

ORIGINAL RESEARCH

Summary of the Recommendations on Sexual Dysfunctions in Men

Tom F. Lue, MD,^a François Giuliano, MD, PhD,^b Francesco Montorsi, MD,^c
 Raymond C. Rosen, PhD,^d Karl-Erik Andersson, PhD,^e Stanley Althof, PhD,^f
 George Christ, PhD,^g Dimitrios Hatzichristou, MD,^h Mark Hirsch, MD,ⁱ
 Yasasuke Kimoto, MD,^j Ronald Lewis, MD,^k Kevin McKenna, MD,^l Chris MacMahon, MD,^m
 Alvaro Morales, MD,ⁿ John Mulcahy, MD,^o Harin Padma-Nathan, MD,^p John Pryor, MD,^q
 Inigo Saenz de Tejada, MD,^r Ridwan Shabsigh, MD,^s and Gorm Wagner, MD, PhD^t

^aDepartment of Urology, UCSF, San Francisco, CA, USA; ^bParis South University, Le Kremlin Bicetre, France; ^cDivision of Urology, Università Vita e Salute-San Raffaele, Milan, Italy; ^dDepartment of Psychiatry, University of Medicine and Dentistry of New Jersey, New Brunswick, NJ, USA; ^eDepartment of Clinical Pharmacology, Lund University, Lund, Sweden; ^fCenter for Marital and Sexual Health, Beachwood, OH, USA; ^gAlbert Einstein College of Medicine, Bronx, NY, USA; ^hDepartment of Urology, Aristotelian University of Thessaloniki, Thessaloniki, Greece; ⁱU.S. Food and Drug Association, Rockville, MD, USA; ^jDept. of Urology, Spinal Injuries Center, Lizuka, Japan; ^kDepartment of Urology, Medical College of Georgia, Augusta, GA, USA; ^lDepartment of Physiology, Northwestern University, Chicago, IL, USA; ^mAustralian Centre for Sexual Health, Sydney, Australia; ⁿDepartment of Urology, Queen's University, Kingston, ON, Canada; ^oDepartment of Urology, Indiana University, Indianapolis, IN, USA; ^pMale Clinic, Beverly Hills, CA, USA; ^qLondon University, London, UK; ^rMadrid, Spain; ^sDepartment of Urology, Columbia University, New York, NY, USA; ^tDepartment of Medical Physiology, Panum Institute, University of Copenhagen, Copenhagen, Denmark

Summary of Committee. For the complete report please refer to *Sexual Medicine: Sexual Dysfunctions in Men and Women*, edited by T.F. Lue, R. Basson, R. Rosen, F. Giuliano, S. Khoury, F. Montorsi, Health Publications, Paris 2004.

ABSTRACT

Introduction. There are few published guidelines for the management of sexual dysfunctions in men and women, despite the prevalence and lack of attention to these problems. Disorders of sexual function in men include erectile dysfunction, orgasm/ejaculation disorders, priapism, and Peyronie's disease.

Aim. To provide evidence-based and expert-opinion consensus guidelines for the clinical management of men's sexual dysfunctions.

Methods. An International Consultation in collaboration with major urological and sexual medicine societies assembled over 200 multidisciplinary experts from 60 countries into 17 consultation committees. Committee members established the scope and objectives for each chapter. Following intensive review of available data and publications, committees developed evidence-based guidelines in each area.

Main Outcome Measure. New algorithms and guidelines for assessment and treatment of men's sexual dysfunction were developed. The Oxford system of evidence-based review was systematically applied. Expert opinion was based on systematic grading of the medical literature, in addition to cultural and ethical considerations.

Results. Recommendations and guidelines for men's sexual dysfunction are presented. These guidelines were developed as evidence-based, patient-centered, and multidisciplinary in focus. For the clinical assessment and diagnosis of ED, a basic evaluation was recommended for all patients, with optional and specialized testing reserved for special cases. A new treatment algorithm is proposed. This algorithm provides a clinically relevant guideline for managing ED in the large majority of men. New treatment guidelines and algorithms are provided for men's orgasm and ejaculation disorders, including premature ejaculation, retrograde and delayed ejaculation. Finally, expert

opinion-based guidelines for the clinical management of priapism and Peyronie's disease are provided.

Conclusions. Additional research is needed to validate and extend these guidelines. Nonetheless, this summary encompasses the recommendations concerning men's sexual dysfunctions presented at the 2nd International Consultation on Sexual Medicine in Paris, France, June 28–July 1, 2003.

Key Words. Guidelines for Diagnosis and Treatment of Men's Sexual Dysfunctions; Management Algorithm; Erectile Dysfunction; Premature Ejaculation; Retrograde Ejaculation; Priapism; Peyronie's Disease

Erectile Dysfunction

Introduction and Definition of Erectile Dysfunction

Sexuality is a complex bio-psycho-social process. Physiological aspects of sexual response (e.g., erection, ejaculation) should be understood in the context of interpersonal and cultural factors. The treating physician and collaborating specialists should possess broad knowledge about human sexuality. Problems may be lifelong or acquired, global or situational. Adequate attention to these aspects during the history taking will educate the often-uninformed patient regarding the complex nature of sexuality, and prepare him for understanding treatment and outcome realities. Patient and partner expectations, needs and priorities will be significantly influenced by cultural, social, ethnic, religious and national/regional factors. The rational selection of therapy by patients is only possible following appropriate education, including information about sexuality and all treatment options for sexual/erectile dysfunction. Although not always possible on the first visit, every effort should be made to involve the patient's sexual partner early in the therapeutic process.

Erectile dysfunction (ED) must be distinguished from other sexual disorders in the male such as early or delayed ejaculation, anejaculation and lack of desire, although these disorders are frequently coexisting.

In contrast to most other medical conditions, the various treatments for sexual dysfunctions have to be considered in the context of traditions, ethnicity and socio-economic conditions, and also the patient and partner's preference, expectations and psychological status.

Erectile dysfunction (ED) is defined as the consistent or recurrent inability of a man to attain

and/or maintain a penile erection sufficient for sexual activity.

The diagnosis of ED is primarily based on patient's self-report. Although the diagnosis may be supported by objective testing (or partner reports), these measures cannot substitute for the patient's self-report in classifying the disorder or establishing the diagnosis.

The necessary reliance on patient reports implies that cultural factors and patient-physician communication will be important determinants in defining and diagnosing the disorder.

Consistency is an important component of the definition of ED. Erectile difficulties must be reported to occur on a consistent or recurrent basis in order to qualify for the diagnosis of ED. A 3-month minimum duration is generally accepted for establishment of the diagnosis. In some instances of trauma or surgically induced ED (after radical prostatectomy), the diagnosis may be given prior to 3 months.

ED may occur at any age after puberty. There are many etiological profiles in ED. It is noteworthy that ED might not be the primary complaint and/or may be associated with other sexual problems.

Diagnosis and Evaluation

All men with ED should be evaluated by a health care professional with sensitivity toward cultural, ethnic and religious factors. A multidisciplinary approach may be required in some cases. Following careful medical, sexual and psychosocial evaluation, treatment options such as psychosexual and/or relationship therapy, pharmacological, or in very specific cases surgical interventions should be considered. A patient-centered approach is emphasized throughout, as physicians and patients

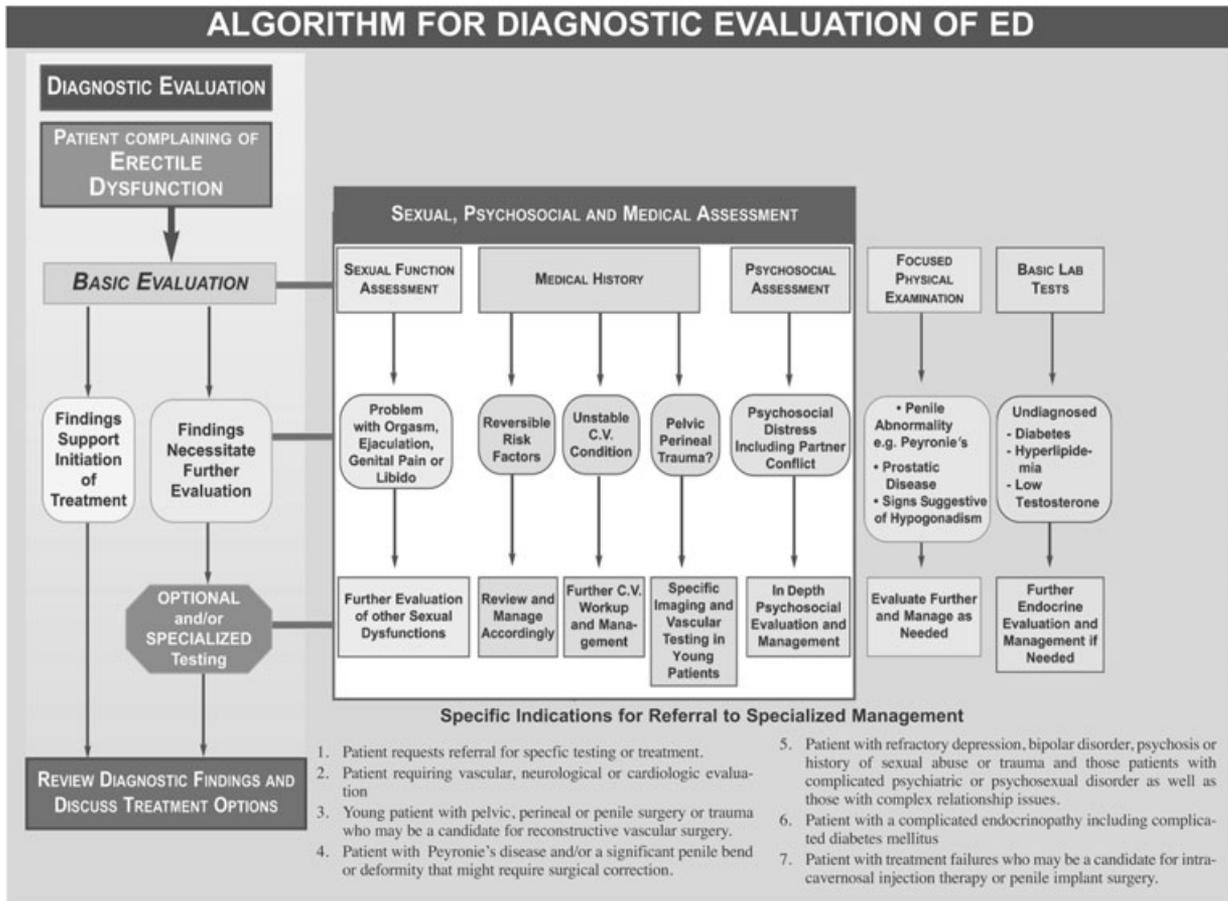


Figure 1 Algorithm for diagnosis of erectile dysfunction (ED).

collaborate in the assessment and management of the patient's sexual dysfunction (Figure 1).

The diagnostic tests utilized in the assessment of the patient with ED may be stratified as: 1) Basic evaluation: an assessment necessary in all patients. All patients with ED should receive a medical, sexual and psychosocial history, physical examination and focused laboratory tests. 2) Optional tests: tests of proven value in the evaluation of specific patient profiles, with use left to the clinical judgment of the treating physician in general practice. 3) Specialized tests: tests of value in select patient profiles in specialized settings.

The rationale for testing and potential impact of a positive test should be explained to the patient (e.g., an abnormal fasting glucose result may lead to the diagnosis of diabetes).

Basic Evaluation

The sexual, medical and psychosocial histories are the most important elements in the basic evaluation and should be obtained in all patients pre-

senting with complaints of ED. A questionnaire to be filled out by the patient (Table 1) should help to initiate physician-patient dialogue.

Sexual, Psychosocial and Medical Assessment

Sexual Function Assessment. The essential components of sexual function assessment should include erectile insufficiency (onset, duration, progression, severity of the problem, qualification of ED as it relates to sex with a partner, nocturnal/morning erections, self-stimulatory and visual erotic induced erections), altered sexual desire, ejaculation, orgasm, sexually related genital pain disorders and partner sexual function, if available.

Sexual Function Scales and Questionnaires.

Brief symptom scales or questionnaires may assist the clinician in recognizing and diagnosing the sexual problem. These measures may also permit patients to acknowledge the problem and to initiate a clinical discussion with their health provider. Scales and questionnaires are also a valuable tool in clinical trials and outcomes research on ED.

Table 1 Diagnosis—Basic Evaluation

Medical, Psychosocial and Sexual Assessment Questionnaire

Last Name: _____ First Name: _____
 Occupation: _____ Date: _____
 Married Married but not sexually active Single Divorced Widowed

A. Medical Assessment

ILLNESS—CHECK FOR YES

Has a doctor ever diagnosed any of the following illnesses?

- High blood pressure
- Heart disease (heart attack, chest pain with exercise or sex)
- Diabetes (high blood sugar)
- Hyperlipidemia (elevated cholesterol or triglycerides)
- Vascular disease (stroke, mini-stroke, blockage of arteries, aneurysms)
- Emotional problems (depression, anxiety or other psychiatric conditions)
- Hormone problems (testosterone, thyroid, steroids)
- Kidney disease
- Neurological problems (Parkinson's, multiple sclerosis, spine injury)
- Trauma or injury to: penis, pelvis, perineum, testes, or rectum
- Prostate problems (enlargement, BPH, elevated PSA, infection)
- Urinary problems (urgency, frequency, hesitancy, weak stream, infection)
- Sleep apnea (severe snoring, daytime sleepiness)
- Chronic fatigue or weakness
- Cancer (bladder, prostate, rectum or other)
- Radiation of the bladder, prostate or rectum
- Unexplained weight loss
- Joint pains (severe or chronic problems moving or changing positions)
- Sexually transmitted diseases

ILLNESS

DRUGS

Have you taken drugs of any kind in the last 3 months?

- 1. PHARMACEUTICALS:** Sedatives For hypertension
 Hormones Drugs for ulcer Other
- 2. RECREATIONAL:**
 Alcohol Tobacco (cigarettes a day . . .)
 Marijuana Cocaine Other

B. Psychosocial Assessment

IN MY PERSONAL LIFE—CHECK FOR YES

- I have sexual fears or inhibitions
- I have problems finding partners
- I am uncertain about my sexual identity
- I have been subjected to emotional or sexual abuse
- I have significant relationship problems with family members
- I have been under considerable emotional or physical stress
- I have a history of depression, anxiety, or emotional problems
- I have had a recent change in employment or finances

My sexual partner has problems with

- Health
- Sexual interest
- Sexual performance
- Sexual fears, inhibitions
- History of sexual abuse

C. Sexual Function Assessment

Please answer the following questions about your overall sexual function in the past 3 months or more.

- 1. Are you satisfied with your sexual function?**
 Yes No If No, please continue.
- 2. How long have you been dissatisfied with your sexual function?**
 3 Months 6 Months 1 Year 2 Years Over

Table 1 Continued

3a. The problem with your sexual function concerns: (mark one or more)
 1 Problems with little or no interest in sex
 2 Problems with erection
 3 Problems ejaculating too early during sexual activity
 4 Problems taking too long, or not being able to ejaculate or have orgasm
 5 Problems with pain during sex
 6 Problems with penile curvature during erection
 7 Other :

**3b. Which problem is most bothersome?
 (circle) 1 2 3 4 5 6 7**

4. What effect, if any, has your sexual problem had on your partner relationships?
 Little or no effect Moderate effect Large effect

5. What is the most likely reason for the sexual problem?
 Medical illness or surgery
 Prescription medications
 Stress or relationship problems
 Don't know

6a. AROUSAL/PERFORMANCE—Chronology
 • When was the last time you had a satisfactory erection? _____
 • Was the onset of your problem gradual or sudden?
 • When was your last normal erection? _____

6b. AROUSAL/PERFORMANCE—Quantify
 Do you have morning or night time erections?
 On a scale of 1 to 5 rate your rigidity during sex.
 1 2 3 4 5
 With sexual stimulation can you initiate an erection?
 With sexual stimulation can you maintain an erection?

6c. AROUSAL/PERFORMANCE—Qualify
 Is your erectile dysfunction partner or situational specific?
 Do you lose erection before penetration, or before climax?
 Do you have to concentrate to maintain an erection?
 Is there a significant bend in your penis?
 Do you have pain with erection?
 Are there any sexual positions that are difficult for you?

7. LIBIDO/INTEREST
 Do you still look forward to sex?
 Do you still enjoy sexual activity?
 Do you fantasize about sex?
 Do you have sexual dreams?
 How easily are you sexually aroused (turned on)?
 How strong is your sex drive?

8. EJACULATION/ORGASM/SATISFACTION
 Are you able to ejaculate when you have sex?
 Are you able to ejaculate when you masturbate?
 If you have a problem with ejaculating, is it:
 You ejaculate before you want to?
 You ejaculate before your partner wants you to?
 You take too long to ejaculate?
 You feel like nothing comes out?
 Do you have pain with ejaculation?
 Do you see blood in your ejaculation?
 Do you have difficulty reaching orgasm?
 Is your orgasm satisfying?
 What percentage of sexual attempts are satisfactory to your partner?

9. PREVIOUS CONSULTATIONS
 Have you consulted a physician or counselor for your sexual problems?
 If yes, what type of physician or counselor have you consulted (check all that apply):
 General practitioner Urologist
 Other specialist Counselor or psychologist
 Are you taking any medication or receiving medical treatment for the problem?
 • If yes, what medical or other non-medical treatments are you using? _____
 • How effective has the treatment been?
 Not at all effective Somewhat effective Very effective

Several brief symptom scales are available for the assessment of male sexual dysfunction. These include the International Index of Erectile Function (IIEF) [1]; The Sexual Health Inventory for Men (SHIM) [2]; and the Brief Male Sexual Function Inventory (BMSFI) [3].

A new screening tool for male sexual function (Male Scale, Table 1) provides clinically relevant information on a variety of sexual function domains (erection, ejaculation/orgasm, desire, pain, satisfaction), including an index of bother or distress associated with sexual dysfunction. This tool can be used as a screening tool in primary care settings or for monitoring individual patient's response to treatment over time.

Although valuable in recognizing and identifying sexual dysfunction, screening tools and questionnaires should not substitute for a careful sexual, medical, and psychosocial history.

For patients with ED and other sexual symptoms (e.g., lack of desire, anorgasmia, pain during intercourse), further evaluation of these symptoms is recommended prior to initiating ED therapy (Figure 2). Whenever possible, the temporal association or causal relationship between the symptoms should be assessed.

Psychosocial Assessment. The current psychological state needs to be assessed with special attention to symptoms of anxiety or depression, altered self-esteem and coping skills, past and present partner relationships, history of sexual trauma/abuse, occupational and social stresses, economic status, and educational attainment.

In the evaluation of ED, particular attention should be paid to patient expectations. A critical aspect of assessment is the identification of patient needs, expectations, priorities and treatment preferences, which may be significantly influenced by cultural, social, ethnic and religious perspectives. Patient education is also important in fostering a therapeutic relationship, facilitating patient-physician communication and enhancing patient compliance.

Partner involvement is important. Although not always possible on the first visit, effort should be made to involve the patient's partner early in the process. Nevertheless, the partner presence may be influenced by cultural and social preferences as well as individual patient needs and preferences.

When psychosocial assessment reveals the presence of significant psychological distress or partner conflict, further evaluation and manage-

ment may be necessary either prior to, or in conjunction with treatment of ED (Figure 2). Referral to an appropriate mental health professional may be indicated in some cases.

Medical History. The essential components of this history should include an assessment of the following: lifestyle factors, smoking, chronic medical illnesses: hypertension, diabetes mellitus, cardiovascular risk factors, renal or hepatic dysfunction, neurological disease, endocrine disease, medications/recreational drug use, psychiatric illness including depression, pelvic/perineal/penile trauma and surgery and pelvic radiotherapy.

For patients with reversible risk factors, such as uncontrolled hypertension or hyperlipidemia, these factors should be assessed and managed prior to or in conjunction with the initiation of ED treatment (Figure 2).

Particular attention should be given to patients with unstable cardiovascular disease (e.g., recent MI, unstable angina). These patients may require further medical evaluation and management prior to initiating ED therapy (Figure 2). Additionally, patients with a history of pelvic or perineal trauma may require additional imaging and vascular studies as part of their diagnostic assessment. This is particularly relevant in younger patients with relatively recent injuries. In such cases, patients should be referred to a specialist familiar with the use of these tests (Figure 2).

Focused Physical Examination. A focused physical examination should be performed on every patient with ED. The physical examination may corroborate aspects of the medical history and may occasionally reveal unsuspected physical findings. This examination should include: an assessment of body habitus (secondary sexual characteristics), an assessment of the cardiovascular, neurological and genito-urinary system focusing on penile, testicular and rectal exam. Blood pressure and heart rate should be measured if not assessed in the previous 3–6 months. In conducting the physical examination, special attention should be given to signs of penile abnormality (e.g., Peyronie's disease), prostatic enlargement or other abnormalities, and signs or symptoms indicative of hypogonadism (Figure 2). In such cases, further diagnostic evaluation should be undertaken by the primary care physician, if qualified, or a suitable specialist.

Basic Laboratory Tests. The physician must tailor the laboratory work-up based on patient complaints and risk factors outlined by the history and taking

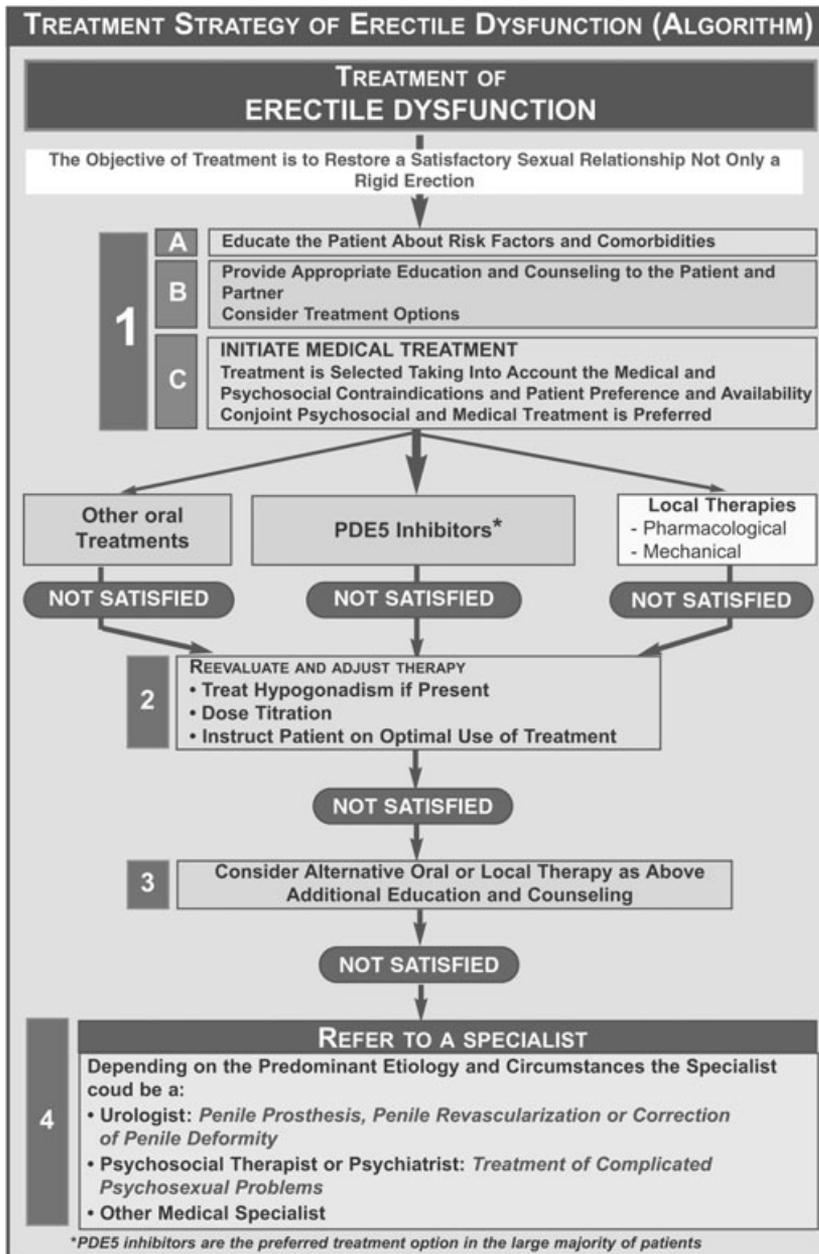


Figure 2 Algorithm for treatment of erectile dysfunction (ED).

into account the cost and availability of testing resources. These tests include the following focused laboratory tests:

Fasting Glucose and Lipid Profile. If not available within the previous 12 months, fasting glucose and lipid profile should be obtained to rule out diabetes mellitus and hyperlipidemia. If these test results indicate significant abnormalities (e.g., hyperlipidemia, diabetes), these conditions should receive further diagnostic evaluation and management, as indicated (Figure 2).

Evaluation of the Hypothalamic-Pituitary-Gonadal Axis. In patients with sexual dysfunction and at risk of or suspected of hypogonadism, the following biochemical investigations are recommended. A blood sample for testosterone (T) determination between 8:00 and 11:00 AM should be obtained. The most accessible and reliable assays to establish the presence of hypogonadism are the measurements of bio-available T or the calculated free T (cFT). Assays for total testosterone, particularly in the elderly, may not reflect the man's true androgenic status. If T levels are

below or at the lower limit of the accepted normal values, it is prudent to confirm the results with a second determination together with assessment of luteinizing hormone (LH), follicle stimulating hormone (FSH) and prolactin.

Optional and/or Specialized Diagnostic Testing

As indicated in the diagnostic algorithm (Figure 2), these tests are to further evaluate specific etiological conditions or factors, or to evaluate potential contraindications to direct therapies for ED (e.g., unstable cardiac disease). Patients should be fully informed as to the rationale for these tests and the results of testing should be reviewed with the patient, when available.

While the majority of patients with ED can be managed within the primary care setting by a physician educated in male sexual dysfunction, specific circumstances may dictate the need for referral for specialized testing and/or treatment (Figure 1).

Before considering specialized evaluation and diagnostic testing the physician should consider whether the patient case profile meets the indications for specialist referral.

The physician must also consider the ability of his or her clinic facility to provide and support specific hormonal, vascular, neural and psychological testing. They include the following: in-depth psycho-sexual and relationship evaluation, psychiatric evaluation, nocturnal penile tumescence and rigidity (NPTR) assessment, vascular diagnostics: in office penile injection pharmacotesting, penile Doppler ultrasound, dynamic infusion pharmacocavernosometry and pharmacocavernosography, penile arteriography, CT and MR imaging (to evaluate trauma and infection), nuclear imaging, specialized endocrinologic testing: thyroid function studies, hypothalamic-pituitary-gonadal function studies, MRI sella tursica, neuro-physiologic testing: vibrometry, bulbocavernosus reflex latency, cavernosal EMG and somatosensory evoked potential testing, pudendal and sphincter EMG.

In conclusion, the first step in the management of the patient with ED is to facilitate the patient's and partner's (if available) understanding of the condition, the results of the diagnostic assessment and to identify patient's and partner's needs, expectations, priorities and preferences. The degree to which patients and partners are bothered or distressed by the condition is especially important to assess.

The identification and recognition of ED's associated medical and psychological factors in the individual patient should be emphasized.

Treatment Strategy of Erectile Dysfunction

The clinician has a variety of treatment options available, including medical, psychosocial and surgical treatments for ED. Wherever possible, the selection of therapy should be based on a careful matching of patient needs and preferences with the available treatment options. The selection of therapy is strongly influenced by personal, cultural, ethnic, religious and economic (affordability) factors. As noted above, all patients should receive a medical, sexual and psychosocial history, physical exam and focused laboratory testing in conjunction with or prior to the initiation of therapy. Treatment options should be carefully reviewed with the patient and patient's partner, if available. The goal of therapy should be viewed as restoration of a satisfactory sexual life, not only a rigid erection.

The main steps of the treatment strategy are: 1) address risk factors and co-morbidity; 2) counsel and educate the patient and partner, if available; 3) medical treatment: oral and local; and 4) surgical treatment.

Address Risk Factors and Co-morbidities

In parallel to direct treatment for ED, good medical practice recognizes the value of altering modifiable risk factors. Although frequently insufficient to reverse ED completely, this step may be of great value in select patients. Since ED may be a marker of underlying cardiovascular, metabolic or depressive illness, these co-morbidities should be addressed whenever possible.

Potentially modifiable risk factors and co-morbidities include the following.

Lifestyle and Psychosocial Factors. Lifestyle factors, such as obesity, cigarette smoking, alcoholism or substance abuse may require priority management specific to the particular issue. Psychosocial factors include relationships issues, e.g., partner conflict, mood problems and depression, or other psychosexual dysfunctions.

Prescription or Non-prescription Drug Use. Commonly used antihypertensive agents (e.g., diuretics, beta-blockers) psychotropic drugs (e.g., antidepressants, neuroleptics), in addition to antiarrhythmics, antiandrogens and steroids.

Alterations in drug dosages or classes may be of significant benefit in select patients but this should be coordinated with the primary physician where ever possible.

Hormone Replacement Therapy. Hormone replacement therapy for hormonal abnormalities (e.g., hypogonadism, hyperprolactinemia).

In men with ED and/or diminished interest, a clear indication of hypogonadism (a clinical picture together with biochemical evidence of hypogonadism) should exist prior to initiation of androgen therapy. Since androgen replacement therapy is typically chronic or life-long, it is essential that all patients receiving androgen therapy be followed on a regular basis.

The treating physician must be familiar with the diagnostic, therapeutic and monitoring aspects of androgen therapy. The patient should be monitored closely for possible side effects or contraindications, such as abnormal liver function, hyperlipidemia, polycythemia, prostate abnormalities (prostate cancer or severe bladder outlet obstruction), hyperactivity or aggressive behavior, and sleep apnea. Inadequate therapeutic response or the appearance of significant adverse effects call for reassessment of treatment indications.

Counsel and Educate the Patient and Partner, if Available, about Sexuality

This includes lack of knowledge about normal sexual function and age-related changes in men and women, lack of experience or ability in normal foreplay or intercourse techniques.

Sexual counseling and education for individuals or couples addresses specific psychological or interpersonal factors such as relationship distress, sexual performance concerns, dysfunctional communication patterns and co-morbid sexual conditions that are likely to impact sexual functioning.

Modified sex therapy may serve as an adjunct to the other direct therapies for ED to address psychological reactions to these medical or surgical therapies, which may be perceived as temporary, unnatural or unacceptable by the patient and/or partner. The advantages of psychosexual therapy include its noninvasive nature and broad applicability.

The disadvantages of psychosexual therapy include its variable efficacy in the treatment of ED, cost and acceptability by the patient or the couple and availability of qualified providers. Psychosexual counseling should be considered prior to or in conjunction with medical therapy, whenever indicated.

Medical Treatment for ED

General Principles. The majority of patients will need to consider direct treatment options for ED.

Shared Decision Making. Decision to treat depends mainly on the distress ED provokes in the patient and/or his partner.

The development of ED can significantly affect the quality of life, but it is not a life-threatening disease. Consequently it is reasonable to discuss the benefits, risks, and costs of the available treatment strategies with the patient and have the patient actively participate in the choice of therapy.

Cardiovascular Safety. There is a documented correlation between cardiovascular diseases and ED. In a significant number of patients ED may be sign of endothelial vascular dysfunction.

An important issue prior to the institution of any therapy and the subsequent resumption of sexual activity is the overall cardiovascular condition of the patient. Is this patient able to resume the exercise of sexual activity? If not, priority cardiovascular assessment and intervention may be appropriate.

Partner Issues. The partner's sexual function can interact with the patient's sexuality and if possible should be considered prior to initiating therapy.

Which Drugs for ED Treatment? Only those pharmacological treatments that have been thoroughly tested in randomized clinical trials, with subsequent publication of results in peer-reviewed literature, should be considered for general use. Long-term follow-up of all treatment options must be performed to demonstrate durability and continued efficacy and safety as well as patient and partner acceptability.

Criteria of Selection. The treatment selected by a patient will be influenced not only by issues such as efficacy and safety but also by the patient's cultural, religious and economic background.

Additionally, the following factors may influence the patient's or partner's selection of therapy: ease of administration, invasiveness, reversibility, cost, the mechanism of action (peripheral vs. central, inducer vs. enhancer) and regulatory approval and availability.

Use of Internet. The use of the internet to prescribe therapies for erectile dysfunction should be strongly discouraged since it fails to meet the need for direct physician-patient contact in the assessment of all patients presenting with this complaint.

Oral Agents. Oral therapies may be considered first-line therapies for the majority of patients with ED because of potential benefits and lack of invasiveness.

They demonstrate a good risk to benefit ratio. However it is noteworthy that there is a high placebo effect in most clinical trials for ED.

Several agents are registered for this indication (selective PDE5 inhibitors, apomorphine and yohimbine).

Phosphodiesterase Type 5 (PDE 5) Inhibitors.

PDE 5 is the enzyme responsible for the breakdown of the intracellular second messenger of nitric oxide, i.e., cyclic guanosine monophosphate (cGMP) in the corporal smooth muscle.

PDE5 inhibition increases the concentration of cGMP and promotes corporeal smooth muscle relaxation and erection in response to sexual stimulation.

PDE5 inhibitors are associated with the broadest efficacy and tolerability of oral ED therapies. Accordingly PDE5 inhibitors are considered as the reference class for oral treatment. Three members of this class are available today, sildenafil, vardenafil and tadalafil. Sildenafil was approved worldwide in 1998 and vardenafil and tadalafil in 2003. PDE5 inhibitors are effective and well tolerated as demonstrated in controlled clinical trials and clinical practice experience. In general ED, a high level of evidence exists for the efficacy of all three drugs. The long-term effectiveness and safety of sildenafil has been demonstrated in controlled clinical trials, open label studies, and post-marketing experience.

This class is approved for on-demand use. The clinical action of PDE5 inhibitors may be visible with the first intake. Nevertheless there is a necessity for patient education on how to optimally use the drug because of the need for sexual stimulation and adequate dosing. For this reason, results of treatment improve with repeated dosing.

This class is associated with drug interactions and contraindications. PDE5 inhibitors are strictly contraindicated in patients receiving organic nitrates and nitrate donors.

In patients receiving concomitantly an alpha-blocker, recommendations may vary from caution to contraindication depending on the PDE5-inhibitor and the alpha-blocker to be used. Physicians must carefully follow the label instructions of these drugs.

PDE5-inhibitors undergo hepatic metabolism via cytochrome P450CYP3A4. CYP3A4 inhibitors such as erythromycin, ketoconazole, and protease inhibitors can increase the levels of PDE5-inhibitors. In patients taking these drugs consider

administering PDE5-inhibitors at the lowest available dosage.

The three PDE5 inhibitors are associated with class-related side effects including headache, dyspepsia, facial flushing, and nasal stuffiness. Other side effects such as altered vision (due to PDE6 inhibition), myalgia and back pain may vary according to the specific compound in discussion. These side effects are predominantly mild to moderate.

There is variability of *onset of action* for these three drugs (which may be at least 15–30 minutes). The *duration of action* is about 5 hours for sildenafil and vardenafil and up to 24–36 hours for tadalafil.

Apomorphine SL. Apomorphine SL (sublingual) is a centrally acting non-selective dopamine agonist with modest efficacy and good tolerability in mild ED. It is associated with mild to moderate nausea and rare bradycardia/syncope (vasovagal) syndrome. Apomorphine SL is registered in various countries since 2002.

Yohimbine. Yohimbine is both a peripherally and centrally acting alpha-blocker associated with low level of evidence for efficacy in general ED.

Drugs under Clinical Investigation. PT141 is a non-selective melanocortin receptor agonist and the first metabolite of melanotan II. New PDE5 inhibitors are undergoing investigation.

Advantages and Disadvantages of Oral Treatment. The advantages of oral drug therapies include broad patient acceptance, ease of administration and relative efficacy. The disadvantages include specific contraindications such as the concomitant use of nitrates with respect to PDE5 inhibitors, the relative cost, and the moderate discontinuation rate. Although discontinuation rates in clinical trials are low, in clinical practice the rates may be much higher for a number of reasons including the inadequacy of patient education and follow-up and possibly psychological factors.

Local Therapy. Local therapies include intracavernosal injection therapy, intraurethral/topical therapy and vacuum device therapy. Patients who fail oral drug therapy, who have contraindications to specific oral drugs or who experience adverse events from oral drugs might consider these local therapies. Additionally, individual preferences may direct a patient to consider local therapies prior to or as an alternative to an oral drug therapy.

Intracavernosal Injection (ICI) Therapy. *Alprostadil (Prostaglandin E1)*, the synthetic formu-

lation of the endogenous prostanoid prostaglandin E1, is delivered by local injection into the corpora cavernosa. It affects smooth muscle relaxation primarily by increasing levels of cyclic AMP within the corporal smooth muscle. It is associated with high efficacy and modest tolerability in general ED.

The adverse events associated with alprostadil injection therapy are primarily local and include, acutely, penile pain and priapism (rare) and, chronically, penile fibrosis or curvature (both of which are uncommon).

Papaverine hydrochloride alone or in combination with phentolamine or a combination of papaverine, phentolamine and alprostadil has been extensively and successfully utilized in clinical practice. However this is not an approved therapy.

Intracavernosal injection therapy is contraindicated in patients with sickle cell anemia and with other conditions that predispose to priapism. Anticoagulant therapy is not an absolute contraindication but extra care must be taken to avoid excessive bruising.

The advantages of penile injection therapy include broad efficacy, relative safety and the rapidity of onset of action. The disadvantages include invasive local administration and relative cost.

Intraurethral Therapy. Intraurethral alprostadil therapy is associated with moderate efficacy and tolerability in the management of general ED. In addition to similar adverse events associated with alprostadil ICI therapy, the intraurethral administration of alprostadil is also associated in rare cases with hypotension and syncope.

The advantages of intraurethral therapy include its less invasive nature. The disadvantages include local as well as systemic side effects (rare), relative cost and partner related vaginal irritation. A condom should be used in case the partner is pregnant.

Intrameatal Therapy. The topical (intrameatal) application of the combination of alprostadil and a dermal permeation enhancer is associated with a certain efficacy and tolerability that need to be confirmed by further studies. It has been approved in some Asian countries.

Vacuum Constriction Devices. Vacuum constriction devices (VCD) are widely available including over-the-counter (without prescription) in some countries. They are of appeal to a group of men who are not interested in pharmacological therapies or have specific contraindications to these therapies. VCD apply a negative pressure to the pendulous penis, thus drawing blood into the

penis, which is then retained by the application of an elastic band at the base of the penis.

The side effects associated with VCD therapy include penile pain, penile numbness, bruising and trapped ejaculation. Anticoagulant therapy is a relative contraindication.

The advantages of VCD therapy include its non-pharmacologic nature, on-demand use and cost. The disadvantages of VCD therapy include their cumbersome utilization and minor local side effects.

Surgical Therapy

Vascular Surgery. Microvascular arterial bypass and venous ligation surgery may achieve the goal of increasing arterial inflow and decreasing venous outflow. Certain young patients with vascular insufficiency may be candidates for surgical cure or improvement of ED. These patients must be evaluated by specialized testing and should be treated by an experienced surgeon. This invasive therapy should only be considered after other treatment possibilities have been exhausted.

The final treatment option for ED is the surgical implantation of a malleable or inflatable penile prosthesis. This option is highly invasive and irreversible and should therefore be reserved for select cases failing other treatment modalities. However, under unique and uncommon circumstances a penile implant could be selected as a primary option. When properly selected, penile prostheses may be associated with high rates of patient and partner satisfaction.

Penile implant surgery is uncommonly associated with prosthesis infection (1–5%) but such cases usually require explanation and may result in severe scarring and penile deformity. Mechanical failures are now less than 5% in the first year, about 20% at 5 years and 50% at 10 years.

The advantages of penile prosthesis implantation include relative long lasting effect and high patient satisfaction. The disadvantages of penile prostheses include irreversibility, invasiveness, surgical complications and mechanical failure.

Reassessment and Follow-Up

Reassessment and follow-up should be conducted at regular intervals with every patient receiving treatment for ED. The goals of follow-up include:

1. The need for dose titration or substitution of another treatment intervention should be considered at each treatment follow-up visit. Patients may change treatment preferences,

- seek new information, or wish to re-evaluate their current treatment choices.
2. Patient communication. Patients may have concerns regarding treatment administration, other sexual dysfunctions (e.g., premature ejaculation), partner issues (e.g., anorgasmia) or lifestyle factors (e.g., emotional stress).
 3. Patients may change medication regimens, either for ED or a concomitant medical disorder. The possibility of adverse drug reactions or drug interaction oral ED drugs should be carefully monitored.
 4. General medical and psychosocial reassessment should occur at regular intervals, depending upon the patient's health, physical and psychosocial needs. Follow-up also provides an additional opportunity for patient education.

Orgasm and Ejaculation Disorders in Men

Premature Ejaculation (PE)

Definition

Premature ejaculation, also referred to as rapid or early ejaculation, is defined according to three essential criteria: a) brief ejaculatory latency; b) loss of control; and c) psychological distress in the patient and/or partner.

Ejaculatory latency of 2 minutes or less may qualify a man for the diagnosis, which should include consistent inability to delay or control ejaculation, and marked distress about the condition. All three components should be present to qualify for the diagnosis. Subtypes of the disorder are symptom-based, including lifelong versus acquired, global versus situational PE, and the co-occurrence of other sexual problems, particularly ED. About 30% of men with PE have co-occurring ED, which typically results in early ejaculation without full erection. A wide degree of severity is seen, with patients ejaculating on or prior to penetration in the most severe cases.

Etiology

The etiology of the disorder is uncertain in most cases, and likely includes a combination of organic and psychogenic factors. Negative conditioning and penile hypersensitivity are the most frequently cited etiological factors in PE, although neither mechanism has received adequate experimental support to date.

Prevalence

PE is a highly prevalent disorder; however, accurate population-based data are not available. Although usually associated with less bother than ED, the dis-

order may be highly distressing in some instances. It may be associated with sexual problems in the woman partner, particularly anorgasmia or a sexual pain disorder (e.g., vaginismus). In such cases, couples or sex therapy approaches may be of particular value. These may be combined with pharmacotherapy for treatment of PE in the male.

Diagnostic Assessment

All men who meet diagnostic criteria for PE should receive a medical and sexual history, physical examination and investigations of causal or maintaining factors for the patient's PE, such as anxiety or interpersonal factors (Figure 3). The developmental history of the disorder should be carefully assessed, such as whether the rapid ejaculation is global or situational, lifelong or recent in its development, and the presence or absence of other sexual dysfunctions, such as ED. If ED is present, this should be evaluated according to the guidelines above.

Details of the patient's ejaculatory response should be obtained, particularly the subjective assessment of ejaculatory latency, sense of ejaculatory control and level of sexual dissatisfaction or distress should be fully evaluated. Sexual and emotional responses of the partner need also to be assessed, particularly the presence or absence of sexual dysfunction or pain in the partner. Questionnaire measures or brief symptom scales are available for assessing PE, although these are not well standardized to date. Laboratory-based evaluations (e.g., biothesiometry) are not recommended for routine evaluation.

Treatment

As indicated in the following algorithm, *several management options* are available following initial assessment and diagnosis. In particular, men with premature ejaculation secondary to ED, other sexual dysfunction or genitourinary infection should receive appropriate etiology-specific treatment. Men with lifelong premature ejaculation should be managed with pharmacotherapy, while those with acquired or situational PE can be treated with pharmacotherapy and/or behavioral therapy according to patient/partner preference. Men with significant contributing psychogenic or relationship factors may benefit from concomitant behavioral therapy. Recurrence of premature ejaculation is highly likely to occur following withdrawal of treatment. Behavioral therapy may augment pharmacotherapy to enhance relapse prevention. A flow-chart model for office management of PE is shown below.

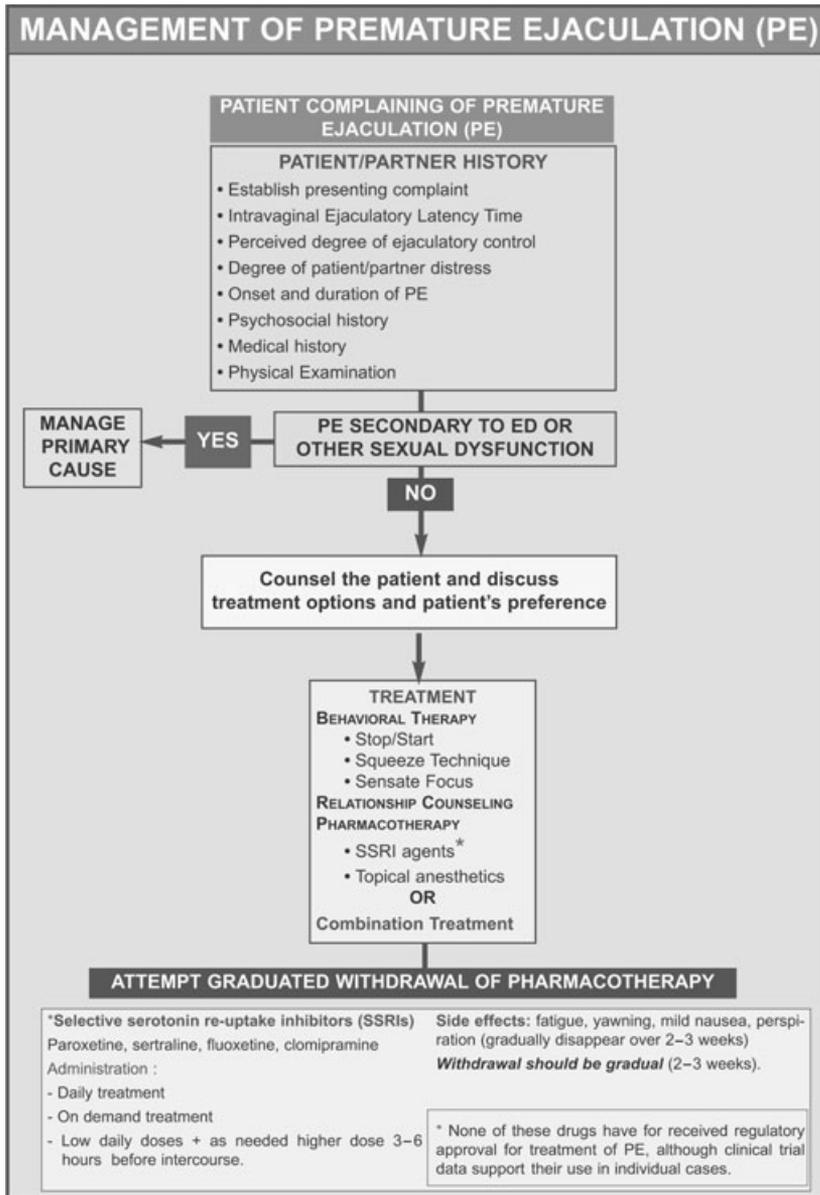


Figure 3 Management of premature ejaculation (PE).

Pharmacological treatments for PE include use of selective serotonin reuptake inhibitors (SSRIs) (e.g., paroxetine, sertraline, fluoxetine), topical local anesthetics (e.g., lidocaine), and PDE-5 inhibitors (e.g., sildenafil). None of these drugs have received regulatory approval for treatment of PE, although clinical trial data support their use in individual cases.

Delayed Ejaculation, Anejaculation and Male Anorgasmia

Definition

Male orgasmic dysfunction (MOD) includes a spectrum of disorders in men ranging from delayed

ejaculation to a complete inability to ejaculate, anejaculation, and retrograde ejaculation.

Multiple etiological factors have been identified, including both organic and psychogenic factors. Any medical disease, drug or surgical procedure which interferes with either central control of ejaculation or the peripheral sympathetic nerve supply to the vas and bladder neck, the somatic efferent nerve supply to the pelvic floor or the somatic afferent nerve supply to the penis can result in delayed ejaculation, anejaculation and anorgasmia.

Ejaculatory dysfunction and loss of orgasmic sensation commonly occur following prostate or bladder surgery and have been reported in associ-

ation with lower urinary tract symptoms (LUTS) in aging men.

Commonly used drugs, such as alpha-blockers (e.g., tamsulosin) and serotonin-uptake inhibitors (e.g., paroxetine), have been associated with loss of orgasm or ejaculation. Precise prevalence data for these disorders are not available, although recent studies suggest that MOD may be almost as prevalent as ED in aging men. Loss of ejaculation is often age-related and may be associated with other sexual dysfunctions in the male, particularly ED.

Diagnostic Assessment

Men with delayed ejaculation, anejaculation and/or anorgasmia should be evaluated with a

detailed medical and sexual history, a physical examination and appropriate investigations to establish the true presenting complaint, identify obvious biological causes such as medication or recent pelvic surgery, and uncover sufficient detail to establish the optimal treatment plan. A flow-chart model in Figure 4.

Relevant information to obtain from the patient includes: 1) a basic medical history, including use of prescribed and recreational medications; 2) the cultural context and developmental history of the disorder, including whether the ejaculatory dysfunction is global or situational, lifelong or recent in its development; 3) measures of the quality of each of the three phases of the sexual response

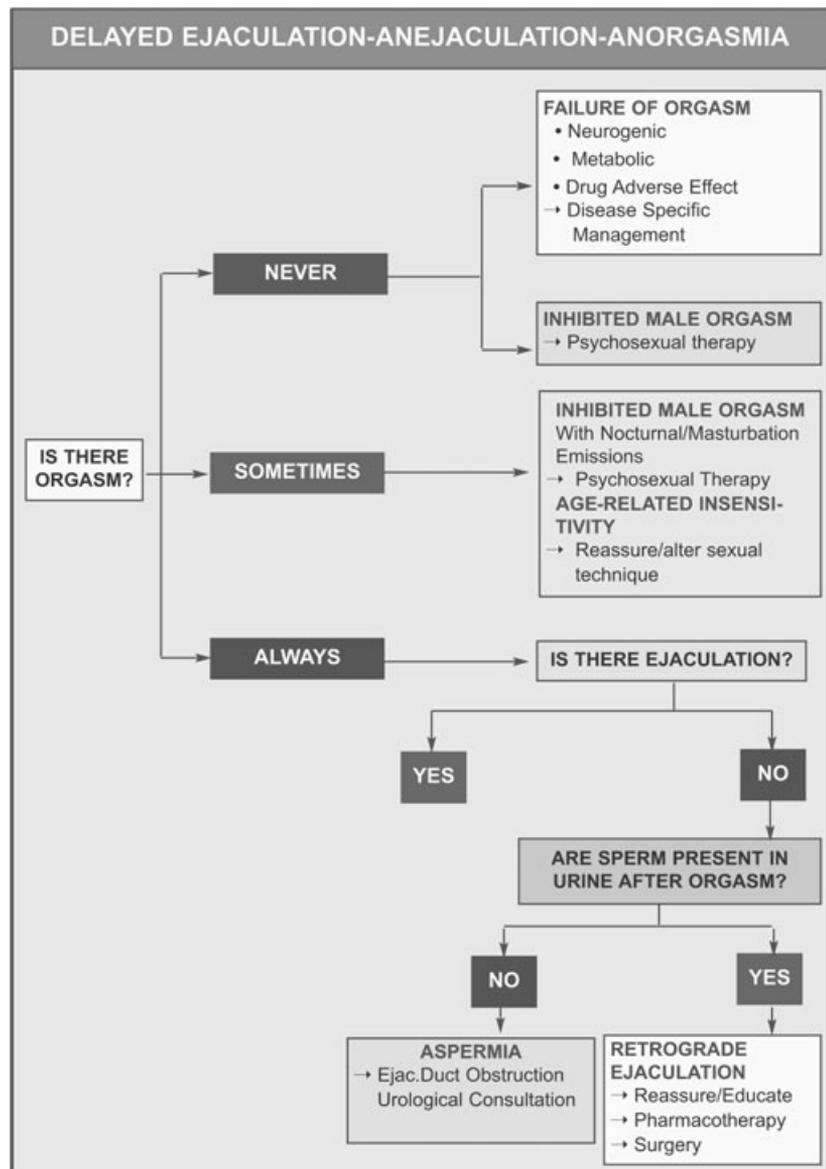


Figure 4 Delayed ejaculation-anejaculation-anorgasmia.

cycle: desire, arousal, and ejaculation, since the desire and arousal phases may impact the ejaculatory response; 4) details about the ejaculatory response, including the presence or absence of orgasm, the prodromal sensation of ejaculatory inevitability and prograde ejaculation, the level of sexual dissatisfaction and distress, the frequency of sexual activity, and degree of sexual stimulation; 5) a careful physical examination to establish whether the testicles and epididymes are normal, and whether the vasa are present or absent, on each side and the sensation of the genitalia; 6) the partner's assessment of the situation, including whether the partner suffers from sexual dysfunction; and 7) assessment of the sexual and overall relationship.

Treatment

Treatment should be etiology-specific and address the issue of infertility in men of a reproductive age. Men who never achieve orgasm and ejaculation are suffering from either a biogenic failure of emission and/or psychogenic inhibited ejaculation. Management involves identification of the etiology and disease specific treatment. Men who occasionally achieve orgasm and ejaculation are usually suffering from psychogenic inhibited ejaculation or penile hypoanesthesia secondary to age or spinal cord disorder related degeneration of the afferent penile nerves.

The former is managed with behavioral therapy and/or psychotherapy. Men with age-related penile hypoanesthesia should be educated, reassured and be instructed in revised sexual techniques which maximize arousal.

The majority of men who always achieve orgasm but never experience prograde (antegrade) ejaculation or have a greatly reduced prograde ejaculatory volume have retrograde ejaculation. The presence of spermatozoa and fructose in centrifuged post-ejaculatory voided urine confirms the diagnosis. Management involves education and reassurance of the patient, pharmacotherapy (with alpha adrenergic agonist) or, in rare cases, bladder neck reconstruction. The absence of spermatozoa suggests congenital absence or agenesis of the testis or vas/vasa or acquired ejaculatory duct obstruction. Management involves investigation by ultrasonic or radiological imaging to identify the site of obstruction and disease specific treatment. Wherever possible, medical and psychological approaches should be combined in the treatment of MOD.

Priapism

Definition

Priapism is a relatively rare condition in men, which is defined as an unwanted erection not associated with sexual desire or sexual stimulation and lasting for more than 4 hours. Three different types of priapism can be distinguished, although there may be some overlap among categories. 1) Low flow (no flow) or ischemic priapism. This is the most common form and is associated with a failure of detumescence, increasing anoxia and ultimately necrosis of the cavernous muscle if untreated. It is an example of the compartment syndrome and requires urgent treatment. 2) High flow, well oxygenated priapism. This is less common than the first type and may occur following surgical treatment or pelvic trauma. It may also be congenital or idiopathic in origin. 3) Recurrent or stuttering priapism commonly occurs in men with sickle cell disease but is not confined to them. Such a priapism is usually high flow but may become low flow and anoxic.

Diagnosis and Initial Management

A careful history and physical examination are sufficient in most cases to make the diagnosis and classification of priapism. The physical examination should focus on the rigidity of the penis, severity of pain and presence of potential causative or co-morbid factors, such as a secondary tumor in the penis. A blood sample should be taken in all cases to exclude sickle cell disease, thalassemia major, and leukemia. These conditions require appropriate management at an early stage.

First Aid Management of Priapism

First aid measures may be initiated by the patient or health practitioner prior to medical examination and diagnosis. Cold showers or ice packs may be beneficial during the early stages. Exercise and micturation are occasionally helpful. Analgesics should be given as appropriate. Pharmacologic oral therapies include terbutaline, pseudoephedrine, ephedrine and procyclidine.

Urologic Management of Anoxic Priapism

If ischemic priapism is diagnosed based on presenting symptoms and physical examination, it is essential to decompress the corpora as soon as possible. This is typically achieved by aspiration of at least 5 mL of blood with a 19–21-gauge butterfly needle. The color of the blood aspirated in an anoxic priapism is almost black and the blood gases will confirm the hypoxic state of the penile corpora. It is necessary to slowly aspirate until

oxygenated red blood is obtained before injecting an alpha-adrenoreceptor agonist in an attempt to cause contraction of the smooth muscle. This process may take 1 hour to occur and the pulse and blood pressure should be monitored. It is doubtful whether irrigation of the corpora is of any benefit. Surgical intervention may be required if repeated aspiration is not successful (Figure 5).

Management of High Flow Priapism

The erection is less rigid and pain is typically less severe in this form of priapism. The condition is typically self-limiting and prognosis is generally

favorable, in contrast to ischemic priapism. Conservative treatment is recommended in most cases. A high flow priapism is by aspirating bright red arterialised blood from the corpora and the diagnosis is then confirmed by Doppler examination. When associated with traumatic injury, treatment of high flow priapism may include selective embolisation with autologous blood clot. This is usually successful and may be repeated. Surgical ligation of the fistula may be successful but it is more difficult and invasive. It should be remembered that an idiopathic high flow priapism may convert to a low flow one and urgent intervention is then required.

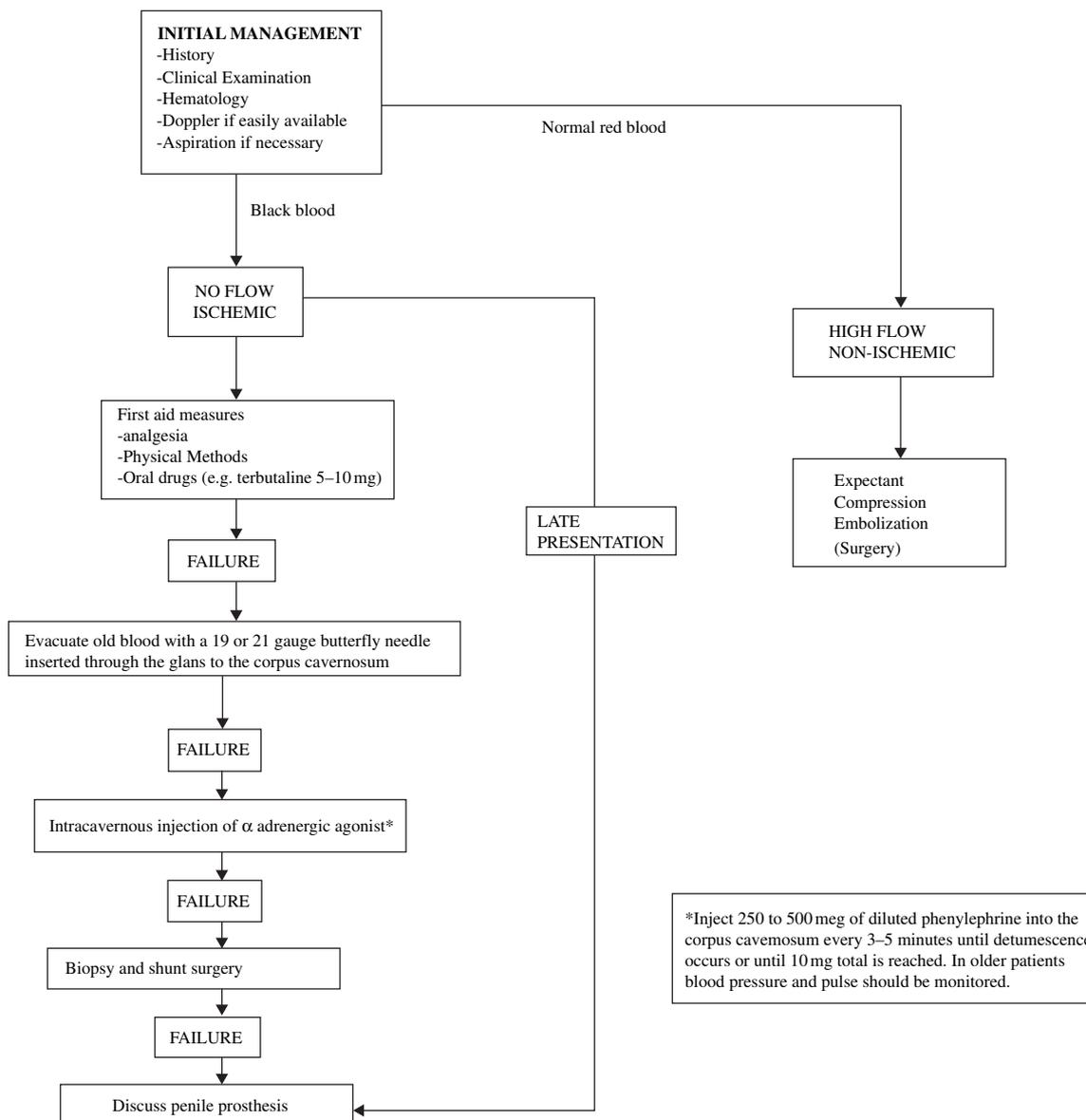


Figure 5 Priapism.

Management of Recurrent (“Stuttering”) Priapism

This condition is uncommon, not confined to men with sickle cell disease, and poorly understood. The onset of the prolonged erection is usually during sleep and detumescence does not occur immediately upon waking. The mechanism is obscure and management of recurrent priapism is difficult as the episodes may be ischemic or non-ischemic in the same patient. Sickle cell disease, if present, requires hematological management, which may reduce the frequency or severity of attacks. The condition is usually benign, although a full blown ischemic episode may occur which requires urgent intervention. Patients should be informed about this eventuality. Pharmacologic agents used in the treatment of recurrent priapism include terbutaline, procyclidine, clonazepam, etilephrine, LHRH agonists, baclofen and phenylephrine implants.

Peyronie’s Disease (“la Peyronie”)

Definition

“La Peyronie” is an acquired disorder of the tunica albuginea characterized by the formation of a plaque of fibrous tissue and often accompanied by penile pain and deformity on erection. There may be difficulty of penetration as a result of the curvature and the condition may be accompanied by some impairment of erectile capacity.

Peyronie’s disease should be differentiated from localized cavernous fibrosis associated with direct external trauma to the corpus, injury from a fractured penis, or damage to the cavernous tissue due to intracavernous injections. Atypical areas in the crura are typically associated with external trauma.

Peyronie’s disease is usually easy to diagnose by clinical history and examination and it should be differentiated from congenital abnormalities (vide infra) and extremely rare secondary tumors in the penis.

Diagnosis and Management

A history and physical examination are usually sufficient to make the diagnosis of Peyronie’s disease, and further investigation is only necessary in selected patients. Plaque size is measured in the flaccid penis, and may be confirmed by means of ultrasound, CT or MRI testing, although these methods have not been shown to be superior to clinical examination. Deformity is better studied after vacuum or pharmacologically induced erection. A careful medical and sexual history should be obtained, included the patient’s ability to

achieve and maintain erection. Most cases are self-limiting and benign, requiring no more than education and reassurance of the patient.

Oral Therapy

Multiple pharmacologic therapies have been described, although few have shown clinically significant treatment effects compared to placebo. A combination of colchicines and Vitamin E has shown promise in some studies, but further research is needed. Procarbazine, paraaminobenzoate (Potaba), tamoxifen, verapamil and acetyl esters of carnitine have also been recommended, but have not demonstrated adequate safety or efficacy to date. Intraplaque injections with betamethasone, collagenase or verapamil have also been shown to have limited benefit in some studies.

Based on available evidence, pharmacological treatments are not recommended in the majority of cases.

Surgical Management

Surgical procedures for correction of Peyronie’s disease are available and can be employed in severe cases. Surgical correction of the penile deformity should not be considered for at least 12 months following initial diagnosis, and after symptoms have been stable for 3, and, preferably, 6 months. The deformity should make intercourse difficult and the quality of erection should be adequate. Indications for surgery are shown in the Table 2. Patients should be fully informed about the nature of their condition and anticipated outcome of surgery.

A number of surgical procedures are available. The Nesbit excision technique usually provides the best results and is the method of choice for most men. Plication techniques have also been used, but with less favorable results. Plaque incision and vein grafting procedures offer effective straightening of the penis, but with an increased risk of postoperative erectile dysfunction. These procedures should only be used in selected patients. Penile prosthesis may be the treatment of choice for the older man with vascular impairment, erectile dysfunction and an erectile

Table 2 Peyronie’s disease: indications for surgery

Disease present for at least 12 months
Stable for at least 3 months (preferably 6 months)
Deformity makes intercourse difficult
Quality of erection important to decide between reconstruction and prosthesis
Patient expectation and informed consent

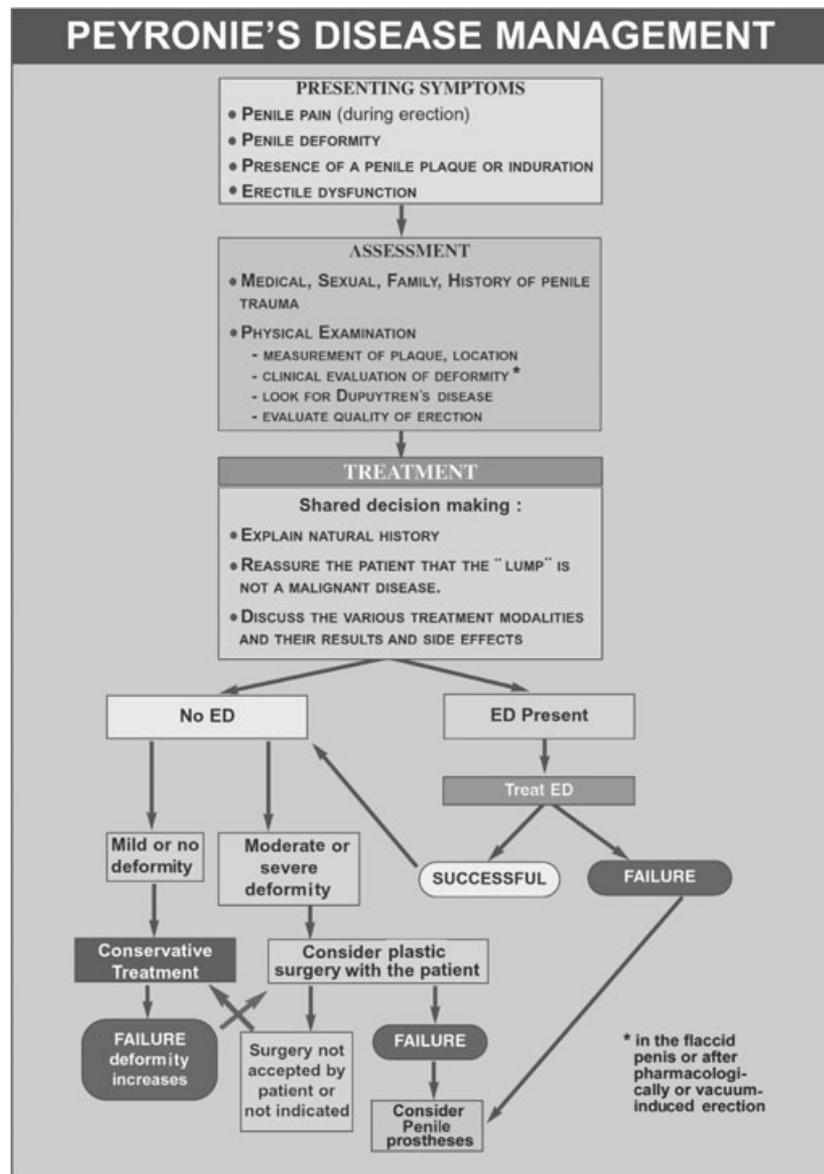


Figure 6 Peyronie's disease management.

deformity. The final algorithm for management of Peyronie's disease is shown in Figure 6.

Corresponding Author: Tom F. Lue, MD, Department of Urology, University of California, San Francisco, CA, USA. Tel: (415) 476-1611; Fax: (415) 476-8849; E-mail: Tlue@urol.ucsf.edu

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