

*In the name of God , the compassionate  
and the merciful*

# **Obesity and Sexual Dysfunction**

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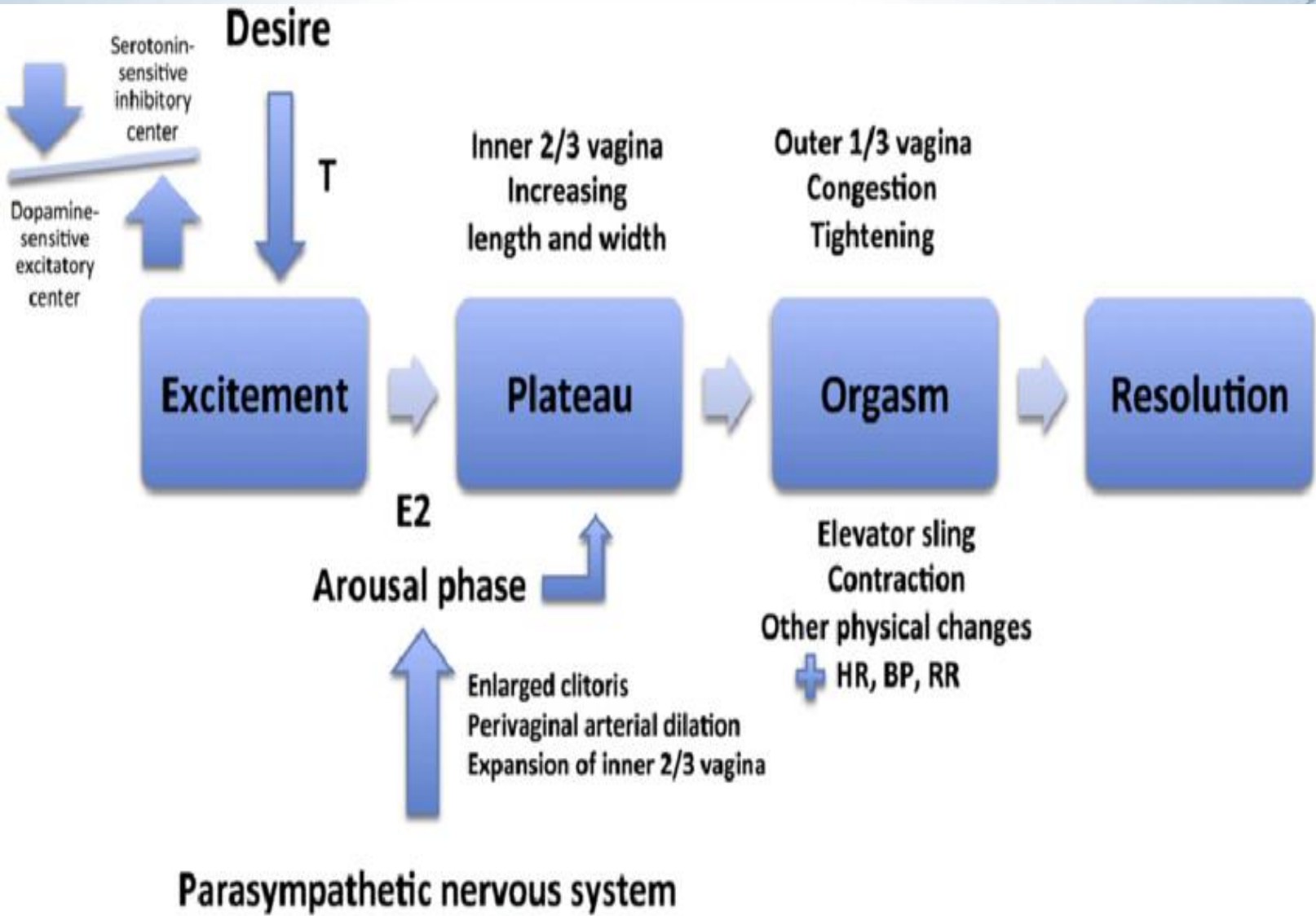
## Outlines:


- ❖ Obesity-vascular dysfunction, and Sexual dysfunction (SD)
- ❖ Obesity- hypogonadism, polycystic ovarian syndrome and SD
- ❖ Obesity-psychogenic dysfunction and SD
- ❖ Obesity - anatomic dysfunction and SD

# Sexual function and dysfunction

- Sexual function is how the body reacts in different stages of the sexual cycle
- Relevant aspects of sexual function are defined on the basis of a modified version of Masters and Johnson's work.<sup>[1]</sup>

*[Masters, William](#); Virginia E. Johnson (1966). *Human Sexual Response*. Little, Brown & Co*





Sexual dysfunction refers to a problem occurring during any phase of the sexual response cycle that prevents the individual or couple from experiencing satisfaction from the sexual activity.

# symptoms of sexual dysfunction

## In men:

- Inability to achieve or maintain an **erection** suitable for intercourse (**erectile dysfunction: ED**) W: 20-31% Iran : 56.1%
- **Absent or delayed ejaculation** despite adequate sexual stimulation (**retarded ejaculation**)
- Inability to control the timing of ejaculation (**early or premature ejaculation**) W: 9-31% Iran: 21.3%


## In women:

- Inability to **achieve orgasm** W: 25% Iran:35.3%
- **Inadequate vaginal lubrication** before and during intercourse W: 41.2% Iran %30.6
- **Sexual pain disorder** W: 20.1% Iran: 20.1%

## In men and women:

- Lack of interest in or desire for sex
- Inability to become aroused

• Ramezani, M. A., Ahmadi, K., Ghaemmaghami, A., Marzabadi, E. A., Pardakhti, F. Epidemiology of Sexual Dysfunction in Iran: A Systematic Review and Meta-analysis. International journal of preventive medicine. 2015;6:43



\*40–45% of adult women and  
20–30% of adult men  
have at least one  
manifest sexual dysfunction

\*Lewis, R. W., Fugl-Meyer, K. S., Bosch, R., Fugl-Meyer, A. R., Laumann, E. O., Lizza, E., et al. Epidemiology/risk factors of sexual dysfunction. *The journal of sexual medicine*. 2004;1(1):35-9

# Male and Female Sexual phases

Phase	Both sex	Males	Females
<b>Excitement</b>	<b>BP</b> and skeletal muscle tones increase; <b>PR</b> quickness	Penis begin to <b>swell and enlarge</b>	<b>Vaginal secretions; clitoris swells</b>
<b>plateau</b>	<b>PR</b> increase; <b>HR</b> increases to 100-160 bpm	<b>Erection forms</b> , scrotum contracts and elevates (i.e. “pulls up”) testes	Orgasmic platform forms; uterus elevates and causes vaginal “tenting”
<b>Orgasm</b>	<b>BP &amp; PR</b> reach Max; HR 110-180 /bpm	<b>Full erection ;emission &amp; ejaculation</b>	Outer third of the vagina contracts rhythmically
<b>Resolution</b>	BP and PR return to normal; skeletal muscle tone relaxes and return to normal	BF to penis returns to normal; erection subsides; refractory period	Uterus returns to normal position; vaginal secretions cease



What is the relationship between obesity and sexual dysfunction?



# Male and Female Sexual phases

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ELSEVIER  
SAUNDERS

Endocrinol Metab Clin N Am  
36 (2007) 453–463

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ENDOCRINOLOGY  
AND METABOLISM  
CLINICS  
OF NORTH AMERICA

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# ED<sup>2</sup>: Erectile Dysfunction = Endothelial Dysfunction

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One Essex Center Drive, Peabody, MA 01960, USA*

<sup>b</sup>*Harvard Medical School, Boston, MA, USA*

[Am J Cardiol.](#) 2011 Aug 15;108(4):599-606.

**The link between erectile and cardiovascular health: the canary in the coal mine.**

[Meldrum DR](#)<sup>1</sup>, [Gambone JC](#), [Morris MA](#), [Meldrum DA](#), [Esposito K](#), [Ignarro LJ](#).



# Obesity as a Proinflammatory State\*




- Adipose tissue is well vascularized and innervated and contains a connective tissue matrix and numerous immune cells including **macrophages**.
- White adipose tissue (**WAT**) is most familiar as the type of fat in which triglyceride is stored and from which lipids are mobilized for systemic utilization when other tissues require energy.
- WAT is now known to secrete a variety of substances that help to regulate metabolic homeostasis. These include:  
**leptin, adiponectin, resistin, tumor necrosis factor- (TNF- $\alpha$ ), interleukin-6 (IL-6), monocyte chemoattractant protein-1 (MCP-1; also known as CCL2), plasminogen activator inhibitor-1 (PAI-1), angiotensinogen, visfatin, retinol-binding protein-4, serum amyloid A (SAA), and others.**

\*

Shoelson, S. E., Herrero, L., Naaz, A. Obesity, inflammation, and insulin resistance. *Gastroenterology*. 2007;132(6):2169-80



- 
- Early phase of atherosclerosis: recruitment of **inflammatory cells** from the circulation
  - This process is predominantly mediated by **cellular adhesion molecules**, which are expressed on the vascular endothelium and on circulating leukocytes in response to several inflammatory stimuli

Hypertension Diabetes mellitus Hypercholesterolemia  
Heart failure Obesity Smoking Aging Menopause

Intact

Initial lesion

Fatty streak

Atheroma

Fibroatheroma

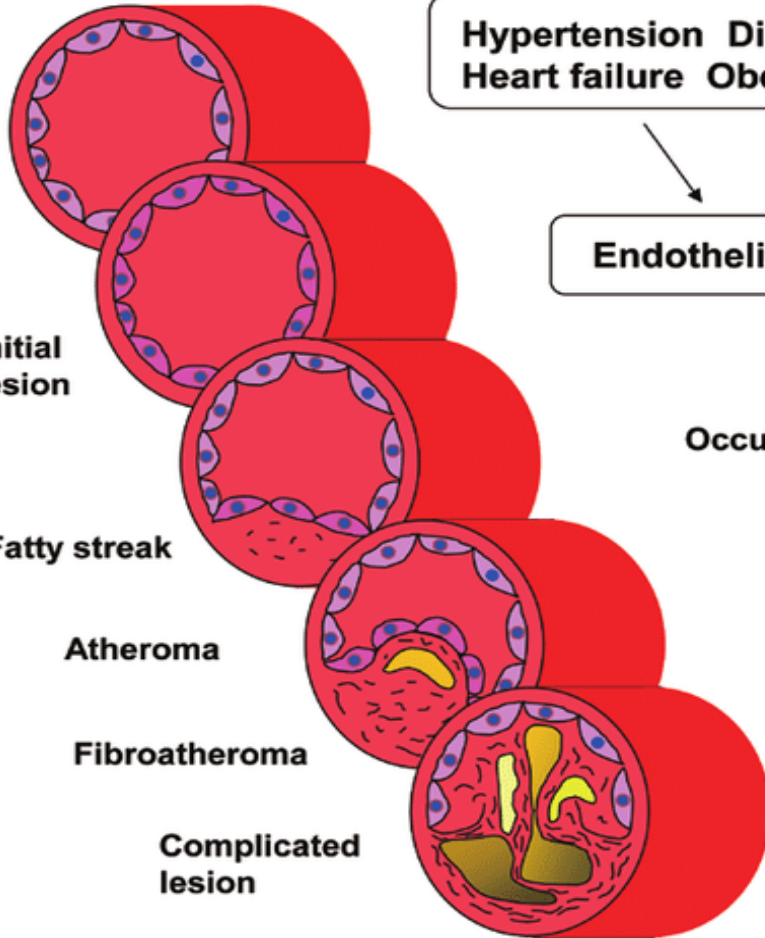
Complicated lesion

Endothelial dysfunction

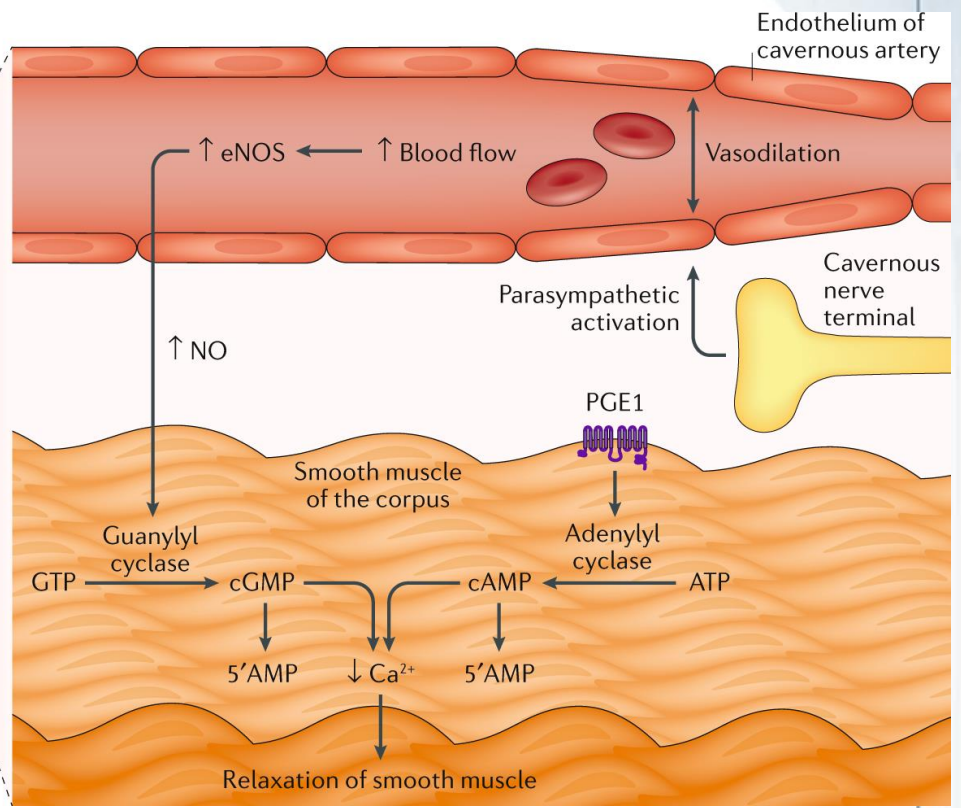
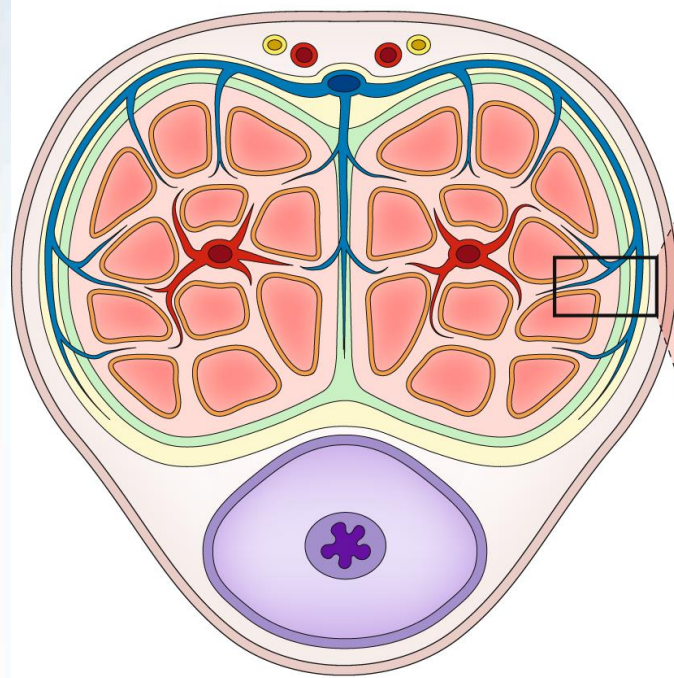
Occurrence of atherosclerosis

Development of atherosclerosis

Cardiovascular events







Classical Risk Factors

Diabetes mellitus  
Dyslipidemia  
Smoking  
Hypertension  
Aging

Novel/Emerging Risk Factors

Infection/Inflammation  
Physical inactivity  
Post-prandial state  
Homocysteine  
Obesity



Intrinsic susceptibility – Genetic and environmental factors

**Endothelial Dysfunction**

Impaired vasomotion/tone    Prothrombotic state    Pro-Inflammatory State    Proliferation in arterial wall

Involvement of small vessels faster than large vessels

Sexual dysfunction

Meldrum et al



# BMI or WC

The World Health Organization defines overweight and obesity as an abnormal or excessive fat accumulation that may impair overall health.

- Body mass index :BMI (kg /m<sup>2</sup>)
  - Low BMI ,but high fat (visceral fat or WC ▲ )
  - High BM, no High fat

WC is better Index

# Obesity , metabolic syndrome and endothelial and SD

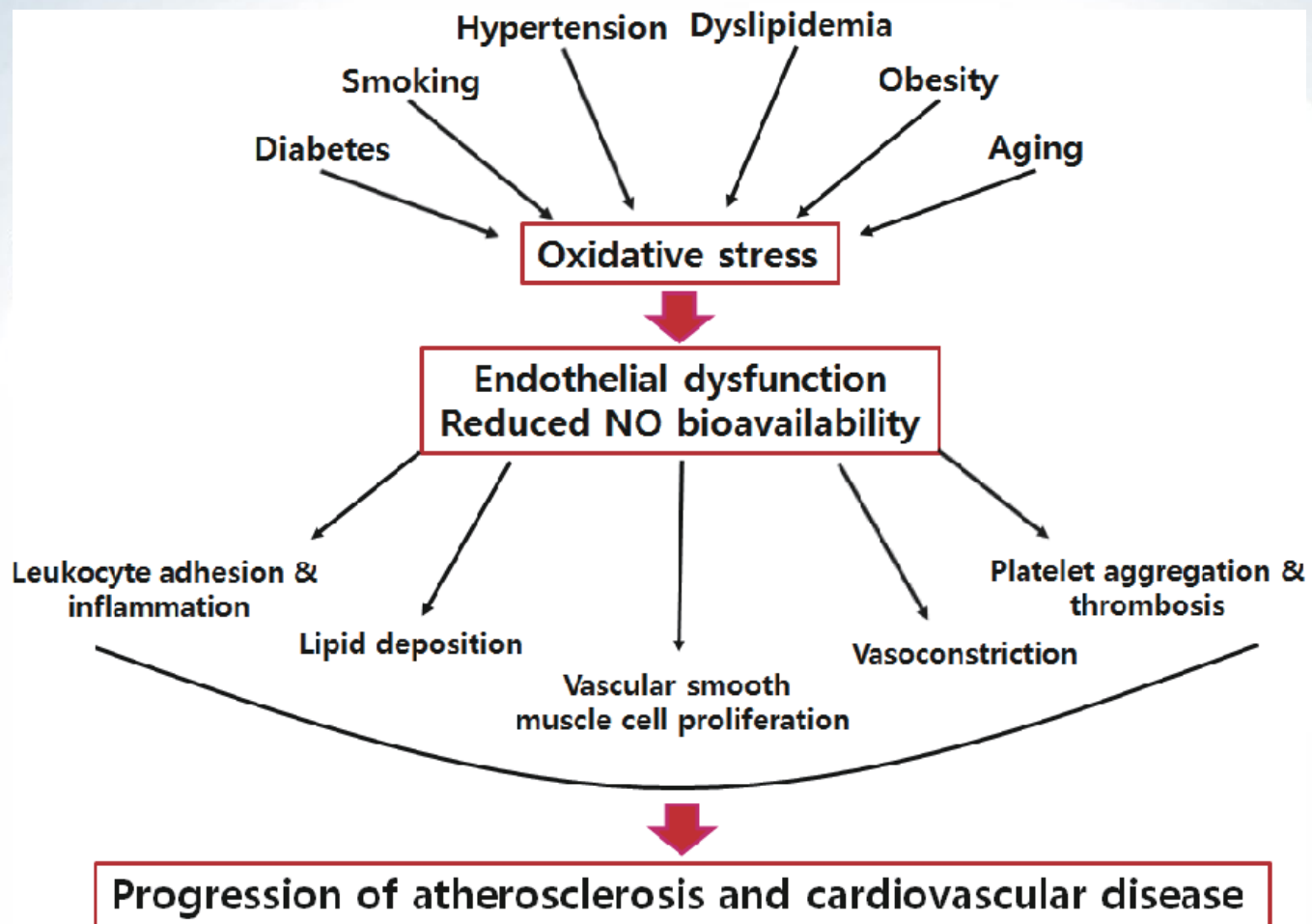


- Waist circumference in females  $>88$  cm and in men  $>102$  cm
- BP  $\geq 130/85$  mmHg
- Fasting serum glucose  $\geq 100$ mg/dl
- Fasting serum triglycerides  $\geq 150$  mg/dl
- Serum HDL-C  $<50$  mg/dl

# Obesity and hypertension



It is well established that overweight or obese healthy adults present with impaired vasodilating properties of the endothelium or endothelial dysfunction suggesting increased risk for cardiovascular disease development



Metabolic syndrome

Insulin resistance

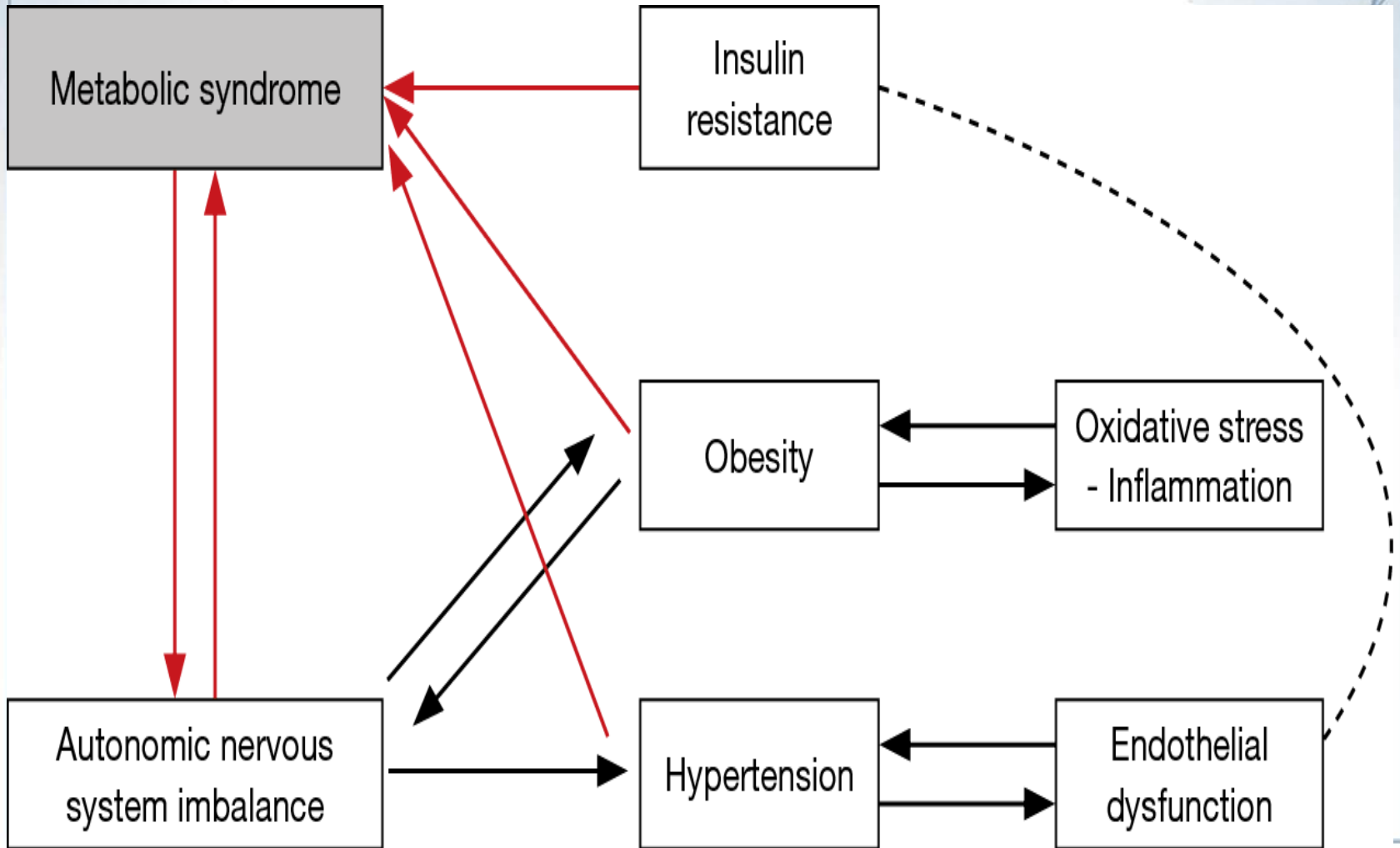
Autonomic nervous system imbalance

Obesity

Oxidative stress - Inflammation

Hypertension

Endothelial dysfunction



# Diabetes, insulin resistance and SD

- Type 2 diabetes is an insulin-resistant state characterized by inflammation, oxidative stress, and accelerated atherosclerosis
- Nitric oxide (NO) bioavailability, critical for normal vasomotor tone and function, is reduced in states of insulin resistance, including type 2 diabetes
- Activation of NO synthase (NOS) augments blood flow to insulin-sensitive tissues (i.e., skeletal muscle, liver, **adipose tissue**), and its activity has been shown to be impaired by hyperglycemia and insulin resistance
- \*

Kashyap, S. R., Lara, A., Zhang, R., Park, Y. M., DeFronzo, R. A. Insulin reduces plasma arginase activity in type 2 diabetic patients. Diabetes care. 2008;31(1):134-9



# Type 2 Diabetes Mellitus

Hyperglycemia

Insulin Resistance

↑ Arginase activity

↓ NOS activity

↑ Ornithine + Urea ← Arginase — L-Arginine — — — NOS — — — → ↓ NO + L-citrulline

↓ NO and ↑ ROS reactive oxygen species

**Insulin Resistance**  
**Inflammation**  
**Endothelial Dysfunction**  
**Atherosclerosis**

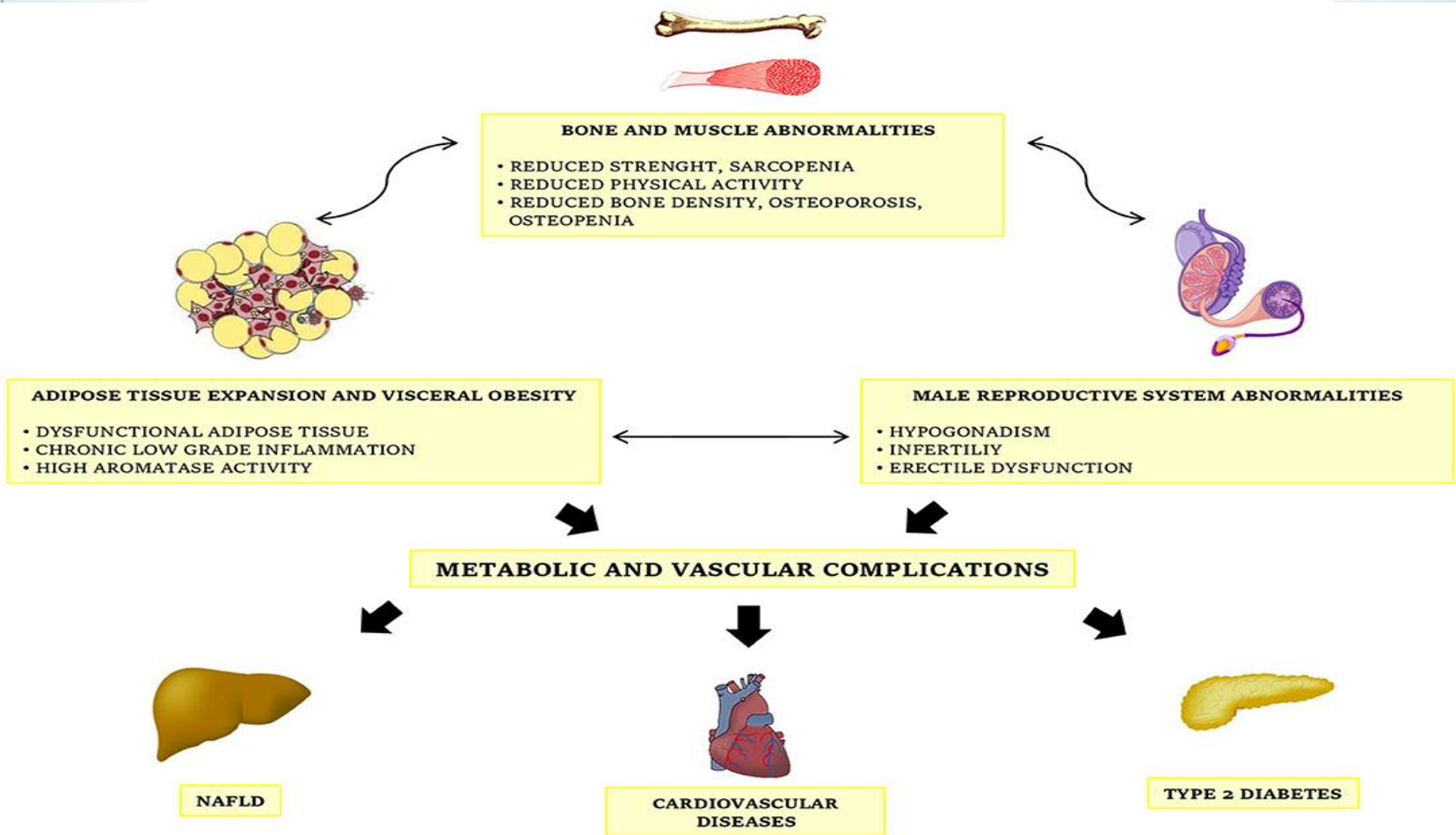


# **Endocrinological dysfunction, obesity, and SD**

## Obesity, hypogonadism, and ED

- The prevalence of hypogonadism is significantly greater in males with obesity than in normal-weight controls
- The most common cause of male hypogonadism in adults is obesity
- It is defined as a syndrome of the **inability** to produce **adequate amounts of total testosterone and/or sperm in males** with obesity
- Reductions in **total testosterone** levels are a consequence of **reductions in sex hormone binding globulin (SHBG)** due to **obesity-associated hyperinsulinemia**.

# Obesity, hypogonadism, and ED



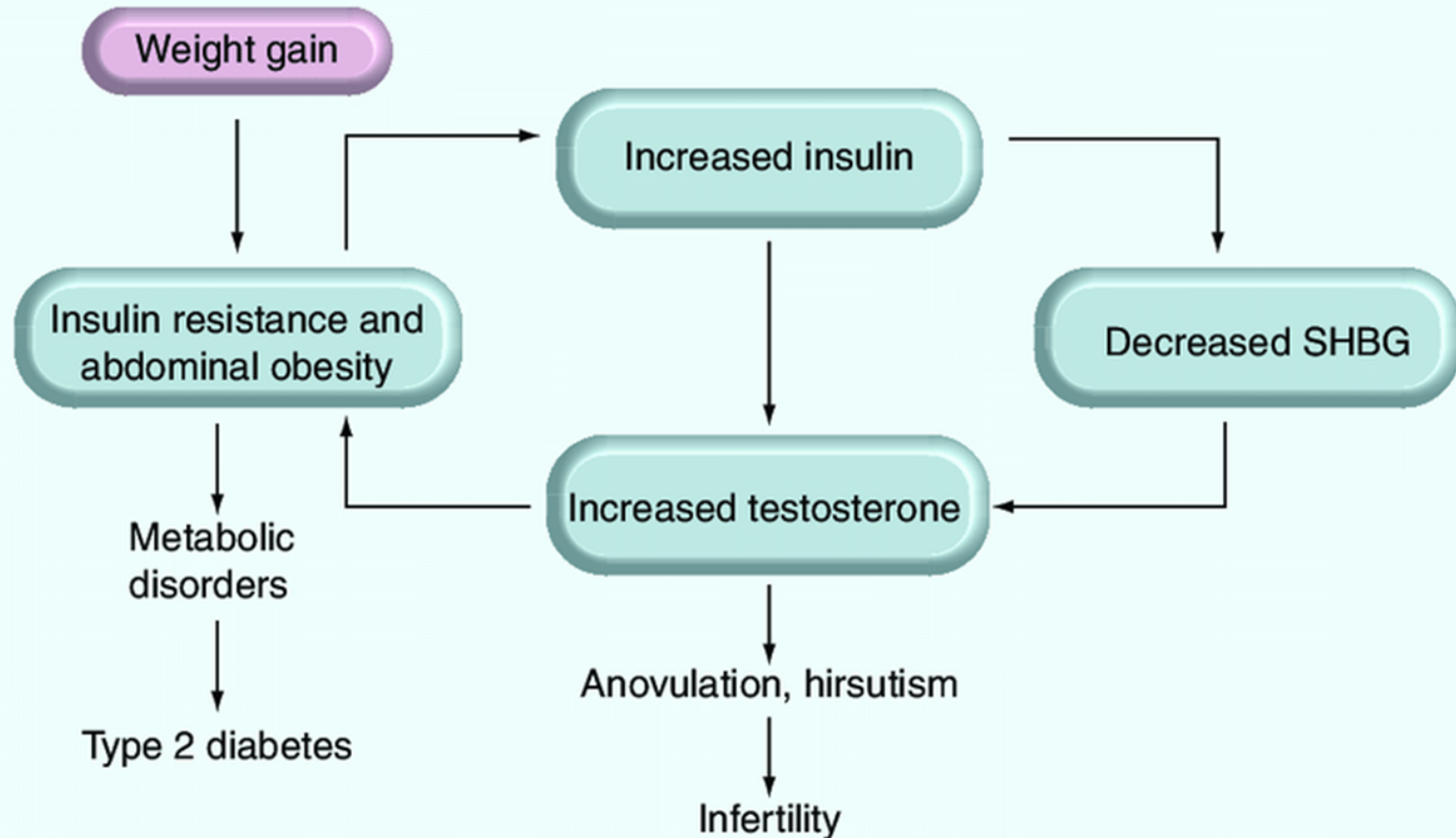
## Obesity, hypogonadism, and ED

Testosterone deficiency, causing hypogonadism in men .Men with erectile dysfunction, hypoactive sexual desire and retarded ejaculation, as well as those with visceral obesity and metabolic diseases, should be screened for testosterone deficiency and treated.

# **Obesity, polycystic ovarian syndrome , and SD**

Obesity also affects the reproductive system and is associated with polycystic ovarian syndrome (PCOS) in women

# Obesity, polycystic ovarian syndrome, and SD



REVIEW

Sexual Dysfunction in Women With Polycystic Ovary Syndrome:  
Systematic Review and Meta-Analysis



Ana Carolina Firmino Murgel, MD, Ricardo Santos Simões, PhD, Gustavo Arantes Rosa Maciel, PhD,  
José Maria Soares -Jr, PhD, and Edmund Chada Baracat, PhD

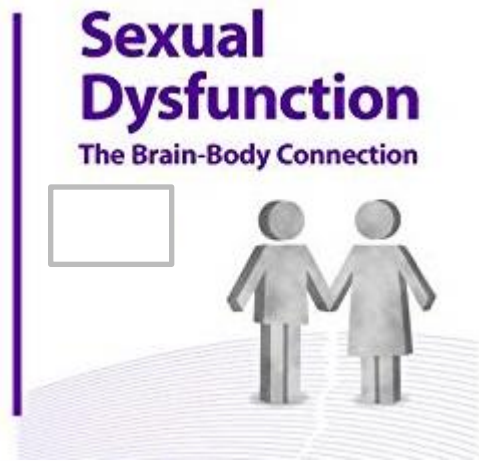
2019

- Sexual function of both PCOS patients and women with regular menstrual cycles might, in general, be similar.
- Hirsutism, BMI, and infertility may influence the emotions and the sexuality of part of the women with PCOS.



# Obesity, psychogenic dysfunction and SD

## Body image

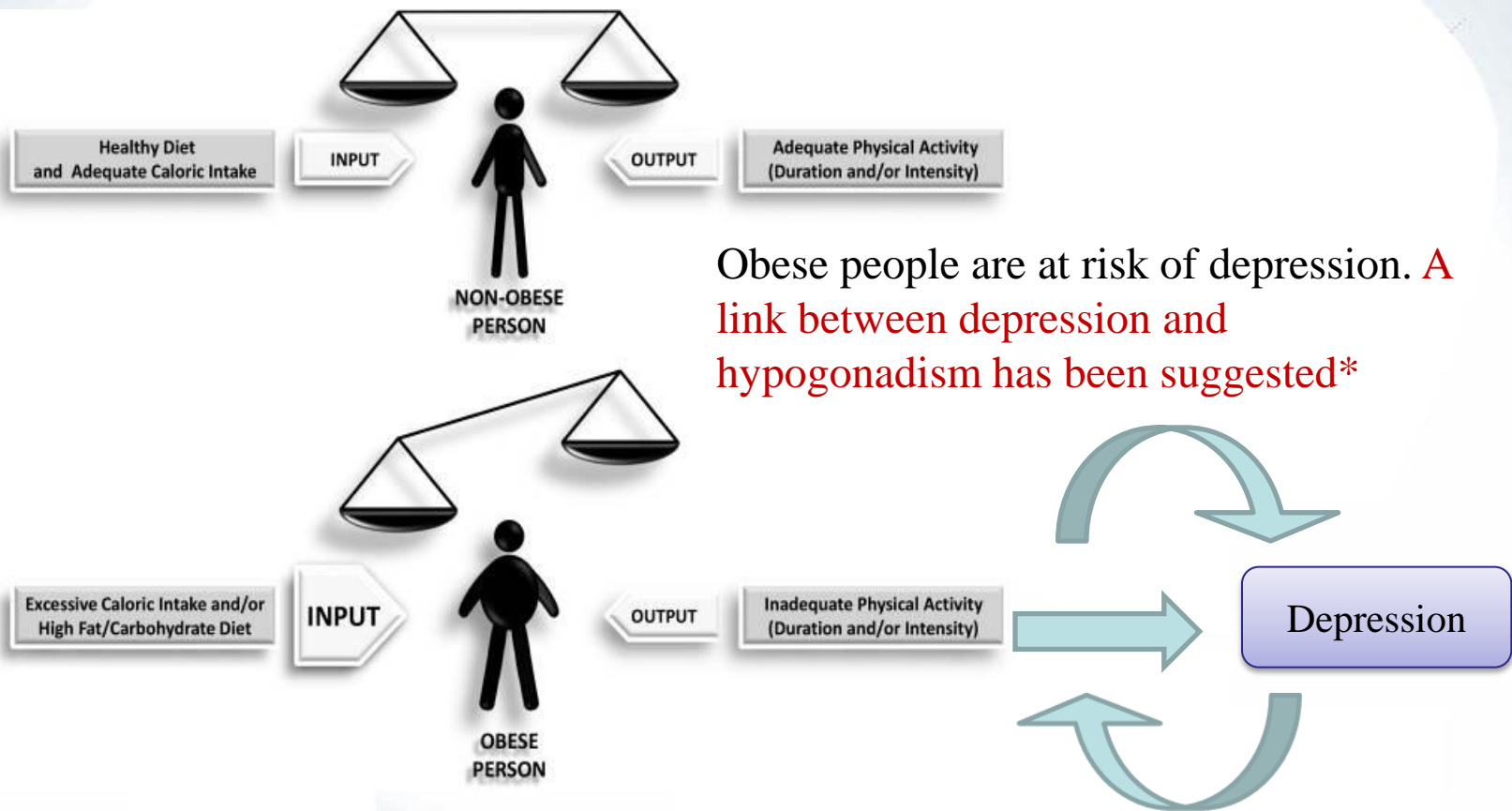


- The body image satisfaction and sexual quality of life levels of obese women were found to be low.\*
- Additionally, as the positive body image increased in normal weight, overweight and obese women, sexual quality of life increased.

\*Taskin Yilmaz, F.,Karakoc Kumsar, A., Demirel, G. The effect of body image on sexual quality of life in obese married women. Health care for women international. 2019;40(4):479-92

# Obesity, psychogenic dysfunction and SD

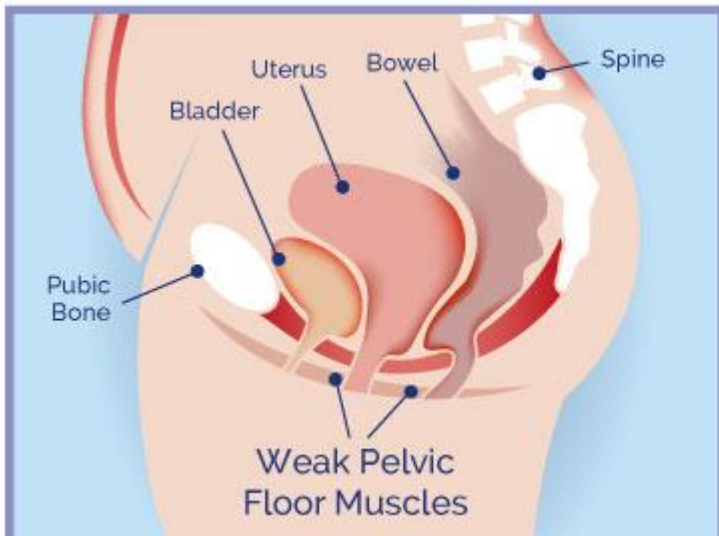
## Depression



\* Mushannen, T.,Cortez, P.,Stanford, F. C., Singhal, V. Obesity and Hypogonadism-A Narrative Review Highlighting the Need for High-Quality Data in Adolescents. Children (Basel, Switzerland). 2019;6(5)

# Obesity , male and female anatomic dysfunction and SD

Pelvic floor muscle dysfunction resulted to anorgasmia



## Pelvic Floor and Weight Gain

Continual pressure of too much weight can weaken the pelvic floor and cause the bladder, the bowel and the vagina to prolapse or bulge through the muscle

# Pelvic floor and weight gain

- The pelvic floor muscles are active in both male and female genital **arousal and orgasm**, pelvic floor muscle hypotonus may impact negatively on these phases of function
- **Hypertonus** of the pelvic floor is a significant component of **sexual pain** disorders in women and men
- conditions related to pelvic floor dysfunction, such as pelvic pain, pelvic organ prolapse, and lower **urinary tract symptoms**, are correlated with **sexual dysfunction**
- Rosenbaum, T. Y. Pelvic floor involvement in male and female sexual dysfunction and the role of pelvic floor rehabilitation in treatment: a literature review. The journal of sexual medicine. 2007;4(1):4-13



Thank you for your  
attention

