

Much more than prescribing a pill – Assessment and treatment of erectile dysfunction by the general practitioner



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Background

Erectile dysfunction is a common but often neglected condition. Prevalence increases with age, but is not insignificant in younger men.

Objectives

This article will broadly describe the epidemiology, classification and risk factors of erectile dysfunction. It will also discuss assessment and current treatment modalities, with a particular focus on the unique role of the general practitioner (GP).

Discussion

Erectile dysfunction may be classified as vasculogenic, neurogenic, endocrinological, drug-related, psychogenic or mixed. Commonly, erectile dysfunction is a cause of anxiety and even depression. Risk factors, such as smoking and hypertension, and reversible causes, such as hypogonadism or offending medications, should be addressed. At present, oral pharmacotherapy represents the first-line option for most patients with erectile dysfunction. It is of utmost importance to evaluate and treat comorbidities, such as depression, metabolic syndrome and cardiovascular disease, that often accompany erectile dysfunction. Patients will undoubtedly benefit from comprehensive management by a dedicated GP. Occasionally, referral to a urologist, psychologist or sexual health physician may be required.

Erectile dysfunction is defined as a man's consistent or recurrent inability to attain and/or maintain penile erection that is sufficient for sexual activity.¹ Although a common condition, sexual dysfunction is often neglected in clinical practice. General practitioners (GPs) are instrumental in the early diagnosis and treatment of men with erectile dysfunction. Sexual complaints should be used as a platform to investigate possible risk factors and comorbidities, and as a means to segue into patient education and lifestyle changes. Even when specialist assistance is required, involvement of the GP is crucial for a durable positive outcome. This review will discuss the basics of erectile dysfunction and its management, and focus on the pivotal role of GPs.

Epidemiology

Erectile dysfunction is very common and not limited to older peoples. In an Australian study measuring self-reported erectile dysfunction in 108,477 men aged 45 years or older,² the overall prevalence of erectile dysfunction was 61% (25% with mild erectile dysfunction; 19% with moderate erectile dysfunction; 17% with complete erectile dysfunction). More than 20% of healthy men aged 60–65 years with no risk factors had moderate or complete erectile dysfunction. A similar prevalence of significant erectile dysfunction was found in men with diabetes in their late 40s. In another Australian study of 810 men aged 35–80 years,³ the overall prevalence of erectile dysfunction was 23.3% at baseline. Of the men with normal erectile function at baseline, 31.7% developed erectile dysfunction at five-year follow-up.

Classifications, causes and risk factors

Traditionally, the aetiology of erectile dysfunction is classified into organic, psychogenic or mixed. Organic causes include anatomical, vasculogenic (ie arterial or venous), neurogenic, endocrinological and drug-related side effects. Psychogenic

aetiology may be generalised or situational. In reality, however, anxiety and depression commonly accompany erectile dysfunction, irrespective of the original aetiology.⁴ Consequently, nearly all organic erectile dysfunction will eventually become 'mixed'. Risk factors for erectile dysfunction are listed in Table 1.

Table 1. Risk factors for erectile dysfunction

<ul style="list-style-type: none"> • Advanced age
<ul style="list-style-type: none"> • Atherosclerosis-related risk factors (eg cardiovascular disease, cigarette smoking, hypertension, dyslipidaemia, diabetes mellitus)
<ul style="list-style-type: none"> • Neurological conditions <ul style="list-style-type: none"> – Alzheimer's disease, multiple sclerosis, Parkinson's disease, stroke – Spinal cord disorders – Peripheral nerve disorder (eg diabetic neuropathy)
<ul style="list-style-type: none"> • Pelvic surgery (eg radical prostatectomy), radiation, trauma
<ul style="list-style-type: none"> • Endocrinological (eg hypogonadism, hyperprolactinaemia, thyroid disorder)
<ul style="list-style-type: none"> • Obesity and metabolic syndrome
<ul style="list-style-type: none"> • Penile abnormalities (eg Peyronie's disease, venous leak)
<ul style="list-style-type: none"> • Psychological and psychiatric conditions <ul style="list-style-type: none"> – Partner-related, stress, guilt, situational anxiety – Self-image problems, low self-esteem, history of sexual abuse, highly restricted sexual upbringing – Generalised anxiety disorder, depression, psychosis – Other disorders of arousal or orgasm: hypoactive sexual desire disorder, sexual aversion disorder, anorgasmia, postorgasmic illness syndrome
<ul style="list-style-type: none"> • Medication <ul style="list-style-type: none"> – Antihypertensive (eg diuretics, alpha and beta blockers) – Psychotropic medications (eg selective serotonin reuptake inhibitors and other antidepressants, antipsychotics, anxiolytics) – Anticonvulsants, anti-Parkinson's agents – Hormone-affecting – anti-androgens, corticosteroids, chronic opioid use
<ul style="list-style-type: none"> • Substance abuse <ul style="list-style-type: none"> – Alcohol – Illicit drugs (eg cannabis, barbiturates, cocaine, heroin, methamphetamine)
<ul style="list-style-type: none"> • Erectile dysfunction associated with other sexual dysfunction(s) (eg rapid ejaculation)

Diagnosis and assessment

Many men lack the opportunity or, for various reasons including embarrassment, cultural barriers or taboos, or scepticism of treatment success, are reluctant to bring up the subject of erectile dysfunction with their doctor. In a telephone survey of 5990 Australian men aged 40 years or older,⁵ only 30% of men with moderate-to-severe erectile dysfunction discussed their problem with a health professional. Moreover, GPs may be disinclined to

bring up the subject because of lack of interest, time constraint or their own discomfort.⁶ Nevertheless, GPs should overcome these barriers and assess sexual health proactively.

Providing the patient with the opportunity to discuss his erectile problems in a non-judgemental manner is the first key step to diagnosis. It is often useful to start with a 'normalisation' statement that leads to a probing question, including: 'Many men at your age are at risk of sexual dysfunction, so I would like to know if you have questions or concerns about your sexual function'. Consideration should be given to the patient's unique ethnic, cultural and personal background. Evaluation should continue with a complete medical, sexual and psychosocial history. An in-depth approach to obtaining sexual history is provided by Althof et al.⁶ If the patient consents, it is preferable if the partner is available and willing to be present at the consultation. The partner not only serves as a valuable source of information, but could significantly affect the patient's response to, and adherence with, treatment.⁷

History

First, it is important to verify the nature of the sexual problem. Some men may confuse premature ejaculation or loss of libido with erectile dysfunction. An accurate delineation of the problem is essential for further management. Sexual history should assess the current state of the patient's relationship with his partner, libido, erectile hardness and whether it is sufficient for penetration, penile deformity or pain, ejaculation and orgasm. A thorough medical history may reveal risk factors for erectile dysfunction (including possible offending medications) and associated comorbid conditions. It should include cardiovascular risk factors, features of metabolic syndrome, neurological conditions, lower urinary tract symptoms (often associated with erectile dysfunction), sleep apnoea, history of depression and substance abuse, and surgical history. Validated questionnaires such as the Sexual Health Inventory of Men (SHIM) can be very useful to assess baseline function and response to treatment.⁸

Examination

Given the multiple aetiologies and various systems that can be involved in erectile dysfunction, the physical examination should be focused, yet must take into account the relevant genitourinary, vascular, endocrine and neurological areas. More often than not, the physical examination will not reveal the diagnosis. Occasionally, however, findings such as the presence of penile plaques (Peyronie's disease) or small testis size (measured with an orchidometer) and signs of lack of androgenisation may point towards the diagnosis.

Investigations

Depending on the patient's age, risk factors and physical examination findings, testing can be individualised. However, most men should be screened for hypogonadism (morning

testosterone), diabetes (glycated haemoglobin or fasting blood glucose) and dyslipidaemia.

Treatment of erectile dysfunction by the GP

If any types of reversible causes are identified in the assessment, these should be treated initially. Typical reversible causes include hormonal imbalance (eg low testosterone), medication-induced erectile dysfunction and psychogenic erectile dysfunction. Modifiable risk factors, such as diabetes, hypertension, smoking and dyslipidaemia, should be optimised as well. Lifestyle modifications, risk factor optimisation, pharmacological and psychological treatments are not mutually exclusive, and patients are often better served by an integrative approach. For example, combining psychological treatment with a phosphodiesterase type 5 (PDE5) inhibitor may optimise the treatment response in patients with psychogenic erectile dysfunction.⁹

Men with sexual misconceptions or mild anxiety may benefit from the guidance and reassurance of a trusted clinician.¹⁰ Referral to a qualified allied health professional (ideally with an interest in sexual dysfunction) may be necessary in many cases of psychosocial-related erectile dysfunction. Furthermore, the patient's sexual partner should be considered. They may experience their own sexual health problems, such as low desire or vaginal dryness, and may be uncomfortable with their partner's renewed interest in sex after successful treatment of longstanding erectile dysfunction. At times, relationship counselling can help to manage expectations and facilitate a smoother return to an active sex life.

Assessment of erectile dysfunction provides the opportunity to identify numerous comorbidities that are associated with erectile dysfunction. Some of these more common conditions, and the unique role of the GP in their assessment, are further discussed. However, many other conditions, including cancer or chronic diseases, can be associated with erectile dysfunction,^{11,12} but their unique features are outside the scope of this review. Table 2 provides a stepwise approach to erectile dysfunction management and treatment by the GP.

Depression

Erectile dysfunction and depression have a bidirectional relationship. Depression and its treatments can cause erectile dysfunction, while sexual dysfunction may be a cause of depression in itself.¹³ To complicate matters, both can be related to other psychosocial (eg marital problems) or medical conditions. Depression in males often goes unrecognised, especially by a specialist. Lee et al¹⁴ showed that as many as one-third of the men presenting to a sexuality clinic had a major current psychiatric disorder. However, only one-third of those men were identified as having a mental disorder by the urologist. Consequently, it is important to evaluate for signs of depression in a patient presenting with erectile dysfunction. Understanding the precipitators and circumstances of these two conditions may

assist the physician to choose the course of treatment. This may be complicated further by the fact that many antidepressants may be detrimental to sexual health, precipitating decreased libido, delayed ejaculation and erectile dysfunction. In certain cases, patients may benefit from a psychiatric consultation.

Metabolic

Metabolic syndrome, comprising central obesity, hypertension, increased fasting blood glucose levels and dyslipidaemia, has been linked with erectile dysfunction.¹⁵ While the worldwide prevalence of metabolic syndrome is increasing, erectile dysfunction has been reported in up to 80–95% of patients with metabolic syndrome.¹⁵ There are several pathways in which metabolic syndrome may impair erectile function, including hormonal changes, inflammation, endothelial dysfunction and atherosclerosis. Patients with metabolic syndrome may benefit from lifestyle modifications, pharmacological interventions or surgery. Treatment of metabolic syndrome may result in improvement in erectile function.

Cardiovascular

A growing body of literature has identified erectile dysfunction as being associated with cardiovascular disease (CVD).¹⁶ This is often overlooked, but erectile dysfunction has a similar or greater predictive value for cardiovascular events than traditional risk factors, such as family history of myocardial infarction, smoking or hyperlipidaemia.¹⁷ Furthermore, erectile dysfunction usually precedes coronary symptoms by three years and might be considered an early marker of CVD.¹⁶ The Princeton Consensus, a multispecialty collaboration, published comprehensive recommendations addressing the management of erectile dysfunction in the context of CVD.¹⁸ Depending on the patient's risk level, further investigation (stress test) or referral to a cardiologist may be required.

Medication

Numerous medications, including commonly used drugs such as antihypertensive agents or psychotropic medications, may negatively affect erectile function. Notably, beta-blockers are the worst offenders of cardiovascular drugs causing erectile dysfunction. It is prudent to discuss the benefits and disadvantages of the medication with the patient, and consider alternative medications without sexual side effects. It is also important to recognise that many men with erectile dysfunction may be using supplements to try to enhance their sexual performance. Most of these nutraceuticals have not been adequately investigated and may have unrecognised side effects and drug interactions.¹⁹

Pharmacological treatment

The most common first-line therapy is a PDE5 inhibitor. The commercially available drugs in Australia are sildenafil, tadalafil

Table 2. Stepwise approach to erectile dysfunction treatment

- **Initiate discussion**
 - Enquire on sexual health with open-ended questions while taking consideration of the patient's unique ethnic, cultural and personal background
- **Define the sexual problem**
 - Differentiate between loss of libido, premature ejaculation, loss of erectile hardness, penile curvature or deformity, ejaculatory or orgasmic dysfunction
- **History**
 - Evaluate for risk factors and related comorbidities
 - Evaluate sexual and psychosocial history
 - Assess Sexual Health Inventory for Men (SHIM) score
- **Physical examination**
 - Blood pressure measurement, cardiovascular assessment
 - Body mass index, waist circumference measurement
 - Genitalia examination
- **Blood tests**
 - Morning testosterone, glycated haemoglobin or fasting blood glucose, lipid panel
- **Treatment**
 - Optimise modifiable risk factors and related comorbidities (as appropriate)
 - Lifestyle – smoking cessation, healthy diet, exercise, reduce alcohol intake, avoid recreational drugs
 - Re-enforce blood pressure, dyslipidemia, diabetes control
 - Assess for cardiovascular disease
 - Treat reversible causes
 - Low testosterone
 - Medication-induced erectile dysfunction – consider alternatives
 - Psychogenic erectile dysfunction – consider referral to a therapist
 - First-line therapy (phosphodiesterase type 5 inhibitor)
 - Referral to a urologist
 - Second-line therapies (eg penile injections, vacuum erection devices, external shock wave lithotripsy)
 - Third-line therapies (eg penile prosthesis)

and vardenafil. Key differences between the drugs are shown in Table 3. PDE5 inhibitors have a generally excellent safety profile, and significant or permanent side effects are extremely rare. In general, side effects cease with cessation of medication. Some side effects were described to resolve over time with a long term use of daily 5 mg tadalafil.²⁰ When choosing the appropriate PDE5 inhibitor, the physician should take into consideration the patient's preferences, including frequency and timing of intercourse, cost (sildenafil is the cheapest as it is off-patent), side-effect profile, significance of spontaneity and satisfaction from previous use. PDE5 inhibitors should not be taken by men who are prescribed nitrate drugs.

There is no large-scale, good-quality comparative study of these drugs. Because of its prolonged half-life, a daily dose of tadalafil 5 mg will allow for constant blood levels. Tadalafil has also been shown to improve lower urinary tract symptoms (LUTS) and, hence, may be useful in men who have erectile dysfunction and LUTS. Contraindications to PDE5 inhibitors include use of topical nitrates, severe congestive cardiac failure, unstable angina (or angina with sexual intercourse), resting hypotension, recent stroke and myocardial infarction. Before classifying a patient as 'non-responsive to PDE5 inhibitors, it should be verified that:

- the medication was sourced from an accredited pharmacy (ie not online, overseas)
- it was taken as directed (sildenafil and vardenafil are usually prescribed on an empty stomach as absorption is reduced after fatty meals) and was allowed adequate time to onset of action before sexual stimulation
- sexual stimulation was attempted
- the patient was prescribed the maximum dose allowed
- the patient trialled at least two different types of PDE5 inhibitor and at least three times.

Management by specialist

Investigations

Most patients will not need specialised investigations. For patients in whom the aetiology is unclear, or first-line or second-line treatments have not worked, ultrasonography should be considered.²¹ A penile duplex Doppler ultrasound, using an intracavernosal vasoactive agent, can help to classify the aetiology of erectile dysfunction and may help direct if further subspecialised tests are needed. It can also predict which treatments may be beneficial. If arteriogenic erectile dysfunction is diagnosed, consideration of referral to a cardiologist for assessment of occult ischaemic heart disease is warranted.

Second-line treatments

When first-line treatment has failed, second-line therapies should be instituted.

Penile injections

Penile injections can be a useful treatment for those who do not respond to a PDE5 inhibitors. It allows a 'natural' erection to occur within 10–15 minutes of administration and, with the correct dosage, should last for under an hour. Alprostadil is the only widely available commercial product in Australia. Alternatives are compounded medications, which are cheaper, but require refrigeration. Structured training of patients in how to administer penile injections (especially with compounded medications) and monitoring for efficacy and side effects can help increase the success of penile injection therapy. The side effects of penile injections include pain (10%, especially with alprostadil), prolonged erections (5%) and fibrosis (2%).²²

Table 3. Comparison of the three commercially available phosphodiesterase type 5 inhibitors in Australia

	Sildenafil	Tadalafil	Vardenafil
Dosage	25 mg, 50 mg, 100 mg	5 mg, 10 mg, 20 mg	5 mg, 10 mg, 20 mg
Administration	On demand	On demand or daily	On demand
Absorption affected by fatty meal	Yes	No	Yes
Time to peak serum concentration (approximately)	1 hour	2 hours	1 hour
Half-life (approximately)	4 hours	18 hours	4 hours
Off-patent	Yes	No	No
Improve voiding symptoms	Not assessed	Yes (daily dose)	Not assessed
Common side effects	Headache, flushing, dyspepsia, nasal congestion, abnormal vision	Headache, dyspepsia, back ache and myalgia, flushing, nasal congestion	Headache, flushing, dyspepsia, nasal congestion, abnormal vision

Vacuum erection devices

These devices draw blood into the corpora and an occlusion ring is placed at the base of the penis to sustain the erection. A certain level of dexterity is needed to use a vacuum erection device (VED); however, when used in the correct fashion, an erection suitable for penetration is often the result. Most men cease using a VED in the long term because of potential side effects such as pain, inability to ejaculate, bruising, ‘hinging’ and paraesthesia.

Low-intensity external shockwave lithotripsy

Low-intensity external shockwave lithotripsy (LIESWL) applied to the penis has been shown to significantly improve erectile function,²³ especially in patients who are considered to have arteriogenic erectile dysfunction. The mechanism of action is still unclear and may involve recruitment of stem cells and/or angiogenesis. Studies to date have involved small numbers of patients and had short-term follow-up. More research is needed before this relatively new treatment modality can be considered mainstream.

Third-line therapy

Penile prostheses (penile implants) are concealed, surgically implanted devices, generally reserved for patients in whom other conservative therapies have failed. Penile prostheses offer patients a permanent solution to their erectile dysfunction. For this reason, and combined with a low complication rate seen with high-volume penile implant surgeons, patient and partner satisfaction rate for this procedure is >90%.²⁴ Patients should be strongly advised that this is an irreversible procedure and a final choice of erectile dysfunction treatment.

Key points

- Be proactive in questioning your patient about his sexual

health. Including the partner in further investigation into erectile dysfunction is beneficial.

- The evaluation of erectile dysfunction provides a good opportunity for patient education, optimising risk factors and assessing for other comorbidities.
- Erectile dysfunction should be suspected as an early warning sign for CVD. It may prompt further investigation considering the patient’s risk.
- A suitable PDE5 inhibitor should be selected according to its pharmacokinetics. Provide proper guidance and ensure proper use before classifying a patient as ‘non-responsive’.

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