

# ***Insufficienza respiratoria acuta***

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# Insufficienza respiratoria

Insufficienza polmonare

Insufficienza scambi gassosi  
Manifestata dall'ipossia

Insufficienza di pompa

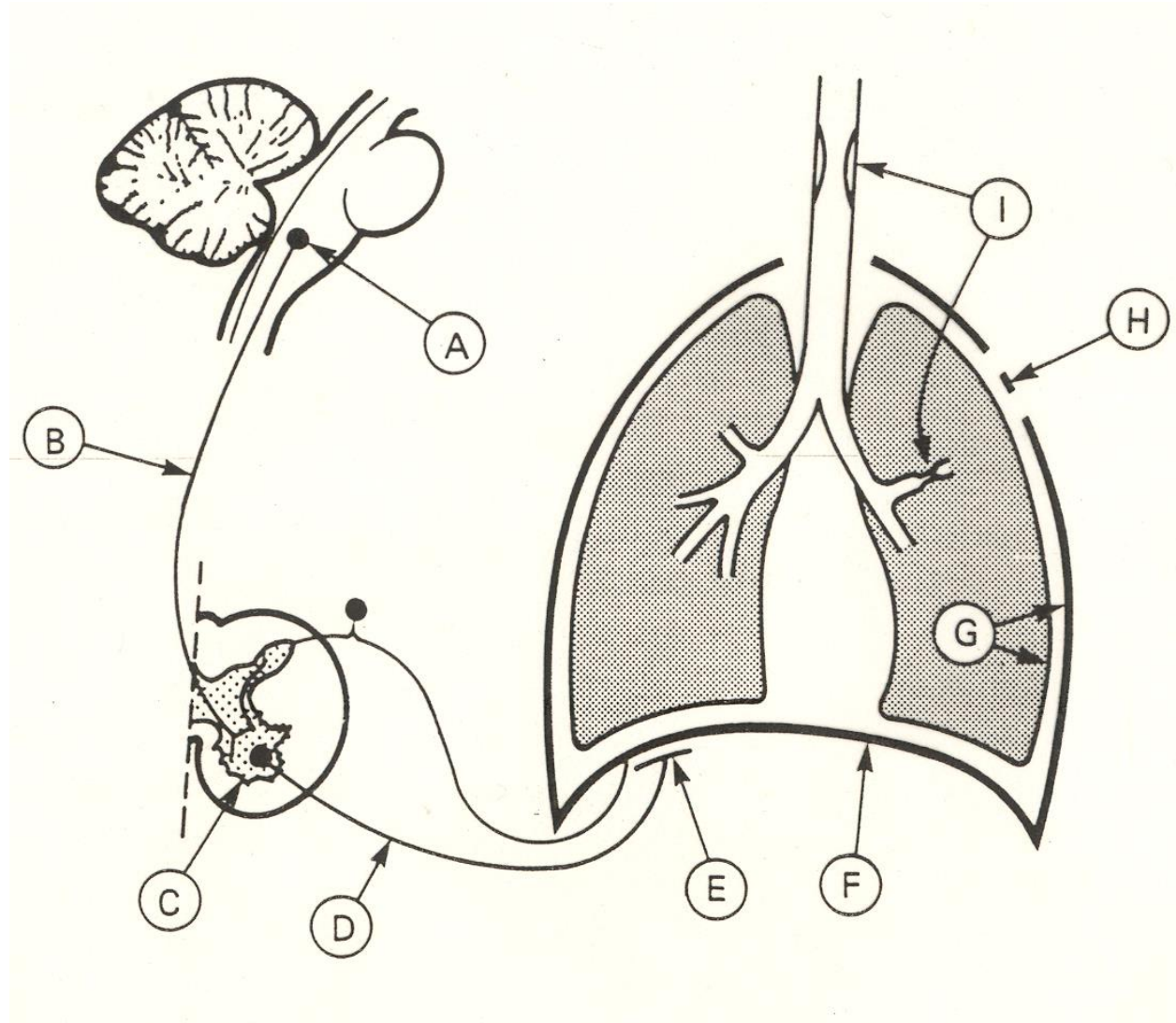
Insufficienza ventilatoria  
Manifestata dall'ipercapnia

Depressione  
centrale

Difetto  
meccanico

Fatica

# Cause di insufficienza respiratoria



# Insufficienza respiratoria acuta

**Capacità**

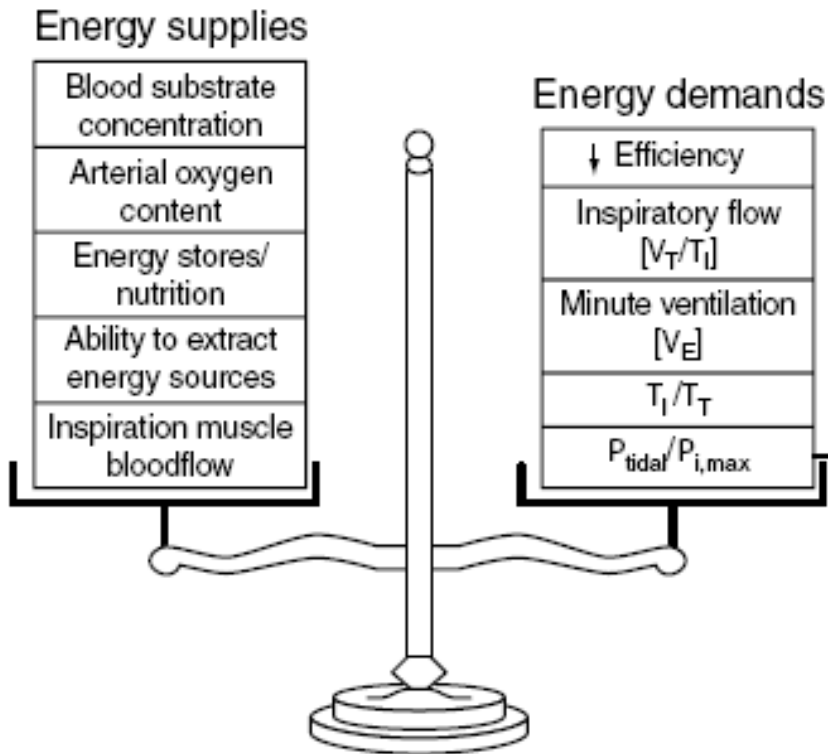
Muscolar  
Performance

**Carico**

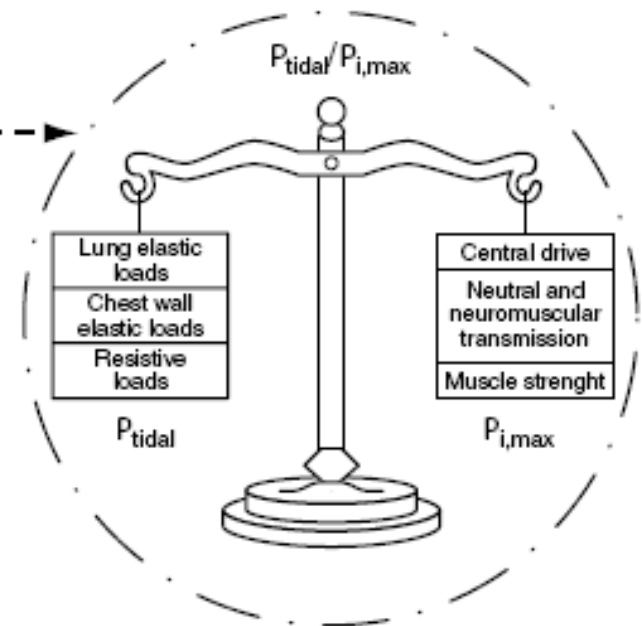
Work of breathing  
Ventilatory demand  
Compliance  
Resistance  
PEEPi

# Insufficienza respiratoria acuta

A



B

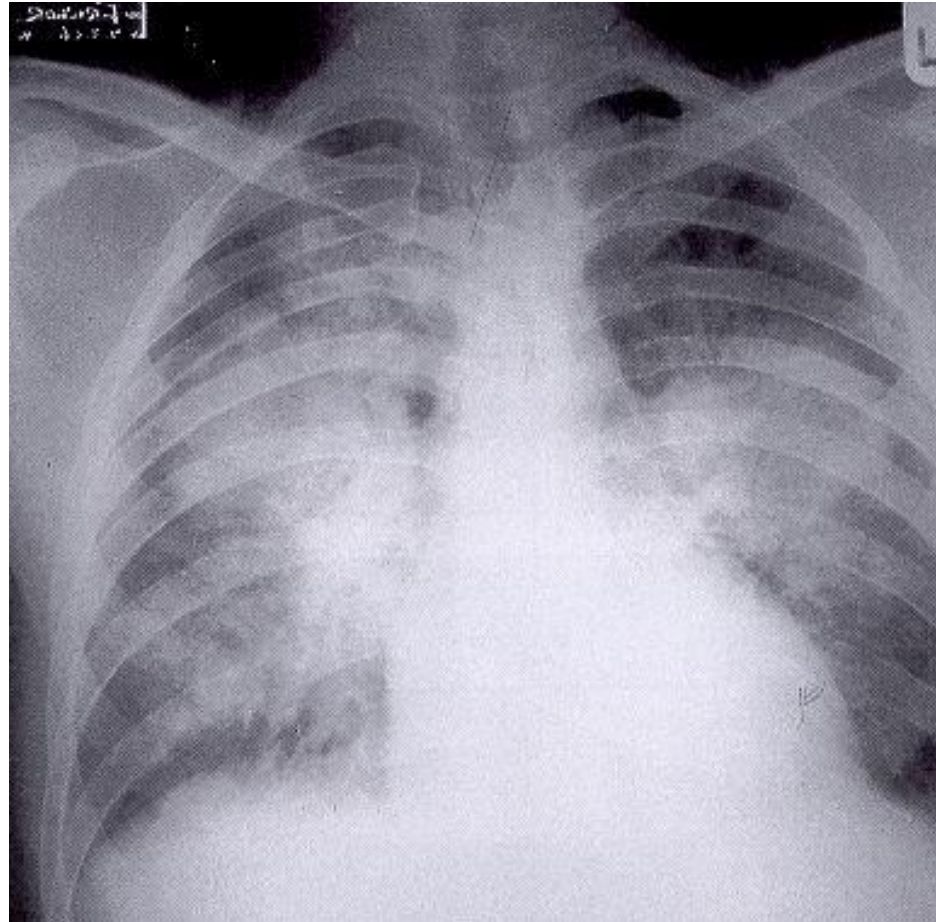


# GRAVITA'?

## RAPPORTO TRA CARICO E CAPACITA'

- ✓ **SENSORIO**
- ✓ FREQUANZA RESPIRATORIA  $\geq 30$  atti/min
- ✓ IPOSSIEMIA
- ✓ **IPERCAPNIA**
- ✓ **ALTRE COMORBIDITA'**

**E' più grave un EPA normocapnico o un EPA ipercapnico???????**



# Diaphragm Fatigue and the Strategy of Breathing in COPD\*

A. Grassino, M.D.; F. Bellemare, M.D.; and D. Laporta, M.D.

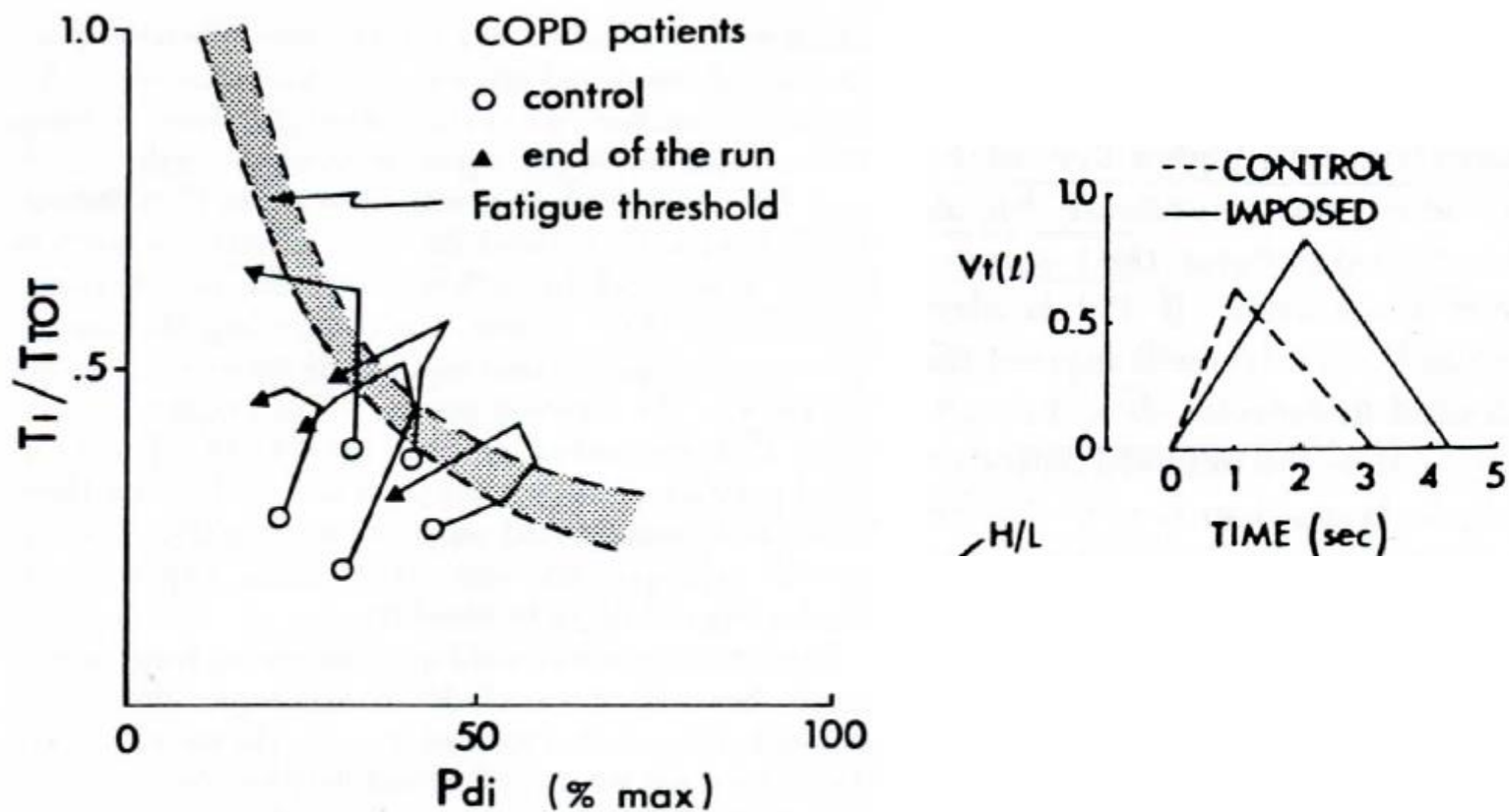


FIGURE 4. Axes as in Figure 2. Open circles indicate resting breathing pattern in 5 COPD patients. The imposed pattern was held at the highest  $T_{Tdi}$ . The arrow indicates the return to their resting pattern as soon as the imposed pattern was discontinued.



# Effect of global inspiratory muscle fatigue on ventilatory and respiratory muscle responses to CO<sub>2</sub>

SHENG YAN, PAWEL SLIWINSKI, ALAIN P. GAUTHIER, IOANNIS LICHROS,  
SPIROS ZAKYNTHINOS, AND PETER T. MACKLEM  
*Meakins-Christie Laboratories, McGill University Clinic, Royal Victoria Hospital, Montreal Chest Hospital,  
and the Respiratory Health Network of Centres of Excellence, Montreal, Quebec H2X 2P2, Canada*

*“Subjects with proven muscle fatigue, developed a rapid  
and shallow breathing”*

our subjects must  
have been able to develop much higher  $\Delta P_{es}$  and thus  
much greater  $V_T$ , but they did not. Thus it is possible  
that rapid shallow breathing may not be a manifestation  
of fatigue but a compensatory mechanism to avoid it.

# Riconoscimento che qualche cosa non va

- alterazione del sensorio
- dispnea, tachipnea, alterazione della meccanica – dinamica ventilatoria
- SpO<sub>2</sub>
- alterazione della PA
- tachicardia, aritmia
- contrazione della diuresi
- ↓↑ T°
- alterazione degli esami ematochimici
- ecc.

## Quanto non va ? Valutazione della gravità

- giudizio personale
- scale di gravità

# Segni precoci di allarme

## Modified Early Warning Score

	3	2	1	0	1	2	3
<b>PA sist</b>	<70	71-80	81-100	101-199		>200	
<b>FC</b>		<40	41-50	51-100	101-110	111-129	>130
<b>FR</b>		<9		9-14	15-20	21-29	>=30
<b>T °C</b>		<35		35-38.4		>=38.5	
<b>AVPU</b>				<b>Alert</b>	reagisce	reagisce	Non reagisce
					<b>Voce</b>	<b>Pain</b>	<b>Unresponsive</b>

Cut-off >4

Subbe CP et al Q J Med 2001; 94: 521-526

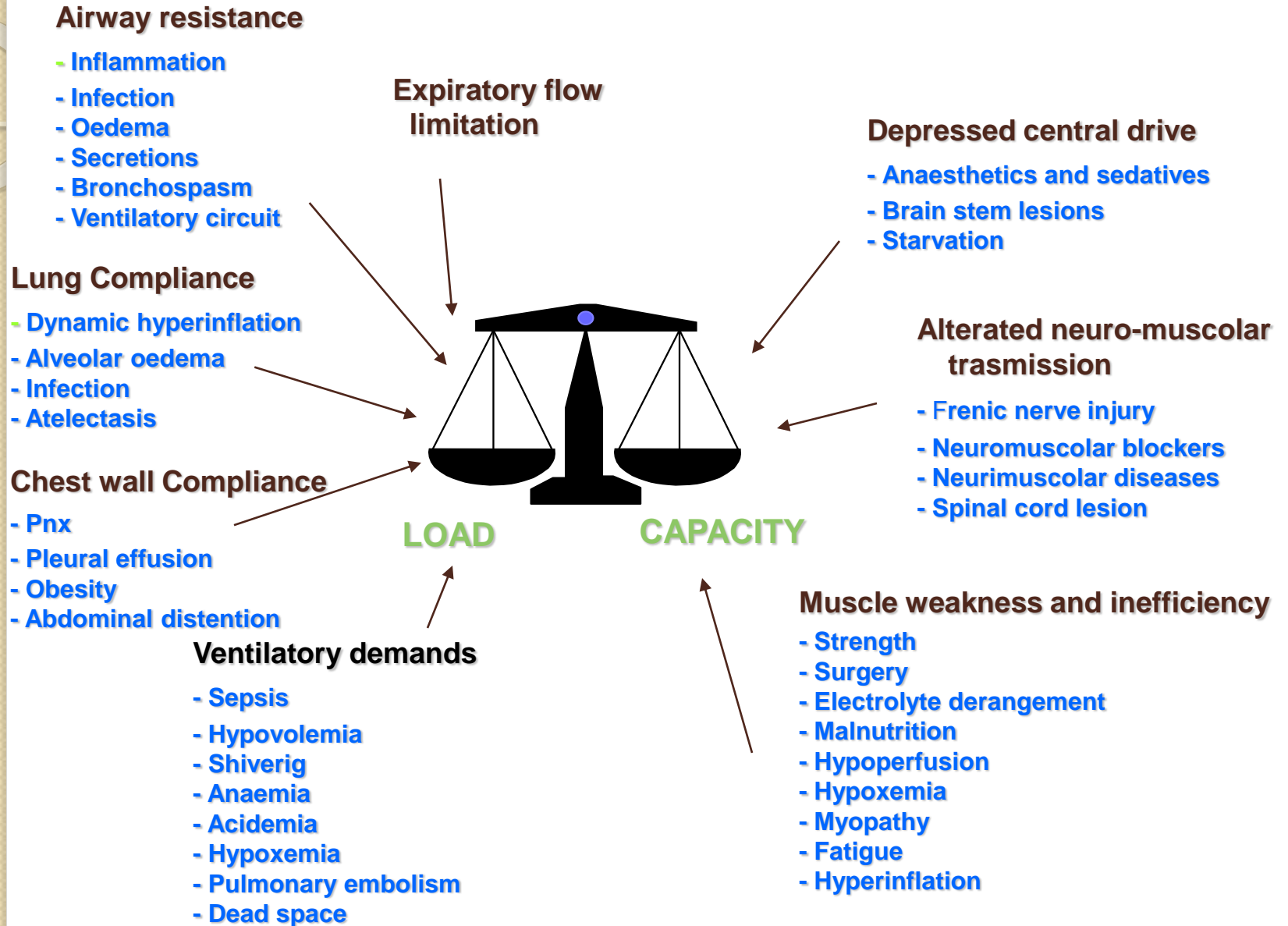
# Segni precoci di allarme

## Patient-At-Risk warning score

	3	2	1	0	1	2	3
<b>SpO2 %</b>	<85	85-89	90-94	>=95			
<b>Diuresi</b>	no	<0.5	dialisi	0.5-3	>3 ml/Kg/h		
<b>PA sist</b>	<70	70-79	80-99	100-179		>=180	
<b>FC</b>	<40		40-49	50-99	100-114	115-129	>=130
<b>FR</b>		<10		10-19	20-29	30-39	>=40
<b>T °C</b>		<35	35-35.9	36.0-37.4	37.5-38.4	>=38.5	
<b>GCS</b>				Alert	Confuso	reagisce	Non reagisce
						voce	o solo dolore

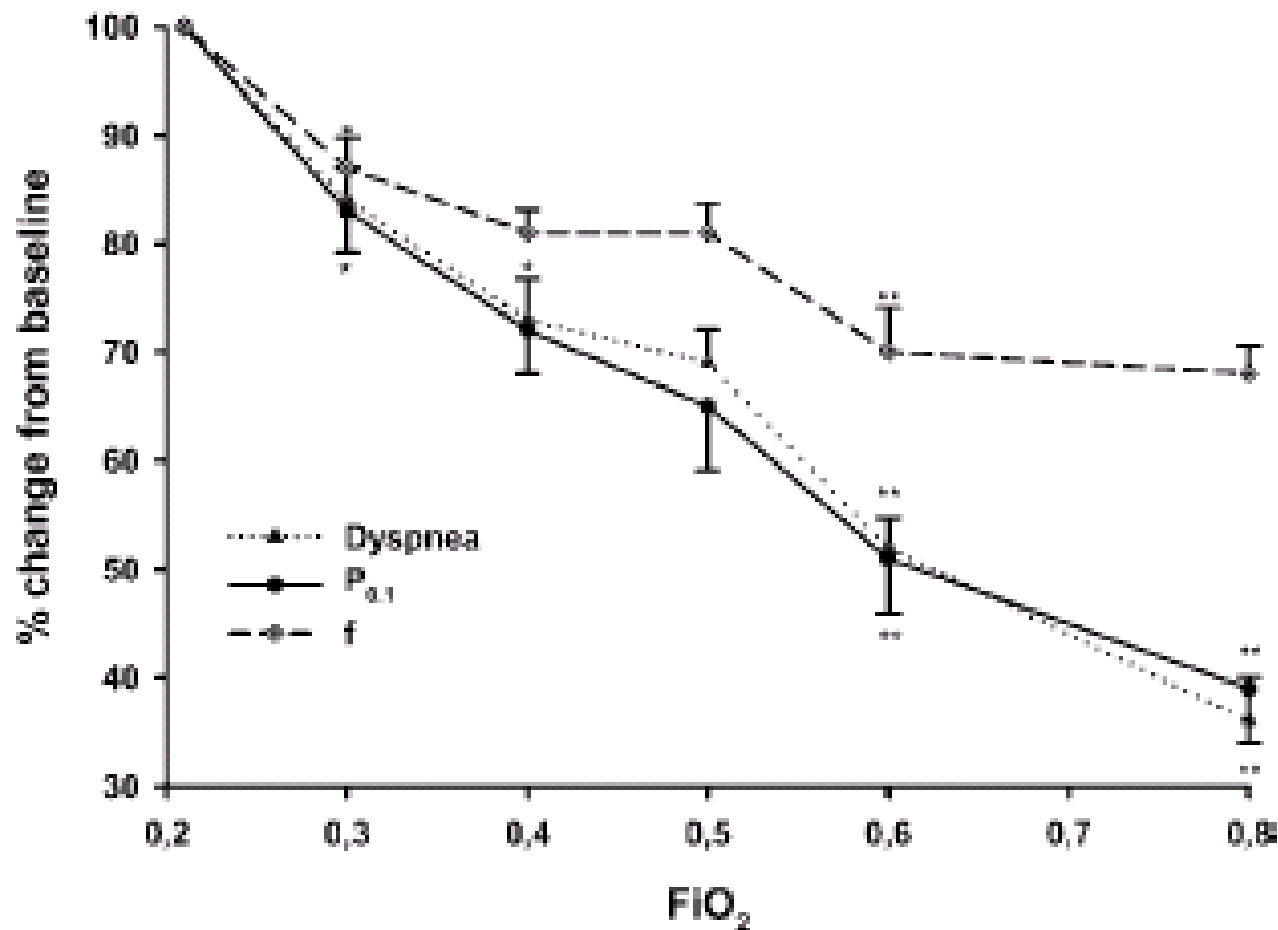
Goldhill DR et al Anaesthesia 2005; 60: 547-553

# Management of patients with ARF



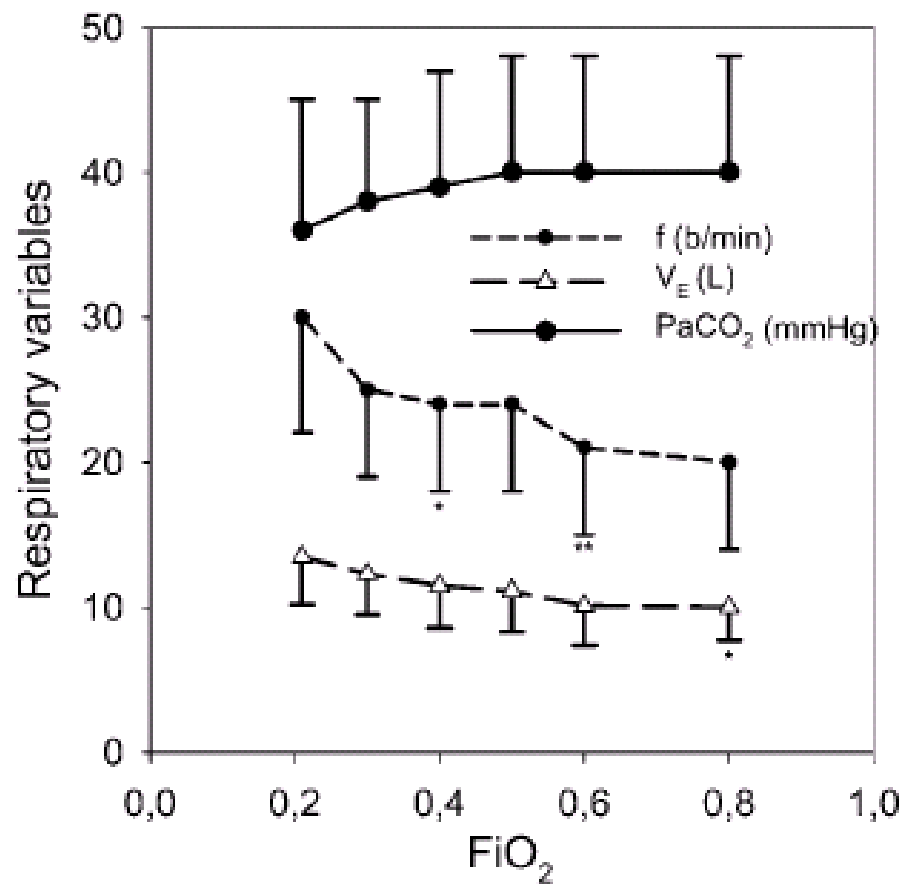
Carlo Alberto Volta  
Valentina Alvisi  
Sara Bertacchini  
Elisabetta Marangoni  
Riccardo Ragazzi  
Marco Verri  
Raffaele Alvisi

## Acute effects of hyperoxemia on dyspnoea and respiratory variables during pressure support ventilation



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## Acute effects of hyperoxemia on dyspnoea and respiratory variables during pressure support ventilation



# *Come migliorare l'ossigenazione?*

- Ossigeno!!!!!!!!!!!!!!
- Ventilando con una PEEP<sub>e</sub> (CPAP) e
- Supportando il paziente con una pressione positiva inspiratoria

**SpO<sub>2</sub>: 90 - 92**



# **Come migliorare l'ossigenazione?**

**ossigeno!!!!!!!!!!!!**

- Occhialini (max 6 l/min)
- Sondino naso-faringeo (max 6 l/min)
- Venti mask con diverse  $FiO_2$
- Venti mask con reservoir

# *Come migliorare l'ossigenazione?*

- Venti mask con diverse  $\text{FiO}_2$



# *Come migliorare l'ossigenazione?*

- Venti mask con reservoir



## Severity

pH > 7,35

pH 7,35 -7,30

pH <7,30; Alertness

pH < 7.25  
and/or  
Neurologic  
Status  
Fatigue or  
ET indication  
MOF

## Location

Ward

Ward

ICU

ICU

## Intervention

Drugs+Oxygen

NPPV

NPPV or INPV

ET intubation

