



มหาวิทยาลัยราชภัฏนครปฐม



Adult and Geriatric Nursing Practicum 2

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Acute Respiratory Failure

Respiratory failure

Type 1 (Hypoxemic respiratory failure)

PaO₂ is low
(PaO₂ < 50 mmHg)

CO₂ is not elevated
(PaCO₂ < 60 mmHg)

See Sect. 1.25

Type 2 (Hypercapnic respiratory failure)

PaO₂ is low
(PaO₂ < 50 mmHg)

CO₂ is elevated
(PaCO₂ > 60 mmHg)

See Sect. 1.26

Type 3 (Per-operative respiratory failure)

FRC falls below
closing volume as a
result of atelectasis.

Contributing factors:

Supine posture

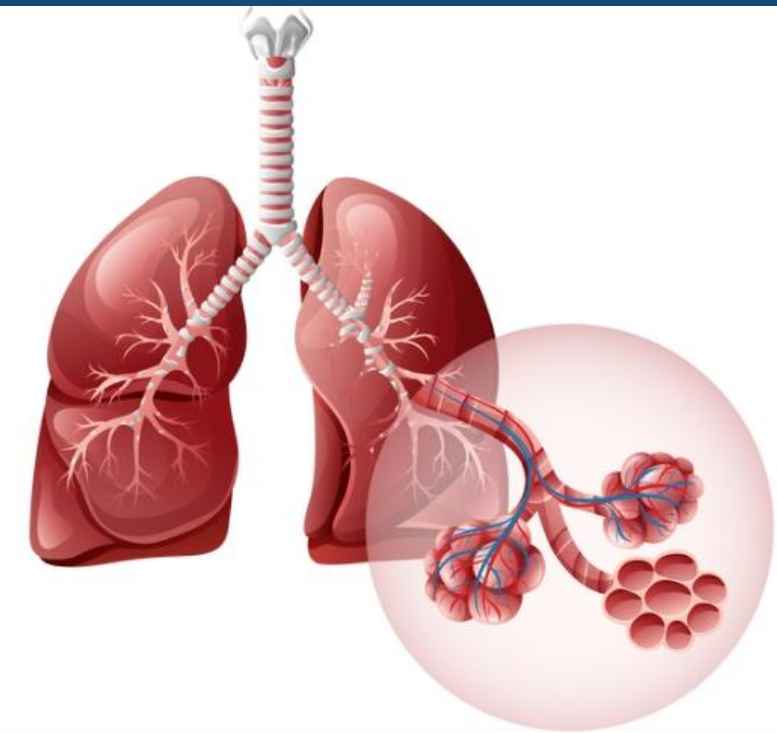
General anesthesia

Depressed cough
reflex

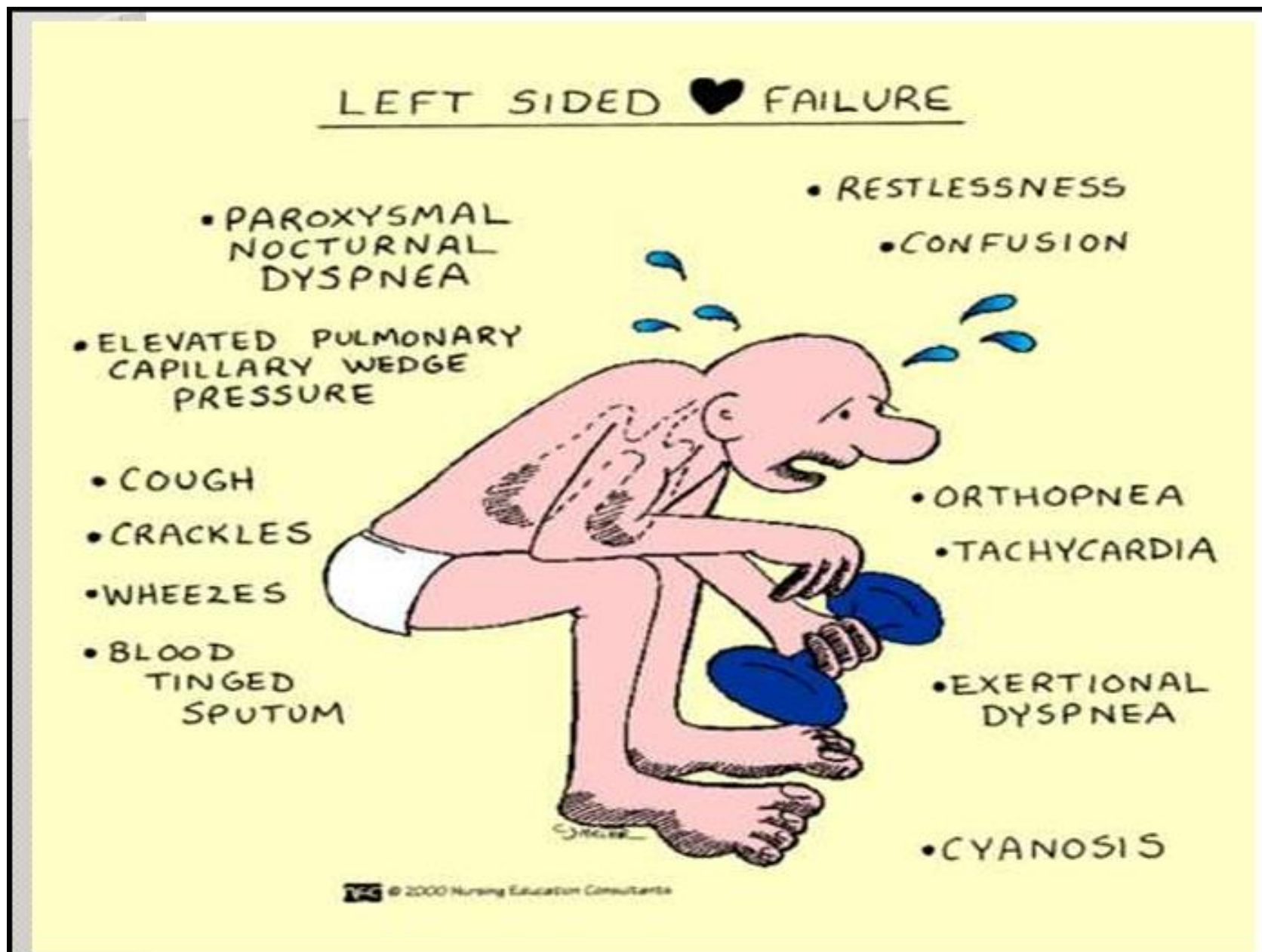
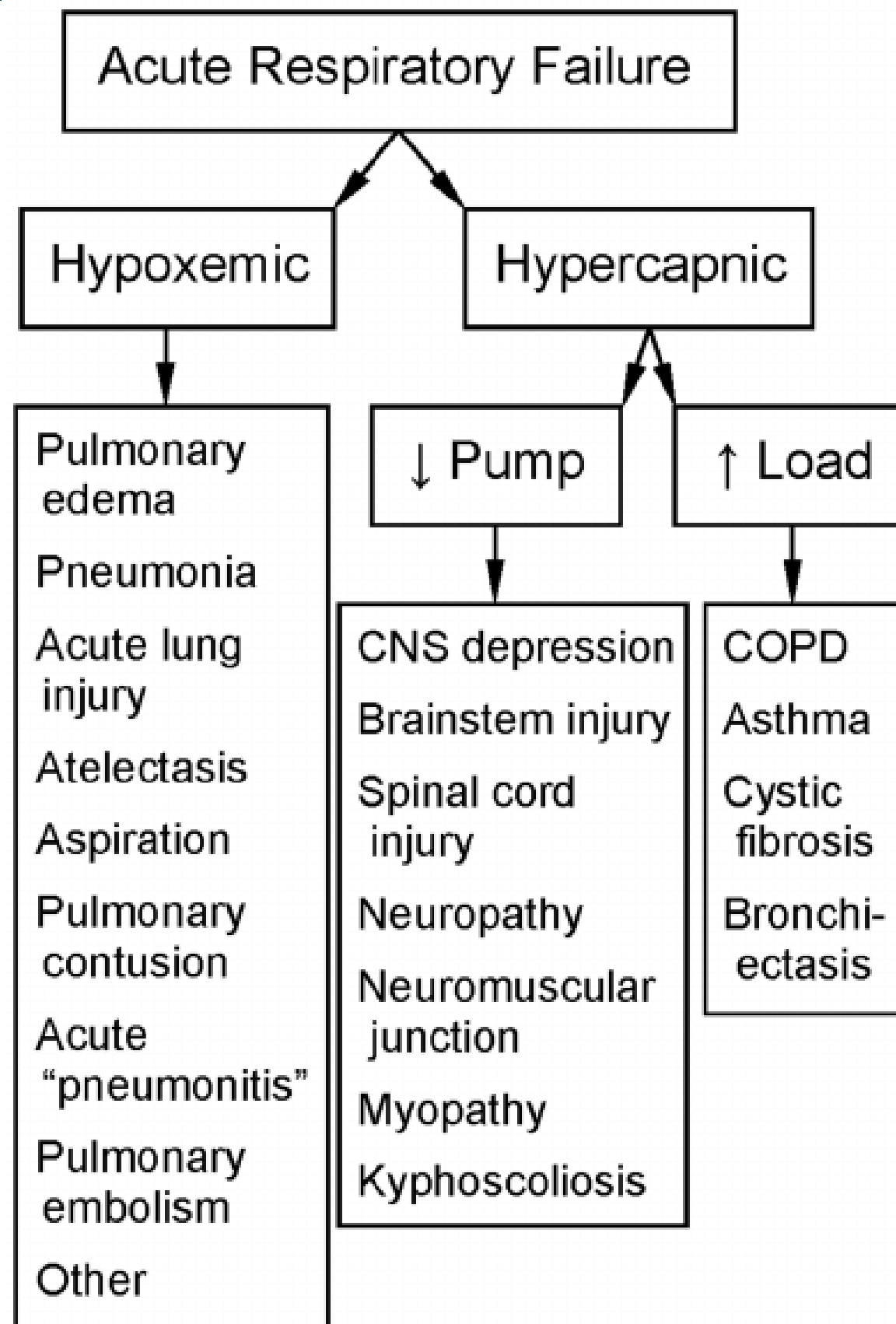
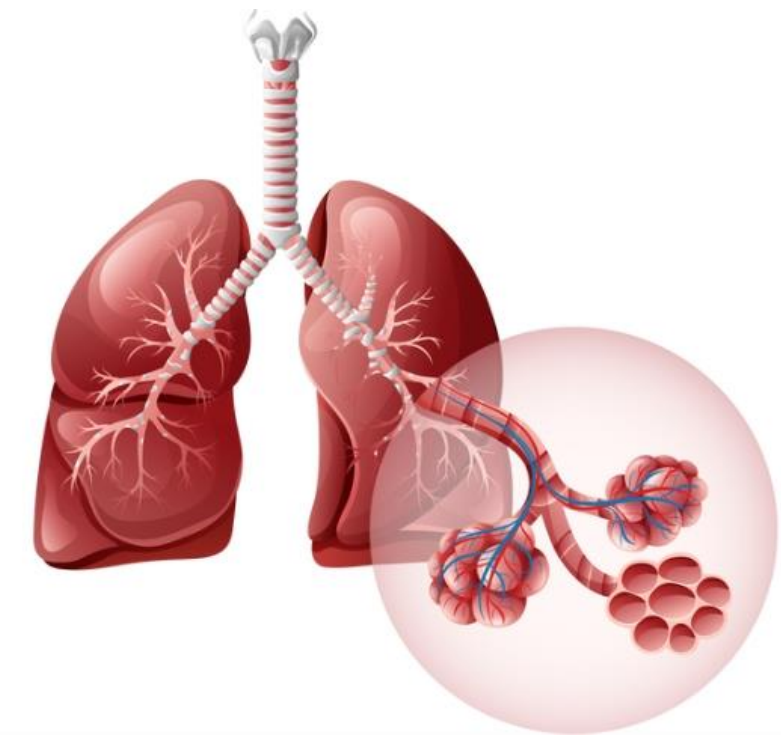
Splinting due to pain

Type 4 (Shock with hypo perfusion)

The proportion of the
cardiac output to the
respiratory muscles
rises by as much as
ten-fold when the
work of breathing is
high; this can
seriously impair
coronary perfusion
during shock.

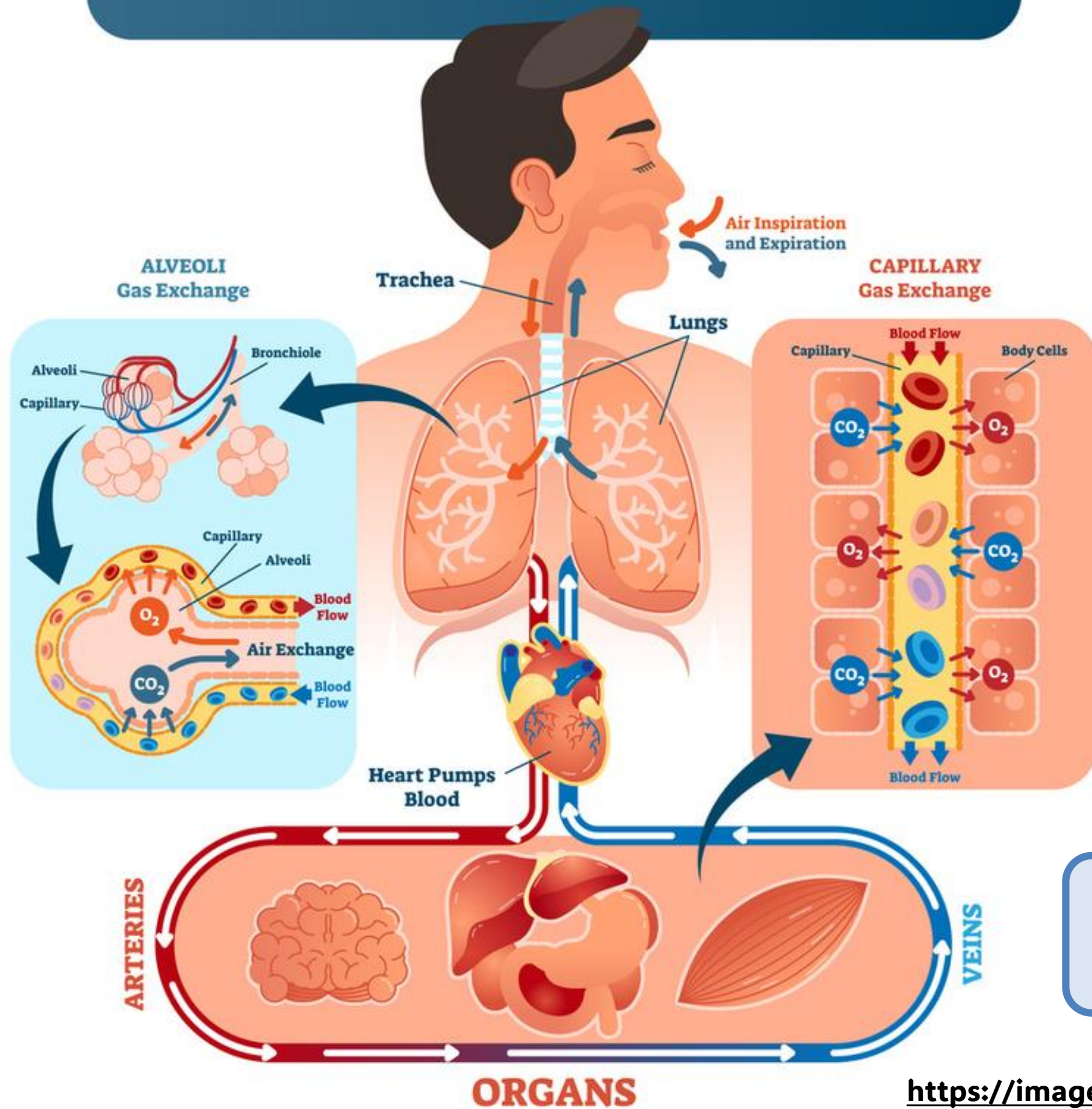


Acute Respiratory Failure



(Chahine and Alvey, 2023)

HUMAN GAS EXCHANGE



ventilation

diffusion

perfusion

Arterial Blood Gas (ABG)



PH acidosis < 7.4 > alkalosis

PH	7.35 - 7.45
PaCO ₂	35 - 45
HCO ₃	22 - 26

← Respiratory

← Metabolic

R Respiratory

O Opposite

M Metabolic

E Equal

PH ↑ PCO₂ ↓ Alkalosis

PH ↓ PCO₂ ↑ Acidosis

PH ↑ HCO₃ ↑ Alkalosis

PH ↓ HCO₃ ↓ Acidosis

Classifications

PaO₂ (rule of thumb)

Normal	80-100 mm Hg
Mild hypoxemia	60-80 mm Hg
Moderate hypoxemia	40-60 mm Hg
Severe hypoxemia	<40 mm Hg

<https://images.app.goo.gl/5r8mVuCb5dzXaz4T9>

Uncompensated : CO₂ or HCO₃ normal

Partially Compensated : Nothing is normal

Compensated : PH is normal (7.4 baseline/neutral)

Arterial Blood Gas (ABG)



Ex.



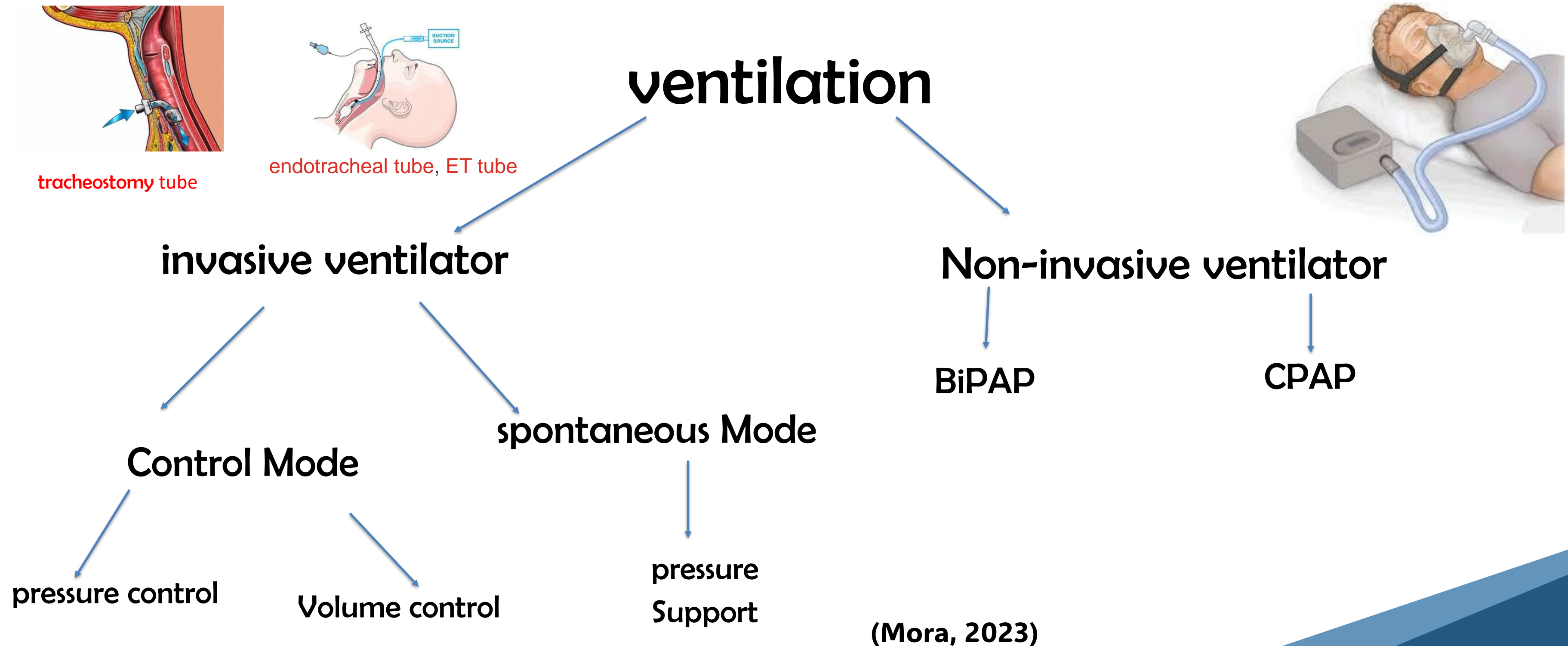
1. pH = 7.29, PCO_2 = 50 mmHg, HCO_3^- = 22 mmol/L, PO₂ 78
2. pH = 7.56, PCO_2 = 20 mmHg, HCO_3^- = 20 mmol/L, PO₂ 65
3. pH = 7.36, PCO_2 = 50 mmHg, HCO_3^- = 28 mmol/L, PO₂ 92

Arterial Blood Gas (ABG)



		pH	pCO ₂	HCO ₃
Respiratory alkalosis	uncompensated	↑	↓	N
	Partially compensated	↑	↓	↓
	Fully compensated	N	↓	↓
Respiratory acidosis	uncompensated	↓	↑	N
	Partially compensated	↓	↑	↑
	Fully compensated	N	↑	↑
Metabolic alkalosis	uncompensated	↑	N	↑
	Partially compensated	↑	↑	↑
	Fully compensated	N	↑	↑
Metabolic acidosis	uncompensated	↓	N	↓
	Partially compensated	↓	↓	↓
	Fully compensated	N	↓	↓

Ventilatory support





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