

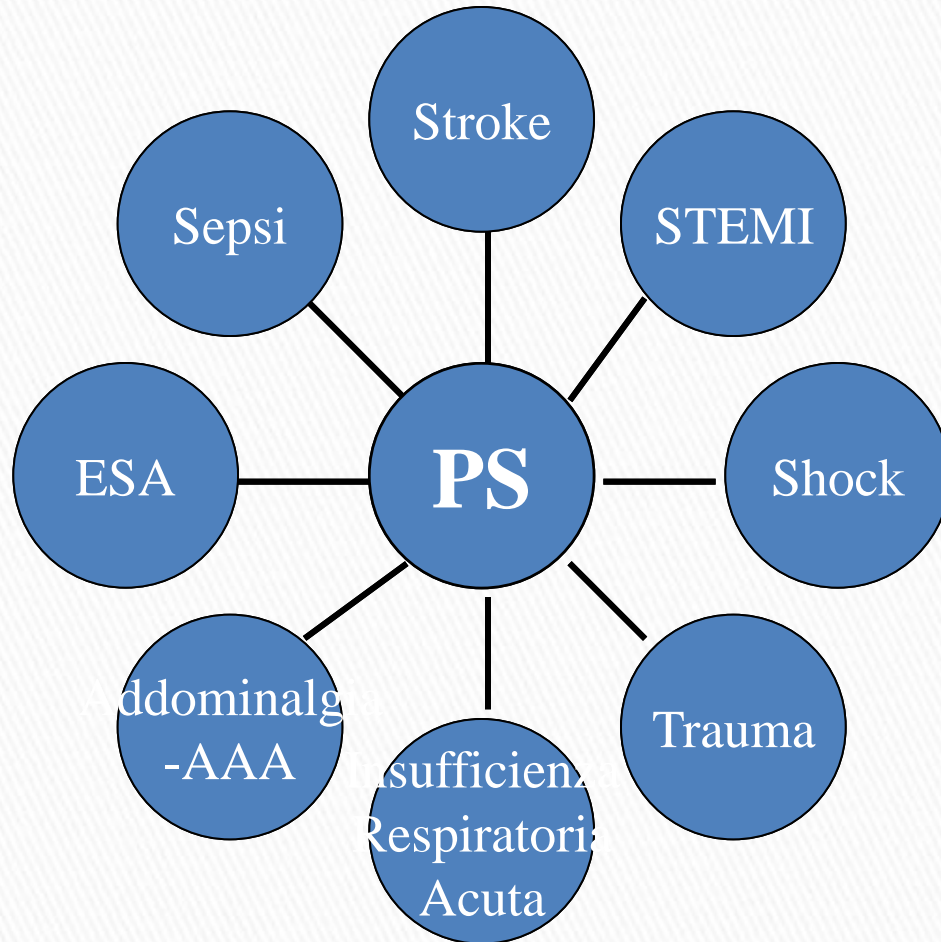
Edema polmonare acuto?

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Patologie “time” related



Ruolo del medico di PS

- 1) Diagnostica differenziale
- 2) Stratificazione del rischio
- 3) Trattamento precoce/stabilizzazione clinica

Insufficienza
respiratoria acuta
costituisce circa il 35%
delle patologie time-
correlate

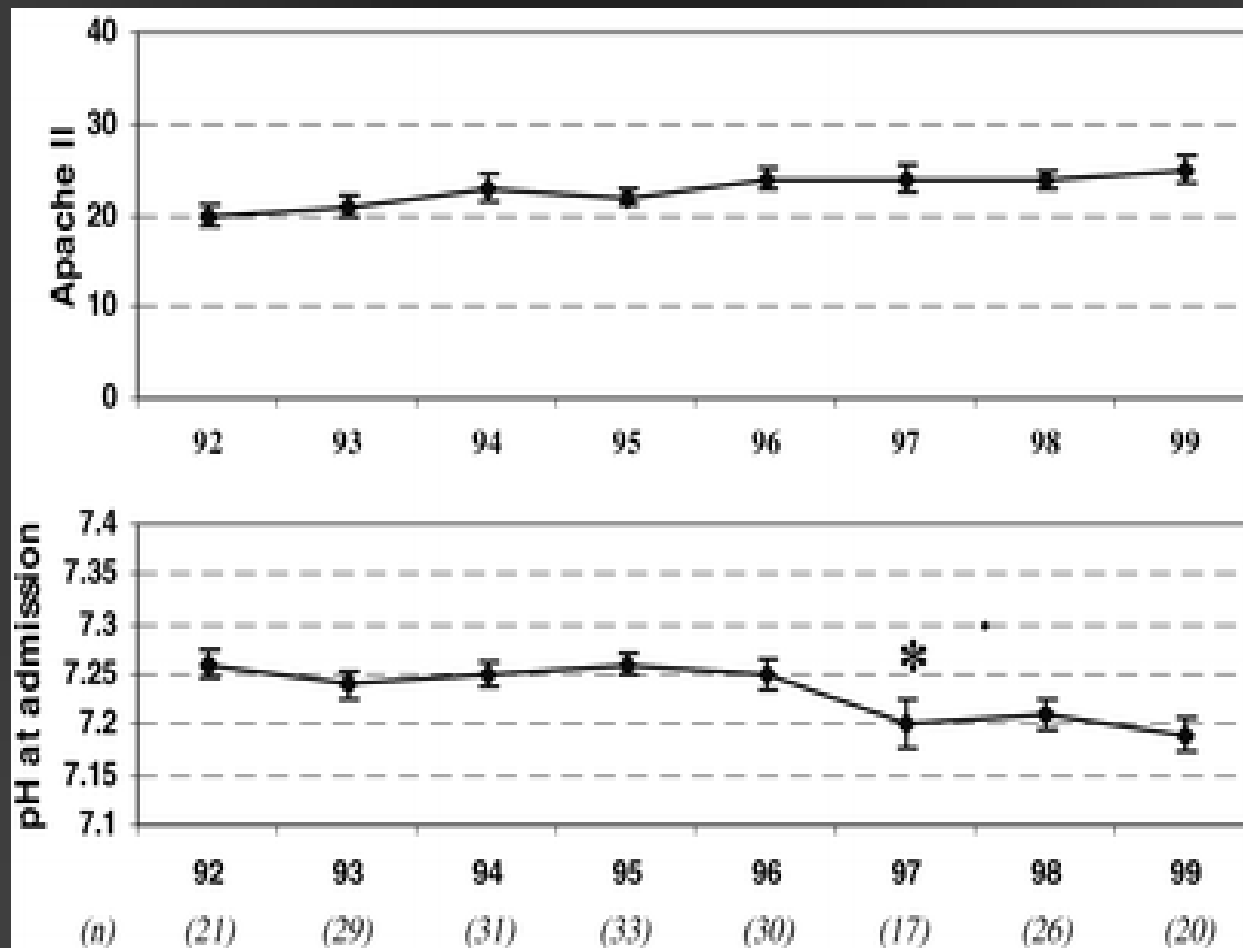
Trattamento precoce.....

EPAC e BPCO riac
costituiscono circa
l'80% delle cause di
IRA in PS

Trattamento precoce.....

LA VNI è mandatoria in
corso di EPAC e BPCO
riac

Carlucci et al ICM 2003 : pts treated with NIV over 8 yrs



Question (1)

CPAP vs Bilevel-PAP vs

O2:

**Mortality and need of
mechanical ventilation?**

Randomized, prospective trial of oxygen, continuous positive airway pressure, and bilevel positive airway pressure by face mask in acute cardiogenic pulmonary edema *.
Critical Care Medicine. 32(12):2407-2415, 2004.

Park, Marcelo; Sangean, Marcia C; Volpe, Marcia de S., et al.

Conclusions: Compared with oxygen therapy, **CPAP and Bilevel PAP resulted in similar vital signs and arterial blood gases and a lower rate of endotracheal intubation (7 vs 42%).** No cardiac ischemic complications were associated with either of the noninvasive ventilation strategies.

Sistematic review and meta-analysis



CPAP and Bilevel PAP reduce the need of intubation and mortality in pts with ACPE although the level of evidence is higher for CPAP, there are no significant differences in clinical outcomes when comparing CPAP vs NIPSV

In patient with ACPE, CPAP and Bilevel PAP reduce the need of MV compared with standard therapy, CPAP reduces mortality

There is a trend towards reduced mortality after bilevel PAP

Gray et al 2008 (NEJM)

“NIV in ACPE encourages more rapid improvements than standard therapy does but has no effect on short-term mortality”

Acute decompensated HF	(de novo or as decompensation of chronic HF): signs and symptoms of acute HF that are mild and do not fulfill the criteria for cardiogenic shock, pulmonary edema, or hypertensive crisis
Hypertensive acute HF	Signs and symptoms of HF are accompanied by high BP and relatively preserved left ventricular systolic function with a chest radiograph compatible with acute pulmonary edema
Pulmonary edema	(verified by chest x-ray) accompanied by severe respiratory distress, with crackles over the lung and orthopnea, with O ₂ saturation usually < 90% on room air before treatment
Cardiogenic shock	Tissue hypoperfusion induced by HF after correction of preload. Usually characterized by reduced BP (SBP < 90 mmHg or a drop of mean BP > 30 mmHg) and/or low urine output (<0,5 mL/Kg/hr), with a pulse rate > 60 beats/min
High output failure	High cardiac output, usually with high heart rate (caused by arrhythmias, thyrotoxicosis, anemia, Paget disease, or iatrogenic or other mechanisms), with warm peripheries, pulmonary congestion, and sometimes low BP, as in septic shock
Right HF	Low-output syndrome with increased jugular venous pressure, increased liver size, and hypotension. There is a continuum from low cardiac output syndrome to cardiogenic shock

HF heart failure; **BP** blood pressure; **SBP** systolic blood pressure

Gray et al.....(limits)

- Cross contamination among the treatment groups
- The competency level with NIV use was highly variable between the centers
- Patients in the study were not affected by respiratory distress (intubation rate was very low)
- Diagnosis

Non-invasive positive pressure ventilation (CPAP or bilevel NPPV) for cardiogenic pulmonary edema (Cochrane Review 2013)

NPPV, especially CPAP, in addition to standard medical care is an effective and safe intervention for the treatment of adult patients with acute cardiogenic pulmonary edema.

Am J Emerg Med 2013 (meta-analysis : 1473
pts)

Conclusions: There are **no significant differences** in clinical outcomes when comparing **CPAP vs BiPAP** and both modalities reduce the need of MV and improve gas exchange.

Question (2)

In hypercapnic patients with ACPE has Bilevel the potential advantage over CPAP?

Chadda et al. CCM 2002

Bilevel PAP is **more effective** than CPAP in unloading respiratory muscle activity

Noninvasive pressure support ventilation vs. continuous positive airway pressure in acute hypercapnic pulmonary edema

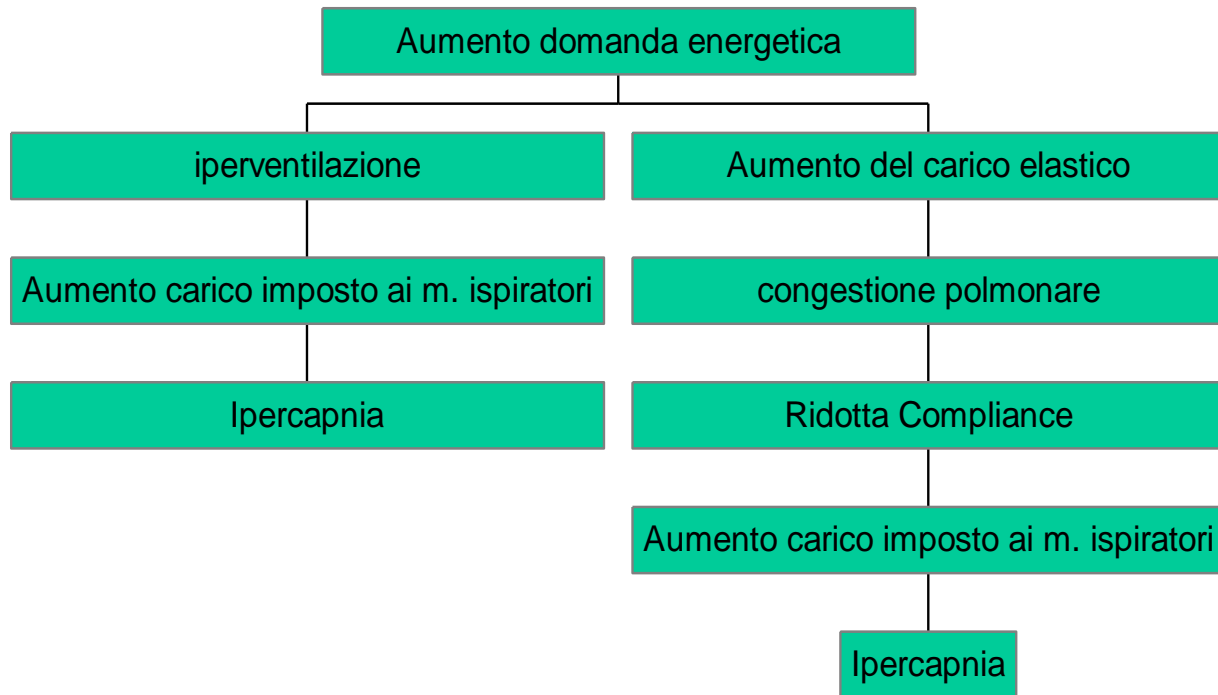
Intensive Care Medicine 2004; 31: 807-11

A Bellone, M Vettorello, A Monari, et al

Conclusions: NIPSV proved as effective as CPAP in the treatment of patients with acute pulmonary edema and hypercapnia but did not improve resolution time.

ACPE

⋮



CONCLUSION (2)

✿ **Bilevel PAP does not seem to offer any advantage compared with CPAP in patients with ACPE and hypercapnia**

Question (3)

NIV and diastolic ACPE ?

What is the role of noninvasive ventilation in diastolic heart failure?

(Intensive Care Medicine 2005)

R Agarwal, D Gupta

“Caution must be used with CPAP because patients with DHF are sensitive to the right and left ventricular preload reduction and may develop hypotension or several prerenal azotemia”

❖ Transthoracic echocardiography

underestimates LVEDV

❖ In chronic diastolic heart failure LVEDV

is reduced but in ACPE due to diastolic

dysfunction is normal

❖ What is the ideal dose of nitrates in

addition to CPAP in pts with ACPE?

The pharmacologic therapy

 **Nitrates**

 **Diuretics**

 **Dosages**

Cotter et al (Lancet 1998)

	ISDN (n=52)	Furosemide (n=52)	p
Died	1	3	0,6
ETI	7	21	0,004
AMI	9	19	0,04
Mean ISDN	11 mg	1,4 mg	
Mean Furosemide	56 mg	200 mg	

CONCLUSION (3)

- ✿ **CPAP and Bilevel PAP seem to be equally effective and safe in diastolic ACPE (preliminary data)**
- ✿ **Caution with diastolic ACPE must be used with regard to the diuretic/nitrate dosage**

CONCLUSION (1)

- ✿ **CPAP and Bilevel PAP seem to be equally effective in the treatment of pts with ACPE.**
- ✿ **Both modalities improve gas exchange, and reduce the need of MV compared with standard therapy.**
- ✿ **The effect of NIV on mortality needs further studies, but only one relevant study is totally negative**

CONCLUSION (2)

- ✿ **CPAP and Bilevel PAP seem to be equally effective and safe in diastolic ACPE**
- ✿ **Bilevel PAP does not increase the risk of myocardial infarction compared with CPAP**
- ✿ **Bilevel PAP is as effective as CPAP in hypercapnic ACPE**
- ✿ **Caution with NIV must be used in hypotensive ACPE**