Patient education: Sexual problems in men (Beyond the Basics)

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SEXUAL PROBLEMS OVERVIEW — For years, men believed that sexual problems were a normal part of growing older. Fortunately, modern medicine and changing attitudes have debunked this myth. As men and their healthcare providers become more comfortable talking about sexual problems and new treatments are developed, there is no reason why men cannot remain sexually active well into their 70s and beyond.

Sexual problems in men include:

- An inability to acquire or maintain an erection satisfactory for sexual intercourse (also called impotence or erectile dysfunction [ED])
- A lack of interest in sex (diminished libido)
- Premature ejaculation
- Delayed or inhibited ejaculation
- Penile curvature (Peyronie's disease)

ERECTILE DYSFUNCTION

Causes — Impotence, also referred to as an erectile dysfunction (ED), is the term used to describe men who cannot acquire or maintain an erection during 75 percent of attempts to have sexual intercourse. Men who experience an occasional inability to have an erection and then have no problems later do not have ED.

Limited blood flow — Anything that limits blood flow to the penis can cause ED. The most common conditions that limit blood flow include cigarette smoking, diabetes, high blood pressure, and normal aging. In addition, many commonly prescribed medications, such as antihypertensive medications, can interfere with male sexual function. Reduced blood flow in the penile arteries can happen before decreased blood flow to other vital organs, such as the heart, begins. Therefore, men with ED should be evaluated for cardiovascular risk (http://tools.cardiosource.org/ASCVD-Risk-Estimator).

Neurological causes — ED can be caused by a stroke, diseases such as diabetes, spinal cord injury, or prostate surgery that damage nerves to the penis.

Drugs — A large number of drugs that affect the nervous system and some that lower testosterone levels or inhibit testosterone action can cause ED. Opioids that are taken for chronic pain can also cause ED.

Psychologic causes — Depression, performance anxiety, and lack of focus are common causes of psychogenic ED.

- Depression – Loss of libido and lack of interest in sexual activity are common symptoms of depression. ED is, in itself, a depressing experience for many men. Many men choose to accept a decline in sexual function as a natural consequence of aging. Because of shame or embarrassment, they do not discuss this problem with their healthcare provider. This is unfortunate because it is often possible to determine the cause(s) of sexual problems, and many options are available to treat ED.

- Performance anxiety – Performance anxiety may develop in men who suddenly experience one or more erectile failures during intercourse. The focus of the sexual act shifts from a sensual experience to one filled with anxiety. During later attempts to have sex, the inability to acquire and maintain an erection becomes the focus of the sexual experience.

Diagnosis — In order to determine the cause of the dysfunction, a healthcare provider will take a sexual history, perform a physical examination, and order blood tests to determine if conditions such as diabetes or low testosterone levels are contributing to the sexual problems. Sometimes more specialized tests, such as evaluating penile blood flow with ultrasound and a flow meter during a pharmacologically-induced erection, can provide useful information. (See 'Testing' below.)

Sexual history — The clinician will ask the patient personal questions about his sex life to help determine the cause of the condition. It is important that the patient answer the questions honestly and provide as much detail as possible.

The clinician will want to know if:

- ED developed slowly or happened suddenly
- There are erections during the night or in the morning when he first wakes up
- There are interpersonal problems with a spouse, girlfriend, or sexual partner
- There are any risk factors for impotence, such as a history of smoking, diabetes, high blood pressure, high cholesterol levels, alcohol or drug abuse, or depression

Physical examination — In addition to doing a basic physical examination, the clinician may:

- Check pulses in the groin and feet
- Check the breasts for abnormal swelling, a condition called gynecomastia
- Examine the penis
- Check the testicles' size and for any abnormal testicular masses
- Check a nerve reflex that causes the scrotum to contract when the inner thigh is stroked
- Check the prostate

Testing — The clinician may order tests to measure levels of testosterone, prolactin, and thyroid hormones in the blood. Abnormally low testosterone, elevated prolactin, and either low or elevated levels of thyroid hormones can cause sexual problems. All men with sexual problems should have blood tests.

If a hormonal problem is present, these tests may help to diagnose a more serious problem, such as growth in the pituitary gland or malfunction of the gonads. Even the most experienced clinicians cannot determine hormone levels by asking about the history and performing a physical examination; blood testing is necessary.

Treatments — The goal of treating impotence is to enable a man to achieve and maintain an erection so that he can have sexual intercourse. Depending upon the cause of impotence, treatment may include one or more of the following:

Obesity — Weight reduction and improvement in lifestyle can improve libido and erectile function in some men.

Drugs — When possible, it may be useful to use alternative medications to treat hypertension and pain. Stopping smoking and reducing or stopping alcohol can be beneficial.

Phosphodiesterase-5 inhibitors — Phosphodiesterase-5 (PDE-5) inhibitors work by increasing chemicals that allow the penis to become and remain erect. They help a man to achieve an erection after sexual stimulation, but the medication does not increase sexual desire.

PDE-5 inhibitors are effective in restoring potency in about 70 percent of men. They work best in men with psychogenic impotence, though they can be used in men with other types of impotence as well. In men with conditions that affect the blood vessels (such as diabetes), PDE-5 inhibitors are effective in about 55 to 60 percent of cases. The success rate in men who have undergone prostate cancer surgery is between 25 and 30 percent.

Sildenafil — Sildenafil (brand name: Viagra) should be taken on an empty stomach one hour before planned sexual intercourse. Its effect lasts for about four hours; this refers to the time frame that erection is possible if sexual stimulation occurs, not the duration of the erection. Only one dose should be taken per 24 hours.

Vardenafil, tadalafil, and avanafil — Vardenafil (brand name: Levitra), tadalafil (brand name: Cialis), and avanafil (brand name: Stendra) are PDE-5 inhibitors used to treat ED. Like sildenafil, men who take vardenafil may have an erection (in response to sexual stimulation) as soon as 30 minutes and for up to four hours after taking a vardenafil tablet (this refers to the time frame that erection is possible if sexual stimulation occurs, not the duration of erection). No more than one dose should be taken per 24 hours.

Men who take tadalafil may have an erection within 16 minutes (in response to sexual stimulation) and may be able to experience an erection (in response to sexual stimulation) up to 36 hours after each dose (this refers to the time frame that erection is possible, not the duration of erection). No more than one dose should be taken every 24 hours. Tadalafil can also be taken every day as a low-dose pill. Daily tadalafil can be helpful for men who respond poorly to an “on demand” PDE-5 inhibitor. It also may be prescribed for men with lower urinary tract symptoms (LUTS) as well as ED. Avanafil was approved recently. The onset of action is 15 to 30 minutes, which is somewhat faster than the other three PDE-5 inhibitors.

Use of PDE-5 inhibitors

- Side effects – Side effects of PDE-5 inhibitors include headache, flushed (red) skin, indigestion, and dizziness. Sildenafil may cause distorted (blue-tinged) vision. Side effects are generally short-lived and resolve spontaneously.
- Drug interactions – Men who use nitrates (nitroglycerin) in any form, either on a regular basis or only as needed for chest pain, should never use PDE-5 inhibitors. Taking PDE-5 inhibitors and nitrates can lead to dangerously low blood pressure. PDE-5 inhibitors do not cause heart attacks.

A man who has used a PDE-5 inhibitor and then develops cardiac problems and requires nitrate medications should NOT use the PDE-5 inhibitor in the future. Men who develop chest pain should contact their healthcare provider or go to an emergency department immediately.

Certain medications (including erythromycin, ketoconazole, protease inhibitors, rifampin, phenytoin, and grapefruit juice) can alter the duration of time that sildenafil, vardenafil, and tadalafil remain in the blood stream, which can cause additional side effects. A healthcare provider or pharmacist can provide specific information.

Medications such as doxazosin (brand name: Cardura) and terazosin (brand name: Hytrin), used to treat LUTS caused by an enlarged prostate (called benign prostatic hyperplasia [BPH]), should be used very cautiously with any of the PDE-5 inhibitors; the combination of these drugs can cause very low blood pressure. However, tamsulosin (brand name: Flomax), also prescribed for bothersome urinary symptoms caused by BPH, is safe to take with tadalafil as it does not cause a dangerous decline in blood pressure. It is

not known if tamsulosin is safe to take with sildenafil or vardenafil. (See "Patient education: Benign prostatic hyperplasia (BPH) (Beyond the Basics)".)

Safety — It is not yet proven that sildenafil is safe for these groups:

- Men who have had a heart attack, stroke, or life-threatening irregular heartbeats (called arrhythmia) within the last six months
- Men with untreated low or high blood pressure
- Men with retinitis pigmentosa, a progressive eye disorder that can lead to blindness

Resuming sexual activity after a prolonged period of inactivity is similar to beginning a new exercise routine. Men considering a PDE-5 medication should be able to participate in an activity that is approximately equal to the energy required for sex (eg, walking two to four miles per hour on a flat surface). The healthcare provider may recommend exercise treadmill testing to ensure that sexual activity will be safe.

Nonarteritic ischemic optic neuropathy or NAION, a condition associated with loss of vision, has been reported in a few men who have taken sildenafil and tadalafil. Most of these cases occurred in men with underlying nerve or blood vessel disease. Contact your healthcare provider if you are taking a PDE-5 inhibitor and develop sudden vision loss in one or both eyes.

Purchasing medications for erectile dysfunction — A number of sources claim to sell medications such as Viagra, Cialis, Levitra, or herbal supplements for ED through the internet or by mail for a reduced cost, often without a prescription. These sources are not known to be safe or reliable, and it is not possible to know whether the pills from these sources contain the actual drug or are counterfeit. Consumers are strongly cautioned to avoid potentially unreliable sources for any medication. Community pharmacies or reputable web-based pharmacies are the most reliable source for all types of medications.

Penile self-injection — With penile self-injection, the patient injects a medication (alprostadil or papaverine) into the corpora cavernosa (the two chambers of the penis that are filled with spongy tissue). This causes an erection by allowing the blood vessels within the penis to expand so that the penis first swells and then stiffens to create a fully rigid erection (figure 1). The erection created by penile injection occurs without sexual stimulation (different from the erection that occurs after sildenafil, vardenafil, or tadalafil).

It takes some training for men to feel comfortable with this type of therapy. Under the guidance of urologists, men are shown how to make the skin on the penis sterile and how to inject the medication properly (figure 2). Although this treatment works well for erections, many men eventually stop using it because of discomfort from the injections.

Side effects — Pain is the most common side effect. Men often say that this is the reason they discontinue this type of treatment.

There is also a small risk that the penis will remain erect after intercourse. This occurs in 6 percent of men who use alprostadil and about 11 percent of those who use papaverine. Prolonged erection, called priapism, that lasts longer than four to six hours is a medical emergency. A healthcare provider should be contacted immediately. An emergency procedure must be done as soon as possible to empty the blood that is trapped in the penis. An erection that lasts longer than 48 hours often results in scarring of the tissue inside the penis.

Intraurethral alprostadil (MUSE) — This treatment uses the same medication (alprostadil) as penile self-injection. Instead of injecting it, the man inserts a device with an alprostadil pellet into the urethra. The urethra is the opening in the center of the penis from which urine flows. The alprostadil is then absorbed into the erectile bodies (corpus cavernosum) to create an erection.

Side effects — Side effects include pain as the blood vessels in the penis widen and swell to create the erection. Problems like prolonged erection and scarring on the outside of the penis are less common than with self-injection therapy.

Vacuum-assisted erection devices — There are several products on the market that involve placing the penis in a plastic cylinder and creating a vacuum around the penis. This increases blood flow into the penis. A rigid ring is placed at the base of the penis (near the body) to hold the blood inside the penis, allowing it to remain erect. Vacuum devices successfully create erections in as many as 67 percent of patients. Satisfaction with vacuum-assisted erections varies between 25 and 49 percent.

Vacuum-assisted devices require that a man be able to hold and pump the unit. It may take a week or more for the device to work effectively. After a man is accustomed to using the device, he can usually create an erection that is rigid enough for penetration and sexual intercourse. He will not be able to ejaculate because the ring that holds blood in the penis also compresses the urethra, preventing semen from exiting. The ability to have an orgasm is not affected by the ring.

Penile prostheses — A penile prosthesis is a device that is surgically implanted and inflates to allow the penis to become erect (figure 3). Penile prostheses can be semi-rigid rods or inflatable cylinders that are inserted into the corpora cavernosa. Penile prostheses are used less frequently because of the popularity of PDE-5 inhibitors and penile injection therapies. For men who do not respond to these therapies or who find vacuum erection therapy distasteful, penile prostheses are an option.

Side effects — Side effects of prosthetic devices include the possibility of infection, pain, and mechanical failure. Mechanical failure may require surgically removing the prosthesis and implanting a new one.

Revascularization — Revascularization is reserved for young men who have experienced pelvic trauma. Revascularization of penile arteries is rarely successful for chronic vascular insufficiency.

Testosterone replacement therapy — Testosterone therapy is prescribed if a man's testes do not make enough of the hormone testosterone. It is of no benefit in improving sexual function in men whose bodies make normal amounts of testosterone. Testosterone levels are determined with blood tests.

Men with low blood testosterone levels may have diminished libido (sex drive), ED (impotence), decreased muscle mass, increased fat, and are at increased risk for thinning of the bones (osteoporosis). Treatment is designed to increase a man's testosterone level, libido, erectile function, and muscle mass; bone density usually improves as testosterone levels return to normal. (See "Patient education: Androgen replacement in men (The Basics)" and "Patient education: Low testosterone in men (The Basics)".)

Psychotherapy and psychoactive medications — Depression and anxiety can cause ED. Often these problems can be treated using psychological counseling, antidepressant drugs, or both. Referral to a certified sexual therapy counselor may be helpful for men with performance anxiety.

Medications are used to treat both depression and anxiety. They are very effective, though some (especially those of the serotonin reuptake inhibitor (SSRI) class) can cause decreased sex drive and ED. On the other hand, some antidepressant drugs can cause delayed ejaculation, which can be helpful for men with premature ejaculation. (See "Patient education: Depression treatment options for adults (Beyond the Basics)".)

DISORDERS OF EJACULATION

Premature ejaculation — Premature ejaculation is defined as ejaculation that occurs too early, before the man is ready. It causes distress in the man and/or his partner. Premature ejaculation causes the penis to become flaccid (limp), making it more difficult to penetrate the partner.

Treatments — Antidepressant drugs prolong the time between arousal and ejaculation in some men. These are regarded as the most successful treatment for premature ejaculation. Antidepressants include selective serotonin reuptake inhibitors (SSRIs), such as sertraline and paroxetine. The tricyclic antidepressant clomipramine has been reported to be more effective than SSRIs, although it can cause dry mouth. Men may take these medications on a regular (daily) basis; intermittent use (three to four hours

before planned sex) works well for some patients. Other treatment options include topical lidocaine formulations and sex therapy. Many patients have reported using tramadol off-label with some success.

Delayed or inhibited ejaculation — In this condition, men have no difficulty acquiring and maintaining an erection but are unable to climax and ejaculate. This can occur with some antidepressant medications (SSRIs). Adjustment of the medication dose is often helpful.

PEYRONIE'S DISEASE — Up to 7 percent of men can experience an abnormal curvature of their penis when it is erect. This is known as Peyronie's disease. The most common cause of Peyronie's disease is penile trauma that occurs during sexual intercourse. The penis develops a scar, and this scar then causes the penis to bend when it is erect. Significant penile curvatures can result in pain, poor erections, and an inability to engage in sexual intercourse. If the penis bends more than 60 degrees, couples usually are unable to have intercourse. Many men are extremely distressed by this curvature of their penis.

Treatments — There is currently only one US Food and Drug Administration (FDA) approved treatment, known as collagenase (brand name: Xiaflex) injections. These injections are placed directly into the penile plaque, and they help remove the scar tissue. Studies have found that patients typically experience a 30 to 40 percent improvement in penile curvature after completing this type of therapy.

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

Patient education: Sex problems in men (The Basics)
Patient education: Recovery after coronary artery bypass graft surgery (CABG) (The Basics)
Patient education: Paraplegia and quadriplegia (The Basics)
Patient education: Sex as you get older (The Basics)
Patient education: Androgen replacement in men (The Basics)
Patient education: Low testosterone in men (The Basics)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

Patient education: Benign prostatic hyperplasia (BPH) (Beyond the Basics)
Patient education: Depression treatment options for adults (Beyond the Basics)

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

Symptom management of multiple sclerosis in adults
Overview of testosterone deficiency in older men
Erectile dysfunction in diabetes mellitus
Evaluation of male sexual dysfunction

Side effects of androgen deprivation therapy
Overview of male sexual dysfunction
Sexual activity in patients with cardiovascular disease
Sexual dysfunction caused by selective serotonin reuptake inhibitors (SSRIs): Management
Sexual dysfunction in uremic men
Surgical treatment of erectile dysfunction
Treatment of male sexual dysfunction

The following organizations also provide reliable health information.

- National Library of Medicine

  (www.nlm.nih.gov/medlineplus/healthtopics.html)

- National Institute of Diabetes and Digestive and Kidney Diseases

  (www.niddk.nih.gov)

- Urology Care Foundation

  (www.urologyhealth.org/)

- Hormone Health Network

  (www.hormone.org)

[1-5]

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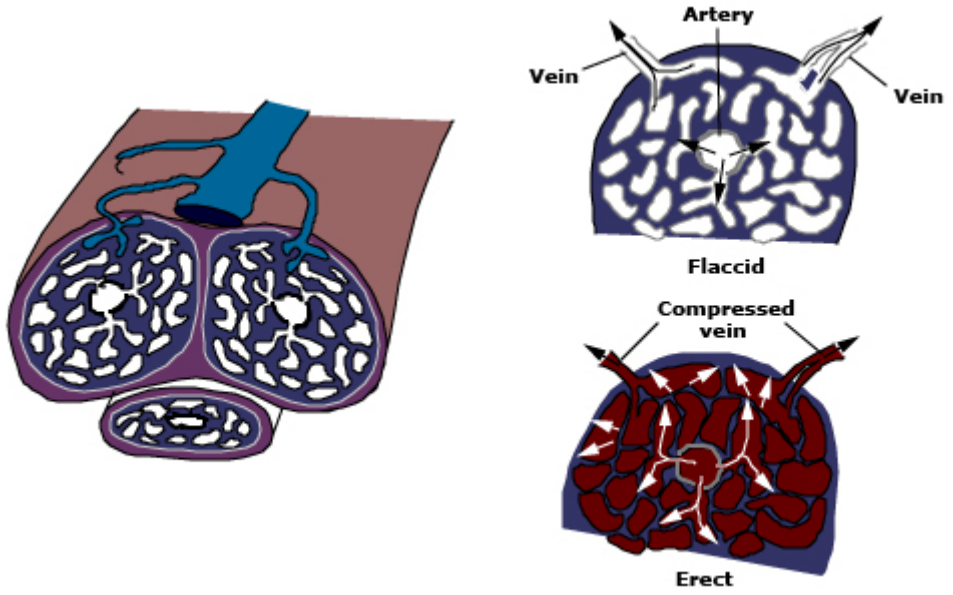
Topic 2161 Version 22.0

GRAPHICS

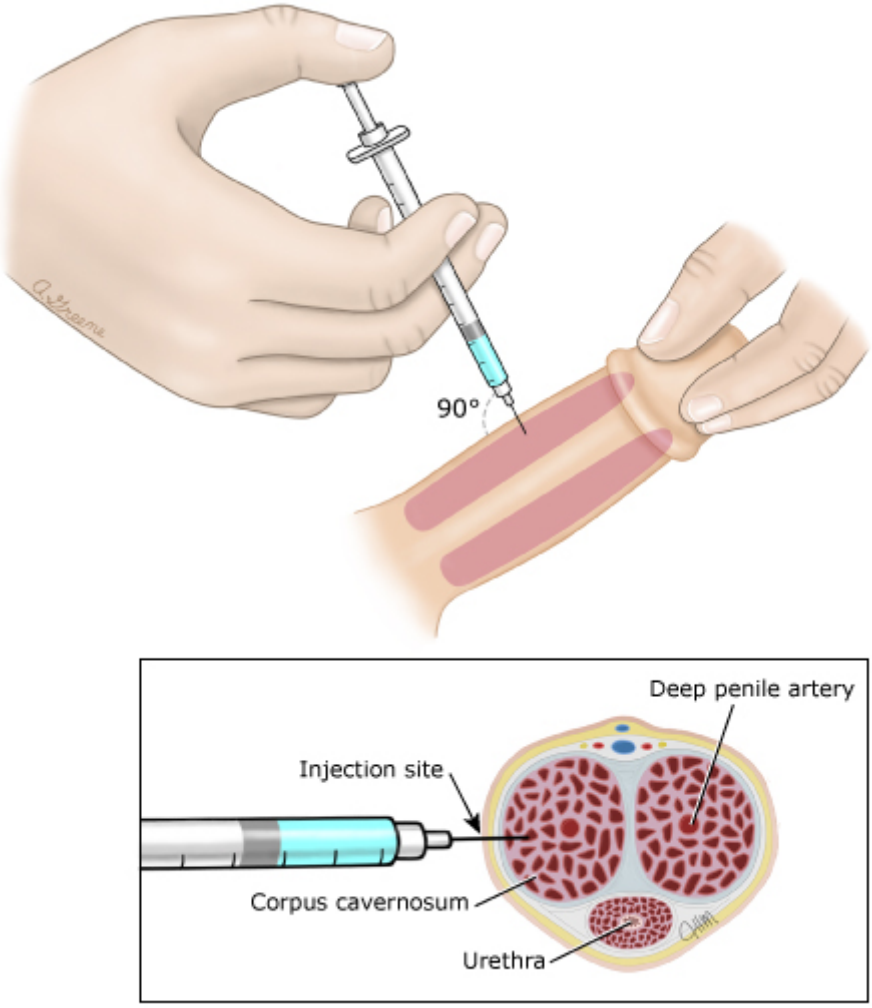
Penile blood flow in erection



Cross-section of corpora cavernosae illustrating penile blood flow in the flaccid and erect state. As intracavernosal pressure rises, emissary veins are occluded to maintain erectile function.

Graphic 55201 Version 1.0

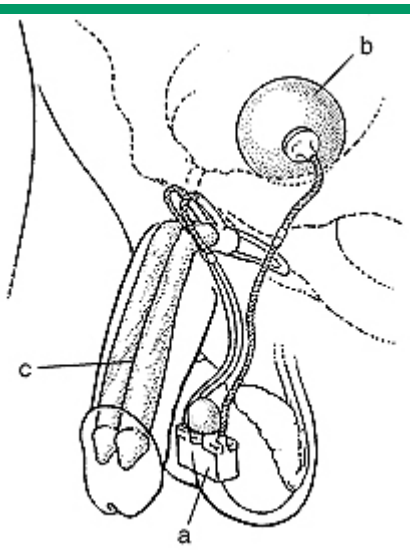
Method of administering intrapenile injection



To be fully effective, the medications must be injected directly into one of the penile erectile bodies, the corporus cavernosum. The medication will diffuse over to the other side of the penis so that symmetrical erection is achieved. A cross section of the penis shows the relationship of the site of injection to the corpora cavernosae. Most men use an insulin syringe with a 26 to 30 gauge 1/2 inch needle.

Graphic 63950 Version 2.0

Inflatable implant



With an inflatable implant, erection is produced by squeezing a small pump (a) implanted in the scrotum. The pump causes fluid to flow from a reservoir (b) residing in the lower pelvis to two cylinders (c) residing in the penis. The cylinders expand to create the erection.

Graphic 51070 Version 1.0

Contributor Disclosures

Glenn R Cunningham, MD Consultant/Advisory Boards: AbbVie [Testosterone replacement (Testosterone gel)]; Apricus Biosciences [SERMs (SERM in development)]; Besins Healthcare [Testosterone replacement (Testosterone gel)]; Clarus Therapeutics [Testosterone replacement (Oral testosterone undecanoate)]; Endo Pharmaceuticals [Testosterone replacement (Injectable testosterone undecanoate]; Ferring [Testosterone replacement (Testosterone gel)]; Lilly [Testosterone replacement (Testosterone solution)]; Lipocine (Testosterone replacement [Oral testosterone undecanoate]) Merck [Benign prostatic hyperplasia (Finasteride)]; Pfizer [Erectile dysfunction (Sildenafil)]; Repros Therapeutics [SERMs (SERM in development)]. **Mohit Khera, MD, MBA, MPH** Consultant/Advisory Boards: AbbVie; Endo Pharmaceuticals; Lipocine, ATYU, Repros [Testosterone (Testosterone products)]. **Peter J Snyder, MD** Grant/Research/Clinical Trial Support: AbbVie [Hypogonadism (Testosterone gel)]; Novo Nordisk [Growth hormone (Somatropin)]; Novartis [Cushing's (Pasireotide, LCI699)]; Cortendo [Cushing's]. Consultant/Advisory Boards: Novartis [Cushing's (Pasireotide)]; Pfizer [Acromegaly (Pegvisomant)]. Watson [Testosterone (Testosterone gel)]. **Kathryn A Martin, MD** Nothing to disclose

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