ERECTILE DYSFUNCTION (ED)

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Erectile dysfunction (ED), also known as impotence, is the persistent inability to achieve or maintain an erection sufficient for satisfactory sexual performance.

Causes of ED:

1. **Atherosclerosis**: Atherosclerosis (hardening/narrowing of the arteries) is by far the most common cause of ED. Plaque buildup in the arteries reduces blood flow to the penis, making it difficult to achieve and maintain an erection. High blood pressure, high cholesterol, diabetes and smoking all contribute to atherosclerosis. ED can be an early warning sign for coronary artery disease because the arteries of the penis are about half the diameter of the arteries in the heart. Therefore, atherosclerosis will typically affect the penis first. Men with ED have a 43% increased risk of cardiovascular disease compared to men who do not.
2. **Venous leak** is when blood seeps out of the veins in the penis during an erection instead of remaining trapped inside. The man can achieve an erection but cannot sustain it.
3. **Diabetes:** Diabetes can cause ED in two separate ways. It can restrict blood flow by damaging the blood vessels and it can harm the nerves that instruct the arteries in the penis to dilate.
4. **Neurologic causes:** Disorders such as Parkinson's disease, multiple sclerosis, spinal cord injuries and neuropathy interfere with the nerve signals necessary for an erection.
5. **Hormonal causes:** Low testosterone or other hormonal imbalances can affect sexual desire and function.
6. **Trauma:** Prolonged sitting on a bicycle or rowing machine, pelvic fractures, surgery/radiation within the pelvis (prostate, bladder and rectum) can injure the nerves and arteries that supply the penis.
7. **Medications:** Antidepressant and nerve medication (Zoloft, Prozac, Elavil), anti-ulcer drugs (Pepcid, Zantac), beta-blockers (Inderal), diuretics (spironolactone), tranquilizers (Valium) and antihistamines can cause ED.
8. **Lifestyle factors**: Smoking, excessive alcohol consumption, obesity (especially abdominal obesity), lack of physical activity, sleeping less than 7 hours per night are all associated with ED.
9. **Chronic diseases:** Heart disease, high cholesterol, high blood pressure, diabetes, insulin resistance, neuropathy, obesity, metabolic syndrome, dementia, BPH and sleep apnea are associated with ED.
10. **Psychological causes:** Anxiety, depression, stress, relationship problems can cause ED.

Diagnostic testing for ED:

1. **Physical examination:** Blood pressure, pulses, strength, reflexes, sensation, penis (Peyronie's disease), testicles and prostate (enlarged) exam.
2. **Psychological exam:** Anxiety, depression, stress, emotions. ED is more likely to be psychological if nocturnal erections are still normal.
3. **Blood tests:** Checks for signs of diabetes, heart disease, prostate, hormones, low testosterone.

Treatment options for ED:

1. **Treat the underlying medical/psychological conditions contributing to your ED.**
2. **Treat hypogonadism/low testosterone if present:** If you have signs and symptoms of low testosterone such as fatigue, loss of energy, depression, loss of sex drive, loss of erections, decreased intensity of orgasm and abdominal weight gain, have your hormones and testosterone levels checked. If low, this can be treated with weekly testosterone injections or daily topical creams.
3. **Healthy lifestyle:** Stop smoking, limit alcohol intake, sleep at least 7 hours per night, exercise five days/week, eat a low sugar diet, lose weight especially if you have abdominal obesity.

4. **Oral medications:** Phosphodiesterase type 5 inhibitors (PDE5Is) are the first-line treatment for ED. Viagra and Cialis are the least expensive and most frequently used oral medications for ED. These medications work by relaxing the muscles of the penis, significantly increasing blood flow. It is important to realize that these medications are not an aphrodisiac. You must feel sexually aroused in order for them to work. They are about 70% effective for all causes of ED. Common side effects include flushing, nasal congestion, headache, visual changes. They can lower blood pressure and should not be taken with alpha blockers or nitrate medications.
    A. **Sildenafil (Viagra):** 50 or 100 mg once daily if needed. Takes 30 to 60 minutes to work and lasts about 5 hours. Generic form is inexpensive ($10/month). High-fat meals can delay its absorption and effectiveness.
    B. **Tadalafil (Cialis):** 5 mg daily or 10 or 20 mg as needed. Takes 30 minutes to start working and last up to 36 hours. Generic form is inexpensive ($10/month). It is less affected by food. Cialis is also the drug of choice for men who have both ED and benign prostatic hypertrophy (BPH)/lower urinary tract symptoms (LUTS). Cialis 5 mg daily is FDA approved for both ED and BPH/LUTS. Cialis 5 mg daily improves the endothelium of the blood vessels throughout the body. This results in about a 30% reduction in strokes and heart attacks.
    C. **Vardenafil (Levitra, Staxyn):** 10 to 20 mg daily as needed. Works in 30 to 60 minutes, lasts 4 to 5 hours, is expensive, and high-fat meals impair its effectiveness.
    D. **Avanafil (Stendra):** 100 to 200 mg daily as needed. Can work as quickly as 15 minutes and last 6 hours. Less affected by food but is very expensive.
5. **Penis Bands:** A tight band is placed at the base of the penis to help maintain the erection. Works great for men with venous leakage who cannot sustain an erection. Onset of action is immediate and cost is about $10-$25.
6. **Vacuum erection device (penis pump):** These devices create a vacuum around the penis, drawing blood into it and causing an erection. A constriction ring is then applied to maintain the erection. The erection typically last long enough for a couple to have sex. Highly effective (about 80%) with no serious side effects. Can be cumbersome. Cost is about $400 per device.
7. **Low-intensity shockwave therapy:** This noninvasive treatment uses high-pressure sound energy to improve blood flow and potentially restore natural erectile function. Cost is about $4000. It is not FDA approved at this time.
8. **Platelet rich plasma (PRP):** Your own blood is drawn and spun down and separated. The enriched plasma portion is injected back into the erectile tissue of the penis to accelerate healing and improve health. Cost is about $800. It is not FDA approved at this time.
9. **Penile injections:** Alprostadil (Caverject, Edex), papaverine, phentolamine, etc. A fine needle is used to inject the medication into the base or side of the penis. Erection occurs in 10 minutes and last about an hour. It is highly effective (about 80%) with few side effects. Cost is about $10 per injection. It requires training and can cause penile pain or painful sustained erections. This is typically used for those who do not respond to oral medications.
10. **Penile implants:** Surgical implants are reserved for those who have failed all conservative options. The implant can create an erection but it will not increase desire or sensation. Some men notice that the penis is shorter after surgery. It can preserve the ability to have an orgasm and ejaculate but it will not restore these abilities if they are not already present. About 90% of men can achieve sexual intercourse.
    A. **Inflatable implants:** A fluid-filled reservoir is placed in the stomach and a release valve placed in the scrotum transfers the fluid into cylinders placed in the penis causing an erection. Requires extensive surgery.
    B. **Semirigid rods:** A bendable rod is placed in the penis. The rods are bent upward to have intercourse and bent downward otherwise. The penis is constantly firm.

Priapism: Priapism is an erection lasting over 4 hours. Oral medication such as trazodone, injections used for erectile dysfunction such as alprostadil and illicit drugs such as amphetamines can cause this. This is a medical emergency and requires intervention within 6 to 12 hours of onset to prevent permanent erectile dysfunction, penile fibrosis and penile shortening. To treat this, a needle is placed in the penis to remove blood and sometimes to inject medication to improve blood flow. If this does not work, surgical intervention is needed.