

# COVID – 19: training

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**CONFLICT OF INTEREST**

**YES**



# Despre ce discutăm

- Cate ceva din acel puțin ce știm despre COVID-19 ajuns în TI
- Ce este hipoxemia și cum se recunoaște
- Pulsoximetria – ce ne spune valoarea și curba pletismografica
- Monitorul parametrilor vitali din TI



**SARS-CoV2**

d=60–140 nm

**ACE 2 -R**

# COVID-19 SUMMARY

## Disease progression

1<sup>st</sup> week : Fever,, non-productive cough  
Vomiting , nausea, diarrhoea  
2<sup>nd</sup> Week : Deterioration – Dyspnoea , SOB , Chest tightness

### Typical evolution :

Day 6 post exposure – Dyspnoea

Day 8 - Admission

Day 10 - ICU admission / Intubation

Deterioration or recovery most commonly occurs at Day 6-7 of illness

## Characteristics

The most associated co-morbidities with ICU admission were diabetes and hypertension.

Most patients are around 70 years old

Obesity is a frequent co-morbidity

Net prevalence in the male population

\*\*\*Interstitial pneumonia / Reps failure +/- Flu like symptoms treat as COVID +ve  
DO NOT BLINDLY trust negative swab if symptoms / pneumonia with suggestive CXR\*\*\*

## Organ Failure

Hypoxaemic respiratory failure > 90 %

Shock 30 %

Akl 10 – 30% (RRT 20%)

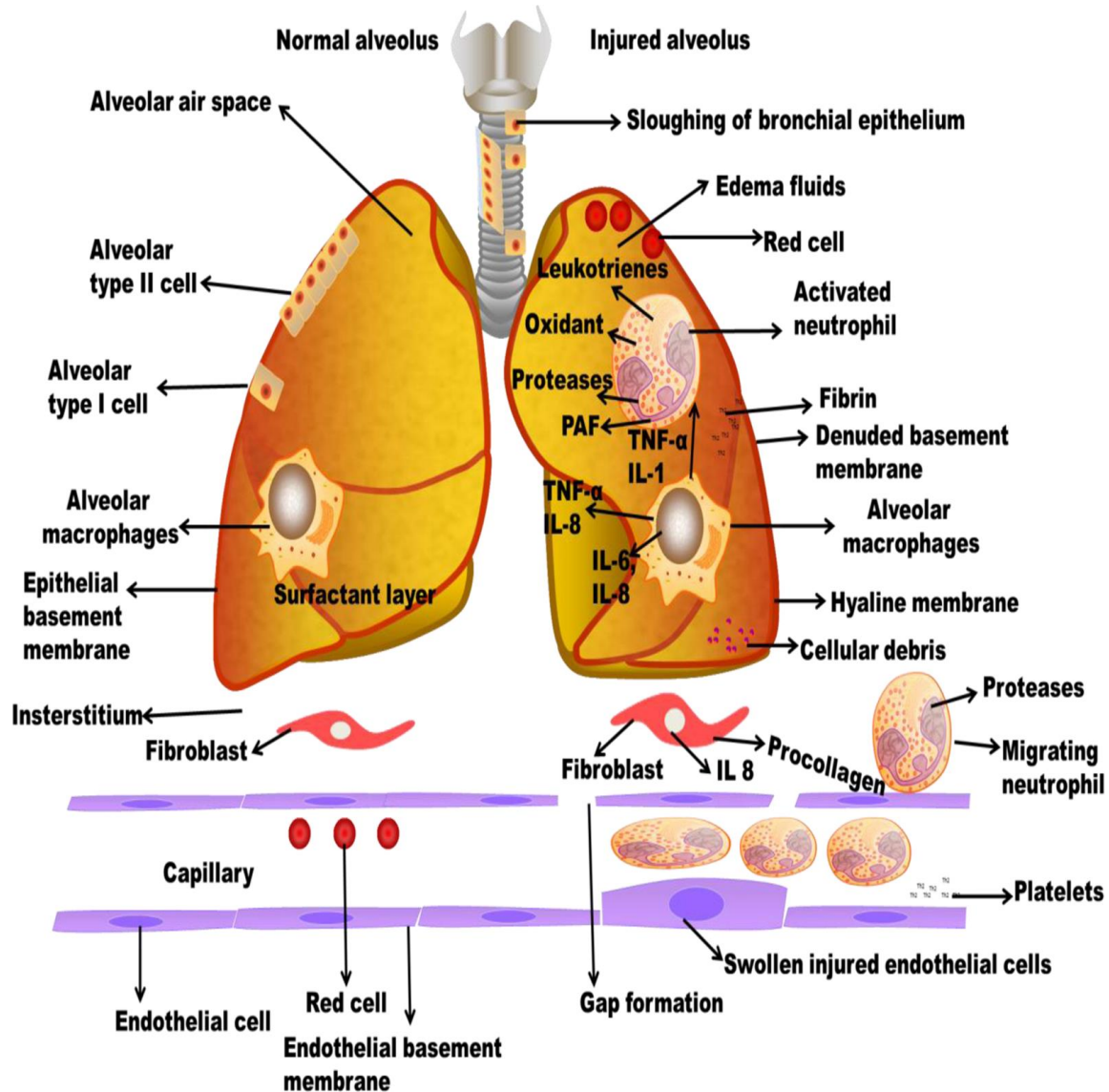


## La nivel pulmonar

- La interval de cel puțin 2 săptăm  
  - leziuni alveolare
  - Descuamări epiteliale
  - Hiperplazii ale celulelor de tip II
  - Depuneri de fibrinogen, colagen în alveole
  - Infiltrații mononucleare

# SARS

## Severe Acute Respiratory Syndrome



# SARS

- Înaltă morbiditate/mortalitate
- Febră persistentă  $>38^{\circ}\text{C}$
- Frisoane
- Mialgii
- Slăbiciune
- Dispnee
- Tuse seacă
- Cefalee
  - Tuse productivă
  - Dureri în gât
  - Fenomene dispeptice

≈ 2 săptămâni

Dispar la a 3-a săpt

# Manifestări

- Raluri umede 43,3%
- HIPOXEMIA
- Valorile CO<sub>2</sub> – normale sau chiar scăzute
- Infiltrații cu consolidare la Ro-grafie 100%
- leziuni multiple de organe

# Prognostic Factors for Severe Acute Respiratory Syndrome: A Clinical Analysis of 165 Cases

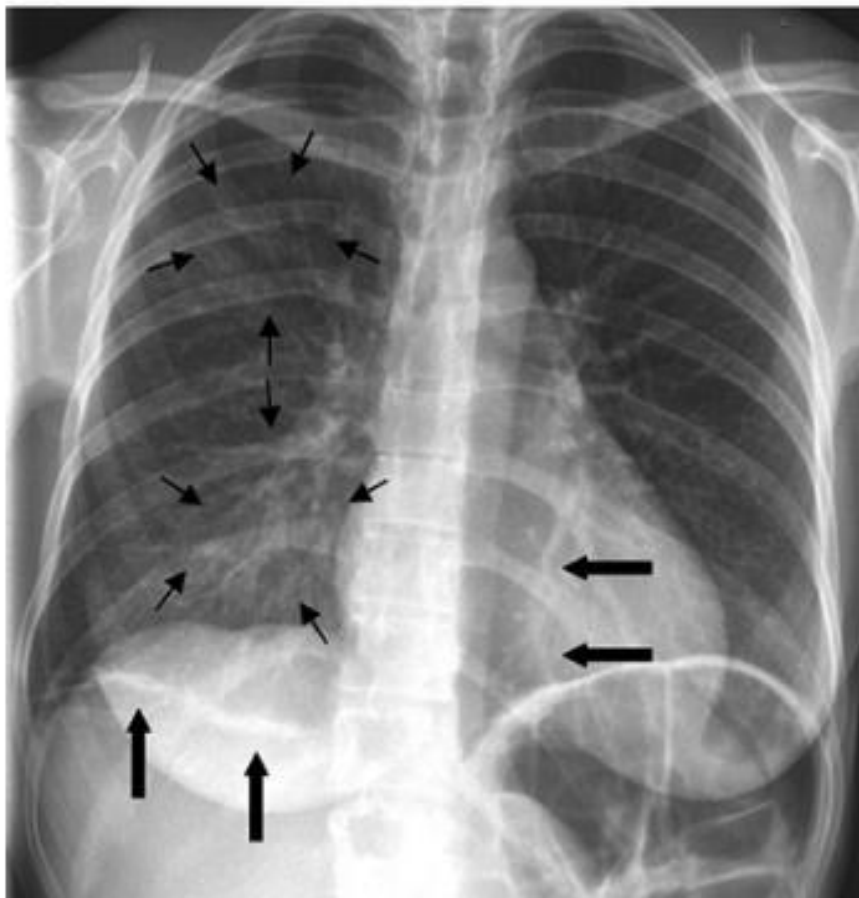
Zhengsheng Zou,<sup>1</sup> Yongping Yang,<sup>1</sup> Jumei Chen,<sup>1</sup> Shaojie Xin,<sup>1</sup> Wei Zhang,<sup>1</sup> Xianzhi Zhou,<sup>1</sup> Yuanli Mao,<sup>1</sup> Liangping Hu,<sup>2</sup> Daojian Liu,<sup>1</sup> Binxia Chang,<sup>1</sup> Weihua Chang,<sup>1</sup> Yanping Liu,<sup>1</sup> Xuemei Ma,<sup>1</sup> Yedong Wang,<sup>1</sup> and Xiqing Liu<sup>1</sup>

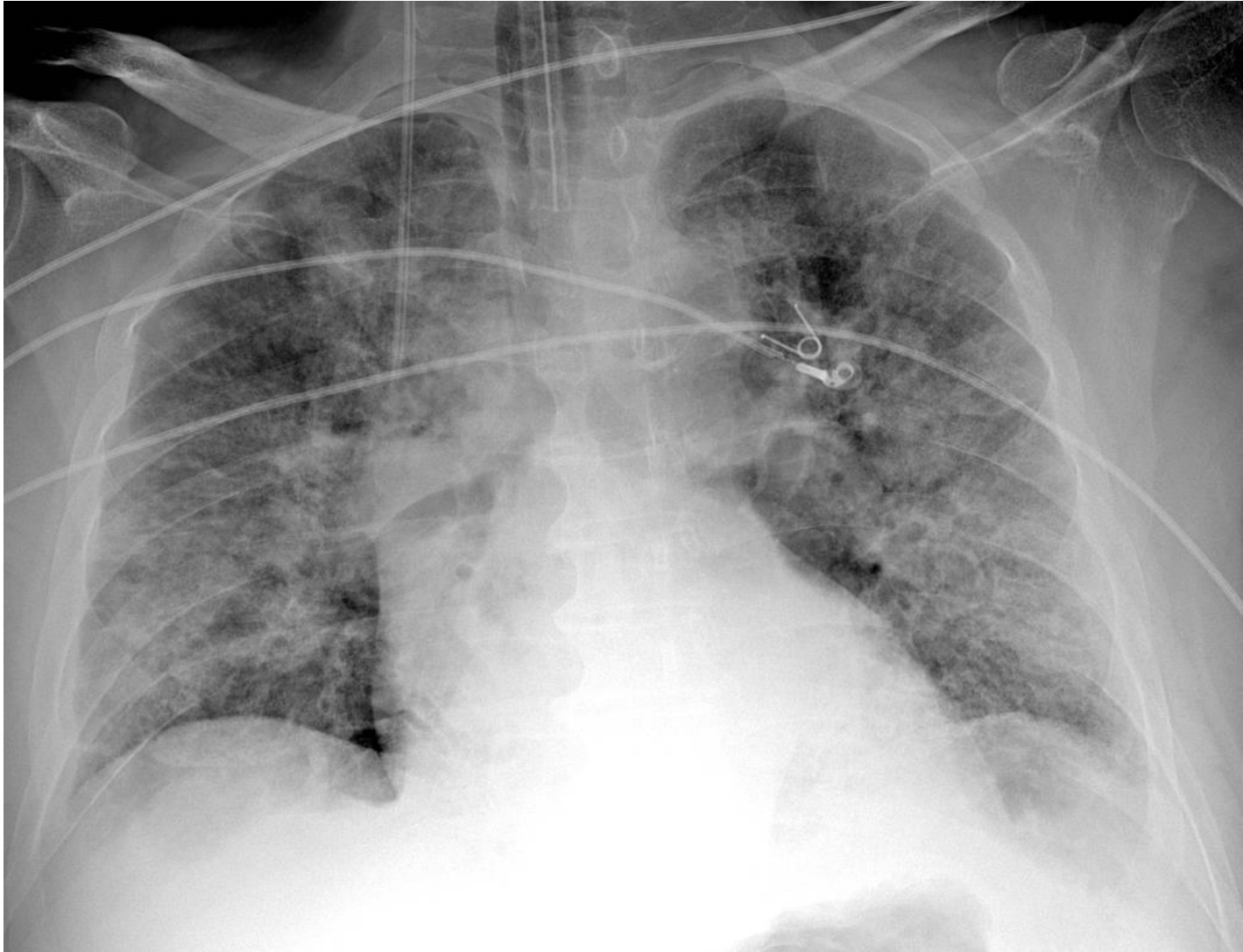
<sup>1</sup>Department of Infectious Diseases, Beijing Infectious Disease Institute of People's Liberation Army, and <sup>2</sup>Institute of Intelligence, Academy of Military Medical Sciences, Beijing, China

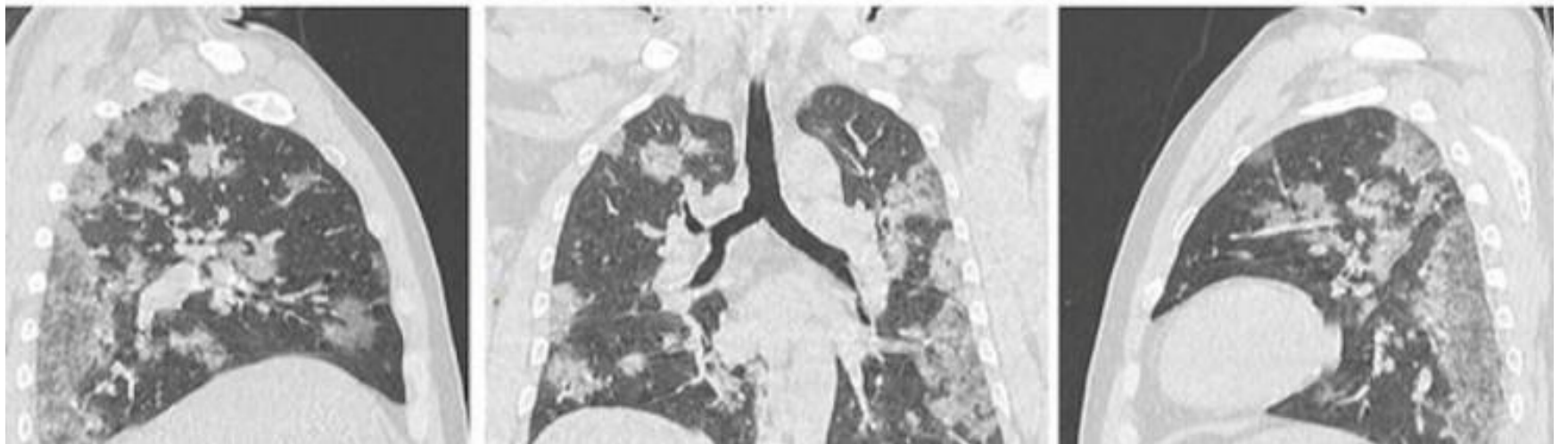
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**B.** Criteria for severe SARS promulgated by the Chinese Ministry of Health: a case is confirmed if  $\geq 1$  of the following conditions is met:

1. Breathing difficulty (respiratory rate,  $>30$  breaths/min).
2. Hypoxemia (arterial  $P_{aO_2}$  of  $<70$  mm Hg or  $SpO_2$  of  $<93\%$  under the condition of oxygen inhalation at 3–5 L/min) or diagnosis of acute lung injury or acute respiratory distress syndrome.
3. Multilobe lesions and range of the lesions to  $>1/3$  of lung field or lesion progression within 48 h to  $>50\%$  of lung field noted on a chest radiograph.
4. Shock or multiorgan dysfunction syndrome.
5. History of severe diseases before SARS, complications of other infections, or age of  $>50$  years.

**A****B**



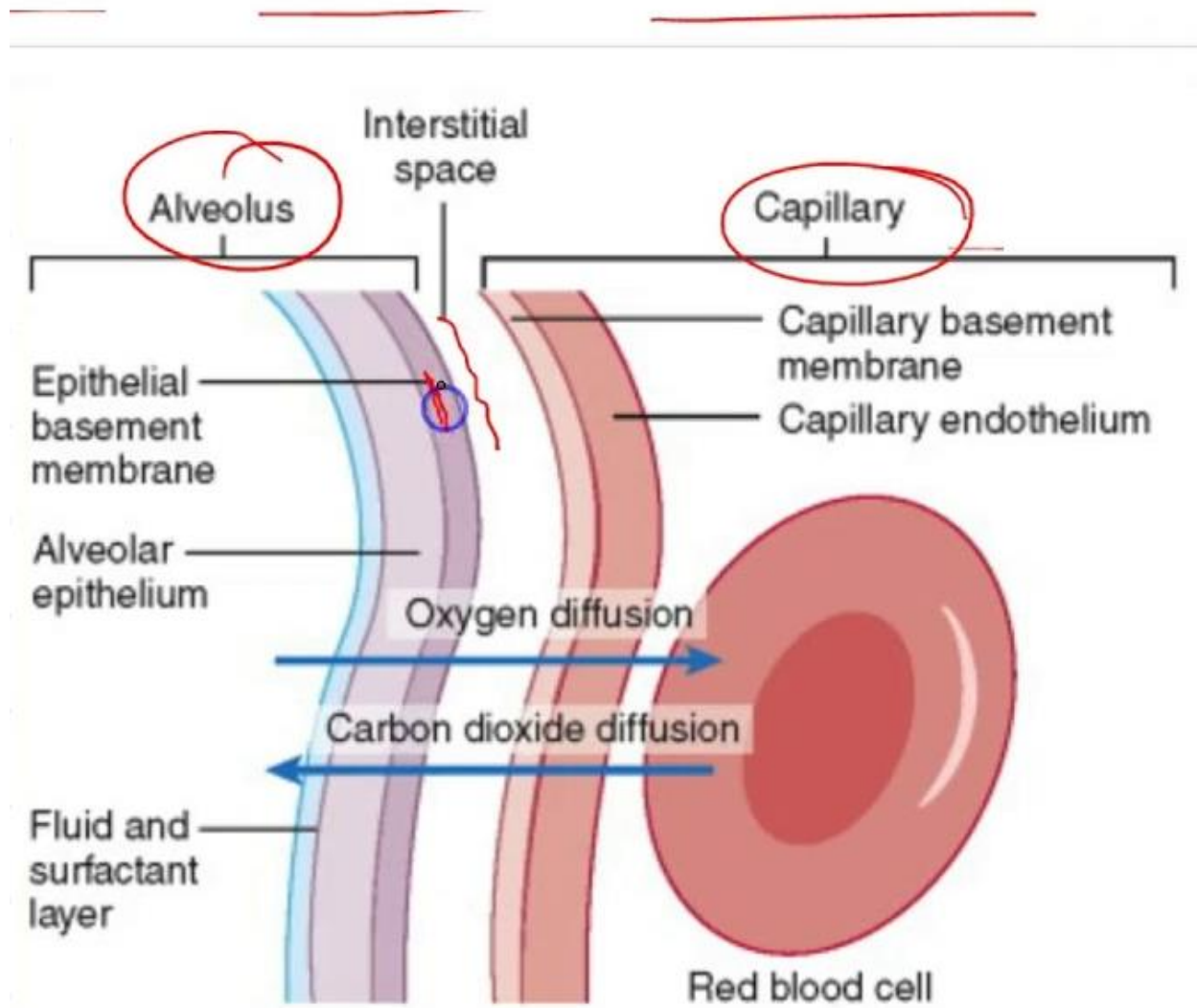




HIPOXEMIA????



1. Scăderea nivelului de O<sub>2</sub> în sânge
2. Scăderea nivelului de O<sub>2</sub> la nivel de țesut

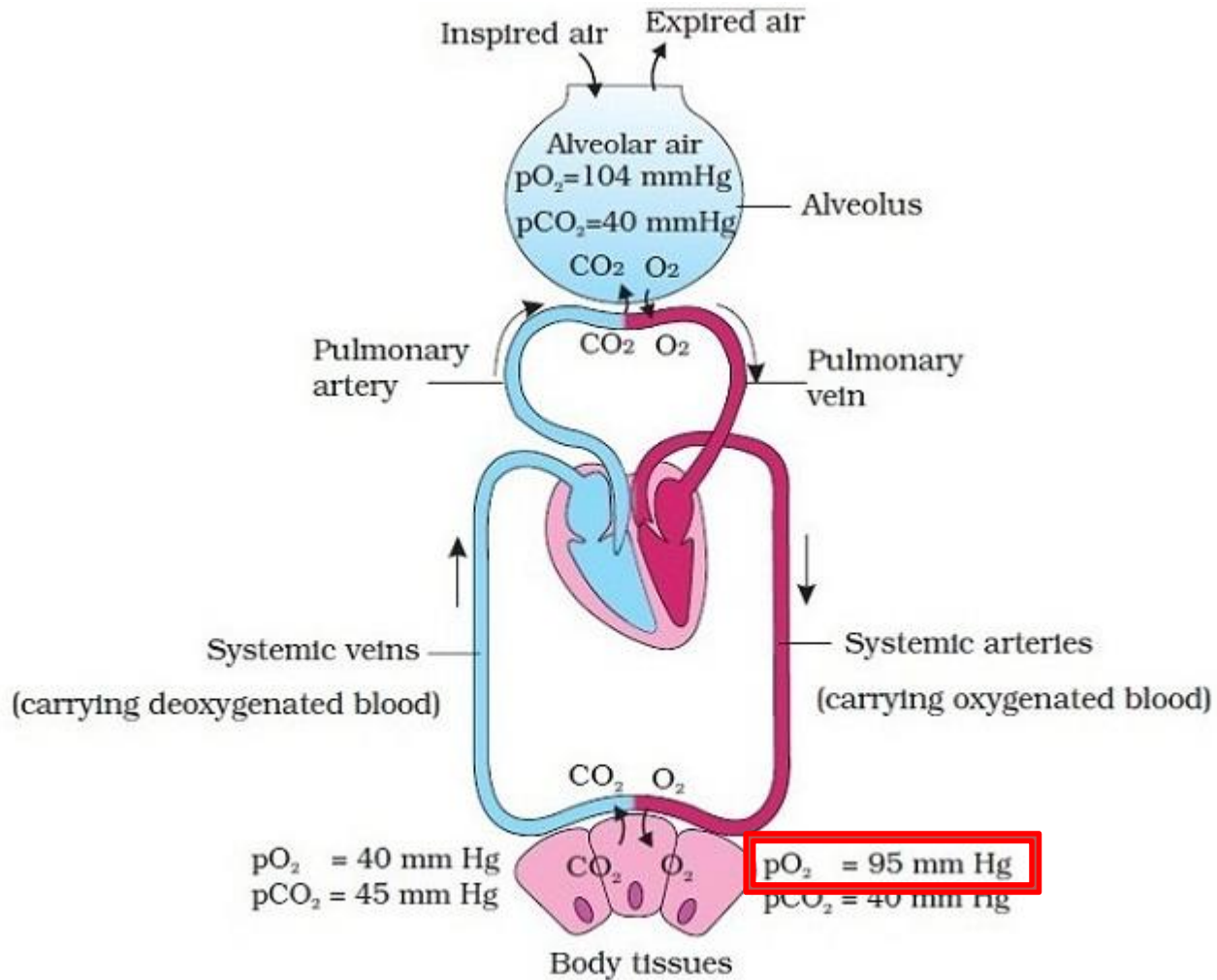


<https://www.youtube.com/watch?v=mZvzI8KH6il>

**HIPOXEMIA = low O<sub>2</sub>, low SpO<sub>2</sub>**

Low O<sub>2</sub> ???

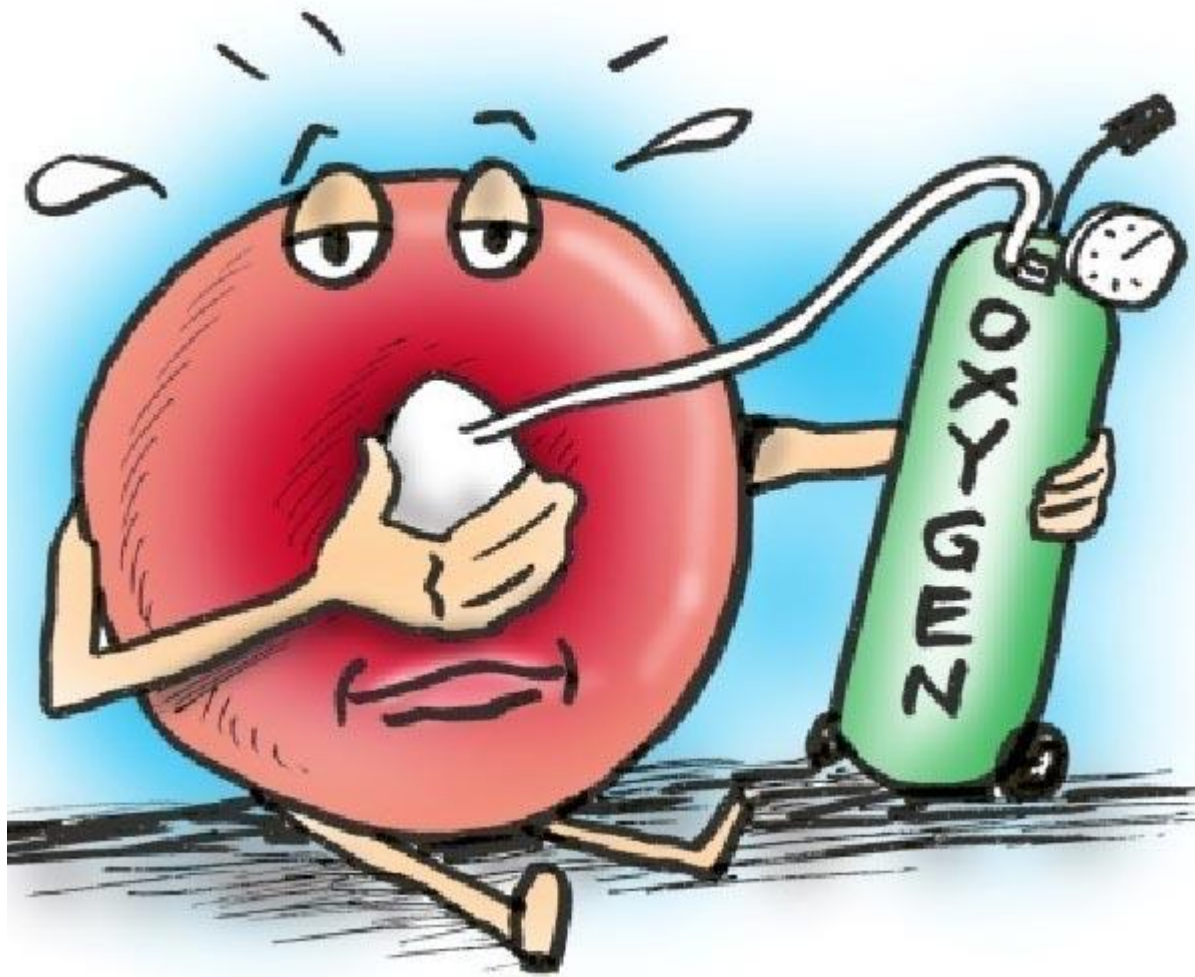
Pat = 760 mmHg  
FiO<sub>2</sub> = 21% (0,21)  
PO<sub>2</sub> în atmosferă  
760 mmHg x 0,21= **160 mmHg**



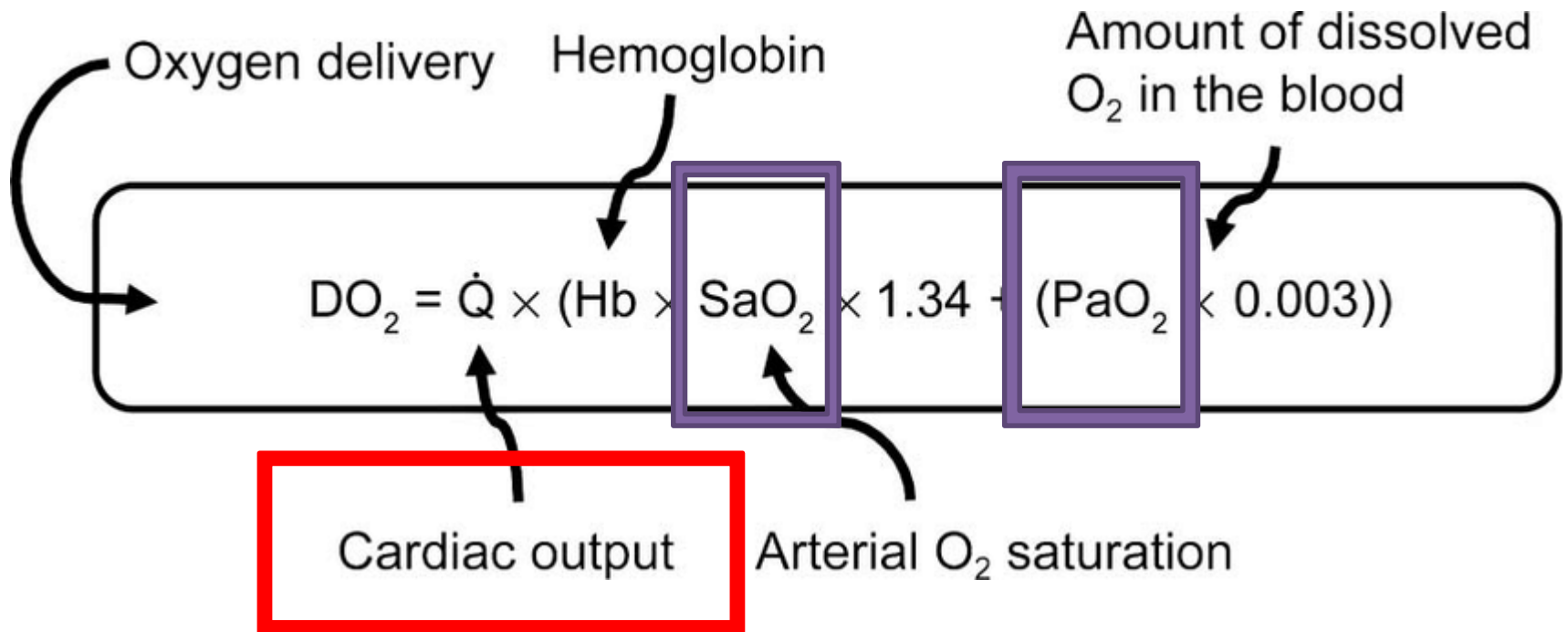
PaO<sub>2</sub><70/60 mmHg

=

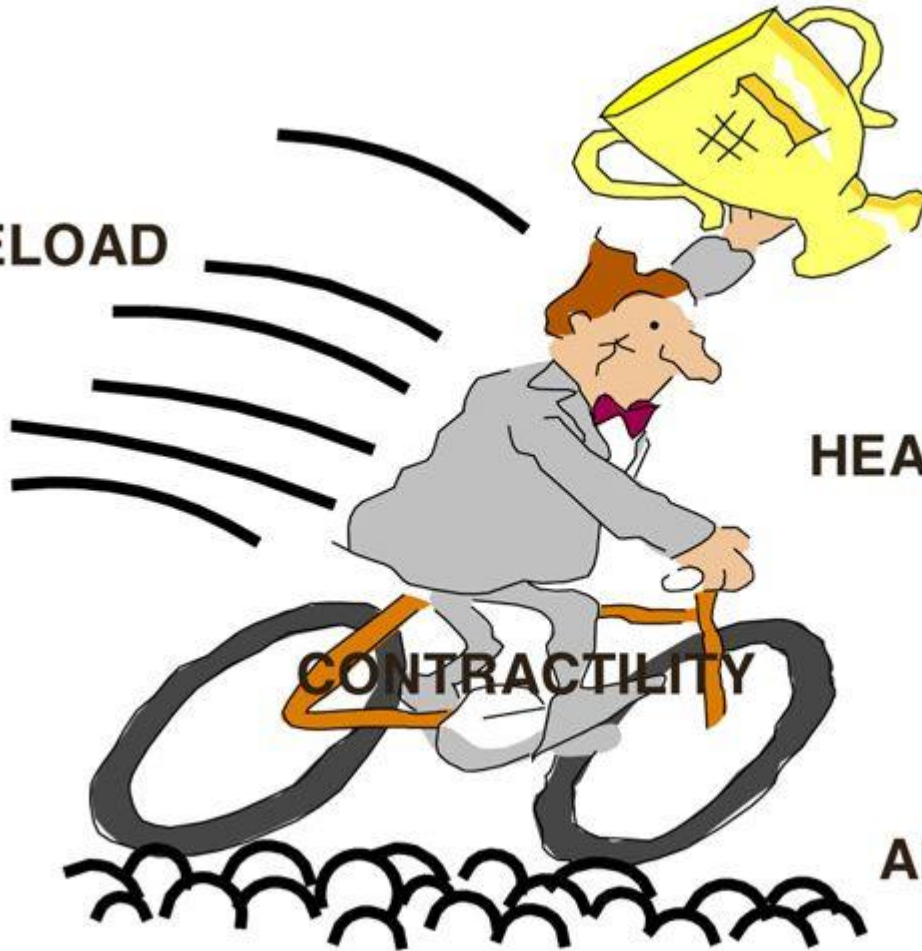
SpO<sub>2</sub><92/90%







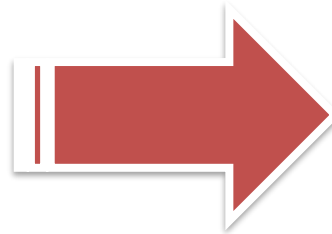
**PRELOAD**



**HEART RATE**

**AFTERLOAD**

HIPOXEMIA

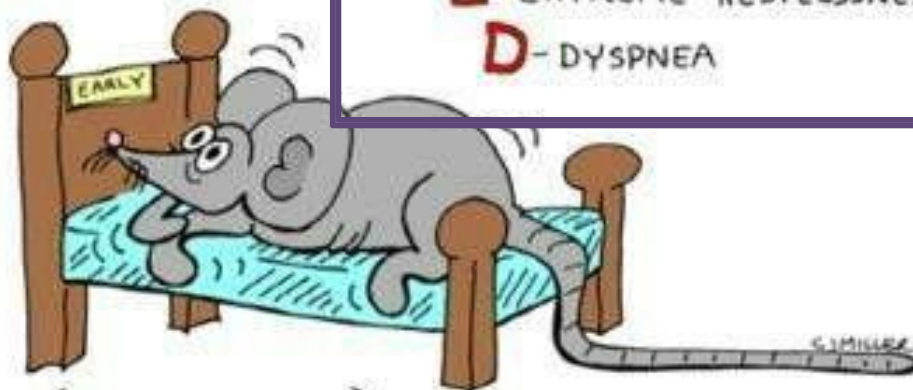


HIPOXIE

# SYMPTOMS OF HYPOXIA

EARLY → **R** - RESTLESSNESS  
**A** - ANXIETY  
**T** - TACHYCARDIA/TACHYPNEA

is LATE → **B** - BRADYCARDIA  
**E** - EXTREME RESTLESSNESS  
**D** - DYSPNEA



(IN PEDIATRICS) → **F** - FEEDING DIFFICULTY  
**I** - INSPIRATORY STRIDOR  
**N** - NARES FLARE  
**E** - EXPIRATORY GRUNTING  
**S** - STERNAL RETRACTIONS

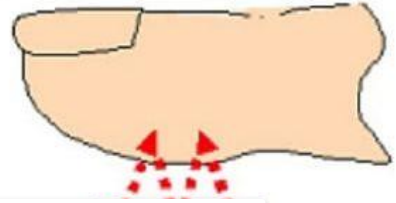
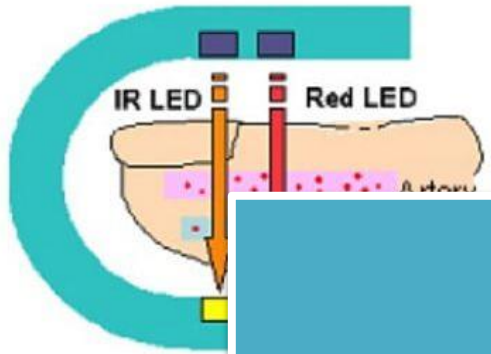
Cum putem sa stim ca pacientul este  
hipoxemic ???

# Pulsoximetru

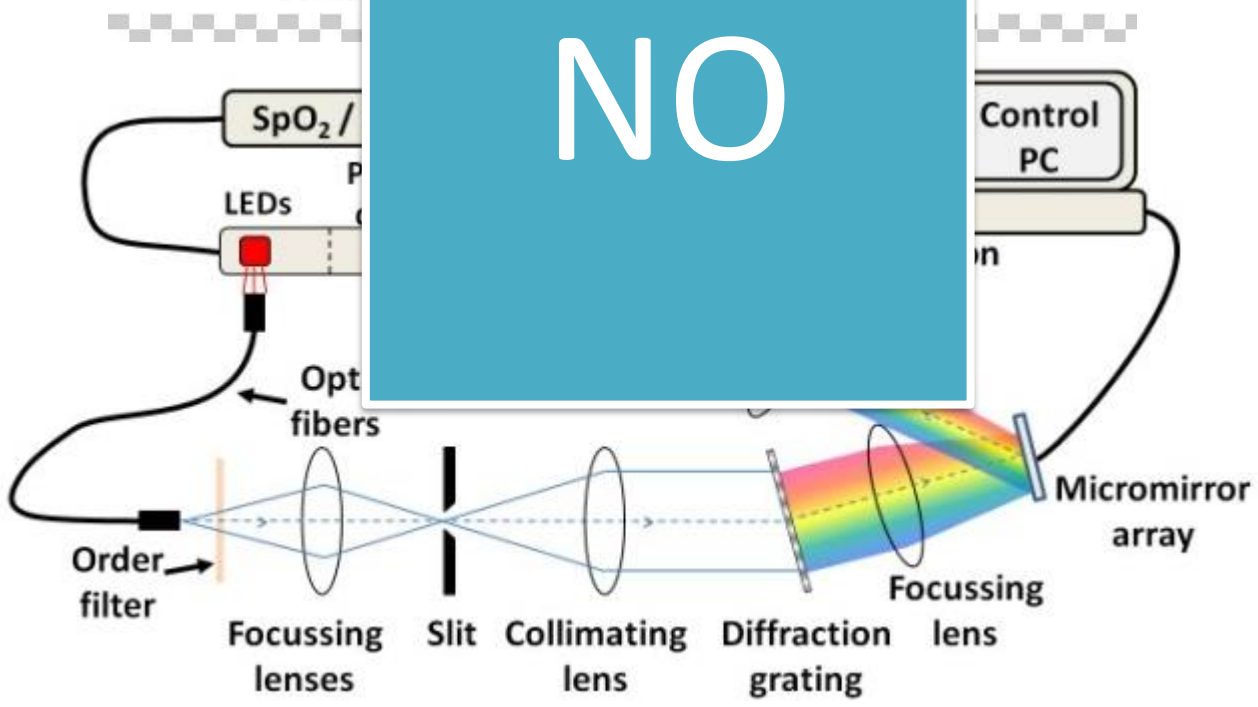


Transmission type(currently the mainstream)

Reflective type

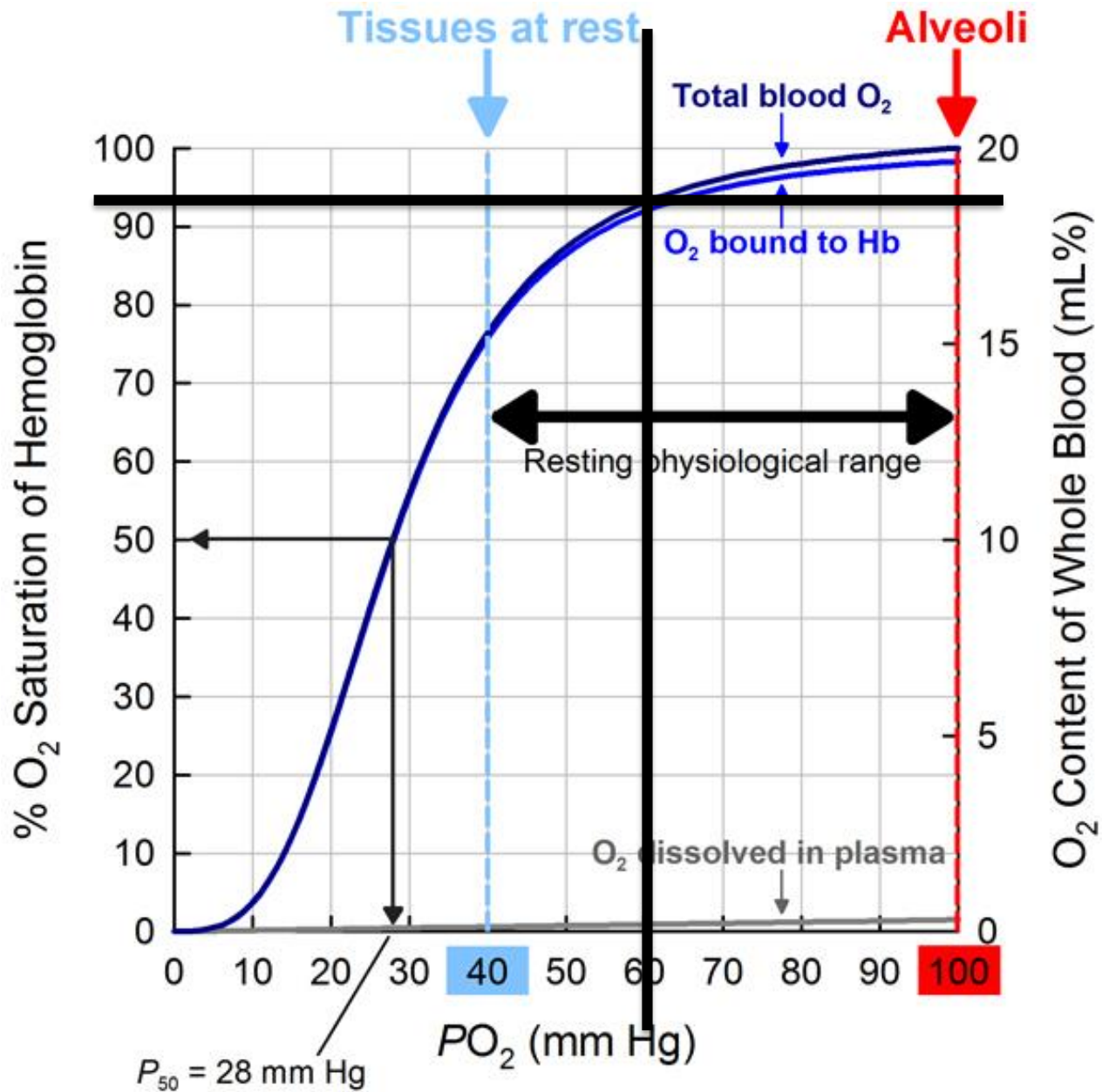


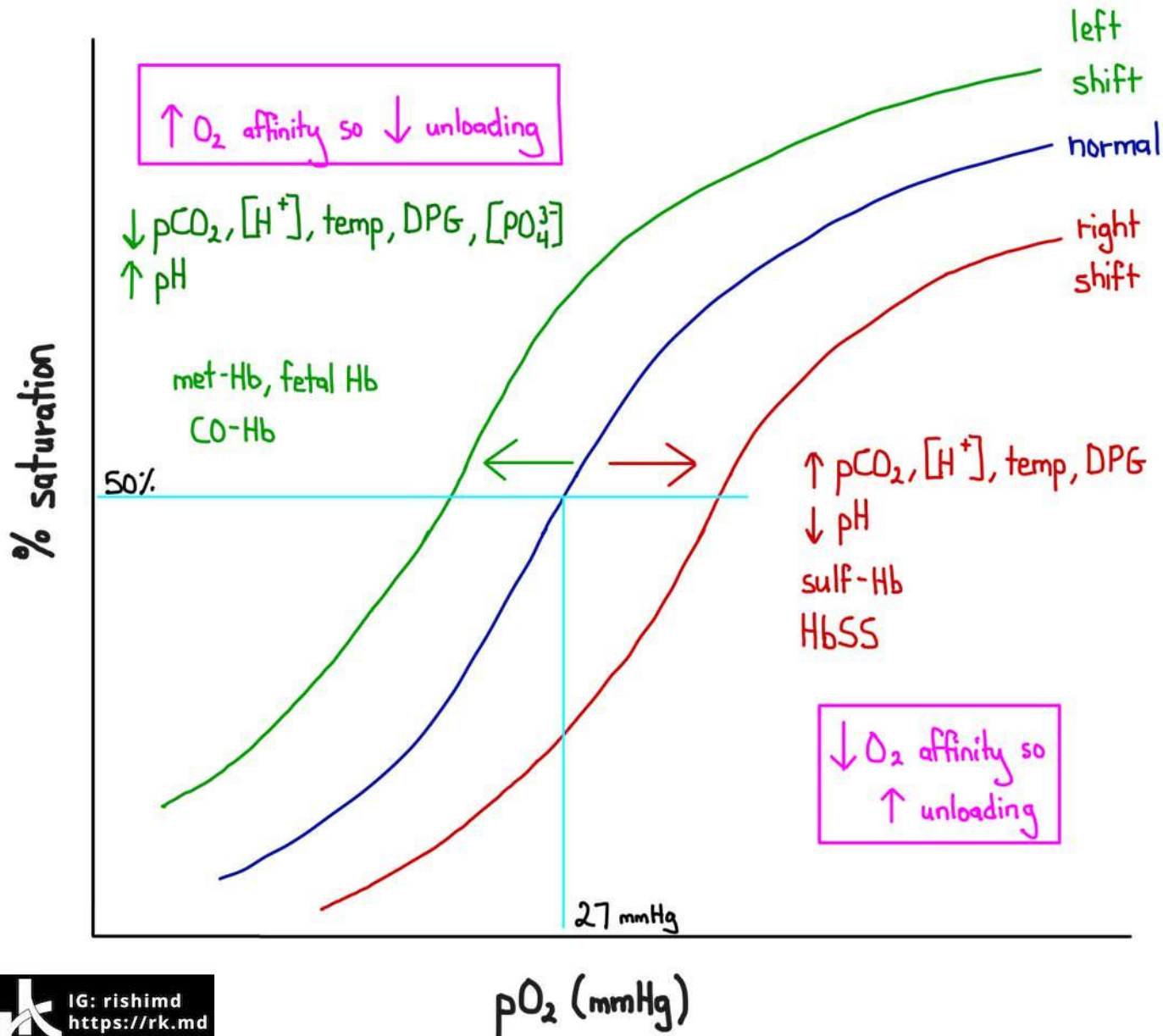
NO

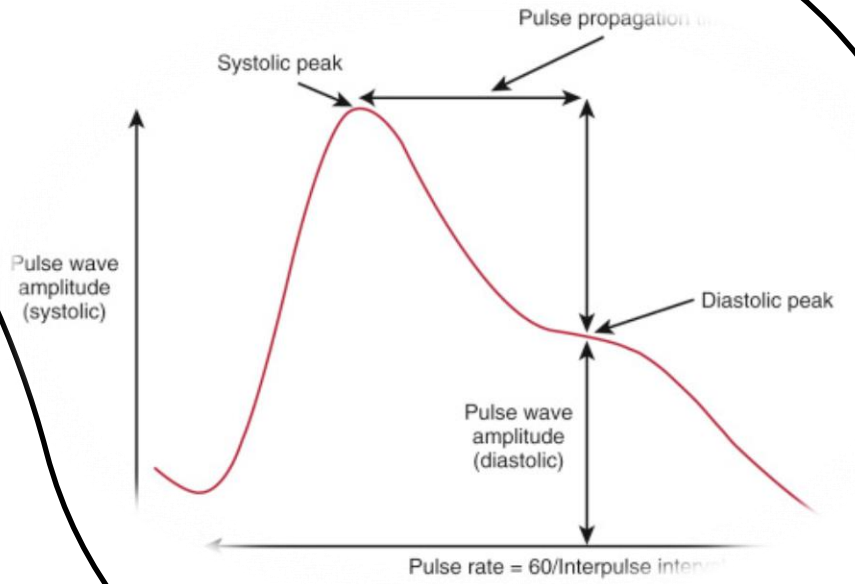


Valorile normale pentru SpO<sub>2</sub>  
94%-98%









## Pulse Oximeter Waveform



Normal Signal



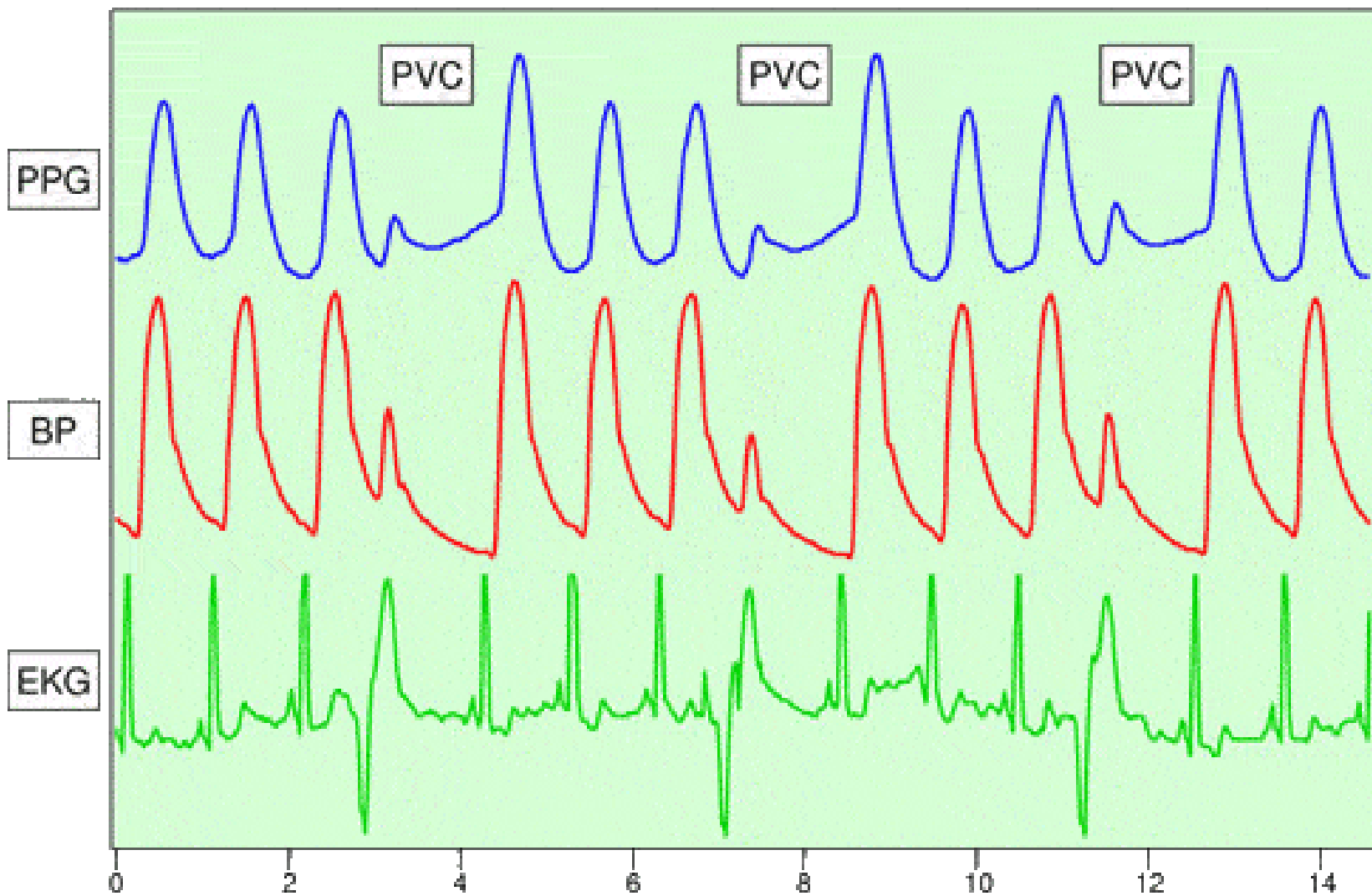
Low Perfusion



Noise Artifact



Motion Artifact



Bed 3

Doe, John

Adult

10:53

3 Waves



II



Pleth

HR

120  
50

76

Pulse

79

SpO<sub>2</sub>

100  
90

84

Temp

37.3  
40.1  
36.9

Resp



RR

30  
8

18



NBP

Auto 10 min

06:40 NBP mmHg

Sys.

160  
90

121/82 (89)

10:30	122/81	(90)
10:40	121/81	(89)
10:48	120/82	(90)
10:50	121/80	(89)
10:51	122/80	(89)

Bed 3

Doe, John

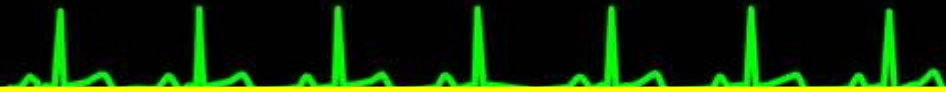
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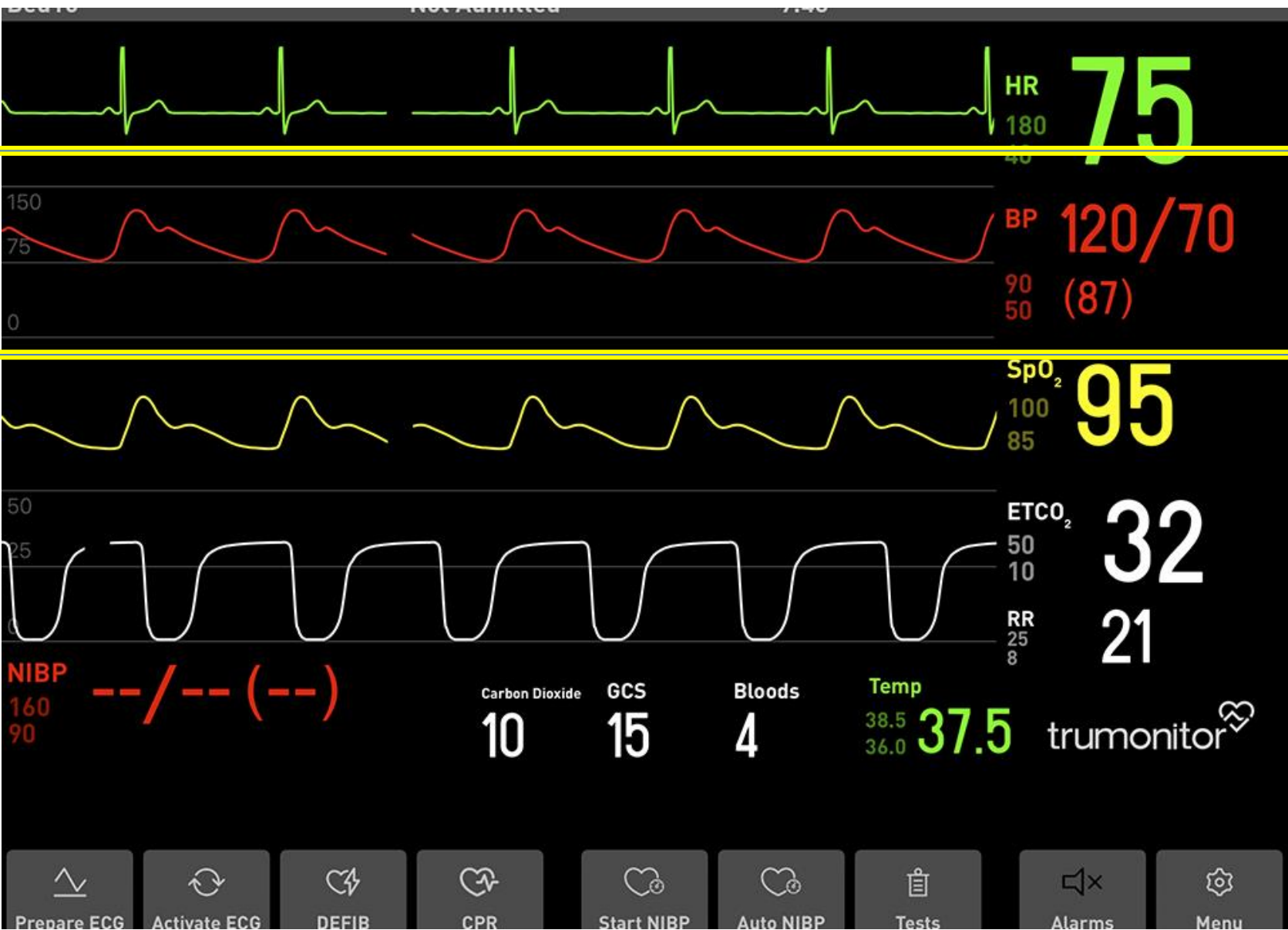
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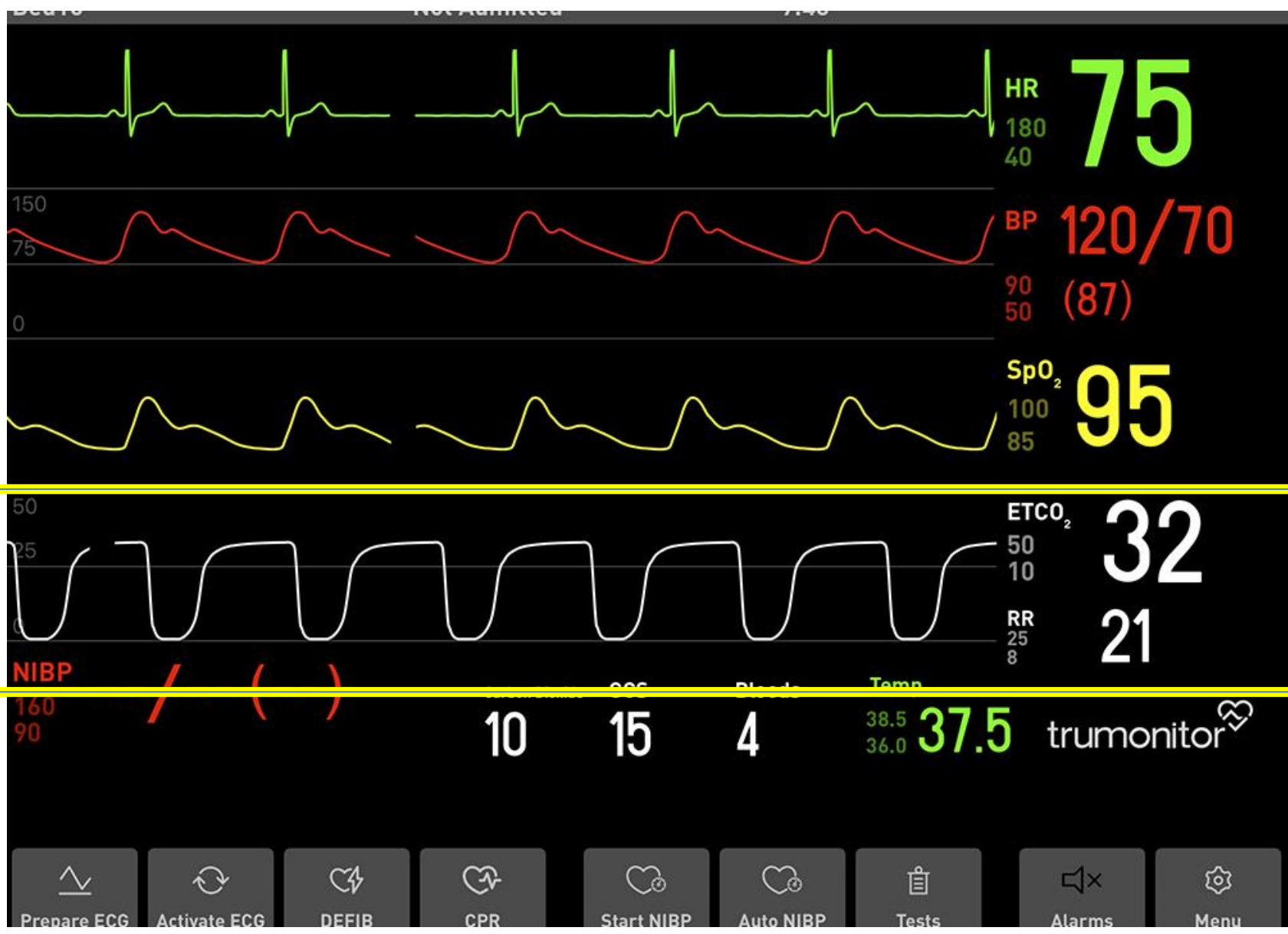
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# Complexitatea monitorizării în ICU



## Mesaje de luat acasa

- SARS CoV2 este un virus nou
- SARS frecvent printre pacientii COVID 19
- HIPOXEMIA
- SpO2 ori de cate ori posibil
- Monitorizare complexa extinsa