[39,46] ***(NEW)***

3.15 Intimacy and sexual avoidance: Unwillingness or reluctance of engaging in sexual activity or intimacy with others.[19,47] ***(NEW)***

3.16 Pain: A subjective phenomenon described as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.[21]

3.17 Chronic pelvic pain: Characterized by persistent pain lasting longer than 6 months or recurrent episodes of abdominal/pelvic pain, hypersensitivity or discomfort often associated with elimination changes, and sexual dysfunction often in the absence of organic etiology.[21,48]

3.18 Penile sexual pain: Penile pain that occurs prior to penetration (ie when an erection occurs), with penetration or post-coital.[21]

3.19 Perineal sexual pain: may occur during intercourse or after intercourse.[21]

3.20 Orgasmic pain (during ejaculation): pain may be felt on the penis, ano-rectum, perineum or in the whole pelvis.[49] ***(CHANGED)***

B-) QUESTIONNAIRES

3.21 American Urological Association (AUA) Symptom Index (AUA-SI) for Benign Prostatic Hyperplasia (BPH): A symptom index for BPH which was developed and validated by a multidisciplinary measurement committee of the AUA. It includes 7 questions covering frequency, nocturia, weak urinary stream, hesitancy, intermittency, incomplete emptying, and urgency.FN3.2 [50] ***(NEW)***

3.22 International Prostate Symptom Score (IPSS): An 8-question written screening tool used to screen for, rapidly diagnose, track the symptoms of, and suggest management of the symptoms of BPH. It contains the seven questions of the AUA symptom index for BPH and one question related to the patient's perceived quality of life (bother score).FN3.3 [51] ***(NEW)***

3.23 International Index of Erectile Function (IIEF): A multi-dimensional and validated self-report instrument for the evaluation of male sexual function.FN3.4 [52] ***(NEW)***

3.24 Sexual Health Inventory for Men (SHIM): The SHIM questionnaire (also known as the IIEF-5) is an abridged and slightly modified 5-item version of the 15-item IIEF, to diagnose the presence and severity of ED in clinical settings.FN3.5 [53] ***(NEW)***

3.25 Erection Hardness Score (EHS): A single-item instrument that asks men to rate erection hardness on a scale that ranges from 0 (penis does not enlarge) to 4 (penis is completely hard and fully rigid).[54] ***(NEW)***

3.26 Male Sexual Health Questionnaire (MSHQ): A tool for assessing key domains of sexual function and satisfaction in aging men with urogenital symptoms of LUTS and sexual dysfunction. It consists of 25 questions that constitute subscales for Erection, Ejaculation, and Satisfaction.FN3.6 [55] ***(NEW)***

3.27 Premature Ejaculation Profile (PEP): A self-report questionnaire used to assess 4 components of PE: satisfaction with sexual intercourse, control over ejaculation, ejaculation-related distress, and interpersonal difficulty. Each of the 4 individual items is assessed on a 5-point scale, and the scores are averaged to provide an index PE score.[56] ***(NEW)***

3.28 Index of Premature Ejaculation (IPE): A 10-item validated tool which was developed to evaluate sexual satisfaction, control, and distress in men with PE.[57] ***(NEW)***

3.29 Brief male sexual function inventory (BMSFI): A validated, self-administered 11-item inventory evaluating male sexual function. There are five domains: Sexual Drive, Erections, Ejaculation, Problem Assessment, and Overall Satisfaction.[FN3.7] [58] ***(NEW)***

C-) QUESTIONNAIRES FOR OVERACTIVE BLADDER AND CORRELATION WITH SEXUAL DYSFUNCTION *(NEW)*

Questionnaire	Contents	Correlation with SD
OAB-SS (OAB symptom score)	Total score is a sum of four-item scores based on a self-administered questionnaire about four symptoms: daytime frequency (0–2), nighttime frequency (0–3), urgency (0–5), and urgency incontinence (0–5).[59]	In patients with diabetes, the component of urge incontinence has the strongest impact on ED (OR 4.06, P = 0.013), followed by nocturia (OR 2.71, P < 0.01) and urgency (OR 1.87, P = 0.046). The OR of ED in patients with OAB or OAB wet compared with no OAB was 1.82 (P = 0.056), and 3.6 (P = 0.026), respectively.[60,61]
OAB-q (OAB Questionnaire) and HRQL (Health-Related Quality of Life)	33 items that assess impact of OAB bother score and its impact on QOL	Low correlation with SD.[62]
OAB-q SF (OAB-q Short Form)	6 items that address urgency, urinary incontinence and nocturia and score them from 1 to 6 based on bother.[63]	No validation for sexual QOL
IPSS	See 3.22	There is a strong correlation between IPSS and erectile

		function, intercourse satisfaction, orgasmic and sexual desire. IPSS is also strongly correlated with IIEF.[64]
CLSS (Core Lower Urinary Tract Symptom Score)	10 symptoms: daytime frequency, nocturia, urgency, urgency incontinence, stress incontinence, slow stream, straining, incomplete voiding, bladder pain, and urethral pain.	Total score and all symptoms but daytime frequency and incomplete voiding have a significant relationship with total IIEF-5 score.[65]
BFLUTS (Bristol Female Lower Urinary Tract Symptoms Questionnaire)	Among other LUTS, this questionnaire assesses frequency, urgency, nocturia and urgency urinary incontinence.	OAB symptoms have a negative impact on sexual life, especially in patients with OABwet.[65,66]
ICIQ-OAB (International Consultation on Incontinence Questionnaire)	4 items: frequency, urgency, nocturia and UUI and bother scale from 0-10 of each item.	The ICIQ-mLUTSsex is and add-on of 4 items to assess impact of sex life: erection, ejaculation, pain during ejaculation and impact of urinary symptoms on sex life.

Table 2: OAB questionnaires, and their correlation with sexual dysfunction.

Footnotes for section 3

3.1: LUTS are often associated with male sexual dysfunctions.

3.2: History taking in a man presenting with ED should include questions about; age, comorbid medical (endocrinopathies, cardiovascular diseases, neurological disorders) and psychological conditions, prior surgeries, medications, family history of vascular disease, substance use, tobacco use.[67]

3.3: The specific LUTS can be divided into storage symptoms (urgency, frequency, nocturia, and urge incontinence) and voiding symptoms (poor stream, hesitancy, feeling of incomplete emptying). Patients are classified into having none or mild, moderate, or severe LUTS based on the IPSS (0–7, 8–21, and 21–35 points, respectively).[68]

3.4: The IIEF consists of 15 questions that quantify 5 domains (sexual desire, erectile function, intercourse satisfaction, ejaculatory/orgasmic function, overall sexual satisfaction). The erectile function domain quantifies ED severity on a scale of 5-30, with scores of:

- 26-30: normal erectile function
- 18-25: mild ED
- 11-17: moderate ED
- ≤10: severe ED

3.5: The SHIM score characterizes the severity of the patient's ED in the following manner:

- 22-25: No ED
- 17-21: Mild ED
- 12-16: Mild-to-moderate ED
- 8-11: Moderate ED
- 5-7: Severe ED

3.6: A 4-question version of the ejaculation subscale of MSHQ is also available to measure ejaculatory dysfunction.

3.7: The BMFSI originally developed by O'Leary has been adapted for use in patient with urethral stricture disease by Erickson et al.[69]

SECTION 4: SIGNS AND EXAMINATION

A-) GENERAL SIGNS AND EXAMINATION FINDINGS

4.1 Cardiovascular examination: Part of the physical examination that should include assessment of vital signs (especially blood pressure and pulse) and signs of hypertensive or ischemic heart disease as well as peripheral vascular disease.[FN4.1, FN4.2] ***(NEW)***

4.2 Gynecomastia: Excessive development of male breast tissue which may or may not be a sign of underlying endocrinological disorder.[FN4.3] ***(NEW)***

4.3 Sarcopenia: A clinical condition characterized by loss of skeletal muscle and function. It might be a sign of hypogonadism. ***(NEW)***

B-) PENILE EXAMINATION

4.4 Peyronie's disease: A connective tissue disorder involving the growth of fibrous plaques in the soft tissue of the penis. Specifically, scar tissue forms in the tunica albuginea, causing pain, abnormal curvature, erectile dysfunction, indentation, loss of girth and shortening. ***(NEW)***

4.5 Stretched penile length: The penile length as measured by a rigid centimeter ruler, which is placed along the dorsal side of the penis (flaccid, and stretched as comfortably as possible), extending in a parallel fashion from the pubopenile skin junction to the tip of the glans where the pre-pubic fat pad was pushed to the bone.[70] ***(NEW)***

4.6 Penile curvature: Abnormal bend in the penis occurring during erection which might lead to sexual dysfunction by impairing the ability to penetrate and/or causing pain in the tumescent state. (NEW)

4.7 Buried penis: A congenital or acquired condition in which penis is partially or totally embedded underneath the skin of the abdomen, thigh, or scrotum. **(NEW)**

4.8 Phimosis: Partial or complete inability to retract the prepuce due to adhesion between the glans and the prepuce or a preputial ring.[5]

4.9 Paraphimosis: Entrapment of the prepuce behind the glans.[5]

4.10 Hypospadias: Refers to the urethral meatus sited on the ventral surface of the penis, either congenital or acquired, proximal to its normal position on the tip of the glans.[5]

4.11 Epispadias: Refers to the urethral meatus sited on dorsal surface of the penis, either congenital or acquired, proximal to its normal position on the tip of the glans.[5]

4.12 Urethral meatal stenosis: Narrowing of the distal opening of the urethra which may be congenital or occur secondary to infection, inflammation, or as a result of surgical (open or endoscopic) intervention.[5] ***(CHANGED)***

4.13 Lichen sclerosus (LS): A chronic, inflammatory disease affecting genital skin that is characterized by hypomelanotic and sclerotic changes, often resulting in phimosis, meatal stenosis, and even pan-urethral strictures.[71] ***(NEW)***

C-) SCROTAL EXAMINATION FINDINGS

4.14 Epididymitis / epididymo-orchitis: The inflammatory condition involving epididymis +/- testis. Affected structures may be swollen and tender, and if severe, the inflammatory process may involve the whole scrotal content and the scrotal skin as well.[5] ***(CHANGED)***

4.15 Cystic dilatations of the epididymis: Epididymal cysts (or spermatocele) and hydroceles (fluid collections between the visceral tunica albuginea and parietal layer of the testicular peritoneum) are usually benign. The examination of these structures would be generally non-tender and without pain.[5] ***(CHANGED)***

4.16 Inguinal hernia:

4.16.1 Indirect inguinal hernia: Protrusion of abdominal content through inguinal canal down to the scrotal sac, causing swelling, discomfort and jeopardizing the vascular supply of the herniated intestinal segment. ***(NEW)***

4.16.2 Direct inguinal hernia: Protrusion of abdominal content through a weakness of the posterior wall of the inguinal canal medial to the inferior epigastric vessels. **(NEW)**

4.17 Varicocele: Abnormal dilation of pampiniform venous plexus which drains blood from each testicle. Varicocele is graded based on the degree of dilation. ***(NEW)***

4.17.1 Subclinical varicocele: Seen on doppler ultrasound imaging, no varicocele on exam.

4.17.2 Grade 1 varicocele: Palpable with valsalva maneuver. ***(NEW)***

4.17.3 Grade 2 varicocele: Palpable when standing, without valsalva maneuver. ***(NEW)***

4.17.4 Grade 3 varicocele: Visible on inspection. ***(NEW)***

4.18 Testicular mass: Palpation of a mass originating from testis. This might be originating from the testicular parenchyma or its appendages and may be cystic or solid in nature and related to a benign or malignant (more commonly) neoplastic process. ***(NEW)***

4.19 Nonpalpable testis: Absence of testis in the hemiscrotum or inguinal canal. This can be a finding related to cryptorchidism (undescended testicle), testicular atrophy or vanishing testis. ***(NEW)***

4.20 Testicular torsion: Torsion of the spermatic cord structures that leads to vascular compromise involving the ipsilateral testicle. Physical examination might reveal a tender, swollen and erythematous hemiscrotum on the affected side. (NEW)

4.21 Absence of vas deferens: Congenital absence of vas deferens in the hemiscrotum. It may be either unilateral or bilateral. FN4.4 **(NEW)**

4.22 Atrophic testis: Testicular dimensions being smaller than expected. Consistency of atrophic testes might be softer than usual. Diminished testicular size may be accompanied by loss of function. ***(NEW)***

D-) DIGITAL RECTAL EXAMINATION FINDINGS

4.23 Rectal and prostate examination: Digital rectal examination (DRE) that is generally done with the patient standing and bent over the examining table, or with the patient in the left lateral knees bent position, or in the lithotomy position.[5] It provides valuable information regarding prostate size, consistency, pelvic floor muscle tone, anal sphincter tone, constipation, and rectal/anal canal masses. It might also raise suspicion for prostate cancer.FN4.4 ***(CHANGED)***

4.24 Anal tone: increased or decreased anal sphincter tone might suggest similar changes in the urinary sphincter and may indicate neurologic disease.FN4.5 [5]

4.25 Prostate tenderness: DRE of the prostate is usually painless. Pain with prostatic palpation may be indicative of chronic prostatitis / chronic pelvic pain syndrome.FN4.6 [5] ***(CHANGED)***

E-) NEUROLOGICAL SIGNS AND EXAMINATION FINDINGS

4.26 Overall neurological status: Assessment of the abnormalities of speech, gait, as well as upper and lower extremity dexterity which should be noted as they may indicate a neurological cause for the sexual dysfunction.[5] ***(CHANGED)***

4.27 Penile, scrotal, or perianal sensory deficits: Neurological examination findings that may indicate damage or injury to sacral roots or nerves.[5] ***(CHANGED)***

4.28 Glans hypoesthesia: Reduced sensitivity of the glans penis. This may be associated with hypospadias and its treatment, penile revascularization procedures, bulbar urethroplasty.FN4.7 [39,46] ***(NEW)***

4.29 Bulbospongiosus reflex (BSR): A reflex contraction of the striated muscle of the pelvic floor (anal sphincter) and the bulbospongiosus muscle that occurs in response to various stimuli in the perineum or genitalia.[5]

4.30 Cremasteric reflex: Contraction of the ipsilateral cremaster muscle, drawing the testis upwards, when the upper inner aspect of the thigh is stroked longitudinally.[5]

Footnotes for section 4

4.1: As obesity is one of the most important risk factors for ED, it should be assessed and documented during ED work-up.

4.2: Abdominal or femoral artery bruits and asymmetric or absent lower extremity pulses may be indicative of underlying vasculogenic etiology. Skin and hair pattern evidence of vascular insufficiency should be noted.

4.3: General physical examination of patients with ED should include assessment for signs of testosterone deficiency (e.g., gynecomastia, underdeveloped facial/pubic/axillary hair), penile skin lesions and placement/configuration of the urethral meatus, documentation of flaccid stretched penile length (especially if the man is considering penile prosthesis implantation or surgical intervention), the presence/absence of a palpable plaque, general assessment of the scrotal skin and palpation of the testicles to assess for size, consistency, and location.

4.4: Congenital absence of vas deferens is commonly associated with cystic fibrosis that occurs as a result of a mutation in the CFTR gene. A smaller percentage of patients might have unilateral renal agenesis.

4.5: Digital rectal examination (DRE) is not required for evaluation of ED; however, BPH is a common comorbid condition in men with ED and may merit evaluation and treatment. During DRE, prostate size and consistency can be estimated, although DRE tends to underestimate true prostate size. DRE may also allow assessment of the bulbocavernosus reflex, which provides information on neural integrity of the pelvis. Anal tone can help in the assessment of pelvic floor muscle tone and may be used to teach and tailor pelvic floor muscle exercises. [67]

4.6: Non-urological conditions such as anal fissure, abscess or hemorrhoids or other painful situations of the anal canal can elicit pain upon DRE.

4.7: Although less recognized, penile hypoesthesia may not be limited to the glans. Procedures requiring penile disassembly may also result in penile shaft hypoesthesia.

SECTION 5: INVESTIGATIONS

A-) LABORATORY TESTS

Blood tests are not normally included in ICS Terminology Reports. However, certain serum-based measurements hold critical importance in the diagnosis and treatment of ED.

5.1 Testosterone: Total testosterone can be measured in men with ED to determine if testosterone deficiency (TD) is present.$_{FN5.1}$ [67] ***(NEW)***

5.1.1 Free testosterone: Fraction of total testosterone that is unbound plasma to proteins. **(NEW)**

5.1.2 Sex hormone binding globulin (SHBG): A plasma protein that is produced by the liver and transports sex hormones (estradiol, testosterone, dihydrotestosterone) in the blood as biologically inactive forms. **(NEW)**

5.1.3 Bioavailable testosterone: Bioavailable testosterone represents an assessment of the biologically active testosterone in serum. It includes the free plus weakly protein bound fractions of testosterone and is calculated by a formula integrating serum albumin, SHBG, and total testosterone. **(NEW)**

5.2 Prostate specific antigen (PSA): Serum prostate specific antigen (PSA) level is measured for prostate cancer screening and to gather additional information about the size of the prostate and associated inflammatory changes.[FN5.2] ***(NEW)***

B-) IMAGING STUDIES

5.3 Retrograde urethrography (RUG): Imaging of the urethra with serial fluoroscopic images during retrograde injection of contrast material. The patient should be positioned obliquely in order to adequately visualize the urethra. Used mainly to diagnose urethral strictures or diverticula, it is also of use to diagnose and stage urethral trauma.[5,72] ***(NEW)***

5.4 Voiding cystourethrography (VCUG): Imaging of the bladder, bladder neck, urethra, and prostate during voiding. The principal use is determining the site of any obstruction, for example, bladder neck or prostate. It can also detect vesico-ureteric reflux, vesical or urethral fistulae, vesical or urethral diverticula and strictures.[5,72]

5.5 Sonourethrography: Ultrasound examination of the urethra, providing information on the location and length of stricture as well as the degree of spongiofibrosis.[73] ***(NEW)***

5.6 Dynamic infusion cavernosometry and cavernosography (DICC): A combined evaluation of intracavernosal pressures and radiographic assessment of penile blood flow. It is used to identify vasculogenic leak in patients being considered for penile vascular surgery.[FN5.3] [40(chap27)] ***(NEW)***

5.7 Penile duplex ultrasonography: Use of real-time ultrasound with and without vasoactive medications for pharmacologically induced erection to evaluate the flow velocities in the dorsal penile and cavernosal arteries.[40(chap27)] ***(NEW)***

5.8 Pudendal angiography: Imaging of the pudendal arteries for patency using injection of intravascular contrast and fluoroscopic imaging.[FN5.4] [40(chap40)] ***(NEW)***

C-) OTHER DIAGNOSTIC TESTS / PROCEDURES

5.9 Cystourethroscopy: Direct visual inspection of the urethra and bladder with a rigid or flexible cystoscope. It is the gold-standard for diagnosing the presence or absence of urethral stricture disease, however it is not sufficient for complete staging.[72] ***(NEW)***

5.10 Urodynamic Studies (UDS): Measurement of all the physiological parameters relevant to the function and any dysfunction of the lower urinary tract. Urodynamic investigations generally involve an individual attending with a comfortably full bladder for free (no catheter) uroflowmetry and post-void residual (PVR) measurement prior to filling cystometry and pressure-flow study.[FN5.5][5]

5.11 Nocturnal penile tumescence (NPT) testing: A diagnostic test for evaluating the penile veno-occlusive mechanism. Penile rigidity is monitored using a specialized device (often the Rigiscan®) for at least two consecutive nights. Three periods of penile tip rigidity of greater than 70%, lasting for at least 10 minutes each, each night, defines normal nocturnal erectile function.[FN5.6] [46,74] ***(NEW)***

5.12 Pudendal somatosensory evoked potentials (SEP): A neurophysiologic test which can be used to support the diagnosis of a neurogenic cause of erectile dysfunction. The test should be performed as per the International Federation of Clinical Neurophysiology guidelines. A latency time >48ms is considered abnormal (the mean normal latency is 37ms).[74,75] ***(NEW)***

Footnotes for section 5

5.1: Routine blood work-up of ED that includes the measurements of serum testosterone, glucose/hemoglobin A1c, and in some cases serum lipids. [67]

5.2: Studies that might be appropriate in some men if recent laboratory results are not available. These include; serum BUN/Cr, fasting lipids, fasting glucose or hemoglobin A1c, and morning testosterone, thyroid function studies (i.e. thyroid-stimulating hormone, free T4) and PSA.67

5.3: DICC useful in patients with a history of pelvic trauma or those with primary (lifelong) erectile dysfunction. Nevertheless, it is not commonly used within the context of ED diagnostic work-up.

5.4: After PFUI, if neither pudendal artery is intact, the patient may benefit from penile artery revascularization before PFUI repair in order to improve erectile potency.

5.5: Urodynamic studies might need to be conducted if sexual dysfunction is thought to be originating from lower urinary tract dysfunction. Better assessment and treatment of the underlying urinary condition with the help of urodynamic studies might serve to improve the management of sexual health-related problems.

5.6: A normal NPT rules out a veno-occlusive cause of erectile dysfunction, but other etiologies are still possible.

SECTION 6: DIAGNOSES

6.1 Erectile dysfunction (ED): Consistent or recurrent inability to attain and/or maintain a penile erection sufficient for sexual satisfaction and/or sexual intercourse.[6] ***(CHANGED)***

6.2 Hypogonadism: A term introduced to signify low testosterone levels associated with infertility. It has more recently been used interchangeably with the idea of low testosterone production alone.[9] ***(NEW)***

6.3 Premature ejaculation (PE): Complaint of a persistent or recurrent pattern of too rapid achievement of ejaculation during partnered sexual activity, that is, before the individual wishes it.[5] It is accompanied by negative personal consequences, such as distress, bother, frustration, and/or the avoidance of sexual intimacy.[6] **(*CHANGED*)**

6.4 Retrograde ejaculation: Expulsion of seminal fluid into the bladder because of bladder neck dysfunction in the presence of otherwise normal emission and expulsion. There can be no or small amounts of antegrade ejaculation. Retrograde ejaculation is defined independently from the sensation of orgasm.[6] ***(NEW)***

6.5 Benign prostatic obstruction (BPO): A term used to describe bladder outlet obstruction (BOO) secondary to BPE and, therefore, usually due to BPH. Bladder outlet obstruction is an urodynamic entity and can only be diagnosed via pressure-flow studies. [14] ***(NEW)***

6.6 Prostatitis: An inflammatory disease of the prostate generally affecting younger men and causing pain and discomfort mostly in the perineal and scrotal region which can be associated with LUTS and/or sexual dysfunction.[15] ***(NEW)***

6.7 Overactive bladder (OAB) syndrome: Urinary urgency, usually accompanied by increased daytime frequency and/or nocturia, with urinary incontinence (OAB-wet) or without (OAB-dry), in the absence of urinary tract infection or other detectable disease.[16]

6.8 Male chronic genital pain syndromes: Male genital pain syndromes are often associated with symptoms suggestive of lower urinary tract and sexual dysfunction. Common complaints: genital pain, uncomfortable urination, dysuria, sensation of residual urine, increased daytime frequency, slow stream, urgency, dyspareunia. Absence of infection, previous operations, or other obvious pathology.[21]

6.9 Chronic prostatitis / Chronic pelvic pain syndrome (CP/CPPS): Persistent or recurrent prostate and/or pelvic pain, associated with symptoms suggestive of urinary tract and/or sexual dysfunction. No proven infection or other obvious pathology is present to account for the symptoms. Pain may be referred to the bladder, perineum, testicles, penis and/or groin.[76] ***(CHANGED)***

6.10 Urethral stenosis: A narrowing of the anterior urethra, caused by spongiofibrosis of the corpus spongiosum.[38] ***(NEW)***

6.11 Posterior urethral stenosis: Narrowing of the membranous urethra, prostatic urethra, or bladder neck, when the prostate is still in-situ.[38,77] ***(NEW)***

6.12 Vesicourethral anastomotic stenosis (VAS): Narrowing of the posterior urethra after radical prostatectomy.[77] ***(NEW)***

6.13 Lichen sclerosus (LS): A chronic, inflammatory disease affecting genital skin that is characterized by hypomelanotic and sclerotic changes, often resulting in phimosis, meatal stenosis, and even pan-urethral strictures.[FN6.1] [71] ***(NEW)***

6.14 Urethral trauma

6.14.1 Blunt urethral trauma: An injury to the urethra from a non-penetrating injury. May include straddle injuries, deceleration injuries, penile fracture, and pelvic fracture urethral injuries.[38] ***(NEW)***

6.14.2 Iatrogenic urethral trauma: Injury to the urethra resulting from instrumentation of the urethra, such as with cystoscopy or catheterization, or treatment of disease in the urethra or prostate, such as urethral dilation, transurethral resection of the prostate, prostate radiation, or radical prostatectomy.[38] ***(NEW)***

6.14.3 Pelvic fracture urethral injury (PFUI): A urethral distraction injury, typically involving the bulbomembranous junction. Previously known as *pelvic fracture urethral distraction defects*, this term should be reserved for cases of PFUI with loss of urethral continuity.[38,78] ***(NEW)***

6.14.4 Penetrating urethral trauma: Injury to the urethra resulting from an object passing into or through the urethra from outside the body. Gunshot wounds, stab injuries, and penile amputation are examples of penetrating urethral trauma. ***(NEW)***

5.14.5 Straddle Injury: Injury to the bulbar urethra resulting from a blunt trauma which compresses the bulbar urethra against the inferior pubic rami. May be remote, or even not recalled by the patient.[79] ***(NEW)***

6.15 Post-infectious stricture: Urethral stricture disease developing as a result of gonococcal and nongonococcal (*Ureaplasma urealyticum, Mycoplasma genitalium,* schistosomiasis, and tuberculosis) urethritis.[38,79] ***(NEW)***

6.16 Prostate cancer (CaP): Development of cancer from the prostate gland.$_{FN6.2}$ [40] ***(NEW)***

6.16.1 Localized: Cancer confined to the gland of the prostate.$_{FN6.3}$ [80] ***(NEW)***

6.16.2 Locally-advanced: Spread of prostate cancer outside the prostate capsule, involvement of the seminal vesicles or involvement of adjacent organs without distant metastasis. ***(NEW)***

6.16.3 Metastatic: Distant spread of prostate cancer to other areas of the body beyond the pelvis, most notably bone and lymph nodes. Spread can also occur to the liver and lungs. ***(NEW)***

Footnotes for section 6

6.1: Lichen sclerosus was previously known as *Balanitis Xerotica Obliterans (BXO)*, but this term is no longer in widespread use.

6.2: The most common pathologic subtype of prostate cancer is adenocarcinoma. Other types include small cell carcinoma, neuroendocrine tumor, urothelial carcinoma and sarcoma.[40]

6.3: Localized prostate cancer can be categorized based on PSA, PSA density, clinical stage digital rectal exam, grade group, amount of cancer on biopsy and imaging results. This risk stratification allows for better prediction of survival and appropriate counselling regarding treatment options.[80]

SECTION 7: CONSERVATIVE AND PHARMACOLOGICAL TREATMENTS FOR SEXUAL DYSFUNCTION (GENERAL)

7.1 Psychotherapy: Psychotherapy and psychosexual counseling focus on helping patients and their partners improve communication about sexual concerns, reduce anxiety related to entering a sexual situation and during a sexual situation, and discuss strategies for integrating ED treatments into their sexual relationship.[67] ***(NEW)***

7.2 Lifestyle recommendations: Dietary changes, weight loss, physical activity increases, and smoking cessation that may improve overall health and ameliorate the comorbidities associated with ED.[67] ***(NEW)***

7.3 Herbal therapy: Plant-derived remedies that can provide alternatives for men to improve their sexual health.FN7.1 [81] ***(NEW)***

7.4 Phosphodiesterase type 5 inhibitors (PDE5i): Oral medication used to block the action of phosphodiesterase type 5 on cyclic guanosine monophosphate in the smooth muscle cells causing a vasodilation of the arteries in the corpora cavernosa of the penis facilitating an erection during sexual stimulation.FN7.2, FN7.3 ***(NEW)***

7.4.1 On-demand dosing of PDE5i: PDE5i being taken prior to anticipated sexual intercourse. ***(NEW)***

7.4.2 Daily dosing of PDE5i: PDE5i being taken on a daily basis, irrespective of sexual activity.FN7.4 ***(NEW)***

7.4.3 Instructions in the appropriate use of PDE5i: Instructions that include the fact that sexual stimulation is necessary and that more than one trial with the medication may be required to establish efficacy. It should include information regarding the

medications' characteristics with regard to the onset of action, duration of action, and whether food intake limits efficacy. Discussion on side effects should include common PDE5i side effects as well as drug-specific side effects. ***(NEW)***

7.5 Vacuum erection device (VED): Negative-pressure chambers that provide passive engorgement of the corpora cavernosa, together with a constrictor ring placed at the base of the penis to retain blood within the corpora.[25] ***(NEW)***

7.6 Intraurethral alprostadil: Topical application of the vasoactive agent alprostadil, which is an analogue of prostaglandin E1. Herein, a specific formulation of alprostadil in a medicated pellet (MUSE™) that includes a permeation enhancer in order to facilitate absorption of alprostadil is administered via the urethral meatus.[25] ***(NEW)***

7.6.1 In-office test of intraurethral alprostadil: An in-office consultation that has to be made with every patient being prescribed intraurethral alprostadil that includes instructions about the method, initial dose-titration, detailed counseling regarding possible adverse reactions and actions to take in response to potentially serious side effects.[67] ***(NEW)***

7.7 Intracavernous injection (ICI): Injecting vasoactive agents into the corpus cavernosa of the penis to produce an erection. The four substances commonly used in clinical practice are alprostadil, papaverine, phentolamine, and atropine.FN7.5 [67] ***(NEW)***

7.7.1 Single agent: ICI of alprostadil ***(NEW)***

7.7.2 Bimix: ICI of papaverine + phentolamine ***(NEW)***

7.7.3 Trimix: ICI of alprostadil + papaverine + phentolamine ***(NEW)***

7.7.4 Quadmix: ICI of alprostadil + papaverine + phentolamine + atropine ***(NEW)***

7.8 In-office injection test: An in-office consultation that has to be made with every patient being recommended ICI of vasoactive agents which aims to determine the appropriate dose and medication(s) to produce sufficient duration of response and to minimize AEs.FN7.6 [67] ***(NEW)***

7.9 Penile rehabilitation: Program that aims to help men regain the ability to achieve erections sufficient for satisfactory sexual intercourse during rehabilitation from prostate cancer treatment, and ultimately return to pretreatment erectile function.FN7.7 [82] ***(NEW)***

Footnotes for section 7

7.1: Panax ginseng, Butea superba, Epimedium herbs (icariin), Tribulus terrestris, Securidaca longipedunculata, Piper guineense, and yohimbine have been investigated for ED.[81]

7.2: The FDA-approved oral PDE5i available for management of ED in the U.S. include sildenafil, tadalafil, vardenafil, and avanafil. Several other PDE5i have been approved for use in other countries.[67]

7.3: For men with LUTS/BPH and ED, sildenafil and tadalafil appear to have similar efficacy to treat ED. There are no studies of vardenafil or avanafil that focused on men with LUTS/BPH and ED. All studies of men with LUTS/BPH and ED used daily dosing because of the beneficial urinary tract effects of PDE5i.[67]

7.4: This approach is particularly suitable for tadalafil 5mg.

7.5: Only alprostadil is FDA-approved in the U.S. for ICI.[67]

7.6: This in-office test also helps the man achieve confidence with the technique and to facilitate adherence.[67]

7.7: The use of any intervention or interventions whose goal is broadly thought of as being aimed at restoring satisfactory erectile functioning.[82]

SECTION 8: SURGICAL TREATMENTS FOR SEXUAL DYSFUNCTION (GENERAL)

8.1 Implantation of penile prosthesis: The surgical implantation of a penile prosthesis for patients who do not respond to more conservative therapies or who prefer a permanent solution to their ED.[25] ***(NEW)***

8.1.1 Inflatable penile prosthesis (IPP): The penile prosthesis type which can be inflated by the patient to create an erection on demand and deflated at other times.[10] ***(NEW)***

8.1.1.1 3-piece IPP: The IPP type which consists of a fluid-filled reservoir implanted under the abdominal wall, a pump and a release valve placed in the scrotum, and two inflatable cylinders inside the penis.[10] ***(NEW)***

8.1.1.2 2-piece IPP: The IPP type which works in a similar way as the 3-piece IPP, but the fluid reservoir is part of the pump implanted in the scrotum.[10] ***(NEW)***

8.1.2 Semirigid (malleable) penile prosthesis (MPP): The penile prosthesis type which consists of two flexible rods that are placed inside the penis. Once implanted with the malleable prosthesis, the penis can be bent away from the body for sexual intercourse and toward the body for concealment.[25] ***(NEW)***

8.2 Penile artery revascularization: A variety of surgical techniques that may be used to reestablish arterial flow to the penis. This is generally reserved for patients with proven pudendal or penile arterial anomalies secondary to post-traumatic lesions or congenital disorders.[46] ***(NEW)***

8.3 Treatments that warrant further investigation (see appendix): Low-intensity extracorporeal shock-wave therapy (LI-SWT), Platelet-rich plasma (PRP) therapy, Intracavernosal stem cell therapy, Nerve graft.

SECTION 9: TREATMENTS FOR LUTS/BPH AND RELATED SEXUAL DYSFUNCTIONS

A-) CONSERVATIVE AND PHARMACOLOGICAL TREATMENT OPTIONS FOR LUTS/BPH

9.1 Watchful waiting: Recommended treatment option for patients with an IPSS score of less than 7 who feel that their symptoms are manageable and do not have signs of postrenal compromise. This treatment consists of the patient decreasing their fluid intake, minimizing caffeinated and alcoholic beverages, and avoiding cholinergic medications.[67,25] ***(NEW)***

9.2 Phytotherapy: Utilization of herbal preparation (plant extracts) to address LUTS/BPH either alone or in combination with oral pharmacotherapy.[FN9.1] [6] ***(NEW)***

9.3 Alpha-blockers: The first-line pharmacotherapeutic options for LUTS/BPH which are effective at relieving emptying phase symptoms via blockade of the alpha-adrenergic receptors in the prostate and the bladder neck.[83] ***(NEW)***

9.3.1 Alpha-blocker and ejaculatory dysfunction (EjD): Alpha-adrenergic antagonists may cause anejaculation. The effect of alpha-blockers on EjD in men with LUTS is significantly affected by two agents (tamsulosin and silodosin). The other alpha-blockers have little or no impact on EjD.[6] ***(NEW)***

9.4 5-Alpha reductase inhibitors (5-ARI): Medications that inhibit the enzyme responsible for the conversion of testosterone to dihydrotestosterone (DHT), which is a more potent androgen and is responsible for prostate growth and development. There are 2 drugs in this category; finasteride inhibits only type 2 of 5-AR, and dutasteride inhibits both types 1 and 2.[83] ***(NEW)***

9.4.1 5-ARI and sexual dysfunction: The effect of 5ARI on sexual function in men with LUTS is modest with effects on penile erection, ejaculation, sexual desire, and includes a small risk of post-finasteride syndrome.[FN9.2] [6] ***(NEW)***

9.5 Beta-3 agonists: A medication class which can be used to improve storage phase LUTS. Mirabegron, a beta-3 agonist, exerts its clinical effect via relaxation of the bladder smooth muscle and increasing bladder storage capacity. ***(NEW)***

9.6 Anticholinergics (Antimuscarinics): Medications that exert their clinical effect via blocking muscarinic (predominantly M3 type) receptors in the bladder and can be used to address storage phase LUTS.[84] ***(NEW)***

9.7 Phosphodiesterase type 5 inhibitors (PDE5i): PDE5i might be used to address LUTS/BPH by inhibition of the PDE5 in the prostate, causing smooth muscle relaxation by a mechanism similar to the one postulated for alpha blockers. ***(NEW)***

B-) SURGICAL TREATMENT OPTIONS FOR LUTS/BPH[85]

Treatment	**Potential sexual side effect**
Alpha-blockers	Retrograde ejaculation, reversible anejaculation
5-Alpha reductase inhibitors	Erectile dysfunction, loss of libido, reduction of ejaculate volume, post-finasteride syndrome
Transurethral resection of prostate (TURP)	Retrograde ejaculation, anejaculation, erectile dysfunction
Transurethral incision of prostate (TUIP)	Retrograde ejaculation (lower risk than TURP)
Simple prostatectomy	Retrograde ejaculation, anejaculation
Laser prostatectomy	Retrograde ejaculation (lower risk than TURP)

Table 3: Potential sexual side effects related to LUTS/BPH treatment.FN9.3, FN9.4

Footnotes for section 9

9.1: They are derived from the roots, seeds, bark, or fruits of the various plants used. Saw palmetto (serenoa repens), pygeum africanum, cucurbita pepo, secale cerelae, urtica dioica and quercetin have all been reported as possible treatments for LUTS/BPH.[6]

9.2: The impact on ejaculation is likely more significant than that on erection and libido. There seems to be no significant difference between the two agents that are currently available.[6]

9.3: Interventions for LUTS/BPH have numerous sexual side effects, including retrograde ejaculation, orgasmic dysfunction, and erectile dysfunction. Sexual side effects from surgical treatments are more likely to be permanent than those from medical treatments, which can often be reversed by stopping medical treatment or switching to an alternative treatment.

9.4: Surgical interventions which involve resection and/or incision at the level of bladder neck (TURP, TUIP, open prostatectomy) increase the risk of retrograde ejaculation.

SECTION 10: TREATMENTS FOR URETHRAL STRICTURE DISEASE AND RELATED SEXUAL DYSFUNCTIONS

A-) NOMENCLATURE OF URETHRAL STRICTURE DISEASE

10.1 Urethral stenosis: A narrowing of the anterior urethra, caused by spongiofibrosis of the corpus spongiosum.[38] ***(NEW)***

10.2 Posterior urethral stenosis: Narrowing of the membranous urethra, prostatic urethra, or bladder neck, when the prostate is still in-situ.[FN10.1,10.2] [38,77] ***(NEW)***

10.3 Vesicourethral anastomotic stenosis (VAS): Narrowing of the posterior urethra after radical prostatectomy.[FN10.2] [77] ***(NEW)***

B-) SURGICAL TREATMENT OPTIONS FOR URETHRAL STRICTURE DISEASE[85]

Treatment	**Potential sexual side effects**
Direct visual internal urethrotomy (DVIU)	Erectile dysfunction
Penile urethroplasty	Poor penile cosmesis, erectile dysfunction (lower risk than bulbar urethroplasty)
Bulbar urethroplasty	Erectile dysfunction, penile curvature, penile shortening, glans hypoesthesia, semen sequestration

Posterior urethral reconstruction	Erectile dysfunction, penile curvature, penile shortening, glans hypoesthesia, semen sequestration, retrograde ejaculation

Table 4: Treatment modalities addressing urethral stricture disease, and their sexual health-related side effects.FN10.3

Footnotes for section 10:

10.1: Commonly secondary to treatment for prostate cancer such as brachytherapy or external beam radiation. May also be secondary to treatments for BPH such as TURP.

10.2: Posterior urethral stenosis and vesicourethral anastomotic stricture are preferred over other terms such as bladder neck stenosis or contracture, prostatic urethral stenosis, and bulbomembranous stricture.

10.3: Other terms such as visual internal urethrotomy (VIU) and optical internal urethrotomy (OIU) are sometimes used, but DVIU is the preferred term. Erectile dysfunction after DVIU occurs at a rate between around 2-10% of cases; mechanisms include damage to the cavernous nerves, fistula creation between corpus cavernosum and spongiosum, and fibrosis from extravasation of irrigant and infectious complications. [86]

SECTION 11: TREATMENTS FOR OVERACTIVE BLADDER AND RELATED SEXUAL DYSFUNCTION

A-) CONSERVATIVE AND PHARMACOLOGICAL TREATMENT OPTIONS FOR OAB

11.1 Behavioral treatments for OAB: considered first-line treatment, these therapies aim at symptomatic improvement by changing behavioral and environmental issues. ***(NEW)***

11.1.1 Bladder training: It consists of a program of patient education, along with a scheduled voiding regimen with gradually adjusted voiding intervals.FN 11.1[87]

11.1.2 Prompted voiding: is used to teach people to initiate their own toileting through requests for help and positive reinforcement from caregivers, often done in combination with a scheduled voiding regimen, typically every 2h.[87]

11.1.3 Double voiding: The patient is taught to urinate, relax, and attempt to urinate again. It is especially useful for patients with incomplete voiding and high post-void residue.[87] ***(CHANGED)***

11.1.4 Scheduled or timed voiding: A passive toileting assistance program, initiated and maintained by caregivers for patients who cannot participate in independent toileting. It is a fixed voiding schedule.[87]

11.1.5 Self-monitoring: This strategy is part of bladder training and consists of registering voiding habits in a bladder diary. ***(NEW)***

11.1.6 Habit training: Consists of a toileting schedule matched to the individual's voiding patterns based on their voiding diary. The toileting schedule is assigned to fit a time interval that is shorter than the person's normal voiding pattern and precedes the time period when incontinent episodes are expected.[87]

11.1.7 Lifestyle modifications: Weight loss and smoking cessation have been shown to reduce LUTS, urgency and urinary incontinence in patients with OAB.[88] ***(NEW)***

11.1.8 Dietary modifications: Consists of reducing or eliminating bladder irritants from the diet.[FN 11.2] [87] ***(CHANGED)***

11.2 Pelvic floor muscle training (PFMT): Exercise to improve PFM strength, endurance, power, relaxation, or a combination of these parameters.[87]

11.3 Frequency volume chart (FVC): The recording of the time of each micturition together with the volume voided for at least 24 hours. Ideally a minimum of 3 days of recording (not necessarily consecutive) will generally provide more useful clinical data. It is relevant to discriminate between daytime and night-time micturition.[5]

11.3.1 Bladder diary: Adds to the FVC, the fluid intake, pad usage, incontinence episodes, the degree of incontinence and the circumstances at the time of the leakage. Episodes of urgency and sensation might also be recorded, as might be the activities performed during or immediately preceding the involuntary loss of urine. Additional information obtained from the bladder diary involves: severity of incontinence in terms of leakage episodes and pad usage.[5]

11.4 Pharmacologic treatment for OAB: considered second-line treatment, may be used in combination with first-line treatments. ***(NEW)***

11.4.1 Antimuscarinics: see 9.6.

11.4.2 Beta-3 agonists: see 9.5.

11.4.3 Combination therapy: this treatment consists of administering an antimuscarinic together with a beta-3 agonist.FN11.3 [89] ***(NEW)***

11.4.4 PDE5i: This treatment reduces OAB symptoms through the phosphodiesterase - nitric oxide pathway.FN11.4 [90] ***(NEW)***

B-) SURGICAL (INVASIVE) TREATMENT OPTIONS FOR OAB

11.5 Third-line treatment for OAB: these therapies include intradetrusor botulinum toxin injection, peripheral tibial nerve stimulation (PTNS) and sacral neuromodulation. ***(NEW)***

11.5.1 Intradetrusor botulinum toxin injection: injection of onabotulinumtoxinA in the bladder wall to induce detrusor muscle relaxation. ***(NEW)***

11.5.2 Peripheral (or posterior tibial) nerve stimulation (PTNS): A neuromodulation technique that consists in stimulating the posterior tibial nerve with a transcutaneous or percutaneous electrode to modulate the neuronal activity of bladder nerves that share the same dorsal root as the posterior tibial nerve (S3)***. (NEW)***

11.5.3 Sacral neuromodulation (SNM): this neuromodulation technique consists in percutaneously implanting a set of electrodes in the S3 foramen connected to an external (temporary) or subcutaneous (permanent) stimulator to modulate the activity of bladder nerves. ***(NEW)***

11.6 Fourth-line treatment for OAB: considered as last resort for patients that have failed all previous treatments, these include augmentation cystoplasty and urinary diversion. ***(NEW)***

Treatment	**Effect on SD**
Lifestyle modifications	A healthy lifestyle has been shown to reduce OAB, SD and their risk factors.[91,92]
Antimuscarinics	Transdermal oxybutinin for OAB showed an improvement in patient's sex life, a positve effect on relationships and an increase in sexual interest.[93]
PDE5i	A well-known treatment for SD, daily tadalafil has been shown to also improve OAB symptoms.[90]
Sacral neuromodulation	Some studies have shown improvement in sexual function in neurogenic patients.[94,95]

Table 5: Effect of OAB treatments on sexual dysfunction.

Footnotes for section 11

11.1: In the past, bladder training has also been referred to as bladder drill, bladder discipline, bladder re-education, and bladder retraining. Specific goals are to correct faulty habit patterns of frequent urination, improve control over bladder urgency, prolong voiding intervals, increase bladder capacity, reduce incontinent episodes, and restore patient confidence in controlling bladder function.

11.2: Bladder irritants include oxalate-rich food (ie spinach, orange, berries, chocolate, coffee, black tea, tofu, soya, sodas), alcoholic drinks and spicy food.

11.3 PDE5i have also been combined with β3-adrenoceptor agonists with good results.[96]

11.4 Despite it hasn't been officially recommended in international guidelines, the effects of PDE5i have been well established in randomized clinical trials and have a positive effect in patients with SD.[90]

SECTION 12: TREATMENTS FOR CHRONIC PROSTATITIS / CHRONIC PELVIC PAIN SYNDROME AND RELATED SEXUAL DYSFUNCTION[97–99] *(NEW)*

A-) CONSERVATIVE AND PHARMACOLOGICAL TREATMENT OPTIONS FOR CHRONIC PROSTATITIS / CHRONIC PELVIC PAIN SYNDROME (CP / CPPS)

12.1 Non-pharmacological therapies for CP / CPPS: these therapies aim at symptomatic improvement by changing behavioral and environmental issues and also include minimally-invasive therapies with a low risk for adverse events.[100] ***(NEW)***

12.1.1 Acupuncture: procedure that consists in inserting acupuncture needles in specific anatomic locations or "acupoints". [101] ***(NEW)***

12.1.2 Lifestyle modifications: treatment based on avoiding irritant food, having a balanced diet, adopting certain sexual habits, avoiding perineal trauma and having a healthy lifestyle. [102] ***(NEW)***

12.1.3 Physical activity: treatment based on a regular exercise program. [103] ***(NEW)***

12.1.4 Extracorporeal shockwave therapy: periodic stimulation of the perineum with extracorporeal low-energy shockwaves. [104] ***(NEW)***

12.1.5 Transrectal thermotherapy: application of transrectal radiofrequency hyperthermia on the prostate. [105] ***(NEW)***

12.1.6 Cystoscopy and bladder hydrodistention: procedure that consists in distending the bladder during cystoscopy, at a pressure of 80 to 100 cmH2O, lasting 1 to 2 minutes and up to 2 times.[49,106] ***(CHANGED)***

12.1.7 Neuromodulation: see 11.5.3

12.1.8 Transurethral resection: see 9.10

12.1.9 Pelvic floor muscle training (PFMT): see 11.2

12.2 Pharmacological therapies for CP / CPPS: different treatments that aim at alleviating and controlling CP and CPPS via pharmacological pathways. [107] ***(NEW)***

12.2.1 Alpha blockers: see 9.3

12.2.2 5-alpha reductase inhibitors (5-ARI): see 9.4

12.2.3 Antibiotics: this treatment is indicated for chronic bacterial prostatitis (category II of the NIH, see 1.30.2). [107] ***(NEW)***

12.2.4 Anti-inflammatories: nonsteroidal anti-inflammatory drugs (NSAIDs) treatment is based on decreasing the pain mediated by inflammatory pathways. [107] ***(NEW)***

12.2.5 Phytotherapy: see 9.2

12.2.6 Nerve blockade/Epidural pain pump: treatment based on the administration of analgesics directly into the epidural space with a small catheter and a pump. ***(NEW)***

12.1.7 Botulinum toxin injections of the prostate[85] and/or bladder (see 11.5.1)

12.1.8 Phosphodiesterase type 5 inhibitors (PDE5i): see 7.4. PDE5i may alleviate Cp/CPPS symptoms by reducing oxidative stress and inflammation on the prostate and pelvic floor. [108] ***(NEW)***

Treatment	**Direct effect on SD**
Tension reduction, relaxation, physical therapy, lifestyle modifications	Usually beneficial[97–99]
Psychotherapy and multidisciplinary pain management	Usually beneficial[97–99]
Nonsteroidal anti-inflammatory drugs (NSAID)	No direct effect on SD

Opioids	Chronic use is associated with worsening of SD[109]
Tricyclic antidepressants (TCA)	Amitriptyline may have a negative impact on arousal and libido, especially on depressive patients[110]
Anticonvulsants	Pregabalin may cause ED, anorgasmia and loss of libido[111]
PDE5i	May improve CPPS symptoms as well as SD[112]
Pentosan polysulfate (PPS)	No direct effect on SD
Intravesical therapy (Pentosan polysulfate, DMSO, hyaluronic acid, chondroitin sulfate)	No direct effect on SD
Bladder hydrodistention	No direct effect on SD
Nerve blockade/Epidural pain pump	No direct effect on SD
Botulinum toxin injection	No direct effect on SD
Neuromodulation	Some studies have shown improvement in sexual function in neurogenic patients[94,95]
Transurethral resection	Retrograde ejaculation

Table 6: Treatment modalities addressing CP/CPPS, and their sexual health-related side effects.

SECTION 13: TREATMENTS FOR PROSTATE CANCER AND RELATED SEXUAL DYSFUNCTIONS

A-) CONSERVATIVE, PHARMACOLOGICAL, AND NONSURGICAL TREATMENT OPTIONS FOR PROSTATE CANCER

13.1 Active surveillance (AS): A treatment plan that involves closely watching a patient's condition but not giving any treatment unless there are changes in test results that show the condition is getting worse. This is suitable for men with favorable-risk prostate cancer (very low to low-risk) who wish to avoid treatment associated harm. Intervention for cure is pursued in those who experience disease progression while on active surveillance.[113] ***(NEW)***

13.2 Watchful waiting (WW): Waiting until the disease progresses to intervene with a palliative approach. Historically the aim of watchful waiting was to avoid treatment altogether among men with a limited life expectancy and advanced disease detected in an era when screening was not routine.[40] ***(NEW)***

13.3 Androgen deprivation therapy (ADT): An antihormone therapy used to control prostate cancer. Prostate cancer cells require androgens to grow. ADT reduces the levels of androgens in the body thereby slowing prostate cancer growth and progression.[FN13.1] [114] ***(NEW)***

13.4 Radiation therapy: Delivery of ionizing radiation treatments to the prostate to control or kill malignant cells.[FN13.2] [115] ***(NEW)***

13.4.1 Brachytherapy: Delivery of radioactive material sealed in needles, seeds, wires or catheters directly into the prostate gland for curative management of prostate cancer.[115,116] ***(NEW)***

13.4.1.1 Low-dose rate (LDR) brachytherapy: Utilizes radioactive seeds that are implanted based on pretreatment and intraoperative image-guidance according to a computer plan.[FN13.3] [115] ***(NEW)***

13.4.1.2 High-dose rate (HDR) brachytherapy: Utilizes temporary catheters implanted in the prostate to allow for the delivery of a high-activity radiation source.[FN13.4] [115] ***(NEW)***

13.4.2 External beam radiation therapy (EBRT): A form of radiation therapy that uses multiple radiation beams and/or arcs to provide a highly conformal treatment of the prostate with normal tissue sparing of adjacent organs, such as the rectum and bladder.[115] ***(NEW)***

13.4.3 Conformal radiation therapy: A type of 3D radiation therapy that uses computer-generated images to show the size and shape of the tumor. As a result, a higher and more effective dose of radiation can be delivered directly to cancerous cells.[117] ***(NEW)***

13.4.4 Intensity-modulated radiation therapy (IMRT): A type of 3D radiation therapy that uses computer-generated images to show the size and shape of the tumor. Thin beams of radiation of different intensities are aimed at the tumor from many angles. This type of radiation therapy reduces the damage to healthy tissue near the tumor.[118,119] ***(NEW)***

13.4.5 Stereotactic body radiation therapy (SBRT): A form of radiation therapy that uses photon-based IMRT to deliver hypofractionated radiation usually in five or fewer fractions of treatment to kill malignant cells.[115] ***(NEW)***

13.4.6 Proton beam radiation therapy: A type of radiation therapy that uses streams of protons (tiny particles with a positive charge) to kill tumor cells. This type of

treatment can reduce the amount of radiation damage to healthy tissue near a tumor.[113] ***(NEW)***

13.5 Focal therapy: Tissue-preserving strategy aimed to target the cancer and not the whole organ when it is morphometrically possible to do so and thus reduce damage to collateral tissues.[120] ***(NEW)***

13.5.1 Cryotherapy: Focal delivery of the cryoprobe transrectally to the prostate to induce extremely low temperatures with subsequent thawing. This process results in direct cellular injury and a delayed inflammation-mediated mechanism of cellular destruction.[120] ***(NEW)***

13.5.2 High-intensity focused ultrasound (HIFU): Focal delivery of ultrasonic waves (frequencies 0.8 to 3.5 MHz) to selectively initiate cellular damage. The energy of the ultrasonic waves is absorbed by the target tissue and converted to heat causing coagulative necrosis. Furthermore, inertial cavitation is caused by alternating cycles of compression and rarefaction.[120] ***(NEW)***

13.5.3 Irreversible electroporation: Delivery using a Nanoknife system to deploy a low-energy direct current to a targeted region within the prostate.[121] ***(NEW)***

13.5.4 Laser ablation: Utilization of a laser to focally ablate the tissue.[121] ***(NEW)***

13.5.5 Photodynamic therapy: Use of pharmacological agents that become active in the presence of light (photosensitizers) to kill malignant cells.[121] ***(NEW)***

13.5.6 Radiofrequency ablation (RFA): Use of a bipolar radiofrequency ablation probe transperineally to deliver radio waves that heat and destroy abnormal cells.[121,122] ***(NEW)***

B-) SURGICAL TREATMENT OPTIONS FOR PROSTATE CANCER

13.6 Radical prostatectomy (RP)[85]

13.6.1 Nerve spare: Avoidance of electrocautery and high anterior release with careful lateral dissection and gentle lateral traction preserves the neurovascular bundles (NVBs; Figure 3) as they course anterior to Denovilliers' fascia at the posterolateral edge of the prostate.[FN13.5, FN13.6] [123] ***(NEW)***

13.6.2 Salvage prostatectomy: Operative removal of the prostate with the goal of successfully eradicating locally recurrent cancer after definitive radiation therapy.[FN13.7] [40] ***(NEW)***

Treatment	Potential sexual side effect
Active surveillance (AS)	Erectile dysfunction, loss of sexual desire[124,125]
Androgen deprivation therapy (ADT)	Ejaculatory dysfunction, erectile dysfunction, hypogonadism, loss of sexual desire, orgasmic disorder, penile shortening[126,127]
Focal therapy	Erectile dysfunction[120,128]
Radiation therapy	Ejaculatory dysfunction, erectile dysfunction[129]
Radical prostatectomy (RP)	Climacturia, ejaculatory dysfunction, erectile dysfunction, orgasmic dysfunction, peyronie's, penile shortening[130–132]
Watchful waiting (WW)	-

Table 7: Potential sexual side effects of each prostate cancer treatment.

Footnotes for section 13

13.1: ADT is used as a radiosensitizer with radiation therapy to cure localized prostate cancer or alone to control locally-advanced or metastatic prostate cancer.

13.2: Radiation therapy is used in combination with androgen deprivation therapy to treat localized prostate cancer with curative intent.[115]

13.3: Standard LDR brachytherapy is 120 Gy.[133]

13.4: Standard HDR brachytherapy is 38 Gy delivered in 4 fractions, 2 times daily for 2 days.[133]

13.5: The sparing of nerves during radical prostatectomy is the only method to date that can preserve erectile function.[134,135]

13.6: A meta-analysis of studies with > 12 months follow-up post RP reported that use of bilateral nerve spare with associated with a 60% erectile function recovery rate (95% CI 58.0-62.0; 21 studies) compared to a rate of 47% (95% CI 42.0 - 53.0; 12 studies for use of a unilateral nerve-sparing technique).[123]

13.7: To be a candidate the patient must have excellent health with a life expectancy of more than 15 years, no evidence of metastatic disease with prostate biopsy, histologic grade, clinical examination findings and serum PSA levels suggesting localized disease).[40]

AREAS FOR FURTHER RESEARCH

This consultation was performed by several experts in the field of male sexual dysfunction and functional urology. The definitions have different levels of empirical support, and some are based on expert clinical opinion, rather than a strong evidence base. Further research should be conducted to determine the support for these definitions and that, where necessary, appropriate modifications will be made to reflect these research findings.

ACKNOWLEDGMENTS/ADDENDUM

No discussion on terminology should fail to acknowledge the fine leadership shown by the ICS over many years. The legacy of that work by many dedicated clinicians and scientists is present in all the Reports by the different Standardization Committees and Working Groups. It is pleasing that the ICS leadership has accepted this vital initiative as a means of progress in this important and most basic area of Terminology and its Standardization.

This document has involved … rounds of full review, by coauthors, of an initial draft (OA, EK) with the collation of comments and figures. Included in the review process were as follows: (i) 6 external expert reviewers; (ii) an open ICS website review; (iii) ICS Standardisation Steering Committee review and (iv) ICS Board of Trustees review.

The process was subject to live meetings in Florence (September 2017, planning), and in-person Working Group Meetings in Philadelphia (August 2018), and Gothenburg (September 2019). There were also 2 teleconferences (March and May 2019). Thereafter, we held monthly online Working Group Meetings, between February - November 2020. Versions 8 to 13 underwent comprehensive reformatting based on the comments of BH (Ex chair, ICS SSC), which included structural changes, redactions, and revisions with regard to scientific content.

We are extremely grateful for the valuable inputs and extensive comments provided by the 6 expert external reviewers (Kari Tikkinen, Tufan Tarcan, Sherif Mourad, Carlos D'Ancona, Roger Dmochowski, Mehri Mehrad). Version 14 was reviewed by Dr. Matthias Oelke (Chair, ICS SSC) and further revisions were applied based on his recommendations. Version 15 was subject to ICS website publication and an open public forum discussion again through the ICS website and ICS social media accounts. We'd like to express our sincere gratitude to everyone who provided formal and/or informal feedback throughout this process. Version ... was sent for ICS Board review. As there were no significant changes, Version ... was submitted to Neurourology and Urodynamics in ... to appear in the Journal in … This document and all the ***NEW*** or ***CHANGED*** definitions will be uploaded to the ***ICS GLOSSARY*** (www.ics.org/glossary) where immediate electronic access to definitions and document download is available.

References:

1. Stedman TL. *Stedman's Medical Dictionary for the Health Professions and Nursing*. Lippincott Williams & Wilkins; 2005.
2. DiSantostefano J. International Classification of Diseases 10th Revision (ICD-10). *The Journal for Nurse Practitioners*. 2009;5(1):56-57. doi:10.1016/j.nurpra.2008.09.020
3. Abrams P, Blaivas JG, Stanton SL, Andersen JT. The standardisation of terminology of lower urinary tract function. The International Continence Society Committee on Standardisation of Terminology. *Scand J Urol Nephrol Suppl*. 1988;114:5-19.
4. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn*. 2002;21(2):167-178.
5. D'Ancona C, Haylen B, Oelke M, et al. The International Continence Society (ICS) report on the terminology for adult male lower urinary tract and pelvic floor symptoms and dysfunction. *Neurourol Urodyn*. 2019;38(2):433-477.
6. McCabe MP, Sharlip ID, Atalla E, et al. Definitions of Sexual Dysfunctions in Women and Men: A Consensus Statement From the Fourth International Consultation on Sexual Medicine 2015. *J Sex Med*. 2016;13(2):135-143.
7. Rogers RG, Pauls RN, Thakar R, et al. An international Urogynecological association (IUGA)/international continence society (ICS) joint report on the terminology for the assessment of sexual health of women with pelvic floor dysfunction. *Int Urogynecol J*. 2018;29(5):647-666.
8. Brotto LA. The DSM Diagnostic Criteria for Sexual Aversion Disorder. *Archives of Sexual*

Behavior. 2010;39(2):271-277. doi:10.1007/s10508-009-9534-2

9. Mulhall JP, Trost LW, Brannigan RE, et al. Evaluation and Management of Testosterone Deficiency: AUA Guideline. *J Urol*. 2018;200(2):423-432.

10. Lunenfeld B, Mskhalaya G, Zitzmann M, et al. Recommendations on the diagnosis, treatment and monitoring of hypogonadism in men. *Aging Male*. 2015;18(1):5-15.

11. Newman HF, Reiss H, Northup JD. Physical basis of emission, ejaculation, and orgasm in the male. *Urology*. 1982;19(4):341-350.

12. Serefoglu EC, McMahon CG, Waldinger MD, et al. An evidence-based unified definition of lifelong and acquired premature ejaculation: report of the second international society for sexual medicine ad hoc committee for the definition of premature ejaculation. *Sex Med Today*. 2014;2(2):41-59.

13. Maksym RB, Kajdy A, Rabijewski M. Post-finasteride syndrome - does it really exist? *Aging Male*. 2019;22(4):250-259.

14. Abrams P. LUTS, BPH, BPE, BPO: A Plea for the Logical Use of Correct Terms. *Rev Urol*. 1999;1(2):65.

15. Schaeffer AJ. Clinical practice. Chronic prostatitis and the chronic pelvic pain syndrome. *N Engl J Med*. 2006;355(16):1690-1698.

16. Haylen BT, de Ridder D, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Neurourol Urodyn*. 2010;29(1):4-20.

17. Gajewski JB, Schurch B, Hamid R, et al. An International Continence Society (ICS) report on the terminology for adult neurogenic lower urinary tract dysfunction (ANLUTD). *Neurourol Urodyn*. 2018;37(3):1152-1161.

18. Guay A, Seftel AD. Sexual foreplay incontinence in men with erectile dysfunction after radical prostatectomy: a clinical observation. *Int J Impot Res*. 2008;20(2):199-201.

19. Mendez MH, Sexton SJ, Lentz AC. Contemporary Review of Male and Female Climacturia and Urinary Leakage During Sexual Activities. *Sex Med Rev*. 2018;6(1):16-28.

20. Doggweiler R, Whitmore KE, Meijlink JM, et al. A standard for terminology in chronic pelvic pain syndromes: A report from the chronic pelvic pain working group of the international continence society. *Neurourology and Urodynamics*. 2017;36(4):984-1008. doi:10.1002/nau.23072

21. Doggweiler R, Whitmore KE, Meijlink JM, et al. A standard for terminology in chronic pelvic pain syndromes: A report from the chronic pelvic pain working group of the international continence society. *Neurourology and Urodynamics*. 2017;36(4):984-1008. doi:10.1002/nau.23072

22. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. *Urology*. 2003;61(1):37-49. doi:10.1016/s0090-4295(02)02243-4

23. Li H-J, Kang D-Y. Prevalence of sexual dysfunction in men with chronic prostatitis/chronic pelvic pain syndrome: a meta-analysis. *World J Urol*. 2016;34(7):1009-1017.

24. Krieger JN, Nyberg L Jr, Nickel JC. NIH consensus definition and classification of prostatitis. *JAMA*. 1999;282(3):236-237.

25. Hatzimouratidis K, Amar E, Eardley I, et al. Guidelines on male sexual dysfunction: erectile dysfunction and premature ejaculation. *Eur Urol*. 2010;57(5):804-814.

26. De Nunzio C, Roehrborn CG, Andersson K-E, McVary KT. Erectile Dysfunction and Lower Urinary Tract Symptoms. *Eur Urol Focus*. 2017;3(4-5):352-363.

27. Rantell A, Apostolidis A, Anding R, Kirschner-Hermanns R, Cardozo L. How does lower urinary tract dysfunction affect sexual function in men and women? ICI-RS 2015-Part 1. *Neurourol Urodyn*. 2017;36(4):949-952.

28. Morant S, Bloomfield G, Vats V, Chapple C. Increased sexual dysfunction in men with storage and voiding lower urinary tract symptoms. *J Sex Med*. 2009;6(4):1103-1110.

29. Coyne KS, Sexton CC, Thompson C, Kopp ZS, Milsom I, Kaplan SA. The Impact of OAB on Sexual Health in Men and Women: Results from EpiLUTS. *The Journal of Sexual Medicine*. 2011;8(6):1603-1615. doi:10.1111/j.1743-6109.2011.02250.x

30. Irwin DE, Milsom I, Reilly K, et al. Overactive bladder is associated with erectile dysfunction and reduced sexual quality of life in men. *J Sex Med*. 2008;5(12):2904-2910.

31. Shoskes DA, Prots D, Karns J, Horhn J, Shoskes AC. Greater endothelial dysfunction and arterial stiffness in men with chronic prostatitis/chronic pelvic pain syndrome--a possible link to cardiovascular disease. *J Urol*. 2011;186(3):907-910.

32. Mo M-Q, Long L-L, Xie W-L, et al. Sexual dysfunctions and psychological disorders associated with type IIIa chronic prostatitis: a clinical survey in China. *Int Urol Nephrol*. 2014;46(12):2255-2261.

33. Cortes E, Sahai A, Pontari M, Kelleher C. The psychology of LUTS: ICI-RS 2011. *Neurourol Urodyn*. 2012;31(3):340-343.

34. Bonierbale M, Lançon C, Tignol J. The ELIXIR study: evaluation of sexual dysfunction in 4557 depressed patients in France. *Curr Med Res Opin*. 2003;19(2):114-124.

35. Smith KB, Pukall CF, Tripp DA, Nickel JC. Sexual and relationship functioning in men with chronic prostatitis/chronic pelvic pain syndrome and their partners. *Arch Sex Behav*. 2007;36(2):301-311.

36. Lee SWH, Liong ML, Yuen KH, et al. Adverse impact of sexual dysfunction in chronic prostatitis/chronic pelvic pain syndrome. *Urology*. 2008;71(1):79-84.

37. Marszalek M, Wehrberger C, Hochreiter W, Temml C, Madersbacher S. Symptoms Suggestive of Chronic Pelvic Pain Syndrome in an Urban Population: Prevalence and Associations With Lower Urinary Tract Symptoms and Erectile Function. *Journal of Urology*. 2007;177(5):1815-1819. doi:10.1016/j.juro.2007.01.008

38. Latini JM, McAninch JW, Brandes SB, Chung JY, Rosenstein D. SIU/ICUD Consultation On Urethral Strictures: Epidemiology, etiology, anatomy, and nomenclature of urethral stenoses, strictures, and pelvic fracture urethral disruption injuries. *Urology*. 2014;83(3 Suppl):S1-S7.

39. Palminteri E, Lumen N, Preto M, Waterloos M. Impact of Urethral Reconstruction on Sexual Function. In: Martins FE, Kulkarni SB, Köhler TS, eds. *Textbook of Male Genitourethral Reconstruction*. Vol 185. Springer International Publishing; 2020:427-435.

40. Partin AW, Wein AJ, Kavoussi LR, Peters CA, Dmochowski RR. *Campbell Walsh Wein Urology, E-Book*. Elsevier Health Sciences; 2020.

41. Drake R, Wayne Vogl A, Mitchell AWM. *Gray's Anatomy for Students E-Book*. Elsevier Health Sciences; 2019.

42. Park YH, Jeong CW, Lee SE. A comprehensive review of neuroanatomy of the prostate. *Prostate Int*. 2013;1(4):139-145.

43. Oelke M, Wiese B, Berges R. Nocturia and its impact on health-related quality of life and health care seeking behaviour in German community-dwelling men aged 50 years or older. *World J Urol*. 2014;32(5):1155-1162.

44. Abrams P, Artibani W, Cardozo L, Dmochowski R, van Kerrebroeck P, Sand P. Reviewing the ICS 2002 terminology report: The ongoing debate. *Neurourology and Urodynamics*. 2009;28(4):287-287. doi:10.1002/nau.20737

45. van Kerrebroeck P, Abrams P, Chaikin D, et al. The standardisation of terminology in nocturia: Report from the standardisation sub-committee of the International Continence Society. *Neurourology and Urodynamics*. 2002;21(2):179-183. doi:10.1002/nau.10053

46. European Society for Sexual Medicine. *The ESSM Syllabus of Sexual Medicine*.; 2012.

47. Nilsson AE, Carlsson S, Johansson E, et al. Orgasm-Associated Urinary Incontinence and Sexual Life after Radical Prostatectomy. *The Journal of Sexual Medicine*. 2011;8(9):2632-2639. doi:10.1111/j.1743-6109.2011.02347.x

48. Nickel JC, Curtis Nickel J, Shoskes DA, Wagenlehner FME. Management of chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS): the studies, the evidence, and the impact. *World Journal of Urology*. 2013;31(4):747-753. doi:10.1007/s00345-013-1062-y

49. Doggweiler R, Whitmore KE, Meijlink JM, et al. A standard for terminology in chronic pelvic pain syndromes: A report from the chronic pelvic pain working group of the international continence society. *Neurourology and Urodynamics*. 2017;36(4):984-1008. doi:10.1002/nau.23072

50. Barry MJ, Fowler FJ Jr, O'Leary MP, et al. The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. *J Urol*. 1992;148(5):1549-1557; discussion 1564.

51. Foster HE, Barry MJ, Dahm P, et al. Surgical Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia: AUA Guideline. *J Urol*. 2018;200(3):612-619.

52. Rosen RC, Cappelleri JC, Gendrano N 3rd. The International Index of Erectile Function (IIEF): a state-of-the-science review. *Int J Impot Res*. 2002;14(4):226-244.

53. Rosen RC, Cappelleri JC, Smith MD, Lipsky J, Peña BM. Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. *Int J Impot Res*. 1999;11(6):319-326.

54. Mulhall JP, Goldstein I, Bushmakin AG, Cappelleri JC, Hvidsten K. Validation of the erection hardness score. *J Sex Med*. 2007;4(6):1626-1634.

55. Rosen RC, Catania J, Pollack L, Althof S, O'Leary M, Seftel AD. Male Sexual Health Questionnaire (MSHQ): scale development and psychometric validation. *Urology*. 2004;64(4):777-782.

56. Patrick DL, Giuliano F, Ho KF, Gagnon DD, McNulty P, Rothman M. The Premature Ejaculation Profile: validation of self-reported outcome measures for research and practice. *BJU Int*. 2009;103(3):358-364.

57. Althof S, Rosen R, Symonds T, Mundayat R, May K, Abraham L. Development and validation of a new questionnaire to assess sexual satisfaction, control, and distress associated with premature ejaculation. *J Sex Med*. 2006;3(3):465-475.

58. O'Leary MP, Fowler FJ, Lenderking WR, et al. A brief male sexual function inventory for urology. *Urology*. 1995;46(5):697-706. doi:10.1016/s0090-4295(99)80304-5

59. Homma Y, Yoshida M, Seki N, et al. Symptom assessment tool for overactive bladder syndrome--overactive bladder symptom score. *Urology*. 2006;68(2):318-323.

60. Liu R-T, Chung M-S, Chuang Y-C, et al. The presence of overactive bladder wet increased the risk and severity of erectile dysfunction in men with type 2 diabetes. *J Sex Med*. 2012;9(7):1913-1922.

61. Amano T, Earle C, Imao T, Takemae K. Are urge incontinence and aging risk factors of erectile dysfunction in patients with male lower urinary tract symptoms? *Aging Male*. 2016;19(1):54-57.

62. Coyne K, Revicki D, Hunt T, et al. Psychometric validation of an overactive bladder symptom and health-related quality of life questionnaire: the OAB-q. *Qual Life Res*. 2002;11(6):563-574.

63. Coyne KS, Thompson CL, Lai J-S, Sexton CC. An overactive bladder symptom and health-related quality of life short-form: validation of the OAB-q SF. *Neurourol Urodyn*. 2015;34(3):255-263.

64. Rosen R, O'Leary M, Altwein J, et al. Luts and male sexual dysfunction: The multi-national survey of the aging male (MSAM-7). *European Urology Supplements*. 2003;2(1):94. doi:10.1016/s1569-9056(03)80371-8

65. Nakamura M, Fujimura T, Nagata M, et al. Association between lower urinary tract symptoms and sexual dysfunction assessed using the core lower urinary tract symptom score and International Index of Erectile Function-5 questionnaires. *Aging Male*. 2012;15(2):111-114.

66. Heidler S, Mert C, Wehrberger C, et al. Impact of overactive bladder symptoms on sexuality in both sexes. *Urol Int*. 2010;85(4):443-446.

67. Burnett AL, Nehra A, Breau RH, et al. Erectile Dysfunction: AUA Guideline. *J Urol*. 2018;200(3):633-641.

68. Maruschke M, Protzel C, Hakenberg OW. How to Make the Diagnosis of Benign Prostatic Disease. *European Urology Supplements*. 2009;8(6):490-495. doi:10.1016/j.eursup.2009.02.007

69. Erickson BA, Wysock JS, McVary KT, Gonzalez CM. Erectile function, sexual drive, and ejaculatory function after reconstructive surgery for anterior urethral stricture disease. *BJU Int*. 2007;99(3):607-611.

70. Mondaini N, Ponchietti R, Gontero P, et al. Penile length is normal in most men seeking penile lengthening procedures. *Int J Impot Res*. 2002;14(4):283-286.

71. Stewart L, McCammon K, Metro M, Virasoro R. SIU/ICUD Consultation on Urethral Strictures: Anterior urethra-lichen sclerosus. *Urology*. 2014;83(3 Suppl):S27-S30.

72. Angermeier KW, Rourke KF, Dubey D, Forsyth RJ, Gonzalez CM. SIU/ICUD Consultation on Urethral Strictures: Evaluation and follow-up. *Urology*. 2014;83(3 Suppl):S8-S17.

73. Saavedra AA, Rourke KF. Clinical Presentation and Diagnostic Evaluation of Male Urethral Stricture. In: Martins FE, Kulkarni SB, Köhler TS, eds. *Textbook of Male Genitourethral Reconstruction*. Vol 56. Springer International Publishing; 2020:45-65.

74. Guan Y, Wendong S, Zhao S, et al. The vascular and neurogenic factors associated with erectile dysfunction in patients after pelvic fractures. *Int Braz J Urol*. 2015;41(5):959-966.

75. Cruccu G, Aminoff MJ, Curio G, et al. Recommendations for the clinical use of

somatosensory-evoked potentials. *Clin Neurophysiol*. 2008;119(8):1705-1719.

76. Doggweiler R, Whitmore KE, Meijlink JM, et al. A standard for terminology in chronic pelvic pain syndromes: A report from the chronic pelvic pain working group of the international continence society. *Neurourology and Urodynamics*. 2017;36(4):984-1008. doi:10.1002/nau.23072

77. Herschorn S, Elliott S, Coburn M, Wessells H, Zinman L. SIU/ICUD Consultation on Urethral Strictures: Posterior urethral stenosis after treatment of prostate cancer. *Urology*. 2014;83(3 Suppl):S59-S70.

78. Gómez RG, Mundy T, Dubey D, et al. SIU/ICUD Consultation on Urethral Strictures: Pelvic fracture urethral injuries. *Urology*. 2014;83(3 Suppl):S48-S58.

79. Alhajeri F, Alwaal A, Soebadi MA. Etiology, Epidemiology, Demographic Differences in Urethral Strictures: A Worldwide Perspective. In: Martins FE, Kulkarni SB, Köhler TS, eds. *Textbook of Male Genitourethral Reconstruction*. Vol 177. Springer International Publishing; 2020:25-32.

80. Sanda MG, Cadeddu JA, Kirkby E, et al. Clinically Localized Prostate Cancer: AUA/ASTRO/SUO Guideline. Part I: Risk Stratification, Shared Decision Making, and Care Options. *J Urol*. 2018;199(3):683-690.

81. Ho CCK, Tan HM. Rise of herbal and traditional medicine in erectile dysfunction management. *Curr Urol Rep*. 2011;12(6):470-478.

82. Chung E, Gillman M. Prostate cancer survivorship: a review of erectile dysfunction and penile rehabilitation after prostate cancer therapy. *Med J Aust*. 2014;200(10):582-585.

83. Herberts M, Butcher M, Köhler T. The Effect of LUTS/BPH and Treatments on Ejaculatory Function. *Curr Urol Rep*. 2016;17(7):48.

84. Liao C-H, Kuo Y-C, Kuo H-C. Predictors of successful first-line antimuscarinic monotherapy in men with enlarged prostate and predominant storage symptoms. *Urology*. 2013;81(5):1030-1033.

85. Abranches-Monteiro L, Hamid R, D'Ancona C, et al. The International Continence Society (ICS) report on the terminology for male lower urinary tract surgery. *Neurourol Urodyn*. Published online October 12, 2020. doi:10.1002/nau.24509

86. Geavlete P, Mulţescu R, Drăguţescu M, Georgescu D, Geavlete B. Optical Internal Urethrotomy in Males. In: *Endoscopic Diagnosis and Treatment in Urethral Pathology*. Elsevier; 2016:11-63.

87. Bo K, Frawley HC, Haylen BT, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for the conservative and nonpharmacological management of female pelvic floor dysfunction. *Neurourol Urodyn*. 2017;36(2):221-244.

88. Wyman JF, Burgio KL, Newman DK. Practical aspects of lifestyle modifications and behavioural interventions in the treatment of overactive bladder and urgency urinary incontinence. *Int J Clin Pract*. 2009;63(8):1177-1191.

89. Abrams P, Kelleher C, Staskin D, et al. Combination treatment with mirabegron and solifenacin in patients with overactive bladder: efficacy and safety results from a randomised, double-blind, dose-ranging, phase 2 study (Symphony). *Eur Urol*. 2015;67(3):577-588.

90. Chen H, Wang F, Yu Z, et al. Efficacy of Daily Low-dose Tadalafil for Treating Overactive Bladder: Results of a Randomized, Double-blind, Placebo-controlled Trial. *Urology*. 2017;100:59-64. doi:10.1016/j.urology.2016.11.008

91. Maiorino MI, Bellastella G, Esposito K. Lifestyle modifications and erectile dysfunction: what can be expected? *Asian J Androl*. 2015;17(1):5-10.

92. Glina S, Sharlip ID, Hellstrom WJG. Modifying risk factors to prevent and treat erectile dysfunction. *J Sex Med*. 2013;10(1):115-119.

93. Sand PK, Goldberg RP, Dmochowski RR, McIlwain M, Dahl NV. The impact of the overactive bladder syndrome on sexual function: a preliminary report from the Multicenter Assessment of Transdermal Therapy in Overactive Bladder with Oxybutynin trial. *Am J Obstet Gynecol*. 2006;195(6):1730-1735.

94. Siegel S, Noblett K, Mangel J, et al. Results of a prospective, randomized, multicenter study evaluating sacral neuromodulation with InterStim therapy compared to standard medical therapy at 6-months in subjects with mild symptoms of overactive bladder. *Neurourol Urodyn*. 2015;34(3):224-230.

95. Khunda A, McCormick C, Ballard P. Sacral neuromodulation and sexual function: a systematic review and meta-analysis of the literature. *Int Urogynecol J*. 2019;30(3):339-352.

96. Yamanishi T, Kaga K, Sakata K, et al. A randomized controlled study of the efficacy of tadalafil monotherapy versus combination of tadalafil and mirabegron for the treatment of persistent overactive bladder symptoms in men presenting with lower urinary tract symptoms (CONTACT Study). *Neurourol Urodyn*. 2020;39(2):804-812.

97. Fall M, Baranowski AP, Elneil S, et al. EAU guidelines on chronic pelvic pain. *Eur Urol*. 2010;57(1):35-48.

98. Morrissey D, Ginzburg N, Whitmore K. Current advancements in the diagnosis and treatment of chronic pelvic pain. *Current Opinion in Urology*. 2014;24(4):336-344. doi:10.1097/mou.0000000000000062

99. Engeler DS, Baranowski AP, Dinis-Oliveira P, et al. The 2013 EAU Guidelines on Chronic Pelvic Pain: Is Management of Chronic Pelvic Pain a Habit, a Philosophy, or a Science? 10 Years of Development. *European Urology*. 2013;64(3):431-439. doi:10.1016/j.eururo.2013.04.035

100. Franco JVA, Tirapegui FI, Turk T, Garrote V, Vietto V. Non-pharmacological interventions for treating chronic prostatitis/chronic pelvic pain syndrome. *Cochrane Database of Systematic Reviews*. Published online 2017. doi:10.1002/14651858.cd012551

101. Sahin S, Bicer M, Eren GA, et al. Acupuncture relieves symptoms in chronic prostatitis/chronic pelvic pain syndrome: a randomized, sham-controlled trial. *Prostate Cancer Prostatic Dis*. 2015;18(3):249-254.

102. Gallo L. Effectiveness of diet, sexual habits and lifestyle modifications on treatment of chronic pelvic pain syndrome. *Prostate Cancer Prostatic Dis*. 2014;17(3):238-245.

103. Küçük EV, Suçeken FY, Bindayı A, Boylu U, Onol FF, Gümüş E. Effectiveness of acupuncture on chronic prostatitis-chronic pelvic pain syndrome category IIIB patients: a prospective, randomized, nonblinded, clinical trial. *Urology*. 2015;85(3):636-640.

104. Zimmermann R, Cumpanas A, Miclea F, Janetschek G. Extracorporeal shock wave therapy for the treatment of chronic pelvic pain syndrome in males: a randomised, double-blind, placebo-controlled study. *Eur Urol*. 2009;56(3):418-424.

105. Gao M, Ding H, Zhong G, et al. The effects of transrectal radiofrequency hyperthermia on patients with chronic prostatitis and the changes of MDA, NO, SOD, and Zn levels in pretreatment and posttreatment. *Urology*. 2012;79(2):391-396.

106. Ens G, Garrido GL. Role of cystoscopy and hydrodistention in the diagnosis of interstitial cystitis/bladder pain syndrome. *Transl Androl Urol*. 2015;4(6):624-628.

107. Franco JV, Turk T, Jung JH, et al. Pharmacological interventions for treating chronic prostatitis/chronic pelvic pain syndrome. *Cochrane Database Syst Rev*. 2019;10:CD012552.

108. Pineault K, Ray S, Gabrielson A, Herati AS. Phosphodiesterase type 5 inhibitor therapy provides sustained relief of symptoms among patients with chronic pelvic pain syndrome. *Transl Androl Urol*. 2020;9(2):391-397.

109. Morasco BJ, Smith N, Dobscha SK, Deyo RA, Hyde S, Yarborough BJH. Outcomes of prescription opioid dose escalation for chronic pain: results from a prospective cohort study. *Pain*. 2020;161(6):1332-1340.

110. Chen LW-H, Chen MY-S, Lian Z-P, et al. Amitriptyline and Sexual Function: A Systematic Review Updated for Sexual Health Practice. *Am J Mens Health*. 2018;12(2):370-379.

111. Hamed SA. Sexual Dysfunctions Induced by Pregabalin. *Clinical Neuropharmacology*. 2018;41(4):116-122. doi:10.1097/wnf.0000000000000286

112. Benelli A, Mariani S, Varca V, Gregori A, Barrese F, Cappa M. Once-daily 5 mg tadalafil oral treatment for patients with chronic prostatitis/chronic pelvic pain syndrome. *Ther Adv Urol*. 2018;10(12):377-381.

113. NCI Dictionary of Cancer Terms. National Cancer Institute. Published February 2, 2011. Accessed June 13, 2020. https://www.cancer.gov/publications/dictionaries/cancer-terms

114. Perlmutter MA, Lepor H. Androgen deprivation therapy in the treatment of advanced prostate cancer. *Rev Urol*. 2007;9 Suppl 1:S3-S8.

115. Huyghe E, Bachaud J-M, Achard J-L, Bossi A, Droupy S, les membres du comité d'andrologie de l'AFU. [Sexual dysfunction after curietherapy and external radiotherapy of the prostate for localized prostate cancer]. *Prog Urol*. 2009;19 Suppl 4:S173-S176.

116. NCI Dictionary of Cancer Terms. National Cancer Institute. Published February 2, 2011. Accessed June 13, 2020. https://www.cancer.gov/publications/dictionaries/cancer-terms

117. Viani G, Hamamura AC, Faustino AC. Intensity modulated radiotherapy (IMRT) or conformational radiotherapy (3D-CRT) with conventional fractionation for prostate cancer: Is there any clinical difference? *Int Braz J Urol*. 2019;45(6):1105-1112.

118. NCI Dictionary of Cancer Terms. National Cancer Institute. Published February 2, 2011. Accessed June 13, 2020. https://www.cancer.gov/publications/dictionaries/cancer-terms

119. NCI Dictionary of Cancer Terms. National Cancer Institute. Published February 2, 2011. Accessed June 13, 2020. https://www.cancer.gov/publications/dictionaries/cancer-terms

120. Yap T, Ahmed HU, Hindley RG, et al. The Effects of Focal Therapy for Prostate Cancer on Sexual Function: A Combined Analysis of Three Prospective Trials. *Eur Urol*. 2016;69(5):844-851.

121. Perera M, Krishnananthan N, Lindner U, Lawrentschuk N. An update on focal therapy for prostate cancer. *Nat Rev Urol*. 2016;13(11):641-653.

122. NCI Dictionary of Cancer Terms. National Cancer Institute. Published February 2, 2011. Accessed June 13, 2020. https://www.cancer.gov/publications/dictionaries/cancer-terms

123. Tal R, Alphs HH, Krebs P, Nelson CJ, Mulhall JP. Erectile function recovery rate after radical prostatectomy: a meta-analysis. *J Sex Med*. 2009;6(9):2538-2546.

124. Fujita K, Landis P, McNeil BK, Pavlovich CP. Serial prostate biopsies are associated with an increased risk of erectile dysfunction in men with prostate cancer on active surveillance. *J Urol*. 2009;182(6):2664-2669.

125. Kamali K, Nabizadeh M, Ameli M, Emami M, Mahvari-Habibabadi M, Amirpoor M. Impact of prostate needle biopsy on erectile function: A prospective study. *Urologia*. 2019;86(3):145-147.

126. Corona G, Gacci M, Baldi E, Mancina R, Forti G, Maggi M. Androgen deprivation therapy in prostate cancer: focusing on sexual side effects. *J Sex Med*. 2012;9(3):887-902.

127. Park KK, Lee SH, Chung BH. The effects of long-term androgen deprivation therapy on penile length in patients with prostate cancer: a single-center, prospective, open-label, observational study. *J Sex Med*. 2011;8(11):3214-3219.

128. Rouget B, Capon G, Bernhard JC, et al. [Eight years of experience with HIFU for prostate cancer: Oncological and functional results]. *Prog Urol*. 2016;26(1):50-57.

129. Sullivan JF, Stember DS, Deveci S, Akin-Olugbade Y, Mulhall JP. Ejaculation profiles of men following radiation therapy for prostate cancer. *J Sex Med*. 2013;10(5):1410-1416.

130. Frey AU, Sønksen J, Fode M. Neglected side effects after radical prostatectomy: a systematic review. *J Sex Med*. 2014;11(2):374-385.

131. Barnas JL, Pierpaoli S, Ladd P, et al. The prevalence and nature of orgasmic dysfunction after radical prostatectomy. *BJU Int*. 2004;94(4):603-605.

132. Benson JS, Abern MR, Levine LA. Penile shortening after radical prostatectomy and Peyronie's surgery. *Curr Urol Rep*. 2009;10(6):468-474.

133. Grills IS, Martinez AA, Hollander M, et al. High dose rate brachytherapy as prostate cancer monotherapy reduces toxicity compared to low dose rate palladium seeds. *J Urol*. 2004;171(3):1098-1104.

134. Castiglione F, Ralph DJ, Muneer A. Surgical Techniques for Managing Post-prostatectomy Erectile Dysfunction. *Curr Urol Rep*. 2017;18(11):90.

135. Catalona WJ, Dresner SM. Nerve-sparing radical prostatectomy: extraprostatic tumor extension and preservation of erectile function. *J Urol*. 1985;134(6):1149-1151.

136. Lu Z, Lin G, Reed-Maldonado A, Wang C, Lee Y-C, Lue TF. Low-intensity Extracorporeal Shock Wave Treatment Improves Erectile Function: A Systematic Review and Meta-analysis. *Eur Urol*. 2017;71(2):223-233.

137. Scott S, Roberts M, Chung E. Platelet-Rich Plasma and Treatment of Erectile Dysfunction: Critical Review of Literature and Global Trends in Platelet-Rich Plasma Clinics. *Sex Med Rev*. 2019;7(2):306-312.

138. Matz EL, Terlecki R, Zhang Y, Jackson J, Atala A. Stem Cell Therapy for Erectile Dysfunction. *Sex Med Rev*. 2019;7(2):321-328.

139. Kim ED, Nath R, Slawin KM, Kadmon D, Miles BJ, Scardino PT. Bilateral nerve grafting during radical retropubic prostatectomy: extended follow-up. *Urology*. 2001;58(6):983-987.

Appendix:

Low-intensity extracorporeal shock-wave therapy (LI-SWT): Extracorporeal application of low intensity shock wave which is a kind of acoustic wave that carries energy and that, when propagating through a medium, can be targeted and focused noninvasively to affect a distant selected anatomic region. When LI-ESWT is applied to penis, the shock waves interact with the targeted tissues and induce a cascade of biological reactions which in turn triggers neovascularization with subsequent improvement of the blood supply.[136] ***(NEW)***

Platelet-rich plasma (PRP) therapy: PRP is an autologous product obtained from whole blood that contains high concentrations of platelet-derived growth factors and provides a fibrin framework over platelets that has the potential to support the regenerative matrix and promote recovery in damaged tissues. PRP therapy denotes intracavernosal injection of autologous platelet-rich plasma concentrates to address erectile dysfunction.[137] ***(NEW)***

Intracavernosal stem cell therapy: Intracavernosal injection of stem cells, which are derived from multiple tissue sources (such as bone marrow, adipose tissue) and have the potential for self-replication, proliferation and differentiation, to restore erectile function.[138] ***(NEW)***

Nerve graft: Interposition of sural nerve graft at the time of RP is proposed to help recovery of erectile function in men who had both cavernous nerves resected.[139] ***(NEW)***