What is erectile dysfunction (ED)?

- ED is the persistent inability to attain and/or maintain an erection sufficient for satisfactory sexual performance.
- ED is caused by various vascular, neuronal, hormonal and metabolic factors, mediated by endothelial and smooth-muscle dysfunction.
- Although most causes of ED are physical, some are due to psychosexual issues; nevertheless, all patients with ED should have a history, examination and investigations performed, even if a psychological cause is suspected.
- ED is a cardiovascular (CV) risk factor, posing a risk equivalent to that of current, moderate smoking.
- ED is also an important marker for future CV events, with symptoms occurring some 3–5 years before an event.
- The physical and psychosocial effects of ED can significantly affect the quality of life of patients and their partners.

Who is at risk?

- The risk factors for ED are similar to those for cardiovascular disease (CVD):
  - Older age
  - Sedentary lifestyle
  - Obesity
  - Dyslipidaemia
  - Metabolic syndrome
  - Diabetes
  - Smoking

What are the other benefits of case-finding ED in practice?

- Increasing awareness regarding the availability of safe and effective oral drugs for ED, has led to more men seeking help for this condition, which facilitates the early detection of:
  - Diabetes (ED may be the first symptom in up to 20% of men).
  - Dyslipidaemia (may not require treatment according to primary prevention guidelines, but may be a major reversible component in ED).
  - Occult cardiac disease (in an otherwise asymptomatic man, ED may be a marker for underlying coronary artery disease).
  - Testosterone deficiency (TD; a reversible cause of ED that may not require specific ED treatment, and which also has other long-term health implications).
  - Associated lower urinary tract symptoms (LUTS)/benign prostatic hyperplasia (BPH) (ED and LUTS severity are closely related, and treatments for one condition may beneficially or adversely affect the other).
History taking

- **Obtain** a detailed description of the problem, including:
  - Symptom duration
  - Predisposing, precipitating and maintaining factors (if identified)
  - Any subsequent investigations
  - Previous/current treatment interventions and response
  - Reported tumescence, rigidity and quality of morning, spontaneous, masturbatory and/or partner-related erections
  - Sexual desire
  - Ejaculatory timing, control and orgasmic dysfunction
  - Previous erectile capacity
  - Any personal issues regarding sexual aversion or pain
  - Any partner issues, such as low sexual desire, menopause or gynaecological pain

- **Record** concurrent medical, psychiatric and surgical history, current relationship status, history of sexual partners and relationships, alcohol intake, smoking status and recreational drug use

- **Consider** the use of validated questionnaires, (such as the IIEF, shorter version of the SHIM, IPSS or AMS scale) to assess sexual function domains and response to therapy

- **Note** any issues regarding sexual orientation and gender identity

AMS – Aging Males’ Symptoms, IIEF – International Index of Erectile Function, IPSS – International Prostate Symptom Score, SHIM – Sexual Health Inventory for Men

Physical examination

- **Measure** heart rate, blood pressure, abdominal circumference, weight, and height if body mass index required

- **Conduct** a DRE of the prostate if there are genitourinary or protracted secondary ejaculatory symptoms

- **Perform** a genital examination, particularly with pain of sudden onset, deviation of the penis during tumescence, symptoms of TD, or other urological symptoms (past or present)

DRE – digital rectal examination

Investigations

- **Check** serum lipids, fasting plasma glucose and/or glycated haemoglobin

- **Measure** serum TT in the morning (before 11 am), in the fasting state. If low (TT <8 nmol/L) or borderline (TT 8–12 nmol/L), repeat with serum LH and prolactin. FT has a greater correlation with clinical symptoms of TD. FT and bioavailable testosterone can be calculated from TT, SHBG and albumin; an online FT calculator and downloadable app, sponsored by the Primary Care Testosterone Advisory Group (PCTAG), can be found at http://www.pctag.uk/testosterone-calculator/. If levels are abnormal, consider specialist referral

- **Consider** specialist investigations in men who:
  - Wish to know the aetiology of their ED
  - Have an arterial abnormality on Doppler ultrasound
  - Have a history of trauma
  - Are young and:
    - Have always had trouble obtaining/maintaining an erection
    - Have a primary CV abnormality
    - Have suspected primary venous leakage
    - Are being considered for surgical intervention
  - Have an abnormality of the penis or testes
  - Have not responded to medical therapy and may want surgical treatment

- **Consider** measuring PSA if clinically indicated, and certainly before commencing testosterone therapy and at 3, 6, and 12 months afterwards

- **Consider** thyroid function tests

FT – free testosterone, LH – luteinising hormone, PSA – prostate-specific antigen, SHBG – sex hormone-binding globulin, TT – total testosterone
**Diagnosing and managing ED in primary care**

- The primary objective in the management of ED is to enable the man or couple to enjoy a satisfactory sexual experience.
- When managing ED, consider not only the efficacy and safety of the different treatments, but also patient and partner preference, and all the factors that may influence this.
- It is of paramount importance to use the opportunity to manage any previously undiagnosed comorbidities that present following the patient assessment, and to treat to target any existing conditions and make lifestyle modifications, where necessary.

**First-line treatment interventions**
Lifestyle and risk factor modification

- PDE5I
  - (consider daily tadalafil for men with ED and bothersome LUTS)
  - or
  - Vacuum erection device

**Second-line treatment interventions**
Intercavernous injection therapy

- or
  - Intraurethral alprostadil
  - or
  - Alprostadil cream
  - or
  - Low-intensity extracorporeal shock wave therapy

**Third-line treatment interventions**
- Penile prosthesis

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LUTS – lower urinary tract symptoms, PDE5I – phosphodiesterase type 5 inhibitor
ED therapies

**PDE5i**
- 25–50% of men fail to respond within 12 months.
  - Rates are higher in men with T2DM or post-RP.
- Inadequate prescribing/instruction is the main cause of treatment failure.
- Daily/frequent dosing regimens may salvage men who’ve failed on-demand therapy.
- Correction of testosterone levels <10.4 nmol/L may salvage non-responders.
- Nitrates may be safely discontinued (with a cardiologist’s approval), to aid therapy.
- Co-administration with antihypertensives may increase the drop in blood pressure.

**Contraindications** include:
- Use of nitrates in any form, guanylate cyclase stimulators, potent CYP3A4 inhibitors.
- Loss of vision in one eye due to NAION.
- Severe renal/hepatic impairment.
- Hypotension.

**Dose adjustments** may be required in:
- Renal or hepatic impairment.
- Concomitant use of CYP3A4 inhibitors.

**Apply caution** in:
- Patients receiving alpha-blockers and those with anatomic penile deformities or a predisposition to priapism.

**Possible adverse effects** include:
- Headache.
- Dizziness.
- Flushing.
- Dyspepsia.
- Nasal congestion.

**Vacuum erection devices**
- Highly effective, regardless of ED aetiology.
- Reported satisfaction rates vary between 35% to 84%.
- Can be a useful adjunct to PDE5i/injection therapy post-RP, to salvage treatment failures.
- Work best if the man and his partner receive sufficient instruction, and have positive attitudes towards their use.

**Contraindications** include:
- Bleeding disorders.
- Concurrent anticoagulant therapy.

**Possible adverse effects** include:
- Bruising.
- Local pain.
- Failure to ejaculate.
- Coldness of the penis.

**Alprostadil cream**
- Store alprostadil cream (Vitaros) in the refrigerator.
- Apply 300 μg in 100 mg (3 mg/g) into the urethral meatus at room temperature.
- Improved tumescence of the glans may be useful in men post-penile prosthesis.
- Has been shown to produce a 2.5-point increase in IIEF and a 15% relative increase in successful intercourse attempts.

**Contraindications** include:
- Anatomical deformity of the penis.
- Predisposition to priapism.

**Apply caution** in:
- Men whose partners could be pregnant (a condom must be used).

**Possible adverse effects** include:
- Penile pain.
- Penile swelling.
- Flushing of face/trunk (A/P).

**Intra-urethral alprostadil**
- Less invasive than injection therapy but works for only ~30–60% of patients.
- Higher doses of MUSE (500/1000 μg) are usually required.

**Contraindications** include:
- Anatomical deformity of the penis.
- Predisposition to priapism.

**Apply caution** in:
- Men whose partners could be pregnant (a condom must be used).

**Possible adverse effects** include:
- Penile pain.
- Haematoma.
- Headache.
- Dizziness.
- Hypotension.
- Muscle spasm.

**Intracavernous injections**
- Include alprostadil and aviptadil+phentolamine (A/P).
- Alprostadil is effective in >70% of men, but compliance rates may be low.
- A/P has similar efficacy to alprostadil, with less painful injections.
- Unlike alprostadil, A/P injections need to be accompanied by some form of sexual stimulation for an optimal erection.

**Contraindications** include:
- Predisposition to priapism.
- Penile implants.

**Possible adverse effects** include:
- Bruising and haematoma at injection site.
- Penile pain (alprostadil).
- Flushing of face/trunk (A/P).

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