EAU GUIDELINES ON SEXUAL AND REPRODUCTIVE HEALTH

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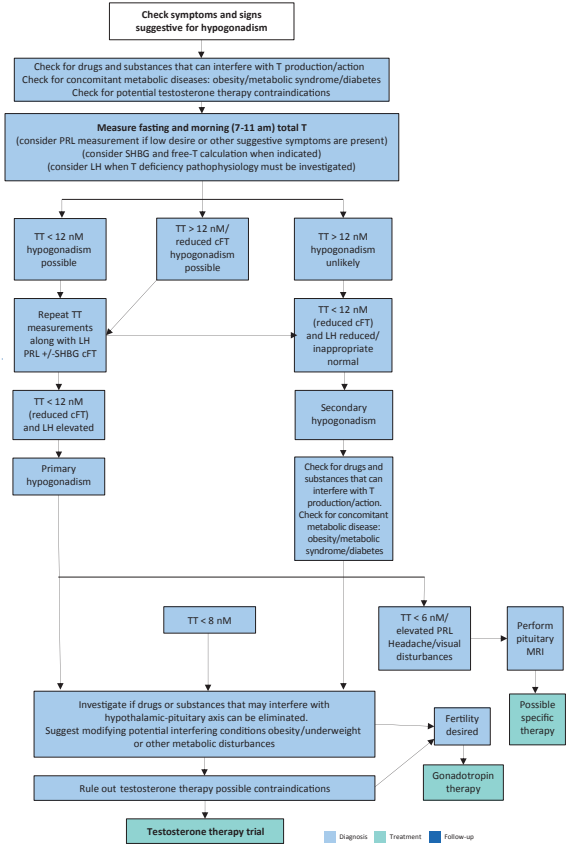
Introduction

This document presents a concise overview of the medical aspects relating to male sexual and reproductive health.

Male hypogonadism

Male hypogonadism, also known as testosterone deficiency, is a disorder associated with decreased functional activity of the testes, with decreased production of androgens and/or impaired sperm production. It may adversely affect multiple organ functions and quality of life (QoL). The prevalence increases with age. The diagnostic evaluation of late-onset hypogonadism (LOH) is presented in Figure 1.

Figure 1: Diagnostic evaluation of late-onset hypogonadism



cFT = calculated free testosterone; LH = luteinising hormone; MRI = magnetic resonance imaging; TT = total testosterone; PRL = prolactin; SHBG = sex hormone-binding globulin.

Recommendations for the diagnostic evaluation and screening of late-onset hypogonadism

Recommendations	Strength rating
Diagnostic evaluation	
Check for concomitant diseases, drugs and substances that can interfere with testosterone production/action.	Strong
Measure total testosterone (TT) in the morning (07.00 and 10.00 hours) and in the fasting state, with a reliable laboratory assay.	Strong
Repeat TT on at least two separate occasions when < 12 nmol/L and before starting testosterone therapy.	Strong
Use 12 nmol/L TT (3.5 ng/mL) as a reliable threshold to diagnose late-onset hypogonadism (LOH).	Strong
Measure sex hormone-binding globulin and free-testosterone calculation when indicated.	Strong
Analyse luteinising hormone and follicle-stimulating hormone serum levels to differentiate between the different types of hypogonadism.	Strong
Measure prolactin (PRL) levels if evidence of low sexual desire (or other suggestive signs/symptoms) and secondary hypogonadism is present.	Strong
Perform pituitary magnetic resonance imaging (MRI) in secondary hypogonadism, with elevated PRL or symptoms specific to a pituitary mass, and/or presence of other anterior pituitary hormone deficiency.	Strong

Perform pituitary MRI in secondary severe hypogonadism (TT< 6 nmol/L).	Weak
Screening	
Screen for LOH only in symptomatic males.	Strong
Do not use structured interviews and self-reported questionnaires for systematic screening for LOH, as they have a low specificity.	Strong

Recommendations for disease management

Recommendations for testosterone therapy (TTh) outcome	**Strength rating**
Do not use TTh in eugonadal males.	Strong
Do not use TTh for the treatment of male infertility and in males wishing to be fathers.	Strong
Use TTh as first-line treatment in hypogonadal patients with mild erectile dysfunction (ED).	Strong
Use a combination of phosphodiesterase type 5 inhibitors and TTh in more severe forms of ED associated with hypogonadism.	Weak
Use conventional medical therapies for severe depressive symptoms and osteoporosis.	Strong
Do not use TTh to reduce weight and enhance cardio-metabolic status.	Weak
Do not use TTh to improve cognition vitality and physical strength in ageing males.	Strong

Recommendations for late-onset hypogonadism choice of treatment	Strength rating
Treat, when indicated, organic causes of hypogonadism (e.g., pituitary masses, hyperprolactinemia, etc.).	Strong
Improve lifestyle and reduce weight (e.g., obesity); withdraw, when possible, concomitant drugs that can impair testosterone production; treat co-morbidity before starting testosterone therapy.	Strong
Fully inform patients about expected benefits and adverse effects of any treatment option. Select the testosterone preparation in a joint decision process, and fully inform patients of the risks and benefits.	Strong
Use testosterone gels rather than long-acting depot administration when starting initial treatment in high-risk males.	Weak

Recommendations on safety and monitoring in testosterone treatment	Strength rating
Fully counsel symptomatic hypogonadal males who have been surgically treated for localised prostate cancer (PCa) and who are currently without evidence of active disease that are considering testosterone therapy (TTh), emphasising the lack of sufficient safety data on long-term follow-up.	Weak

Restrict TTh to patients with a low risk of recurrent PCa after surgery*. Testosterone therapy should start after at least one year follow-up with prostate-specific antigen (PSA) level < 0.01 ng/mL and no evidence of recurrence.	Weak
Advise patients that safety data on the use of TTh in males treated for breast cancer are unknown.	Strong
Advise patients on active surveillance or treated with non-surgical curative intent that safety data on the use of TTh are unclear.	Weak
Assess cardiovascular risk factors before commencing TTh.	Strong
Assess males with known cardiovascular disease (CVD) for cardiovascular symptoms before initiating TTh and monitor these patients with close clinical assessment and evaluation during treatment.	Strong
Treat males with hypogonadism and pre-existing CVD, venous-thromboembolism or chronic cardiac failure, who require TTh with caution, by careful clinical monitoring and regular measurement of haematocrit (not exceeding 54%) and testosterone levels.	Weak
Exclude a family history of venous-thromboembolism before starting TTh.	Strong

Monitor testosterone, haematocrit at three, six and twelve months after TTh initiation, and thereafter annually. A haematocrit > 54% requires TTh adjustment or withdrawal and venesection if required. Re-introduce TTh at a lower dose once the haematocrit has normalised and consider switching to topical testosterone preparations.	Strong
Evaluate patients with polycythaemia vera and those with a higher risk of developing elevated haematocrit every three months during the first year of TTh, and at least every six months thereafter.	Strong
Consider further diagnostic testing in PCa-naïve patients if there is a significant rise or increase in PSA velocity or total PSA.	Strong
Evaluate total PSA in PCa survivors at three, six and twelve months during the first year of TTh, and annually thereafter.	Strong

**For European Association of Urology (EAU) risk groups for biochemical recurrence of localised or locally advanced PCa see EAU Prostate Cancer Guidelines, 2026.*

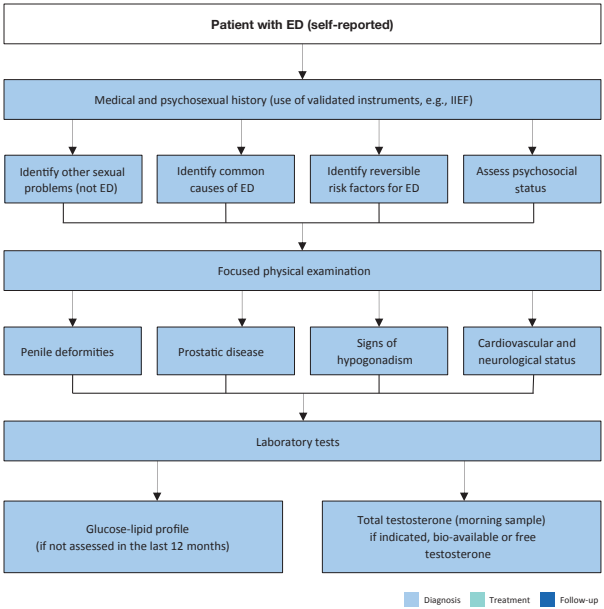
Erectile dysfunction

Erectile dysfunction (ED) is defined as the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance. Erectile dysfunction may affect physical and psychosocial health and may have a significant impact on the QoL of sufferers and their partners. There is increasing evidence that ED can also be an early manifestation of coronary artery and peripheral vascular disease; therefore, ED should not be regarded only as a QoL issue, but also as a potential warning sign of cardiovascular diseases (CVD).

Diagnostic evaluation

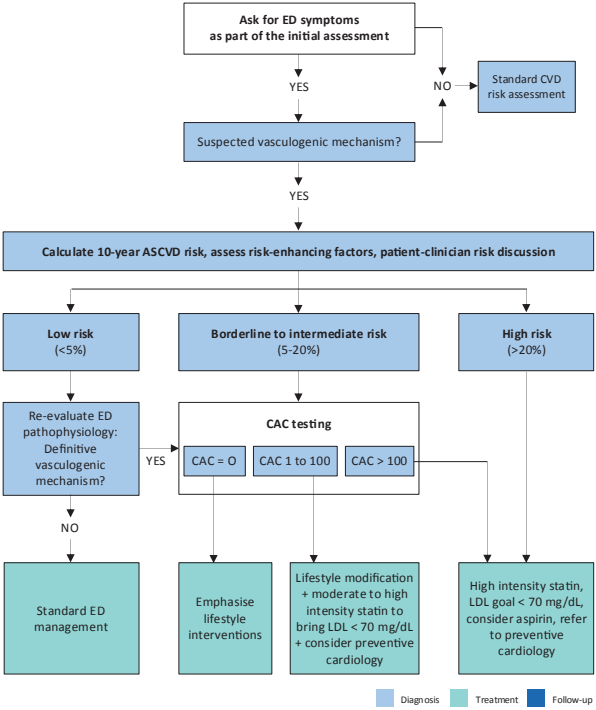
The minimal diagnostic evaluation for ED is presented in Figure 2. Patients who seek treatment for sexual dysfunction have a high prevalence of CVDs. Erectile dysfunction significantly increases the risk of CVD, coronary heart disease, stroke, atrial fibrillation, cardiovascular and all-cause mortality. Figure 3 presents the cardiovascular risk assessment of ED patient with no overt disease or cardiac symptoms based on the IV Princeton Consensus. Indications for specific diagnostic tests for ED and the specific diagnostic tests are presented in Table 1.

Figure 2: Minimal diagnostic evaluation (basic work-up) in patients with erectile dysfunction



ED = erectile dysfunction; IIEF = International Index of Erectile Function.

Figure 3: Cardiovascular risk assessment of erectile dysfunction patient with no overt disease or cardiac symptoms based on the IV Princeton Consensus



Reproduced with permission from Kloner et al., 2024.
ASCVD = Atherosclerotic Cardiovascular Disease;
CAC = coronary artery calcium; CVD = cardiovascular disease;
ED = erectile dysfunction; LDL = low-density lipoprotein.

Table 1: Indications for specific diagnostic tests for erectile dysfunction (ED) and the specific diagnostic tests

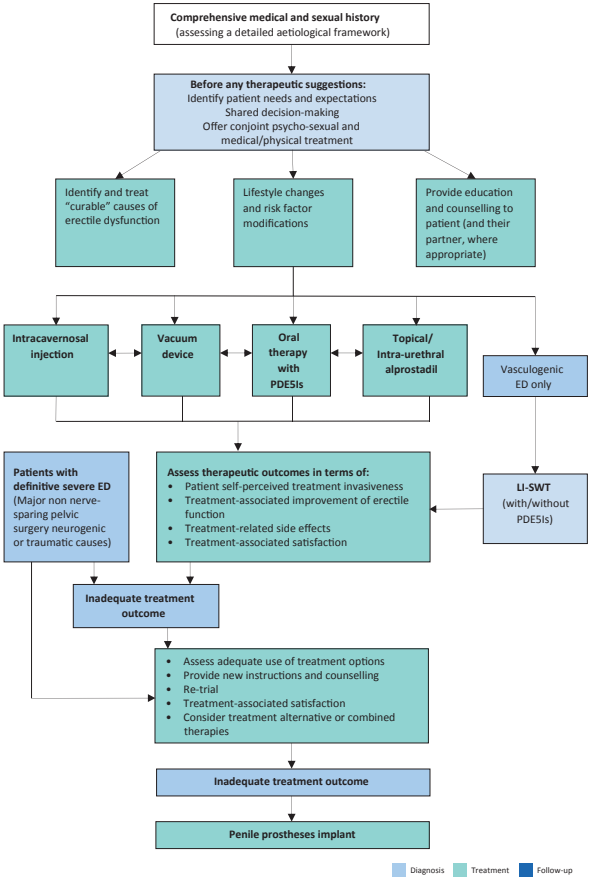
Indications for specific diagnostic tests for ED
Primary ED (not caused by acquired organic disease or psychogenic disorder).
Young patients with a history of pelvic or perineal trauma, who could benefit from potentially curative revascularisation surgery or angioplasty.
Patients with penile deformities that might require surgical correction (e.g., Peyronie's disease and congenital penile curvature).
Patients with complex psychiatric or psychosexual disorders.
Patients with complex endocrine disorders.
Specific tests may be indicated at the request of the patient or their partner.
Medico-legal reasons (e.g., implantation of penile prosthesis to document end-stage ED, and sexual abuse).
Specific diagnostic tests for ED
Nocturnal Penile Tumescence and Rigidity using Rigiscan®.
Vascular studies: • Intracavernous vasoactive drug injection. • Penile dynamic duplex ultrasonography. • Penile dynamic infusion cavernosometry and cavernosography. • Internal pudendal arteriography.
Specialised endocrinological studies.
Specialised psycho-diagnostic evaluation.

Recommendations for the diagnosis of erectile dysfunction	Strength rating
Take a comprehensive medical and sexual history from every patient presenting with erectile dysfunction (ED). Consider psychosexual development, including life stressors, cultural aspects, and cognitive/thinking style of the patient regarding their sexual performance.	Strong
Use a validated questionnaire related to ED to assess all sexual function domains (e.g., International Index of Erectile Function) and the effect of a specific treatment modality.	Strong
Include a focused physical examination in the initial assessment of males with ED to identify underlying medical conditions and comorbid genital disorders that may be associated with ED.	Strong
Evaluate laboratory tests, including glucose and lipid profile and total testosterone, to identify and treat any reversible risk factors and lifestyle factors that can be modified.	Strong
Include specific diagnostic tests in the initial evaluation of ED in the presence of the conditions presented in Table 1.	Strong

Disease management

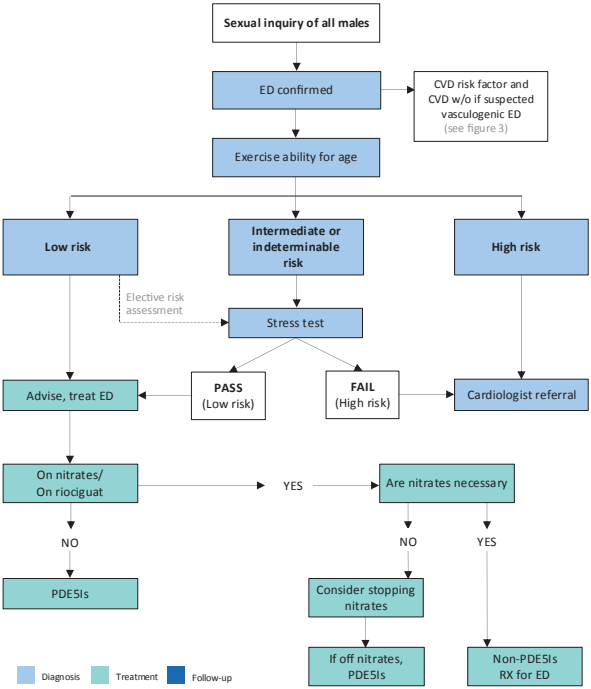
The management of ED is presented in Figure 4. Figure 5 outlines the management of ED in patients with overt cardiovascular symptoms and/or CVD.

Figure 4: Management algorithm for erectile dysfunction



ED = erectile dysfunction; LI-SWT = low-intensity shockwave treatment; PDE5Is = phosphodiesterase type 5 inhibitors.

Figure 5: Management of erectile dysfunction in men with overt cardiovascular symptoms and/or cardiovascular disease based on the IV Princeton Consensus*



**For definition of low-, intermediate- and high-risk patients please refer to the extended EAU Sexual and Reproductive Health Guidelines.*
Reproduced with permission from Kloner et al., 2024.
CVD = cardiovascular disease; ED = erectile dysfunction; PDE5Is = Phosphodiesterase 5 Inhibitors; RX = prescription.

Recommendations for treatment of erectile dysfunction	Strength rating
Initiate lifestyle changes and risk factor modification prior to, or at the same time as, initiating erectile dysfunction (ED) treatments.	Strong
Use phosphodiesterase type 5 inhibitors (PDE5Is) as first-line therapy for the treatment of ED.	Strong
Use intracavernous injections as an alternative first-line therapy in well-informed patients or as second-line therapy.	Strong
Use topical/intra-urethral alprostadil as an alternative first-line therapy in well-informed patients who: • do not wish to have or are not suitable for oral vasoactive therapy; • do not wish to have intracavernous injections; • prefer a less invasive therapy.	Weak
Use vacuum erection devices in well-informed patients requesting non-invasive, drug-free management of ED.	Weak
Use low-intensity shockwave treatment with/without PDE5Is in patients: • with mild vasculogenic ED; • as an alternative therapy in well-informed patients who do not wish to have or are not suitable for oral vasoactive therapy; • who are vasculogenic ED patients that are poor responders to PDE5Is.	Weak

Use supplements with L-arginine or ginseng daily in males with mild ED who refuse pharmacological treatment after counselling them that the improvement of erectile function could be mild.	Weak
Direct the patient to cognitive behaviour therapy as a psychological approach (include the partner), when indicated, combined with medical treatment to maximise treatment outcomes.	Strong
Fully inform patients of the mechanism of action and the ways in which PDE5Is should be taken, as incorrect use/ inadequate information is the main causes of a lack of response to PDE5Is.	Weak
Implant a penile prosthesis if other treatments fail or depending upon patient preference. Patients should be fully informed of the benefits and harms associated with the procedure.	Strong
Discuss the risk of sexual changes other than erectile dysfunction (ED) with patients undergoing active treatment for prostate cancer (PCa), including sexual desire reduction, changes in orgasm, anejaculation, Peyronie's-like disease and penile size changes.	Strong
Inform patients that available data are inadequate to support any specific regimen for penile rehabilitation.	Weak
Start pro-erectile treatments at the earliest opportunity after radical prostatectomy/pelvic surgery and other curative treatments for PCa.	Weak

Disorders of ejaculation

Ejaculation is a complex physiological process, which is composed of emission and expulsion and is mediated by interwoven neurological and hormonal pathways. Any condition that interferes with these pathways may cause a wide range of ejaculatory disorders, including: premature ejaculation; retarded or delayed ejaculation; anejaculation; painful ejaculation; retrograde ejaculation; anorgasmia; and haemospermia.

Diagnostic evaluation

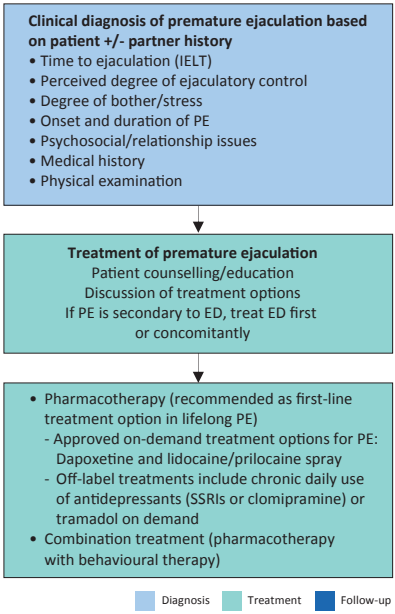
Recommendations for the diagnostic evaluation of premature ejaculation (PE)	Strength rating
Perform the diagnosis and classification of PE based on medical and sexual history, which should include assessment of intravaginal ejaculatory latency time (self-estimated), perceived control, distress and interpersonal difficulty due to the ejaculatory dysfunction.	Strong
Use patient-reported outcomes in daily clinical practice.	Weak
Include physical examination in the initial assessment of PE to identify anatomical abnormalities that may be associated with PE or other sexual dysfunctions, particularly erectile dysfunction.	Strong
Do not perform routine laboratory or neurophysiological tests. They should only be directed by specific findings from history or physical examination.	Strong

Disease management

Recommendations for the treatment of premature ejaculation	Strength rating
Treat erectile dysfunction (ED), other sexual dysfunction or genitourinary infection (e.g., prostatitis) first.	Strong
Use either dapoxetine or topical lidocaine/prilocaine spray as first-line treatments for lifelong premature ejaculation (PE).	Strong
Use off-label oral treatment with daily selective serotonin re-uptake inhibitor (SSRIs) or daily/on-demand clomipramine as a viable alternative for second-line treatments.	Strong
Use off-label tramadol with caution as a viable on-demand third-line treatment alternative to on-demand/daily antidepressants (SSRIs or clomipramine).	Strong
Use phosphodiesterase type 5 inhibitors (alone or in combination with other therapies in patients with PE (without ED).	Strong
Use psychological/behavioural therapies in combination with pharmacological treatment in the management of acquired PE.	Weak
Use hyaluronic acid injection with caution as a treatment option for PE compared to other more established treatment modalities	Weak
Do not perform dorsal neurectomy as more safety data are warranted.	Weak

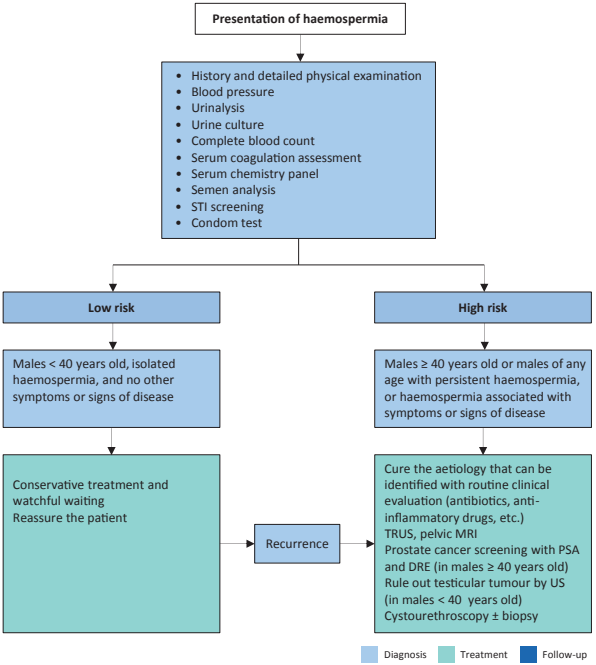
Recommendations for the investigation and management of haemospermia	Strength rating
Perform a full medical and sexual history with detailed physical examination.	Strong
Use risk-stratification system to manage the disease systematically.	Weak

Figure 6: Management of premature ejaculation



Adapted from Lue et al., 2004.
ED = erectile dysfunction; IELT = intravaginal ejaculatory latency time; PE = premature ejaculation; SSRI = selective serotonin receptor inhibitor.

Figure 7: Management of haemospermia



DRE = digital rectal examination; MRI = magnetic resonance imaging; PSA = prostate-specific antigen; STI = sexually transmitted infections; TRUS = transrectal ultrasonography; US = ultrasonography.

Low sexual desire

It has always been a challenge to define low sexual desire (LSD) because of its complex nature and the fact it can be conceptualised in many different ways.

Table 2: Common causes of low sexual desire in males

Androgen deficiency	Post-traumatic stress syndrome
Hyperprolactinaemia	Renal failure
Anger and anxiety	Coronary disease and heart failure
Depression	Ageing
Relationship conflict	HIV infection
Stroke	Body-building and eating disorders
Antidepressant therapy	Erectile dysfunction
Epilepsy	Prostatitis/chronic pelvic pain syndrome

Psychological intervention

Findings on treatment efficacy for psychological intervention are scarce. Accordingly, recommendations must be interpreted with caution. Psychological interventions with a focus on cognitive and behavioural strategies may be beneficial for LSD in males, as well as mindfulness treatments. Since both members of a couple may experience age-related changes concurrently and interdependently, it could be helpful to address the sexual health needs of the aging couple (including LSD) as a whole rather than treating the individual patient.

Disease management

Recommendations for the treatment of low sexual desire (LSD)	Strength rating
Perform the diagnosis and classification of LSD based on medical and sexual history, which could include validated questionnaires.	Weak
Include physical examination in the initial assessment of LSD to identify anatomical abnormalities that may be associated with LSD or other sexual dysfunctions, particularly erectile dysfunction.	Weak
Perform laboratory tests to rule out endocrine disorders.	Strong
Modulate chronic therapies which can negatively impact sexual desire.	Weak
Provide testosterone therapy if LSD is associated with signs and symptoms of testosterone deficiency.	Strong

Penile curvature

Congenital penile curvature (CPC) results from disproportionate development of the tunica albuginea of the corporal bodies and is not associated with urethral malformation. In most cases, the curvature is ventral; however, it can also be lateral or rarely, dorsal.

Diagnostic evaluation

Taking a medical and sexual history is usually sufficient to establish the diagnosis of CPC. Patients usually present after reaching puberty as the curvature becomes more apparent with erections, and a severe curvature can make intercourse difficult or impossible. Physical examination during erection

(autophotograph or after intracavernosal injection of vasoactive drugs) is useful to document curvature and exclude other pathologies.

Recommendation	Strength rating
Use the Nesbit procedure or plication techniques with or without neurovascular bundle dissection (medial/lateral) for satisfactory curvature correction.	Strong

Peyronie's disease

The aetiology of Peyronie's disease (PD) is unknown. However, repetitive microvascular injury or trauma to the tunica albuginea is still the most widely accepted hypothesis to explain the aetiology. Abnormal wound healing leads to the remodelling of connective tissue into a fibrotic plaque. Penile plaque formation can result in curvature which, if severe, may impair penetrative sexual intercourse. The most commonly associated comorbidity and risk factors are diabetes, hypertension, dyslipidaemia, ischaemic cardiopathy, autoimmune diseases, ED, smoking, excessive consumption of alcohol, low testosterone and pelvic surgery (e.g., radical prostatectomy).

Two phases of the disease can be distinguished. The first is the active inflammatory phase, which may be associated with painful erections and a palpable nodule or plaque in the tunica of the penis; typically, but not invariably, a penile curvature begins to develop. The second is the fibrotic phase with the formation of hard, palpable plaques that can calcify, with stabilisation of the disease and development of the penile deformity.

Diagnostic evaluation

The aim of the initial evaluation is to obtain information on the presenting symptoms and their duration (e.g., pain on erection, palpable nodules, deformity, length and girth and erectile function). It is important to obtain information on the distress caused by the symptoms and the potential risk factors for ED and PD.

Recommendations for diagnosis of Peyronie's disease	Strength rating
Take a medical and sexual history of patients with Peyronie's disease (PD), include duration of the disease, pain on erection, penile deformity, difficulty in vaginal/anal intromission due to the deformity and erectile dysfunction (ED).	Strong
Perform a physical examination, including assessment of palpable plaques, stretched or erect penile length, degree of curvature (autophotograph, vacuum-assisted erection test or pharmacological-induced erection) and any other related diseases (e.g., Dupuytren's contracture, Ledderhose disease) in patients with PD.	Strong
Use the PD specific questionnaire especially in clinical trials, but routine use in daily clinical practice is not mandatory.	Weak
Use dynamic penile Doppler ultrasound in the case of diagnostic evaluation of ED, to evaluate penile haemodynamics especially prior to surgery.	Weak

Disease management

Non-operative treatment

Recommendations for the non-operative treatment of Peyronie's disease	Strength rating
Fully counsel patients regarding all available treatment options and outcomes before starting any treatment.	Strong
Offer conservative treatment to patients not fit for surgery or when surgery is not acceptable to the patient.	Strong
Use nonsteroidal anti-inflammatory drugs to treat penile pain in the acute phase of Peyronie's disease (PD).	Strong
Use extracorporeal shockwave treatment (ESWT) to treat penile pain in the acute phase of PD.	Weak
Use phosphodiesterase type 5 inhibitors to treat concomitant erectile dysfunction.	Weak
Use intralesional hylauronic acid either alone or in combination with other treatments to reduce pain and/or penile curvature in the acute phase of PD, although outcome data are still limited.	Weak
Use intralesional therapy with *Collagenase Clostridium Histolyticum* to patients with PD and dorsal or lateral curvature > 300, who request non-surgical treatment.	Strong

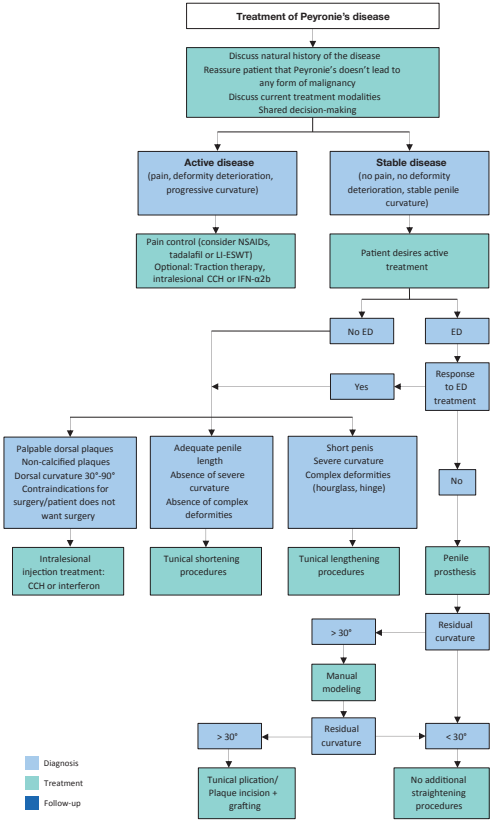
Fully counsel patients that data on the use of intralesional platelet-rich plasma, either alone or in combination with oral treatment to reduce pain or penile curvature, are still limited.	Strong
Do not use ESWT to improve penile curvature.	Strong
Offer penile traction devices and vacuum devices to reduce penile deformity or as part of a multimodal therapy approach, although outcome data is limited.	Weak

Surgical treatment

Recommendations for the surgical treatment of Peyronie's disease	Strength rating
Perform surgery only when Peyronie's disease (PD) is stable and sexual intercourse is compromised due to the deformity.	Strong
Assess penile length, curvature severity, erectile function (including response to pharmacotherapy in case of erectile dysfunction [ED]) and patient expectations prior to surgery.	Strong
Use tunical shortening procedures as the first treatment option for PD patients with adequate penile length and rigidity, less severe curvatures and absence of complex deformities (hourglass or hinge). The type of procedure used is dependent on surgeon and patient preference, as no procedure has proven superior to its counterparts.	Weak

Use tunical lengthening procedures for patients with PD and normal erectile function without adequate penile length, severe curvature or presence of complex deformities. The type of graft used is dependent on the surgeon and patient preference, as no graft has proven superior to its counterparts.	Weak
Do not use the sliding technique as there is a significant risk of life changing complications (e.g., glans necrosis).	Strong
Use penile prosthesis implantation, with or without any additional straightening procedures (modelling, plication, incision or excision with or without grafting), in PD patients with ED not responding to pharmacotherapy.	Strong

Figure 8 : Treatment algorithm for Peyronie's disease



CCH = collagenase Clostridium histolyticum; ED = erectile dysfunction; LI-ESWT= low-intensity extracorporeal shockwave treatment; NSAIDs = non-steroidal anti-inflammatory drugs.

Penile size abnormalities and dysmorphophobia

Short penis condition represents both a diagnostic and treatment challenge. To date there is no consensus on standard penis size. Disorders of penile size include: micropenis; adult-acquired buried penis; small penis anxiety syndrome; and penile dysmorphic disorder related to body dysmorphic disorder.

Recommendations for classification of short penile size	Strength rating
Perform a detailed genital examination in all males, particularly in males with BMI > 30, lichen sclerosis or penile cancer history and complaints of urinary/sexual difficulties or poor cosmesis, to exclude the presence of an adult-acquired buried penis (AABP) condition.	Strong
Use classification systems to classify AABP clinical presentation and surgical management.	Weak
Inquire on the presence of body dysmorphic disorder/penile dysmorphic disorder in patients with normal-sized penis complaining of short penile size.	Strong

Table 4: Classification of the clinical conditions underlying a short penis condition or dysmorphophobia in adults

Group name	Aetiology	Definition	Pathogenesis	Prevalence, %
False penile shortness	Acquired	Reduced exposure of the penile shaft in the presence of normal penile size	Adult-acquired buried penis	NA
Intrinsic penile shortness	Congenital	Small penis due to an incomplete genital development secondary to a congenital condition	· Hypogonadotropic hypogonadism · Genetic syndromes · Bladder exstrophy-epispadias complex	0.9 - 2.1
Intrinsic penile shortness	Acquired	Shortening/shrinking of the corpora cavernosa due to an acquired pathological process	· Peyronie's Disease · Radical prostatectomy · Radical cystectomy · Radiation therapy · Low flow priapism · Multiple penile operations (e.g., urethral surgery or penile prosthesis infection) · Penile traumatic event (traumatic or surgical amputation for penile cancer)	NA
Body dysmorphic disorder	Acquired	Perceived defect or flaw in the individual's physical appearance followed by significant distress or impairment in important areas of the individual's life	· Penile Dysmorphic Disorder	1.8 - 9.5

Diagnosis

Recommendations for diagnosis of short penile size	Strength rating
Take a comprehensive medical and sexual history in every patient presenting complaining of short penile size.	Strong
Use stretched penile length measurements (skin junction-to-glans tip or dorsally from the pubic bone-to-glans tip) to define penile length.	Weak
Measure flaccid and erect measurements to assess penile length in detail.	Weak
Measure penile girth in every patient presenting complaining of a short penile size.	Weak
Use validated questionnaires to screen for body dysmorphic disorder (BDD) in cases of a normal-sized penis.	Weak
Use validated questionnaires (e.g., IIEF-15, BAPS) to assess baseline sexual function and beliefs concerning penile size.	Weak
Refer patients with BDD for mental health counselling.	Strong

Management

Recommendations for non-surgical management of short penile size	Strength rating
Consider psychotherapy when psychopathological comorbidities are detected, or when aversive relationship dynamics may underlie the request for penile augmentation.	Strong
Consider the use of penile traction therapy as a conservative treatment to increase penile length.	Weak
Consider the use vacuum erection devices to increase penile length.	Weak
Use endocrinological therapies to restore penile size in boys with micropenis or disorders of sex development.	Strong
Do not use testosterone therapy or other hormonal therapies to increase penile size in males after puberty.	Strong

Recommendations for surgical treatment of short penile size	Strength rating
Adult-acquired buried penis (AABP)	
Extensively counsel patients on the benefits and complications of AABP surgery.	Strong
Initiate lifestyle changes and modification of risk factors, particularly weight loss, to minimise AABP surgical complications and to optimise surgical outcomes.	Strong
Consider surgical treatment to address AABP.	Weak

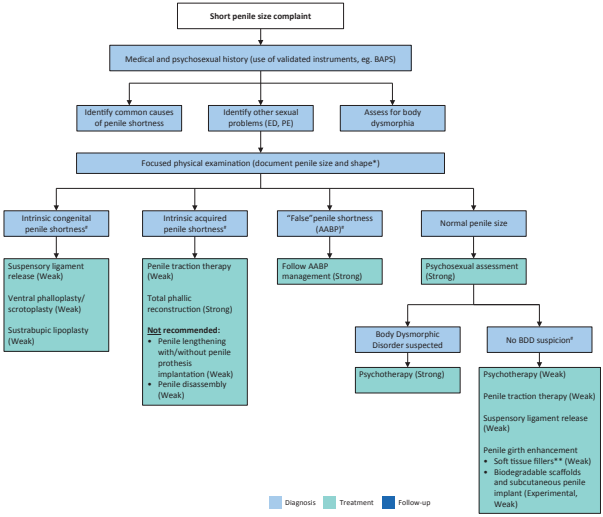
Congenital intrinsic penile shortness	
Perform surgery for AABP in high volume centres.	Strong
Use suspensory ligament release (SLR), ventral phalloplasty and suprapubic lipoplasty/liposuction/lipectomy to address penile lengthening.	Weak
Counsel patients extensively regarding the possible complications related to SLR, ventral phalloplasty and suprapubic lipoplasty/liposuction/lipectomy.	Strong
Use total phallic reconstruction to restore genital anatomy in patients affected by congenital micropenis.	Weak
Acquired penile shortness	
Do not recommend penile prosthesis implantation, penile disassembly or sliding technique to patients seeking penile lengthening options.	Strong
Use total phallic reconstruction to restore genital anatomy in genetic males with penile inadequacy due to traumatic loss.	Weak

Penile girth enhancement

Recommendations	Strength rating
Counsel patients extensively regarding the risks and benefits of penile girth enhancement techniques.	Strong
Do not use silicone, paraffin and petroleum jelly (Vaseline) to address penile girth enhancement.	Strong

Use hyaluronic acid, soft tissue fillers and autologous fat injection to address penile girth enhancement.	Weak
Do not use hyaluronic acid, soft tissue fillers and autologous fat injection to address penile girth enhancement in males with penile dysmorphic disorder.	Strong
Do not use grafts in penile girth enhancement as they are considered experimental.	Strong
Do not use biodegradable scaffolds and subcutaneous penile implant (Penuma®) to address penile girth enhancement as they are considered experimental.	Strong

Figure 9: Management of short penile size



AABP = adult-acquired buried penis; BAPS = Beliefs about Penis Size; BDD = body dysmorphic disorder; ED = erectile dysfunction; PE = premature ejaculation.

** Penile length should be measured stretched both from penopubic skin junction-to-glans tip and from the pubic bone-to-glans tip.*

 # There is lack of evidence to recommend one treatment over another.

*** Hyaluronic acid (HA), poly-L-lactic acid (PLA), hydroxyethyl methacrylate, polymethylmethacrylate (PMMA), polyalkylamide hydrogel (PAAG) and calcium hydroxyapatite are considered as injectable materials for penile girth enhancement. Although the level of evidence is low, there is more evidence for HA, PLA and PMMA. Do not use silicone, paraffin or Vaseline (Strong evidence against).*

Strength of recommendations is depicted between brackets where appropriate.

Priapism

Priapism is a persistent erection in the absence of sexual stimulation that fails to subside. It can be divided into ischaemic, non-ischaemic and stuttering priapism.

Ischaemic (low-flow or veno-occlusive) priapism

Ischaemic priapism is a persistent erection marked by rigidity of the corpora cavernosa and by little or no cavernous arterial inflow. Ischaemic priapism is the most common subtype of priapism, accounting for > 95% of all episodes.

Diagnostic evaluation

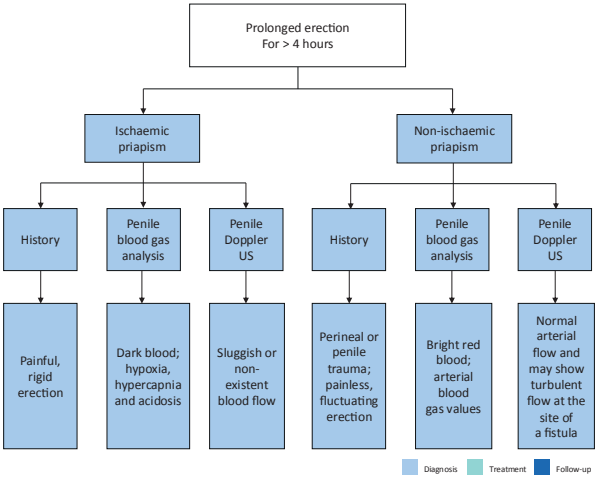
Taking a comprehensive history is critical in priapism diagnosis and treatment. Table 5 presents the typical blood gas values and Figure 10 shows the differential diagnosis of priapism.

Table 5: Typical blood gas values

Source	pO_2 (mmHg)	pCO_2 (mmHg)	pH
Normal arterial blood (room air) (similar values are found in arterial priapism)	> 90	< 40	7.40
Normal mixed venous blood (room air)	40	50	7.35
Ischaemic priapism (first corporal aspirate)	< 30	> 60	< 7.25

pCO_2 = partial pressure of carbon dioxide; pO_2 = partial pressure of oxygen.

Figure 10: Differential diagnosis of priapism



US = ultrasound.

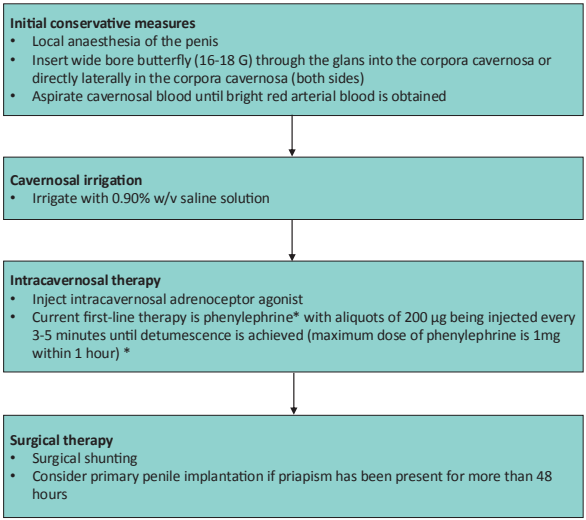
Recommendations for the diagnosis of ischaemic priapism	Strength rating
Take a comprehensive history to establish the diagnosis which can help to determine the priapism subtype.	Strong
Include a physical examination of the genitalia, perineum and abdomen in the diagnostic evaluation.	Strong

Include a full blood count, white blood cell count with blood cell differential, platelet count and coagulation profile for laboratory testing. Perform directed further laboratory testing depending upon history and clinical and laboratory findings. Perform a complete evaluation of all possible causes of priapism in children.	Strong
Perform a haemoglobinopathy screen in patients with low flow priapism who are at high risk of sickle cell disease or thalassemia.	Strong
In the emergency setting, perform analysis of blood gas parameters from aspirated corporal blood to distinguish between ischemic and non-ischemic priapism.	Strong
Perform colour duplex ultrasound of the penis and perineum before aspiration to differentiate between ischaemic and non-ischaemic priapism.	Strong
Use magnetic resonance imaging of the penis in cases of prolonged ischaemic priapism or refractory priapism, and as an adjunct to predict smooth muscle viability.	Weak

Disease management of ischaemic priapism

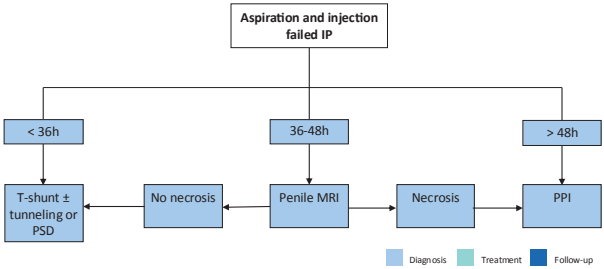
The treatment is sequential and physicians should move on to the next stage if treatment fails. Figure 11 presents the management work-up of ischaemic priapism. Whilst Figure 12 details the surgical management of the condition.

Figure 11: Medical and surgical management of ischaemic priapism



(*) Dose of phenylephrine should be reduced in children. It can result in significant hypertension and should be used with caution in males with cardiovascular disease. Monitoring of pulse and blood pressure is advisable in all patients during administration and for one hour afterwards. Its use is contraindicated in males with a history of cerebro-vascular disease and significant hypertension.

Figure 12: Surgical management of priapism



IP = ischaemic priapism; MRI = magnetic resonance imaging; PPI = penile prosthesis implantation; PSD = penoscrotal decompression.

Recommendations for the treatment of ischaemic priapism	**Strength rating**
Start management of ischaemic priapism as early as possible (within four to six hours) and follow a stepwise approach.	Strong
Perform corpus cavernosum aspiration and washout until fresh red blood is obtained as first treatment step.	Strong
Replace blood aspiration with intracavernous injection of a sympathomimetic drug as the first step in priapism secondary to intracavernous injections of vasoactive agents.	Strong
Perform intracavernous injection of a sympathomimetic drug in priapism that persists despite aspiration.	Strong

Repeat aspiration and intracavernous injection of a sympathomimetic drug in cases that persist despite prior aspiration and intracavernous injection of a sympathomimetic drug, before considering surgical intervention.	Strong
Treat ischaemic priapism associated with sickle cell disease in the same fashion as idiopathic ischaemic priapism. Do not use exchange transfusion as a primary treatment. Provide other supportive measures but do not delay initial treatment to the penis.	Strong
Proceed to surgical treatment only when blood aspiration and intracavernous injection of sympathomimetic drugs have failed.	Strong
Perform distal shunt surgical procedures first and combine them with tunnelling if necessary.	Weak
Peno-scrotal decompression may be used as an alternative first-line option instead of distal shunting (with or without tunnelling).	Weak
Discuss implantation of a penile prosthesis in cases of delayed presentation (> 48 hours) and in cases refractory to injection therapy and distal shunting.	Weak
Delay implantation of a penile prosthesis if a shunt has been performed, to minimise the risk of infection and erosion of the implant.	Strong

Decide on which type of implant to insert based on: • patient suitability; • surgeons' experience; and • availability and cost of equipment. If a malleable penile prosthesis is implanted it can be exchanged for an inflatable penile implant.	Strong

Priapism in special situations

Stuttering (recurrent or intermittent) priapism

Stuttering priapism is similar to ischaemic priapism in that it is low-flow and ischaemic and, if left untreated, can result in significant penile fibrosis, with sickle cell disease being the most common cause.

Recommendations for treatment of stuttering priapism	Strength rating
Manage each acute episode according to the treatment recommendation for ischaemic priapism.	Strong
Use hormonal therapies (mainly gonadotropin-receptor hormone agonists or antagonists) and/or anti-androgens for the prevention of future episodes in patients with frequent relapses. Do not use them before sexual maturation is reached.	Weak
Initiate treatment with phosphodiesterase type 5 inhibitors only when the penis is in its flaccid state.	Weak

Use digoxin, α-adrenergic agonists, baclofen, gabapentin or terbutaline only in patients with frequent and uncontrolled relapses.	Weak
Use intracavernous self-injections of sympathomimetic drugs at home for treatment of acute episodes on an interim basis until ischaemic priapism has been alleviated.	Weak

Non-ischaemic (high-flow or arterial) priapism

Non-ischaemic priapism is significantly less common than the ischaemic type, comprising only 5% of all priapism cases.

Recommendations for the diagnosis of non-ischaemic priapism	Strength rating
Take a comprehensive history to establish the diagnosis, which can help to determine the priapism subtype.	Strong
Include a physical examination of the genitalia, perineum and abdomen in the diagnostic evaluation.	Strong
Include a neurological examination if neurogenic non-ischaemic priapism is suspected.	Strong
Include complete blood count, with white blood cell differential, and coagulation profile for laboratory testing.	Strong
Analyse the blood gas parameters from blood aspirated from the penis to differentiate between ischaemic and non-ischaemic priapism.	Strong

Perform colour duplex ultrasound of the penis and perineum to differentiate between ischaemic and non-ischaemic priapism.	Strong
Perform selected pudendal arteriography when embolisation is planned for non-ischaemic priapism.	Strong

Recommendations for the treatment of non-ischemic priapism	**Strength rating**
Perform definitive management for non-ischaemic priapism at the discretion of the treating physician, as it is not a medical emergency.	Weak
Manage non-ischaemic priapism conservatively with the use of site-specific perineal compression as the first step. Consider androgen deprivation therapy only in adults.	Weak
Perform selective arterial embolisation when conservative management has failed.	Strong
Perform the first selective arterial embolisation using temporary material.	Weak
Repeat selective arterial embolisation with temporary or permanent material for recurrent non-ischaemic priapism following selective arterial embolisation.	Weak
Reserve selective surgical ligation of a fistula as a final treatment option when repeated arterial embolisations have failed.	Weak

Male infertility

"Infertility is the inability of a sexually active, non-contraceptive couple to achieve spontaneous pregnancy in one year" (World Health Organization, 2000).

Diagnostic evaluation

A focused evaluation of the male patient must always be undertaken and should include: a medical and reproductive history; physical examination; semen analysis – with strict adherence to World Health Organization (WHO) reference values for human semen characteristics; and hormonal evaluation. Other investigations (e.g., genetic analysis and imaging) may be required depending on the clinical features and findings on semen analysis.

Semen analysis

A comprehensive andrological examination is always indicated if the semen analysis shows abnormalities when compared to reference values (Table 6).

Table 6: Lower reference limits (5th centiles and their 95% CIs) for semen characteristics

Parameter	2021 Lower reference limit (95% CI)
Semen volume (mL)	1.4 (1.3-1.5)
Total sperm number (10^6/ejaculate)	39 (35-40)
Sperm concentration (10^6/mL)	16 (15-18)
Total motility (PR + NP, %)	42 (40-43)
Progressive motility (PR, %)	30 (29-31)
Vitality (live spermatozoa, %)	54 (50-56)
Sperm morphology (normal forms, %)	4 (3.9-4.0)
Other consensus threshold values	
pH	> 7.2
Peroxidase-positive leukocytes (10^6/mL)	< 1.0
Tests for antibodies on spermatozoa	
MAR test (motile spermatozoa with bound particles, %)	No evidence-based reference values. Each laboratory should define its normal reference ranges by testing a sufficiently large number of normal fertile males.
Immunobead test (motile spermatozoa with bound beads, %)	No evidence-based reference limits.

Accessory gland function	
Seminal zinc (µmol/ejaculate)	≥ 2.4
Seminal fructose (µmol/ejaculate)	≥ 13
Seminal neutral α-glucosidase (mU/ejaculate)	≥ 20

CIs = confidence intervals; MAR = mixed antiglobulin reaction; NP = non-progressive; PR = progressive (a+b motility).

** Distribution of data from the population is presented with one-sided intervals (extremes of the reference population data). The lower 5th percentile represents the level under which only results from 5% of the males in the reference population were found.*

Recommendations for the diagnostic work-up of male infertility

Recommendations	Strength rating
Include a parallel assessment of the fertility status, including ovarian reserve, of the female partner during the diagnosis and management of the infertile male, since this might determine decision making in terms of timing and therapeutic strategies (e.g., assisted reproductive technology [ART] versus surgical intervention).	Strong
Examine all males seeking medical help for fertility problems, including males with abnormal semen parameters.	Strong

Take a complete medical reproductive and family history, assessment of lifestyle and behaviour risk factors, physical examination and semen analysis.	Strong
Counsel infertile males or males with abnormal semen parameters on the associated health risks.	Weak
Assess testicular volume with a Prader's orchidometer or testicular ultrasound (US).	Weak
Perform semen analyses according to the latest edition of the World Health Organization Manual for the Examination and Processing of Human Semen.	Strong
Perform at least two consecutive semen analyses if the baseline analysis was abnormal.	Strong
Do not routinely use reactive oxygen species testing in the diagnosis and management of the male partner of an infertile couple.	Weak
Perform sperm DNA fragmentation (SDF) testing in the assessment of couples with recurrent pregnancy loss from natural conception and failure of ART or males with unexplained infertility.	Strong
Consider the use of testicular sperm for intra-cytoplasmic sperm injection (ICSI) in patients with high SDF in ejaculated sperm as experimental.	Weak

Perform a hormonal evaluation including serum total testosterone and Follicle-Stimulating Hormone/Luteinising Hormone at least in all cases of oligozoospermia and azoospermia.	Strong
Offer standard karyotype analysis and genetic counselling to all males with azoospermia and oligozoospermia (spermatozoa < 5 million/mL) for diagnostic purposes.	Strong
Provide long-term endocrine follow-up and appropriate medical treatment to males with Klinefelter syndrome.	Strong
Perform Y-chromosome microdeletion testing in males with sperm concentrations of ≤ 1 million sperm/mL. Consider it in males with sperm concentrations of < 5 million sperm/mL.	Strong
Inform males with Yq microdeletion and their partners who wish to proceed with ICSI that microdeletions will be passed to sons.	Strong
Do not perform testicular sperm extraction in patients with complete deletions that include the AZFa and AZFb regions.	Strong
Test males with structural abnormalities of the vas deferens (unilateral or bilateral absence with no renal anomalies) and their partners for cystic fibrosis transmembrane conductance regulator gene mutations.	Strong

Provide genetic counselling in all couples with a genetic abnormality found on clinical or genetic investigation and in patients who carry a (potential) inheritable disease.	Strong
Perform scrotal US in patients with infertility, as there is a higher risk of testis cancer.	Weak
Discuss invasive diagnostic modalities (e.g., US-guided testicular biopsy with frozen section versus radical orchidectomy versus surveillance) in infertile males with US-detected indeterminate testicular lesions, especially if additional risk factors for malignancy are present, in a multidisciplinary team setting.	Weak
Perform transrectal US if a partial or complete distal obstruction is suspected.	Strong

Special conditions and relevant clinical entities

Crytorchidism

Cryptorchidism is the most common congenital abnormality of the male genitalia; at one year of age nearly 1% of all full-term male infants have cryptorchidism. Approximately 30% of undescended testes are non-palpable and may be located within the abdominal cavity.

Recommendations for cryptorchidism	Strength rating
Do not use hormonal treatment for cryptorchidism in post-pubertal males.	Strong

Perform simultaneous testicular biopsy for the detection of intratubular germ cell neoplasia *in situ* (formerly carcinoma *in situ*) if undescended testes are corrected in adulthood.	Strong
Offer orchidectomy to adult males with unilateral undescended testis and normal hormonal function or spermatogenesis.	Strong
Offer adult males with unilateral or bilateral undescended testis, with biochemical hypogonadism and/or spermatogenic failure (i.e., infertility), unilateral or bilateral orchidopexy, if technically feasible.	Weak

Germ cell malignancy and male infertility

Testicular germ cell tumour (TGCT) is the most common malignancy in Caucasian males aged 15-40 years, and affects approximately 1% of sub-fertile males. Overall, sperm cryopreservation is considered standard practice in all patients with cancer and not only those with testicular cancer. As such, it is important to stress that all males with cancer must be offered sperm cryopreservation prior to the therapeutic use of gonadotoxic agents or ablative surgery which may impair spermatogenesis or ejaculation (i.e., chemotherapy; radiation therapy; retroperitoneal surgery). Men with TGCT have decreased semen quality, even before cancer treatment.

Recommendations for germ cell malignancy and testicular microcalcification (TM)	Strength rating
Advise males with TM to perform self-examination, even without additional risk factors, as this may result in early detection of a testicular germ cell tumour (TGCT).	Weak
Do not perform testicular biopsy, follow-up scrotal ultrasound (US), measure biochemical tumour markers, or abdominal or pelvic computed tomography in males with isolated TM without associated risk factors (e.g., infertility, cryptorchidism, testicular cancer and atrophic testis).	Strong
Offer testicular biopsy to infertile males with TM who belong to one of the following higher risk groups: spermatogenic failure (infertility), bilateral TM, atrophic testes (< 12 mL), history of undescended testes and TGCT.	Weak
Perform inguinal surgical exploration with testicular biopsy or offer orchidectomy after multidisciplinary team meeting and discussion with the patient, if there are suspicious findings on physical examination or US in patients with TM with associated lesions.	Strong
Manage males treated for TGCT in a multidisciplinary team setting with a dedicated late-effects clinic and survivorship program, since they are at increased risk of developing hypogonadism, sexual dysfunction and cardiovascular risk.	Strong

Perform sperm cryopreservation prior to planned orchidectomy or before additional neoadjuvant or adjuvant oncological therapies.	Strong
Offer onco-testicular sperm extraction at the time of radical orchidectomy in males with testicular cancer and azoospermia or severe abnormalities in their semen parameters.	Strong

Varicocele

Varicocele is a common genital abnormality which may be associated with the following andrological conditions:

- male subfertility;
- failure of ipsilateral testicular growth and development;
- symptoms of pain and discomfort;
- hypogonadism.

Recommendations for varicocele	Strength rating
In adolescents, offer surgery for varicocele associated with a persistent small testis (size difference of > 2 mL or 20%), which should be confirmed on two subsequent visits performed six months apart.	Strong
Do not treat varicocele in infertile males who have normal semen analysis and in males with a sub-clinical varicocele.	Strong
Treat infertile men with a clinical varicocele, abnormal semen parameters and otherwise unexplained infertility in a couple where the female partner has good ovarian reserve to improve fertility rates.	Strong

Varicocelectomy may be considered in males with raised sperm DNA fragmentation with otherwise unexplained infertility or who have suffered from failure of assisted reproductive techniques, including recurrent pregnancy loss, failure of embryogenesis and implantation.	Weak

Male accessory gland infections and infertility

Infections of the male urogenital tract are potentially curable causes of male infertility. The WHO considers urethritis, prostatitis, orchitis and epididymitis to be male accessory gland infections (MAGIs). Semen analysis clarifies whether the prostate is involved as part of a generalised MAGI and provides information regarding sperm quality. In addition, leukocyte analysis allows differentiation between inflammatory and non-inflammatory chronic pelvic pain syndrome.

Recommendations	Strength rating
Treat male accessory gland infections as it may improve sperm quality, although it does not necessarily improve the probability of conception.	Weak
Refer sexual partners of patients with accessory sex gland infections that are known or suspected to be caused by sexually transmitted diseases for evaluation and treatment.	Strong

Non-invasive male infertility management

Idiopathic male infertility and Oligo-astheno-teratozoospermia syndrome

Oligo-astheno-teratozoospermia (OAT) is a clinical condition, with a reduced number of spermatozoa in the ejaculate, which is also characterised by a reduced motility and morphology; often referred to as OAT syndrome (OATS).

Recommendations for non-invasive male infertility management	Strength rating
Inform infertile males about the detrimental effects of obesity, low physical activity, smoking and high alcohol intake on sperm quality and testosterone levels. Therefore, advise infertile males to optimise lifestyle factors to improve their chances of conception.	Strong
Do not routinely treat patients with idiopathic infertility with antioxidants, prebiotic/probiotic, selective oestrogen receptor modulators or aromatase inhibitors.	Weak

Hormonal therapy

Recommendations for treatment of male infertility with hormonal therapy	Strength rating
Induce spermatogenesis in males with congenital or acquired hypogonadotropic hypogonadism who wish to conceive by effective drug therapy (Human Chorionic Gonadotropin; human menopausal gonadotropins; recombinant follicle-stimulating hormone [FSH]; highly purified FSH).	Strong
Use FSH treatment in males with idiopathic oligozoospermia and FSH values within the normal range, to increase spermatogenesis.	Weak
Do not treat idiopathic infertility with high-dose FSH.	Weak
Do not start hormonal stimulation prior to testicular sperm extraction in males with non-obstructive azoospermia outside clinical trials.	Weak
Do not use testosterone therapy for the treatment of male infertility.	Strong
Provide testosterone therapy for symptomatic patients with primary and secondary hypogonadism who are not considering parenthood.	Strong
Offer dopamine agonist therapy in males with proven hyperprolactinemia to improve sperm quality.	Weak

Withdraw anabolic steroids in infertile men for six to twelve months before considering treatment with selective oestrogen receptor modulators or gonadotrophin therapy to induce spermatogenesis.	Weak

Invasive male infertility management

Obstructive azoospermia

Obstructive azoospermia (OA) is the absence of spermatozoa in the sediment of a centrifuged sample of ejaculate due to obstruction. Obstructive azoospermia is less common than non-obstructive azoospermia (NOA) and occurs in 20-40% of males with azoospermia. Males with OA usually have a normal follicle-stimulating hormone, testes of normal size and epididymal enlargement or distension. Of clinical relevance, males with late maturation arrest may present with normal gonadotrophins and testis size and may be only be distinguished from OA at the time of surgical exploration. The vas deferens may be absent bilaterally or unilaterally. Obstruction in primary infertile males is more frequently present at the epididymal level.

Recommendations for obstructive azoospermia	**Strength rating**
Perform microsurgical vasovasostomy or epididymovasostomy for azoospermia caused by vasal or epididymal obstruction in males with female partners with good ovarian reserve.	Strong

Use sperm retrieval techniques such as microsurgical epididymal sperm aspiration, testicular sperm extraction, and percutaneous techniques (percutaneous epididymal sperm aspiration and testicular sperm aspiration), either as an adjunct to reconstructive surgery or if the condition is not amenable to surgical repair, or when the ovarian reserve of the partner is limited, or when patient preference is not to undertake surgical reconstruction and the couple prefer to proceed directly to intra-cytoplasmic sperm injection treatment.	Strong

Non-obstructive azoospermia

Non-obstructive azoospermia is defined as the absence of sperm in semen analysis after centrifugation, with usually a normal ejaculate volume. This finding should be confirmed on at least two consecutives semen analyses. The severe deficit in spermatogenesis observed in NOA patients is often a consequence of primary testicular dysfunction or may be related to a dysfunction of the hypothalamus-pituitary gonadal axis.

Recommendations for non-obstructive azoospermia	Strength rating
Confirm a diagnosis of non-obstructive azoospermia (NOA) in two consecutive semen analyses when no sperm are found after centrifugation.	Strong

Perform a comprehensive assessment, including detailed medical history, hormonal profile, genetic tests and scrotal ultrasound, to investigate the underlying aetiology and associated comorbidity in patients with NOA.	Strong
Genetic counselling is mandatory in couples with genetic abnormalities prior to any assisted reproductive technology.	Strong
Perform surgery for sperm retrieval in males who are candidates for assisted reproductive technology (i.e., intra-cytoplasmic sperm injection).	Strong
Do not perform surgery for sperm retrieval in patients with complete AZFa and AZFb microdeletions, since the chance of sperm retrieval is zero.	Strong
Do not perform fine needle aspiration (FNA) and testicular sperm aspiration in patients with NOA.	Strong
Do not perform FNA mapping as a prognostic procedure prior to definitive testicular sperm extraction (any type) in patients with NOA.	Weak
Use microdissection testicular sperm extraction (TESE) as the treatment of choice to retrieve sperm in patients with NOA.	Weak
Do not consider pre-operative biochemical and clinical variables as sufficient and reliable predictors of sperm retrieval outcome at surgery in patients with NOA.	Weak

Do not routinely use medical therapy, for example, hormonal stimulation in males with NOA and hypergonadotrophic hypogonadism before conventional or microdissection TESE to improve sperm recovery.	Weak

This short booklet text is based on the more comprehensive EAU Guidelines accessible on the website: http://www.uroweb.org/guidelines/.