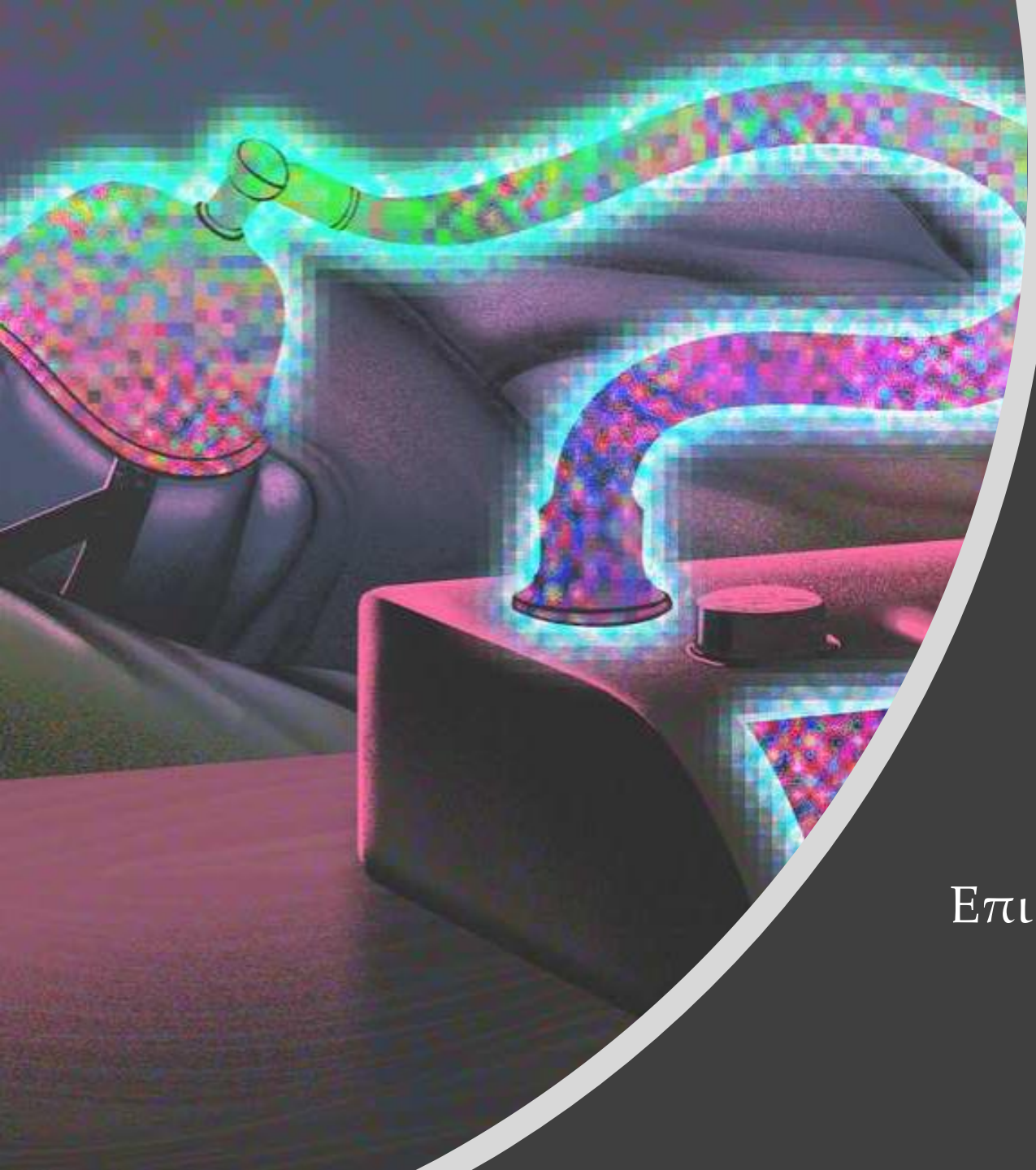


Ενδείξεις εφαρμογής ΜΕΜΑ στα ΤΕΠ

Κυριακούδη Άννα

Πνευμονολόγος –Εντατικολόγος

Επιμελήτρια Β'/ ΜΕΘ Α' Πανεπιστημιακή Πνευμονολογική κλινική

ΝΝΘΑ «Η Σωτηρία»

No Conflict of Interest

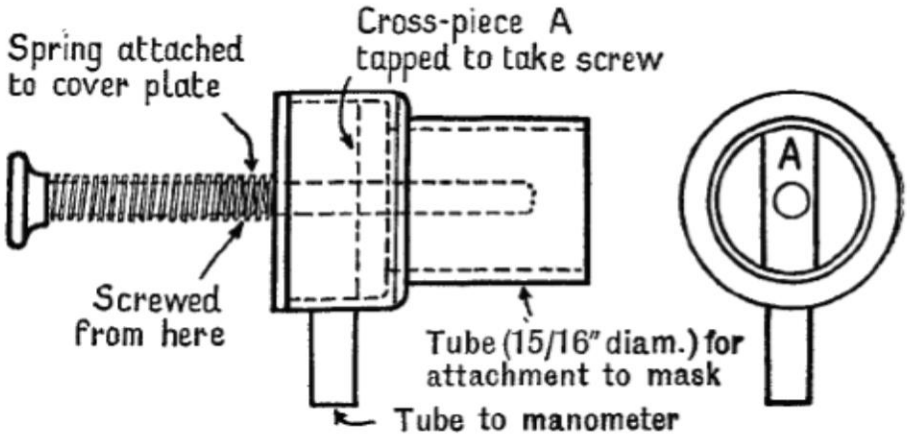
PULMONARY ŒDEMA

ITS TREATMENT WITH THE "PULMONARY PLUS PRESSURE MACHINE"

By E. P. Poulton, D.M. Oxon., F.R.C.P. Lond.
PHYSICIAN TO GUY'S HOSPITAL, LONDON

Acute pulmonary œdema of circulatory origin must be due to incoördination between the right and left ventricle such that the volume of blood delivered per minute into the pulmonary circulation is not completely passed on into the systemic circulation by the left ventricle. Congestion of the pulmonary circulation with local rise of blood pressure must follow, leading to acute pulmonary œdema. A case of this kind with myocardial degeneration was investigated about ten years ago by Campbell and Poulton [1 2] in which evidence was brought forward that

vacuum cleaner used as a blower usually gives too big a flow; it is cut down by an adjustable resistance or a machine of oversize voltage may be used. When the household vacuum cleaner is employed the machine should be run for some minutes first of all to get rid of dust; then a new flexible tube should be fitted, and there should be a cotton-wool filter. If



POSITIVE PRESSURE RESPIRATION AND ITS APPLICATION TO THE TREATMENT OF ACUTE PULMONARY EDEMA*

By Alvan L. Barach, M.D., F.A.C.P., John Martin, M.D., and Morris Eckman, B.S., *New York, N. Y.*

Κύριες ενδείξεις ΜΕΜΑ στο ΤΕΠ

- Οξύ πνευμονικό οίδημα
- Οξεία παρόξυνση ΧΑΠ
- Υποξαιμική αναπνευστική ανεπάρκεια (Πνευμονία)
- Παχυσαρκία – υποαερισμό
- Άλλες (πχ. Νευρομυϊκά, ανοσοκαταστολή, ηλικιωμένους, στην ανακουφιστική φροντίδα)

Contra-indications

Absolute	Relative
Respiratory arrest	Medically unstable (hypotensive shock, uncontrolled cardiac ischemia, or arrhythmia)
Unable to fit mask	Agitated, uncooperative
Uncontrolled vomiting or copious upper gastrointestinal bleeding	Unable to protect airway
Total upper airway obstruction	Swallowing impairment
Facial trauma	Excessive secretions not managed by secretion clearance techniques
Patient decline	Multiple (two or more) organ failure
	Recent upper airway or upper gastrointestinal surgery
	Progressive severe respiratory failure
	Pregnancy

Thorax ***2016****;71:ii1–ii35.*

ORIGINAL ARTICLE

Non-invasive ventilation as a first-line treatment for acute respiratory failure: "real life" experience in the emergency department

C Antro, F Merico, R Urbino, V Gai

Retrospective study, 190pts with ARF, 200 NIV trials:

- Mean age 72±12.9
- Mean APACHE II 18.9±5.9
- 61% of trials was successful
- Global mortality 34.5%
- ETI rates were 6.5%
- Tracheostomy rate 1%

Predictive factors (adjusted for age and sex) of non-invasive ventilation (NIV) success and death

	Overall			Hypercapnic group		
	OR	CI 95%	p	OR	CI 95%	p
Age, years	1.03	1.00–1.05	0.039	1.03	0.99–1.06	0.102
Sex (male = 1)	0.58	0.32–1.06	0.075	0.49	0.24–1.02	0.057
APACHE II	1.09	1.03–1.16	0.003	1.12	1.04–1.20	0.003
pH*	1.01	0.98–1.04	0.640	0.98	0.94–1.02	0.315
$PaCO_2$ (mm Hg)	1.00	0.98–1.01	0.612	1.01	0.99–1.03	0.410
Decreased level of consciousness	1.55	0.97–2.51	0.067	1.65	0.93–2.91	0.085
†$PaCO_2$ 6 h	0.44	0.17–1.14	0.091	0.33	0.97–1.13	0.078
†pH 6 h	0.16	0.05–0.50	0.002	0.14	0.03–0.62	0.009

Emerg Med J **2005**;22:772–777.

risk factors for NIV failure

	Univariate analysis			Multivariate analysis		
Risk factors (predictors)	OR	95 % CI	*P* value	OR	95 % CI	*P* value
Age (years)	0.97	0.94–0.99	0.015	0.96	0.93–0.99	0.007
Male gender	2.24	0.86–5.83	0.100			
Mean arterial pressure (mmHg)	0.98	0.95–1.00	0.037			
Heart rate (bpm)	1.02	1.00–1.05	0.037			
APACHE II score	1.10	1.00–1.21	0.039	1.13	1.02–1.25	0.018
Arterial pH	0.95	0.89–1.01	0.116			
Bicarbonate (mmol/L)	0.87	0.78–0.97	0.009			
Arterial lactate (mg/dL)	1.05	0.99–1.10	0.081			
Transplantation	10.50	2.00–54.95	0.005			
Acute respiratory distress syndrome	2.57	0.68–9.80	0.167			

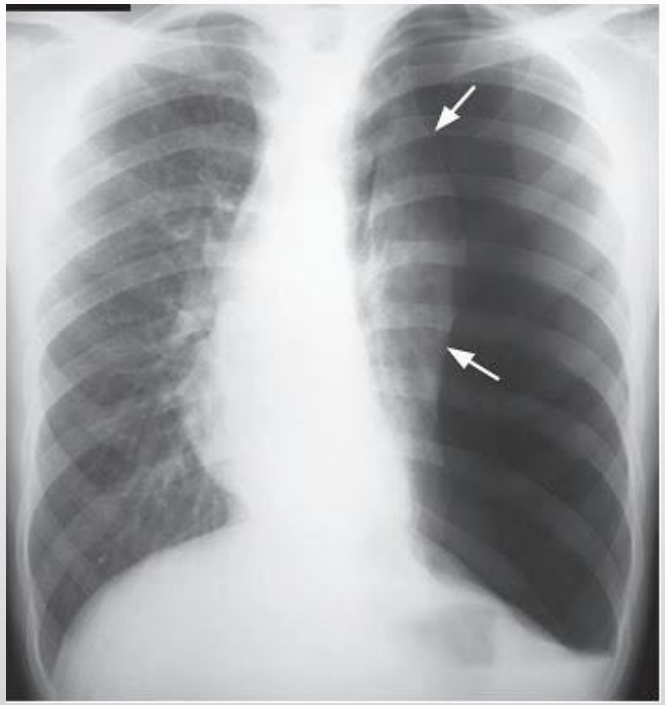
BMC Pulmonary Medicine (2015) 15:144

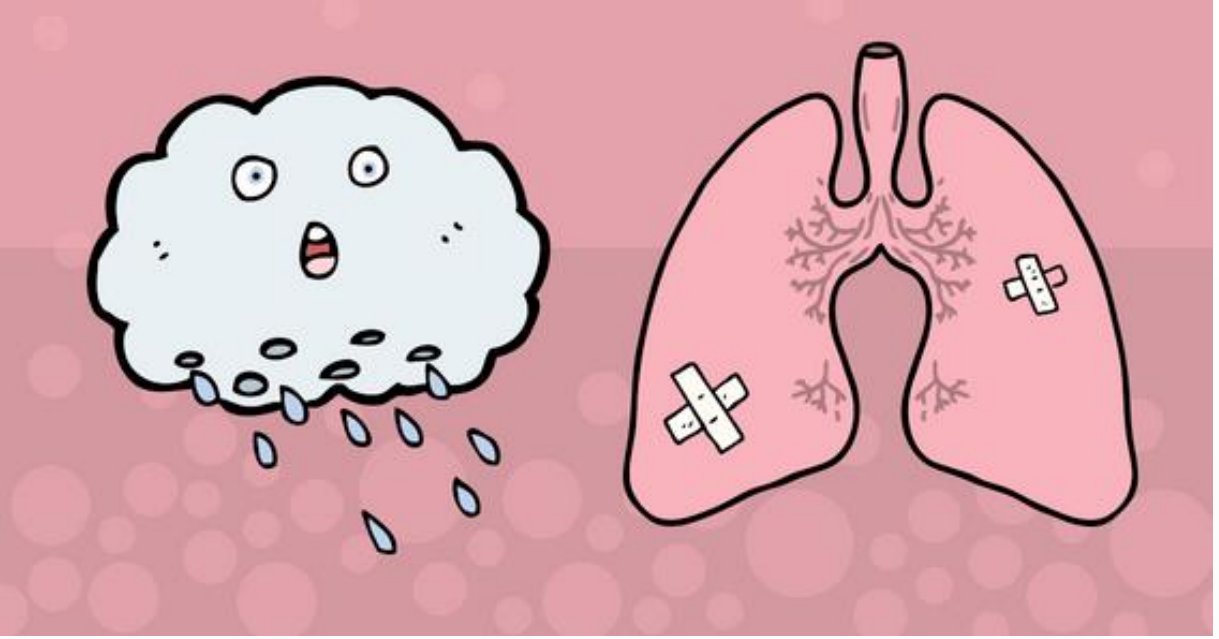
Επιπλοκές

Συχνές

Λιγότερο συχνές

Σπάνιες





Non-Invasive Ventilation in Acute Cardiogenic Pulmonary Edema

Rational

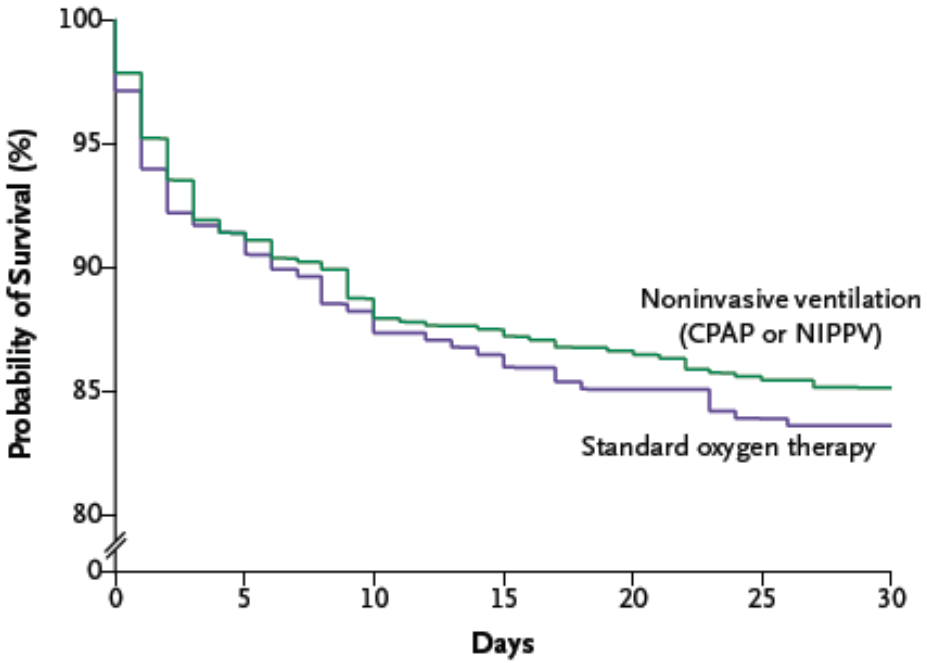
- Μείωση προφόρτιου ΔΕ κοιλίας
- Μείωση μεταφόρτιου ΑΡ κοιλίας
- Μείωση του έργου της αναπνοής
- Αποφόρτιση αναπνευστικών μυών
- Βελτίωση της δύσπνοιας

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Noninvasive Ventilation in Acute Cardiogenic Pulmonary Edema

Alasdair Gray, M.D., Steve Goodacre, Ph.D., David E. Newby, M.D., Moyra Masson, M.Sc., Fiona Sampson, M.Sc., and Jon Nicholl, M.Sc., for the 3CPO Trialists*



No. at Risk							
CPAP or NIPPV	667	609	591	583	577	570	567
Standard therapy	348	318	307	301	296	292	291

N Engl J Med **2008**;359:142-51.

Primary and secondary outcomes

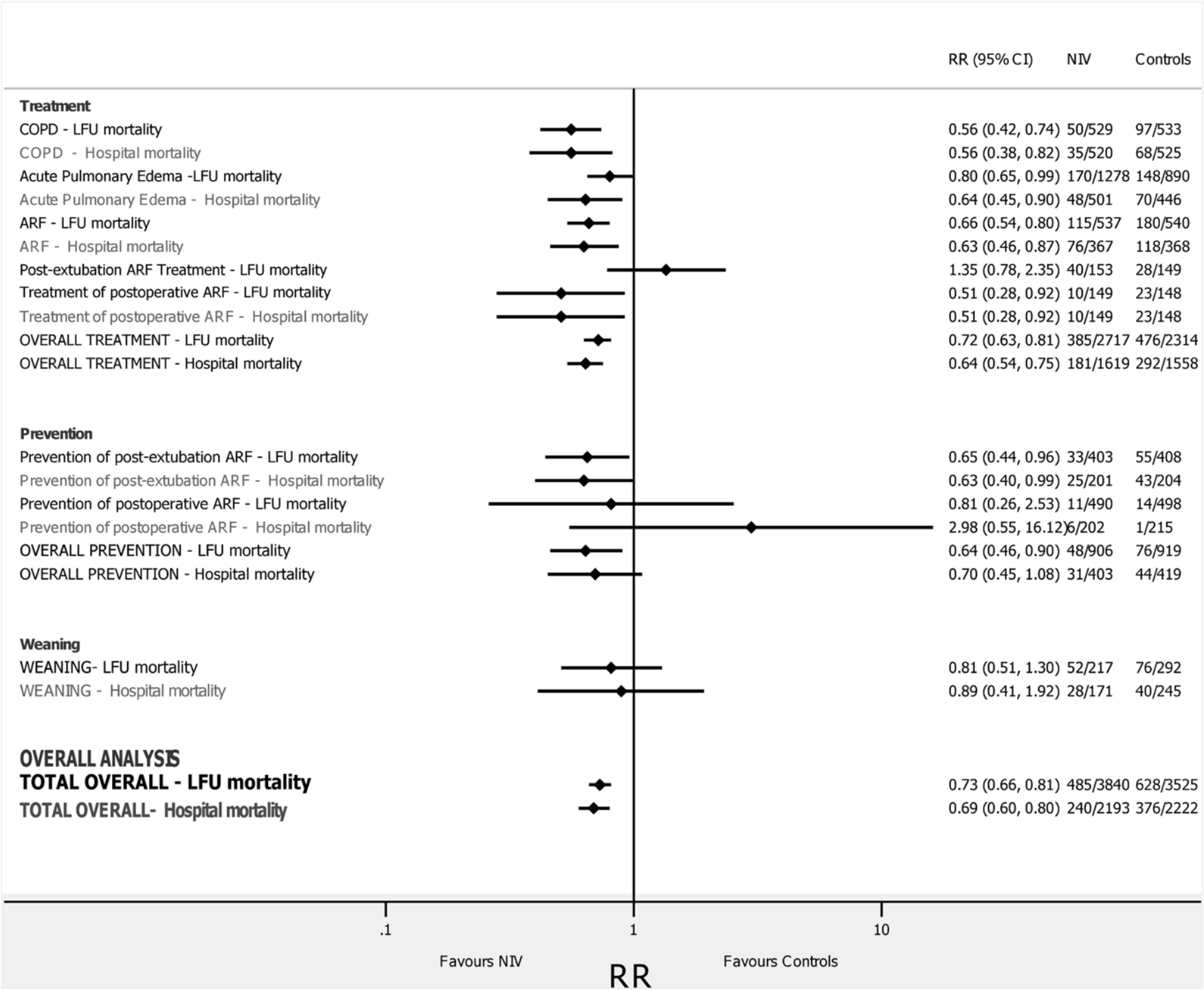
Variable	Standard Oxygen Treatment (N= 367)	CPAP or NIPPV (N= 702)	Odds Ratio (95% CI)	P Value
Death within 7 days (% of patients)	9.8	9.5	0.97 (0.63 to 1.48)	0.87
Intubation within 7 days (% of patients)	2.8	2.9	1.05 (0.49 to 2.27)	0.90
WHO criteria	24.9	27.0	1.12 (0.84 to 1.49)	0.46
Universal criteria	50.5	51.9	1.06 (0.82 to 1.36)	0.66
			Difference between Means (95% CI)†	
Mean length of hospital stay (days)	10.5	11.4	0.9 (−0.2 to 2.0)	0.10
Dyspnea score§	3.9	4.6	0.7 (0.2 to 1.3)	0.008
Pulse rate (beats/min)	13	16	4 (1 to 6)	0.004
Blood pressure (mm Hg)				
Systolic	34	38	3 (−1 to 8)	0.17
Diastolic	22	22	0 (−3 to 3)	0.95
Respiratory rate (breaths/min)	7.1	7.2	0.2 (−0.8 to 1.1)	0.74
Peripheral oxygen saturation (%)	3.5	3.0	−0.4 (−1.4 to 0.6)	0.41
Arterial pH	0.08	0.11	0.03 (0.02 to 0.04)	<0.001
Arterial PaO_2 (kPa)	0.7	−0.6	−1.2 (−2.6 to 0.1)	0.07
Arterial $PaCO_2$ (kPa)	0.8	1.5	0.7 (0.4 to 0.9)	<0.001
Serum bicarbonate level (mmol/liter)	1.7	1.8	0.1 (−0.7 to 1.0)	0.77

N Engl J Med **2008**;359:142-51

Meta-analysis, 76 trials:

- NIV ↓ mortality (12.6% vs 17.8% in control arm, RR=0.73 (0.66 -0.81),p<0.001)

Crit Care Med ***2015****;43:880-888*



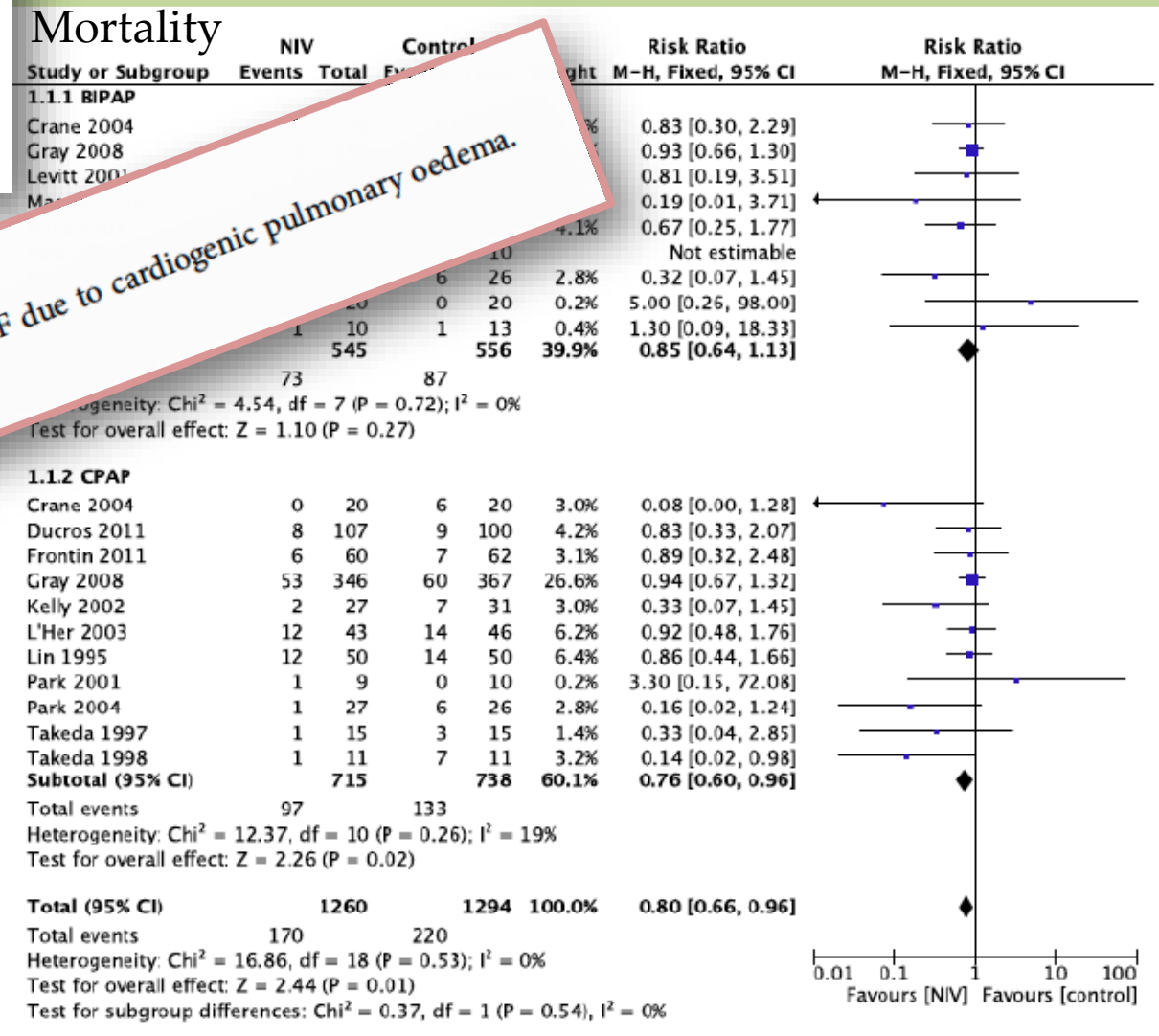
Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure

Bram Rochwerg[1], Laurent Brochard[2,3], Mark W. Elliott[4], Dean Hess[5], Nicholas S. Hill[6], Stefano Nava[7] and Paolo Navalesi[8] (members of the steering committee); Massimo Antonelli[9], Jan Brozek[1], Giorgio Conti[9], Miquel Ferrer[10], Kalpalatha Guntupalli[11], Samir Jaber[12], Sean Keenan[13,14], Jordi Mancebo[15], Sangeeta Mehta[16] and Suhail Raoof[17,18] (members of the task force)

Recommendation

We recommend either bilevel NIV or CPAP for patients with ARF due to cardiogenic pulmonary oedema. (Strong recommendation, moderate certainty of evidence.)

Mortality



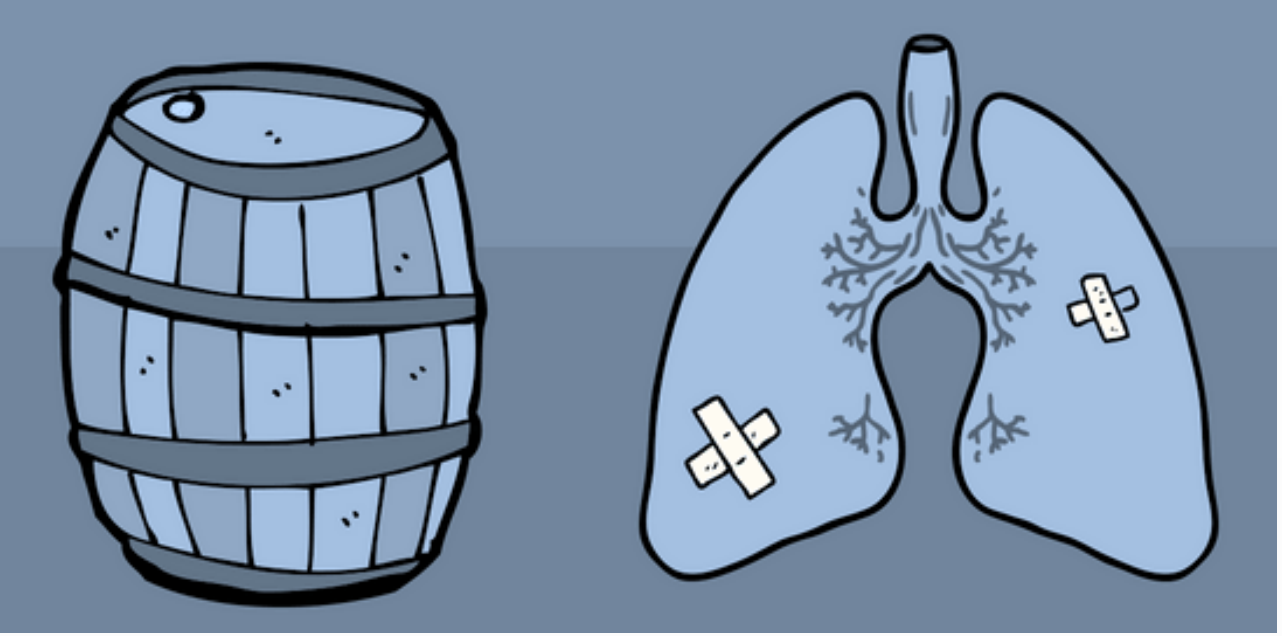
Eur Respir J **2017**; 50: 1602426

Cochrane Library

24 studies, 2664 pts with ACPE

- NIV ↓ hospital mortality RR=0.65 (0.51-0.82)
- NIV probably ↓ intubation rate RR=0.49 (0.38-0.62)
- Adverse events were similar between groups

Cochrane Database Syst Rev ***2019***; *4:CD005351*



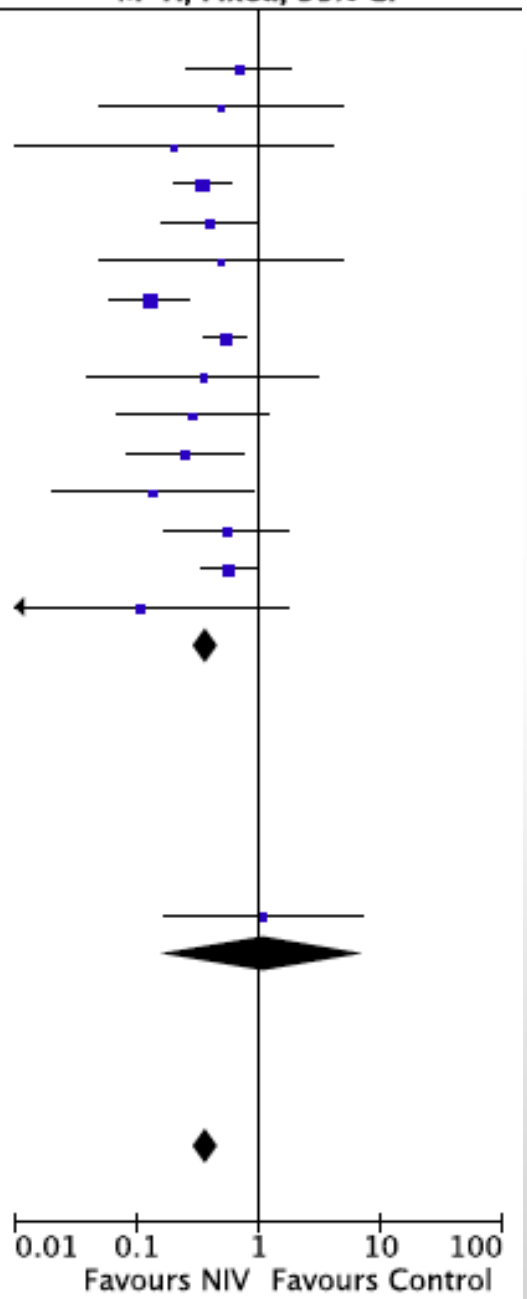
Non-Invasive Ventilation in Acute Exacerbation of COPD

NIV

- relieves dyspnea
- improves vital signs
- improves gas exchange
- prevents endotracheal intubation
- ↓ complications
- ↓ mortality
- shortens the time spent in hospital

EUROPEAN RESPIRATORY *journal*
FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Study or Subgroup	NIV Events	NIV Total	Standard Medical Care Events	Standard Medical Care Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.2.1 Patients with ARF who are acidotic						
Avdeev 1998	5	26	8	29	3.9%	0.70 [0.26, 1.86]
Bardi 2000	1	15	2	15	1.0%	0.50 [0.05, 4.94]
Bott 1993	0	30	2	30	1.3%	0.20 [0.01, 4.00]
Brochard 1995	11	43	31	42	16.3%	0.35 [0.20, 0.60]
Carrera 2009	5	37	13	38	6.7%	0.40 [0.16, 1.00]
Celikel 1998	1	15	2	15	1.0%	0.50 [0.05, 4.94]
Chen 2005	8	171	26	71	19.1%	0.13 [0.06, 0.27]
Conti 2002	12	23	26	26	12.9%	0.53 [0.36, 0.78]
Del Castillo 2003	1	20	3	21	1.5%	0.35 [0.04, 3.09]
Dikensoy 2002	2	17	7	17	3.6%	0.29 [0.07, 1.18]
Khilnani 2010	3	20	12	20	6.2%	0.25 [0.08, 0.75]
Kramer 1995	1	11	8	12	4.0%	0.14 [0.02, 0.92]
Martin 2000	3	12	5	11	2.7%	0.55 [0.17, 1.78]
Plant 2000	18	118	32	118	16.6%	0.56 [0.34, 0.94]
Thys 2002	0	7	3	5	2.1%	0.11 [0.01, 1.71]
Subtotal (95% CI)		**565**		**470**	**99.0%**	**0.37 [0.29, 0.46]**
Total events	71		180			
Heterogeneity: $Chi^2 = 18.68$, df = 14 (P = 0.18); $I^2 = 25\%$						
Test for overall effect: Z = 8.74 (P < 0.00001)						
1.2.2 Patients with ARF who are not acidotic						
Barbe 1996	0	10	0	10		Not estimable
Keenan 2005	2	25	2	27	1.0%	1.08 [0.16, 7.10]
Subtotal (95% CI)		**35**		**37**	**1.0%**	**1.08 [0.16, 7.10]**
Total events	2		2			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.08 (P = 0.94)						
Total (95% CI)		**600**		**507**	**100.0%**	**0.37 [0.30, 0.47]**
Total events	73		182			
Heterogeneity: $Chi^2 = 19.61$, df = 15 (P = 0.19); $I^2 = 24\%$						
Test for overall effect: Z = 8.65 (P < 0.00001)						
Test for subgroup differences: $Chi^2 = 1.24$, df = 1 (P = 0.26), $I^2 = 19.6\%$						



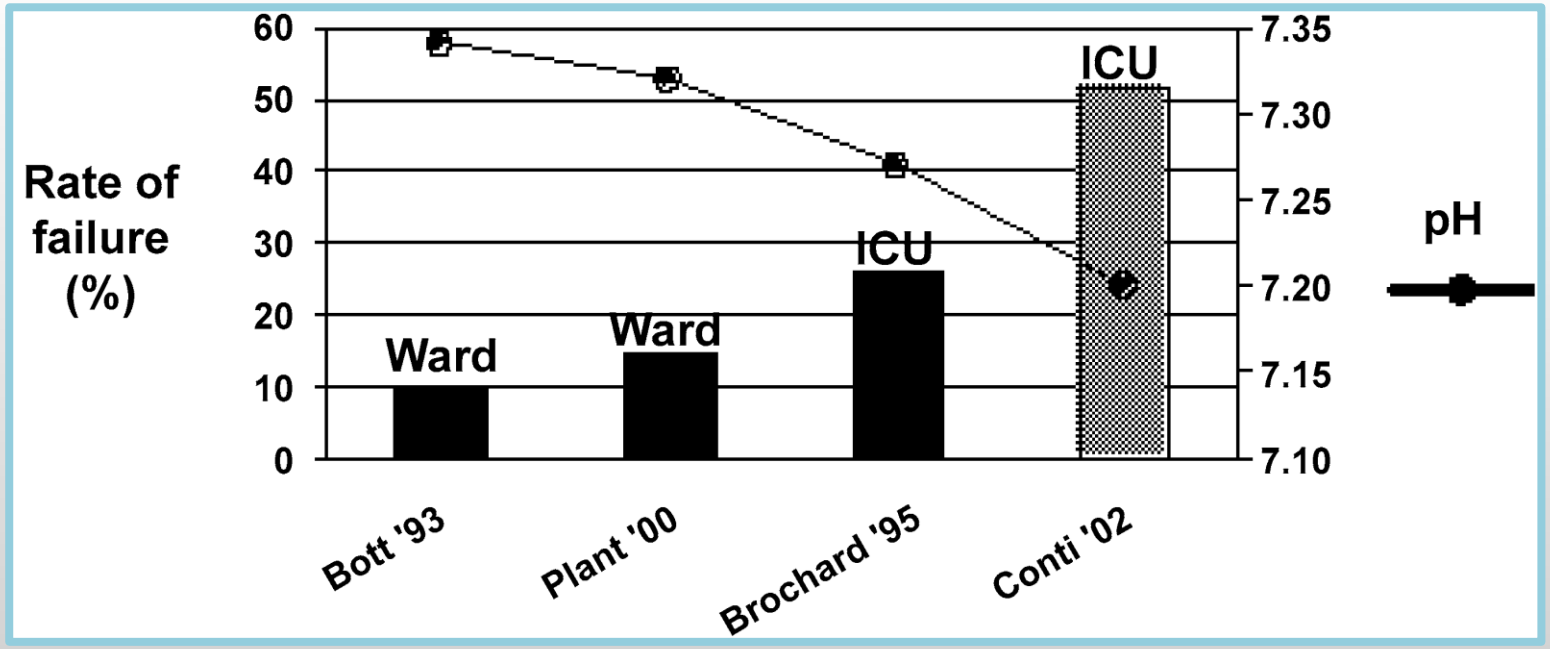
↓ the need for intubation in AECOPD

Eur Respir J **2017**; 50: 1602426

Ποιοι ασθενείς με παρόξυνση ΧΑΠ ωφελούνται;

	Standard	NIV	p
Intention-to-treat			
Failed	32/118 (27%)	18/118 (15%)	0·02
Died	24/118 (20%)	12/118 (10%)	0·05
Subgroup analysis			
pH<7·30			
Failed	16/38 (42%)	13/36 (36%)	0·64
Died	13/38 (34%)	8/36 (22%)	0·31
pH>=7·30			
Failed	16/80 (20%)	5/82 (6%)	0·01
Died	11/80 (14%)	4/82 (5%)	0·06

Lancet ***2000****; 355: 1931–35*



Όσο πιο οξεωτικό pH τόσο μεγαλύτερο ποσοστό αποτυχίας

Intensive Care Med ***2006*** *32:361–370*

EUROPEAN RESPIRATORY *journal*
FLAGSHIP SCIENTIFIC JOURNAL OF ERS

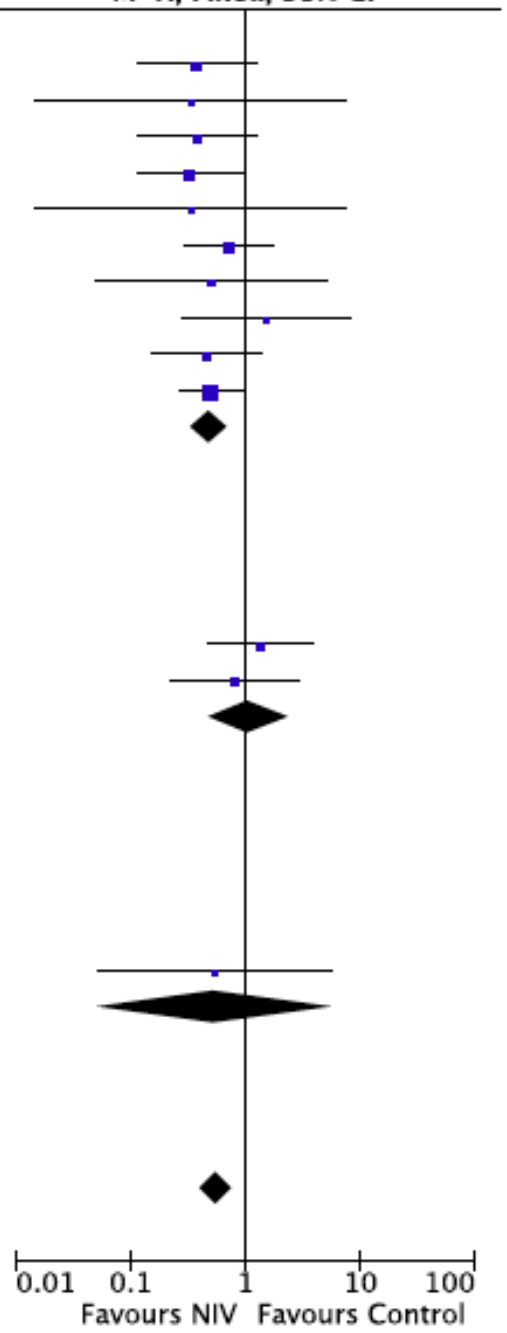
NIV ↓ mortality in acute hypercapnic respiratory failure due to a COPD exacerbation

Recommendations:

- We recommend bilevel NIV for patients with ARF with pH ⩽7.35 due to COPD exacerbation. *(Strong recommendation, high certainty of evidence.)*

Eur Respir J ***2017****; 50: 1602426*

Study or Subgroup	NIV Events	NIV Total	Standard Medical Care Events	Standard Medical Care Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.1.1 Compared to standard of care						
Avdeev 1998	3	26	9	29	9.7%	0.37 [0.11, 1.23]
Bardi 2000	0	15	1	15	1.7%	0.33 [0.01, 7.58]
Bott 1993	3	26	9	30	9.5%	0.38 [0.12, 1.27]
Brochard 1995	4	43	12	42	13.8%	0.33 [0.11, 0.93]
Celikel 1998	0	15	1	15	1.7%	0.33 [0.01, 7.58]
Chen 2005	12	171	7	71	11.3%	0.71 [0.29, 1.73]
Dikensoy 2002	1	17	2	17	2.3%	0.50 [0.05, 5.01]
Khilnani 2010	3	20	2	20	2.3%	1.50 [0.28, 8.04]
Martin 2000	3	12	6	11	7.1%	0.46 [0.15, 1.40]
Plant 2000	12	118	24	118	27.3%	0.50 [0.26, 0.95]
Subtotal (95% CI)		**463**		**368**	**86.8%**	**0.49 [0.34, 0.70]**
Total events	41		73			
Heterogeneity: $Chi^2 = 3.46$, df = 9 (P = 0.94); $I^2 = 0\%$						
Test for overall effect: Z = 3.89 (P = 0.0001)						
1.1.2 Compared to MV						
Conti 2002	6	23	5	26	5.3%	1.36 [0.48, 3.86]
Jurjevic 2009	4	78	5	78	5.7%	0.80 [0.22, 2.87]
Subtotal (95% CI)		**101**		**104**	**11.0%**	**1.07 [0.48, 2.39]**
Total events	10		10			
Heterogeneity: $Chi^2 = 0.40$, df = 1 (P = 0.53); $I^2 = 0\%$						
Test for overall effect: Z = 0.16 (P = 0.87)						
1.1.3 Patients with ARF who are not acidotic						
Barbe 1996	0	10	0	10		Not estimable
Keenan 2005	1	25	2	27	2.2%	0.54 [0.05, 5.59]
Subtotal (95% CI)		**35**		**37**	**2.2%**	**0.54 [0.05, 5.59]**
Total events	1		2			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.52 (P = 0.61)						
Total (95% CI)		**599**		**509**	**100.0%**	**0.55 [0.40, 0.77]**
Total events	52		85			
Heterogeneity: $Chi^2 = 6.98$, df = 12 (P = 0.86); $I^2 = 0\%$						
Test for overall effect: Z = 3.58 (P = 0.0003)						
Test for subgroup differences: $Chi^2 = 3.02$, df = 2 (P = 0.22), $I^2 = 33.7\%$						

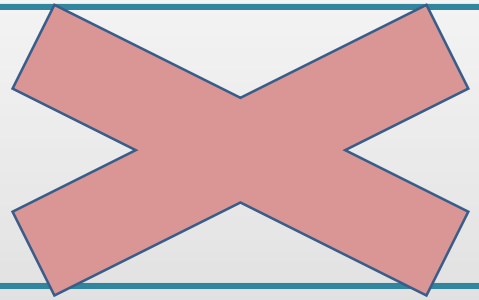


Prognostic features relating to use of NIV in COPD

- ↓ RR, improvement pH within 4h
- ↓ signs of resp. distress

Eur Respir J ***2005****;25:348–55.*

- Age>75 years



Age Ageing ***2011****;40:444–50.*
Int J Clin Pract ***2012****;66:434–7.*

Thorax 2001;**56**:708–712

Non-invasive ventilation in acute exacerbations of chronic obstructive pulmonary disease: long term survival and predictors of in-hospital outcome

P K Plant, J L Owen, M W Elliott

Variables at enrolment associated with failure of treatment

Variable	*Univariate analysis p value*	*Multivariate analysis*	
		Odds ratio	*p value*
Age	0.569		
Sex	0.526		
H^+	<0.001	1.22 (1.09 to 1.37) per nmol/l	<0.01
Pa_{O_2}	0.035		
Pa_{CO_2}	<0.001	1.14 (1.14 to 1.81) per kPa	<0.01
Respiratory rate	0.330		
Radiographic consolidation	0.136		
Allocation to NIV	0.038	0.39 (0.19 to 0.80)	<0.01

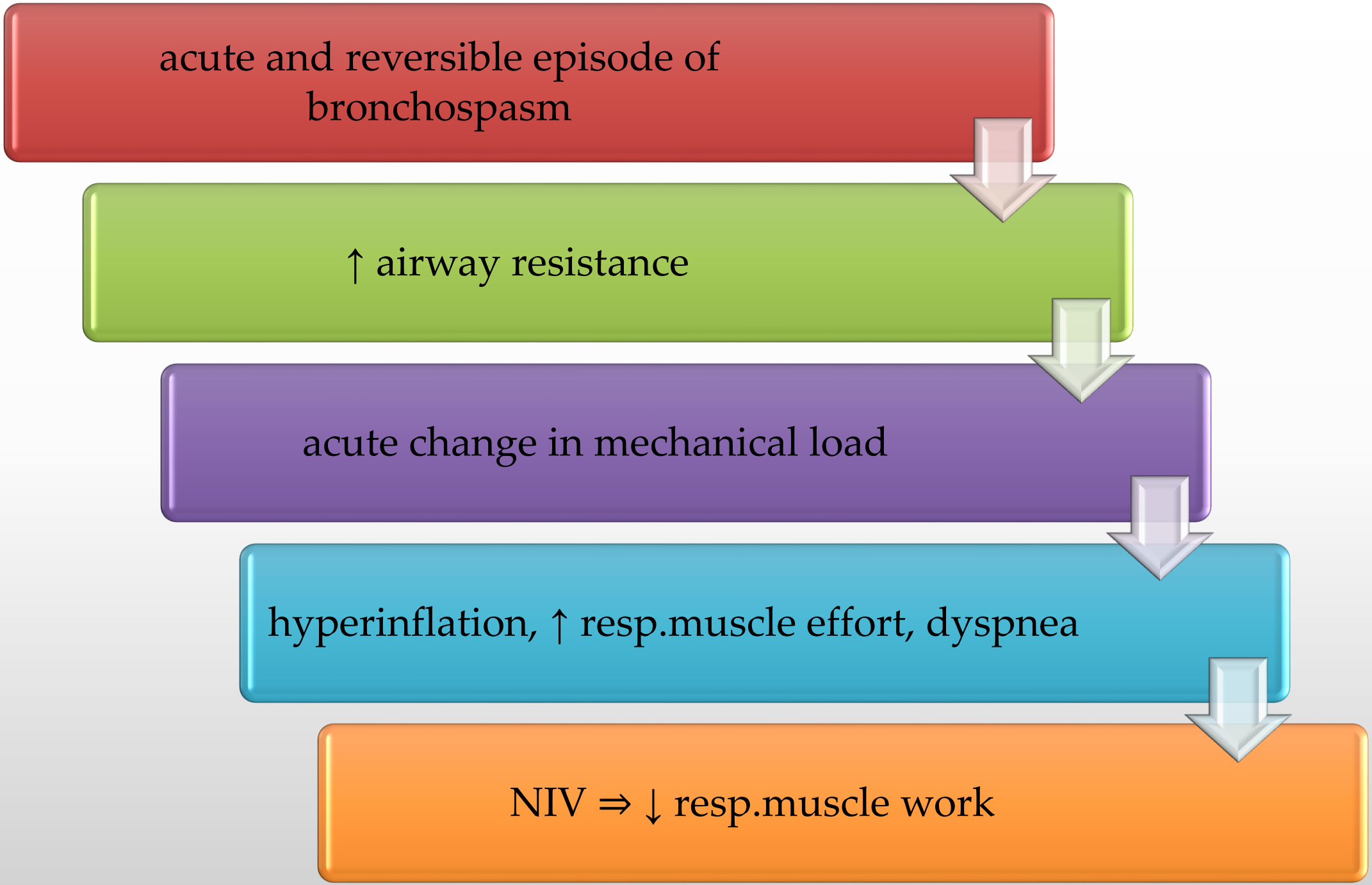
Relative risk of failure

pH	*Treatment*	Pa_{CO_2} 6 kPa	*8 kPa*	*10 kPa*	*12 kPa*
7.35	Standard	1.00	1.30	1.69	2.19
	+ NIV	0.39	0.51	0.66	0.86
7.30	Standard	2.96	3.84	5.00	6.49
	+ NIV	1.15	1.50	1.95	2.53
7.25	Standard	9.98	12.97	16.85	21.90
	+ NIV	3.89	5.06	6.57	8.54

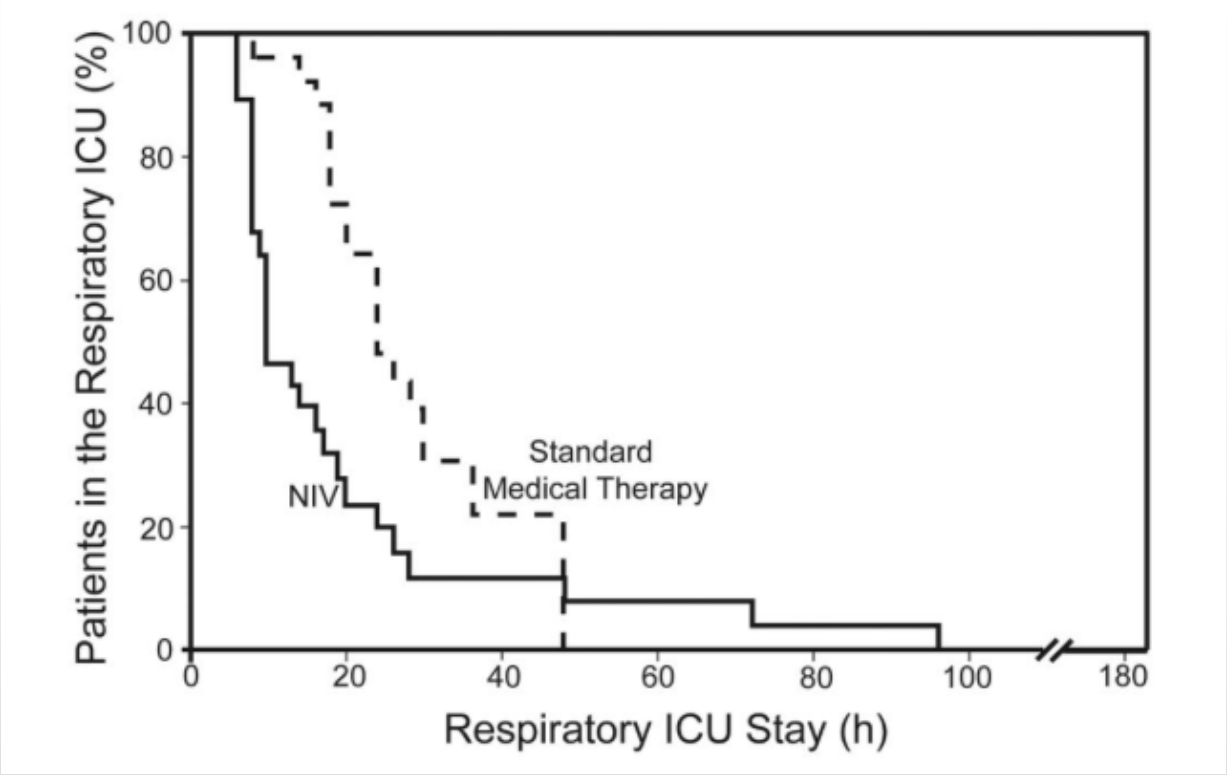
Σε ποιους ασθενείς με AECOPD και που θα πρέπει να εφαρμόζεται ο ΜΕΜΑ

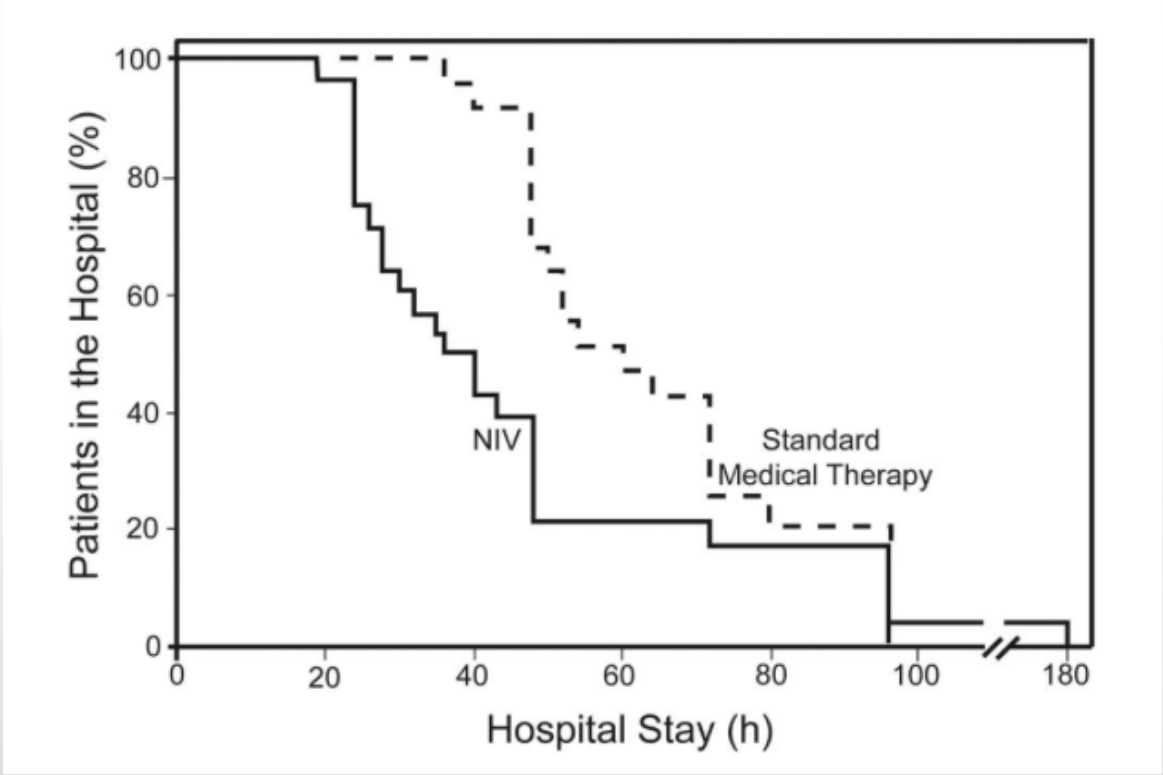
	Ward	ICU/HDU	Standard	NIV	IMV
pH> 7.35	✖		✖		
7.30<pH < 7.35	✖			✖	
7.25<pH<7.30	✖	✖		✖	
pH<7.25		✖		✖	✖

Non-Invasive Ventilation in Acute Asthma


acute and reversible episode of bronchospasm
↑ airway resistance
acute change in mechanical load
hyperinflation, ↑ resp.muscle effort, dyspnea
NIV ⇒ ↓ resp.muscle work

NIV in severe acute Asthma





Respir Care ***2010****;55(5): 536 –543*

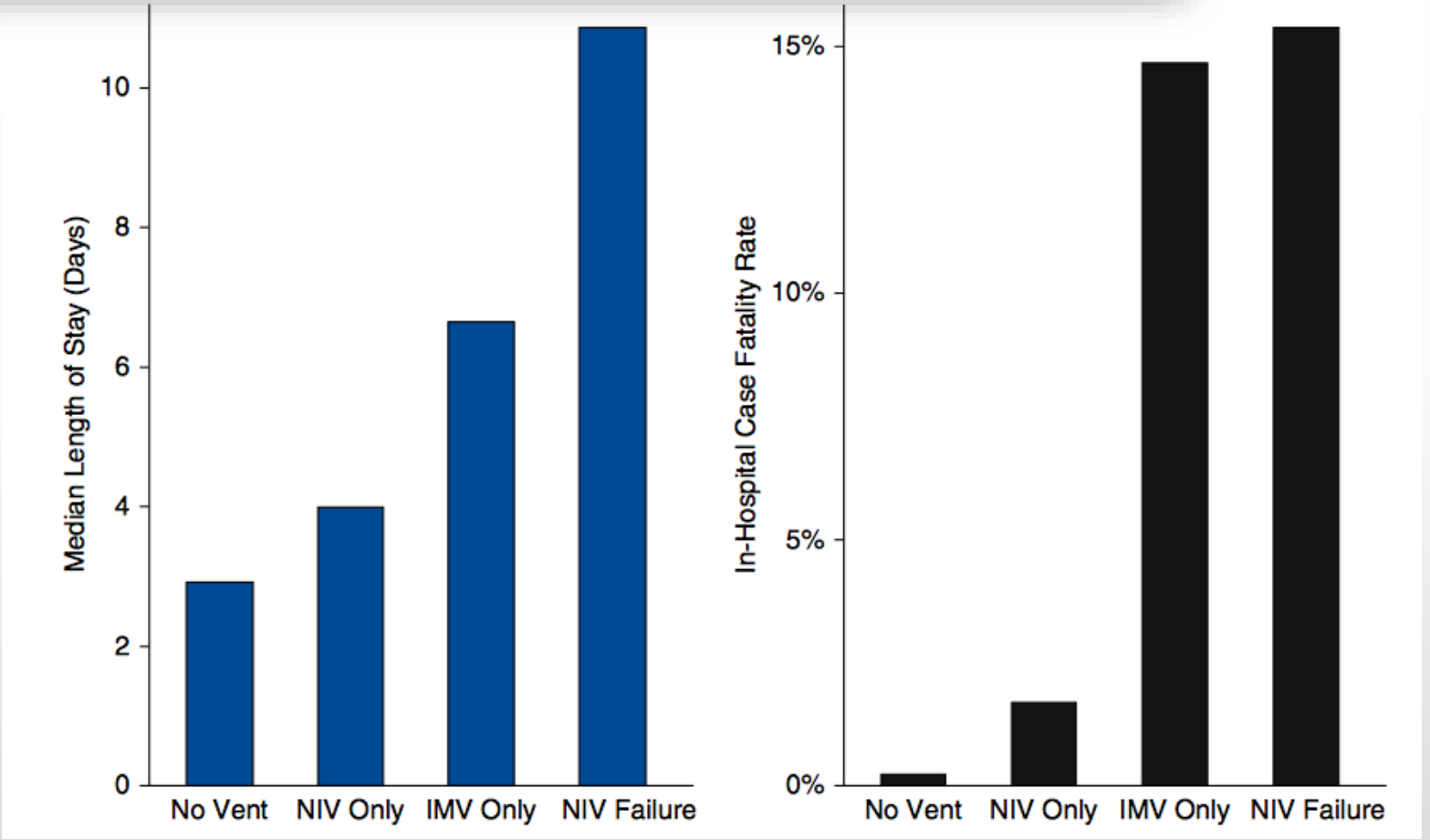
Outcomes of Noninvasive and Invasive Ventilation in Patients Hospitalized with Asthma Exacerbation

Mihaela S. Stefan[1,2,3], Brian H. Nathanson[4], Tara Lagu[1,2,3], Aruna Priya[1], Penelope S. Pekow[1,5], Jay S. Steingrub[6], Nicholas S. Hill[7], Robert J. Goldberg[8], David M. Kent[9], and Peter K. Lindenauer[1,2,3]

Retrospective cohort study, 97

USA hospitals, 4-years period:

- Use NIV was 4%
- Use IMV was 5%
- Failure rate of NIV was 4.7%



The increased risk of mortality for pts who fail NIV need careful monitoring to avoid delay in intubation

Ann Am Thorac Soc ***2016****; 13: 1096–1104.*

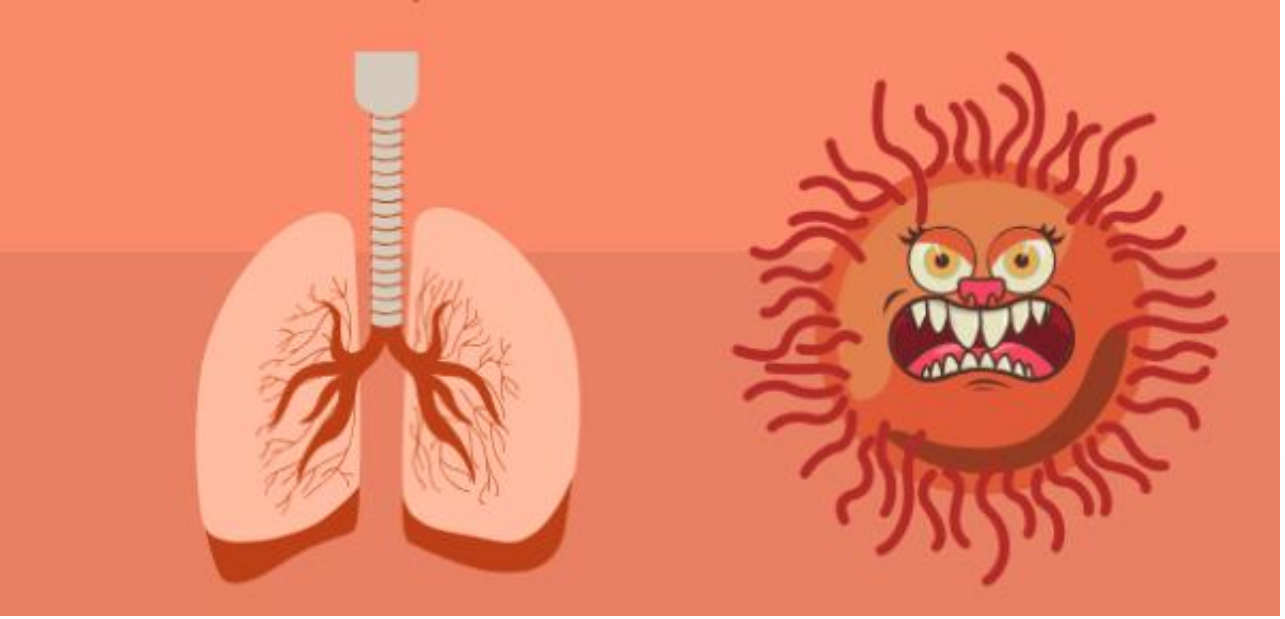
Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure

Bram Rochwerg[1], Laurent Brochard[2,3], Mark W. Elliott[4], Dean Hess[5], Nicholas S. Hill[6], Stefano Nava[7] and Paolo Navalesi[8] (members of the steering committee); Massimo Antonelli[9], Jan Brozek[1], Giorgio Conti[9], Miquel Ferrer[10], Kalpalatha Guntupalli[11], Samir Jaber[12], Sean Keenan[13,14], Jordi Mancebo[15], Sangeeta Mehta[16] and Suhail Raoof[17,18] (members of the task force)

Recommendation

Given the uncertainty of evidence we are unable to offer a recommendation on the use of NIV for ARF due to asthma.

Eur Respir J ***2017***; *50: 1602426*



Non-Invasive Ventilation in Acute Respiratory Failure due to pneumonia

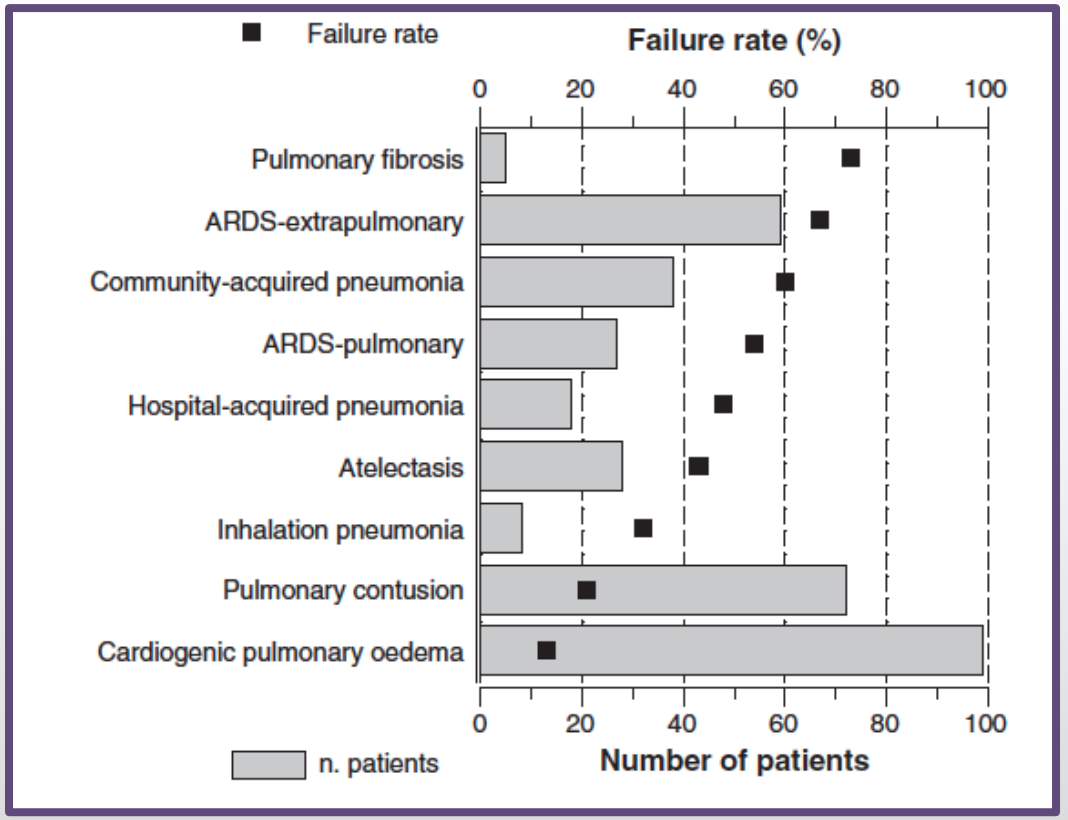
EUROPEAN JOURNAL OF INTERNAL MEDICINE

Review article

The use of non-invasive ventilation during acute respiratory failure due to pneumonia ☆

Miquel Ferrer [a,*], Roberto Cosentini [b], Stefano Nava [c]

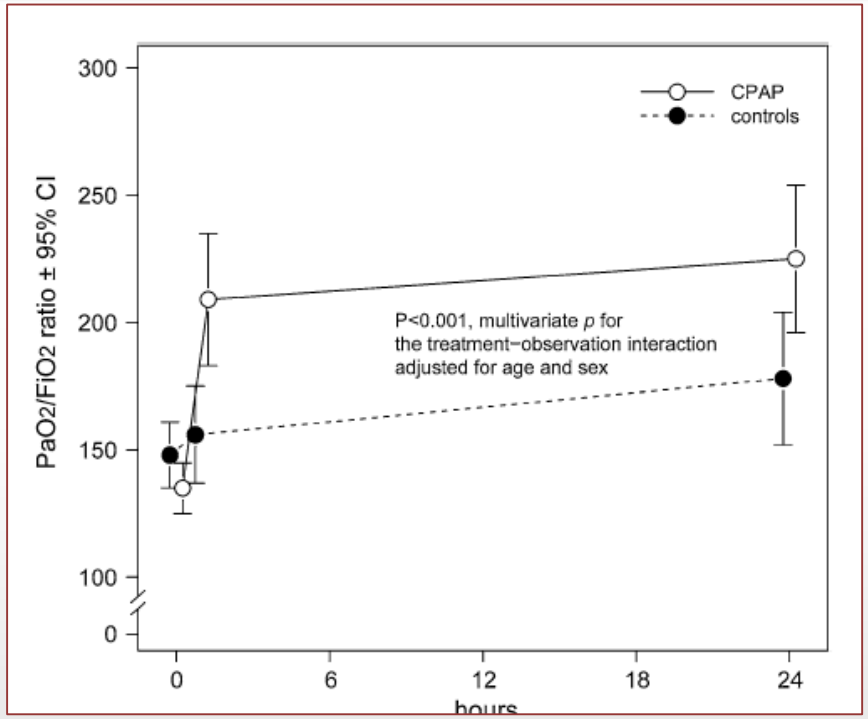
- Αμφιλεγόμενο όφελος
- Καλύτερη απάντηση έχουν αυτοί με προϋπάρχον καρδιακό ή αναπνευστικό νόσημα
- Χρήση NIV σε CAP πάντα με στενή παρακολούθηση του ασθενούς
- Αποτυχία NIV- καθυστέρηση διασωλήνωσης- μείωση επιβίωσης

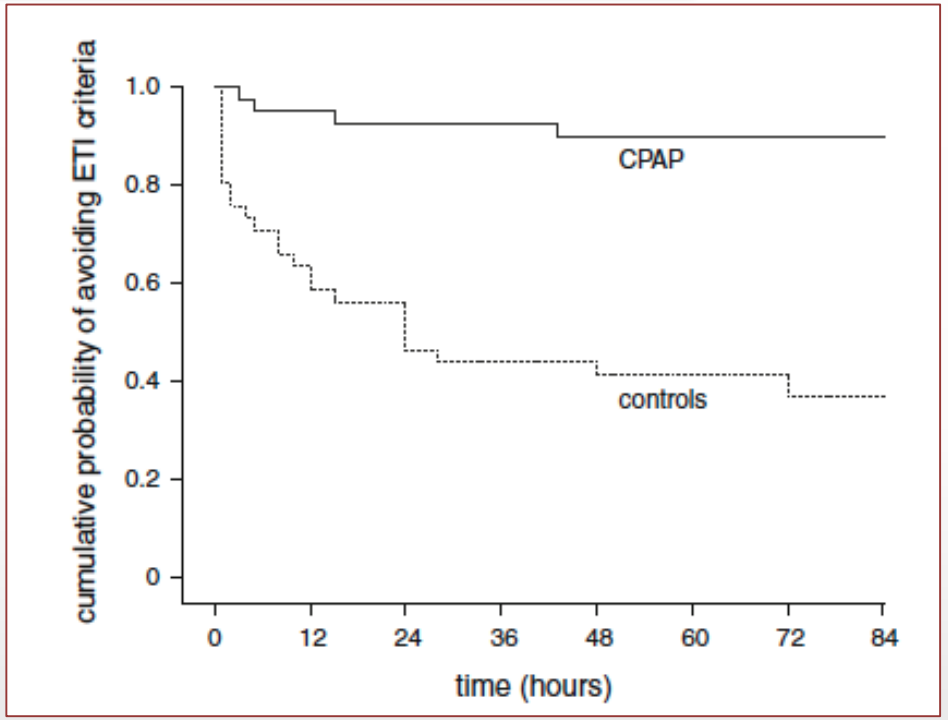


Eur J Intern Med **2012**; *23(5)420-8*

Intensive Care Medicine
July 2014, Volume 40, Issue 7, pp 942–949 | Cite as

Helmet CPAP vs. oxygen therapy in severe hypoxemic respiratory failure due to pneumonia





Characteristic	CPAP group ($n = 40$)	Control group ($n = 41$)	p
In-hospital mortality, n (%)	2 (5.0)	7 (17.1)	0.155[c]
Hospital length of stay, median (IQR) days[a]	14.5 (10.8–24.3) $n = 38$	14.0 (10.0–16.0) $n = 34$	0.122[d]
Discomfort to device, n (%)	6 (15.0)[b]	2 (4.9)	0.155[c]

Cochrane Library

Oxygen therapy for pneumonia in adults.

Zhang Y[1], Fang C, Dong BR, Wu T, Deng JL.

- Metanalysis 3 RCTs, 151 pts Non-Invasive Ventilation and oxygen therapy via venturi mask
- Non-Invasive ventilation
  - ↓ need for ETI *(OR 0.28, 95% CI: 0.09–0.88)*
  - ↓ mortality *(OR 0.26, 95% CI: 0.11-0.61)*
  - ↓ Length of ICU stay *(OR -1.00, 95% CI: -2.05 to -0.05)*

Cochrane Database Syst Rev. **2012**;(3):CD006607

Contents lists available at ScienceDirect

American Journal of Emergency Medicine

journal homepage: www.elsevier.com/locate/ajem

Outcomes and predictors of failure of non-invasive ventilation in patients with community acquired pneumonia in the emergency department☆·☆☆

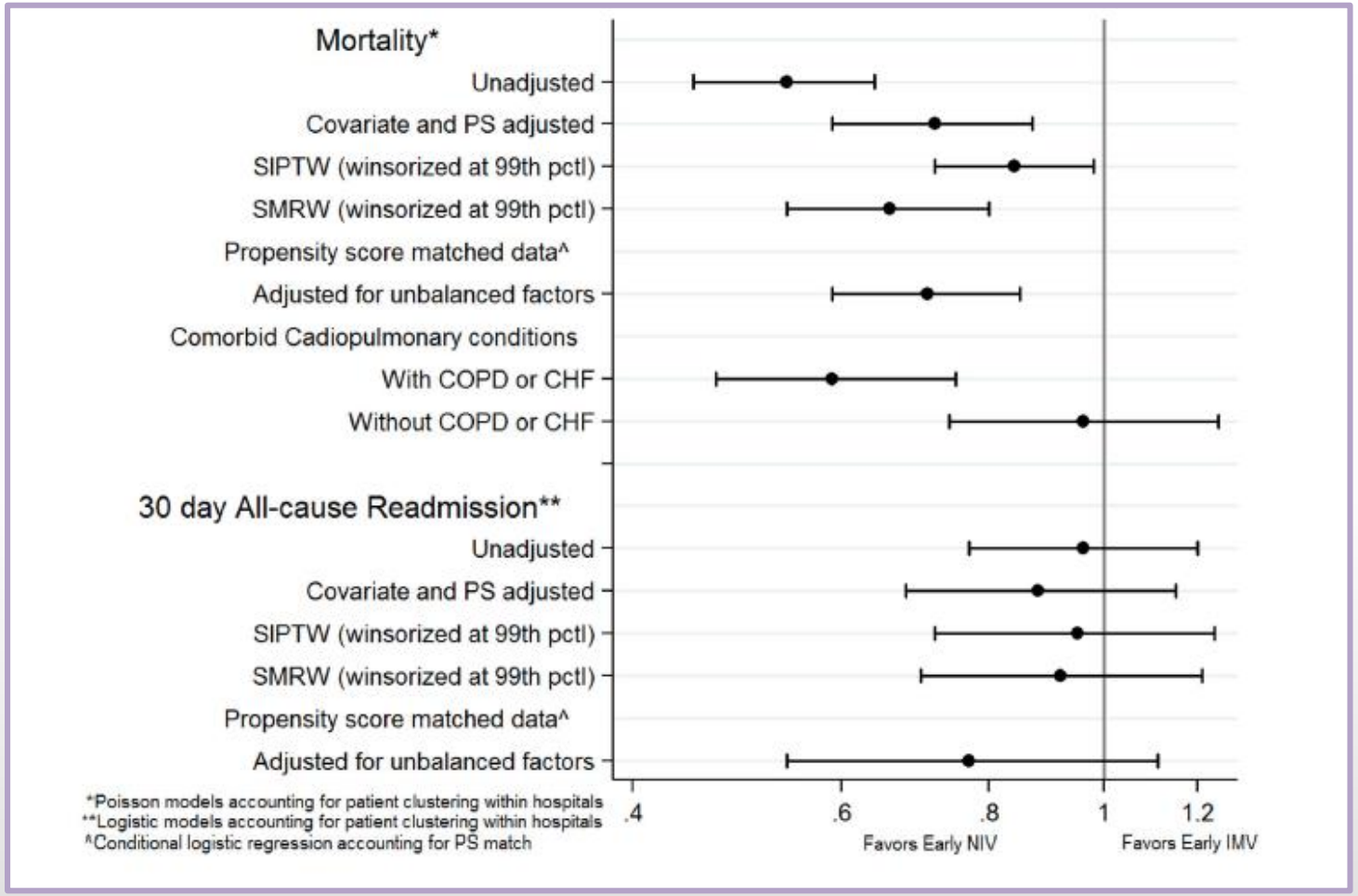
Amjad Al-Rajhi, MD [a], Anwar Murad, MD [a], P.Z. Li, MSc [b], Jason Shahin, MSc [a,b,c,*]

[a] Department Critical Care Medicine, McGill University, Montreal, Quebec, Canada
[b] Respiratory Epidemiology Clinical Research Unit, Montreal Chest Institute, Montreal, Quebec, Canada
[c] Department of Medicine, McGill University, Montreal, Quebec, Canada

Am J Emerg Med **2018** ;36(3):347-351

Hemodynamic support is a strong predictor of NIV failure

Characteristics	Whole NIV cohort (163)	Successful NIV (81)	Failed NIV (82)	p-Value[a]
Demographics				
Mean age, n (SD)	73(13)	75(13)	71(13)	0.02
Male sex, n (%)	101(62)	49(60.5)	52(63.4)	0.70
Acute severity of illness				
Mean APACHE II score (SD)	13.4(6.7)	12.7(6)	14.2(7.2)	0.21
Severe comorbidities n (%)				
Any prior illness	154(94.5)	79(97.5)	75(91.5)	0.09
Severe cardiovascular disease	43(26.4)	25(30.9)	18(22)	0.20
Severe respiratory disease	29(17.8)	17(21)	12(14.6)	0.30
History of COPD	51(31.3)	35(43.2)	16(19.5)	0.001
Renal disease	27(16.6)	15(18.5)	12(14.6)	0.51
Chronic liver disease	6(3.7)	3(3.7)	3(3.7)	0.99
Hematologic malignancy	5(3.1)	3(3.7)	2(2.4)	0.64
Metastatic disease	16(9.8)	7(8.6)	9(11)	0.62
Immunological dysfunction	17(10.4)	5(6.2)	12(14.6)	0.10
Interstitial lung disease	7(4.3)	2(2.5)	5(6.1)	0.30
Neuromuscular disease	5(3.1)	2(2.5)	3(3.7)	0.70
Dementia	17(10.4)	11(13.6)	6(7.3)	0.20
No. of CXR quadrants affected n (%)				
1	73(44.8)	50(61.7)	23(28.1)	<0.001
2	55(33.7)	22(27.2)	33(40.2)	
3	21(12.9)	7(8.6)	14(17.1)	
4	14(8.6)	2(2.5)	12(14.6)	
Physiological parameters prior to ventilation				
Need for haemodynamic support n (%)	12(7.4)	1(1.2)	11(13.4)	0.003
Mean arterial pressure (SD)	92.3(24.6)	93.3(24.4)	91.3(25)	0.59
Respiratory rate, mean (SD)	30.3(7.8)	30.1(7.2)	30.5(8.4)	0.81
PaO_2/FiO_2 ratio, mean (SD)	145(91.1)	161.3(95.8)	133.1(86.3)	0.10
pH, mean (SD)	7.30(0.10)	7.30(0.10)	7.30(0.20)	0.80
$PaCO_2$, mean(SD)	54.8(26)	58.1(25.4)	51(26.8)	0.02
Mean tidal volume achieved in cc (SD)	575(170.5)	578(175)	572(167)	0.84
Final destination from ED n (%)				
Critical care unit	111(68.1)	32(39.5)	79(96.3)	<0.001
Ward	48(29.4)	45(55.6)	3(3.7)	
Home	4(2.5)	4(4.9)	0(0)	
Acute hospital mortality n (%)	47(28.8)	13(16.1)	34(41.5)	<0.001
Median length of hospital stay (IQR)	14(8–26)	10(5–17)	22.5(12–38)	<0.001



Predictors of NIV failure:

- principal diagnosis of ARF
- weight loss
- use of vasopressors in the first 24 hours of admission
- initial admission to ICU

J Crit Care. ***2018*** *; 43: 190–196.*

Intensive Care Med (2012) 38:458–466
DOI 10.1007/s00134-012-2475-6

ORIGINAL

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Non-invasive ventilation in community-acquired pneumonia and severe acute respiratory failure

	Adj. OR	95% CI	*p* value	AUC	Optimal cut-off	Sensitivity (%)	Specificity (%)	Likelihood ratio	
								Positive	Negative
Maximum SOFA during NIV	1.442	1.187–1.753	<0.001	0.86	≥7	81	80	4.08	0.24
Worsening X-ray infiltrate 24 h after onset of NIV	84.23	16.74–423.8	<0.001	–	–	77	86	5.58	0.27
Heart rate 1 h after NIV onset, min^{-1}	1.064	1.029–1.100	<0.002	0.68	≥104	63	67	1.93	0.55
PaO_2/FiO_2 ratio 1 h after NIV onset, mmHg	0.980	0.965–0.996	0.012	0.78	<144	53	91	5.58	0.52
HCO_3 1 h after NIV onset, mEq/L	0.802	0.711–0.905	<0.001	0.77	<23	67	68	2.72	0.48

Multivariate analysis of predictors of NIV outcome

Others indication of Non-Invasive Ventilation

NIV in Neuromuscular disorders

- Any elevation of pCO2
- Do not wait for acidosis to develop
- VC<1lt, RR>20/min EVEN normocapnic
- Intubation should not be delayed if NIV is failing

Lancet Neurol ***2006****; 5: 140–47*
Thorax ***2016****;71:ii1–ii35.*

NIV in pts with ARF receiving palliative care

RCTs in pts with advanced cancer

- Reduce dyspnea
- Reduce the dose of morphine

Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure

Bram Rochwerg[1], Laurent Brochard[2,3], Mark W. Elliott[4], Dean Hess[5], Nicholas S. Hill[6], Stefano Nava[7] and Paolo Navalesi[8] (members of the steering committee); Massimo Antonelli[9], Jan Brozek[1], Giorgio Conti[9], Miquel Ferrer[10], Kalpalatha Guntupalli[11], Samir Jaber[12], Sean Keenan[13,14], Jordi Mancebo[15], Sangeeta Mehta[16] and Suhail Raoof[17,18] (members of the task force)

Recommendation

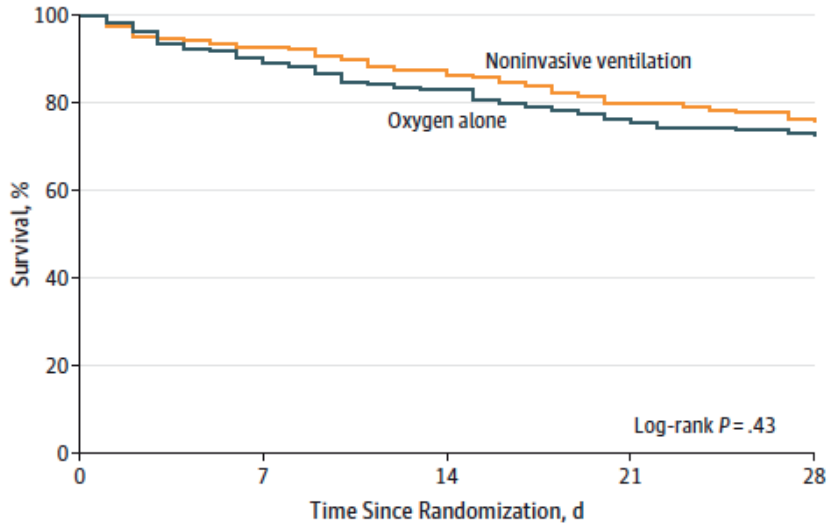
We suggest offering NIV to dyspnoeic patients for palliation in the setting of terminal cancer or other terminal conditions. (Conditional recommendation, moderate certainty of evidence.)

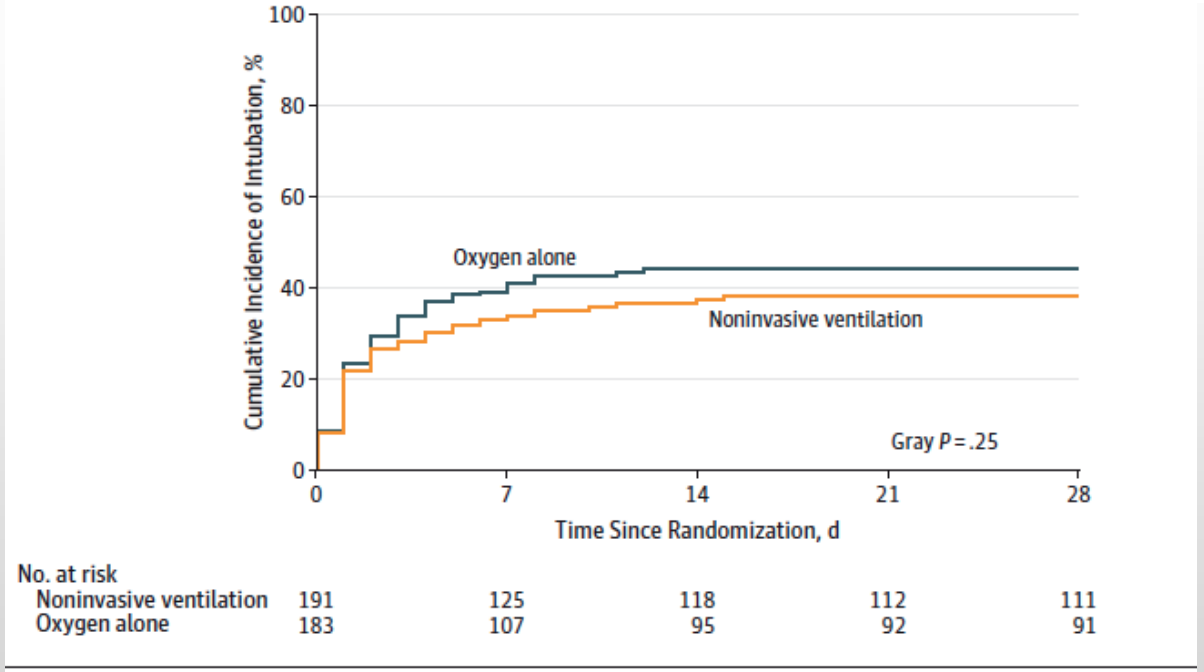
Lancet Oncol **2013**; 14: 219–227
Eur Respir J **2017**; 50: 1602426

NIV σε ανοσοκαταστολή

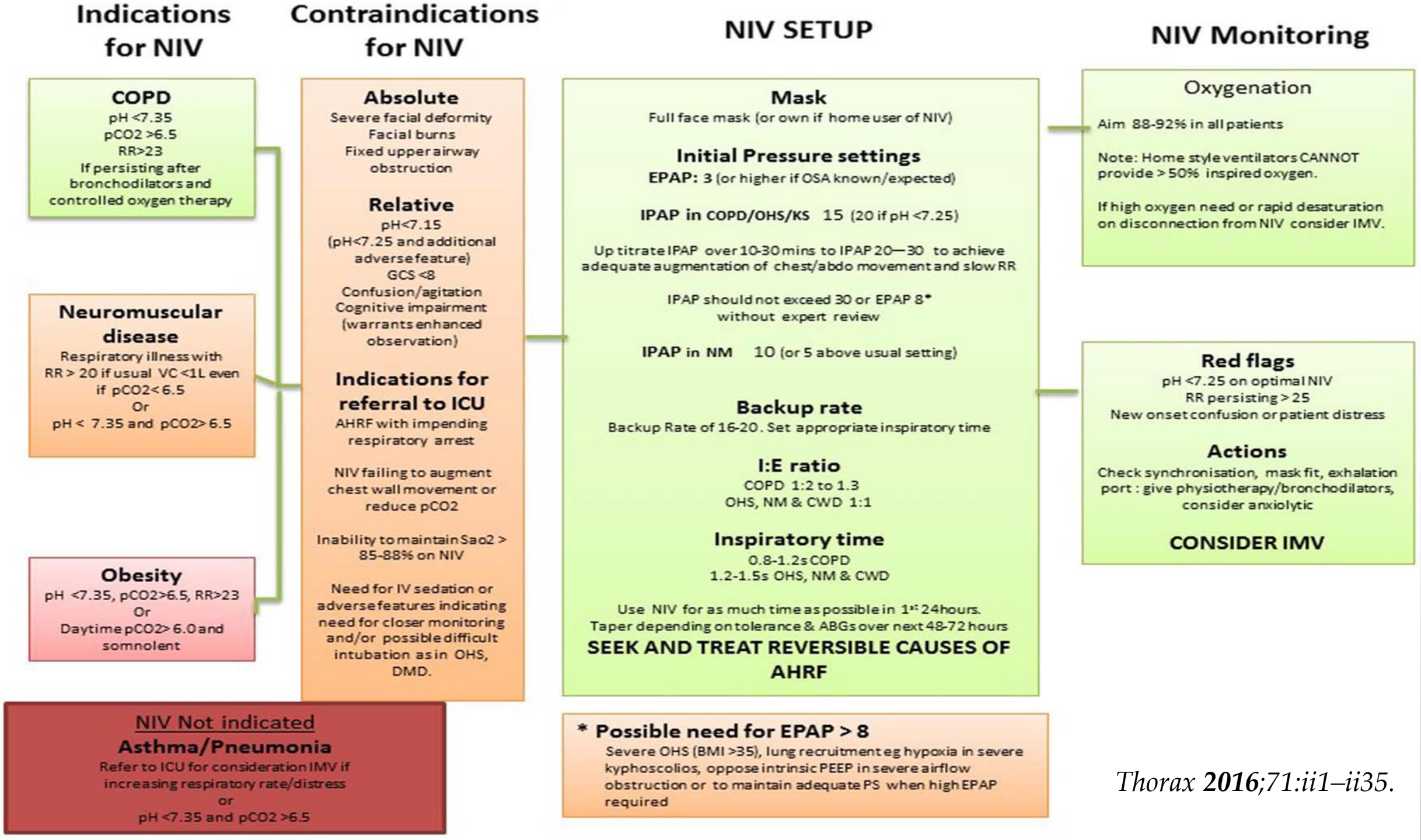
Factor	Odds Ratio[a] Point Estimate (95% Confidence Limits)
Initial ventilatory support: Noninvasive Mechanical Ventilation vs. Invasive Mechanical Ventilation	0.73 (0.53–1.00)
Hematologic Malignancy: Admission Diagnosis vs. Comorbidity	1.34 (1.03–1.73)
Admission from Another Intensive Care Unit vs. Medical Ward	0.98 (0.60–1.60)
Admission from Emergency Department vs. Medical Ward	0.66 (0.49–0.88)
Admission from Surgical Ward vs. Medical Ward	0.62 (0.42–0.92)
Acute Lung Injury	1.69 (1.16–2.47)
Adult Respiratory Distress Syndrome	2.09 (1.32–3.31)
Stroke	2.29 (1.11–4.75)
Septic Shock	2.43 (1.61–3.65)
Other Type of Shock	2.16 (1.24–3.76)
Coagulopathy	1.59 (1.13–2.23)
Coma	1.68 (1.05–2.69)
Age	1.01 (1.01–1.02)
Simplified Acute Physiology Score II (each 4-point increase)	4.66 (2.98–7.28)
Propensity score	5.07 (1.40–18.32)

Crit Care Med ***2011****; 39:000–000)*





JAMA ***2015****;314(16):1711-9*



Thorax **2016**;71:ii1–ii35.


THANK YOU
FOR YOUR
ATTENTION