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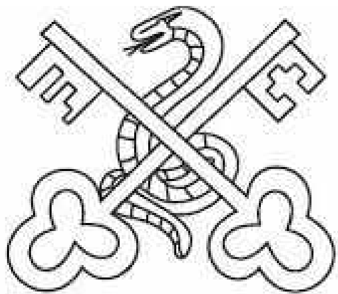
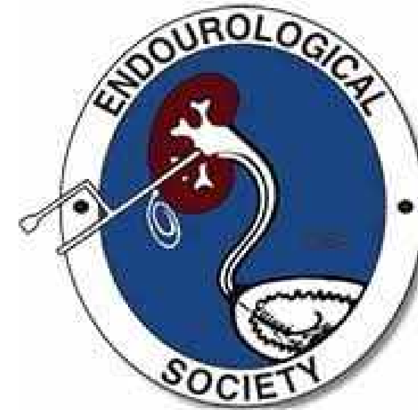
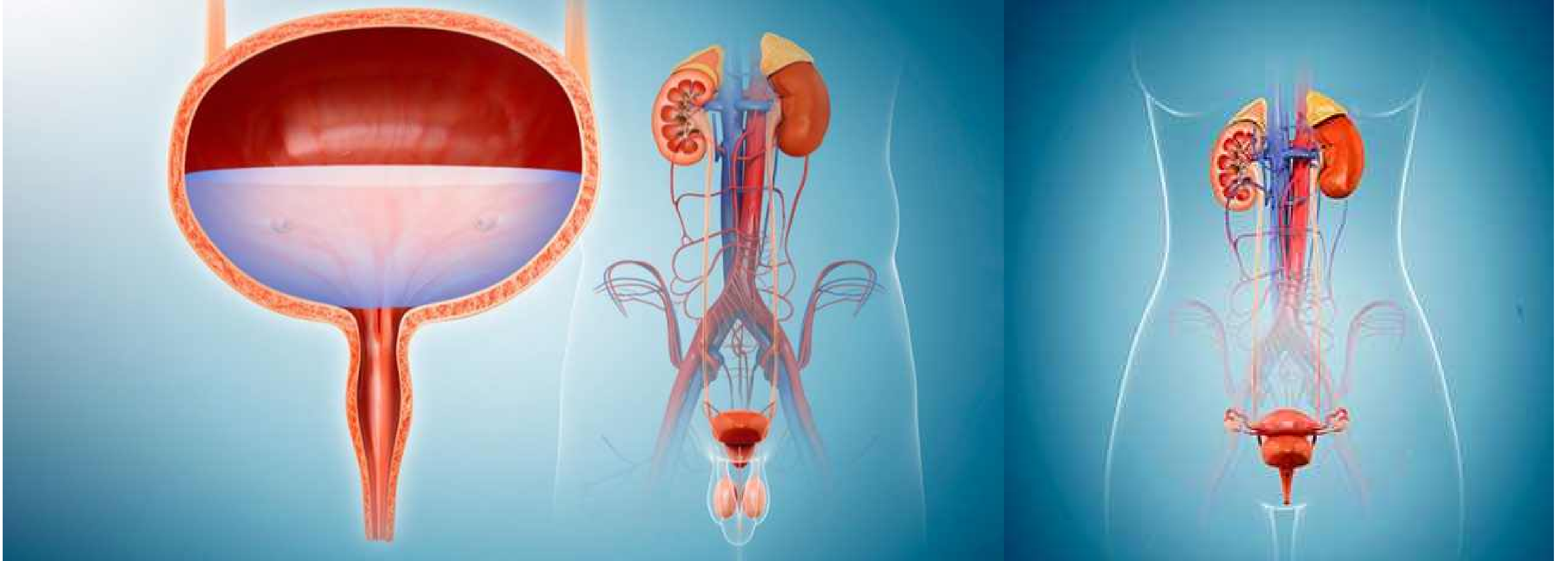
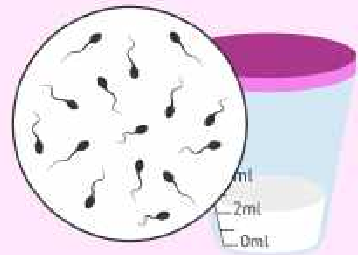


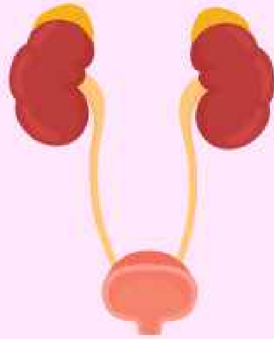


# UROLOGY



# ANDROLOGY





Andrology

Urology

- Men’s health
- Sexual health
- Endocrinology of the testis
- Fertility
- Chronic pelvic or testicular pain
- Plastic surgery of the urethra and external genitalia
- Oncology of male external genitalia

# Erectile dysfunction

….persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance…

NIH Consensus Conference, 1993

# Erectile Dysfunction

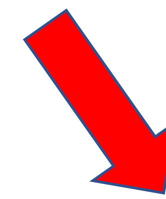
**Aim of assessment**

- To differentiate psychogenic ED from organic
- To identify potentially reversible causes
- To identify co-existing pathology, including cardiovascular risk factors

# Common risks factors with CAD

- obesity
- diabetes mellitus
- dyslipidaemia
- metabolic syndrome
- lack of exercise
- hypertension
- smoking

atherosclerosis
&
endothelial dysfunction



ED + CAD

- 300 pts – Angio confirmed CAD: Prevalence of ED- 49%
- In 67% , ED *preceded* CAD symptoms: mean interval 3 years

Montorsi 2003

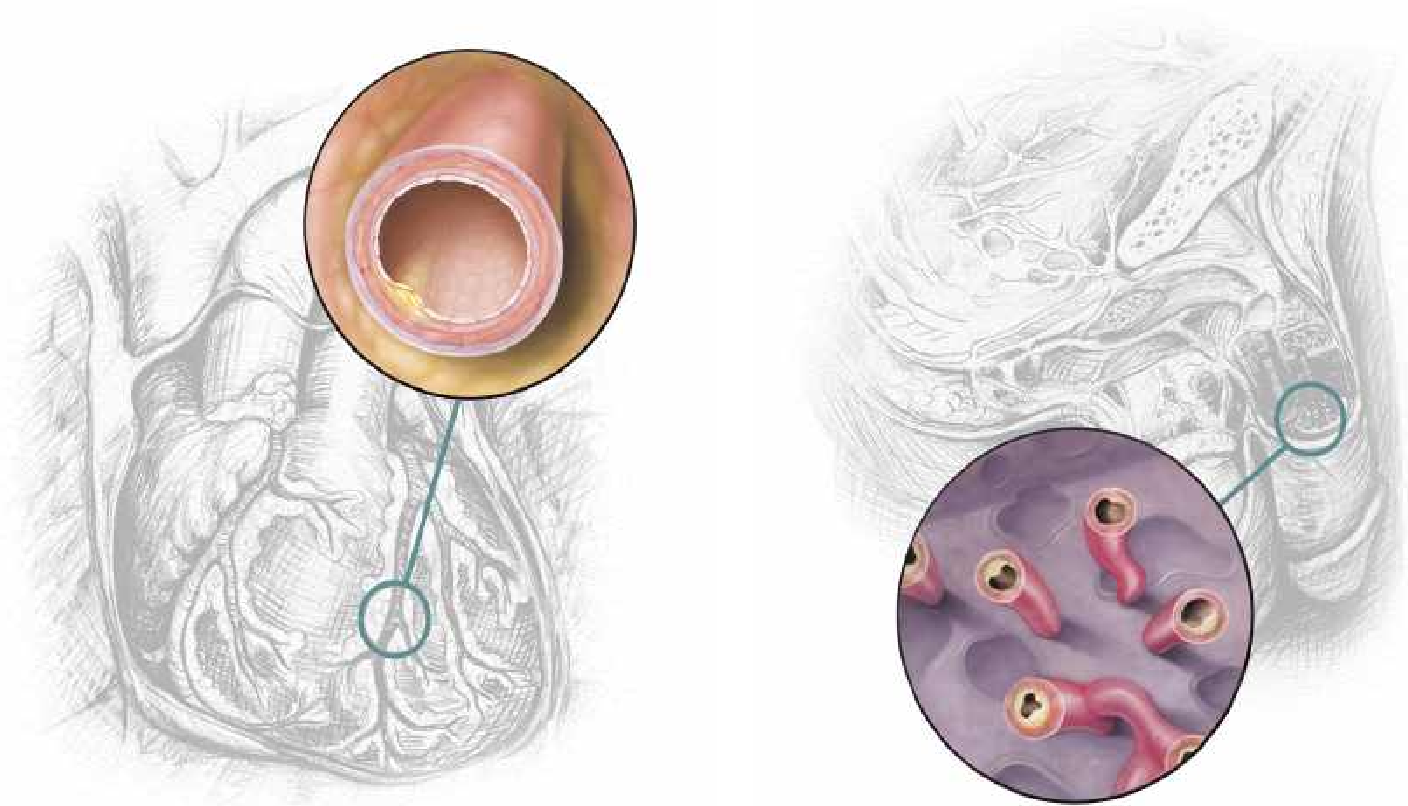


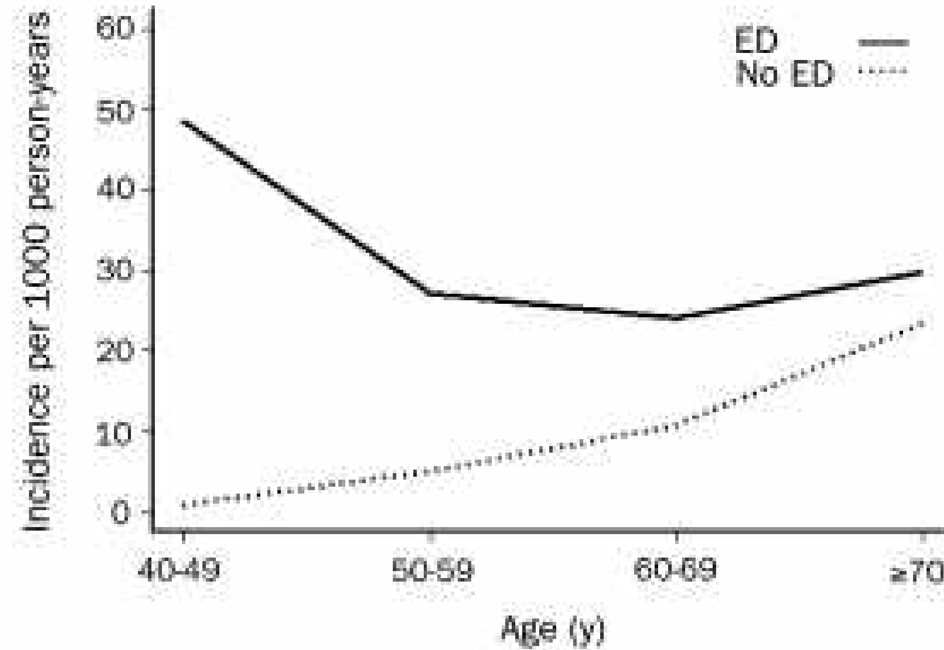
**Table 1** Artery size and atherothrombosis. A significant restriction to flow in the penile arteries may be subclinical in larger vessels.

| Artery | Diameter (mm) | Clinical Event |
|---|---|---|
| Penile | 1–2 | ED |
| Coronary | 3–4 | Ischaemic heart disease |
| Carotid | 5–7 | TIA/stroke |
| Femoral | 6–8 | Claudication |

TIA = transient ischaemic attack.

Jackson 2013

# Incidence of coronary artery disease with respect to age and erectile dysfunction (ED) status.




Inman et al. 2009

# Risks factors

- Age
- LUTS
- DM duration
- poor glycaemic control
- BMI
- COPD
- hyperhomocysteinaemia
- chronic liver failure associated with hepatitis B
- RP – EBRT – brachytherapy for PCa

# Basic work-up

- detailed medical and sexual history
- preferably with partner present
- relaxed atmosphere during history-taking
- physical examination

# History

- Onset sudden vs gradual
- ? normal nocturnal/ early morning erections
- ?Normal libido
- ?problems getting/ maintaining/ both
- Any ejaculatory problems
- Any situational variation
- Relationship issues/ life stress/trigger
- What tried if anything

- Co-morbidities /Medications/ Drugs
- Validated questionnaires (IIEF)

***Sudden onset, situational ED, young age group, no comorbidities, preserved morning erections more likely to be psychological***

**Table 3 .** Drugs that may cause erectile dysfunction.

| Drug class | Examples |
|---|---|
| Diuretics* | Thiazides (for example bendroflumethiazide), spironolactone |
| Antihypertensives† | Methyldopa, clonidine, beta-blockers (for example propranolol), verapamil |
| Fibrates‡ | Clofibrate, gemfibrozil |
| Antipsychotics | Phenothiazines (for example chlorpromazine), butyrophenones (for example haloperidol) |
| Antidepressants | Tricyclics (for example amitriptyline), monoamine oxidase inhibitors (for example phenelzine), selective serotonin reuptake inhibitors (for example fluoxetine), lithium |
| Histamine ($H_2$)-antagonists§ | Cimetidine, ranitidine |
| Hormones and hormone-modifying drugs | Oestrogens (for example estradiol), progesterone, corticosteroids (for example prednisolone), cyproterone acetate, 5-alpha reductase inhibitors (for example finasteride) |
| Cytotoxics | Cyclophosphamide, methotrexate |
| Anti-arrhythmics and anticonvulsants | Disopyramide, carbamazepine |

* Consider loop diuretics (for example furosemide). † Consider angiotensin-converting enzyme (ACE) inhibitors or other calcium-channel blockers (for example lisinopril). ‡ Consider statins (although these have also been linked to erectile dysfunction). § Consider proton pump inhibitors (for example omeprazole).

**Data from:** [Hackett et al, 2008; British Society for Sexual Medicine, 2009; Wespes et al, 2012]

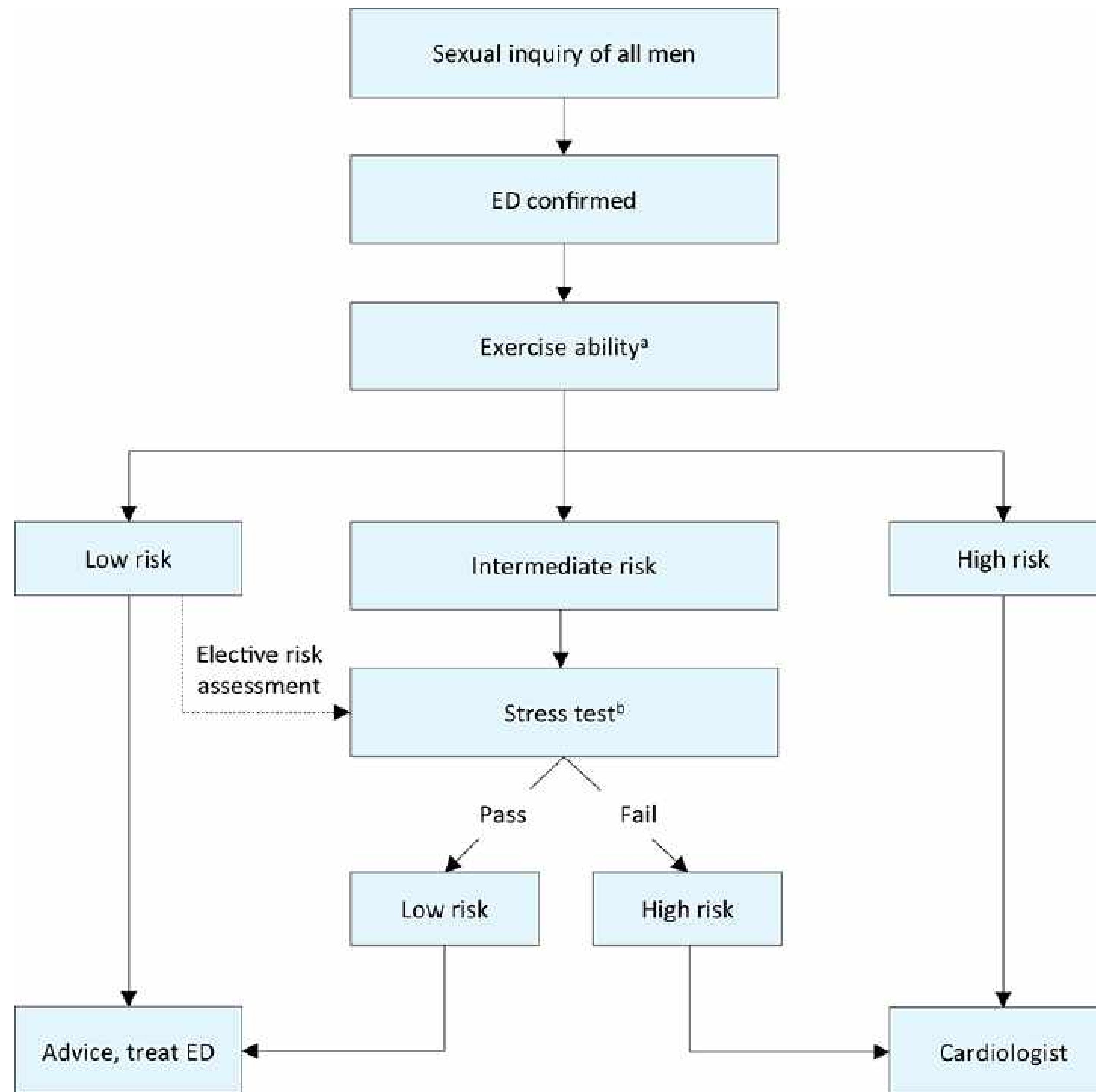
# Assess Cardiovascular Status

***Ensure no contributing cause, significant co-morbidity, or contraindication to treatment that requires special cardiological assessment***

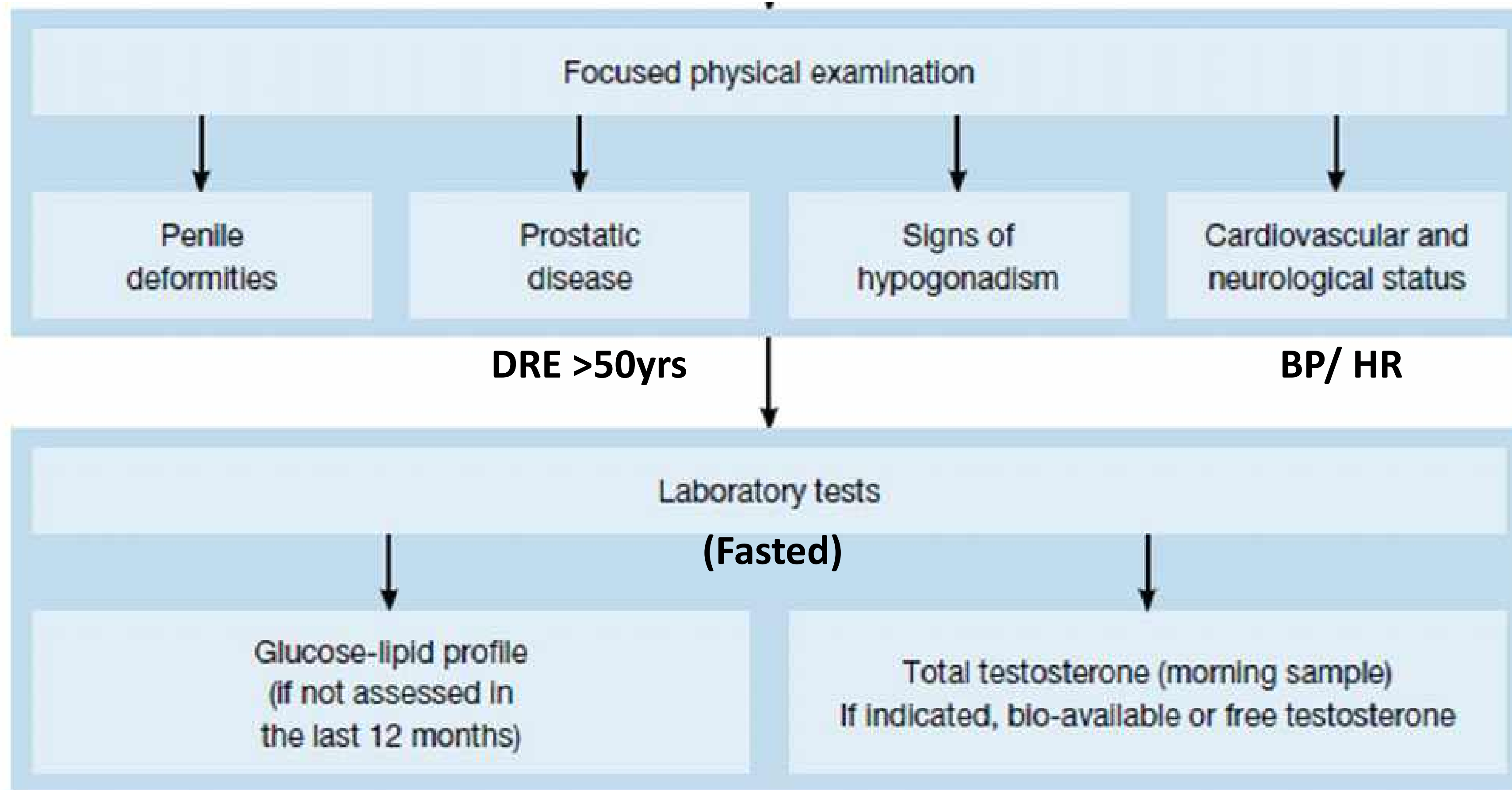
| Low-risk category | Intermediate-risk category | High-risk category |
|---|---|---|
| Asymptomatic, < 3 risk factors for CAD (excluding sex) | ≥ 3 risk factors for CAD (excluding sex) | High-risk arrhythmias |
| Mild, stable angina (evaluated and/or being treated) | Moderate, stable angina | Unstable or refractory angina |
| Uncomplicated previous MI | Recent MI (> 2, < 6 weeks) | Recent MI (< 2 weeks) |
| LVD/CHF (NYHA class I) | LVD/CHF (NYHA class II) | LVD/CHF (NYHA class III/IV) |
| Post-successful coronary revascularisation | Non-cardiac sequelae of atherosclerotic disease (e.g., stroke, peripheral vascular disease) | Hypertrophic obstructive and other cardiomyopathies |
| Controlled hypertension | | Uncontrolled hypertension |
| Mild valvular disease | | Moderate-to-severe valvular disease |

*CAD = coronary artery disease; CHF = congestive heart failure; LVD = left ventricular dysfunction; MI = myocardial infarction; NYHA = New York Heart Association.*

Kostis et al. 2005




*a Sexual activity is equivalent to walking 1 mile on the flat in 20 minutes or briskly climbing two flights of stairs in 10 seconds.*
*b Sexual activity is equivalent to four minutes of the Bruce treadmill protocol*




Additional bloods

- PSA if >50yrs or suspicious DRE/ LUTS
- PRL/ LH / Free testosterone if total is testosterone low

# Indications for further studies

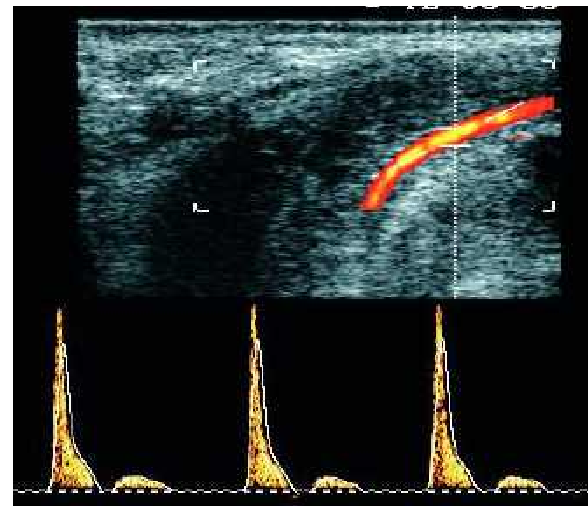
- Young man with unexplained organic ED, significant atherosclerotic risk factors or disease
- Non responder to medical treatment
- Young patient with ED post perineal / pelvic trauma
- Complex Psychogenic ED
- Peyronie’s disease and erectile dysfunction prior to surgical correction

# Penile Doppler US

- Dynamic test (PGE1 injection)
- Peak systolic velocity
  - > 30 cm/s normal
  - < 25 cm/s abnormal (arteriogenic)
- End diastolic velocity
  - < 3 cm/s normal
  - PSV >30 and EDV> 5 cm/s abnormal (venogenic)
- <u>Doppler flaws</u>
  - Stress → high → poor erection
  - Cannot confirm venous problems in absence of erection
  - Must correlate with clinical

Normal Arterial Duplex Ultrasound Determinants as Stratified by Age*

| *Age, y* | *PSV, cm/s* |
|---|---|
| 20–29 | 53.7 |
| 30–39 | 45.0 |
| 40–49 | 45.0 |
| 50–59 | 33.4 |
| 60–69 | 33.0 |
| 70–79 | 32.9 |



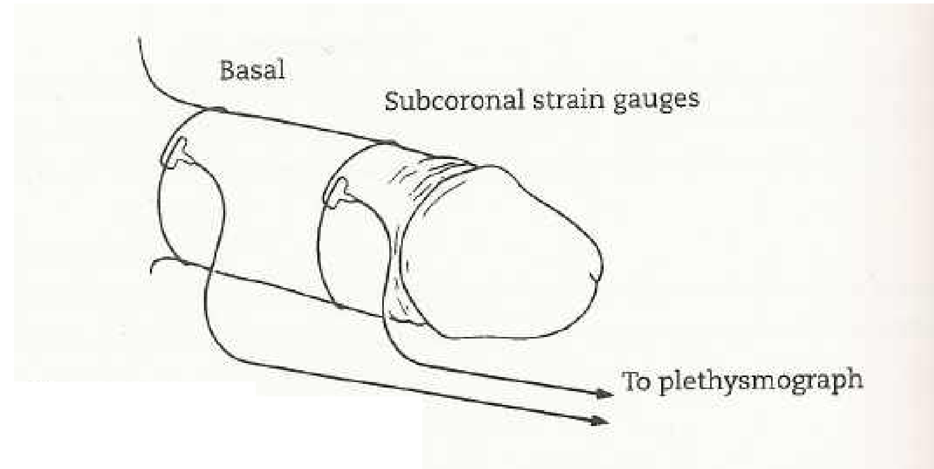
* Broderick et al.1994

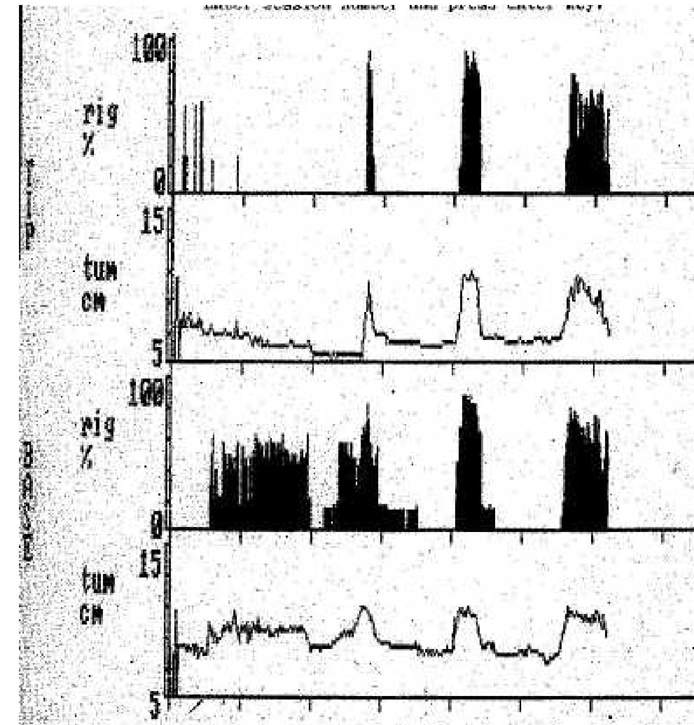
# Nocturnal penile tumescence and rigidity test

- Differentiates psychogenic vs organic
- Overnight (2 nights)
- Normal patient
  - erection in REM sleep
  - usually ~4 of 30-60 mins duration
- Normal study:
  - >2 erections / night
  - >60% rigidity at tip for >10mins

(Hatzichristou et al.1998)

- NPT Flaws: false negatives with
  - Sleep disorders (loss of REM)
  - Depression (esp. if early morning wakening)
  - Hypogonadism



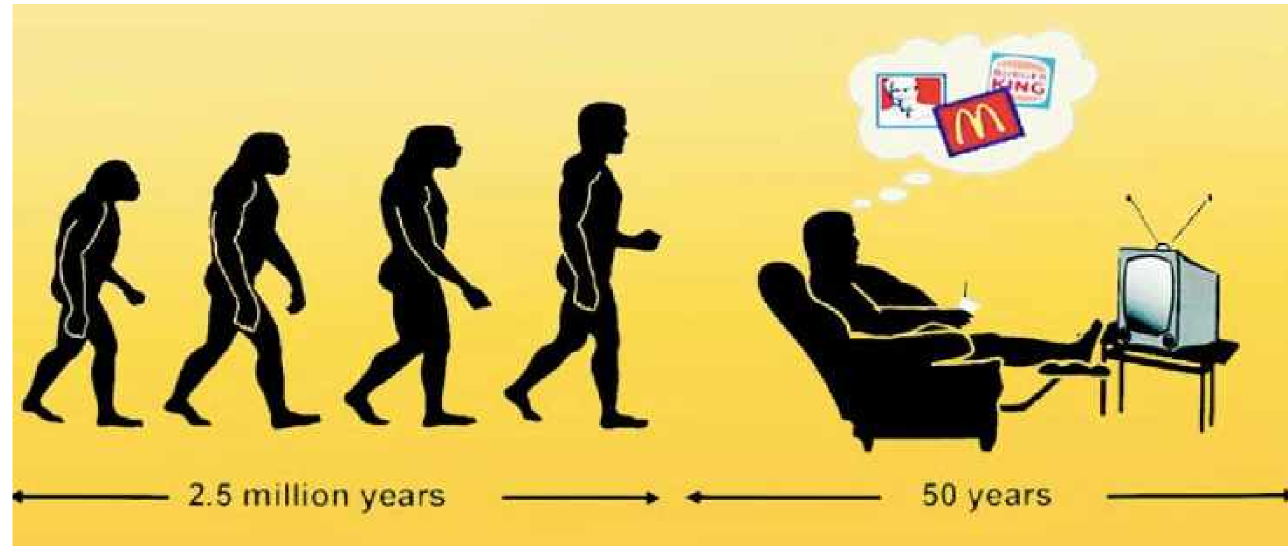



# Management

Risk factor modifications first

- Stop smoking
- Balanced diet
- Loose weight
- Improve physical activity
- Treat latent dyslipidaemia, hypertension, diabetes
- Change anti-hypertensive
- Treat endocrine abnormality (hyperprolactinaemia/ low testosterone / thyroid abnormality)

# Metabolic syndrome




- x 5 risk of type II DM
- x 3 greater risk of heart attack, stroke

- Increased likelihood of
  - low testosterone (Makhsida et al. 2005)
  - ED by 48% (Heidler et al. 2007)

# Management

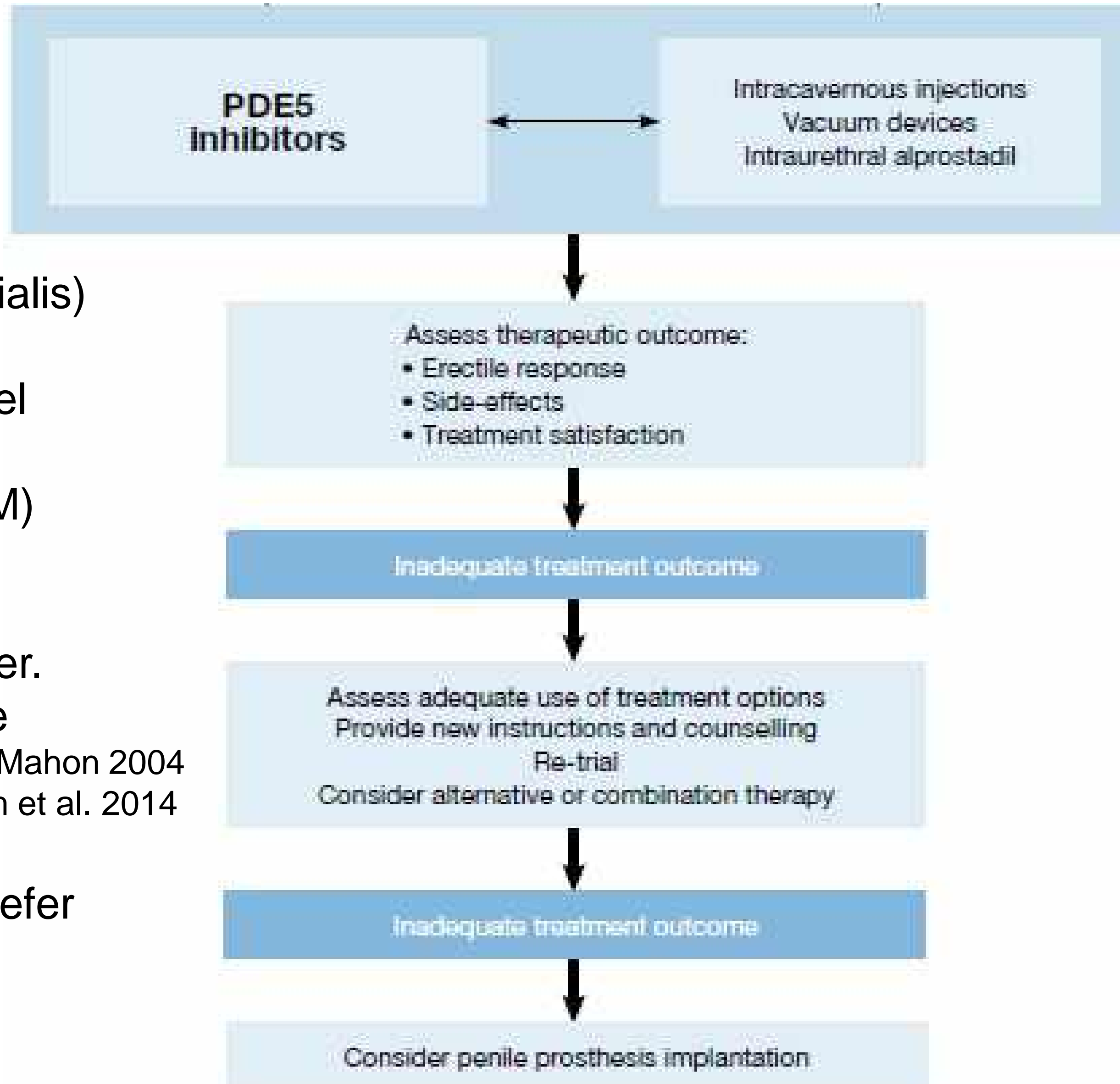
**PDE5i**

- Sexual stimulation
- Not after meal (except Cialis)
- Adequate time
- Normal Testosterone level
- X6-8 doses
- Efficacy ~70% (~50% DM)

- If first line fails, try another.
- If still fails, try OD regime

McMahon 2004
Kim et al. 2014

- If still no response ➡ refer



# PDE5i

| Parameter | Sildenafil, 100 mg | Tadalafil, 20 mg | Vardenafil, 20 mg |
|---|---|---|---|
| $C_{max}$ | 560 µg/L | 378 µg/L | 18.7 µg/L |
| $T_{max}$ | 0.8-1 h | 2 h | 0.9 h |
| $T_{1/2}$ | 2.6-3.7 h | 17.5 h | 3.9 h |
| AUC | 1685 µg.h/L | 8066 µg.h/L | 56.8 µg.h/L |
| Protein binding | 96% | 94% | 94% |
| Bioavailability | 41% | NA | 15% |

*$C_{max}$: maximal concentration, $T_{max}$: time-to-maximum plasma concentration; $T_{1/2}$: plasma elimination halftime; AUC: area under curve or serum concentration time curve.*

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** Fasted state, higher recommended dose. Data adapted from EMA statements on product characteristics.*

**Table 8: Common adverse events of the three PDE5 inhibitors used to treat ED***

| Adverse event | Sildenafil | Tadalafil | Vardenafil |
|---|---|---|---|
| Headache | 12.8% | 14.5% | 16% |
| Flushing | 10.4% | 4.1% | 12% |
| Dyspepsia | 4.6% | 12.3% | 4% |
| Nasal congestion | 1.1% | 4.3% | 10% |
| Dizziness | 1.2% | 2.3% | 2% |
| Abnormal vision | 1.9% | | < 2% |
| Back pain | | 6.5% | |
| Myalgia | | 5.7% | |

** Adapted from EMA statements on product characteristics.*

# PDE5i – Cautions/ Interactions

- **Nitrates** – absolute contraindication
- Withhold GTN for at least 24h if Sildenafil / Vardenafil used and for at least 48h if Tadalafil
- **α-Blocker** (Doxazosin) –marked hypotension
- Vardenafil with Tamsulosin is not associated with clinically significant hypotension
- If LUTS/ ED: use Tadalafil 5mg OD – licenced for dual indication

# Alprostadil (PGE1)

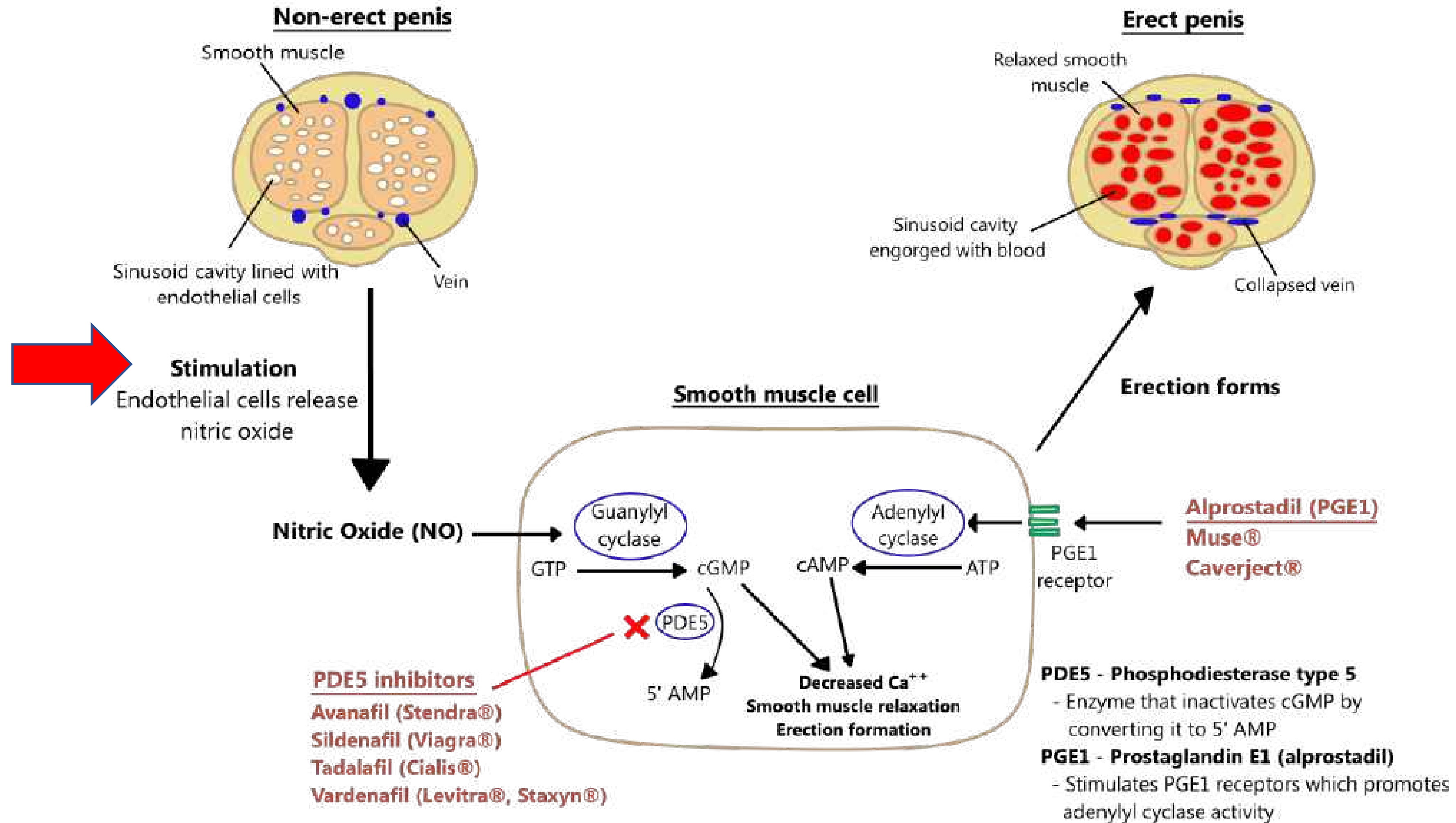
**Caverject / Viridal Duo**

- Intracavernosal injection
- 5-40mcg
- Response rate > 70%
- Complications
    - penile pain 30% (?Invicorp)
    - prolonged erections 1%
    - priapism 1%
    - fibrosis 2%

**MUSE / Vitaros**

- Urethral pellet / cream
- 250-1000 µg / 300 µg
- Response rate 30-65.9%
- Complications
    - local pain (29-41%)
    - dizziness with possible hypotension (2-14%)
    - Urethral bleeding (5%)
    - Penile fibrosis and priapism very rare (< 1%)

# ERECTILE DYSFUNCTION DRUG MECHANISM OF ACTION



# Vacuum erection devices

- Motivated, interested, and understanding partner

- Long-term use decreases to 50-64% after 2 years
- Most discontinue within 3 months

- Adverse events < 30%
  - pain,
  - inability to ejaculate
  - petechiae
  - bruising
  - numbness
  - **cold penis**

- Remove the constriction ring within 30 min

- Contraindicated in patients with bleeding disorders or on anticoagulant therapy

# Penile Prosthesis - Indications

1. Refractory ED (Increasingly post RP & DM)

2. Inability to tolerate/ dissatisfaction with alternative therapies

3. Refractory ischaemic priapism

4. Peyronie’s disease with concurrent ED