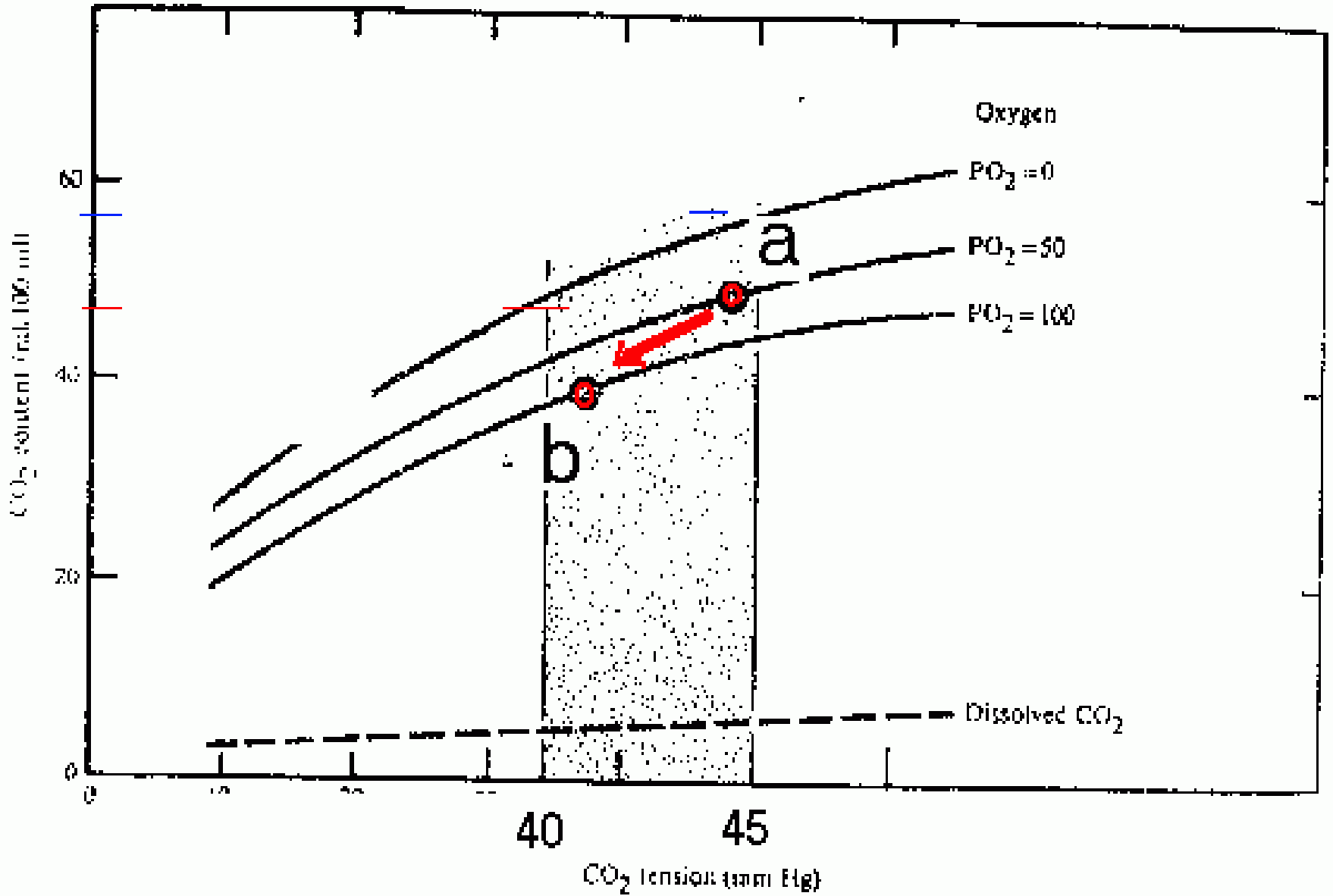
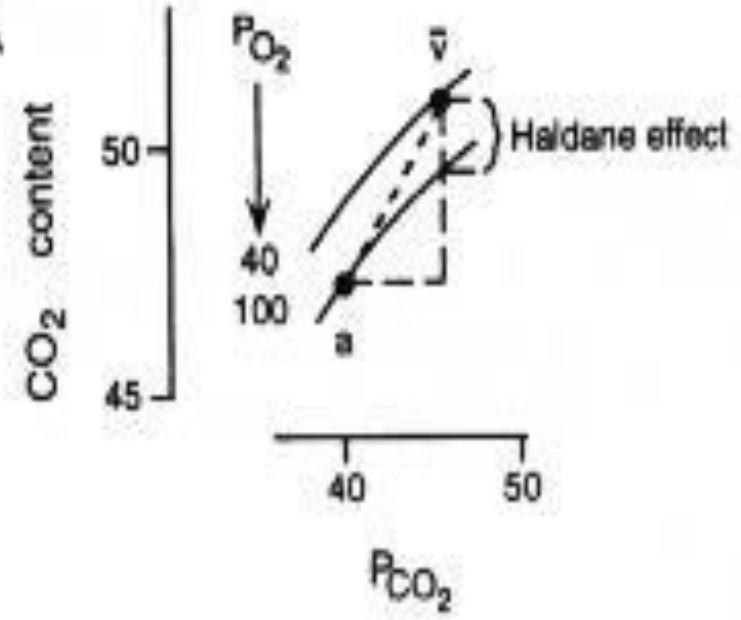
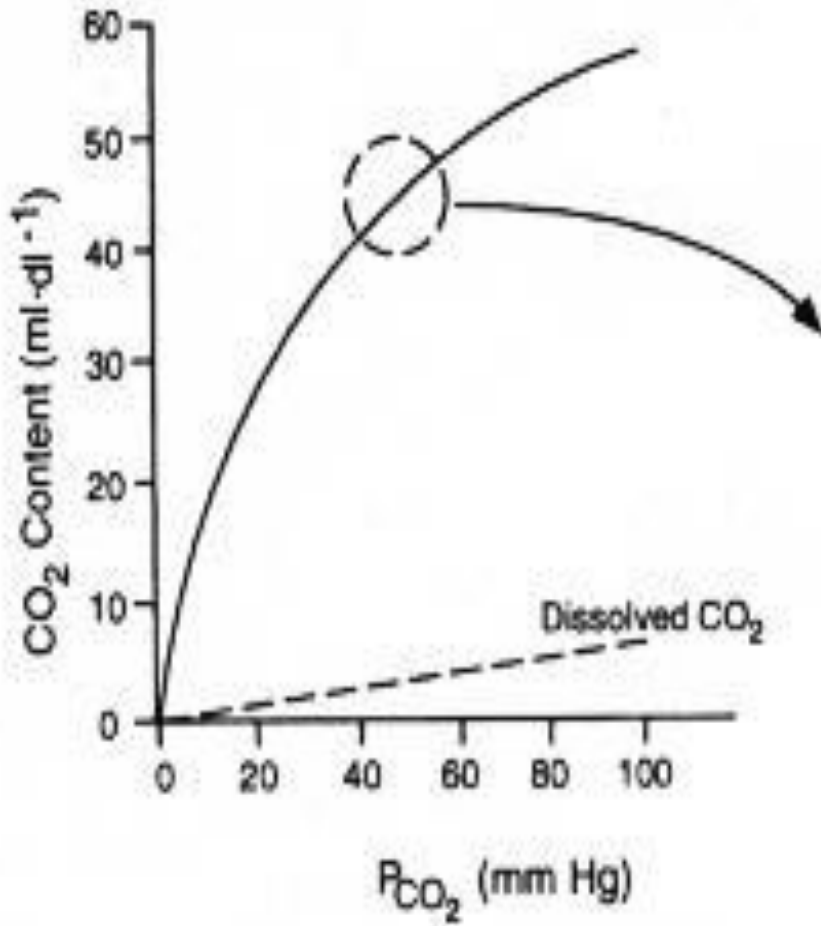


Physiology of Respiration

Part 4

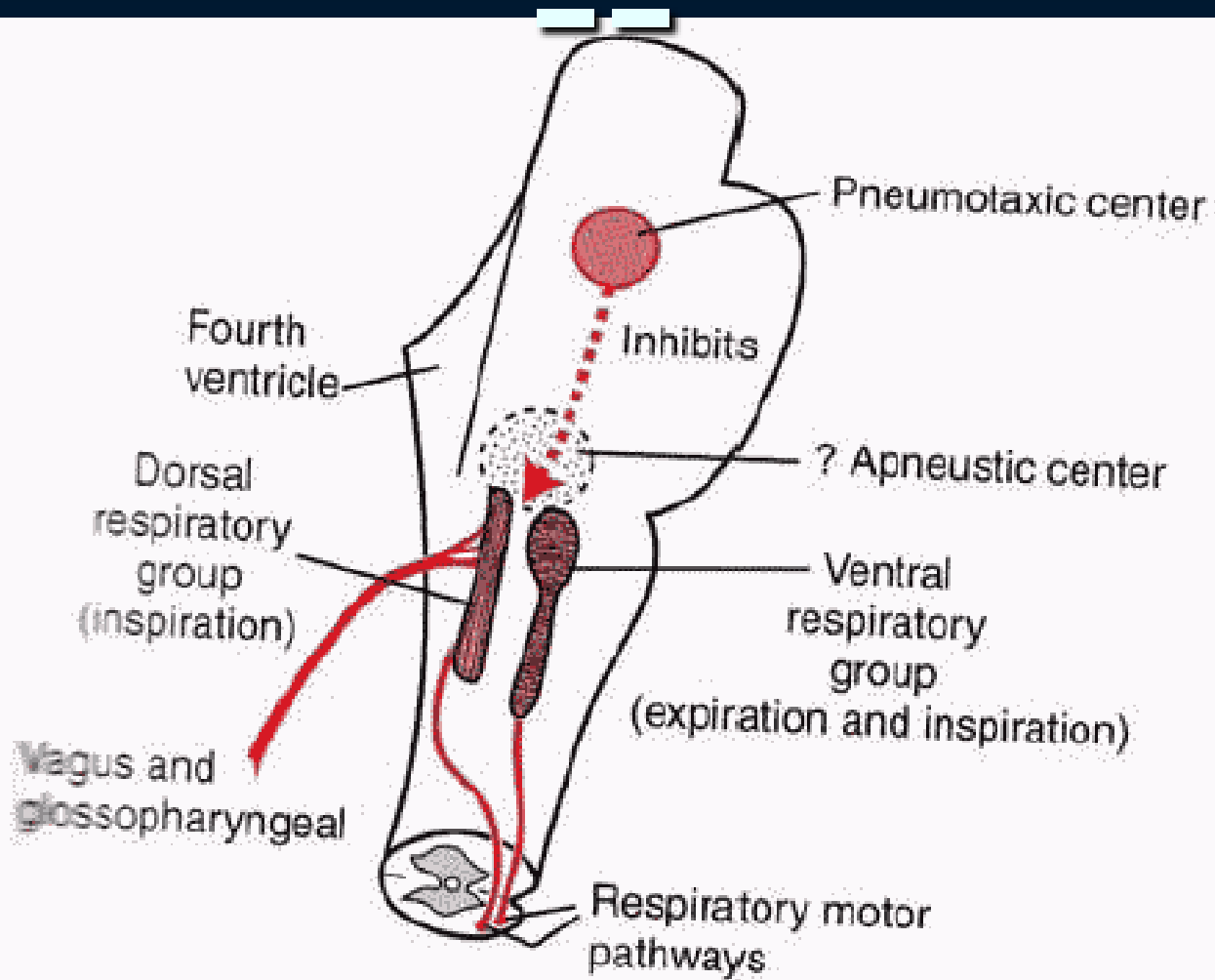






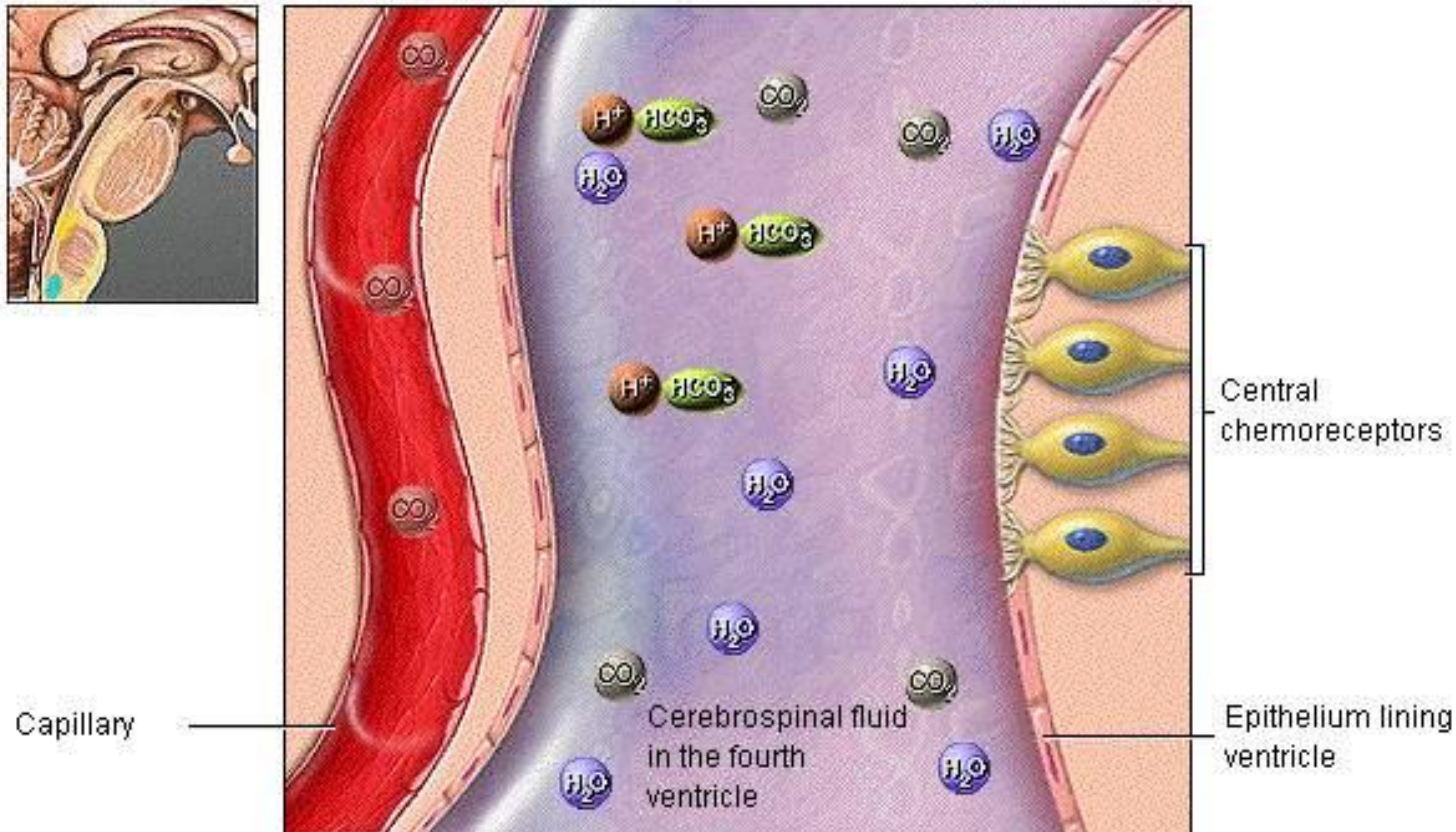
Control



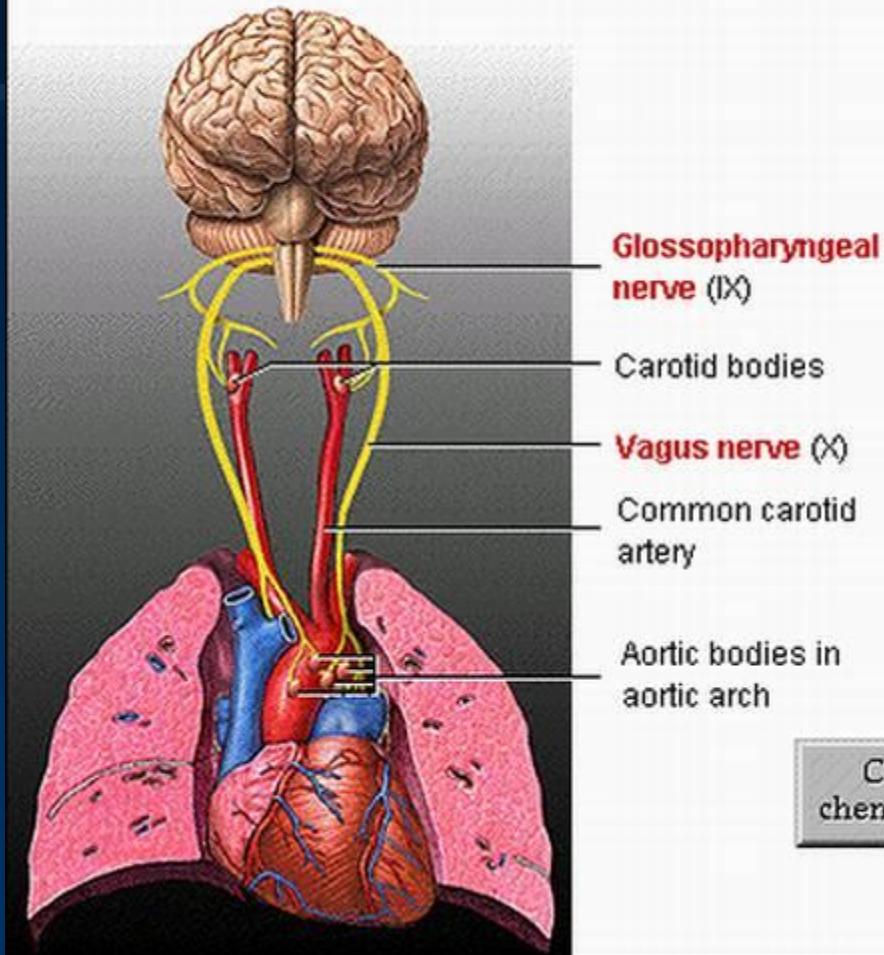


Organization of the respiratory center.

CENTRAL CHEMORECEPTORS: EFFECT OF PCO_2



LOCATION OF CHEMORECEPTORS

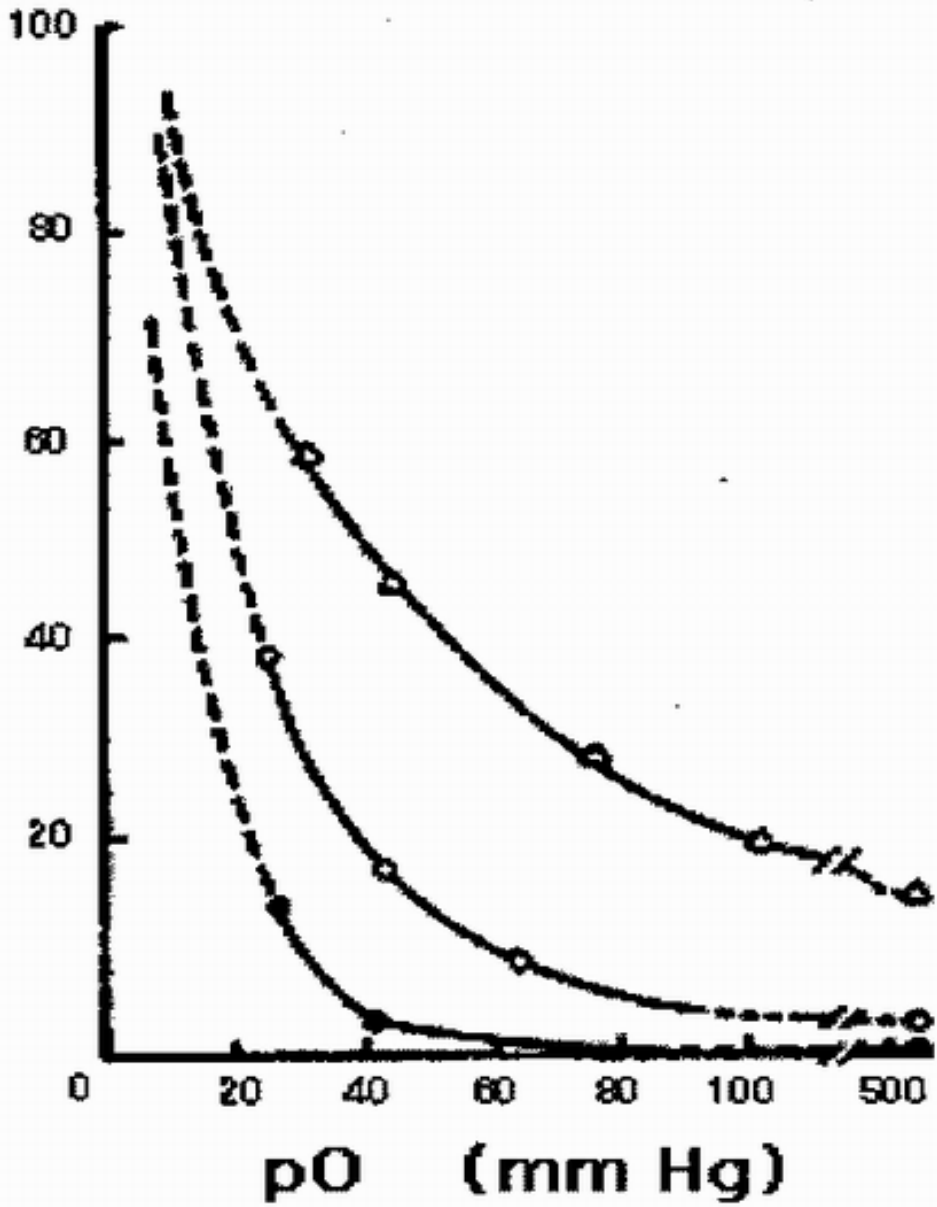


The basic rhythm of breathing is modified by input from the central and peripheral **chemoreceptors**. They respond to changes in the P_{CO_2} , pH, and P_{O_2} of arterial blood, the most important factors altering ventilation.

Central chemoreceptors

Peripheral chemoreceptors

Carotid Body Activity
(% maximum)

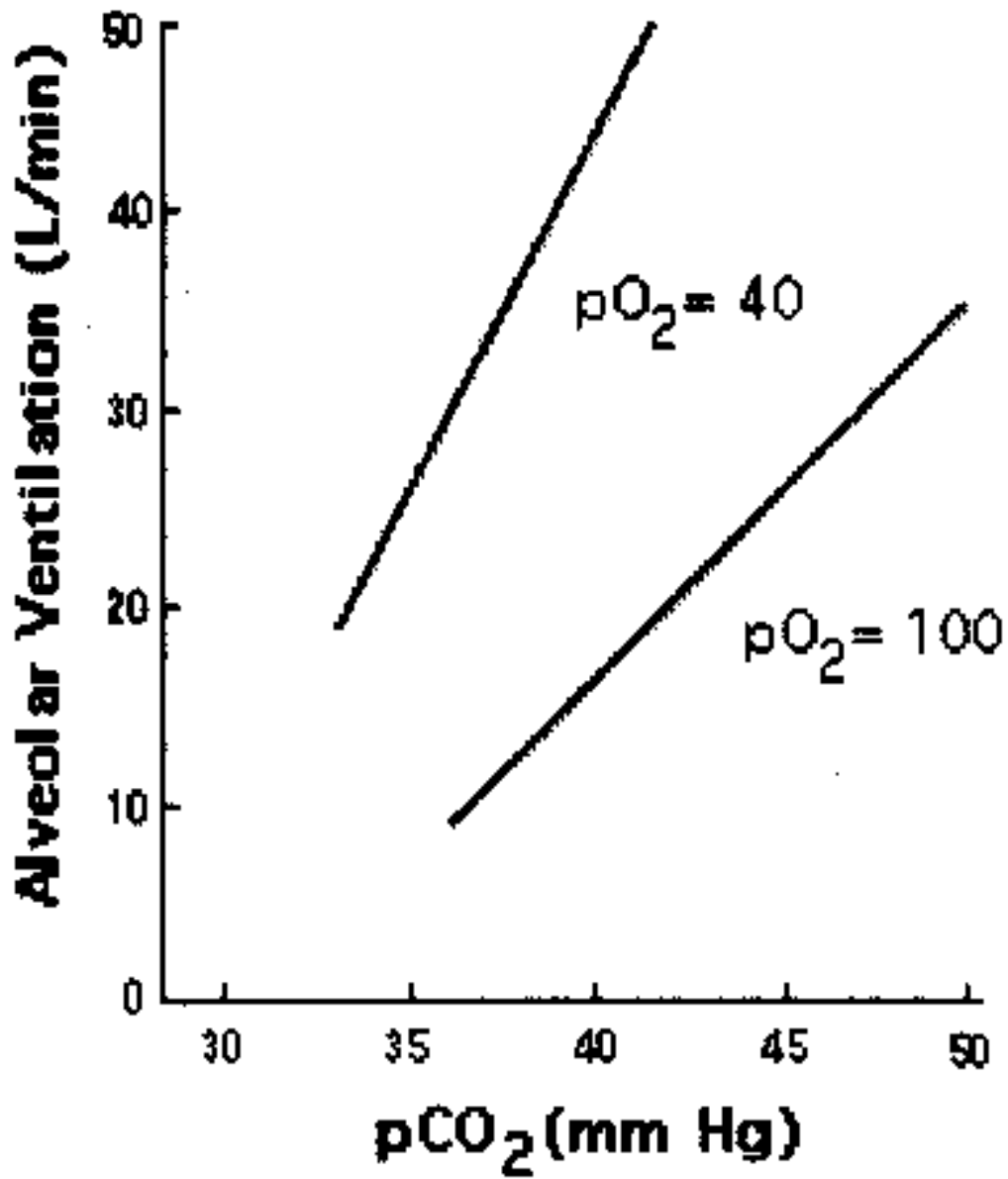


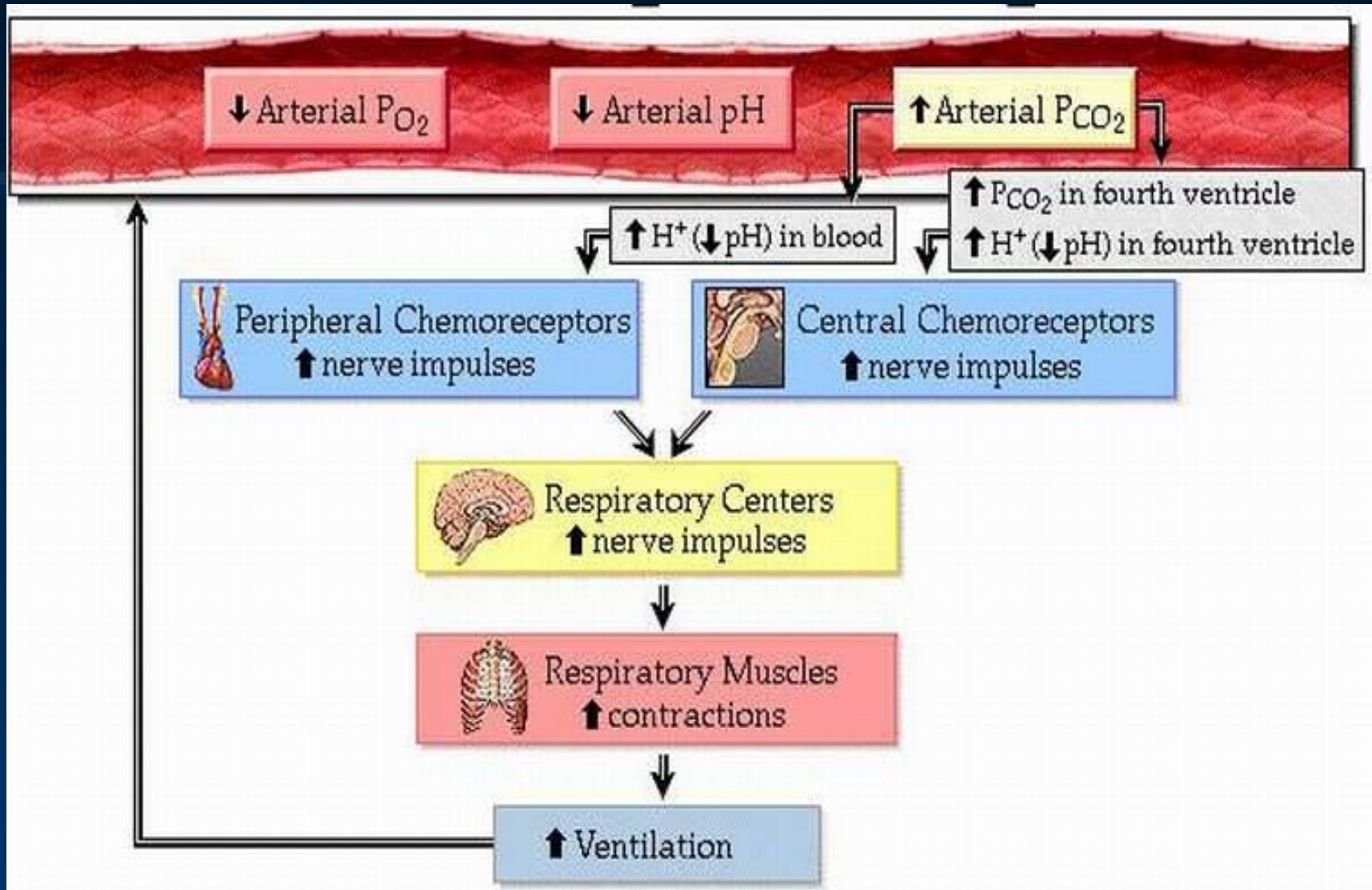
pH

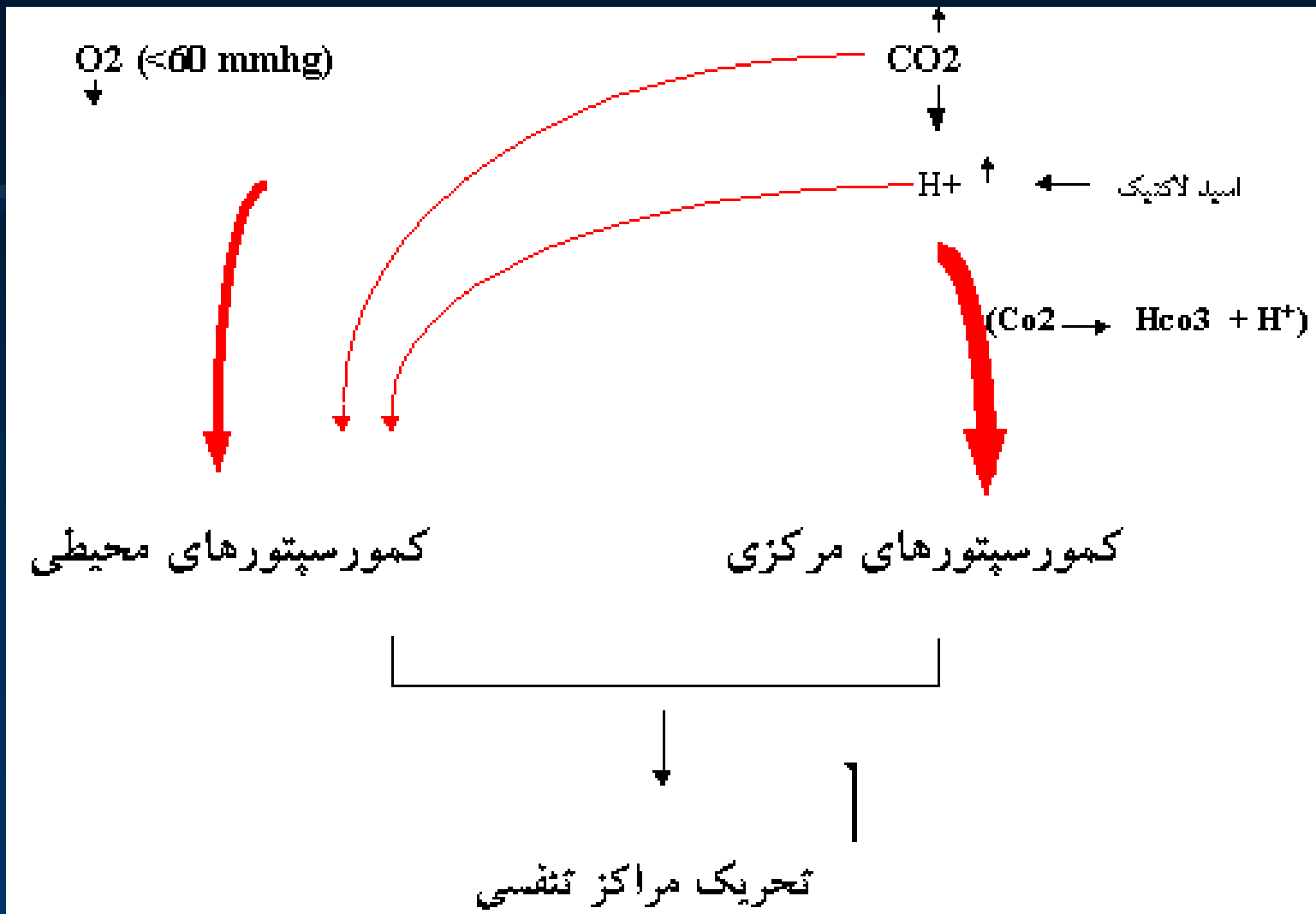
7.2

7.4

7.5







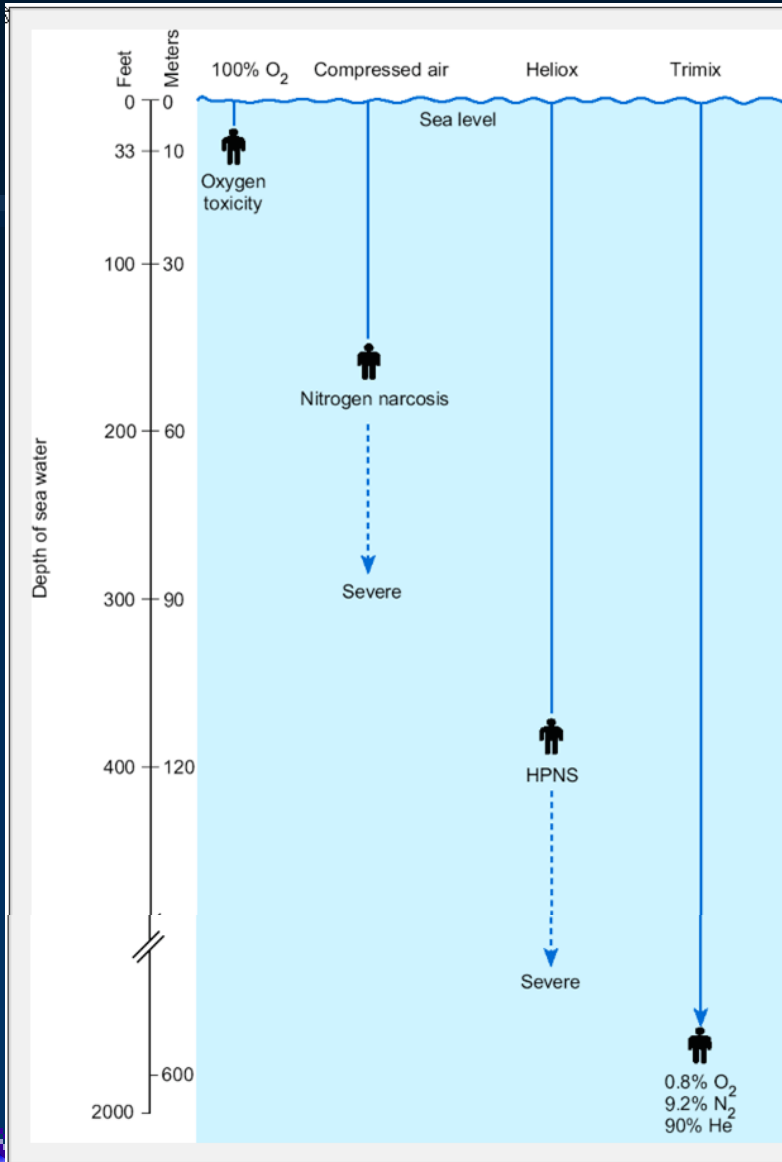
فاکتورهای جانبی

Inflation reflex = Hering-Breuer ■

- استرچ رسپتورهای پلور احشایی و راههای هوایی بزرگ در دم بسیار عمیق از طریق واگ باعث مهار تنفس
- کنترل ارادی – مراکز کم رسپتوری بر آن تفوق دارند.
- درد و مسائل روحی
- دود و غبار - عطسه و سرفه
- ورزش سنگین – دم عمیق تر و تعداد کمتر تنفس
 - یادگیری
 - گیرنده های عضلات و مفاصل
 - اپینفرین و نور اپینفرین و اسید لاکتیک خون



Diving



Decompression Sickness

DCS can happen in these situations:

- A diver **ascends quickly** from a dive or does not carry out decompression stops after a long or deep dive.
- An **unpressurized aircraft** flies upwards.
- The **cabin pressurization system** of a high-flying aircraft fails.
- **Divers flying** in any aircraft shortly after diving
- A worker comes out of a **pressurized caisson** or out of a mine, which has been pressurized to keep water out

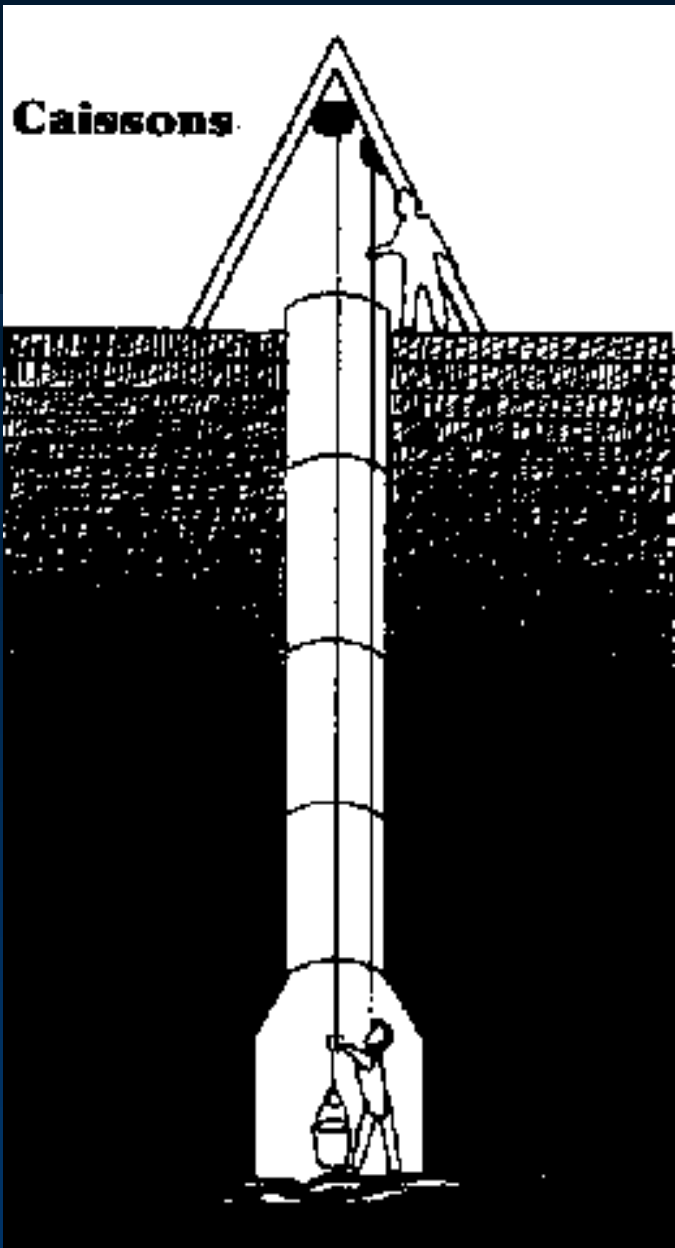


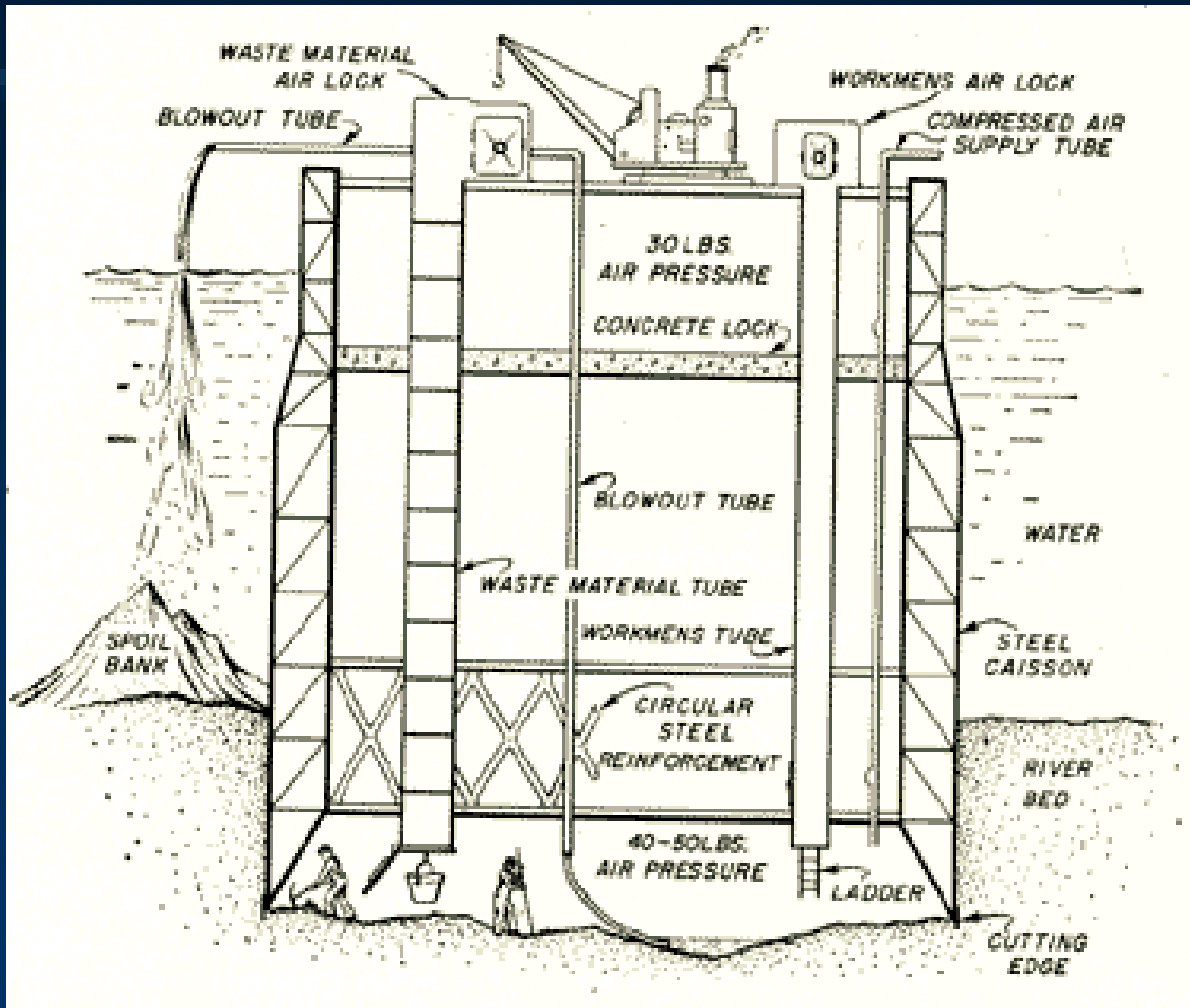
caisson sickness

- Roebeling
- . . . He went to Europe to study engineering and especially **pneumatic caissons**. After his father's death he directed the construction of the Brooklyn Bridge. Because of continuous underground work he was stricken (1872) with decompression sickness (**caisson disease**), but despite his invalidism he directed the project until the bridge was opened to traffic (1883).



Caissons





- Most bridge foundations over the sea are caissons that are embedded into the river-bed (or ocean floor) until a suitable firm stratum is encountered. A caisson foundation, in simple words, is like a can (although it need not be circular!). It is a watertight chamber that facilitates the operation of construction equipment by workers within it.

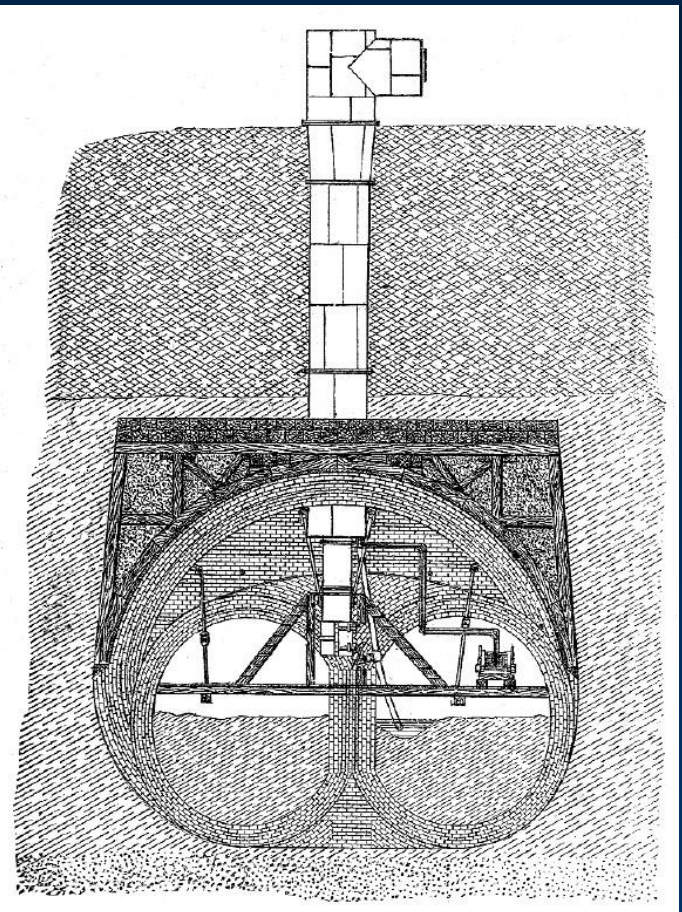


The workers operate construction equipment and excavate the soil within the caisson walls thus sinking the caisson into the river-bed (or ocean floor). Compressed air is pumped into the caisson and regulated to ensure that the caisson remains stable and soil/mud/water do not rush in through the bottom.



Inside the caisson





Alveolar Gas At Altitude And Sea Level

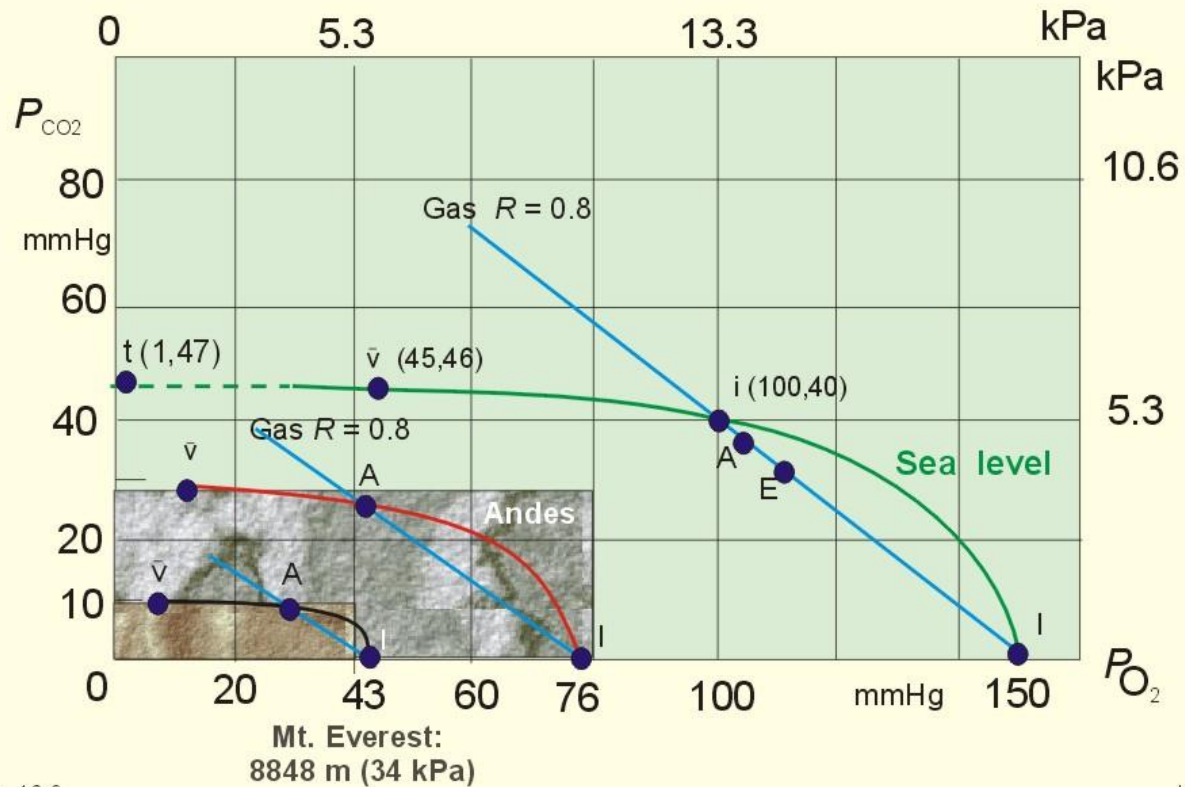


Fig.16-9

KMc

Biological Barriers Of Diving

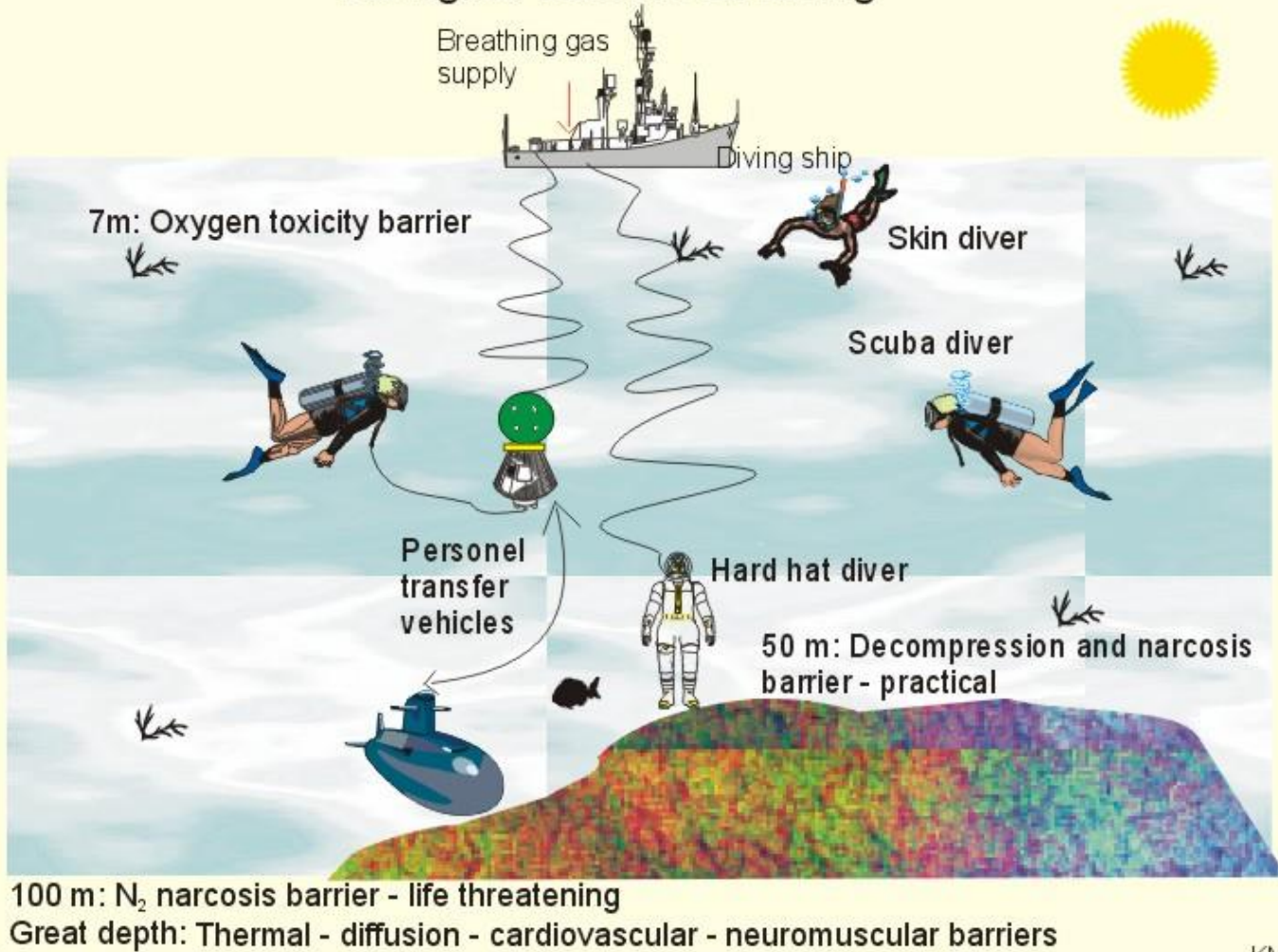


Fig.19-8

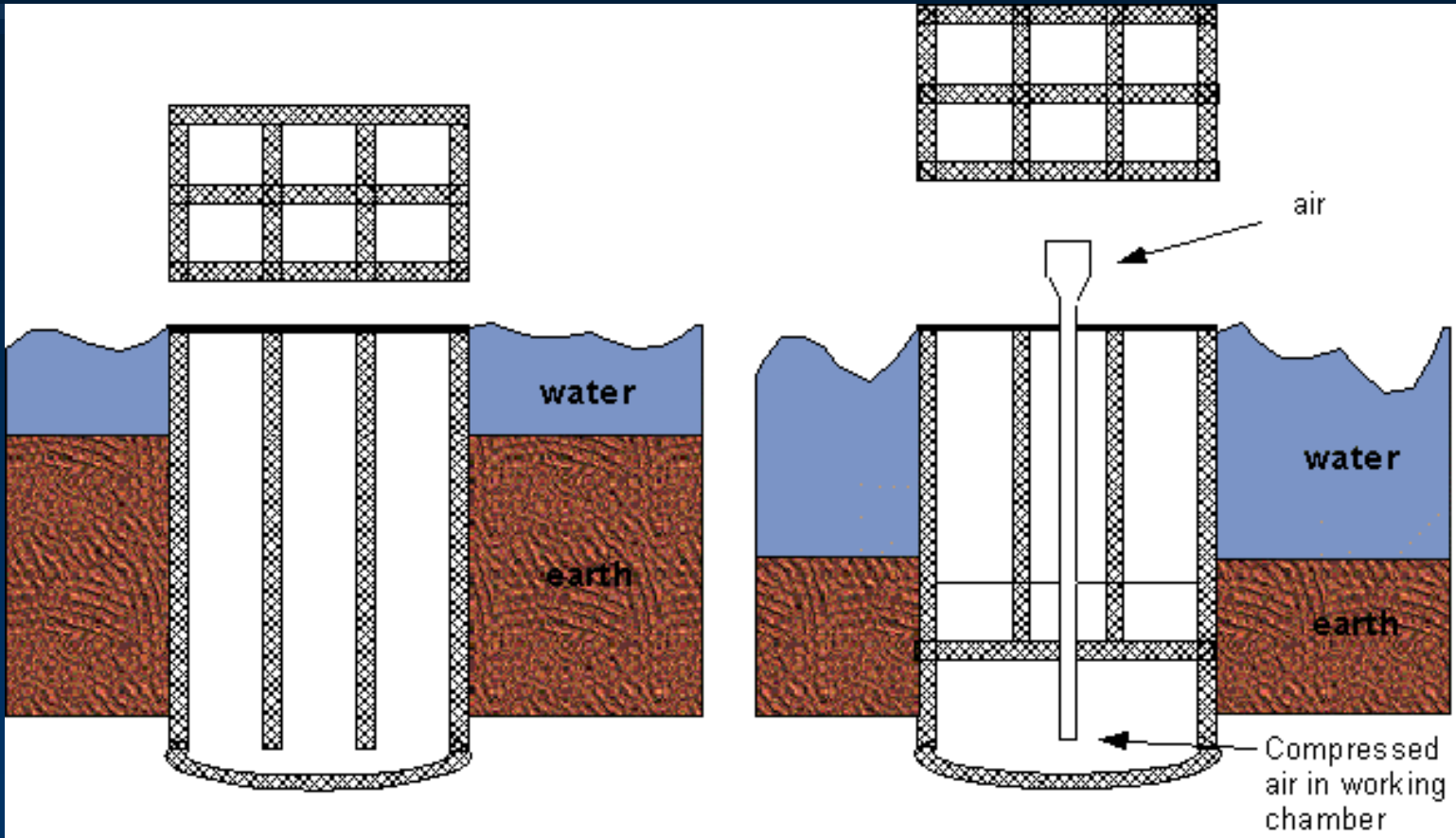
KMc













Organophosphate Poisoning Nerve Gas



History of Iraqi Chemical War

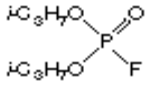
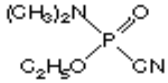
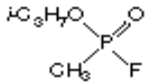
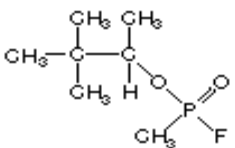
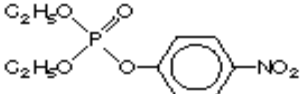
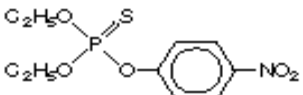
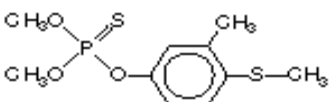
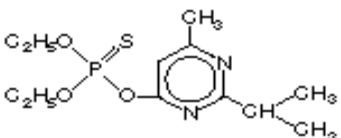
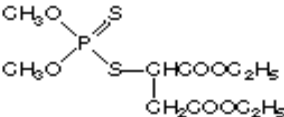





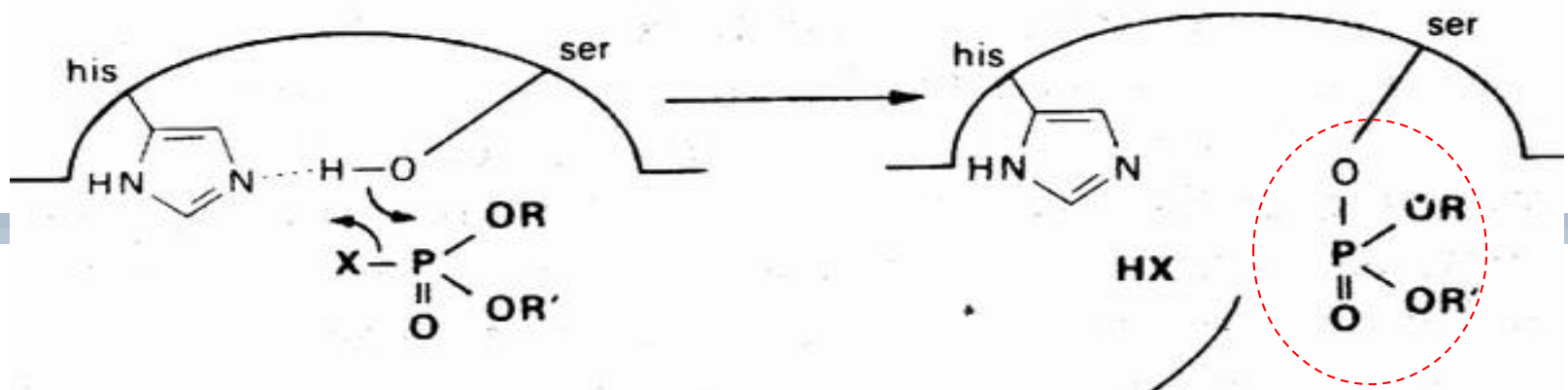


Table 8-1

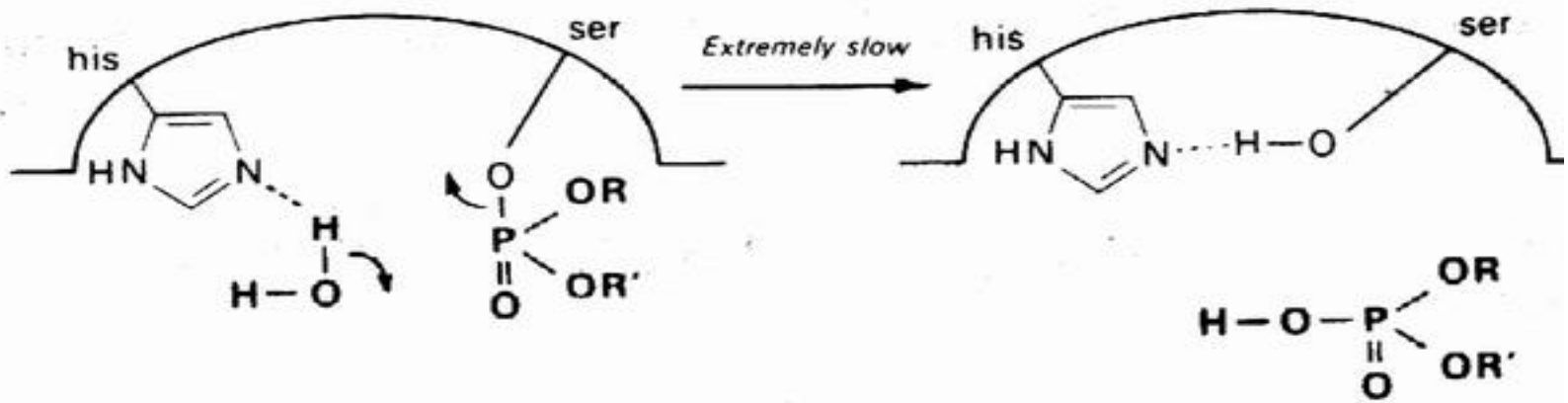
Chemical Classification of Representative Organophosphorus Compounds of Particular Pharmacological or Toxicological Interest

GROUP	STRUCTURAL FORMULA	COMMON, CHEMICAL, AND OTHER NAMES	COMMENTS
General formula (Schrader, 1952): $\begin{array}{c} \text{O} \\ \parallel \\ \text{R}_1-\text{P}-\text{X} \\ \\ \text{R}_2 \end{array}$			
Group A, X = halogen, cyanide, or thiocyanate; group B, X = allylthio, arylthio, alkoxy, or aryloxy; group C, thio- or thiono-phosphorus compounds; group D, pyrophosphates and similar compounds; group E, quaternary ammonium compounds			
A		DFP; Isofluorophate (see trade names in text); diisopropyl fluorophosphate	Potent, irreversible inactivator
		Tabun Ethyl N-dimethylphosphoramidocyanidate	Extremely toxic "nerve gas"
		Sarin (GB) Isopropyl methylphosphonofluoridate	Extremely toxic "nerve gas"
		Soman Pinacolyl methylphosphonofluoridate	Extremely toxic "nerve gas"
	B		Paraoxon (MONTA-COL), E 600 O,O-Diethyl O-(4-nitrophenyl)phosphate
C		Parathion (see trade names in text) O,O-Diethyl O-(4-nitrophenyl)phosphorothioate	Employed as agricultural insecticide, resulting in numerous cases of accidental poisoning
		Fenitrothion O,O-Dimethyl O-4-methylthio-m-tolyl phosphorothioate	Insecticide with high lipid solubility; agricultural use
		Dimpylate, Diazinon O,O-Diethyl 2-isopropyl-6-methyl-4-pyrimidinyl phosphorothioate	Insecticide in wide use for gardening and agriculture
		Malathion O,O-Dimethyl S-(1,2-dicarbethoxyethyl) phosphorodithioate	Widely employed insecticide of greater safety than parathion or other agents because of rapid detoxification by higher organisms
	D		TEPP Triethyl phosphorotriphosphate

Phosphoryl enzyme

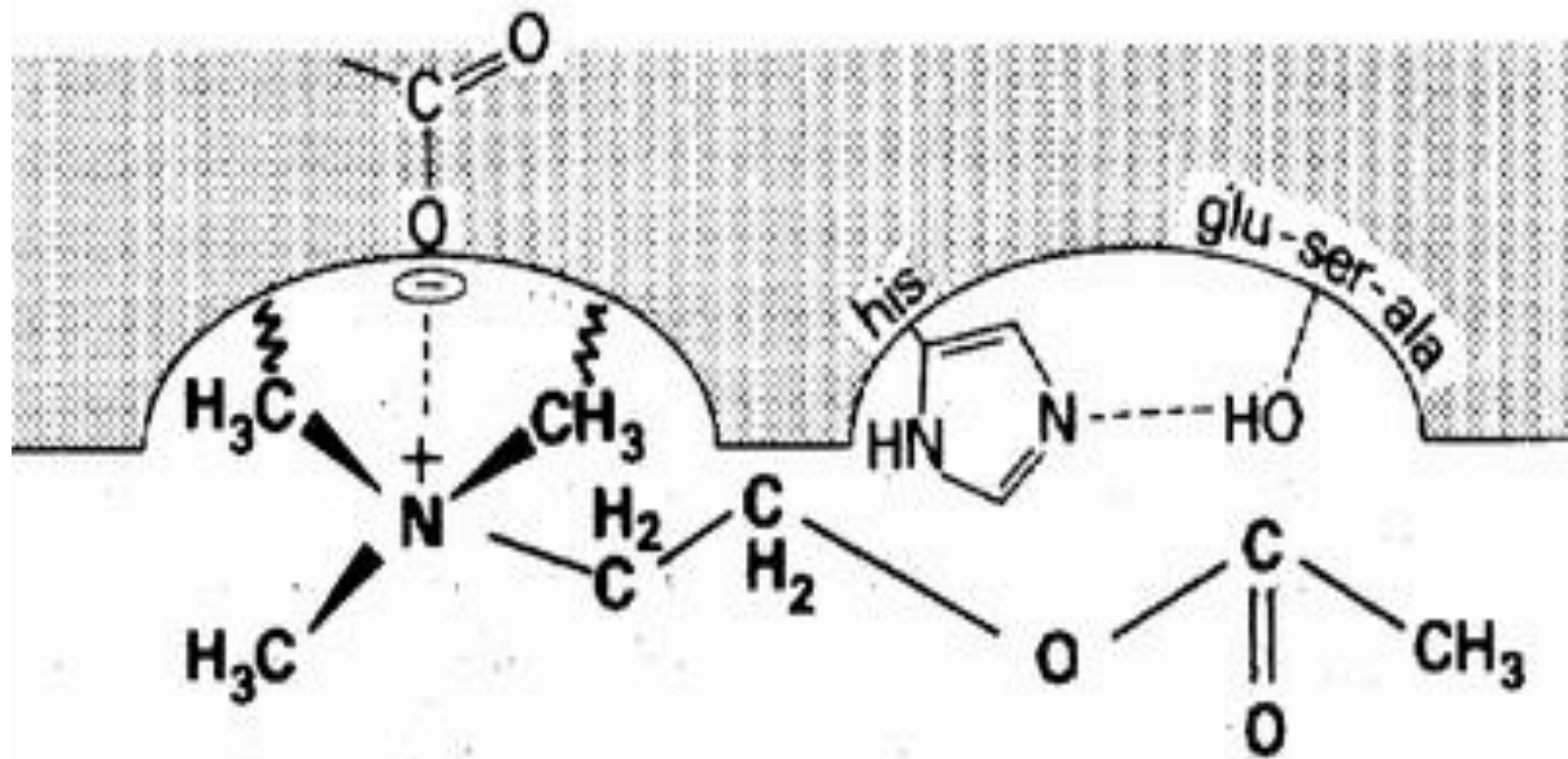


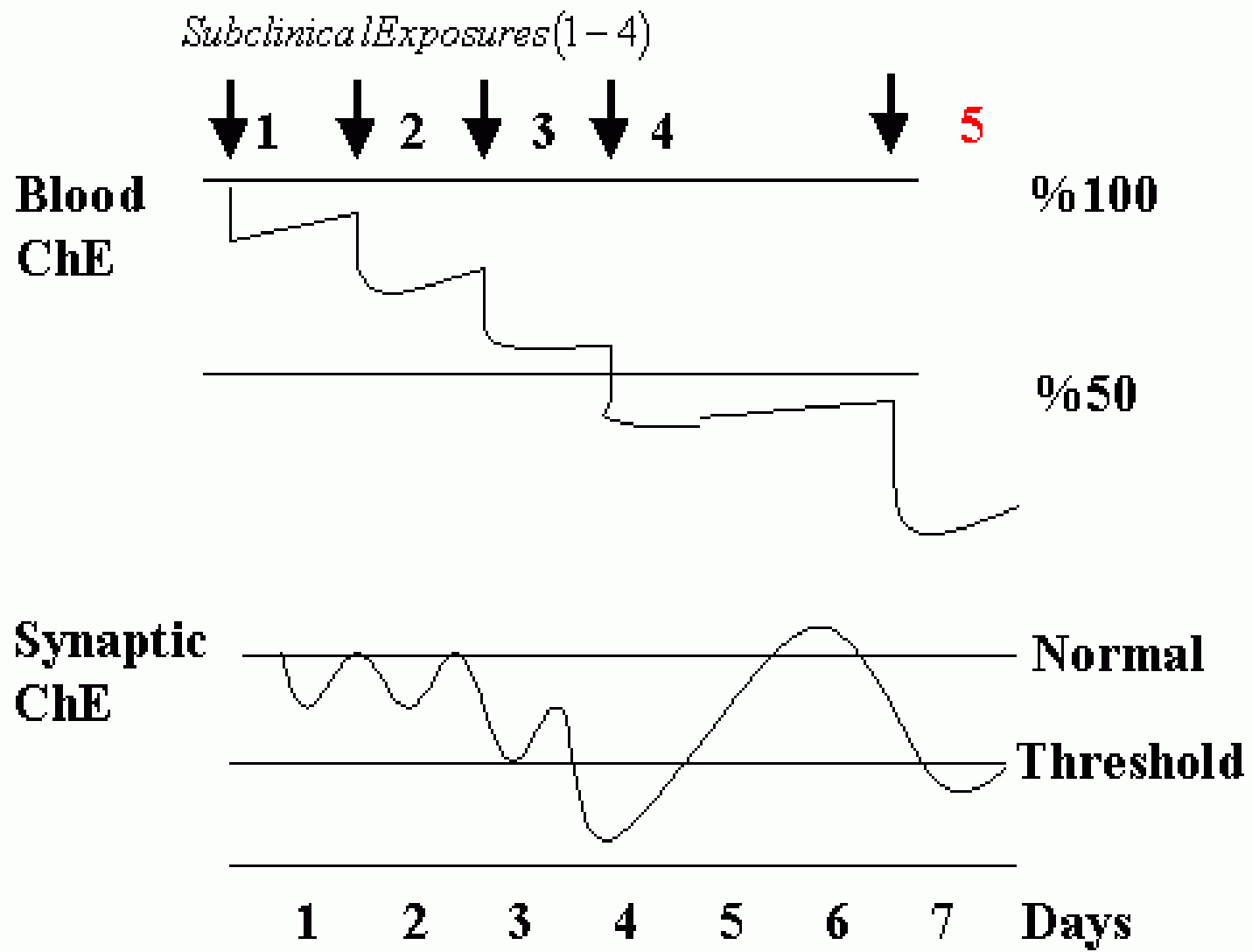
Active enzyme

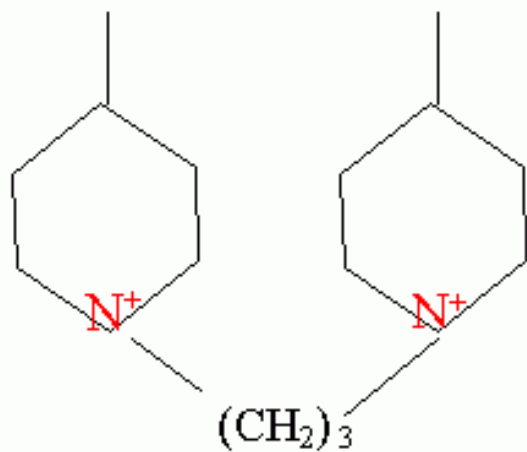


Anionic site

Esteratic site



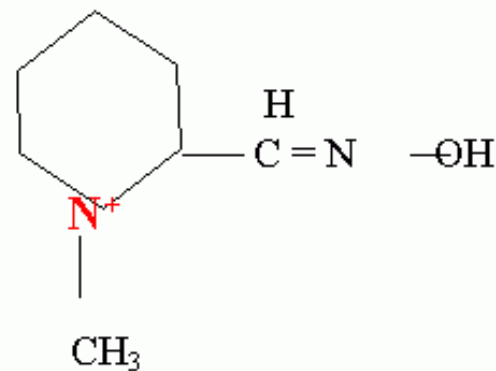
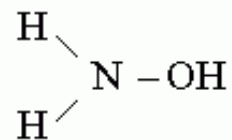




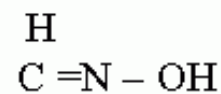
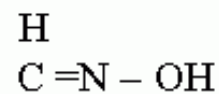
Obidoxime

2 Br⁻

Hydroxylamine



Pralidoxime



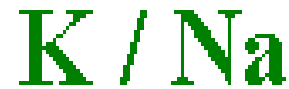
I⁻

Cyanide Poisoning





- اسید سیاندریک



- سیانوژن کلراید - سیانوژن پروماید

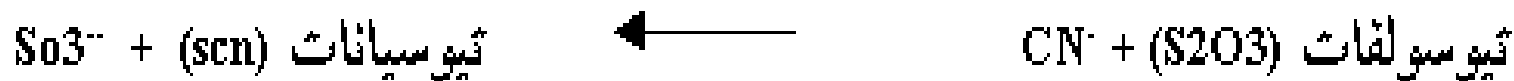
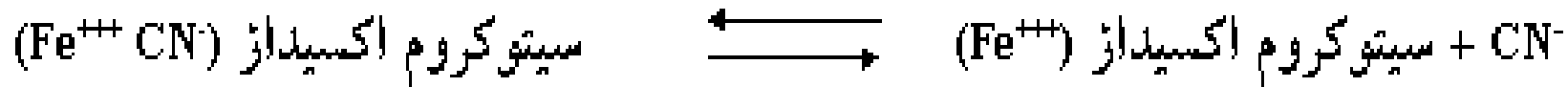
- سیانید سدیم، پتاسیم

- Amigdaline

- Sodium Nitroprusside

- ماده اولیه صنایع شیمیایی، سوختن برخی ترکیبات شیمیایی

- MIC (CH₃-NCO)



دفع اداری

علائم بالینی	مرحله ۱ تحریک	مرحله ۲ دپرسیون
CNS	سر درد - سرگیجه - اضطراب - تعریق	کاهش هوشیاری - اغماء - تشنج
دستگاه تنفس	تنگی نفس - تاکی پنه - گلگون شدن پوست و مخاط	ضعف و کاهش تنفس - سیانوز - وقفه تنفس
دستگاه گردش خون	افزایش فشار خون - برادی کاردی رفلکسی	سقوط فشار خون - تاکی کاردی - کلاپس قلبی و عروقی

۱- اڪسيژن (+ نيتريت استيشافي)

۲- * نيتريت / تيسولفات
تيسولفات ۱۲/۵ + ۳۰۰ ميليگرم نيتريت

* DMAP / تيسولفات

DICOBALT-EDTA

۳- مصرف مايعات فراوان

