

Slide 1

James A. Haley VA  
Sexuality and  
Erectile  
Dysfunction

## Sexuality and Disability: Mind and Method

By  
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With assistance by SCI Nurse Educators  
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Slide 2

Definition

- Sex - physical interaction
- Sexuality - feelings, attitudes & behaviors that express being a man or woman; can be shown in interactions, body image, grooming, clothing, hobbies & interests

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Slide 3

Disability  
Sexuality: Sex  
and the  
Disabled  
Information

- Sex and disability tends to be a taboo area for many abled bodied persons and is rarely discussed in the same sentence. As a result more than 50% of disabled people do not have any form of a regular sex life.
- Sexuality and disability refers to the sexual behavior and practices of people with a disability (PWD). Physical disabilities such as a spinal cord injury may change the sexual functioning of a person.
- A disabled person may enjoy sex with the help of sex toys and physical aids (such as bed modifications), by finding suitable sex positions, or through the services provided by a qualified sex worker.

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**Disability Sexuality**

- According to the World Health Organization, "Sexuality is an integral part of the personality of everyone: man, woman and child; it is a basic need and aspect of being human that cannot be separated from other aspects of life."
- If sex and disability are discussed, it is very much in terms of capacity, technique, and fertility - in particular, male capacity and technique and female fertility - with no reference to sexual feelings by ignoring aspects of sexuality, such as touching, affection, and emotions
- Opportunities for sexual exploration among disabled people, particularly the young, are very limited.  
<https://www.disabled-world.com/disability/sexuality/>

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**The importance of Sexuality**

- Sexuality has been recognized as a very sensitive issue in almost every culture.
- Thus, the majority of the people hesitate to discuss about their sexual problems and intimacy
- There is emerging awareness of the importance of estimating the sexual functioning in neurological disorders

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**Five Myths about Sex and Disability**

- 1. Disabled people don't want or need sex.**
  - Disabled people come across as being asexual just because of the way society paints disability.
  - The truth is that disabled people are just like everybody else. We have all the same wants and needs, dreams and desires, lusts and fantasies.
- 2. Disabled people can't have sex**
  - It's funny this one, because this one is a really big myth. The truth is the majority of disabled people have sex just like everybody else; they work just like everyone else.
  - High injury breaks can still enjoy a sex life because there are ways of creating erogenous orgasmic zones all over your body that you can feel that allow you to enjoy sex and reach orgasm.

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**Five Myths Continued**

- 3. **Disabled people only have sex with each other**
  - Because they share similar experiences and an understanding of each other's life experiences.
  - The majority of disabled people say, "Hey, I want to fall in love with someone who I like, I want to have sex with someone I fancy. And I don't care if they're disabled"
- 4. **Disabled people aren't sexy**
  - We're not sexy because we're not thought of as sexy, and yet there many disabled people that are thought of as being very sexy.
  - There's a whole new generation of young disabled models being raised in today's society. It's just the fact that society, sort of, says 'disability is not sexy'

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**Five Myths Continued**

- 5. **Disabled people can't have kids**
  - There is nothing about the majority of impairments that impact[s] someone's fertility at all.
  - Most disabled people can have children just like everybody else.
  - There are a very small number of disabilities that do impact on fertility but, even then, if you can't have kids, even with the help of modern science, you can adopt or foster.

<https://mosaicscience.com/story/ten-myths-about-sex-and-disability>

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**Spinal Cord Injury**

- Paraplegic and quadriplegic people, a loss of sexual function does not mean a corresponding loss of sexuality
- Sexual function may be impaired but can, like other functions, be increased.
- After a spinal cord injury the spinal center for sexual function is generally intact, it is the communication from the brain to the spinal center that is usually disrupted.
- However, the physical and emotional aspects of sexuality, despite the physical loss of function, continue to be just as important for disabled people as for non-disabled people.

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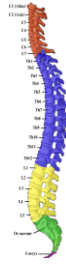
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**Upper Motor Neuron vs. Lower Motor Neuron**

- **Upper Motor Neuron**  
T-12 and above  
Originate in brain/brain stem  
Reflexes - Spasticity
- **Lower Motor Neuron**  
Below L-1  
Originate in spinal cord  
No reflexes - Flaccid



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**Upper Motor Neuron Injury**

- Perceives excitement from cerebral or other stimulation above injury level
- Increased sensations may be present in other parts of the body
- Genital manifestations from stimulation below injury level

Reflexogenic erections:

- Sacral nerves intact & functioning
- Elicited by stimulation to scrotum, penis, or anus
- Poorly maintained without constant stimulation

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**Lower Motor Neuron Injury**

- Reflex arc destroyed, no reflexogenic erections or vaginal lubrication
- Mild psychogenic erections & vaginal lubrication possible



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Changes in Male Sexual Health

- Erectile dysfunction
  - Reflexogenic erection
  - Psychogenic erection
- Fertility: Severely compromised
  - Ejaculatory dysfunction
  - Poor semen quality

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Fertility (Male)

Sterility incidence high

- A. erectile dysfunction
- B. inability to ejaculate
- C. retrograde ejaculation
- D. decreased sperm motility



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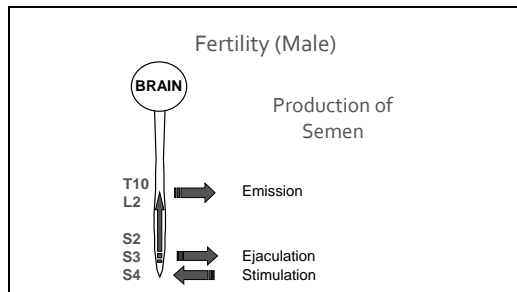
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**Interventions**

- Penile vibratory stimulation
- Electro-ejaculation
- Artificial insemination
- In vitro fertilization

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**Sexuality Interventions**

- Information on sexual functioning
- Education on adapting physical limitations for sexual activity
- Counseling on self-image, sexual desire, feelings of sexual attractiveness & intimacy issues
- Peer counseling

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**Male sexual dysfunction and infertility associated with neurological disorders**

- Normal sexual and reproductive functions depend largely on neurological mechanisms.
- Neurological defects in men can cause infertility through erectile dysfunction, ejaculatory dysfunction.
- Among the major conditions contributing to these symptoms are pelvic and retroperitoneal surgery, diabetes, congenital spinal abnormalities, multiple sclerosis and spinal cord injury.
- Erectile dysfunction can be managed by an increasingly invasive range of treatments including medications, injection therapy and the surgical insertion of a penile implant.

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**Male sexual dysfunction and infertility cont.**

- Ejaculation with penile vibratory stimulation can be done by some spinal cord injured men and their partners at home, followed by in-home insemination if circumstances and sperm quality are adequate.
- The other options always require assisted reproductive techniques including intrauterine insemination or *in vitro* fertilization with or without intracytoplasmic sperm injection.
- The method of choice depends largely on the number of motile sperm in the ejaculate.

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**Normal Erectile Function**

- Erections are initiated by a combination of psychic and physical stimuli, and erectile function is controlled by parasympathetic fibers originating from S2 to S4.
- These fibers travel through the pelvic nerve and the pelvic plexus to the cavernous nerve, which enters the corpora cavernosa.
- As these fibers pass through the pelvis, the nerves run in close proximity to the prostate and rectum, which makes them prone to injury during surgical procedures.

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**Normal Erectile function Cont**

- When activated, the cavernous nerves release nitric oxide and acetylcholine, both of which induce relaxation of the smooth muscle tissue.
- Which will induce cyclic guanosine monophosphate and cyclic adenosine monophosphate, respectively, which in turn results in calcium efflux.
- This process causes a massive influx of blood to the tissue.
- Through a shear stress mechanism induced by this blood flow, the endothelium in the penis releases more nitric oxide that causes an erection to reach a maximum and then maintains that erection

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**Normal Erectile function Cont.**

- Increased intracavernosal pressure then compresses the small venules, which results in blood trapping and contributes to maintaining the erection.
- The activation of basic sympathetic tone following sexual activity results in the contraction of smooth muscle, which results in the penis returning to a flaccid state.
- Phosphodiesterase 5 (PDE5), which is abundant in the penile tissue, contributes to this process by breaking down cyclic guanosine monophosphate.

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**Ejaculatory Function**

- Ejaculation is the result of coordination of both psychological and physical sexual stimulation.
- The ejaculatory reflex is coordinated by the spinal cord and depends on thoracolumbar sympathetic fibers from segments T10-L2 and somatic fibers from segments S2-S4.
- This reflex receives its somatic input primarily from the dorsal nerve of the penis, which is activated by stimulation of the glans penis.
- Neurons in the cortex, thalamus, hypothalamus, midbrain and pons, all play a role in ejaculation

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**Ejaculatory Function Cont.**

- Prior to ejaculation, sperm that are stored in the epididymis are transported to the vas deferens by means of contractions of smooth muscle tissue.
- This is followed by coordinated contractions of the vas mediated by the sympathetic fibers.
- The contractions move sperm through the vas to the ejaculatory ducts, which also have an inlet from the seminal vesicles.
- Along with seminal plasma from the seminal vesicles and prostate, the sperm are then transported to the urethra from which they are expelled in a projectile manner as somatic nerve fibers induce rhythmic contractions of the pelvic/periurethral muscles

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**Ejaculatory Function Cont.**

- During ejaculation, the bladder neck closes and the external urethral sphincter opens.
- This mechanism is coordinated by the sympathetic fibers and prevents retrograde ejaculation into the bladder.
- Given that erection and ejaculation are separate events and that the neurons responsible for the two events are different, ejaculation can occur without the presence of an erection and erections can be present without the ability to ejaculate.

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**Erectile and ejaculatory function in patients with neurological damage**

- The disruption of any of the neural features described above can cause erectile and/or ejaculatory dysfunction. Therefore, the systems are very susceptible to neurological damage, with a number of different conditions having the ability to disrupt them.
- Erectile dysfunction (ED) is the inability to achieve or maintain an erection that is sufficiently rigid for achieving satisfying sexual intercourse<sup>2</sup> and it is either partial or complete depending on the extent of neurological damage.

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**Erectile and ejaculatory function with neurological damage**

- Ejaculatory dysfunction may take different forms, including premature ejaculation, retrograde ejaculation, anejaculation and delayed ejaculation.
- The latter three are associated with neurological defects. In retrograde ejaculation, all or part of the ejaculate reaches the bladder instead of being expelled through the urethral meatus.
- This condition is caused by a malfunction in the bladder neck closure secondary to dysfunction of the sympathetic nerves, which control this mechanism.

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**Erectile and ejaculatory function with neurological damage cont.**

- Retrograde ejaculation causes the post-ejaculatory urine to be cloudy and is ultimately diagnosed when sperm are present in the bladder or urine after ejaculation.
- Anejaculation is a complete lack of both antegrade and retrograde ejaculate.
- SCI is the most common neurological cause of anejaculation.
- Delayed ejaculation is a less severe condition in which ejaculation can occur at a higher threshold of stimulation than normally needed.

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**Diabetes and ED Treatment**

- ED is common in men who have diabetes, especially those with type 2 diabetes.
- Diabetes causes disruption of sexual function via the following two mechanisms: autonomic neuropathy, which causes ED and ejaculatory dysfunction, and concurrent vascular disease, which is a major cause of ED.
- ED affects 35%–75% of type 1 diabetic males and ejaculatory dysfunction is estimated to be present in approximately 40% of this group

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**Diabetes and ED Treatment**

- Ejaculatory dysfunction can exhibit a slow progressive decline from a decreased amount of ejaculate-to-retrograde ejaculation to anejaculation depending on the degree of sympathetic autonomic neuropathy involved
- Poor long-term blood sugar control can damage nerves and blood vessels related to the penis.
- While there is no cure for ED, there are treatment options available. Consult your doctor before starting any treatment.
- Newest treatment on the market is Stendra (avanafil)

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**Diabetes and ED Treatment**

- As with other long-term complications of diabetes, the occurrence of these conditions is related to how well the patient's blood sugar is controlled
- Semen volume has been shown to be reduced in patients with diabetes (both types 1 and 2) compared to normal controls.
- Potential mechanisms behind the altered semen parameters in diabetic patients include endocrine disruption with reduced testosterone production and oxidative stress.

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**Diabetes and ED Treatment**

- Both the sexual dysfunction and the potentially reduced semen quality can cause infertility.
- While the topic is still controversial, infertility has been found to be more prevalent in diabetic men than in non-diabetic controls.
- A recent retrospective analysis has found a high prevalence of subfertility (51%) among men with diabetes, thus highlighting the possible link between diabetes and infertility.

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**Congenital spinal abnormalities**

- Neural tube defects are congenital disorders of the spinal cord. The lumbar vertebrae are involved in more than 90% of cases, and the lower thoracic vertebrae in another 5% of cases.
- Most patients with these conditions have some kind of sexual dysfunction. Surgical treatment of these conditions can be a separate cause of neurological damage that creates further sexual dysfunction.

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**Congenital spinal abnormalities cont.**

- The highest likelihood of becoming a father is found in men with lower and less severe damage.
- Sometimes, patients with lifelong ejaculatory dysfunction are found to have an occult dysplasia of the lower spinal cord, possibly with tethered cord syndrome.

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**Multiple sclerosis MS**

- MS is a demyelinating disease of unknown etiology that affects the central nervous system—both the brain and the spinal cord.
- The course of this condition varies; however, it usually progresses and increases in severity over time. Its effect on sexual function depends on the location of plaques in the central nervous system with the degree of sexual dysfunction not necessarily correlating to the duration of the condition.
- ED may be present in approximately 73% of men and ejaculatory dysfunction in about 50% of men with this condition.
- Reduced libido is reported in about 40%.

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**Multiple sclerosis MS Cont.**

- Little research has been done to assess fertility and the semen quality, however, a study from 2008 clearly points to reduced sperm counts, reduced sperm motility and altered sperm morphology in MS patients compared to normal controls.
- Possible explanations for the findings include a disturbed hypothalamus–pituitary–testis axis with reduced levels of sex hormones due to neurological damage.
- In addition to sexual dysfunction and reduced semen quality caused by the disease, MS patients may have reduced fertility as a consequence of adverse effects from their treatment.

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**Spinal Cord Injury**

- SCI induce a disruption of the nerve supply responsible for erectile function and ejaculation, which commonly causes both ED and anejaculation.
- Only about 9% of SCI men can ejaculate through masturbation or sexual intercourse.
- In addition, SCI can cause semen abnormalities in the form of low sperm motility and low sperm viability.
- Factors in sperm transportation/storage, the seminal plasma, and the immune system have recently emerged as the most likely explanations for these abnormalities.

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**Spinal Cord Injury Cont.**

- Semen abnormalities are most likely to occur in SCI men who have complete lesions of the spinal cord.
- As this condition most often occurs in young men, fertility is a major concern for these patients.
- Other courses of neurologically induced sexual dysfunction include various causes of peripheral neuropathy, transverse myelitis and vascular spine injuries.

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Slide 39

**Recognizing and Treating Erectile Dysfunction at the Primary Care Level**  
By  
Benny Lloyd, ARNP-C  
Surgery Service

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**Diagnostic Evaluation of Erectile Dysfunction**

- Goal is to define the problem
- Distinguish ED from complaints about ejaculation and/or orgasm
- Establish chronology and severity of symptoms
- Initial evaluation should be done in person by provider
- Include a medical, sexual and psychosocial history
- Assessment of patient's needs and his expectations from treatment

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**Performing Medical History**

- Causes or Comorbidities such as Cardiovascular disease
  - Hypertension
  - Atherosclerosis or Hyperlipidemia
  - Diabetes Mellitus
  - Depression
  - Alcoholism
- Additional Risk Factors
  - Smoking
  - Pelvic pain or trauma
  - Endocrinopathy
  - Obesity

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**Perform a Physical Evaluation for new ED**

- Focused exam of abdomen, penis, testicles, and lower extremity pulses
- Digital rectal exam and serum PSA in men >50 years of age
  - A rectal exam checks for an enlarged prostate gland. An enlarged prostate and ED have been linked in recent studies.
- Additional Assessment could include
  - Testosterone levels
  - Vascular and/or neurological
  - Nocturnal erections
    - Michael E. DeBakey VA Medical Center - Houston, Texas Urology Director for ED has been working on research to provider patients with sleep studies in order to distinguish organic ED from psychological

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**Initial Management without Prescribing**

- Management by identified organic comorbidities or psychosocial dysfunction
- Consider alternatives to erectile dysfunction medications first
  - Does the patient have Hypertension and if so is he controlled
    - Many patients refuse to stay on their prescribed BP medication due the side effects of certain drugs for HTN
- Smoking Cessation for Veteran population
  - Smoking places the patient at a much higher risk for ED
  - Smoking decreases erections placing a strain on sex life and starting families

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**Initial Management without Prescribing cont.**

Management by identified organic comorbidities or psychosocial dysfunction

- Can Obesity Cause Erectile Dysfunction
  - Obesity, 4 out of 5 people who report symptoms of ED are also overweight
  - Obesity is a major risk factor for vascular disease and endothelial dysfunction
- Anxiety, emotional distress and depression are common feelings among obese people

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**Smoking Cessation for Veteran population**

- Patient should be offered the class on smoking cessation
  - Consult placed for patient education about smoking
- Both smoking and erectile dysfunction have often been associated
- plaque build-up in the arteries, called **atherosclerosis**.

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**Smoking Cessation for Veteran population cont.**

- The plaque obstructs blood flow through vessels, causing a host of circulatory problems throughout the body, such as erectile dysfunction.
- Consider stopping PDE5s treatment for Erectile Dysfunction
  - Treatment should be DC'd if patient refuses to attend smoking cessation class to quit smoking.
  - Once class or educated is completed PDE5 therapy can resume

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**Definition of PDE5**

- Phosphodiesterase type 5 inhibitors (PDE5)
  - sildenafil (Viagra)
  - vardenafil (Levitra)
  - tadalafil (Cialis)
- How PDE5 inhibitors work: Following sexual stimulation, PDE5 inhibitors increase blood flow to the penis, causing an erection.
- They inhibit the cGMP-specific isoform 5 of phosphodiesterase, resulting in cGMP accumulation, which, for example in smooth muscle cells, reduces muscular tone.

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**Management of Erectile Dysfunction ED**

- Success of ED treatment depends on the degree of neurological damage.
- The least invasive method is oral treatment with PDE5 inhibitors
- Its a prerequisite that the patient has some residual nerve function to induce the erection.
- PDE5 inhibitors were shown to be effective in approximately 50% of diabetic men.
- In a small non-randomized study investigating spina bifida patients, 63% had improved erections with treatment.
- Men with SCI may benefit considerably from PDE5 inhibitor treatment

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**Viagra (Sildenafil Citrate) : Uses vs Side Effects**

- Viagra (sildenafil) relaxes muscles found in the walls of blood vessels and increases blood flow to particular areas of the body.
- Viagra is used to treat erectile dysfunction (impotence) in men.
- Common side effects may include: flushing (warmth, redness, or tingly feeling); headache, dizziness, abnormal vision (blurred vision, changes in color vision)runny or stuffy nose, nosebleeds; sleep problems (insomnia); muscle pain, back pain; or upset stomach.
- The cost of Viagra 25mg for a supply of 6 pills costs around \$447

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**Levitra (Vardenafil HCl): Side Effects, Interactions**

- LEVITRA (vardenafil hydrochloride) is administered orally for the treatment of erectile dysfunction.
- This monohydrochloride salt of vardenafil is a selective inhibitor of cyclic guanosine monophosphate (cGMP)-specific phosphodiesterase type 5 (PDE5).
- Vardenafil HCl is designated chemically as piperazine, 1-[[3-(1,4-dihydro-5-methyl-4-oxo-7-propylimidazo[5,1-f][1,2,4]triazin-2-yl)-4-ethoxyphenyl]sulfonyl]-4-ethyl-, monohydrochloride and has the following structural formula:
- Same medication as Viagra but with less side effects. No HA, blurred vision, nasal congestion

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**Cialis (tadalafil): Uses vs Side Effects**

- Cialis (tadalafil) relaxes muscles of the blood vessels and increases blood flow to particular areas of the body.
- Cialis is used to treat erectile dysfunction (impotence) and symptoms of benign prostatic hypertrophy (enlarged prostate).
- Common side effects of Cialis include: flushing (redness or warmth of the face, neck, or chest), headaches, stomach upset, diarrhea, flu-like symptoms (such as stuffy nose, sneezing, or sore throat), memory problems, muscle or back pain, nausea, low blood pressure, dizziness.
- Last up 36 hours, 90mg tablets just went generic, talk about the cost

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**Management of Erectile Dysfunction ED second line**

- The second line therapy—which is often necessary in neurological disorders—is penile injection therapy in which vasoactive agents are injected into the cavernous tissue of the penis. EDEX
- This activates the cyclic adenosine monophosphate system and leads to calcium efflux, smooth muscle relaxation and an erectile response.
- Alprostadil, papaverine and phentolamine (TRIMIX) can be used for this purpose and the treatment has been shown to be effective in a number of neurological conditions, including MS, diabetes and SCI.

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**Intracavernous Injection ICI**

- Edex (Alprostadil) is used to treat erectile dysfunction (impotence) and to help diagnose certain causes of this disorder.
- Alprostadil is also used to improve blood flow in newborn babies with heart problems.
- This medication guide addresses only the adult male use of alprostadil in erectile disorders.
- Alprostadil relaxes blood vessels and muscles in the penis which increases blood flow, causing an erection.

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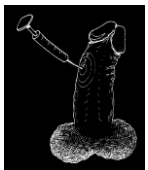
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**Penile Injection**



e.g. Papaverine, Prostaglandin E<sub>1</sub>



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**Do Not Use**

You should not use alprostadil if you are allergic to it, or if you have:

- A. sickle cell anemia or the sickle cell trait;
- B. leukemia;
- C. a tumor of the bone marrow (multiple myeloma);
- D. a curved or deformed penis;
- E. penile fibrosis or Peyronie's disease;
- F. if you have a penile implant; or
- G. if you must avoid sexual intercourse for health reasons.

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**Management of Erectile Dysfunction ED**

- It is important to note that in men with SCI, the denervated tissue tends to be very sensitive to intracavernous injection.
- This means that the treatment has a success rate of up to 95% and also that the risk of priapism is increased.
- Therefore, SCI patients should generally be treated with lower doses than non-SCI men.
- Intraurethral alprostadil (MUSE) can be attempted if injection therapy is unacceptable to the patient; however, this method is generally less effective

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**Management of Erectile Dysfunction ED cont.**

- Vacuum constriction devices can also be used based on patient preference.
- These devices induce a negative pressure that pulls venous blood into the penis. A constriction band is then placed at the base of the penis to keep the blood there.
- Vacuum devices can cause discoloration of the penis, decrease in penile temperature, discomfort with ejaculation and reduced penile sensation, but for some patients, the method can be a satisfactory choice.
- This treatment has been shown to be effective in 75% of diabetic men and in 72%–93% of SCI men.
- In SCI men with reduced penile sensation, it is important to be aware of potential ischemic complications with prolonged use of vacuum devices.

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Slide 58

Vacuum Erection Device



e.g. ErecAid

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Slide 59

Management of Erectile Dysfunction ED

- The third-line treatment for ED is penile implants, which can be rigid, semirigid and inflatable.
- Three-piece inflatable devices, consisting of two cylinders, a reservoir and a pump in the scrotum, are the most commonly used.
- Simpler devices can sometimes be an advantage in patients with decreased hand function, such as with some SCI patients.
- Penile implants may provide a benefit in keeping condom catheters in place, as well as provide stability for intermittent catheterization in SCI patients.

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Slide 60

Management of Erectile Dysfunction ED

- Satisfaction rates are high and the complication rates are low with penile implants.
- Infection rates are higher in diabetics than in the general patient population,
- Both infection rates and the number of mechanical failures are increased in SCI men.
- These problems should be considered carefully prior to inserting an implant.

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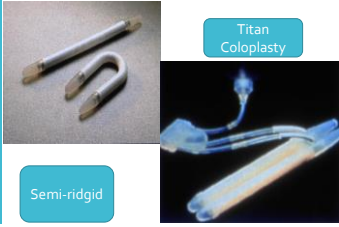
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Slide 61

Penile Prosthesis



Semi-rigid

Titan Coloplasty

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Slide 62

Male Adaptive Techniques

- Vardenafil (Levitra), sildenafil (Viagra)
- Penile injections
- Transurethral therapy
- Vacuum erection device
- Penile prosthesis



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Slide 63

Penile Vibratory Stimulation (PVS)

- In PVS, a vibrator used to induce an ejaculation in SCI men.
- Stimulation with amplitude and frequency (2.5 mm and 100 Hz respectively).
- Placed on the glans penis through which it activates the dorsal nerve of the penis, which, as previously described, constitutes the afferent limb of the ejaculatory reflex.
- This, in turn, activates the efferent part of the reflex via the spinal cord and an antegrade ejaculation is initiated.
- The urethra is milked manually to retrieve as many sperm cells as possible. Sent off for IVF

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