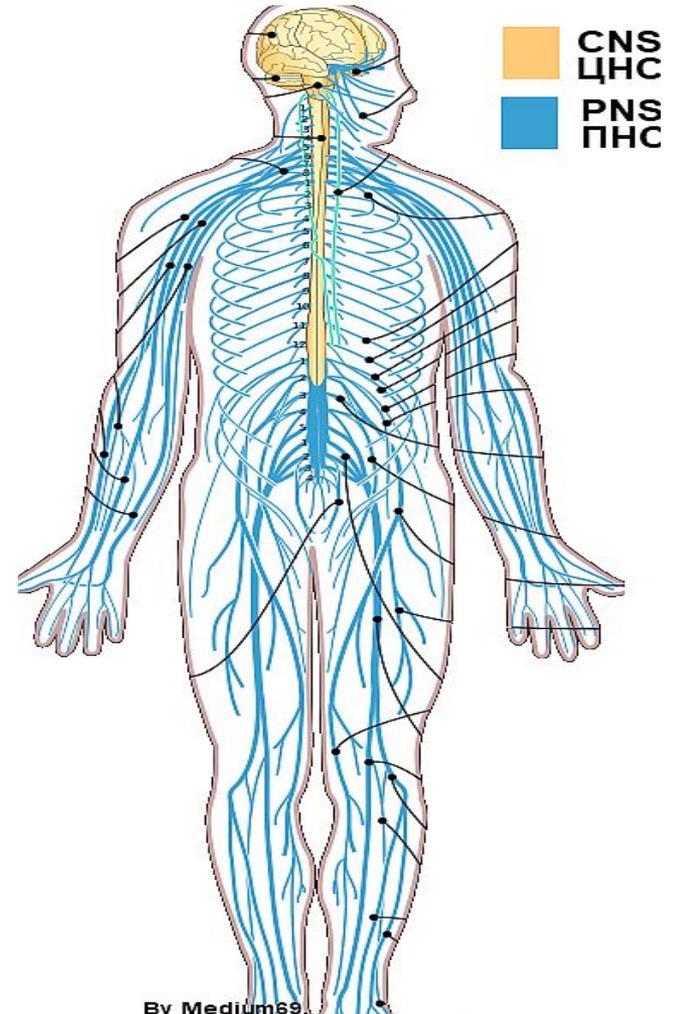
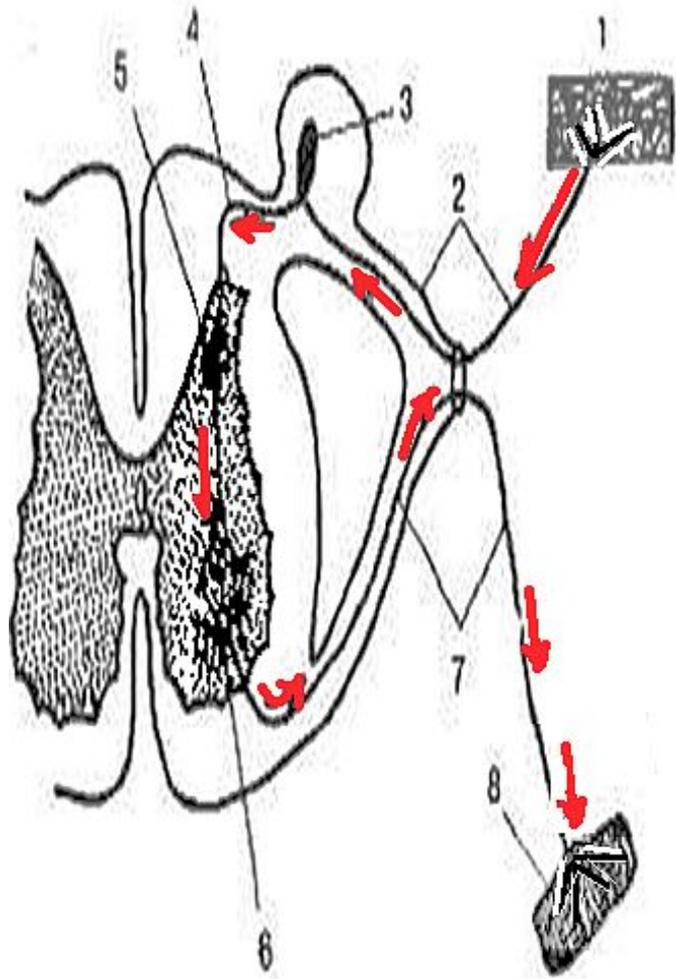


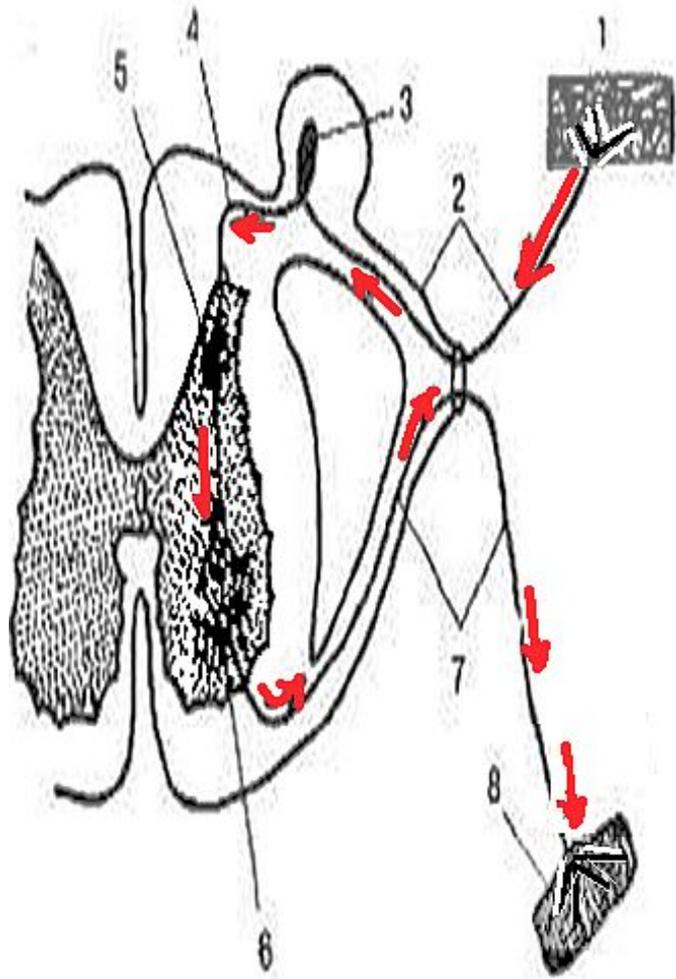
■ CNS  
ЦНС  
■ PNS  
ПНС

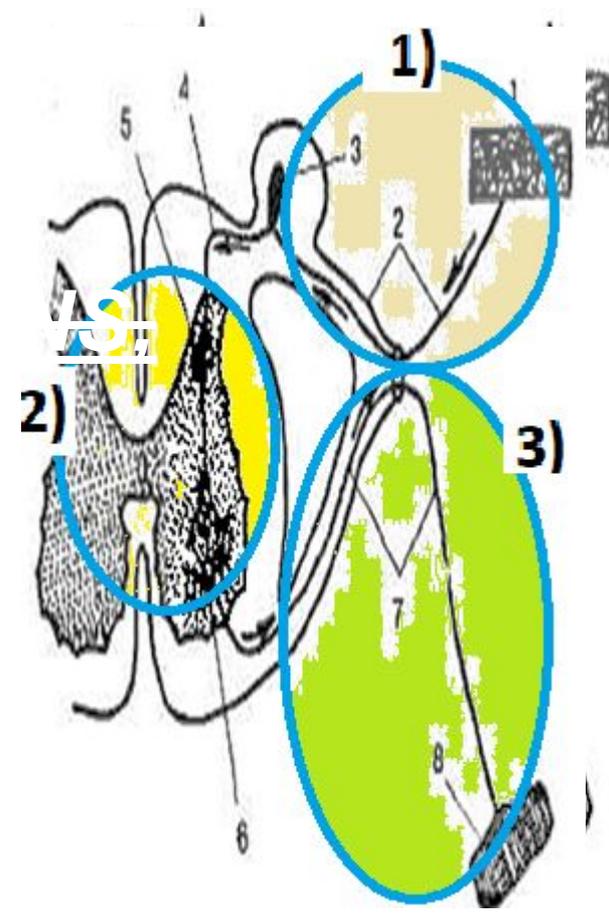
By Medium69,  
Jmarohn - File:Nervous system  
diagram.png, CC BY-SA 4.0,  
<https://commons.wikimedia.org/w/index.php?curid=36395693>

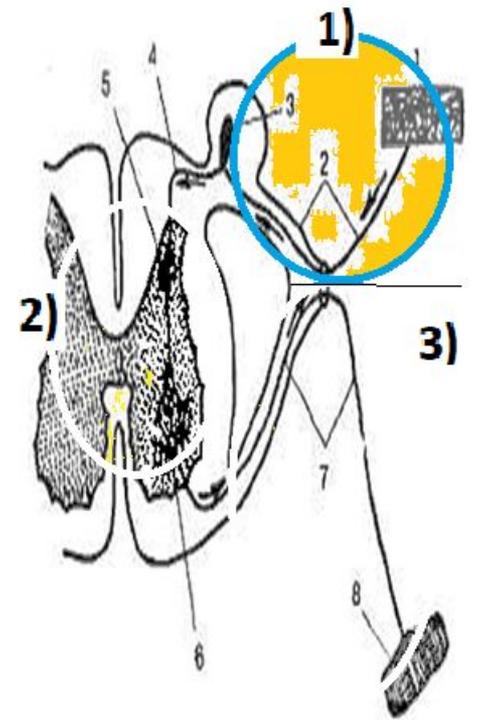


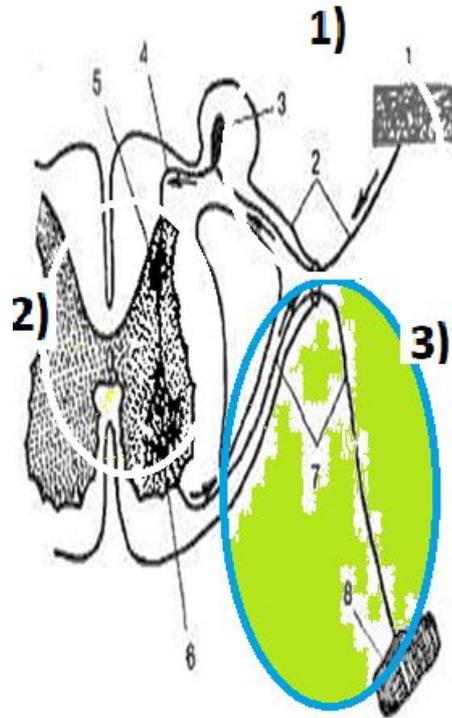
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Jmarohn - File:Nervous system  
diagram.png, CC BY-SA 4.0,  
<https://commons.wikimedia.org/w/index.php?curid=36395693>







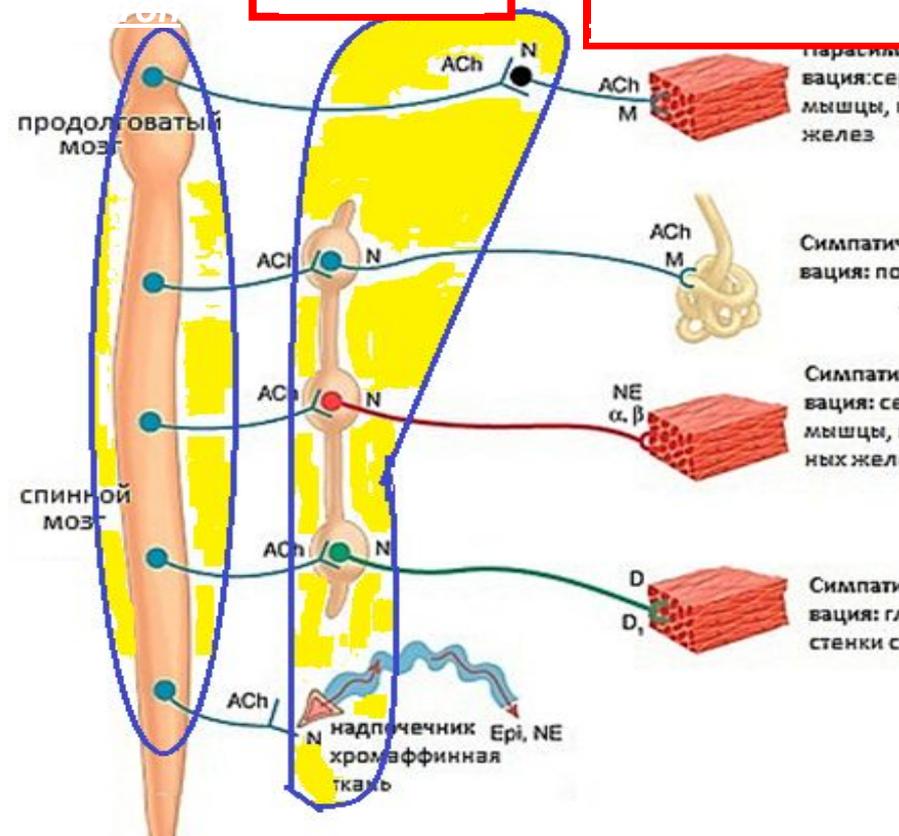


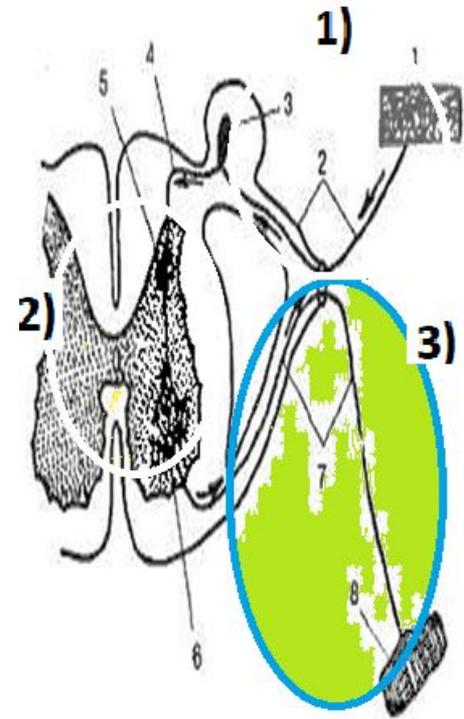










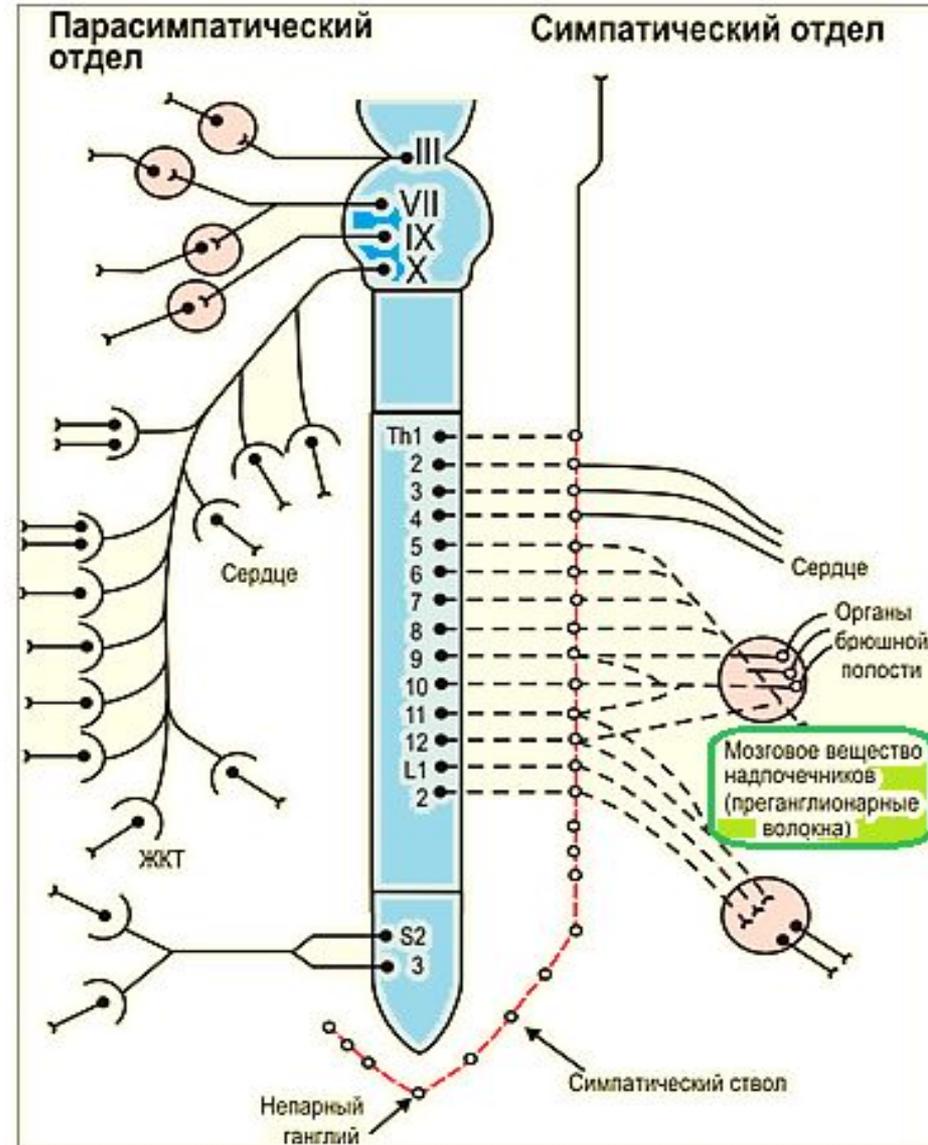


# Similarities between Autonomic Sympathetic (right) and Parasympathetic (left) Nerves

Both consist of

- preganglionic fiber (the body of the preganglionic neuron is in the CNS) and
- postganglionic fiber (the body of the neuron is in the ganglion).

The exception is the **adrenal medulla** (it is an embryogenetically modified ganglion).



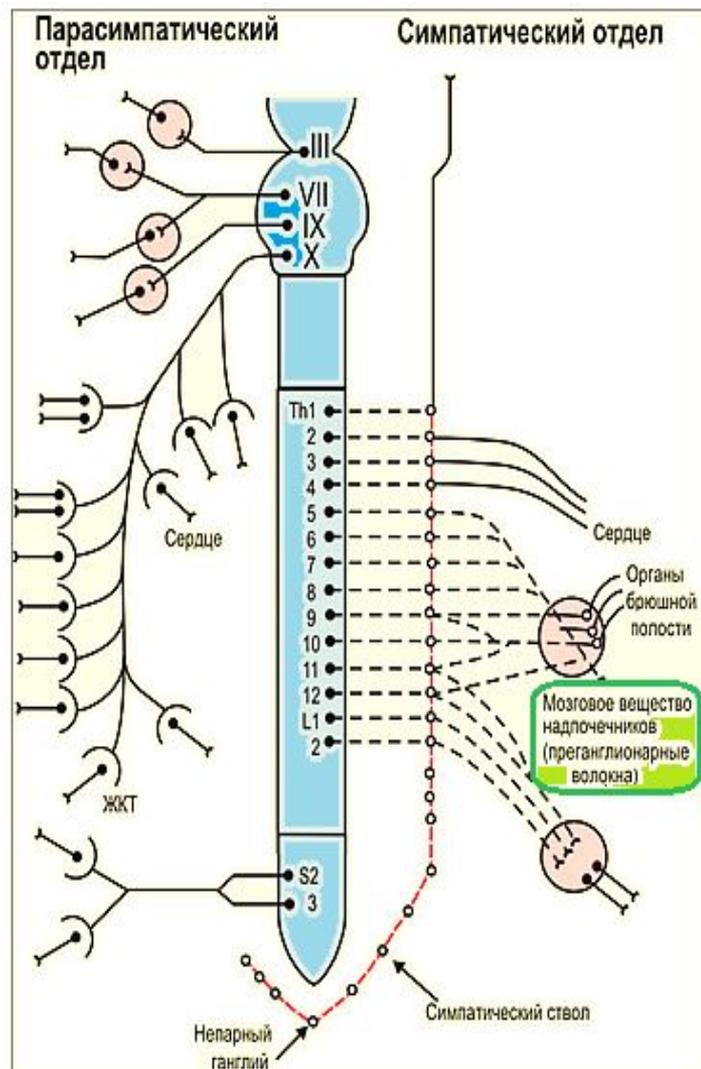
## Differences: ANATOMICAL

Location of bodies of preganglionic neurons:

a) **sympathetic** - at the thoracolumbar level (thoracic and lumbar Spinal Cord)

b) **parasympathetic** - at the cranio-sacral level (pons and medulla oblongata - nuclei III, VII, IX and X - cranial nerves),

as well as the sacral segments of the Spinal Cord.



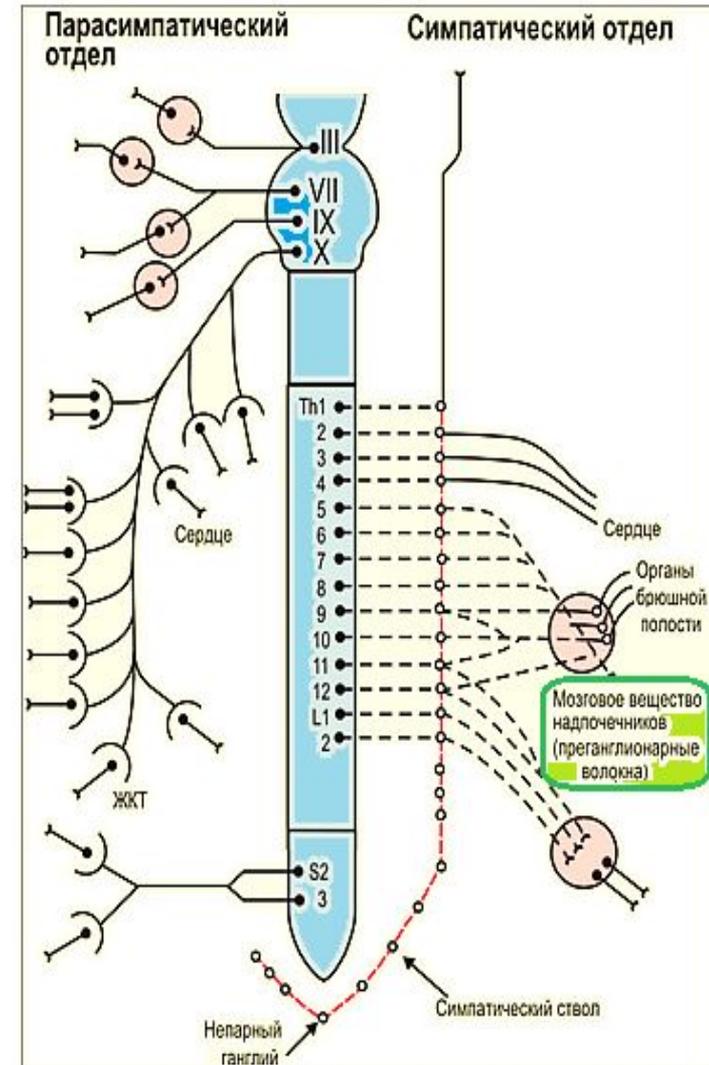
# Differences: ANATOMICAL

(cont. . .)

The location of the ganglia and the ratio of the length of pre- and postganglionic fibers:

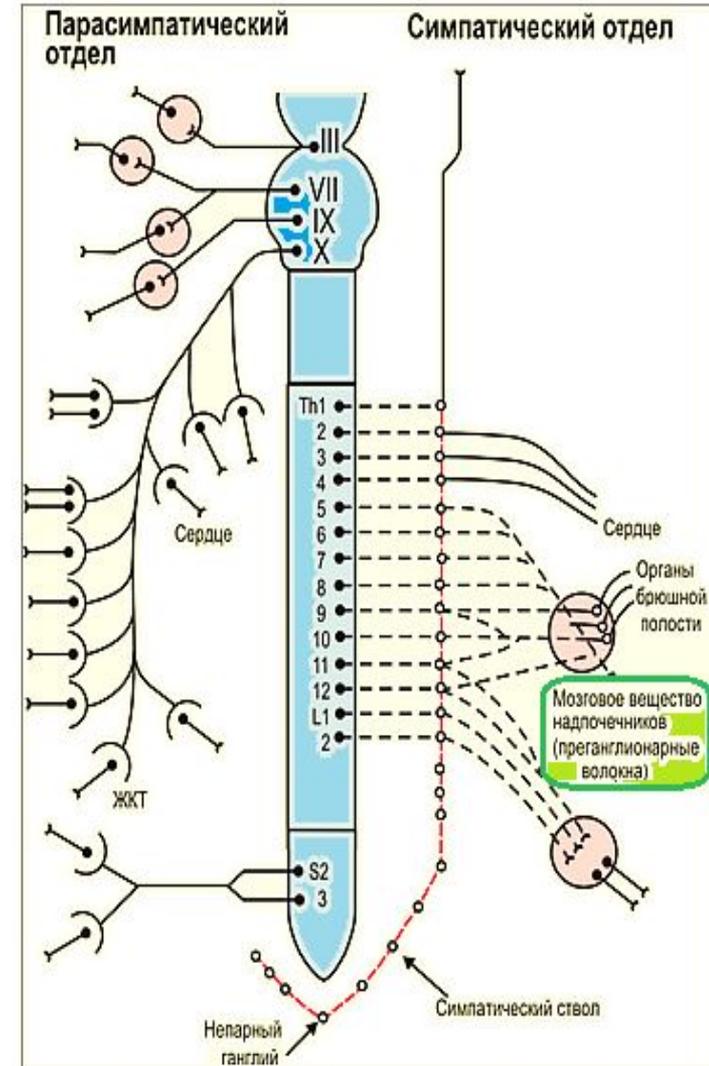
**a) sympathetic:** paravertebral arrangement of ganglia, preganglionic fibers are relatively short, postganglionic fibers are long.

**b) parasympathetic:** located in the innervated organs (intramurally), preganglionic fibers are long, postganglionic - short.



## Differences : FUNCTIONAL:

- 1) **sympathetic nerves** stimulate the cardiovascular system
- 2) **parasympathetic nerves** stimulate:
  - a) organs embryogenetically originating from the intestinal tube
    - smooth muscles
    - intestines,
    - bronchi,
    - bile ducts,
  - b) myometrium, urinary tract, glands of external secretion of the gastrointestinal tract, sweat glands.



# Differences :

## NEURO-CHEMICAL

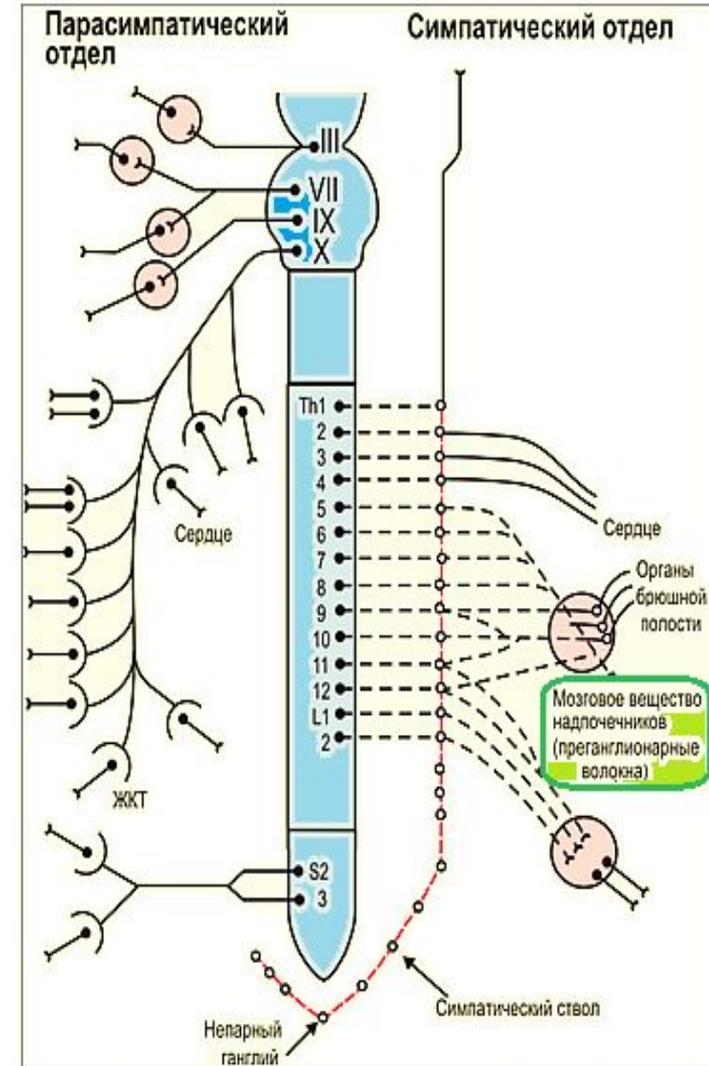
(according to the nature of neurotransmitters **in the synaptic ending of postganglionic fibers**):

### 1) **sympathetic** nerves :

- transmitters catecholamines
- locating on the postsynaptic membrane
- (name) adrenoreceptors

### 2) **parasympathetic** nerves

- acetylcholine
- on the postsynaptic membrane
- cholinergic receptors



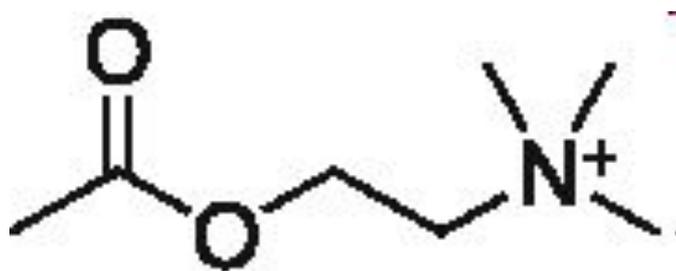


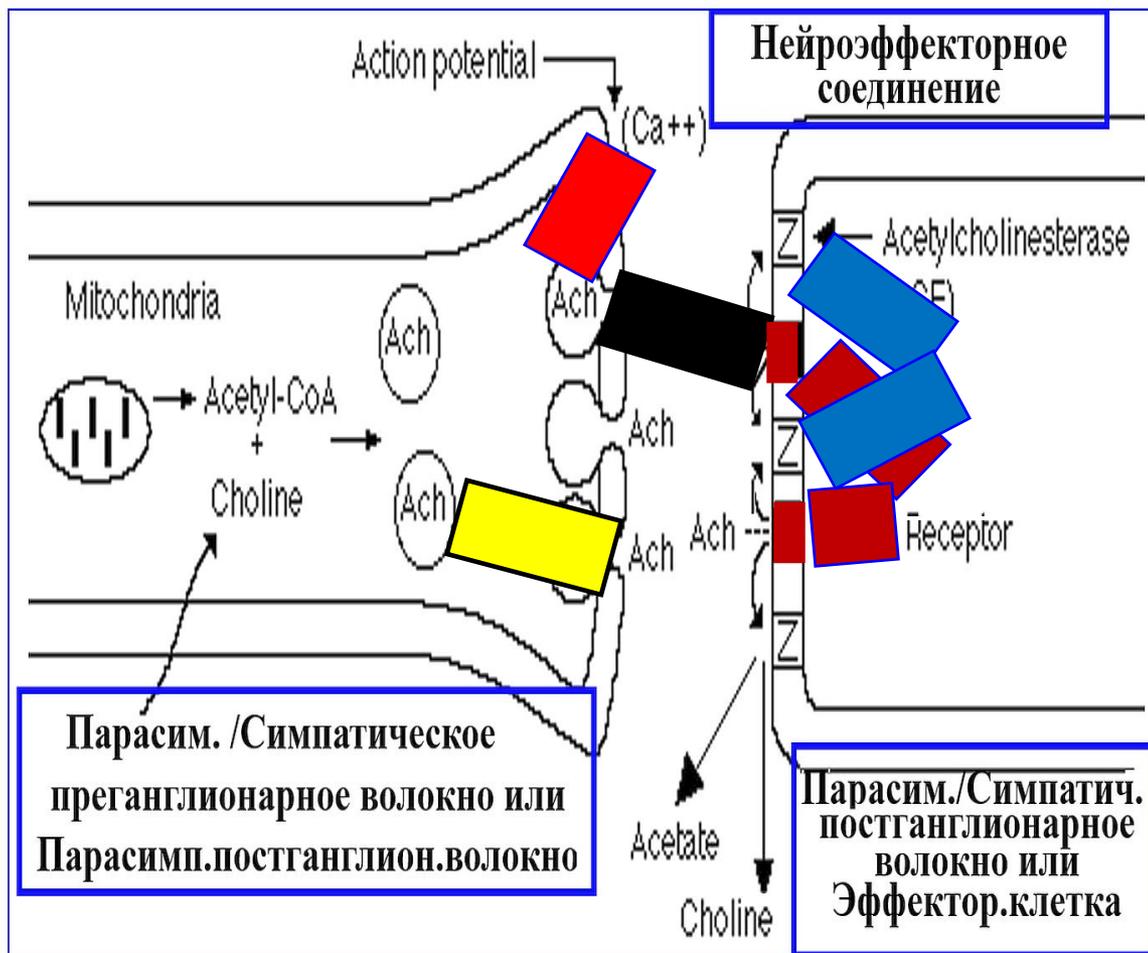
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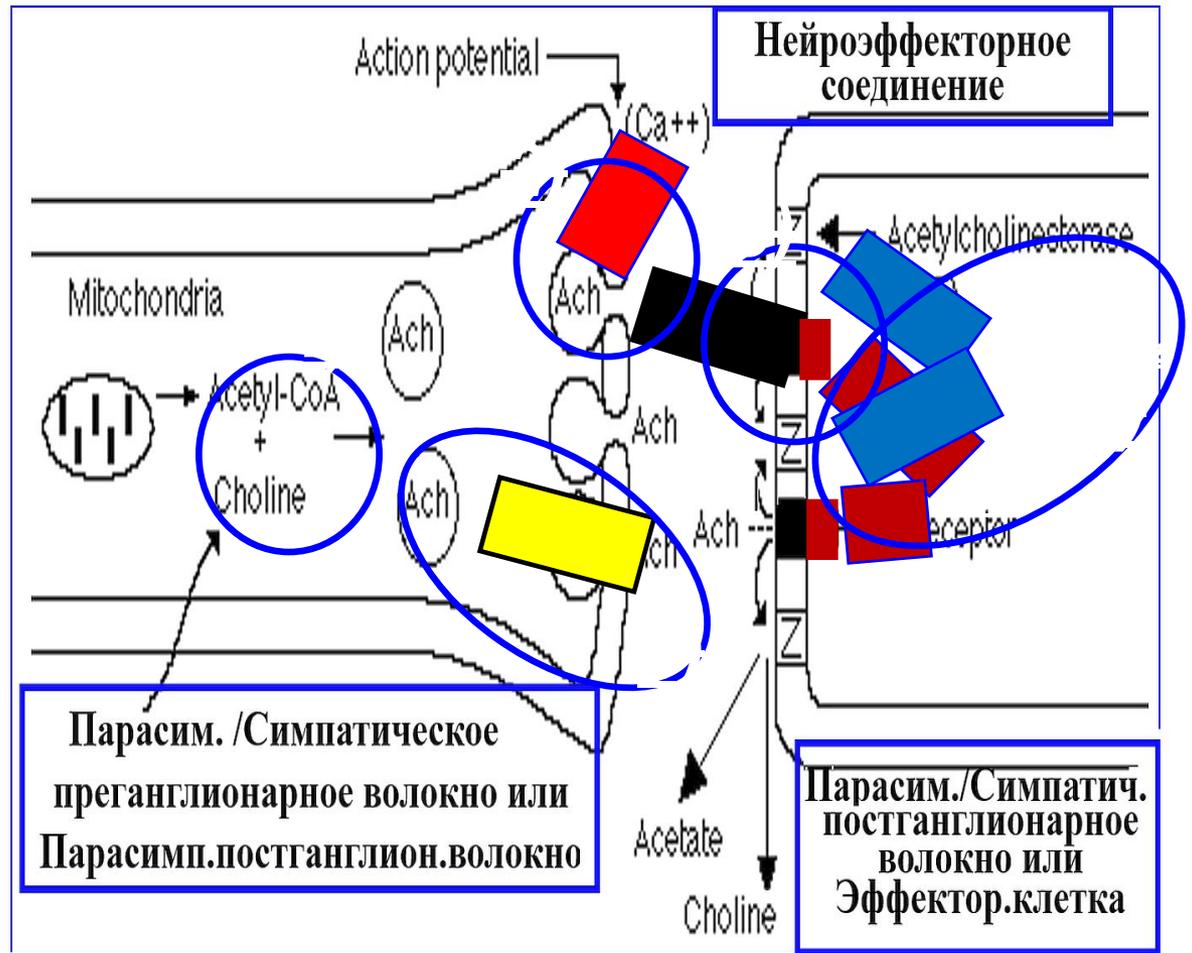
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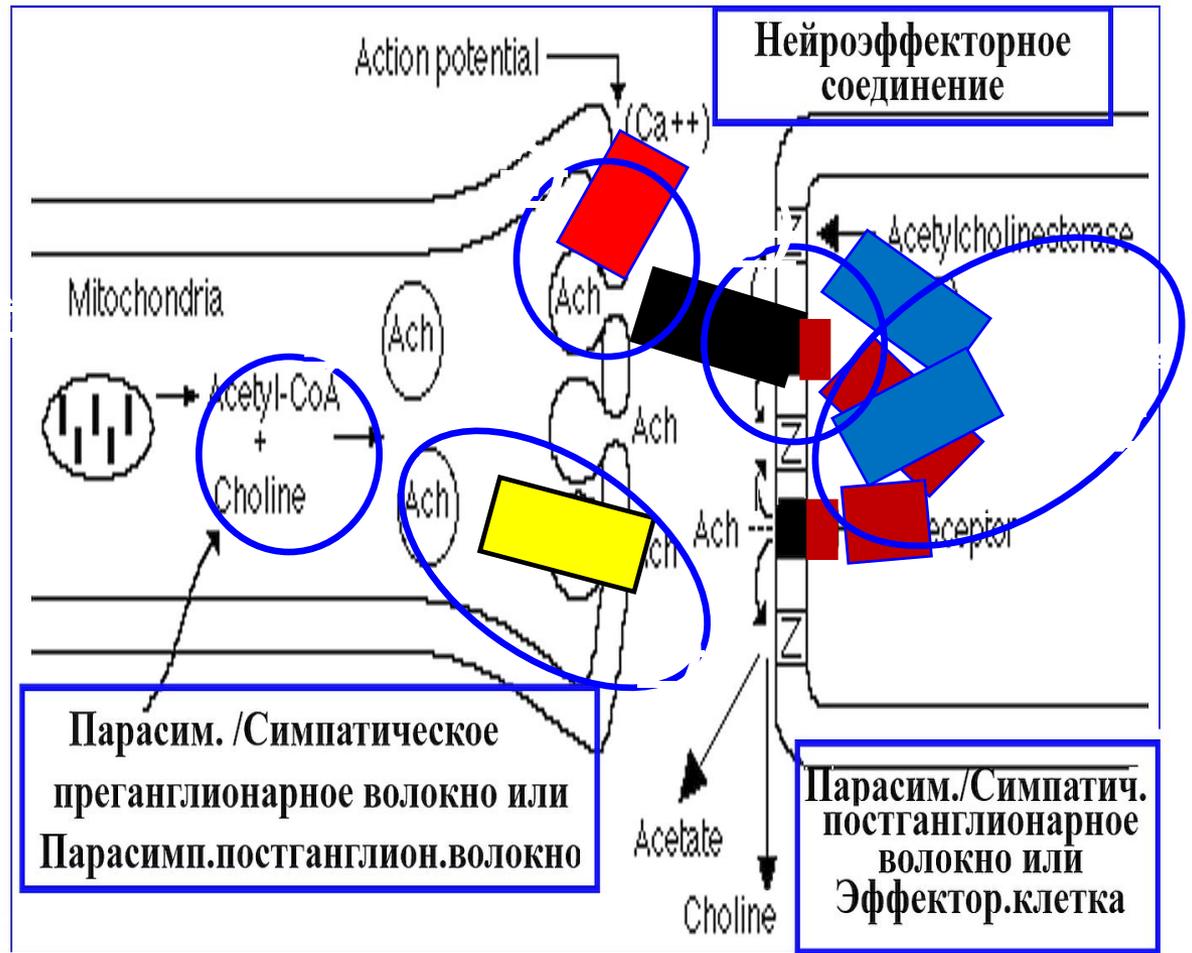




**Нейроэффторное  
соединение**

**Парасим. /Симпатическое  
преганглионарное волокно или  
Парасимп.постганглион.волокно**

**Парасим./Симпатич.  
постганглионарное  
волокно или  
Эффтор.клетка**



**Нейроэффторное  
соединение**

**Парасим. /Симпатическое  
преганглионарное волокно или  
Парасимп.постганглион.волокно**

**Парасим./Симпатич.  
постганглионарное  
волокно или  
Эффтор.клетка**

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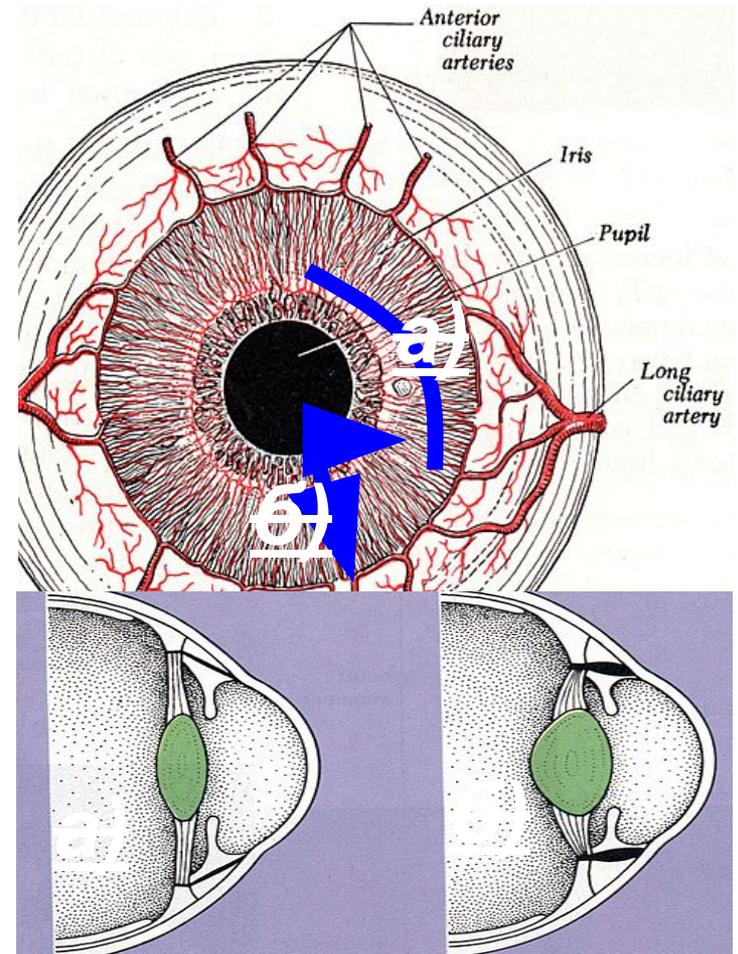
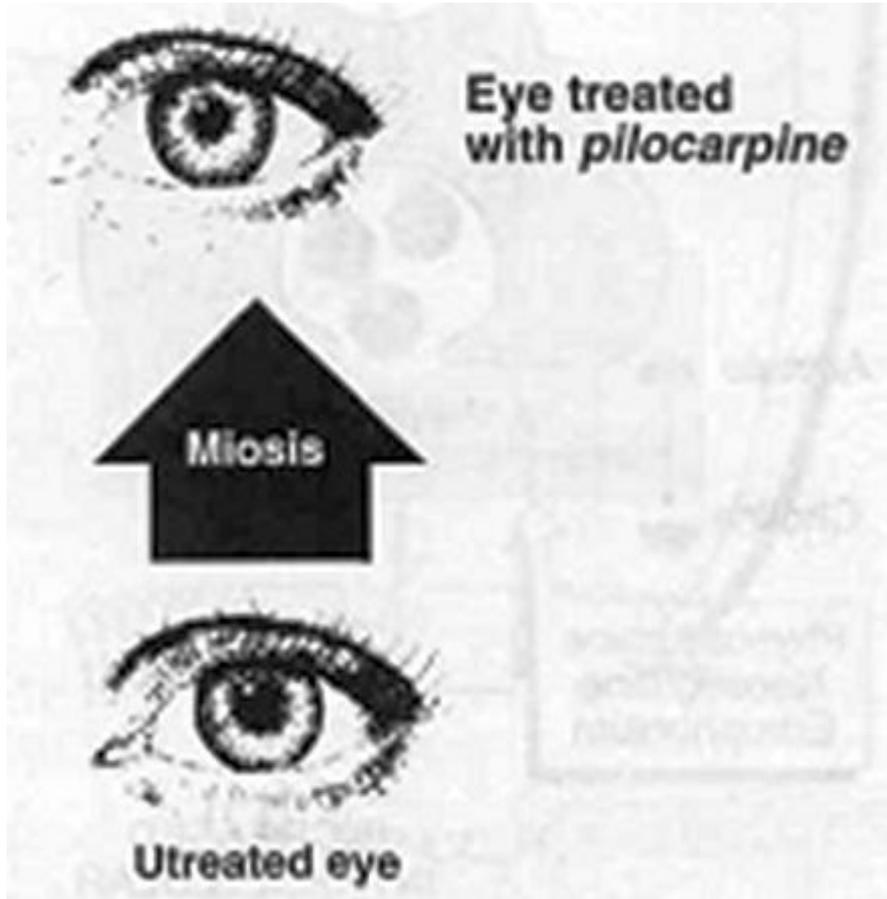
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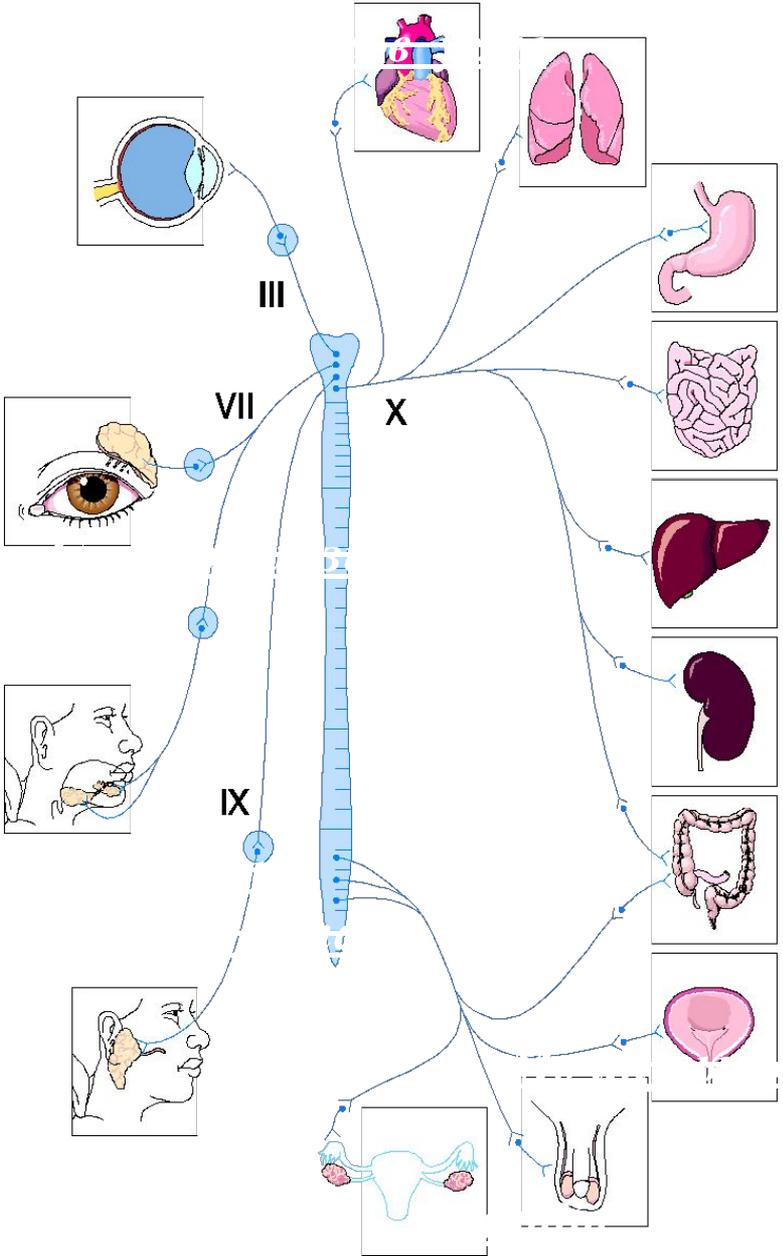


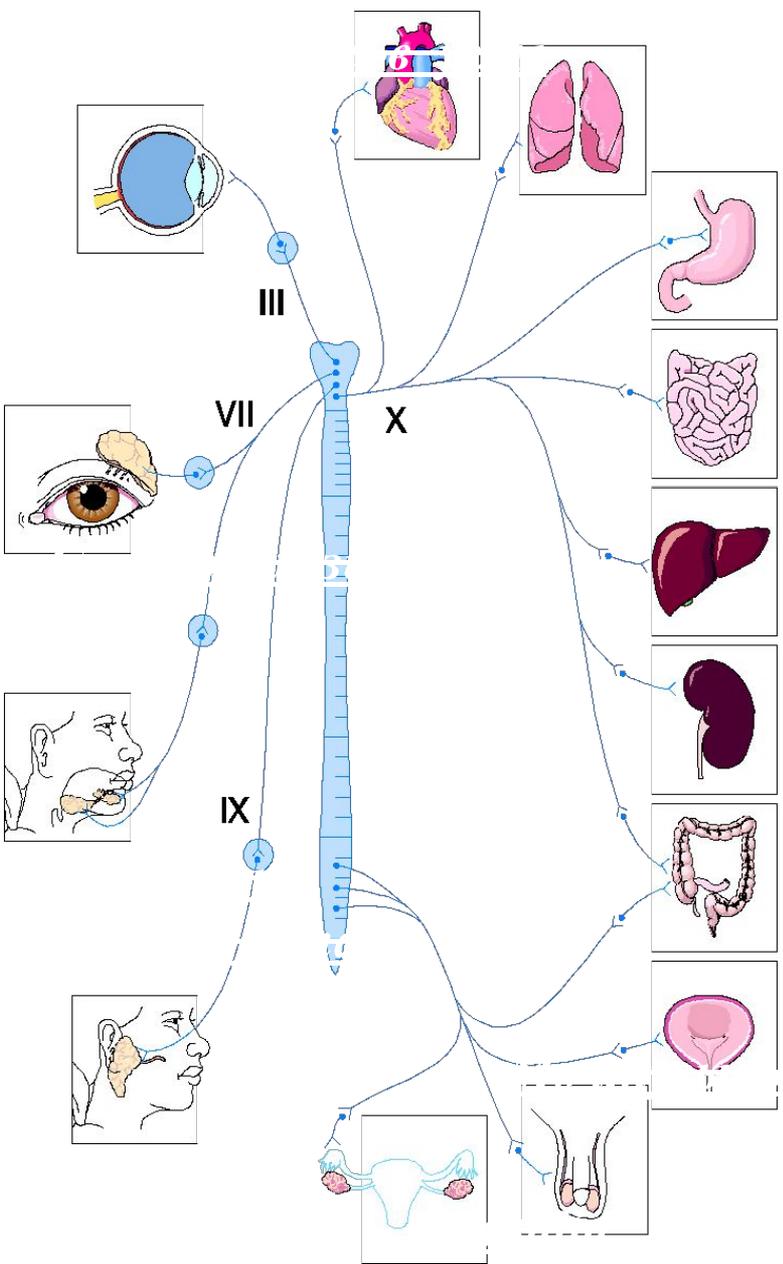






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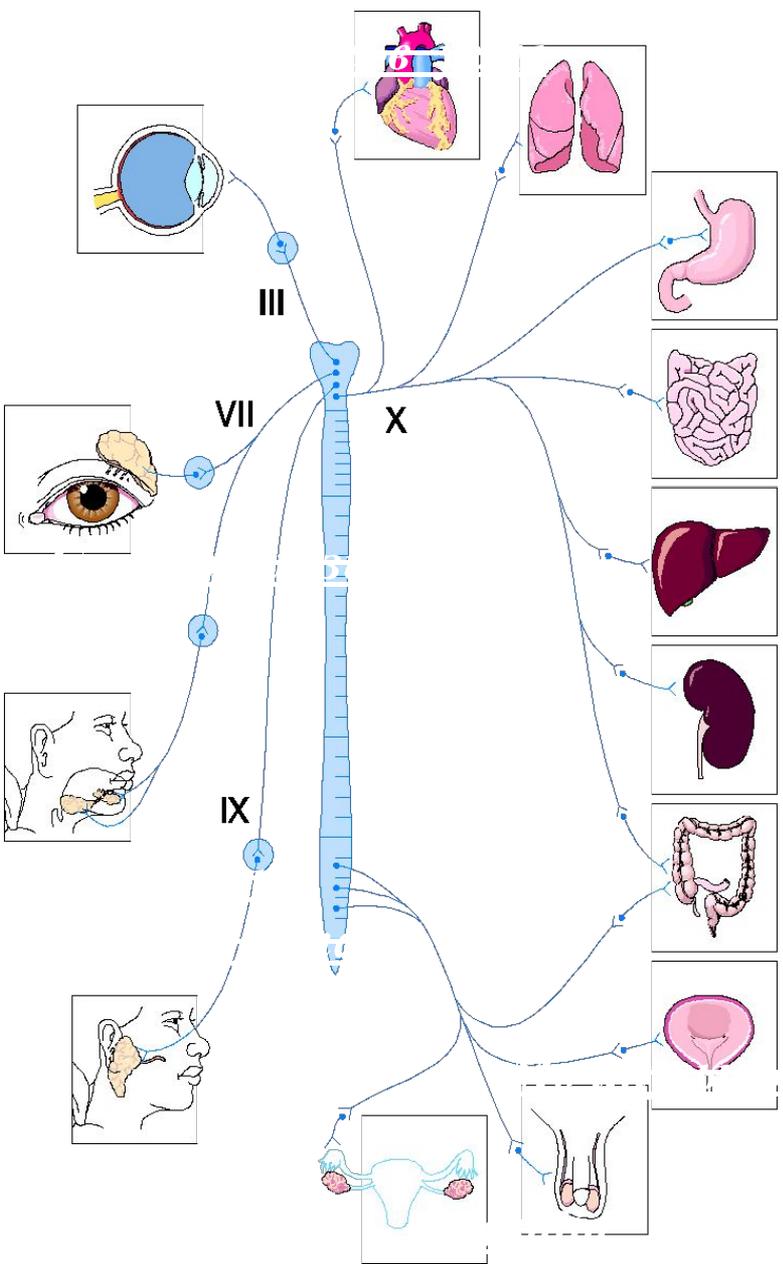


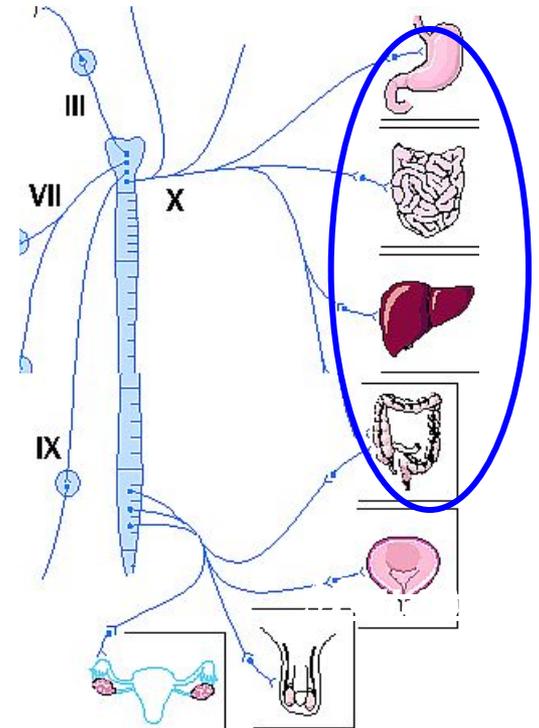
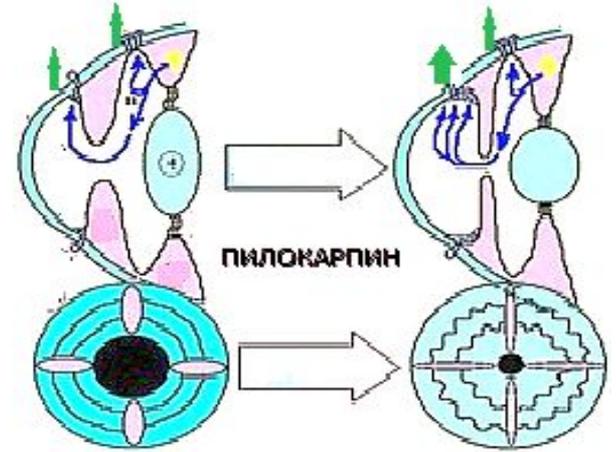


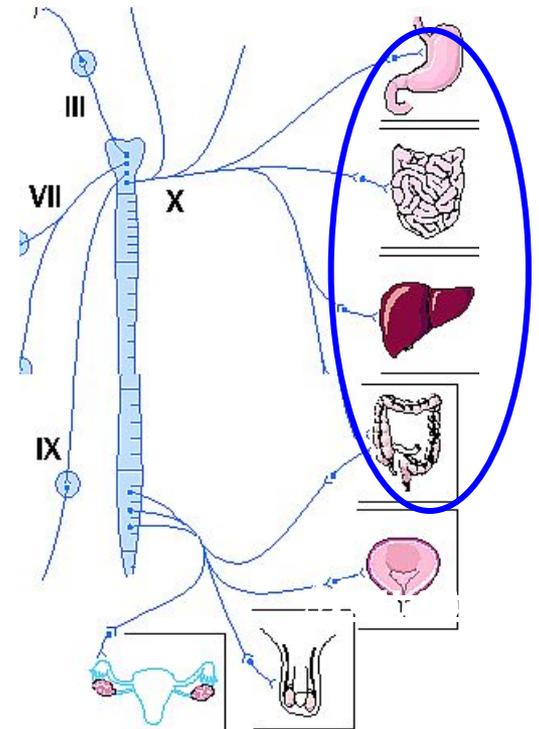
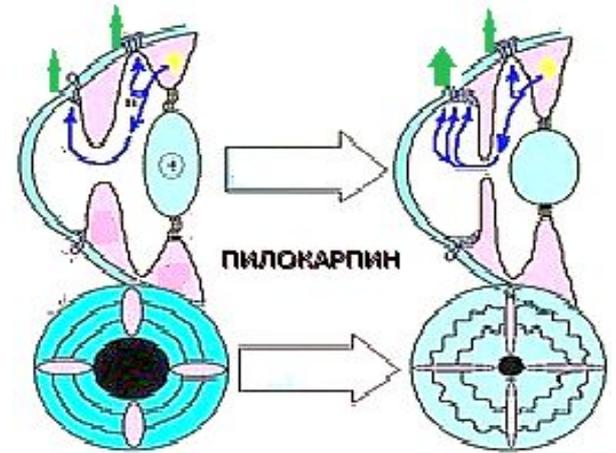
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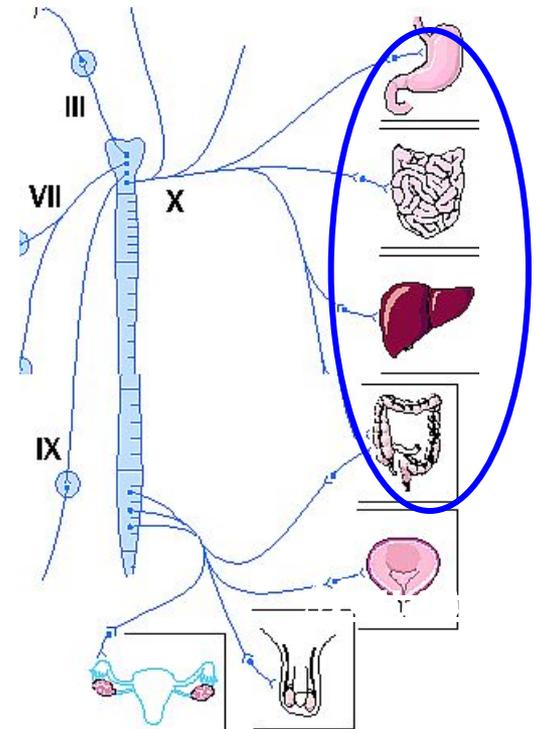
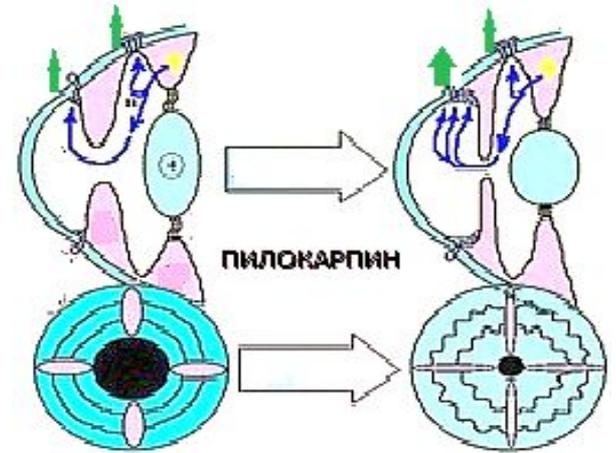
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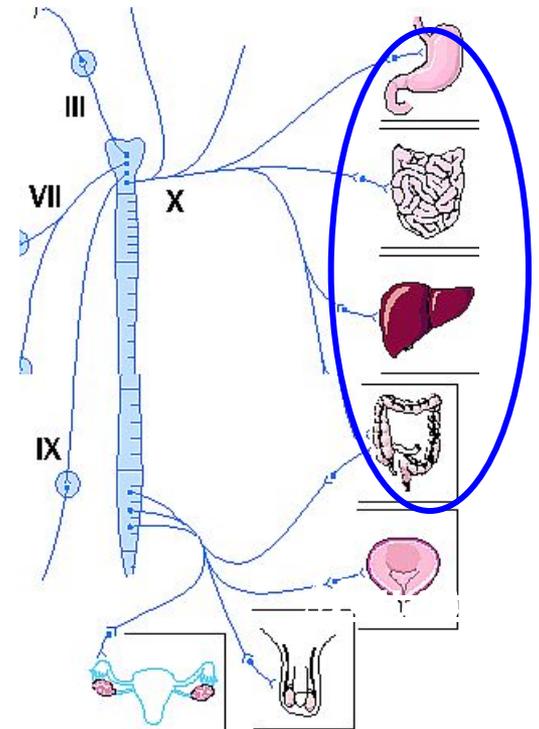
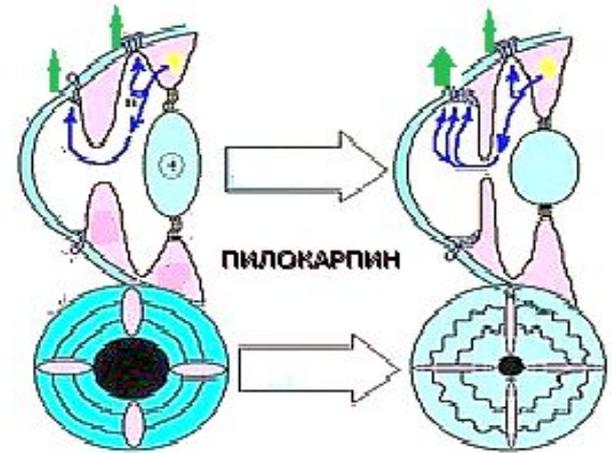
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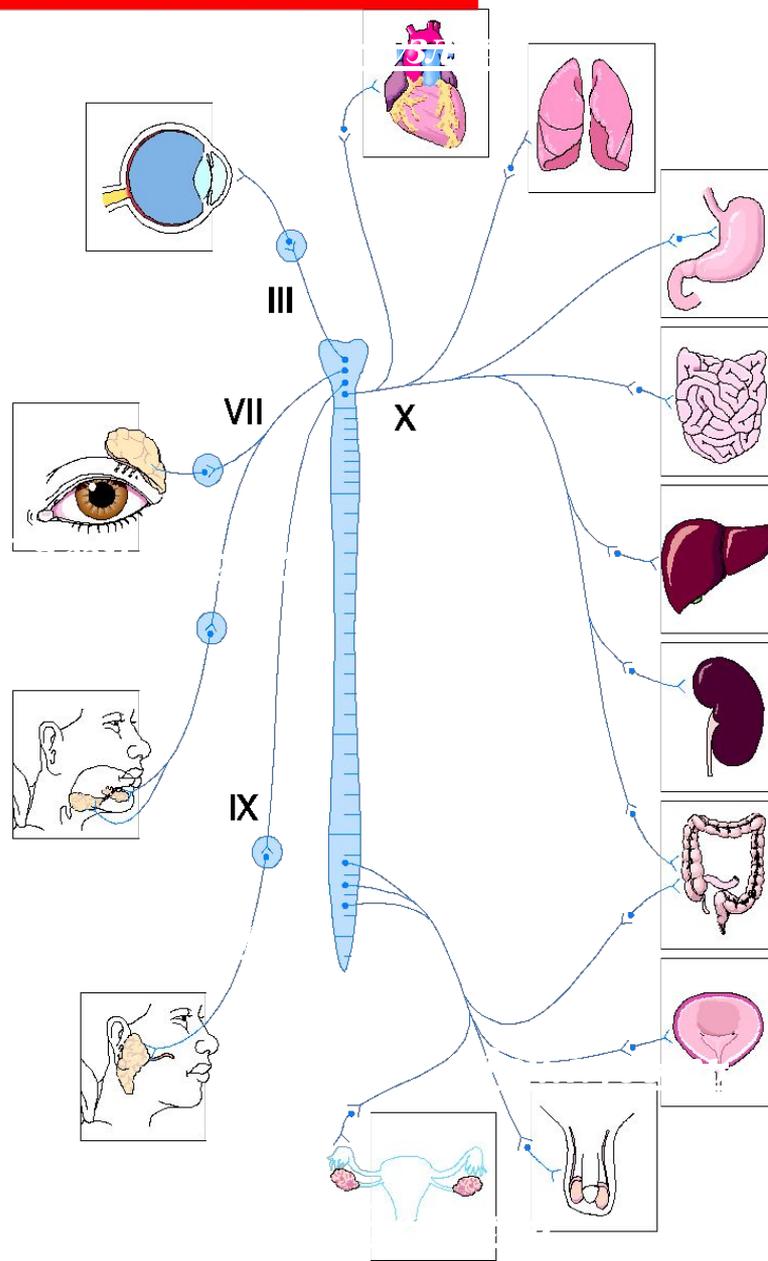






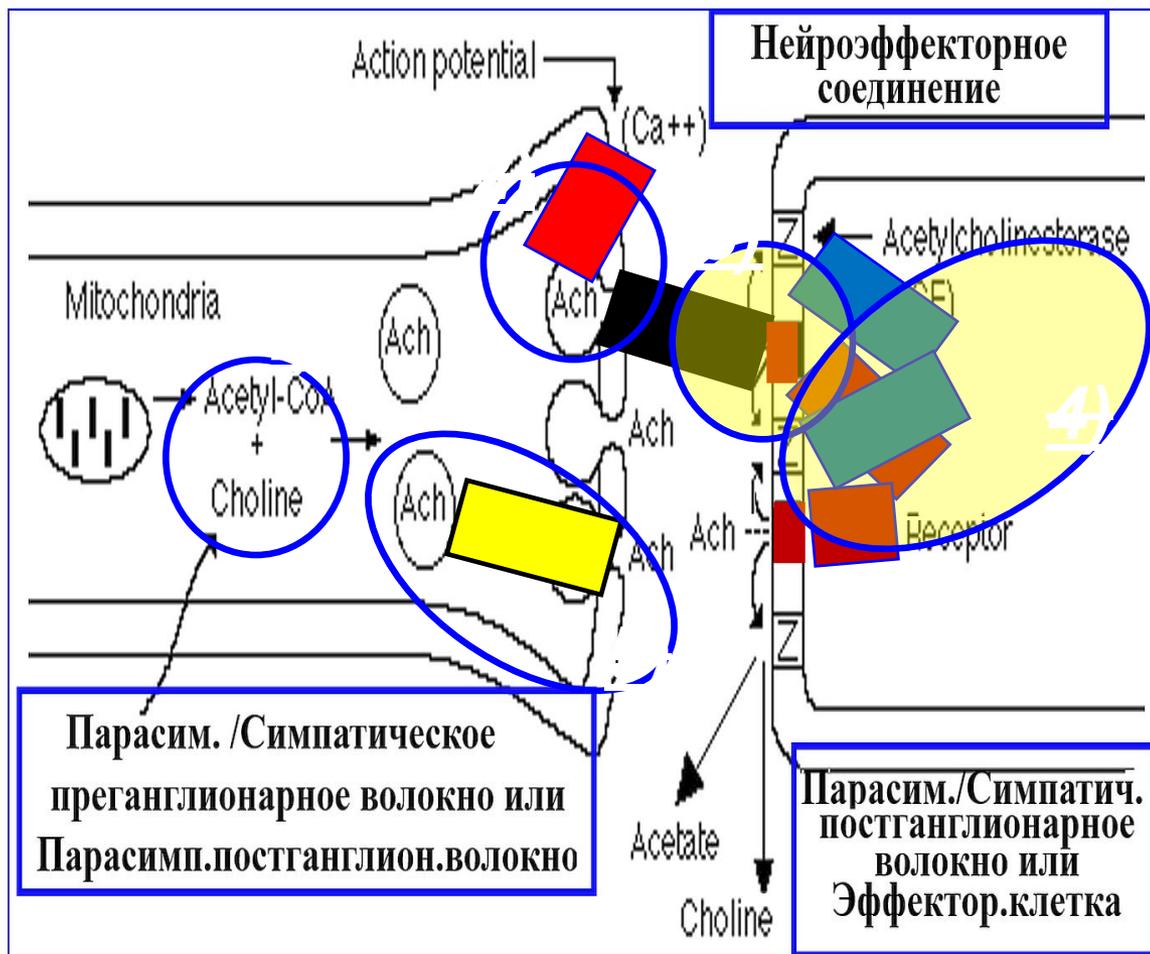
# Эффекты воздействия на ацетилхолиновые рецепторы:

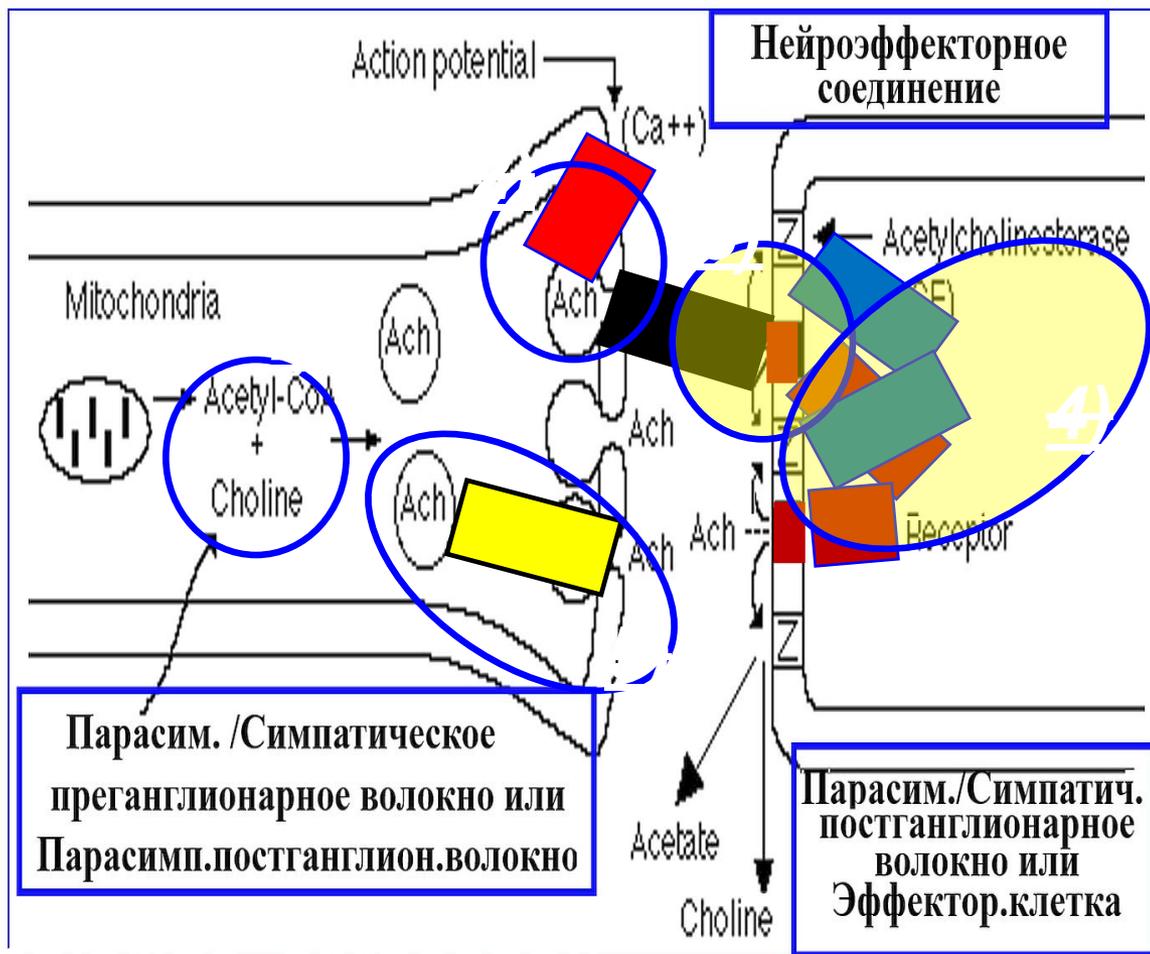
## M-холиномиметики: **Противопоказания**

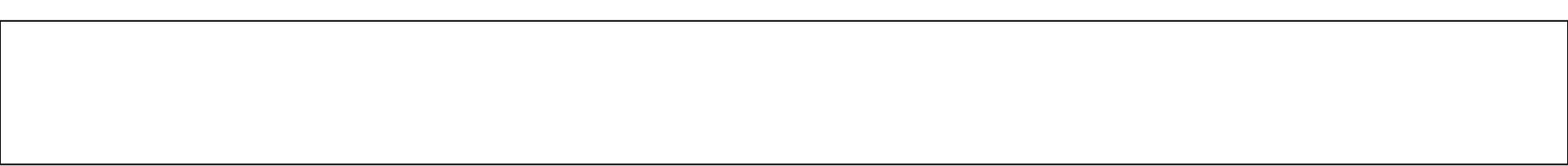


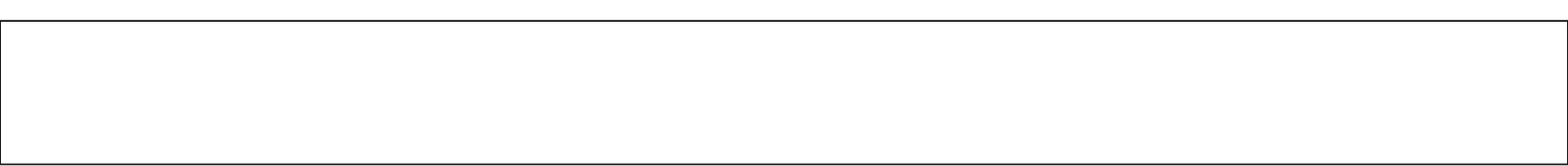


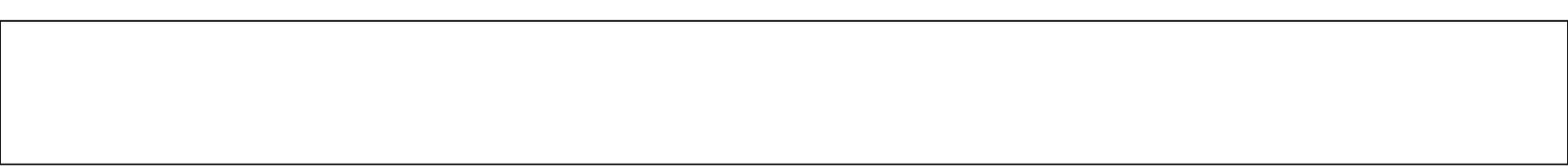


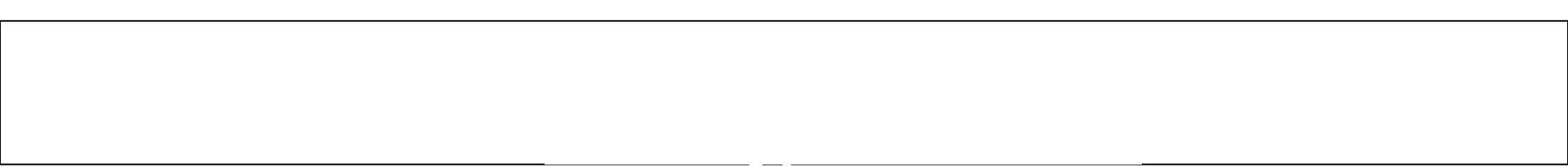


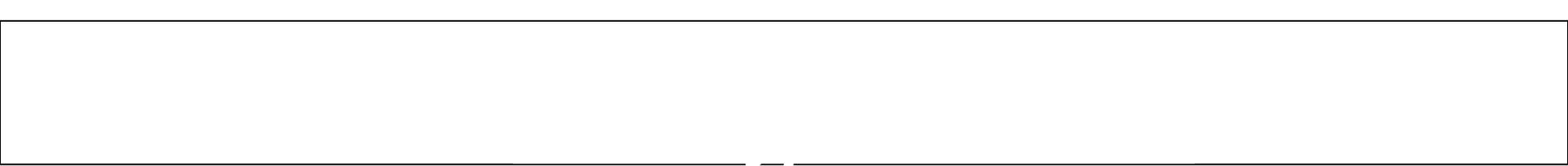


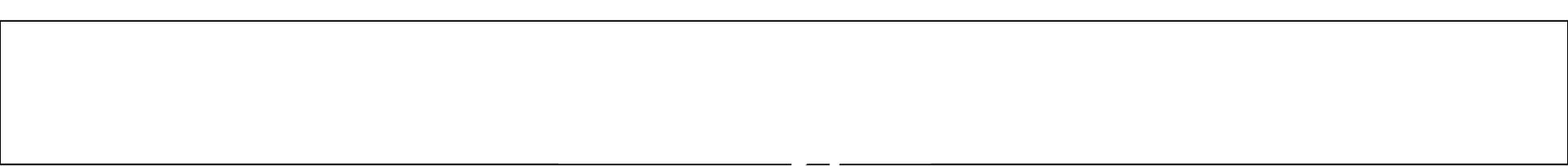


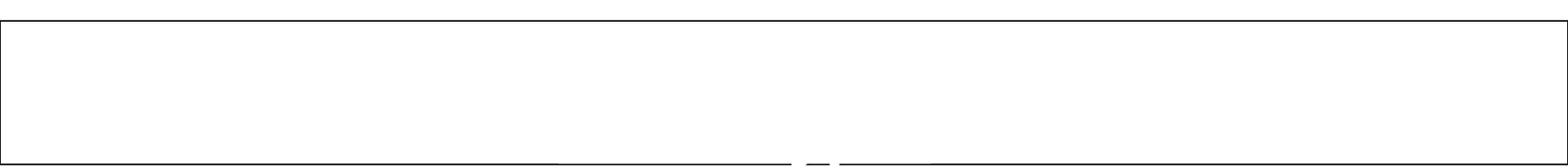


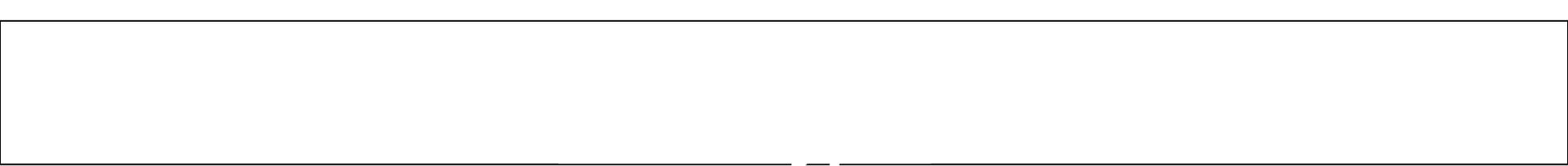










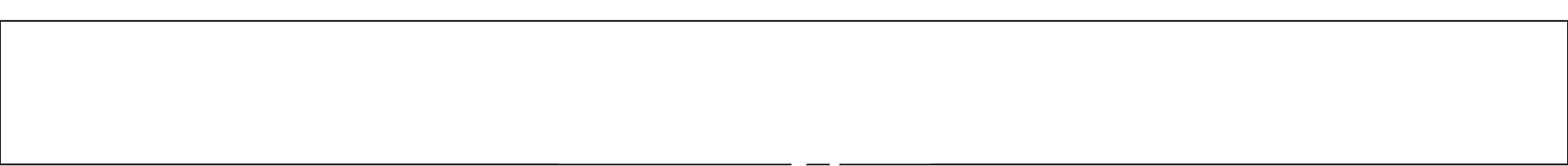


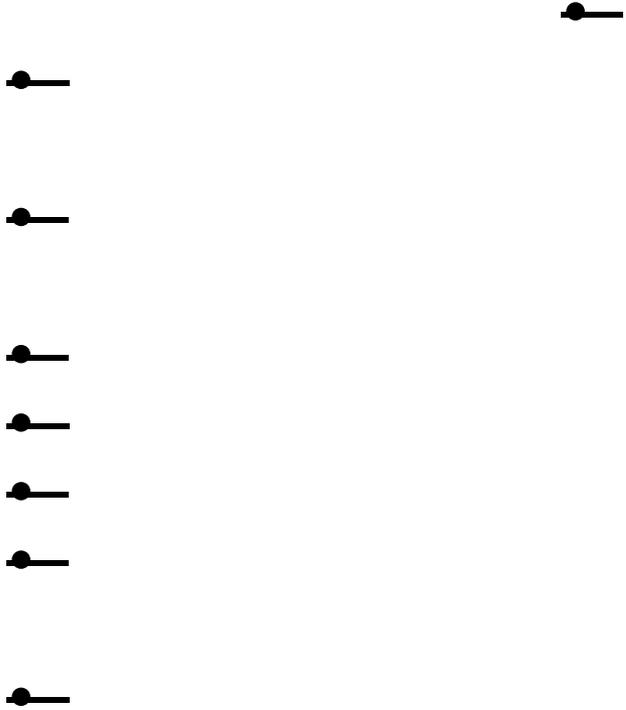
# Toxicity of Cholinesterase Inhibitors

## Organophosphates / Carbamates

- **Miosis**
- **Diaphoresis**
- **Salivation**
- **Lacrimation**
- **Urination**
- **Defecation**
- **Gastroenteric cramping**
- **Emesis**





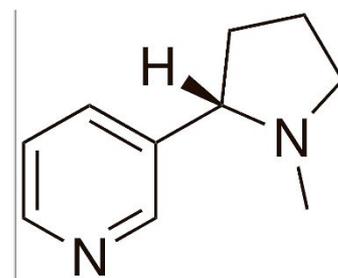


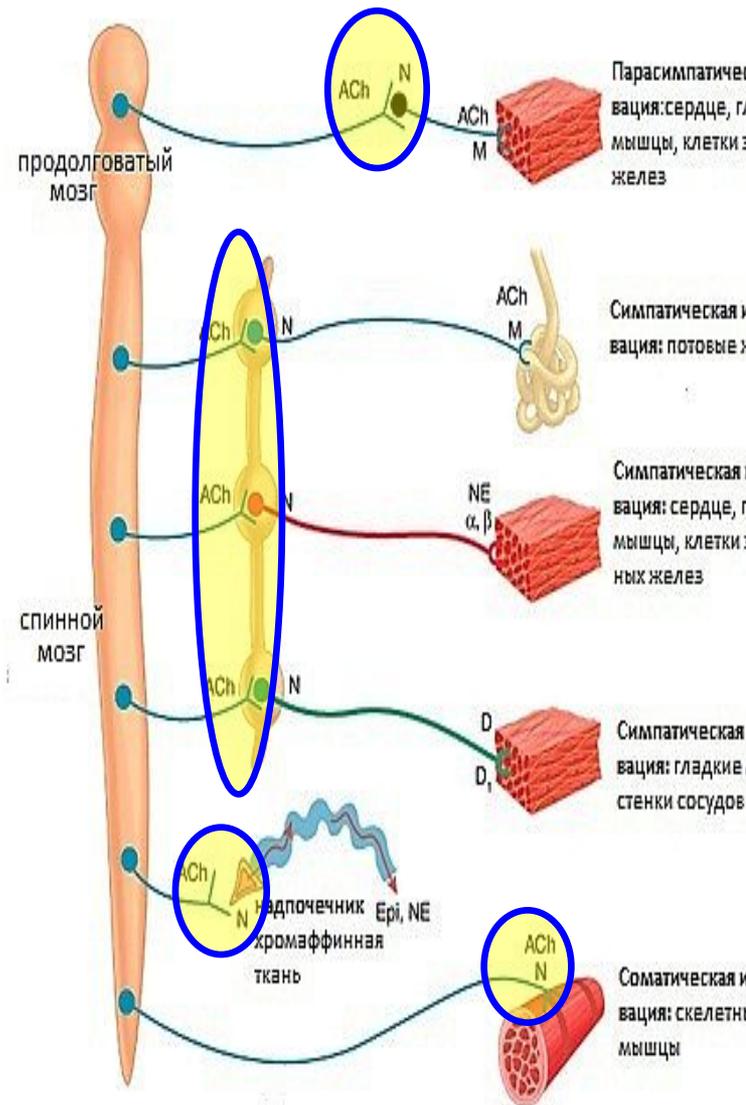


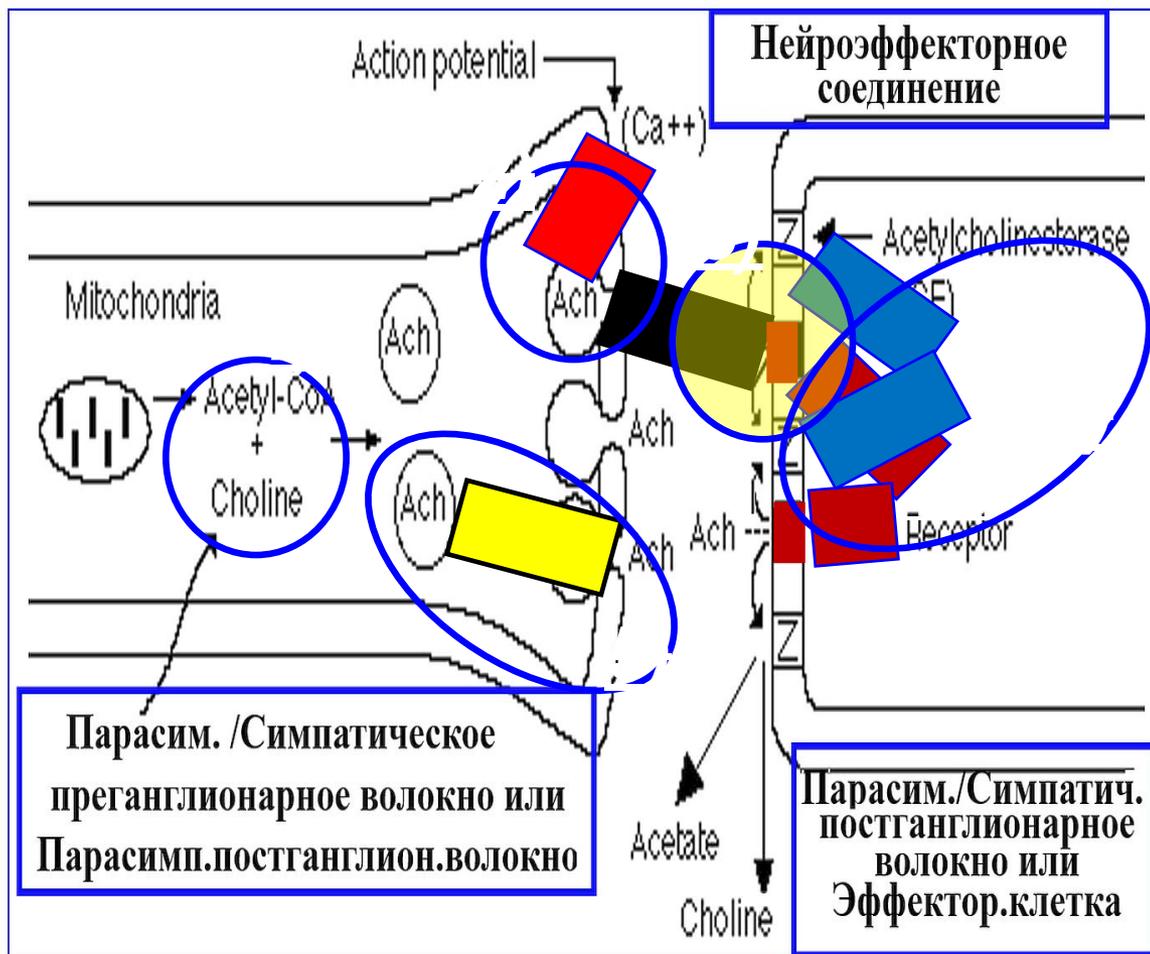


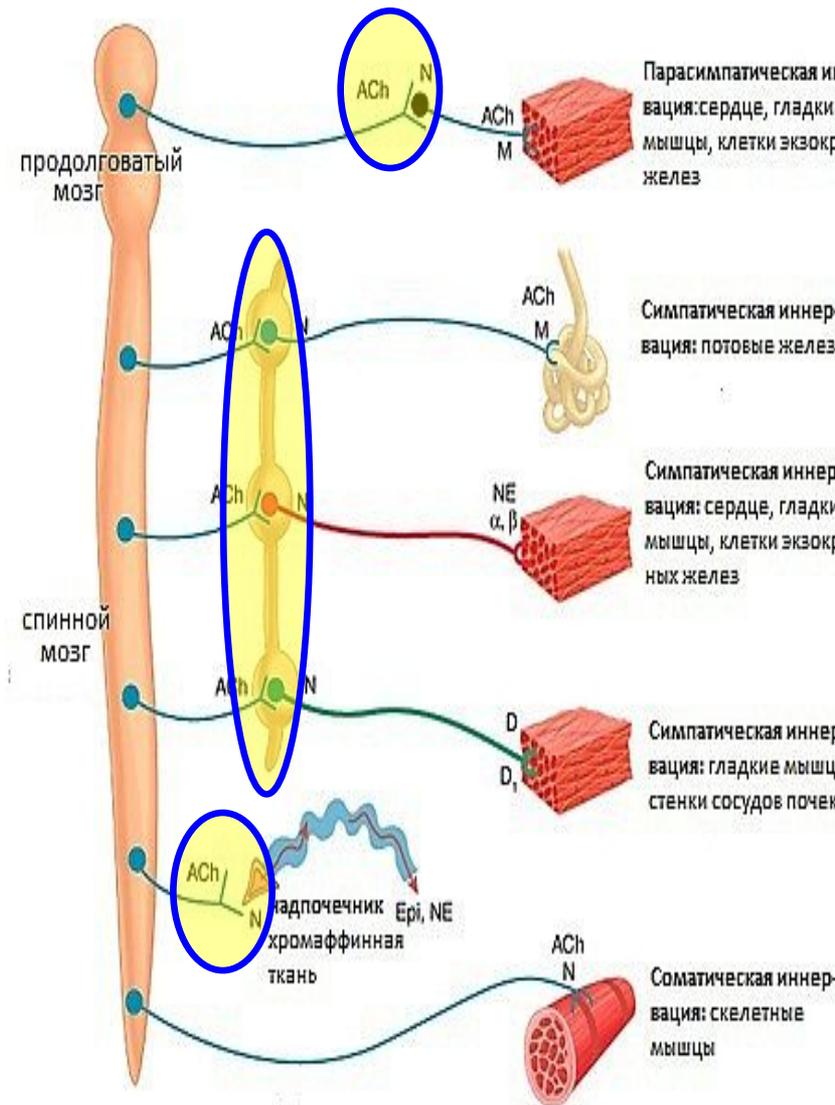


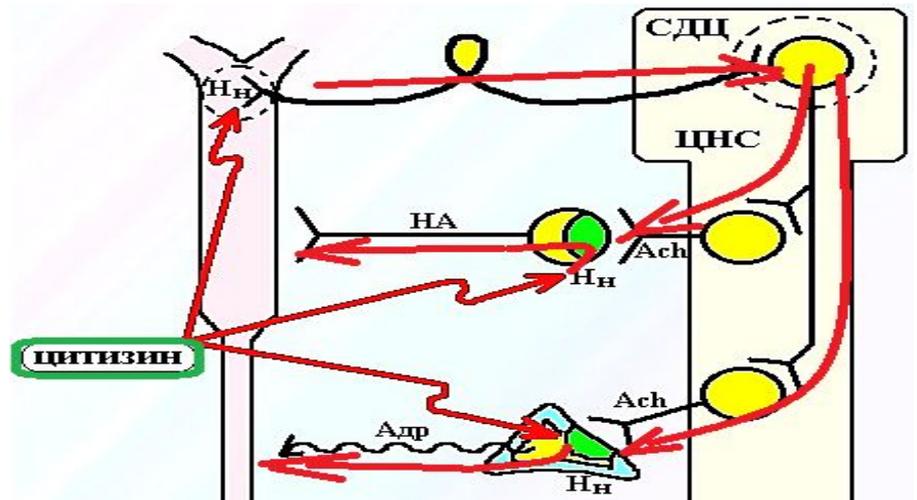
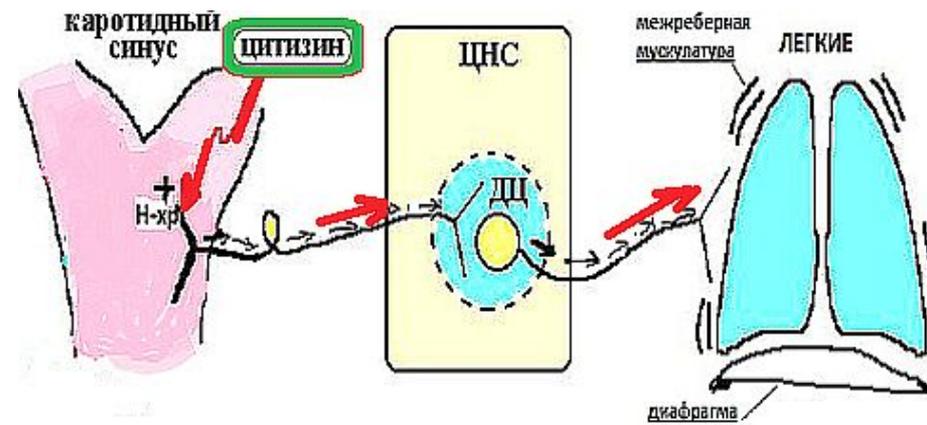














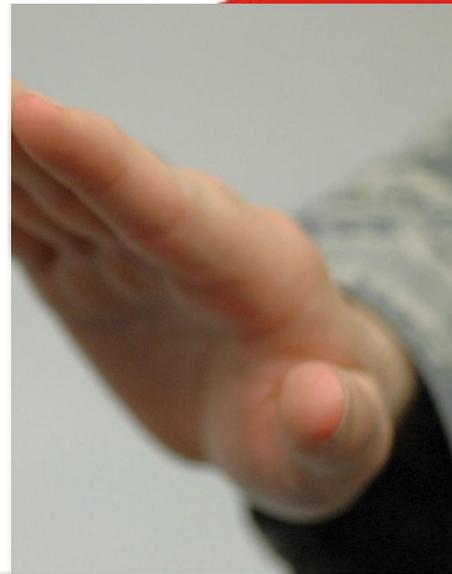
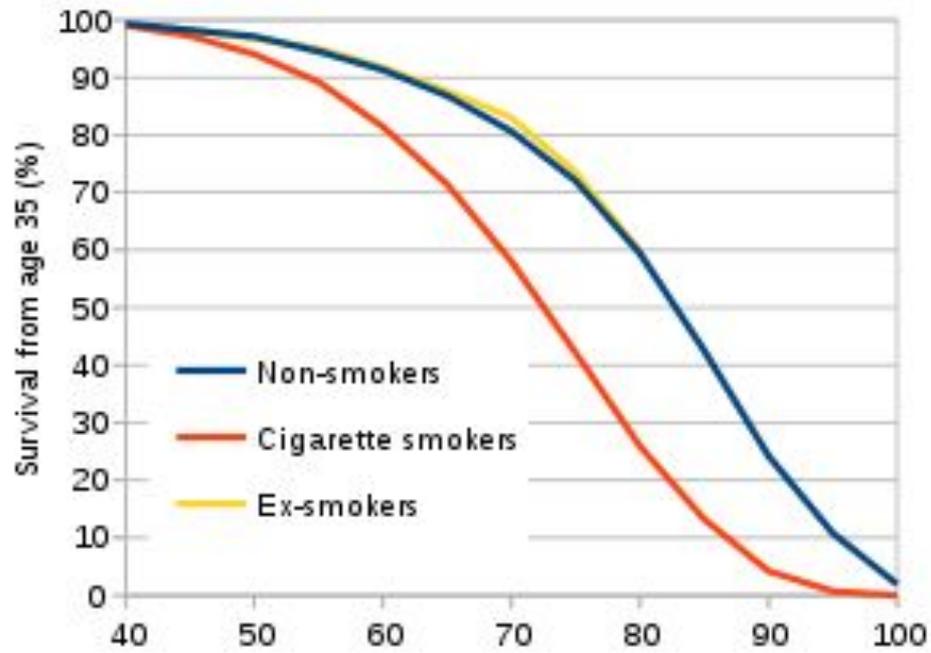




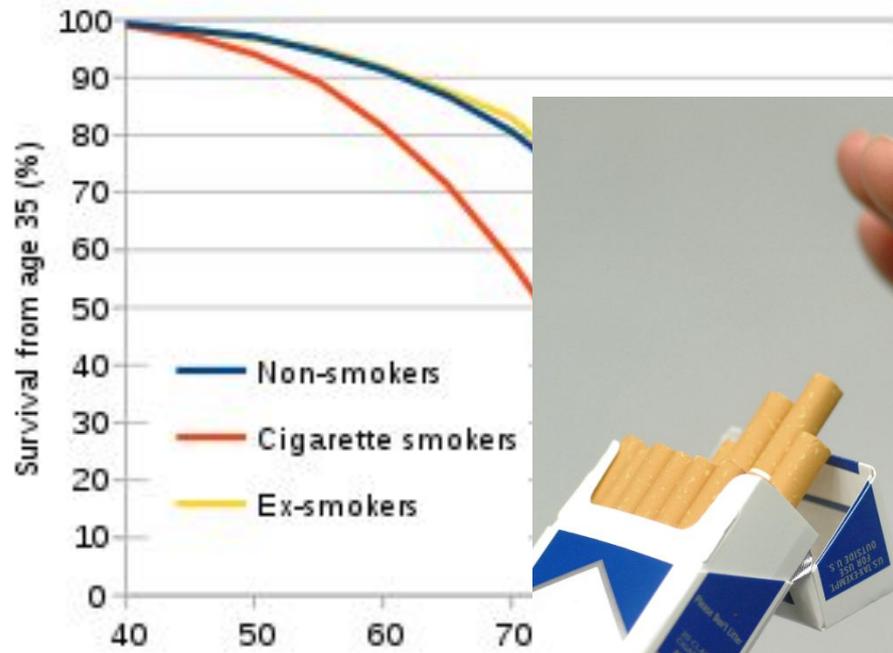
**Никотин- это яд!**



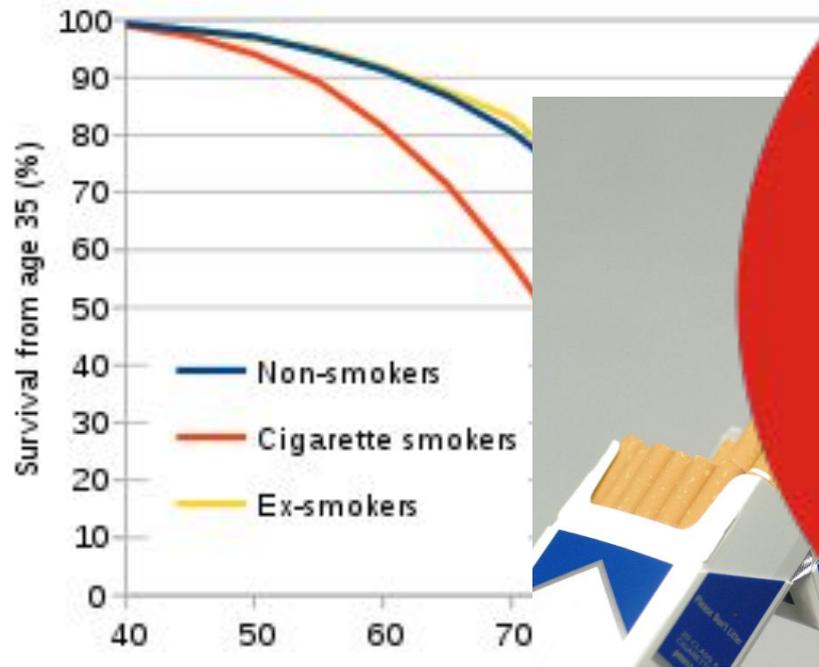
### Stopping smoking at age 25-34



## Stopping smoking at age 25-34



### Stopping smoking at age 25-34







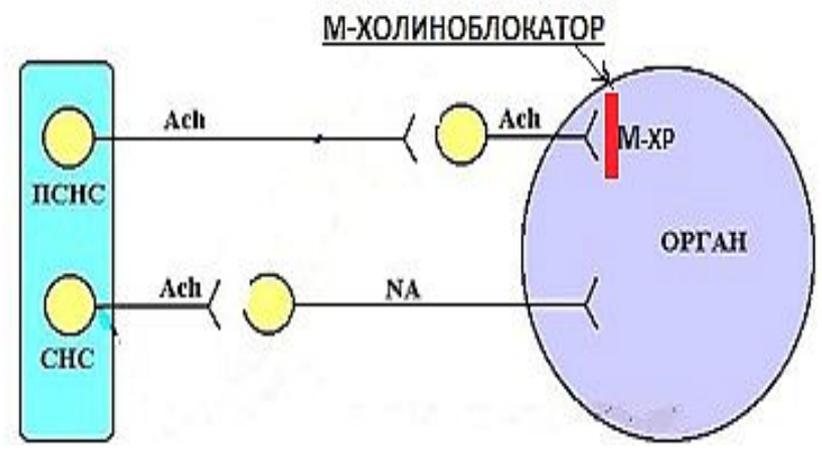




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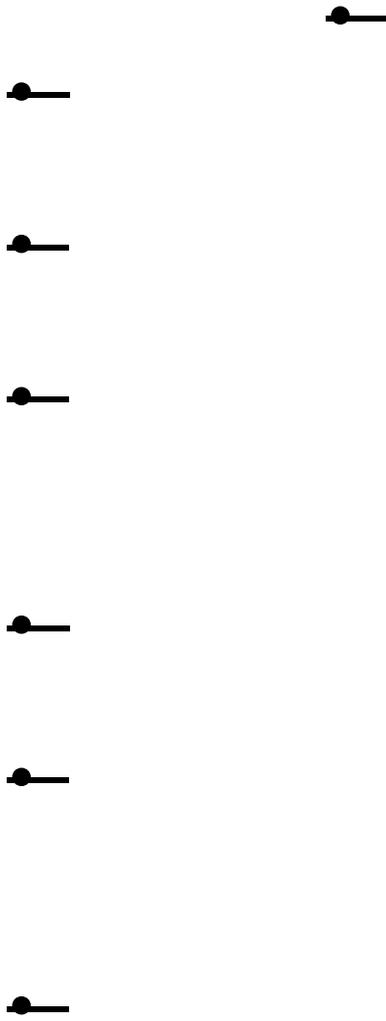
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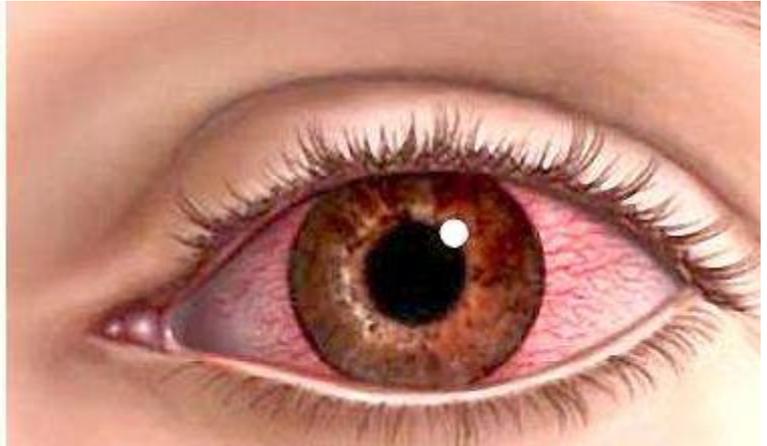








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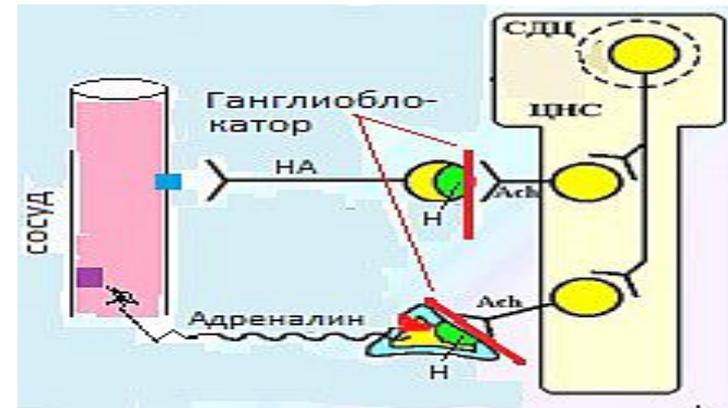
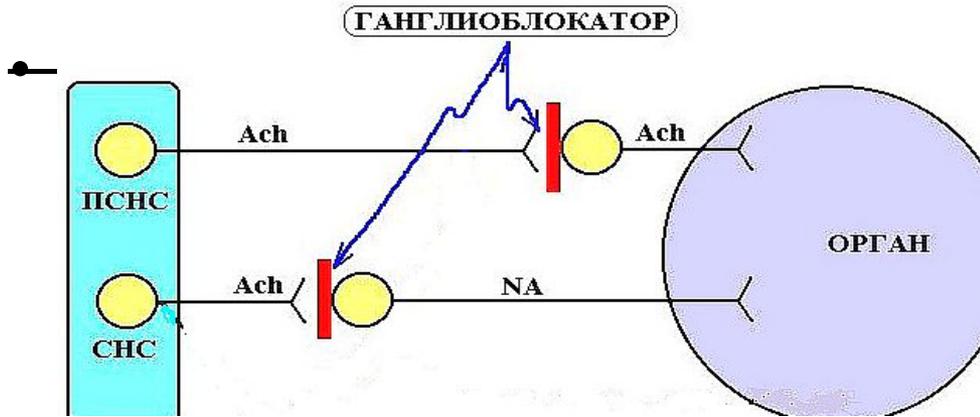
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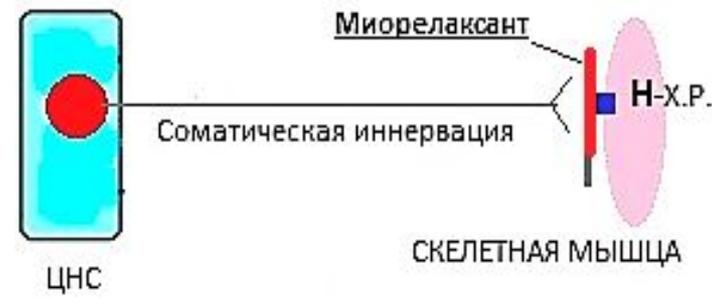


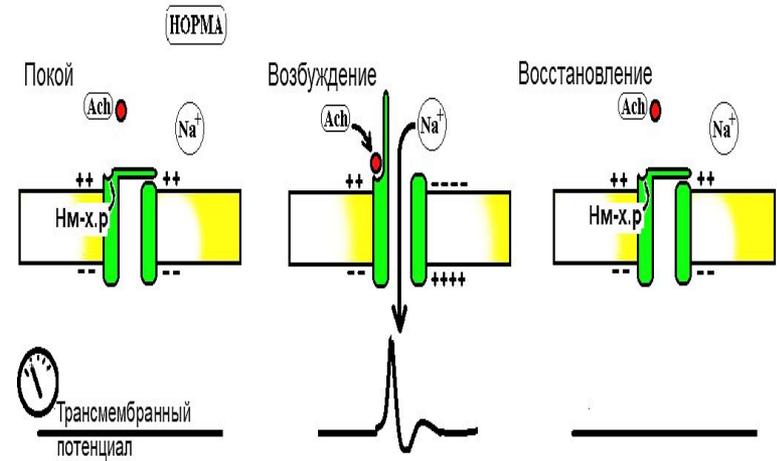




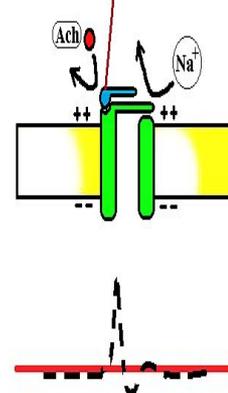




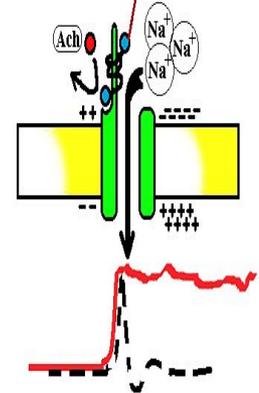


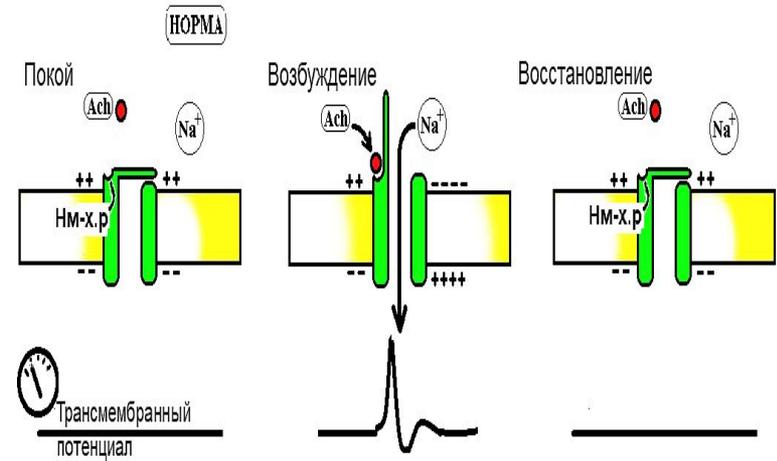


Недеполярирующий М-Р  
**ТУБОКУРАРИН**

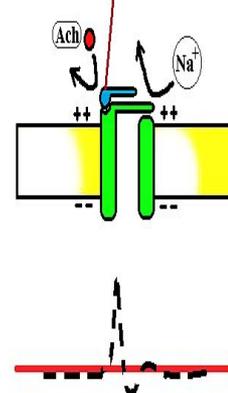


Депольярирующий М-Р  
**СУКЦИНИЛХОЛИН**

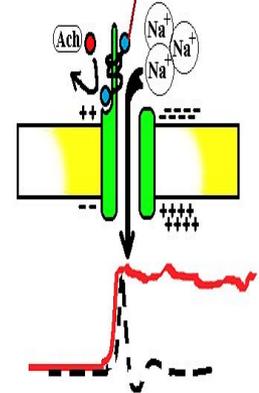




Недеполярирующий М-Р  
**ТУБОКУРАРИН**



Депольярирующий М-Р  
**СУКЦИНИЛХОЛИН**





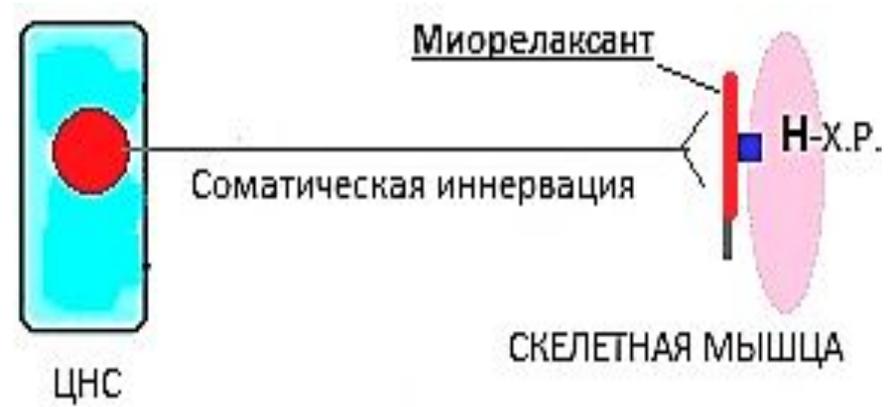
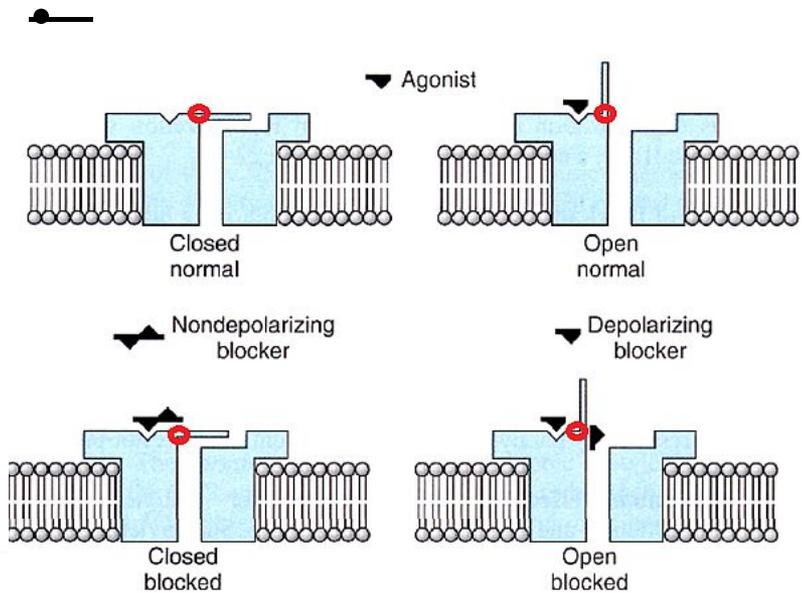












## Классификация миорелаксантов



## Антидоты при передозировке миорелаксантов

АНТИДЕПОЛЯРИЗУЮЩИХ  
(КОНКУРЕНТНЫХ)

Атропин:  
в/в 0,5-1,0 мл 0,1% р-ра

Прозерин:  
в/в 1-4 мг 0,05% р-ра

ДЕПОЛЯРИЗУЮЩИХ

Специфических антагонистов нет

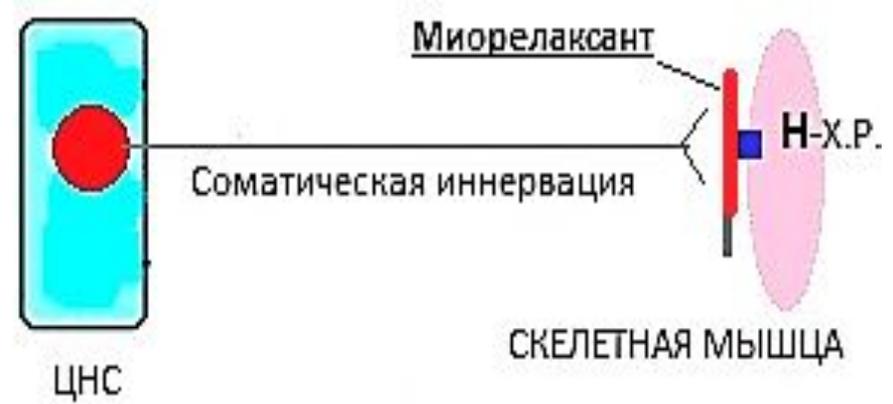
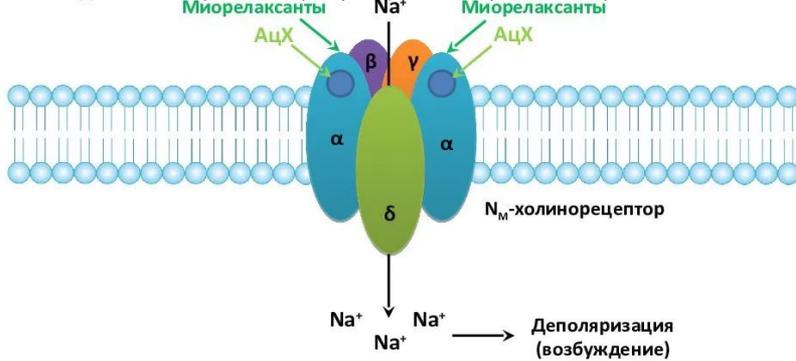
Введение свежей питательной крови, содержащей холинэстеразу или эритроцитарной массы

## ДЕПОЛЯРИЗУЮЩИЕ МИОРЕЛАКСАНТЫ

**Мишень** –  $N_M$ -холинорецепторы

**Механизм действия** – неконкурентно связываются с  $N_M$ -ХР и стимулируют их, не разрушаются АХЭ, вследствие чего вызывают стойкую деполяризацию (деполяризационный блок). Чувствительность рецептора снижается.

**Специфический антидот** - свежая цитратная кровь (в ней содержится псевдохолинэстераза, которая разрушает миорелаксанты).



## Недеполяризующие миорелаксанты

Яд для стрел южноамериканских индейцев

**Атракурий**

CN1CCc2cc(O)c(O)c2C1C(=O)OCCCCCOCC(=O)N3CCc4cc(O)c(O)c4C3

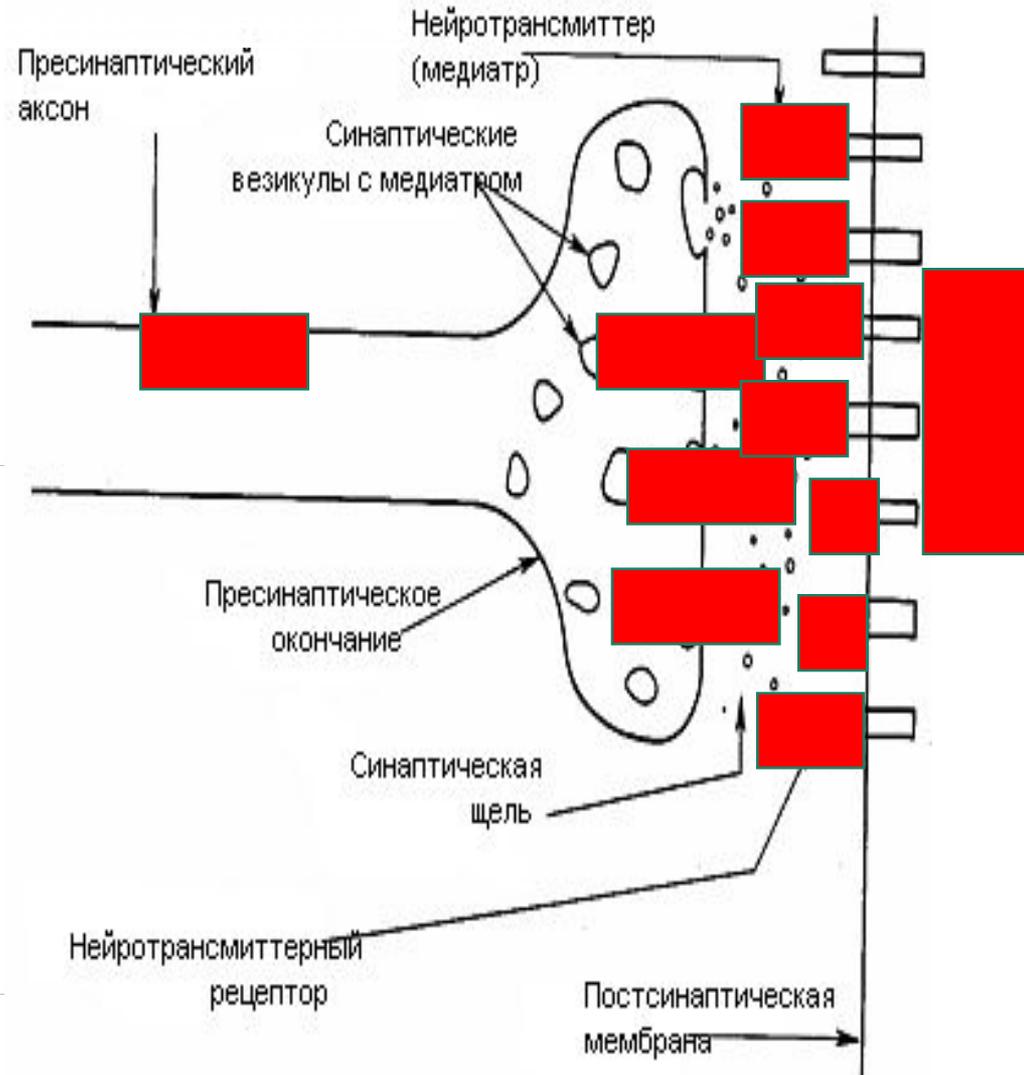
Chemical structure of Atracurium, a non-depolarizing muscle relaxant. It features a central quaternary ammonium group (N<sup>+</sup>) connected to two piperidine rings, each substituted with two hydroxyl groups (OH). The structure also includes a methyl group (CH<sub>3</sub>) and a long chain containing an ester linkage and a carboxylate group (O=C-CH<sub>3</sub>).

## Строение синапса

Эфферентный нейрон тоже заканчивается синапсом на исполнительном органе.

Синапс включает

- пресинаптическое окончание (терминальное расширение аксона),
- откуда выделяется нейромедиатор в
- синаптическую щель и
- постсинапт. мембрану, на которой расположены
- рецепторы, обладающие аффинитетом к медиатору.



**В РЕЗУЛЬТАТЕ ПРИШЕДШИЙ К СИНАПСУ СИГНАЛ ПЕРЕЙДЕТ ДАЛЬШЕ – НА ПОСТСИНАПТИЧЕСКИЙ НЕЙРОН ИЛИ ИСПОЛНИТЕЛЬНЫЙ ОРГАН**