



RAMA
UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF NURSING

Chapter-07



RAMA
UNIVERSITY

((Drugs and sexual dysfunction))

Mr. SHAHANWAZ KHAN
LECTURER (MSN)



((Sexual Dysfunction))

- Sexual dysfunction is a term usually referring to either disturbances in sexual desire or functioning. Although sexual dysfunction is usually thought of to be a male-related disorder, it may be associated with either the female or male gender. sexual dysfunction is a multidimensional phenomenon, composed of various psychological, social and physical dimensions, for which there are now several effective options for treatment.
-



((Female Sexual dysfunction))

- Female sexual dysfunction (FSD) is a term that include a collection of sexual disorders that can affect women throughout their adult life. FSD has multiple causes, with physiological, psychological, and social determinants.
-



□ **Hypoactive sexual desire disorder (HSDD):**

is the most common type of FSD and has received the most attention from drug companies. The production of testosterone, which is known to be important for maintaining libido in women, decreases with age and is affected by hormonal status. The ovaries are a major source of testosterone production, and oophorectomized women have low levels of circulating testosterone, so in this case hormone therapy is the treatment of choice.



((Male sexual dysfunction))

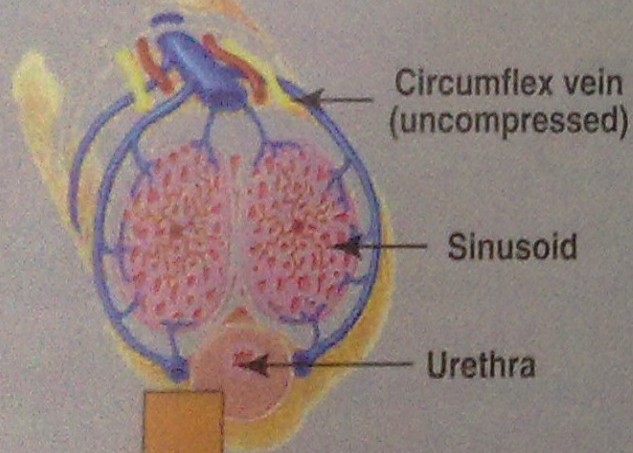
- Sexual or Erectile dysfunction(ER): it is the inability to achieve or maintain penile erection.
 - It affects 100million men worldwide,39% of them are over 40 years old.
-



(Mechanism of Penile Erection)

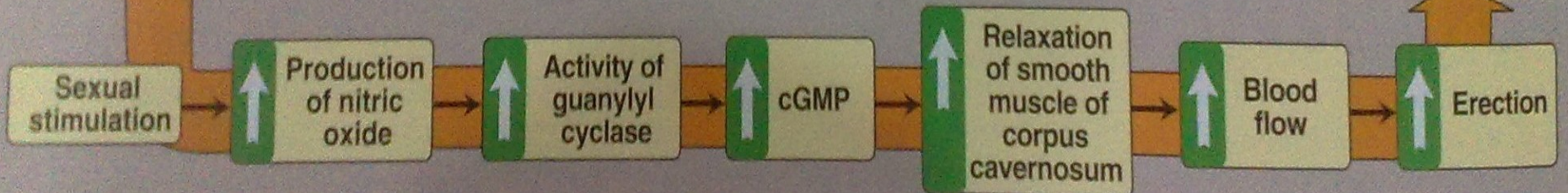
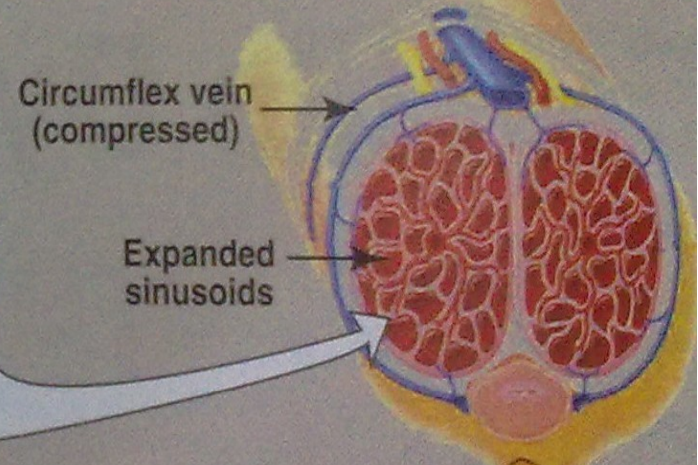
- The stimulation result in the relaxation of smooth muscles of corpus cavernosum which leads to increase in the blood flow.
 - This process is mediated by Nitric oxide(NO) which activates Guanylyl cyclase which forms Cyclic guanosine monophosphate(cGMP) from guanosine triphosphate(GTP),cGMP produces smooth muscle relaxation and decreases intracellular Ca concentration.
 - The duration of action of cGMP is controlled by Phosphodiesterase (PDE),specially PDE-5 which is the isozyme responsible for the termination of cGMP in the corpus cavernosum.
-

FLACCID PENIS

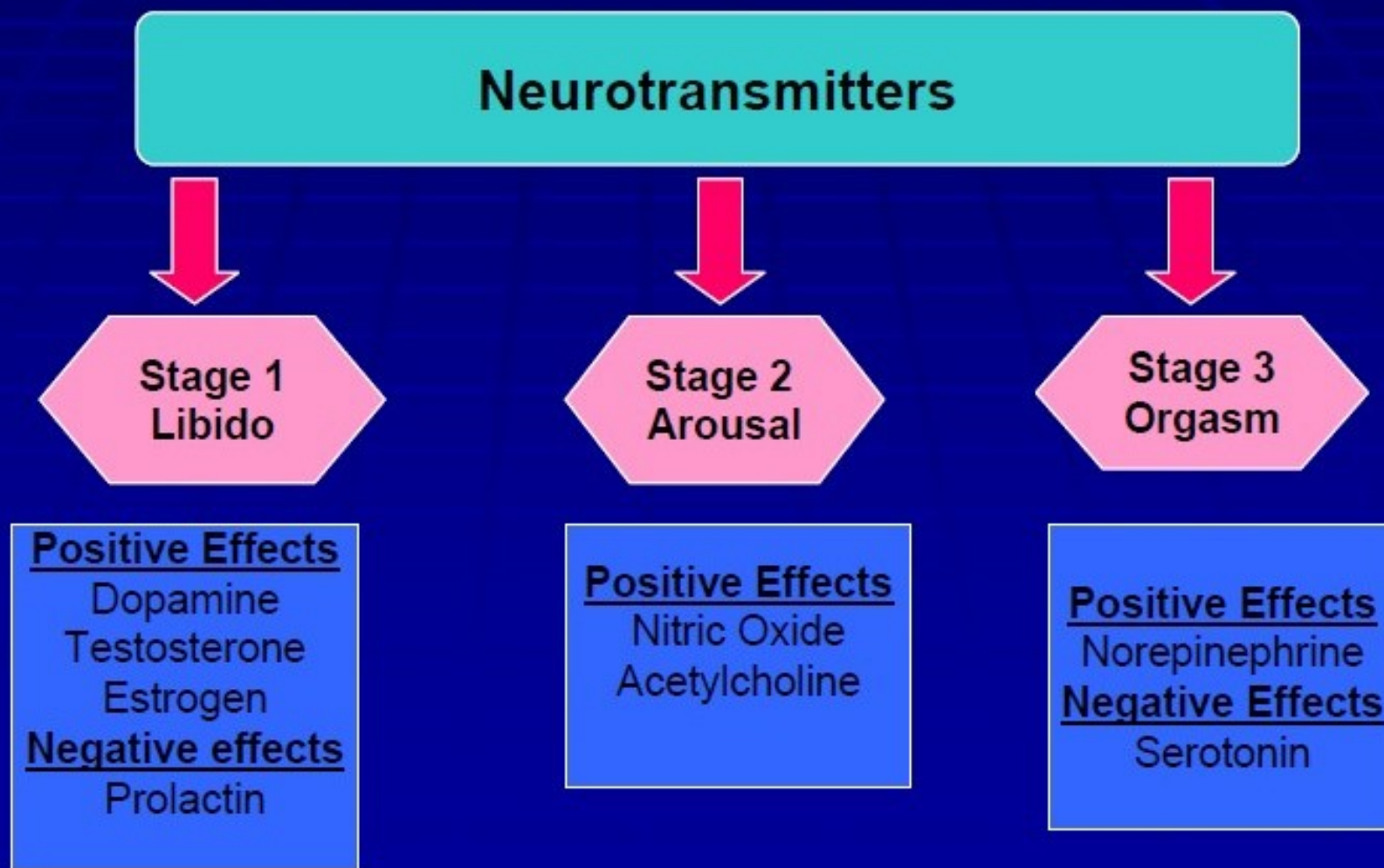



Sexual stimulation causes the smooth muscle cells of the arteries in the penis to relax. As a result, more blood flows into the sinusoids, and their volume increases. The penis becomes swollen and erect.

ERECT PENIS



Sexual Dysfunction and Neurotransmitters



- 
- **Drugs that increase serotonergic activity have an inhibitory effect on all 3 stages of the sexual response**
 - **In animal models, increases in serotonin causes a decrease in dopamine levels**
 - **Serotonin increases prolactin levels while dopamine acts as a prolactin inhibiting factor**

(Causes)

- **Cardiovascular disease.**
- **diabetes.**
- **alcohol .**
- **psychological factors.**
- **Drug therapy like: antidepressant, phenothiazines, cyproterone acetate, fibrate, livodopa, histamine H₂ receptor blocker, phenytoin, carbamazepine ,B- adrenoceptor blockers and thiazide diuretics.**

((Examples of drugs that cause sexual dysfunction))

((Antidepressant drugs))

1 SSRIs(Selective serotonin reuptake inhibitor):

Luvox (fluvoxamine)

2SNRIs(Serotonin-norepinephrine reuptake inhibitor):-


Effexor (venlafaxine)

3 MAOIs(Monoamine oxidase inhibitor):-

Nardil (phenelzine)

4 Tricyclics:-

Endep (amitriptyline)

- 
- SSRIs are the most common group that causes sexual side effects. these effects include problems with sexual desire, lack of interest in sex, and anorgasmia (trouble achieving orgasm). although usually reversible, these sexual side effects can, in rare cases, last for months or years after the drug has been completely withdrawn.
 - The mechanism of these drugs is that they compete with dopamine receptors and decrease its effect which in turn decrease norepinephrine and reduce blood flow, and finally erection problem.
 - Some SSRI's are potent nitric oxide synthase inhibitors, and nitric oxide is a critical element in the signal transduction cascade mediating penile erection



((Antihypertensive drugs))

□ *Beta Blockers:*

Beta blockers are another class of medications that are commonly used alone or in combination with other therapies for men with **hypertension**. Unfortunately, beta blockers have a significant association with **erectile dysfunction**. For this reason, if men complain that their **erections** were adequate but decreased dramatically when they started a beta blocker, it is time for a discussion for the health professional who prescribed the medication.



□ *Potassium Sparing Diuretics:*

Some of the less commonly used medications include a class of diuretics that are known as the potassium sparing diuretics. These drugs are commonly used for **hypertension** in men with some degree of renal insufficiency and can have a side effect of **erectile dysfunction** because of effects on the hormonal status of the patient. The potassium sparing diuretics can also cause painful breast tenderness which can be quite significant for men.



□ *Alpha Blockers:*

The class of medications called alpha blockers includes drugs such as prazosin, terazosin and doxazosin. These classic alpha blockers are used for **hypertension** and more commonly have been used to treat men for the symptoms related to an enlarged prostate. These drugs have not been shown to affect the **erection** in an adverse way. However, they have been shown to decrease a man's ability to ejaculate, a condition called retrograde ejaculation, because of a unique action on the bladder neck. Retrograde ejaculation is the reason some men do not like to take alpha blockers. They are usually not primary therapy for the man with the new diagnosis of **hypertension** but are more commonly used in combination therapy. A newer class of alpha blockers formulated specifically for prostate disease does not tend to have as many cardiovascular side effects.



((Chemotherapy))

- For women, some types of chemotherapy can cause vaginal dryness , which can be treated by the use of water based lubricants.
 - Erectile dysfunction, or impotence, is a condition in which a man is unable to achieve or keep an erection. Some chemotherapy drugs may directly cause impotence in men.
-

Cocaine

- ❑ Inhibits reuptake of dopamine
- ❑ Potent vasoconstrictor
- ❑ Increased sexual desire
- ❑ Arousal:
 - ❑ Men:
 - ❑ low doses – prolonged erection
 - ❑ high doses – erectile failure
 - ❑ Women: reports of both increased and decreased subjective arousal
- ❑ Delayed or absent orgasm

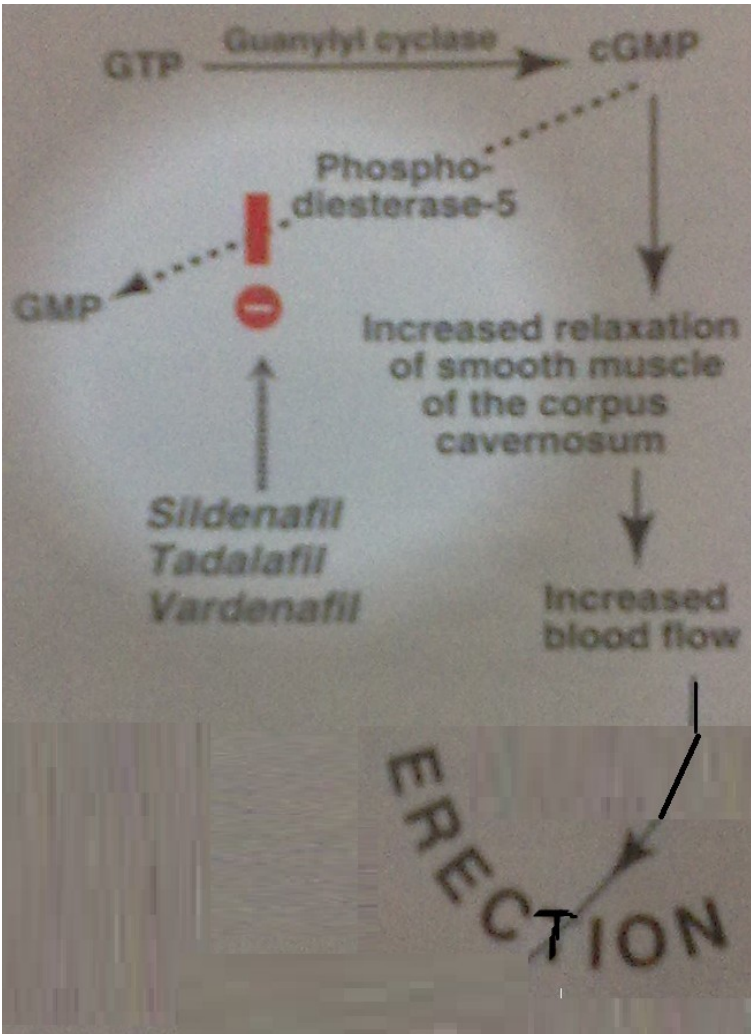
Opioids: Heroin


- ❑ Stimulate opiate receptors (enkephalins (body) and endorphins (brain)) – results in reduction in circulating testosterone
- ❑ Produce relaxation/sense of well being
- ❑ Analgesic affect – opiate receptors in female genital tract
- ❑ Few reports of acute use: lowers drive, delays orgasm
- ❑ Male Heroin addicts:
 - ❑ loss of drive, erectile dysfunction, orgasmic dysfunction
 - ❑ Withdrawal: increased morning erections, spontaneous ejaculation, slow return of sex drive, erectile and orgasmic dysfunction
- ❑ Female Heroin addicts:
 - ❑ Decreased drive, anorgasmia
 - ❑ Withdrawal: loss of libido



(Drugs used for treatment of ED)


- 1- PDE-5 inhibitors: these drugs inhibits the action of PDE-5 and prolongs the action of cGMP which leads to increase the blood flow to the corpus cavernosum, and these drugs are:
-





a. Sildenafil (viagra): this drug is taken orally and it takes 60 mins to produce an effect and it has a half life of 3-4 hrs and its absorption is delayed when it is taken with food.

b. Vardenafil : this drug is similar to Sildenafil and its absorption is also delayed by food intake and it takes 50 mins to produce an effect and its half life is 4-5 hrs.



c- Tadalafil : it has slower onset of action(120mins) but it has a long half life (approximately 18hrs), resulting in enhanced erectile function for at least 36hrs, and the pharmacokinetics of Tadalafil are not affected by food or alcohol consumption.

(Adverse effects of PDE inhibitors)

- ▶ □ The most frequent adverse effect of PDE inhibitors are headache, flushing, dyspepsia and nasal congestion.
 - ▶ □ And they also lead to disturbance in color vision, probably because of inhibition of PDE-6 (Which is a PDE found in retina which is important for color vision) except Tadalafil.
-

Contra indication of PDE


INHIBITOR

- because of the ability of PDE inhibitors to enhance the activity of NO, there is an absolute contraindication against the use of organic nitrates.
 - P D E should not be used with alpha-adrenergic antagonists due to potential hypotension.
-



2-Alprostadil:

- it is a stable form of prostaglandin E₁.
- It is powerful vasodilator.
- it is effective for psychogenic and neuropathic ED



(Mechanism of action of Alprostadil)

this drug increases the arterial inflow and decreases the venous out flow by contracting the corporal smooth muscle that occludes draining venules.



3-Papaverine:

it is an alkaloid drug and it is nonspecific phosphodiesterase inhibitor, and it is used to treat neurologic and psychogenic ED.




4-Apomorphine:

it is a dopamine agonist and it is given by subcutaneous injection, and it may cause nausea.

((Treatment of FSD))

- ▶ **Estrogen therapy.** Localized estrogen therapy — in the form of a vaginal ring, cream or tablet — can improve sexual function in a number of ways, including improving vaginal tone and elasticity, increasing vaginal blood flow, enhancing lubrication, and having a positive effect on brain function and mood factors that impact sexual response.
-

- 
- **Androgen therapy.** Androgens include male hormones, such as testosterone. Testosterone is important for sexual function in women as well as men, although testosterone occurs in much lower amounts in a woman. Androgen therapy for sexual dysfunction is controversial. Some studies show a benefit for women who have low testosterone levels and develop sexual dysfunction; other studies show little or no benefit.



((References))

- Lippincott's Illustrated Reviews: Pharmacology 3rd edition.
 - Clinical pharmacology: P.N. Bennet, MJ. Brown(ninth edition) .
 - Wikipedia.
-



THANK YOU
