Erectile Dysfunction
Etiology and Management

1. Causes and Evaluation of ED
2. Management of ED
   a. Noninvasive management options
   b. Pharmacologic management options
   c. Surgical management options

Erectile Dysfunction
- The persistent inability to achieve or maintain an erection firm enough to have sexual intercourse

Prevalence
- ~20% of men ≥20 years old experience ED in their lifetime
- >50% of men over 40 have some degree of ED
- ~39 million American men

Physiology of Erection
- When aroused
  - Nerves surrounding the penis become active
  - Muscles around the arteries relax resulting in increased blood flow into the penis
  - Veins are occluded, decreasing outflow enabling the penis to remain erect
Etiology of Erectile Dysfunction

- Positive correlation with overall poor health

- Associated with:
  - Prostate Cancer Treatment
  - Diabetes
  - Heart Disease

- Top three physical causes:
  - Vascular
  - Diabetes
  - Medication

ED and Diabetes

According to the 2012 Census data, 3.3 million men in the US have diabetes.

1 in 2 men with diabetes have sexual function caused by their disease.

In men with diabetes, ED is more severe and associated with a poorer quality of life.

ED occurs 10-15 years earlier in men with diabetes.

In some patients, ED can be the presenting symptom of diabetes.
ED may be a symptom of diabetes

- Diabetes damages nerves and vasculature associated with achieving and maintaining an erection.
- 60–70% of diabetics have neuropathy.
- Diabetes results in endothelial dysfunction.
- Neuropathy and microvascular damage/endothelial dysfunction will often impair the effectiveness of PO medications.

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ED - Heart Disease connection

- ED may be early symptom of CAD.
- ED is an independent risk factor for future cardiovascular events.
- ED precedes CAD symptoms or silent CAD in almost 70% of cases.

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Low testosterone and ED

- ~4 in 10 men over the age of 45 may have low testosterone (prevalence increases with age).
- Hypogonadism common with:
  - Obesity
  - Type 2 DM
  - High cholesterol
  - HTN

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### Hypogonadism signs and symptoms

<table>
<thead>
<tr>
<th>Physical</th>
<th>Mental or emotional</th>
<th>Sexual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue and loss of energy</td>
<td>Feeling sad or blue</td>
<td>Reduced sex drive (libido)</td>
</tr>
<tr>
<td>Decreased muscle and strength</td>
<td>Less motivation or drive to do things</td>
<td>Erectile dysfunction (ED)</td>
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<tr>
<td>Increased body fat</td>
<td>Less self-confidence and enthusiasm</td>
<td></td>
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<tr>
<td>Loss of hair or reduced need to shave</td>
<td>Poor concentration and memory</td>
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<tr>
<td>Decreased physical or work performance</td>
<td>Hot flushes, sweats</td>
<td></td>
</tr>
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<td>Hot flashes, sweats</td>
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</tbody>
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### Prostate Cancer and ED

- Common adverse effect of prostate cancer therapy
- Neurovascular bundles lie close to prostate and at risk of injury during prostate cancer treatment
- Prostate cancer treatments may result in temporary or permanent ED

### Erectile Dysfunction after prostate cancer treatment

- Overall erectile dysfunction affects 25–75% of men
- Erectile dysfunction as a result of prostate cancer surgery, robot-assisted radical prostatectomy (RARP), 10–48% of men, 1 year after surgery had ED
- Sexual dysfunction after radiation affects up to 50% of men
Peyronie’s disease and Erectile Dysfunction

- Peyronie’s disease - fibrous scar tissue forms inside the penis resulting in curved, painful erections

May result in
- Inability to have sexual intercourse
- ED
- Problems with self image
- Stresses on the marriage/relationship

ED may be a symptom of Peyronie’s disease

- May appear suddenly or develop gradually
- Plaque can be felt under the skin of the penis often as a flat lump or band of hard tissue
- Penis may curve upward, downward or sideways with erection, or the plaque may result in a narrowing of the penis or an hourglass deformity
- Peyronie’s may cause problems getting or maintaining an erection
- May notice shortening of the penis
- Penile pain is often present with active inflammation of the plaque, with or without an erection

Diagnostic Evaluation of Erectile Dysfunction

- Perform medical history
  - CAD, HTN, hyperlipidemia, DM, ETOH abuse, depression?
  - Related dysfunctions-Peyronie’s, premature ejaculation, psychosexual relationship problems?
  - Any contraindications to drug therapy?
  - Smoking, pelvic/perineal/penile trauma or surgery, neurologic disorders, endocrinopathy, prescription or recreational drug use?
  - Decreased libido, problems with ejaculation or orgasm, genital pain or deformity?
  - Also review lifestyle factors, history of partner’s sexual function
Diagnostic Evaluation of Erectile Dysfunction

- Perform physical exam
  - Focus on abdomen, penis, testicles, secondary sexual characteristics, lower extremity pulses
  - DRE and serum PSA in men >50 with >10 year of life expectancy

- Additional testing in select pts
  - Testosterone levels
  - Venous/urodynamic testing
  - Neurological testing

Management of ED

- Review available treatment options
- Patients at intermediate/high risk for cardiovascular disease need referral to cardiology
- If suspected psychological etiology- psychosexual therapy referral

Treatment Options for Erectile Dysfunction

- Oral Medications
- Injections
- Penile Implants
- Vacuum Erection Devices
- Pelvic Suppositories
- Urethral Suppositories
PDE-5 Inhibitors

- Increase blood flow to the penis
- Require sexual stimulation
- Typically taken 1 hour before anticipated sexual activity
- Not to be taken more than once a day
- Efficacy can be affected by food
- Effective in approximately 60–80% of cases
- ~50% of men with ED post prostatectomy give up or the pills stop working
- Diabetics are 1.5 to 2 times more likely to move on to other treatments

Oral medications

Common adverse effects:
- Headache
- Facial flushing
- Stuffy nose
- Upset stomach

Cautions:
- Poor cardiovascular health
- Alpha blockers such as tamsulosin—recommended that pt is stable on therapy before using PDE5 inhibitor
- Contraindicated with nitrates
Vacuum erection device (VED)\textsuperscript{30}

- Tube is placed over the penis
- Manual or electric pump creates a vacuum that pulls blood into the penis
- Elastic tension ring/constriction band placed at the base of the penis to maintain the erection
- Initial satisfaction rates range from 68–80\%, but up to 86\% of patients decided to move on to other therapies in some studies\textsuperscript{23}

Common adverse effects:\textsuperscript{30,34}

- Obstructed ejaculation
- Bruising
- Penile discomfort
- Numbness or coldness

Reasons cited for discontinuation:\textsuperscript{10,35}

- Insufficient rigidity or duration
- Cumbersome to use
- Bruising
- Lack of spontaneity

Urethral suppository

MUSE\textsuperscript{TM} applicator stem inserted into urethra after urination

- Erection onset within 5 to 10 minutes
- Must be refrigerated
- Success rates ~40–65\%, but 40–50\% discontinue therapy after 6–8 months\textsuperscript{32,33}

Common adverse effects\textsuperscript{39,40}

- Pain in the penis, urethra or testes
- Dysuria
- Low blood pressure
- Dizziness

Reasons for discontinuation\textsuperscript{41}

- Erections not sufficient for intercourse
- Urethral pain and burning
Intracavernous injection therapy (ICI)

- Self-injected medication directly into corpora cavernosa
- Erection occurs within 5 to 20 minutes
- ~60% of patients initially satisfied

Common adverse effects:
- Penile pain
- Fibrosis or scarring of the corpora
- Priapism
- Hematoma or bruising

Reasons for discontinuation:
- Unsatisfactory erections
- Pain
- Allergy to injections

Penile implants

- 2 manufacturers in the US
  - AMS (Boston Scientific)
  - Coloplast
Types of AMS Men’s Health penile implants

- Spectra™ Concealable Penile Implant
- AMS Ambicor™ Inflatable Penile Implant
- AMS 700™ Penile Implant with MS Pump™
  - LGX
  - CX
  - CXR

AMS 700™ 3 piece penile prosthesis

Antibiotic-impregnated - clinically proven and FDA approved to significantly reduce the rate of revision due to infection

- AMS 700 CX
  - Cylinders expand in Girth
- AMS 700 LGX
  - Cylinders expand in Girth and Length depending on patient anatomy

Penile Prosthesis can add penile length.

- A. True
- B. False *
AMS 700 3 piece prosthesis

- Squeeze the pump located in the scrotum to move fluid from reservoir into the cylinders
- Deflate by pressing the smaller deflate button on the pump and allowing fluid to return from cylinders back into the reservoir

Patient and partner satisfaction with AMS 700™ Penile Implant

- 97% of patients would recommend the penile implant to others
- 98% of patients reported their erections to be excellent or satisfactory
- 96% of sexual activity with the implant to be excellent or satisfactory
Penile prosthesis risks

Include:
- Inability to achieve natural or spontaneous erections without or with the aid of other interventional treatment options
- Mechanical failure of the implant, which may require revision surgery
- Pain (often associated with healing process)
- Men with diabetes, spinal cord injuries or open sores may have an increased risk of infection
  * ~1–2.5% risk of infection with the AMS Men’s Health inflatable penile implants,
  * Erosion into urethra or through skin requiring removal
  * Need to use caution with urethral catheterization

Male stress urinary incontinence

BONUS!

Short-term treatment options

Intervention
- Pelvic floor physical therapy
- Kegel exercises
- Biofeedback
Long-term treatment options

**Male Sling**
- Designed to support the urethra to better control urine
- For mild to moderate SUI
- Mesh sling, no moving or mechanical parts

**Artificial Urinary Sphincter (AUS)**
- Replicates function of the external sphincter muscle to control urine
- Can treat all levels of SUI severity
- Consists of 3 small connected components that are completely concealed inside the body
  - Cuff
  - Control Pump
  - Pressure Regulating Balloon

Long-term treatment options: AMS 800™ Urinary Control System

- 40+ years of AUS clinical use
- Treats all levels of male SUI
- The “Gold Standard” treatment for male SUI
- Cuff fits around the urethra, inflates and occludes it
- To void, squeeze the scrotal pump several times to deflate the cuff, open the urethra and allow urine to flow freely
- After several minutes, the cuff re-inflates on its own and again closes the urethra

AMS 800 Urinary Control System animation

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