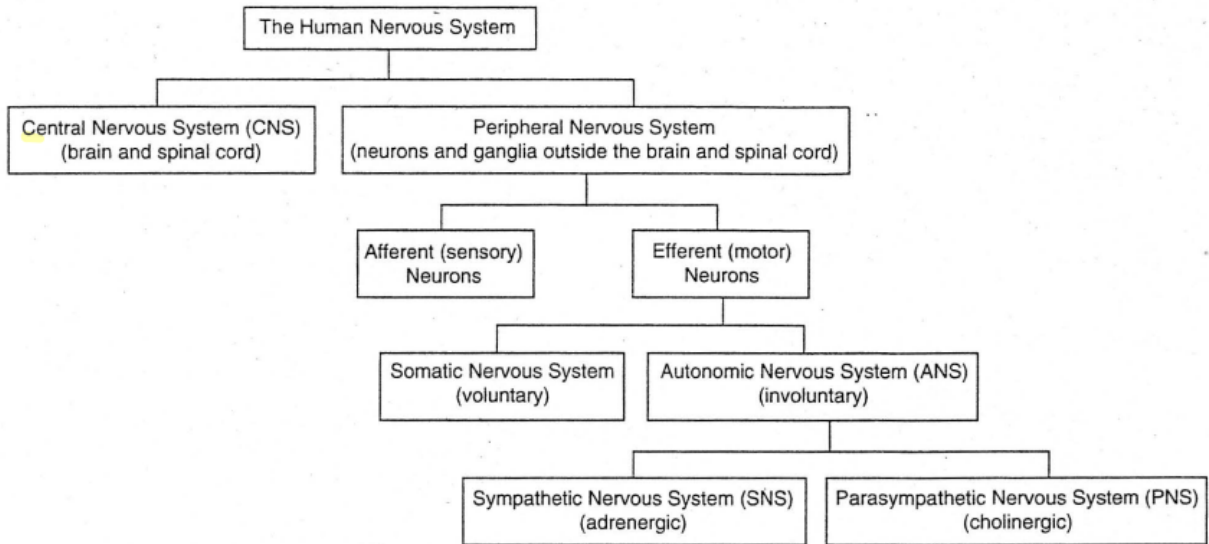
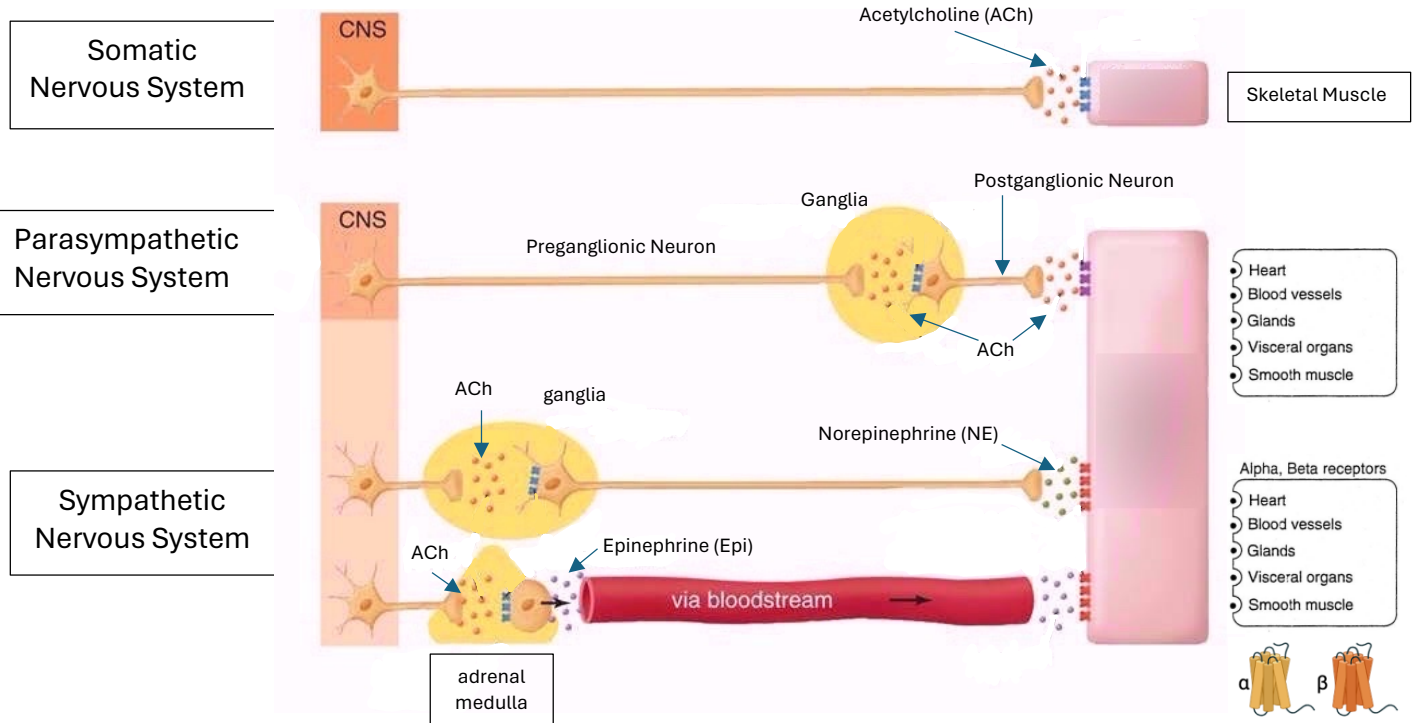


# REVIEW OF THE AUTONOMIC NERVOUS SYSTEM (ANS)

## I. Division of the Human Nervous System



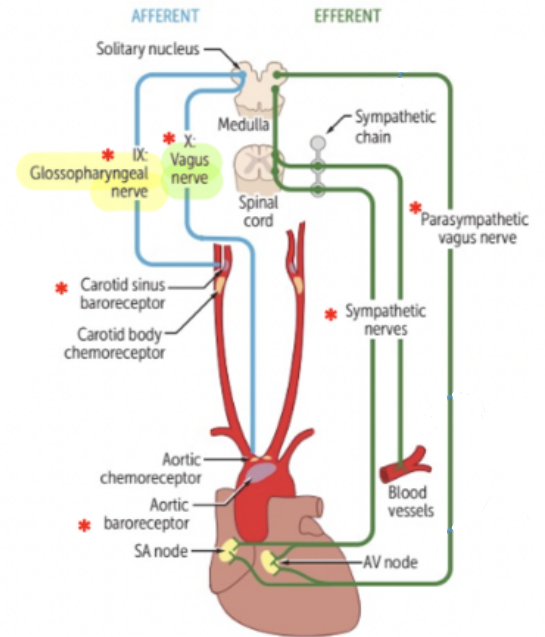
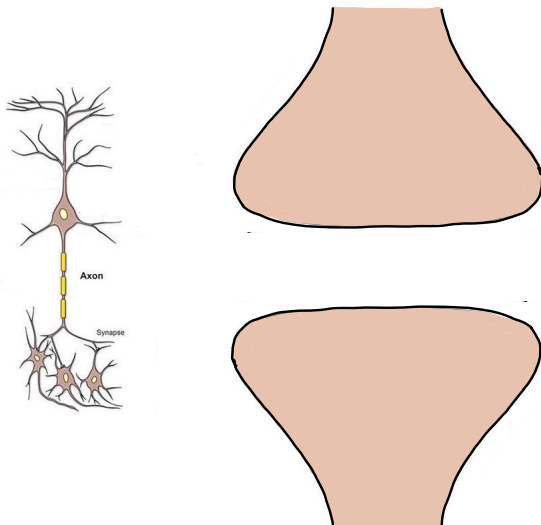
## II. Organization of the Autonomic and Somatic Nervous Systems



### III. Medulla Oblongata

- The medulla oblongata contains 4 major centers:
  1. Respiratory Center
  2. ARAS (ascending reticular activating system)
  3. Vasomotor Center
  4. Cardiac Center

Resp. Center	Vasomotor
ARAS	Cardiac



### IV. Review of the Sympathetic Nervous System (SNS)

- A. "Fight or Flight" Response
  - mobilizes the body
  - allows the body to function under stress
- B. Neurotransmitters
  - epinephrine (Epi)
  - norepinephrine (NE)
- C. Synonymous Terms
  - adrenergic
  - anticholinergic
  - catecholamine
  - sympathomimetic
  - cholinergic blocker
  - parasympatholytic

## IV. Review of the Sympathetic Nervous System (cont.)

### D. Sympathetic Receptors

#### (1) alpha-1

- stimulating alpha-1 on vascular smooth muscle → vasoconstriction

#### (2) alpha-2

- presynaptic alpha-2 receptors → regulate NE release

#### (3) beta-1 (heart)

- stimulating beta-1 (heart) → increases heart rate, increases AV conduction velocity, and increases myocardial force of contraction

#### (4) beta-2 (e.g., lungs, blood vessels)

- stimulating beta-2 receptors in bronchi → bronchodilation
- stimulating beta-2 receptors on blood vessels → vasodilation

## V. Review of the Parasympathetic Nervous System (PSNS)

### A. "Feed and Breed" Response

- conservation of body resources
- restoration of body resources

### B. Neurotransmitter: Acetylcholine (ACh)

### C. Synonymous Terms

- cholinergic
- sympatholytic
- adrenergic blocker
- sympathetic blocker
- parasympathomimetic

### D. Parasympathetic Receptors

#### (1) nicotinic receptors (located on skeletal muscles)

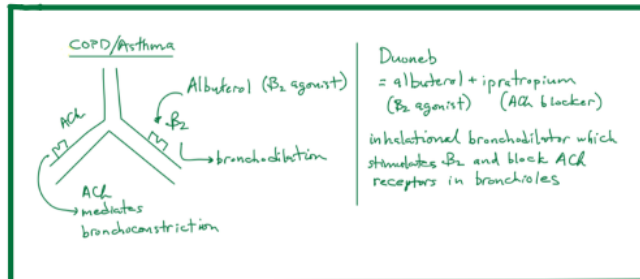
#### (2) muscarinic receptors (located on smooth muscle, organs, etc...)

- activating muscarinic receptors on bronchi → bronchoconstriction
- activating muscarinic receptors in the heart → decreases heart rate, decreases AV conduction velocity, decreases myocardial force of contraction
- activating muscarinic receptors on the GI Tract → increases peristalsis and increases secretions

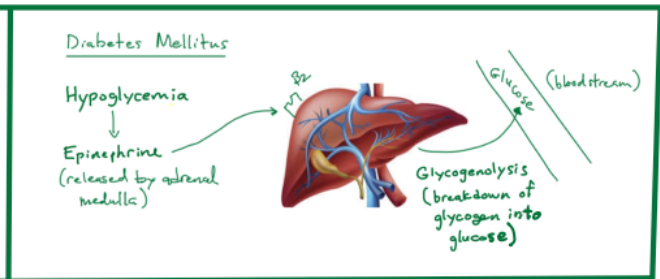
## VI. Function of the Autonomic Nervous System (ANS)

Effector Organ	Parasympathetic Effect (Cholinergic)	Sympathetic Effect (Norepinephrine)	
		Receptor	Response
Eye (ciliary muscle)	contraction (for near vision)	beta	relaxation (for far vision)
<b>Heart</b>			
SA Node	decrease HR	beta-1	increase HR
Atria	Decrease contractility	beta-1	increase contractility
AV Node	Decrease conduction velocity	beta-1	increase conduction velocity
Ventricles	decrease in contractility	beta-1	increase in contractility
Arterioles	.....	alpha-1	vasoconstriction
	.....	beta-2	vasodilation
Veins (systemic)	.....	alpha-1	venoconstriction
	.....	beta-2	venodilation
Lung (bronchial)	bronchoconstriction	beta-2	bronchodilation
Salivary Glands	(+) secretions	alpha / beta-2	(-) secretions
Stomach	increase motility	alpha / beta-2	decrease motility
	(+) secretions	.....	(-) secretions
Intestine	increase motility	alpha / beta-2	decrease motility
	(+) secretions	.....	(-) secretions
Gallbladder & Ducts	contraction	.....	relaxation
<b>Urinary Bladder</b>			
Detrusor	contraction	beta	relaxation
Trigone and Sphincter	relaxation	alpha	contraction
Male Sex Organs	erection	alpha	ejaculation
Liver	.....	beta-2	glycogenolysis
Adipose Tissue	.....	beta	lipolysis
Juxtaglomerular (JG) Cells	.....	beta	renin secretion

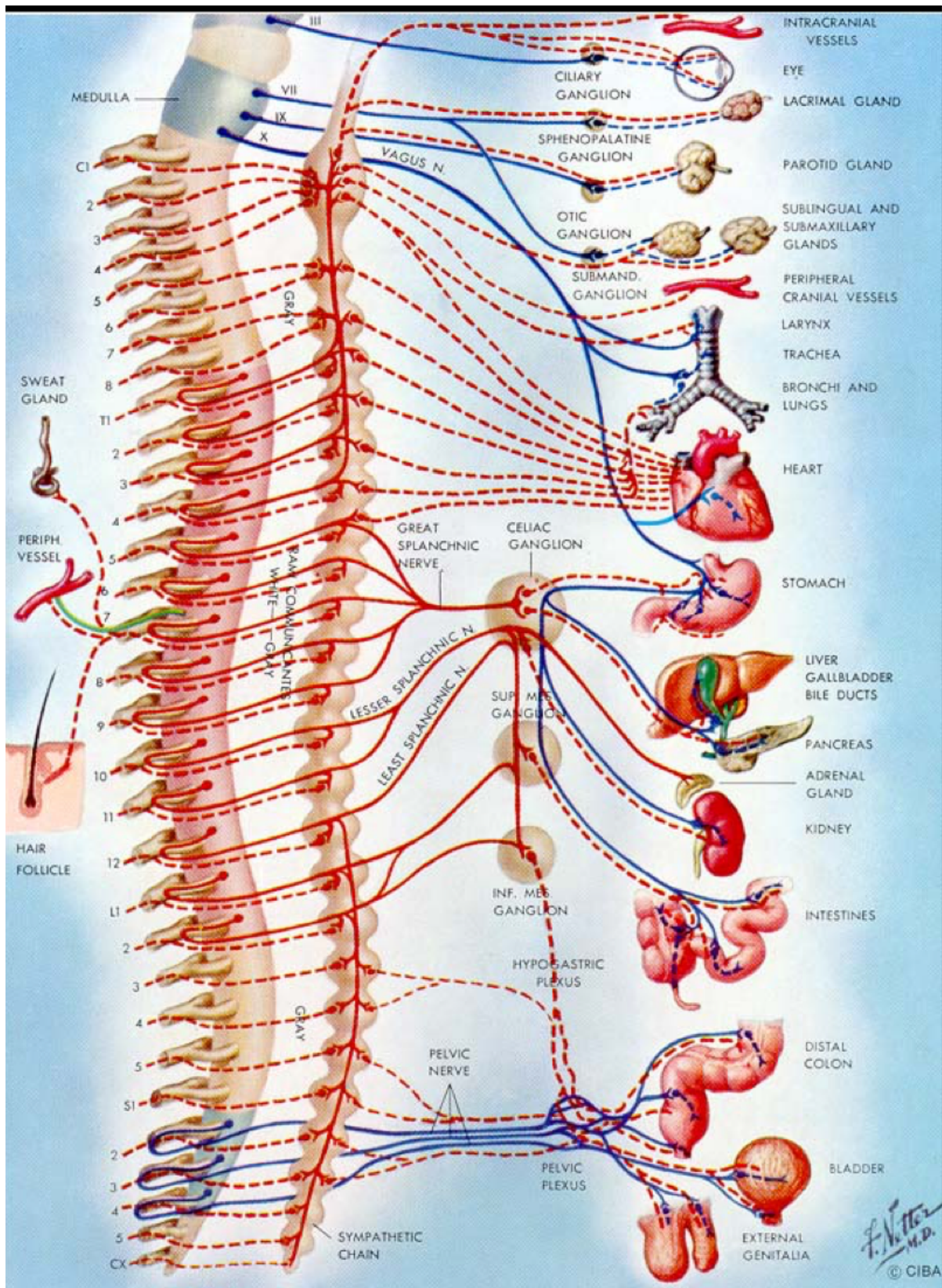
### LUNGS



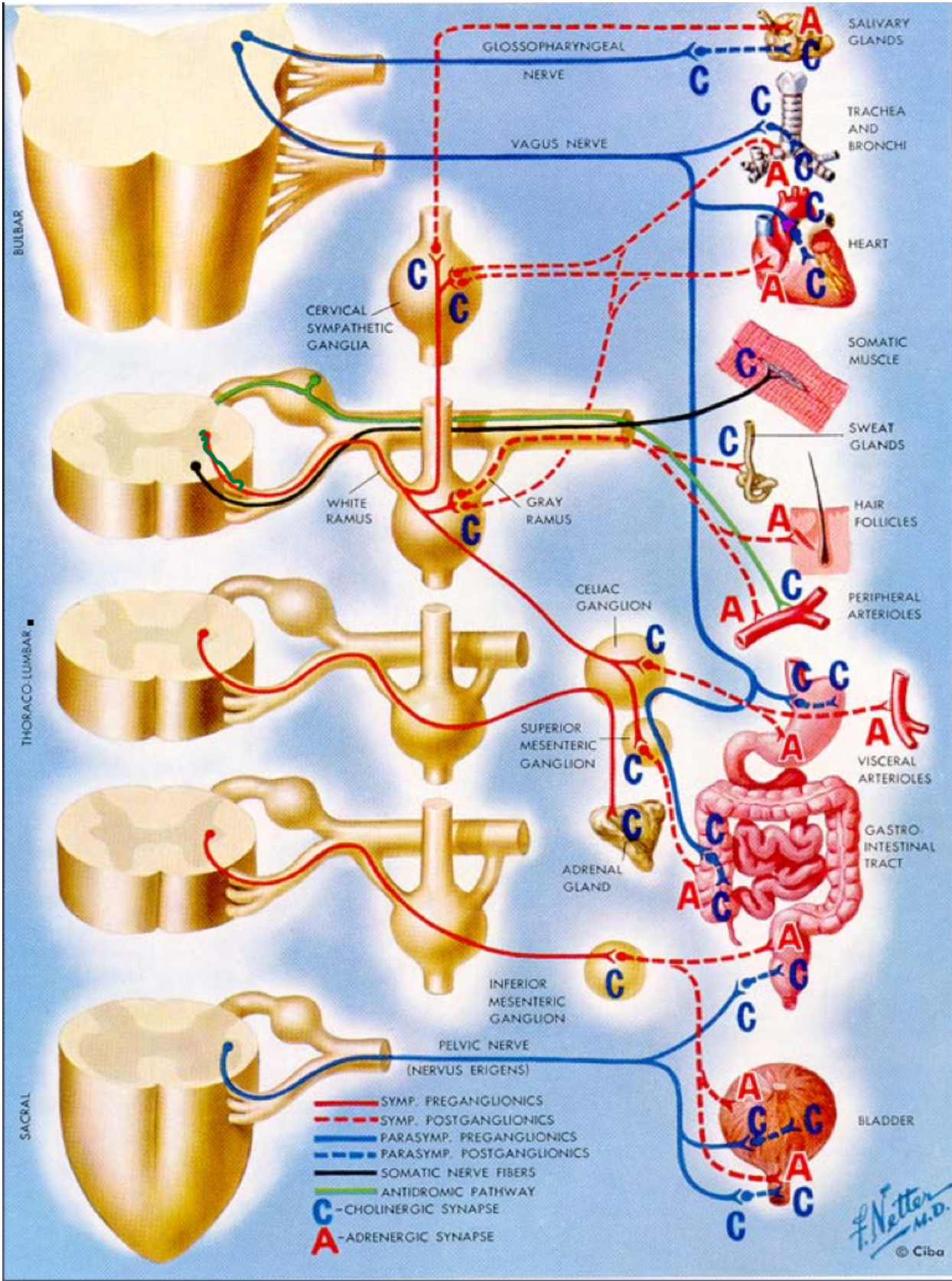
### LIVER



# Supplement: Graphic Illustrations of the Autonomic Nervous System



# Supplement: Graphic Illustrations of the Autonomic Nervous System



# Supplement: Interdependent & Interacting Factors in Blood Pressure Regulation

