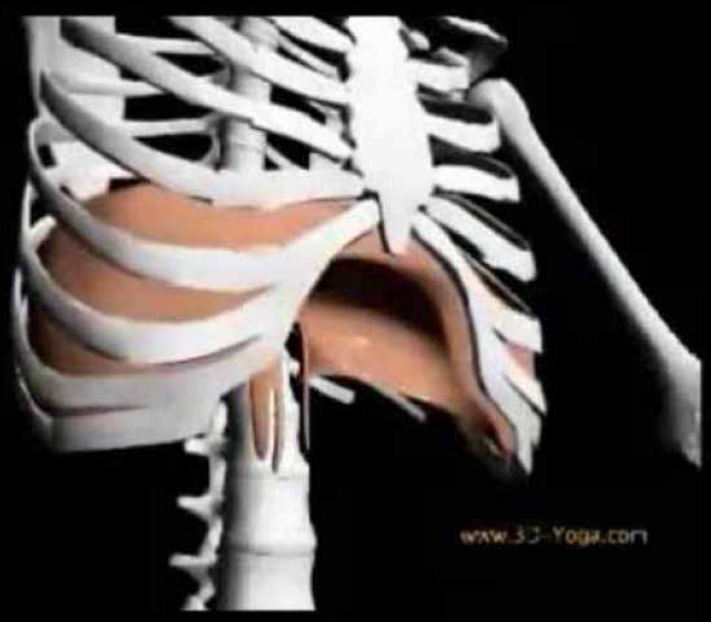
VMNI en el pacient ancià: Escenaris clínics i evidència científica

- Dra. Eva Lista.
- Servei d'Urgències. Hospital Universitari de Bellvitge. L'Hospitalet de Llobregat. **elista@bellvitgehospital.cat**
- Coordinadora GdT VMNI. Membre del GdT GERIURG. SOCMUE

¿PARA QUÉ SIRVE LA VMNI?



PARA QUE SIRVE

LA VMNI

La VENTILACION MECANICA proporciona

SOPORTE VENTILATORIO

Y ese soporte ventilatorio *sólo* nos permite comprar tiempo!!!

TIEMPO CLINICO :

reducir los síntomas asociados a la I.R.A.

TIEMPO TERAPEUTICO …

que el tratamiento ESPECIFICO RESUELVA LA CAUSA

TIEMPO *al* CLINICO… el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

Y ese soporte ventilatorio *sólo* nos permite comprar tiempo!!!

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TIEMPO CLINICO :

reducir los síntomas asociados a la I.R.A.

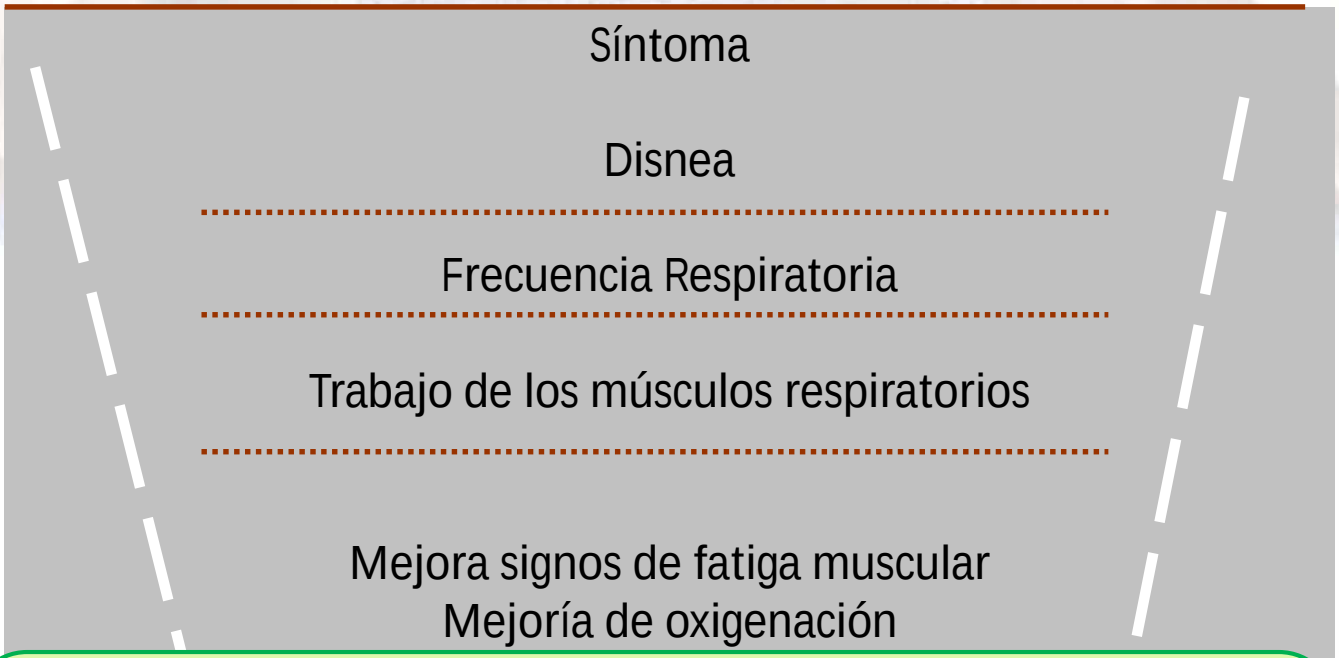
SIGNOS de insuficiencia respiratoria ***aguda***

Y

Presencia de ***trabajo respiratorio*** (work of breathing –WOB-)

TIEMPO CLINICO :

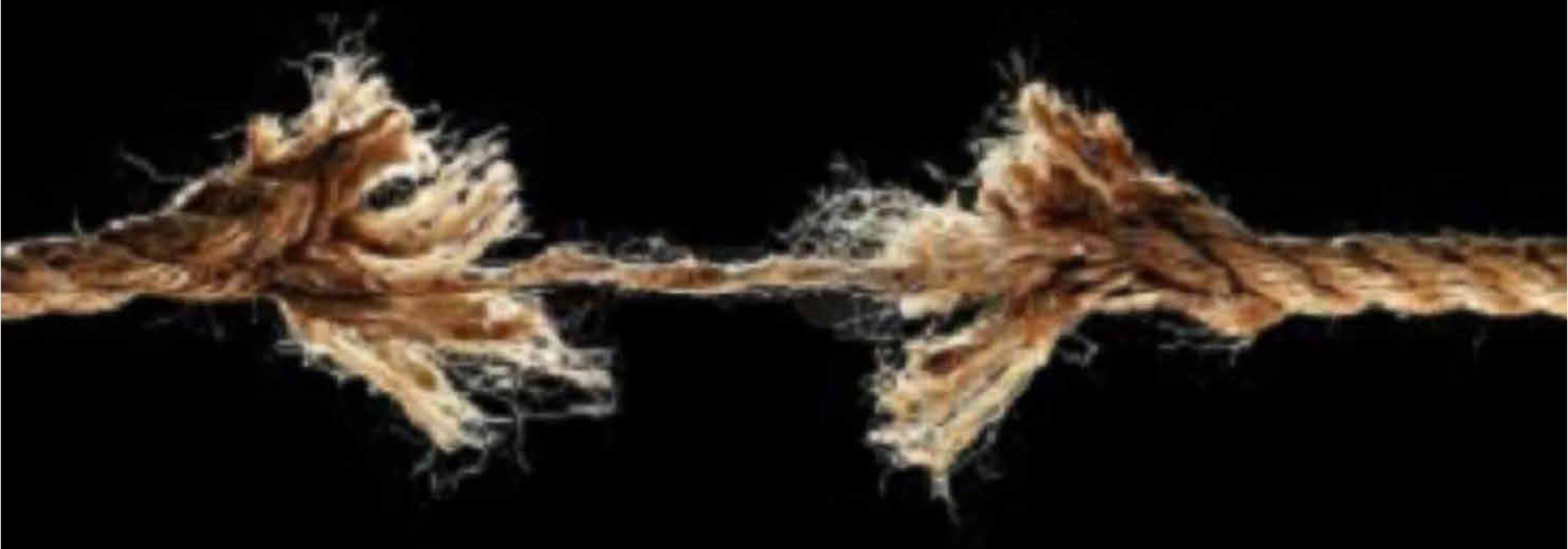
reducir los síntomas asociados a la I.R.A.



DEL SINTOMA AL SIGNO :

MEJORIA CLINICA PRECOZ A LOS CAMBIOS NUMÉRICOS

SIGNOS de insuficiencia respiratoria ***aguda***



INSUFICIENCIA VENTILATORIA

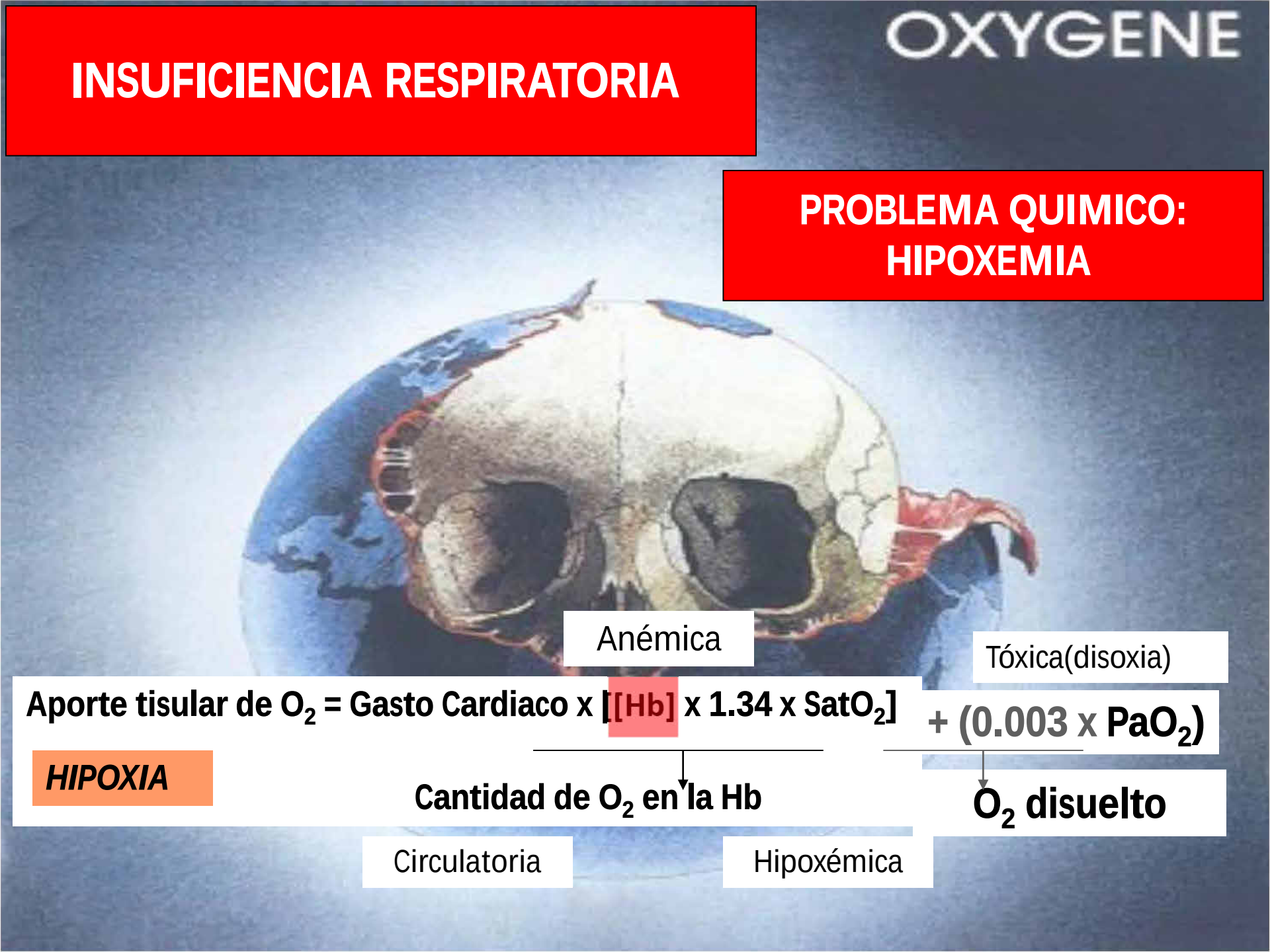
INSUFICIENCIA RESPIRATORIA

I.VENTILATORIA: PROBLEMA NEUROMECANICO

¡¡¡FATIGA DIAFRAGMATICA!!!

INSUFICIENCIA RESPIRATORIA

PROBLEMA QUIMICO: HIPOXEMIA



Anémica

Tóxica(disoxia)

Aporte tisular de O_2 = Gasto Cardiaco x [[Hb] x 1.34 x $SatO_2$] + (0.003 x PaO_2)

HIPOXIA

Cantidad de O_2 en la Hb

O_2 disuelto

Circulatoria

Hipoxémica

TIEMPO CLINICO :

reducir los síntomas asociados a la I.R.A.

Presencia de ***trabajo respiratorio*** (work of breathing –WOB-)

¿COMO LO PUEDO VALORAR?

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

Presencia de ***trabajo respiratorio*** (work of breathing –WOB-)

¿COMO LO PUEDO VALORAR?

DISNEA:

ESCALA BORG

FRECUENCIA RESPIRATORIA

WOB:

ESCALA PATRICK

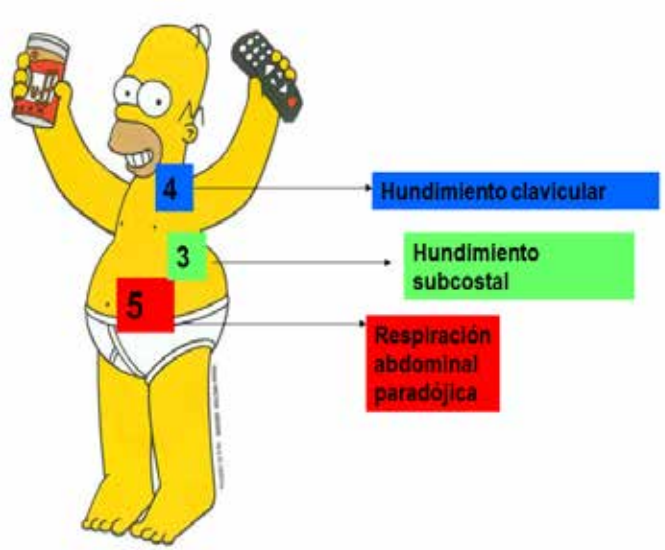
SIGNOS CLINICOS DE FATIGA DIAFRAGMATICA

Respiratory muscles: the vital pump.

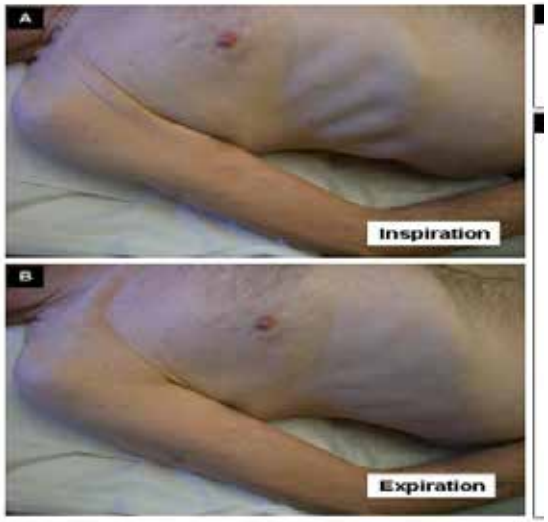
P T Macklem

Chest 1980;78;753-758
DOI 10.1378/chest.78.5.753

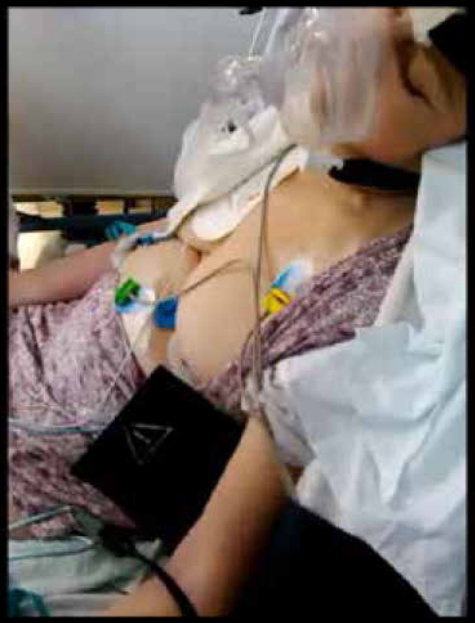
HOOVER'S SIGN

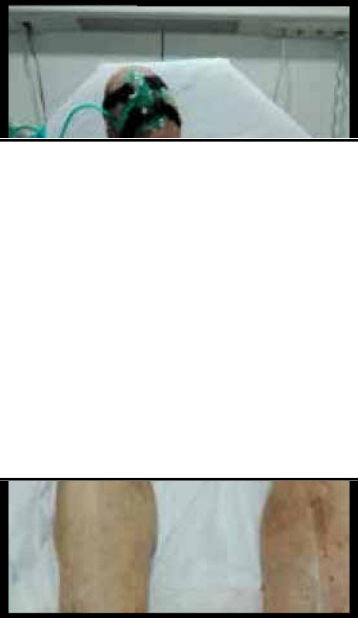


ESCALA PATRICK



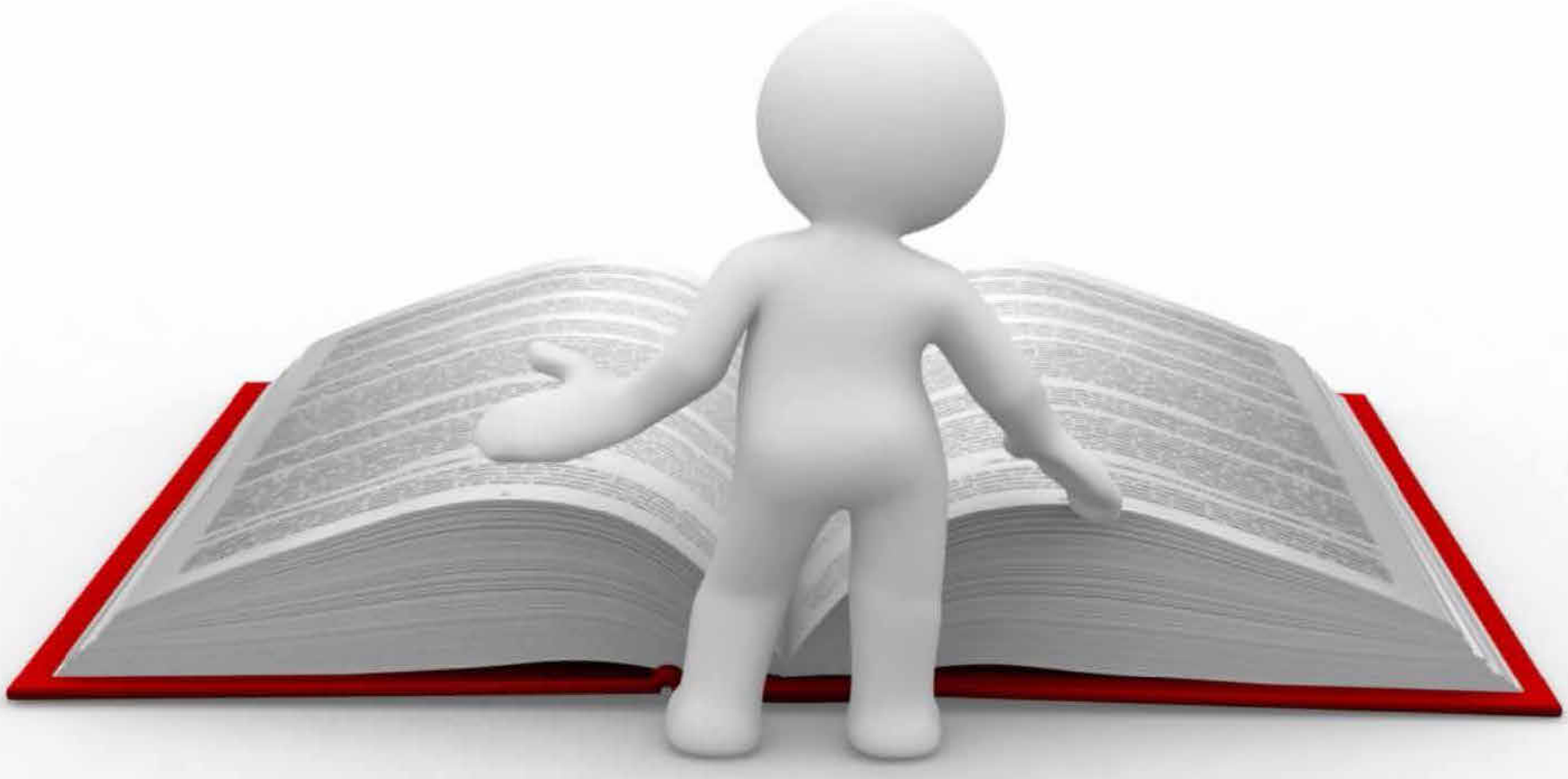
Respiratory muscles: the vital pump.





Entonces...

¿qué pacientes se benefician de aplicar VMNI ?



¿qué pacientes se benefician de aplicar VMNI ?

EXPERTO

END POINT VMNI:

EVITAR IOT

REDUCIR MORTALIDAD

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

¿qué pacientes se benefician de aplicar VMNI ?

PACIENTE

ESCENARIOS CLINICOS:

SERVICIOS DE URGENCIAS

SISTEMAS DE EMERGENCIAS MEDICAS

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

Y ese soporte ventilatorio *sólo* nos permite comprar tiempo!!!

TIEMPO CLINICO :

reducir los síntomas asociados a la I.R.A.

TIEMPO TERAPEUTICO …

que el tratamiento ESPECIFICO RESUELVA LA CAUSA

TIEMPO *al* CLINICO… el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

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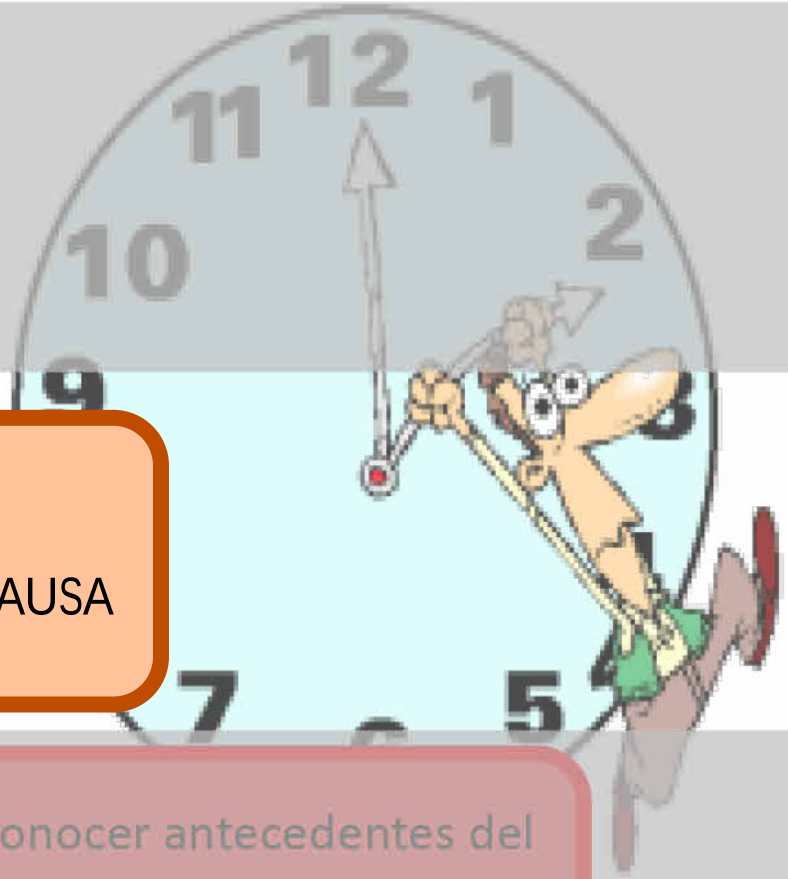
reducir los síntomas asociados a la I.R.A.



TIEMPO TERAPEUTICO ...

que el tratamiento ESPECIFICO RESUELVA LA CAUSA

TIEMPO *al* CLINICO... el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

TIEMPO TERAPEUTICO …

que el ***TRATAMIENTO ESPECIFICO*** resuelva la causa

CAUSAS DE I.R.A

ESCENARIOS CLÍNICOS

¡¡NO SON SINÓNIMOS!!

Síndrome HIPOXÉMICO

Ocupación alveolar

NO SON TODAS

LAS "IRAS" IGUALES

Presencia de I.R. **AGUDA**

+

Trabajo respiratorio **WOB**

Síndrome HIPERCÁPNICO ACIDÓTICO

Fracaso diafragmático

IMPORTANCIA DEL ESCENARIO CLINICO

¿ CUALQUIER PROCESO QUE CURSA CON I.RA. Y/O TRABAJO RESPIRATORIO SE BENEFICIA SIEMPRE DE VMNI?

NO

¡¡¡DEPENDE DEL ESCENARIO CLÍNICO!!!

¿EN QUÉ ESCENARIOS CLÍNICOS LA VMNI....

...puede reducir la tasa de IOT?

...puede reducir la mortalidad?

ESCENARIOS CLÍNICOS

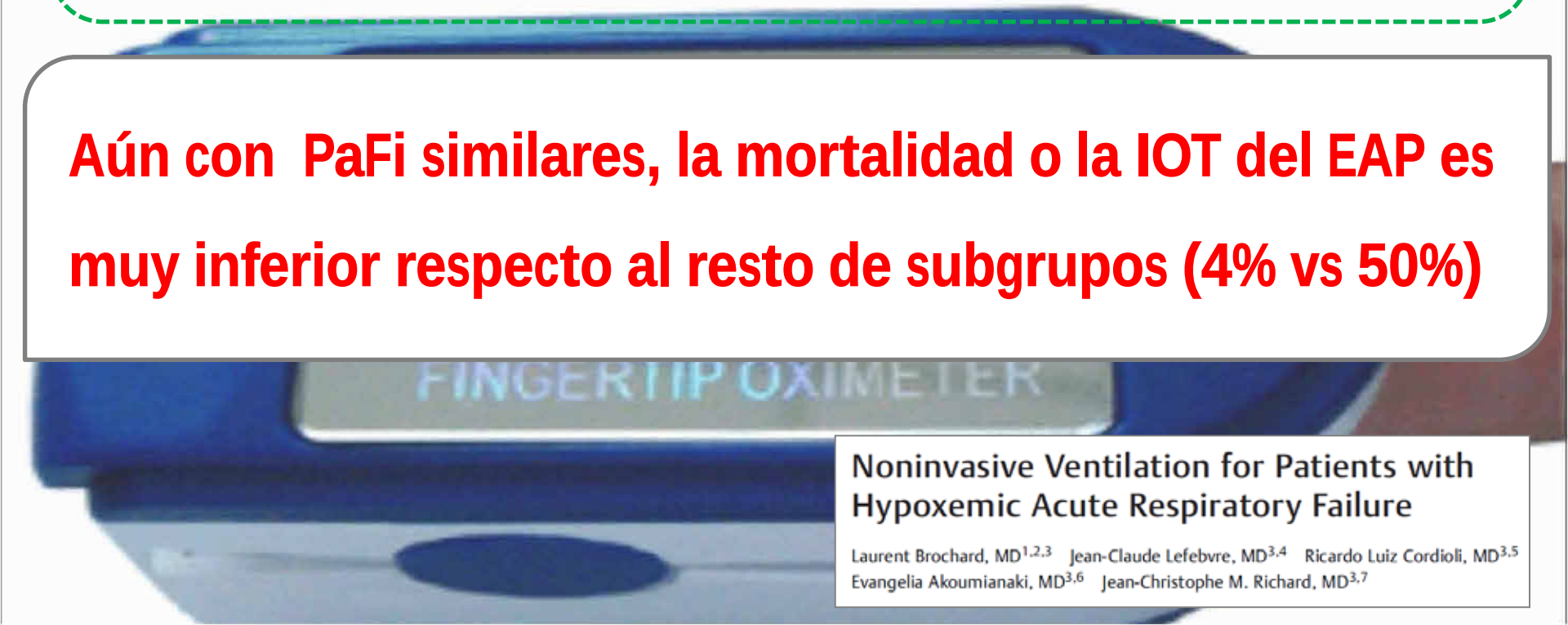
- **IRA de novo**
  - No immunocomprometido
  - Inmunocomprometido
- ***Acute on chronic***
- **Edema Agudo de Pulmón**

Síndrome HIPOXÉMICO

Ocupación alveolar

NEUMONIA | **EAP** | **SDRA**

Aún con PaFi similares, la mortalidad o la IOT del EAP es muy inferior respecto al resto de subgrupos (4% vs 50%)



Noninvasive Ventilation for Patients with Hypoxemic Acute Respiratory Failure

Laurent Brochard, MD[1,2,3] Jean-Claude Lefebvre, MD[3,4] Ricardo Luiz Cordioli, MD[3,5]
Evangelia Akoumianaki, MD[3,6] Jean-Christophe M. Richard, MD[3,7]

PACIENTE HIPOXÉMICO

NEUMONIA

EAP

SDRA

NEUMONIA EN IMMUNODEPRIMIDO

NEUMONIA EN IMMUNOCOMPETENTE (NAC)

NEUMONIA POR GRIPE A

PACIENTE HIPOXÉMICO

NEUMONIA

¿Puede reducir la tasa de IOT?

¿Puede reducir la mortalidad?

NEUMONIA

NEUMONIA EN IMMUNODEPRIMIDO

Respiratory Medicine (2012) 106, 1509–1516

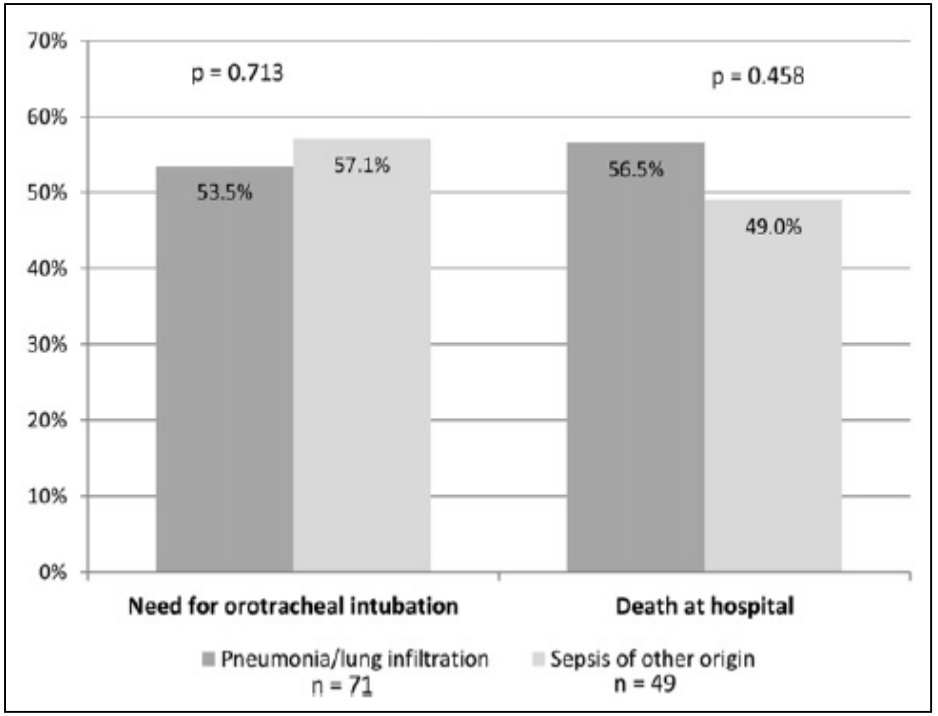
Available online at www.sciencedirect.com

SciVerse ScienceDirect

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

Non-invasive ventilation in immunosuppressed patients with pneumonia and extrapulmonary sepsis

Peter Razlaf [a], Dirk Pabst [b], Michael Mohr [c], Torsten Kessler [c], Rainer Wiewrodt [c], Matthias Stelljes [c], Holger Reinecke [d], Johannes Waltenberger [a], Wolfgang E. Berdel [c], Pia Lebiedz [a,*]



NIV failure 55%

NEUMONIA

NEUMONIA EN IMMUNOCOMPETENTE (NAC)

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

ORIGINAL

Andres Carrillo
Gumersindo Gonzalez-Diaz
Miquel Ferrer
Maria Elena Martinez-Quintana
Antonia Lopez-Martinez
Noemi Llamas
Maravillas Alcazar
Antoni Torres

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

Table 2 Variables associated with successful and unsuccessful treatment with non-invasive ventilation in patients with "de novo" ARF and previous cardiac or respiratory disease

"De novo" ARF			Previous cardiac or respiratory disease		
NIV success ($n = 55$)	NIV failure ($n = 47$)	p value	NIV success ($n = 61$)	NIV failure ($n = 21$)	p value

N= 102

N= 82

NIV failure 46%
Mort 28%

NIV failure 26%
Mort 23%

NEUMONIA EN IMMUNOCOMPETENTE (NAC)

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

El ESCENARIO CLÍNICO modifica la tasa de IOT

IRA de novo	*Acute on chronic*
NIV failure 46%	**NIV failure 26%**
Mort 28%	**Mort 23%**
N= 102	N= 82

NEUMONIA

NEUMONIA POR GRIPE A

ORIGINAL ARTICLE INFECTIOUS DISEASES

Early non-invasive ventilation treatment for severe influenza pneumonia

J. R. Masclans[1,2], M. Pérez[1], J. Almirall[2,3], L. Lorente[4], A. Marqués[5], L. Socias[6], L. Vidaur[2,7], J. Rello[1,2] and H1N1 GTEI/SEMICYUC Investigators*

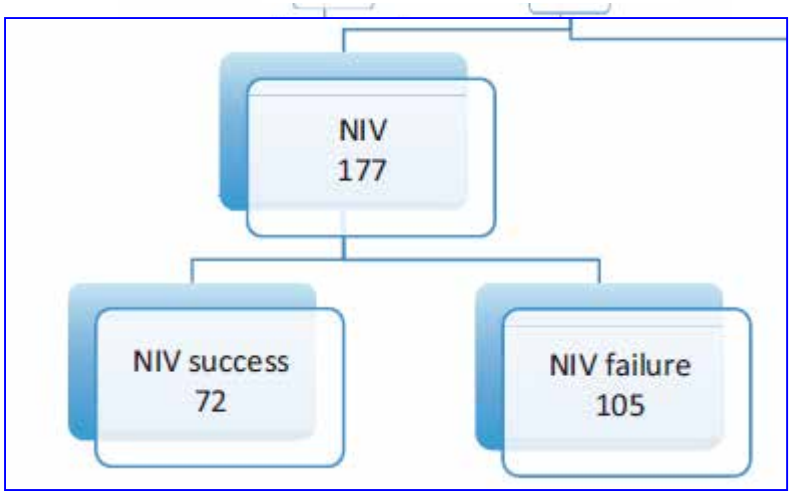
1) Critical Care Department, Vall d'Hebron University Hospital, Vall d'Hebron Research Institute (VHIR), Universitat Autònoma de Barcelona, Barcelona, 2) CIBERes, Instituto de Salud Carlos III, Madrid, 3) Critical Care Department, Hospital de Mataró, Mataró, Barcelona, 4) Critical Care Department, Hospital Universitario de Canarias, La Laguna, 5) Critical Care Department, Hospital de la Ribera, Valencia, 6) Critical Care Department, Hospital Son Llatzer de Mallorca, Palma de Mallorca and 7) Critical Care Department, Hospital Donostia, San Sebastian, Spain

NIV failure 59%

Mortalidad semejante:

26.5% grupo de IOT post VNI

24.2% grupo de IOT inicial



PACIENTE HIPOXÉMICO

NEUMONIA

¿Puede reducir la tasa de IOT?

- **NEUMONIA EN INMUNODEPRIMIDO**
- **NEUMONIA EN INMUNOCOMPETENTE (NAC)**
- **NEUMONIA POR GRIPE A**

N O*

*** EXCEPTO EN LA NAC EN EL ACUTE ON CHRONIC**

PACIENTE HIPOXÉMICO

NEUMONIA

¿Puede reducir la MORTALIDAD?

- **NEUMONIA EN INMUNODEPRIMIDO**
- **NEUMONIA EN INMUNOCOMPETENTE (NAC)**
- **NEUMONIA POR GRIPE A**

N O

LA MORTALIDAD ESTÁ RELACIONADA CON LA GRAVEDAD POR APACHEII, SAPS Y PAFI

PACIENTE HIPOXÉMICO

NEUMONIA

EAP

SDRA

O2 CONVENCIONAL VS VMNI

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

Vital FMR, Ladeira MT, Atallah ÁN

THE COCHRANE COLLABORATION®

VMNI VS IOT

ORIGINAL

Noninvasive mechanical ventilation in acute respiratory failure: trends in use and outcomes

PACIENTE HIPOXÉMICO

EAP

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

Vital FMR, Ladeira MT, Atallah ÁN

THE COCHRANE COLLABORATION®

AUTHORS' CONCLUSIONS

Implications for practice

Data from RCTs have demonstrated that NPPV (CPAP and bilevel NPPV) is effective in reducing hospital mortality, intubation rate and ICU length of stay. In addition, NPPV resulted in faster improvement and was better tolerated than SMC. Further, our meta-analysis did not demonstrate an increase in the incidence of acute myocardial infarction during and after NPPV application. We show a lower risk of progressive respiratory distress and neurological failure (coma) when compare NPPV to SMC and cardiorespiratory arrest when compare only CPAP to SMC as well as a lower risk of arrhythmia when comparing CPAP to bilevel NPPV. CPAP can be considered the first option in selection of NPPV due to more robust evidence for its effectiveness and safety and lower costs compared with bilevel NPPV.

O2 CONVENCIONAL VS VMNI

¿Puede reducir la tasa de IOT?

O2 CONVENCIONAL VS VMNI

- Reduce mortalidad hospitalaria: NNT 14

  (CPAP NNT 9)

- Reduce la tasa de IOT: NNT 8

  (CPAP NNT 7)

SÍ

PACIENTE HIPOXÉMICO

EAP

ORIGINAL

Noninvasive mechanical ventilation in acute respiratory failure: trends in use and outcomes

VMNI VS IOT

¿Puede reducir la MORTALIDAD?

Study group	
Acute-on-chronic respiratory failure	1,036 (33 %)
Cardiogenic pulmonary edema	1,156 (36 %)
Immunocompetent	510 (16.1)
Immunocompromised	461 (14.6)

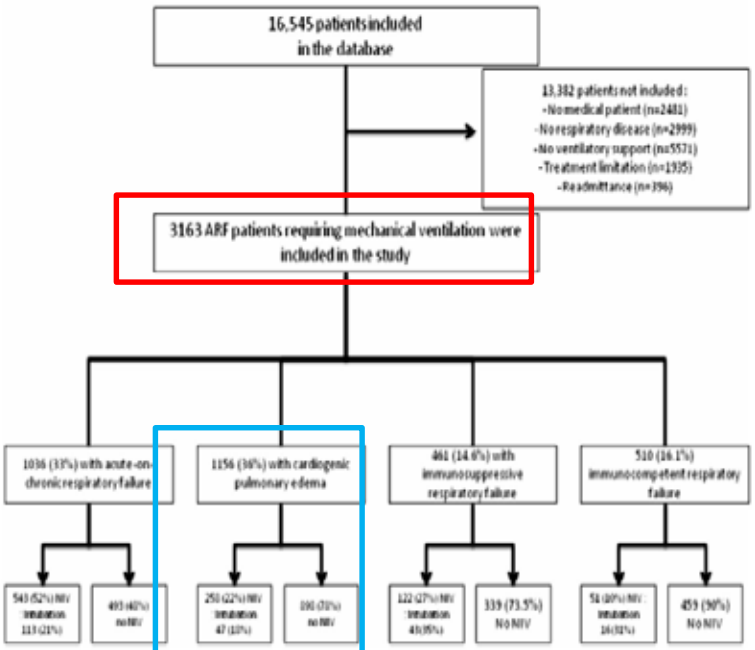


Fig. 1 Flow chart of the study. *ARF* acute respiratory failure, *NIV* noninvasive mechanical ventilation

ORIGINAL

Noninvasive mechanical ventilation in acute respiratory failure: trends in use and outcomes

Study group	
Acute-on-chronic respiratory failure	1,036 (33 %)
Cardiogenic pulmonary edema	1,156 (36 %)
Immunocompetent	510 (16.1)
Immunocompromised	461 (14.6)

Table 1 first-line

Characte

Male ge

Age in y

Table 3 Effect on mortality of noninvasive ventilation as first-line ventilatory support modality, as assessed using a marginal structural model

Population	Crude HR (95 % CI)	*P* value	Adjusted HR[a] (95 % CI)	*P* value
Study cohort ($n = 3{,}163$)	0.82 (0.75–0.89)	<0.0001	0.75 (0.68–0.83)	<0.0001
Acute-on-chronic respiratory failure ($n = 1{,}036$)	0.50 (0.40–0.62)	<0.0001	0.71 (0.57–0.90)	0.004
Cardiogenic pulmonary edema ($n = 1{,}156$)	0.87 (0.77–0.99)	0.044	0.85 (0.70–1.03)	0.10
De novo respiratory failure immunocompromised ($n = 461$)	0.80 (0.66–0.99)	0.036	0.89 (0.70–1.13)	0.35
De novo respiratory failure immunocompetent ($n = 510$)	0.98 (0.79–1.20)	0.81	1.18 (0.87–1.59)	0.30

¿Puede reducir la MORTALIDAD?

Éxito de VMNI como primera línea de tratamiento (*no requiere IOT posterior)*

- ü mantenimiento del éxito 75% EAP

Mortalidad a 60 dies:

- ü No modifica la mortalidad en el EAP* (*estimada 4%)

2015

European Heart Journal Advance Access published May 21, 2015

European Heart Journal
doi:10.1093/eurheartj/ehv066

CURRENT OPINION

Recommendations on pre-hospital and early hospital management of acute heart failure: a consensus paper from the Heart Failure Association of the European Society of Cardiology, the European Society of Emergency Medicine and the Society of Academic Emergency Medicine – short version

Alexandre Mebazaa[1*], M. Birhan Yilmaz[2], Phillip Levy[3], Piotr Ponikowski[4], W. Frank Peacock[5], Said Laribi[6], Arsen D. Ristic[7], Ekaterini Lambrinou[8], Josep Masip[9], Jillian P. Riley[10], Theresa McDonagh[11], Christian Mueller[12], Christopher deFilippi[13], Veli-Pekka Harjola[14], Holger Thiele[15], Massimo F. Piepoli[16], Marco Metra[17], Aldo Maggioni[18], John J.V. McMurray[19], Kenneth Dickstein[20], Kevin Damman[21], Petar M. Seferovic[22,23], Frank Ruschitzka[24], Adelino F. Leite-Moreira[25,26], Abdelouahab Bellou[27,28], Stefan D. Anker[29,30], and Gerasimos Filippatos[31]

Figure 3 Oxygen therapy and ventilatory support in acute heart failure. PS-PEEP, pressure support-positive end-expiratory pressure; CPAP, continuous positive airway pressure.

Noninvasive Ventilation for Acute Hypercapnic Respiratory Failure: Intubation Rate in an Experienced Unit

Damien Contou MD, Chiara Fragnoli MD, Ana Córdoba-Izquierdo MD, Florence Boissier MD, Christian Brun-Buisson MD, and Arnaud W Thille MD PhD

PACIENTE HIPERCAPNICO

EAP

Acute on chronic

Hipercapnico de novo (neumonia)

Mínima tasa de IOT (4%) en EAP, 15% *AoC*, 38% de novo.

IOT 11% si pH>= 7.30

IOT 18% si pH< 7.30

Mortalidad post IOT: 36%. Fracaso tardio

Mortalidad sin IOT previa: 3% EAP, 5% *AoC*, 14% de novo. Fracaso precoz.

PACIENTE HIPERCAPNICO

EAP

Acute on chronic

Hipercapnic de novo

MPOC

Asma

SHO

Nmuscular/ toracic

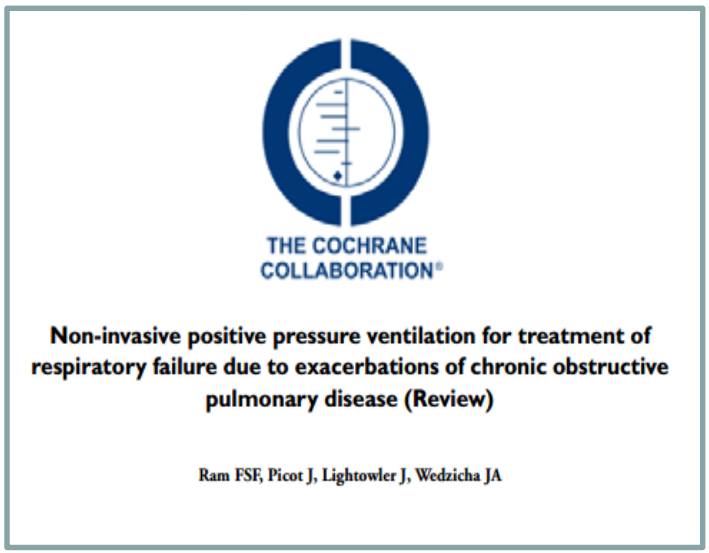
PACIENTE HIPERCÁPNICO

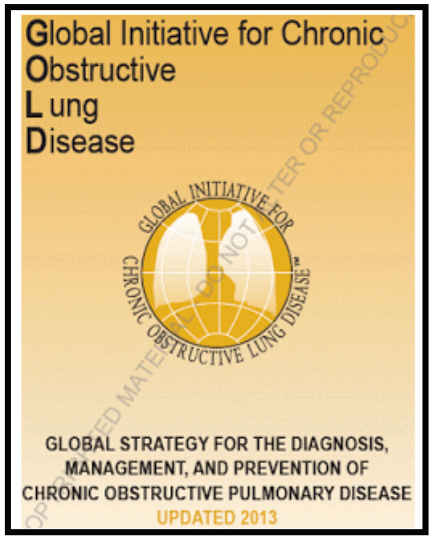
EPOC

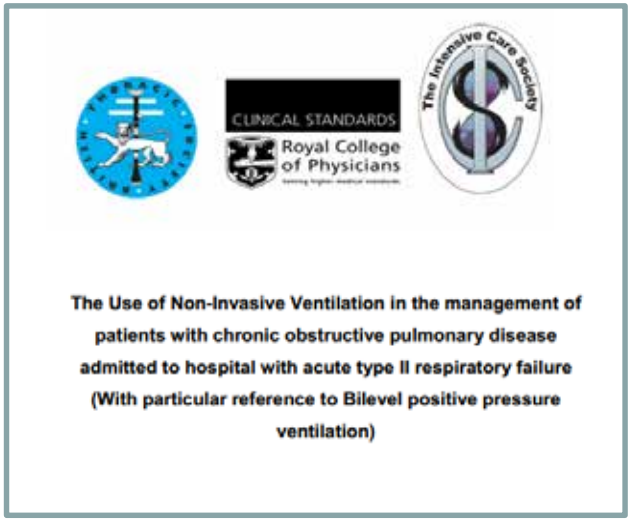
SMC* VS VMNI

¿Reduce la tasa de IOT?

¿Reduce la mortalidad?

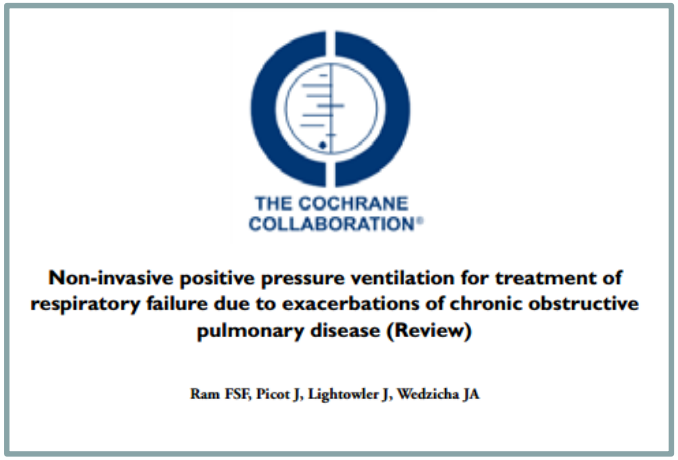


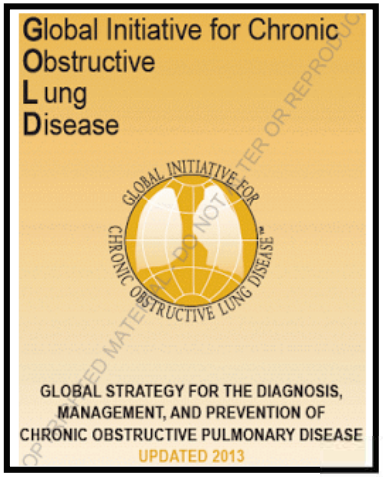




PACIENTE HIPERCÁPNICO

EPOC





SMC* VS VMNI

SÍ

REDUCE TANTO LA TASA DE IOT

COMO LA MORTALIDAD

PACIENTE HIPERCÁPNICO

EPOC

VMNI VS VMI

¿Reduce la mortalidad?

Outcomes Associated With Invasive and Noninvasive Ventilation Among Patients Hospitalized With Exacerbations of Chronic Obstructive Pulmonary Disease

Peter K. Lindenauer, MD, MSc, Mihaela S. Stefan, MD, Meng-Shiou Shieh, PhD, Penelope S. Pekow, PhD, Michael B. Rothberg, MD, MPH, and Nicholas S. Hill, MD

JAMA Intern Med. 2014 December ; 174(12): 1982–1993.

Outcomes Associated With Invasive and Noninvasive Ventilation Among Patients Hospitalized With Exacerbations of Chronic Obstructive Pulmonary Disease

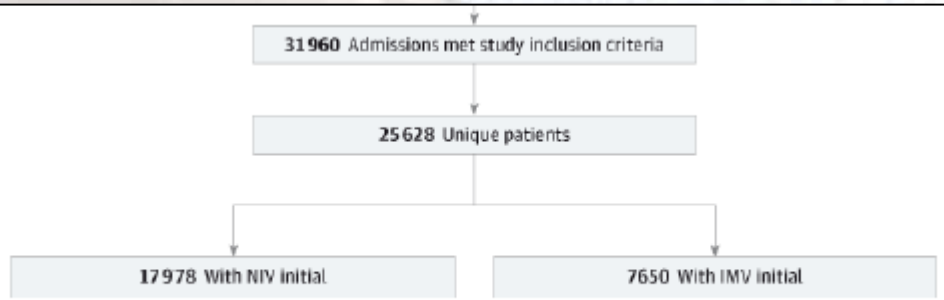


Figure 1. Study Selection Criteria/Recruitment Table

Patient Characteristic	All Ventilated Patients	Ventilation		*P* Value
		Noninvasive	Invasive	
Age, mean, y	68.5	69.0	67.4	<.001
Median (IQR)	69 (61–77)	69 (61–78)	67 (60–75)	
Female	14 513 (56.6)	10 213 (56.8)	4300 (56.2)	.38
Indicators of COPD severity				
Admission for COPD in past year	7243 (28.3)	5416 (30.1)	1827 (23.9)	<.001
Noninvasive ventilation in past year	2844 (11.1)	2249 (12.5)	595 (7.8)	<.001
Invasive mechanical ventilation in past year	1566 (6.1)	902 (5.0)	664 (8.7)	<.001
Pulmonary heart disease	3165 (12.4)	2309 (12.8)	856 (11.2)	<.001
Pneumonia present on admission	6129 (23.9)	3800 (21.1)	2329 (30.4)	<.001
Comorbidities[b]				
Congestive heart failure	9070 (35.39)	6142 (34.2)	2928 (38.3)	<.001

JAMA Intern Med. 2014 December ; 174(12): 1982–1993.

Outcomes Associated With Invasive and Noninvasive Ventilation Among Patients Hospitalized With Exacerbations of Chronic Obstructive Pulmonary Disease

Hospital Characteristic	Ventilation[a]		*P* Value
	Noninvasive (n = 5225)	Invasive (n = 5225)	
Unknown	1933 (35.0)	1918 (34.7)	
Outcomes			
Hospital-acquired pneumonia	139 (2.5)	210 (3.8)	<.001
In-hospital mortality	334 (6.0)	506 (9.2)	<.001
LOS, d	7.2	8.9	<.001

VMNI VS VMI

- Reduce la Neumonía Nosocomial
- Reduce la mortalidad
- Reduce la estancia hospitalaria

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

PACIENTE HIPERCÁPNICO

EPOC

VMNI VS VMI

¿Reduce la mortalidad?

ORIGINAL

Noninvasive mechanical ventilation in acute respiratory failure: trends in use and outcomes

Acute on chronic

Éxito de VMNI como primera línea de tratamiento (*no requiere IOT posterior):*

incremento del 68 hasta el 90% *acute on chronic*

Mortalidad a 60 días:

Reducción global del 27 al 9% a expenses del subgrupo *acute on chronic*

PORQUE NO TODAS LAS "IRAS" SON IGUALES....

Table 1 Main patient characteristics and comparison of patients with noninvasive ventilation and invasive mechanical ventilation as the first-line ventilatory support modality

Characteristics, *N* (%) or median (IQR)	Study cohort *N* = 3,163	First-line NIV	First-line IMV	*P* value
Study group				
Acute-on-chronic respiratory failure	1,036 (33 %)	543 (56 %)	493 (23 %)	
Cardiogenic pulmonary edema	1,156 (36 %)	258 (27 %)	898 (41 %)	
Immunocompetent	510 (16.1)	51 (5.2)	459 (21)	
Immunocompromised	461 (14.6)	122 (12.5)	339 (15.5)	
ICU mortality	652 (21 %)	65 (7 %)	587 (27 %)	<0.0001
Days spent in the hospital	21 (10–40)	19 (12–34)	22 (9–43)	0.3
Hospital mortality	949 (30 %)	143 (15 %)	806 (37 %)	<0.0001

Mortalidad global SIN fracaso de vni 15%

Mortalidad global si fracasa vni (post iot): 36%

¿EN QUÉ ESCENARIOS CLÍNICOS LA VMNI....

...puede reducir la tasa de IOT?

...puede reducir la mortalidad?

- **IRA de novo**
  - No immunocomprometido
  - Inmunocomprometido
- ***Acute on chronic***
- **Edema Agudo de Pulmón**

¿Tenemos escenario propio en la VMNI?

Respiratory Failure in Elderly Hospitalised Patients

Journal of the Hong Kong Geriatric Society

J. KEANE, F. CHAN, J. OVER, P. FINUCANE

Acute respiratory failure in the elderly: diagnosis and prognosis

Age and Ageing 2008; **37:** 251–257
doi:10.1093/ageing/afn060

Predictors of in-hospital mortality of older patients admitted for community-acquired pneumonia

Age and Ageing 2011; **40:** 736–741

Acute non-invasive ventilation in older patients: medical evolution and improvement in survival of the un-fittest

Age and Ageing 2011; **40:** 414–416
doi: 10.1093/ageing/afr043

SÍ

Non-invasive ventilation in elderly patients with acute hypercapnic respiratory failure: a randomised controlled trial

Age and Ageing 2011; **40:** 444–450

¿Cuáles son las causas más frecuentes de IRA en el anciano en los SU?

Journal of the Hong Kong Geriatric Society

Respiratory Failure in Elderly Hospitalised Patients

J. KEANE, F. CHAN, J. OVER, P. FINUCANE

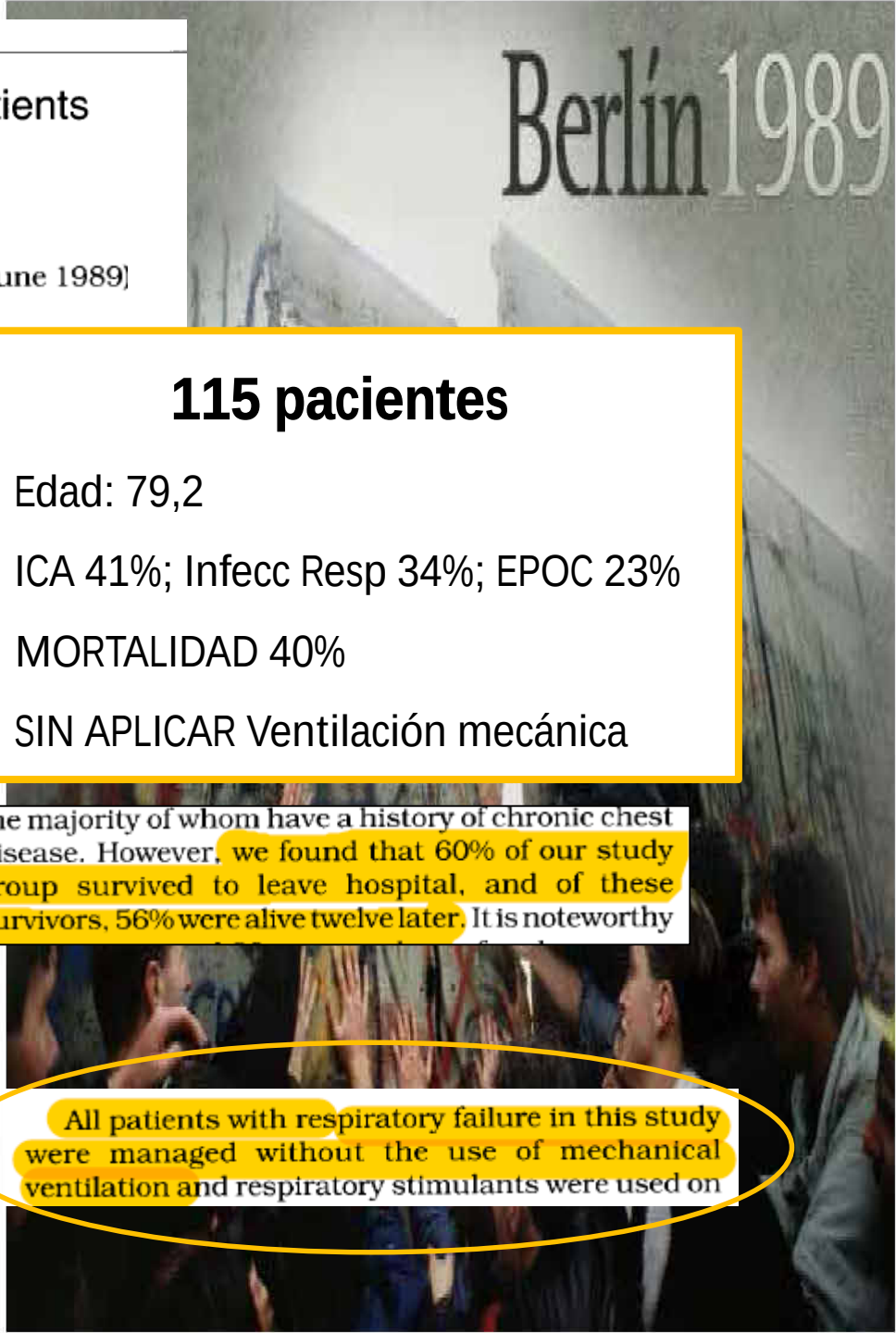
UNIVERSITY DEPARTMENT OF GERIATRIC MEDICINE
CARDIFF ROYAL INFIRMARY (WEST WING)
CARDIFF CF2 1SZ.

[July 1988 to June 1989]

Table 1 Conditions precipitating respiratory failure (N = 103)

RESPIRATORY DISORDES		
Respiratory tract infection	35	(34%)
Exacerbation of chronic bronchitis/emphysema	24	(23%)
Bronchiectasis	2	(2%)
Pulmonary fibrosis	2	(2%)
Carcinoma of lung	2	(2%)
Asthma	2	(2%)
CARDIAC DISORDERS		
Acute cardiac failure	42	(41%)
Pulmonary embolus	6	(6%)
OTHER		
Acute stroke	4	(4%)

Note: Respiratory failure was attributed to more than one cause in some patients.



115 pacientes

- Edad: 79,2
- ICA 41%; Infecc Resp 34%; EPOC 23%
- MORTALIDAD 40%
- SIN APLICAR Ventilación mecánica

the majority of whom have a history of chronic chest disease. However, we found that 60% of our study group survived to leave hospital, and of these survivors, 56% were alive twelve later. It is noteworthy

All patients with respiratory failure in this study were managed without the use of mechanical ventilation and respiratory stimulants were used on

Research

Critical Care 2006, **10**:R82

Open Access

Acute respiratory failure in the elderly: etiology, emergency diagnosis and prognosis

Patrick Ray[1], Sophie Birolleau[2], Yannick Lefort[2], Marie-Hélène Becquemin[3], Catherine Beigelman[4], Richard Isnard[5], Antonio Teixeira[6], Martine Arthaud[7], Bruno Riou[1] and Jacques Boddaert[8]

Table 1

Patient characteristics

Variable	Men ($n = 253$)	Women ($n = 261$)	All patients ($n = 514$)
Age (years)	78 ± 8	82 ± 9[a]	80 ± 9
Age ≥ 70 years	157 (62)	201 (77)[a]	358 (70)
Living in an institution	19 (8)	26 (10)	45 (9)
Previous cardiac insufficiency	53 (21)	57 (22)	110 (21)
COPD	104 (41)	21 (8)[a]	125 (24)
MacCabe score 3	113 (45)	63 (24)[a]	176 (34)

Mac Cabe score 3 : death expected in 1 year.

Table 3

Diagnosis of causes of acute respiratory failure by experts, and mortality

Diagnosis	Number of patients (%)	Mortality[a], %
Cardiogenic Pulmonary Edema	219 (43)	21 [16–27]
Community-acquired pneumonia	181 (35)	17 [12–23]
Exacerbation of chronic respiratory disease	164 (32)	12 [8–18]
Pulmonary embolism	93 (18)	15 [9–24]
Bronchitis	23 (4)	4 [0–21]
Acute asthma	15 (3)	0 [0–20]
Others	78 (15)	24 [16–34]
No diagnosis	8 (2)	

Ranges in square brackets are 95% confidence intervals. Because several causes could occur 100%. [a]Percentages represent mortality in each diagnostic category.

ICA 41%; Infecc Resp 34%; EPOC 23% (*1989*)

Research

Open Access

Acute respiratory failure in the elderly: etiology, emergency diagnosis and prognosis

Patrick Ray[1], Sophie Birolleau[2], Yannick Lefort[2], Marie-Hélène Becquemin[3], Catherine Beigelman[4], Richard Isnard[5], Antonio Teixeira[6], Martine Arthaud[7], Bruno Riou[1] and Jacques Boddaert[8]

Variables associated with in-hospital death

Variables	Alive ($n = 434$)	Dead ($n = 80$)	Adjusted odds ratio	p
Inappropriate treatment in the ED	73/434 (17)	28/80 (35)	2.83 [1.48–5.41]	0.002
$PaCO_2 \geq 45$ mmHg	90/414 (21)	29/73 (40)		0.004
$PaCO_2$ (mmHg)	41 ± 13 ($n = 414$)	44 ± 14 ($n = 73$)	2.79 [1.39–5.58]	
Creatinine clearance ≤ 50 ml minute^{-1}	191/410 (47)	48/74 (65)		0.013
Creatinine clearance (ml minute^{-1})	54 ± 26 ($n = 410$)	43 ± 18 ($n = 74$)	2.37 [1.20–4.71]	
Elevated natriuretic peptide	148/317 (47)	43/58 (74)	2.06 [1.01–4.18]	0.046
BNP (pg ml^{-1})	148 [102–178] ($n = 275$)	371 [237–503] ($n = 54$)		
ProBNP (pg ml^{-1})	1,172 [748–1,700] ($n = 208$)	4,084 [1,317–7,887] ($n = 38$)		
Clinical signs of acute ventilatory failure	91/434 (21)	36/80 (45)	1.98 [1.01–3.90]	0.047

Table 5

Variables associated with missed diagnosis in the emergency department

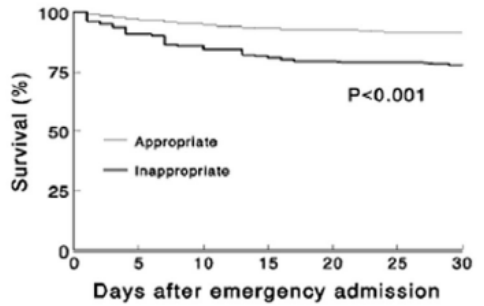
Variable	Appropriate diagnosis ($n = 413$)	Missed diagnosis ($n = 101$)	Adjusted odds ratio	p
History of arterial hypertension	288 (55)	45 (45)	0.59 [0.36–0.98]	0.04
Final diagnosis of CAP	152 (37)	67 (66)	4.85 [2.73–8.61]	<0.001
Final diagnosis of CPE	135 (33)	46 (46)	9.35 [5.16–16.14]	<0.001
Final diagnosis of PE	60 (15)	33 (33)	9.27 [4.72–18.22]	<0.001

Research
Open Access

Acute respiratory failure in the elderly: etiology, emergency diagnosis and prognosis

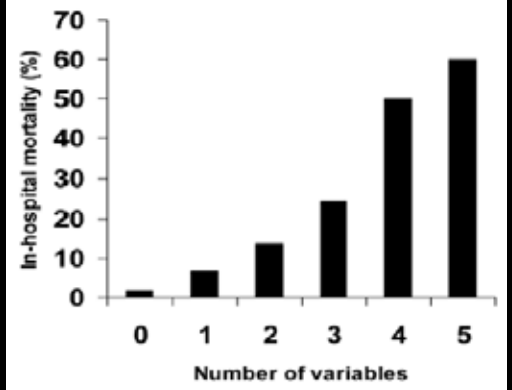
- **Mortalidad global 16%**
- Aumenta hasta el **32% si el tratamiento en ED es inadecuado**
- Aumenta hasta el **45% en presencia de fracaso ventilatorio**
- La suma de procesos aumenta la mortalidad

Figure 2



Kaplan-Meier estimates of survival according to the initial treatment received in the emergency department. Inappropriate treatment was noted in 162 (32%) of the 514 patients. The log-rank test was used to calculate *p*.

Figure 3



Mortality (%) according to the five variables (X axis) associated with death in the multivariate analysis.

We confirmed that undertreatment of the causes of ARF was associated with higher morbidity and mortality (Figure 1b) with a close odds ratio for improved survival (2.83 (95% CI 1.48 to 5.41), $p < 0.002$). Again, age, sex, previous quality of life, respiratory rate, initial severity of hypoxemia, and admission to ICU were not significantly associated with mortality.

Key messages

- The mortality of elderly patients with acute respiratory failure was high (16%).
- CPE was the main cause of ARF in elderly patients; however, half of the patients had more than two diagnoses.
- An inappropriate initial treatment was associated with increased mortality.
- To evaluate the severity of illness of elderly patients with ARF, physicians should focus on available criteria: $PaCO_2$, creatinine clearance, levels of BNP or NT-proBNP, and clinical signs of acute ventilatory failure.

Age and Ageing 2008; **37:** 251–257

Acute respiratory failure in the elderly: diagnosis and prognosis

SAMUEL DELERME, PATRICK RAY

Abstract

Acute respiratory failure (ARF) in patients over 65 years is common in emergency departments (EDs)

Difficult diagnosis of ARF in the elderly

Ray *et al.* found that the sensitivity of the emergency physician was 86% for pneumonia, 75% for PE, and 71% for CHF [3]. In this study, the variables associated to a missed diagnosis were a final diagnosis of CHF, CAP or PE, highlighting the fact that frequent causes of ARF are very challenging to diagnose in the ED. Riquelme *et al.* demonstrated that the definite diagnosis of CAP was delayed for more than 72 h in 62% of patients [14]. The association of dyspnea, cough, and fever, was observed in only 32% of patients with CAP, and delirium at admission was very common (45%) [9, 14]. Atypical signs of CHF are frequent (confusion or leg swelling, or wheezing), and confusing [15, 16, 17]. Unfortunately, an inappropriate

Prognosis of elderly admitted in an ICU

Age is included in several scores of severity such as the APACHE II, Fine's score for CAP [27], and Aujesky's score for PE [2, 28]. However, the large majority of the

Ethical considerations

The decision to admit a patient to the ICU from the ED is challenging, as physicians must decide in a short time. When a patient potentially requiring ICU care is admitted to the ED, emergency physicians take the first decision as to whether to propose the patient to the ICU. Thus, intensivists are involved only if an ICU admission is requested for the patient. Age over 85 years seems to be an independent predictor of ICU refusal [30]. Actually, the decision to admit

Potential role of non-invasive ventilation by a face mask

In acute COPD exacerbations, non-invasive positive-pressure ventilation (NPPV) decreases $PaCO_2$ by unloading the respiratory muscles and supplementing alveolar ventilation. Several trials and meta-analysis support the use of NPPV by reducing ventilator associated pneumonia, intubation, duration of ICU stay, and mortality [13]. The few studies on NPPV suggest that the response of middle-aged patients with acidotic COPD exacerbations to NPPV may extend to the geriatric population. In CHF, NPPV improves oxygenation, reduces work of breathing, and may prevent intubation,

Necesitamos estudios VMNI elderly!!! (??)

Predictors of in-hospital mortality of older patients admitted for community-acquired pneumonia

Hon Ming Ma, Wing Han Tang, Jean Woo

Age and Ageing 2011; **40:** 736–741

- Mortalidad intrahospitalaria 12,3%
- Mortalidad a 30 d: 11,3%
- **No evaluada la VMNI como factor de riesgo/protector.**

Aumentan la mortalidad:
- q CURB
- q Comorbilidad Charlson
- q Estado nutricional

($n = 488$)

Variables[a]	Mean/median or count (%)
Demographic characteristics	
Age (year)	81.0 (±7.9)
Gender (male:female)	282:206
Nursing home residence	116 (23.8%)
Charlson's comorbidity index (CCI)	2 (1–3)
Katz's index (range: 0–6)	6 (2–6)
On immunosuppressant	10 (2.0%)
Pneumonia severity	
CURB score (range: 0–4) (%)	1 (0–1)
0	181 (37.1)
1	195 (40.0)
2	88 (18.0)
3	21 (4.3)
4	3 (0.6)
Clinical outcomes (%)	
In-hospital mortality	60 (12.3)
ICU admission	7 (1.4)
Non-invasive mechanical ventilation	84 (17.2)
Length of stay (days)	10 (6–20)
Change in residential status	10 (2.0)

Table 3. Logistic regression analysis of risk factors associated with the in-hospital mortality

Variables	Relative risk (95% CI)	*P*-value
Nursing home residence	1.178 (0.486–2.856)	0.717
Age	1.011 (0.962–1.063)	0.654
Katz's index	0.923 (0.792–1.076)	0.923
CCI	1.596 (1.338–1.904)	<0.001
MAC	0.729 (0.645–0.823)	<0.001
Albumin	0.875 (0.817–0.936)	<0.001
CURB score	2.583 (1.733–3.851)	<0.001

Necesitamos estudios VMNI elderly!!! (??)

Dame una

M

Dame una

N

Dame una

V

Dame una

I

VMNI

Noninvasive continuous positive airway pressure in elderly cardiogenic pulmonary edema patients

Erwan L'Her
Françoise Duquesne

Patient characteristics	Oxygen (n=46)	CPAP+oxygen (n=43)	p value
Demographic age (years; mean±SD)	84±6	84±6	0.66
Males	18 (39)	19 (44)	0.63
Autonomy score (mean±SD)	5±1	5±1	0.16
History pre-existing heart disease			
Ischemic	15 (33)	17 (40)	0.50
Hypertensive	6 (13)	6 (14)	0.90
Valvular	3 (7)	1 (2)	0.34
Mixed	12 (26)	11 (26)	0.96
NYHA classification			
I–II	32 (70)	20 (47)	0.41
I–IV	7 (15)	16 (37)	0.02
Cause of plmonary eema			
Respiratory tract infection	19 (41)	11 (26)	0.12
Tachyarrhythmia	2 (4)	6 (14)	0.12
Acute ischemic heart disease	6 (13)	7 (16)	0.67
Other and miscellaneous	19 (41)	19 (44)	0.78
Echocardiographic findings			0.93
Systolic heart failure	21 (70)	20 (69)	
Diastolic heart failure	9 (30)	9 (31)	
Prior hospitalization for a 6-month period (mean±SD)	0.5±0.8	0.4±0.7	0.49

Outcome	Oxygen (n=46)	CPAP (n	
Initial improvement in PaO_2/F_IO_2	24 (52)	34 (79)	
PaO_2/F_IO_2 >300 at 1 h	7 (15)	20 (47)	
Clinical improvement (dyspnea score)	24 (52)	36 (84)	
Serious complications	17 (37)	4 (9)	
Ventilatory assistance	14 (30)	4 (9)	0.01
48-h mortality	11 (24)	3 (7)	0.017
In-hospital mortality	14 (30)	12 (28)	0.8
Death within the emergency department	10 (22)	3 (7)	0.05
Death within the general ward	4 (9)	9 (21)	0.19
In-hospital length of stay (mean±SD, days)			
Among all patients	9±7	12±11	0.07
Among survivors	10±4	13±8	0.20
Among non-survivors	6±10	12±17	0.30

Data are number of patients (numbers in parentheses are percentages)

Randomizado 46 O2VS 43 CPAP

- ü Edad media 84 a
- ü Intercurrencia proceso infeccioso 26-41%
- ü Reducción mortalidad precoz grupo CPAP (tanto en ED como en 48h)
- ü No cambios en mortalidad hospitalaria

Intensive Care Med (2004) 30:882–888

Non-invasive ventilation in elderly patients with acute hypercapnic respiratory failure: a randomised controlled trial

STEFANO NAVA[1], MARIO GRASSI[3],

Age and Ageing 2011; **40:** 444–450

Table 1. Patients' characteristics at enrolment

	SMT	NIV	*P*-value
Age (years)	81.3 ± 4.8	81.3 ± 4.8	0.98
BMI (kg/m^2)	24.9 ± 5.7	26.6 ± 5.7	0.58
McCabe score	1.3 ± 0.6	1.1 ± 0.6	0.26
Kelly score	1.9 ± 0.9	1.6 ± 0.8	0.11
SAPS II	35.0 ± 13.2	32.0 ± 13.5	0.46
Sex (M/F)	26/15	28/13	0.66
pH	7.29 ± 0.05	7.30 ± 0.04	0.11
$PaCO_2$ (KPa)	9.16 ± 1.47	8.69 ± 1.57	0.17
PaO_2/FiO_2	238.9 ± 70.1	231.1 ± 54.4	0.59
Chronic respiratory disorder			
COPD	33	33	0.77
Kscoliosis	3	3	
Fibrothorax	4	5	
Other	1	0	
Number of co-morbidities (Charlson index)	0.98 ± 0.7	1.02 ± 0.8	0.78
Do-not-Resuscitate order	29/41	33/41	0.81

tasa de IOT

	NIV	SMT	*P*-value
ETI	3/41 (7.3%)	26/41 (63.4%)	<0.001
pH	0.04 ± 0.05	−0.006 ± 0.03	<0.001
$PaCO_2$ (KPa)	−0.91 ± 1.11	0.29 ± 1.13	<0.001
Respiratory rate (b.p.m.)	−4.1 ± 6.4	−0.9 ± 4.1	0.01
Dyspnoea score	−1 ± 1.5	−0.4 ± 1.2	0.05

mortalidad

	No. of death/no. of alive				
	Inhospital	6 m	12 m	OR (95% CI)[b]	*P*-value
Randomised treatment					
SMT	6/35	11/22[a]	8/14	1 (reference)	0.014[c]
NIV	1/40	4/34[a]	11/23	0.40 (0.19–0.83)	
Rescue treatment					
SMT	1/15	2/11	5/6	1 (reference)	
NIV	3/57	13/42[a]	12/30	0.60 (0.18–1.92)	0.009[c]
ETI	3/3	0/3	2/1	4.03 (2.35–6.94)	

Non-invasive ventilation in elderly patients with acute hypercapnic respiratory failure: a randomised controlled trial

tasa de IOT

ETI

mortalidad

	No. of death/no. Inhospital	6 m
Randomised treatment		
SMT	6/35	11/
NIV	1/40	4/
Rescue treatment		
SMT	1/15	2/
NIV	3/57	13
ETI	3/3	0/

Mortalidad VMNI 2

Mortalidad SMT 17%---50% ---57%

Acute on chronic es el beneficiado

Conclusions

In conclusion, we have shown that, during an episode of AHRF in old patients with a pre-existing chronic respiratory disorder, the use of NIV is associated with a lower proportion of patients meeting the ETI criteria, a higher survival rate and faster resolution of respiratory distress when compared with SMT. The use of NIV as a rescue therapy is associated with a lower mortality rate compared with ETI. NIV seems appropriate to use in elderly patients when intubation may be considered a questionable option or when the patient has signed a DNI order.

RESEARCH Open Access

Annals of Intensive Care 2012, 2:5

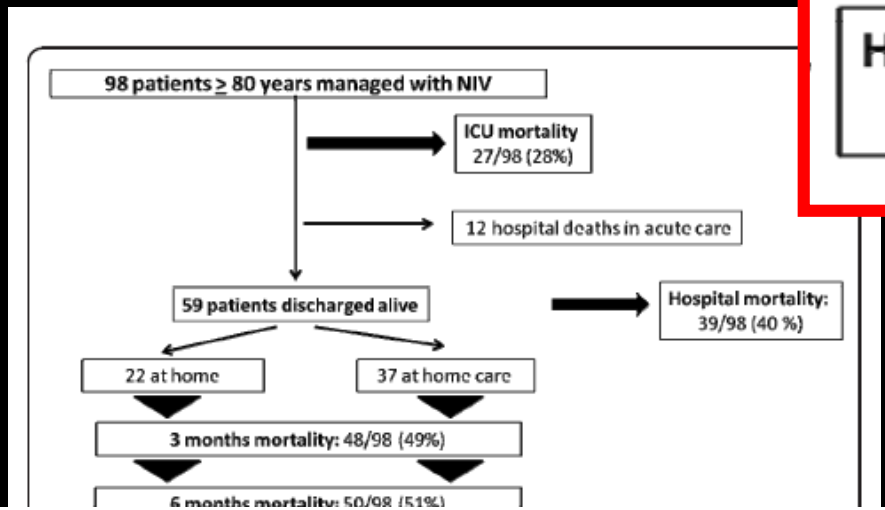
Results of noninvasive ventilation in very old patients

Frederique Schortgen[1,2*], Arnaud Follin[1], Lucilla Piccari[1], Ferran Roche-Campo[1], Guillaume Carteaux[1], Elodie Taillandier-Heriche[3], Sebastien Krypciak[3], Arnaud W Thille[1], Elena Paillaud[3,4] and Laurent Brochard[2,4,5]

Background: Noninvasive ventilation (NIV) is frequently used for the management of acute respiratory failure (ARF) in very old patients (≥ 80 years), often in the context of a do-not-intubate order (DNI). We aimed to determine its efficacy and long-term outcome.

Table 1 Characteristics of all patients managed with NIV according to age

	Patients ≥ 80 y (n = 98)	Patients < 80 y (n = 278)	*p* value
Characteristics at ICU admission			
Age, yr	84 (80-86)	67 (54-74)	< 0.001
[min-max]	[80-94]	[17-79]	
Gender, M/F, n	45/53	185/93	< 0.001
Home respiratory support, n (%)	14 (14)	28 (10)	0.4
Nasal O_2	10	17	
NIV	4	11	
History of ICU admission for ARF, n (%)	18 (18)	49 (18)	0.87
Immunocompromised, n (%)[a]	9 (9)	54 (19)	0.02
Location before ICU admission, n (%)			0.15
Emergency room	59 (60)	140 (50)	
Medical ward	28 (29)	110 (40)	
Surgical ward	11 (11)	28 (10)	
NIV start before ICU admission, n (%)	15 (15)	28 (10)	0.16
SAPS II at admission, points	43 (36-52)	39 (31-49)	< 0.01
Non-age-related SAPS II, points[b]	25 (18-34)	27 (20-38)	0.21
Characteristics at NIV start			
Patients with extra respiratory organ failure, n (%)[c]	65 (66)	189 (68)	0.76
NIV context, n (%)			< 0.001
CPE-AOC respiratory failure	30 (31)	93 (34)	
de novo ARF	16 (16)	79 (28)	
Postextubation	13 (13)	84 (30)	
Do-not-intubate order	39 (40)	22 (8)	



Hospital mortality:
39/98 (40 %)

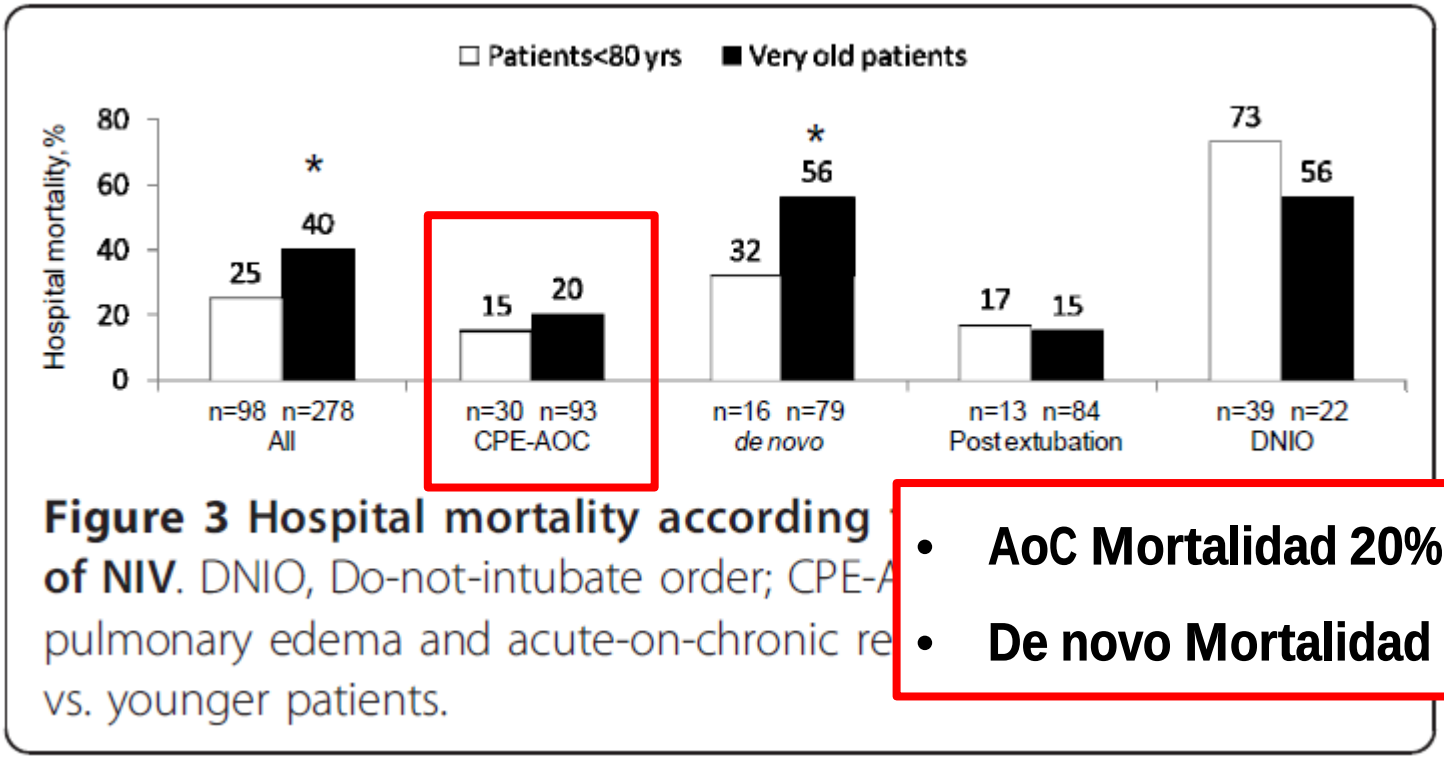


Figure 3 Hospital mortality according **of NIV**. DNIO, Do-not-intubate order; CPE-A pulmonary edema and acute-on-chronic re vs. younger patients.

- **AoC Mortalidad 20% (>80a)**
- **De novo Mortalidad 56% (>80 a)**

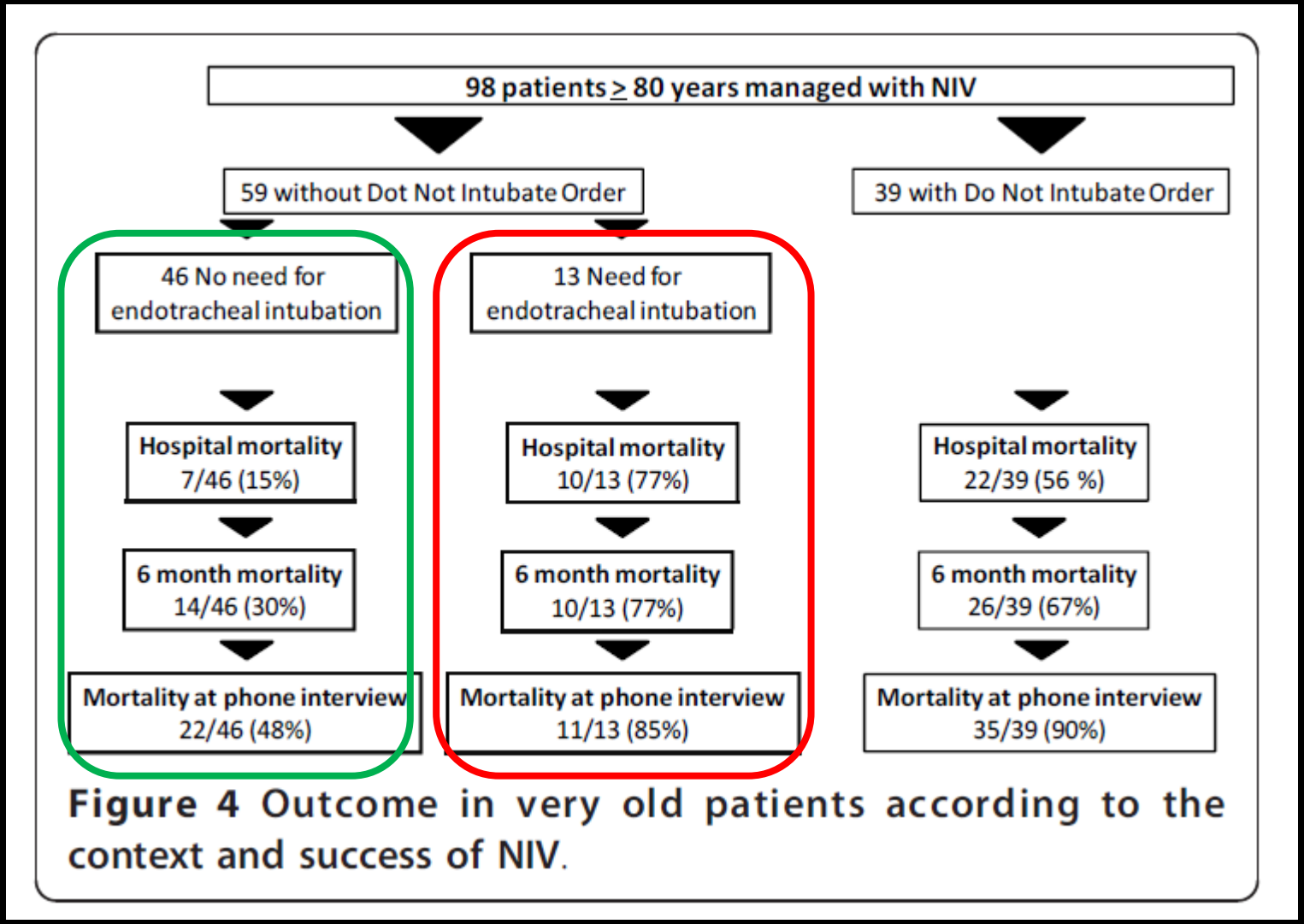


Figure 4 Outcome in very old patients according to the context and success of NIV.

Anciano > 80 a SIN IOT Y SOLO VMNI: MORTALIDAD 15%-30%-48%

Anciano > 80 a BAJO IOT: MORTALIDAD 77%-77%-85%

Y tú que prefieres,

¿IOT o VNI?

Mejor VNI, así reconsulto más!

Jiu jiu jiu

Claro, claro, Vmni… que eres chronic… (mala hierba nunca...)

Original

Ventilación mecánica no invasiva en una población anciana que ingresa en una unidad de monitorización respiratoria: causas, complicaciones y evolución al año de seguimiento

Gonzalo Segrelles Calvo*, Enrique Zamora García, Rosa Girón Moreno, Emma Vázquez Espinosa, Rosa Mar Gómez Punter, Gilda Fernandes Vasconcelos, Claudia Valenzuela y Julio Ancochea Bermúdez

Servicio de Neumología, Hospital Universitario La Princesa, Madrid, España

Tabla 2
Principales diagnósticos al ingreso en la unidad de monitorización respiratoria

	Número de pacientes	Total (%)
Agudización de la EPOC	31	36,5%
Insuficiencia cardíaca	27	31,8%
Patología restrictiva	7	8,2%
Síndrome obesidad-hipoventilación	5	5,9%
Fármacos	5	5,9%
No filiada	10	11,76%

Mortalidad del grupo> 75 años similar al grupo <75 a

v Acute on chronic

v EAP

21.7 vs 21.4%

Original

Ventilación mecánica no invasiva en una población anciana que ingresa en una unidad de monitorización respiratoria: causas, complicaciones y evolución al año de seguimiento

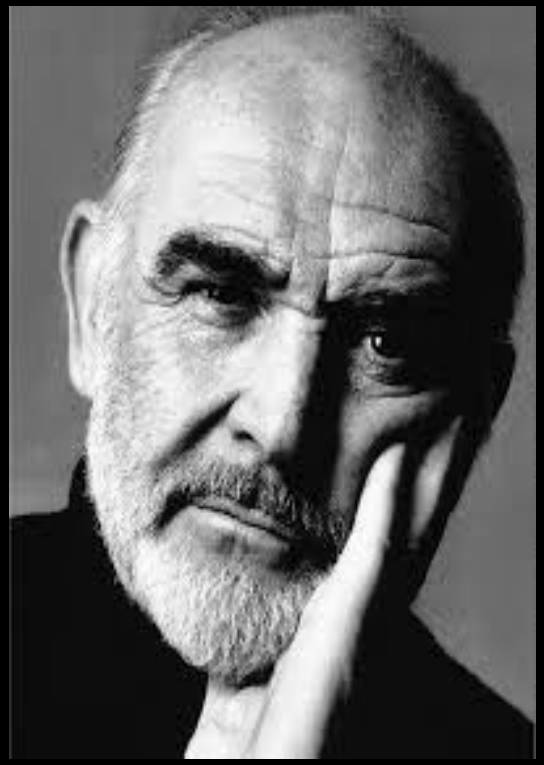
Gonzalo Segrelles Calvo*, Enrique Zamora García, Rosa Girón Moreno, Emma Vázquez Espinosa, Rosa Mar Gómez Punter, Gilda Fernandes Vasconcelos, Claudia Valenzuela y Julio Ancochea Bermúdez

Servicio de Neumología, Hospital Universitario La Princesa, Madrid, España

Resultados

Se incluyeron 85 pacientes, de los que 43 (50,6%) fueron mujeres. La edad media fue de 80,6 años (desviación estándar [DE], 5,93), con una edad máxima de 92 años.

Se recogieron datos relativos a la vida basal (capacidad para realizar actividades cotidianas, cuidador principal, polifarmacia, grado de disnea según la MRC e institucionalización), que se muestran en las Figuras 1 y 2 y en la Tabla 1, respectivamente. La puntuación del índice de Barthel fue de 88,19 (dependencia moderada).



Barthel: 88.19 = "Abuelo caramelo"!!!

Servicios de Urgencias:

Real practice

MEDICINA BASADA EN LA EVIDÈNCIA

Effectiveness
Results obtained in real-world, everyday clinical practice
Unselected patients
Many patients have other medical conditions and other problems that complicate management
Techniques and protocol may or may not match what was done in the clinical trial
No special oversight of the intervention

Efficacy
Results under research conditions
Patients carefully selected
No comorbidities or other interfering problems
Rigidly controlled protocol for management and monitoring
Overseen by investigators and dedicated research staff

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

Use of noninvasive ventilation on internal wards for elderly patients with limitations to respiratory care: a cohort study

European Journal of Clinical Investigation Vol 41 67

Características pacientes:

- Edad> 80 a
- Charlson: 6-10
- Barthel > 50

Pacientes "fuera de guías"

address this question. They would be useful to select these patients better, to help patients and their families in the decision-making process, and to make a more efficient use of the resources.

We conclude that NPPV can be useful to treat selected patients with severe ARF in a setting of low-intensity care when NPPV is the ceiling of ventilator care.

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

Emerg Med J 2005;22:772–777.

Characteristics	Number ± SD (or %)*
Mean age ± SD (years)	72.2 ± 12.9
Number (%) female	93 (48.9%)
Clinical indication to NIV, number (and %) of trials	
CPE	70 (35%)
COPD exacerbation	39 (19.5%)
CPE and COPD exacerbation	11 (5.5%)
Pneumonia and COPD exacerbation	21 (10.5%)
Pneumonia	27 (13.5%)
Obesity/hypoventilation decompensation	6 (3%)
Others†	26 (13%)

Pacientes "real life"

Emergency department

72,2 anys

Conclusions: Our results confirm the global efficacy of NIV in an ED setting, and show that, in spite of lower success rate in "real practice" in comparison with RCTs, an intermediate care unit can represent an appropriate and less expensive setting to perform this technique. The low rate of ETI seems to be because of the high number of patients for whom NIV was used as "ceiling" treatment.

Emergency Department

Mortality in acute cardiogenic pulmonary edema treated with continuous positive airway pressure

Roberto Cosentini
Stefano Aliberti

Table 1 Demographics, comorbidities, clinical data and severity of the disease upon arrival to ED of the study population

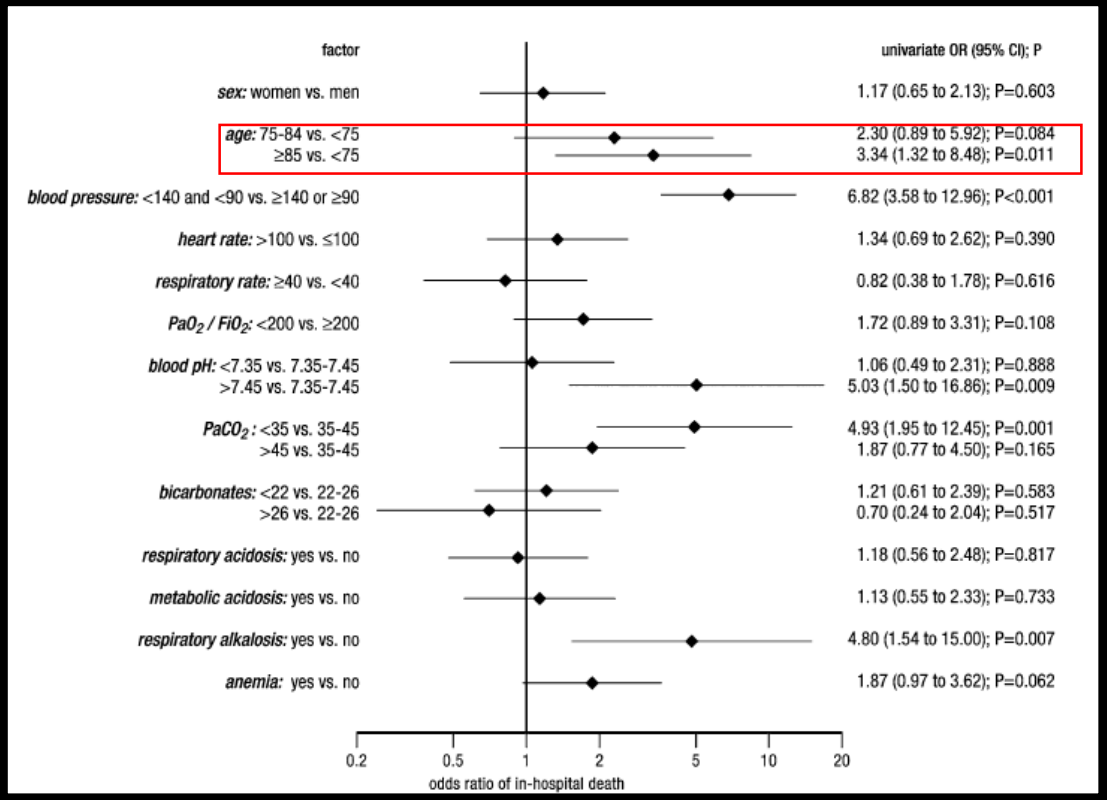
Variable	Value	Missing
Total monitored patients	454	
Demographics		
Age, years (mean ± SD)	79.5 ± 10.1	0
Range	39–102	0
<75 (no, %)	121 (26.7)	0
75–84 (no, %)	180 (39.6)	0
≥85 (no, %)	153 (33.7)	0
Male (no, %)	210 (46.3)	0
Comorbidities		
Chronic obstructive pulmonary disease (no, %)	115 (25.4)	2
Essential hypertension (no, %)	242 (53.5)	2
Diabetes mellitus (no, %)	110 (24.3)	2
Coronary artery disease (no, %)	254 (56.2)	2
Chronic renal failure (no, %)	102 (22.6)	2
Physical findings		
Systolic BP, mmHg (mean ± SD)	168.3 ± 33.7	7
Diastolic BP, mmHg (mean ± SD)	96.0 ± 21.2	12
Systolic BP < 140 mmHg and diastolic BP < 90 mmHg (no, %)	68 (15.3)	9
Heart rate, beats/min (mean ± SD)	114.8 ± 22.6	12
Heart rate > 100 beats/min (no, %)	302 (68.3)	12
Respiratory rate, breaths/min (mean ± SD)	40.4 ± 6.8	167
Respiratory rate ≥ 40 breaths/min (no, %)	185 (64.5)	167
SpO_2 (%) (mean ± SD)	87 ± 10	155
SAPS II (mean ± SD)	42.3 ± 8.3	66

Pacientes “real life”

Emergency department

79,5 anys

Intensive Care Med (2009) 35:299–305



In conclusion, in our real life study the in-hospital mortality in ACPE patients treated with CPAP ranges around 11% and values recorded within minutes from ACPE patient arrival to the hospital can predict it. Particularly, advanced age, normal-to-low blood pressure, hypocapnia, anemia and low PaO_2/FiO_2 ratio are independent predictors for in-hospital mortality. This

Retrospectivo

Real practice ED

- ü Edad media 79,5 a
- ü **Mortalidad global 11%**
- ü Aumenta la mortalidad en:
  - v Edad avanzada
  - v EAP NO Hipertensivo
  - v PaFI bajas

Medical emergency team and non-invasive ventilation outside ICU for acute respiratory failure

Intensive Care Med (2009) 35:339–343

Pacients "real life"
Out of UCI

73-76 anys

Diagnosis	Number of patients (%)	Age	SAPSII	Favourable outcome (%)	Tracheal intubation (%)	Death (%)
Acute pulmonary oedema	45 (34)	73 ± 11.9	43 ± 9.1	38 (84.4)	3 (6.7)	4 (8.9)
COPD exacerbation	34 (26)	76 ± 12	42 ± 10.4	32 (94.1)	2 (5.9)	0 (0)
Pneumonia	30 (23)	69 ± 15.8	46 ± 14	18 (60)	4 (13.3)	8 (26.7)

- ✓ **Acute on chronic, edad >70 años, excelente pronóstico con VMNI**
- ✓ **IRA de novo (neumonia), más jóvenes, PEOR pronóstico que AoC**

This is the first report giving a general picture on what are the indications, outcomes, and complications of NIV outside ICU in the "real life". We illustrated for the first time how NIV could be managed by a MET.

REGISTRO DE VENTILACIÓN NO INVASIVA EN LOS SISTEMAS DE URGENCIAS DE CATALUNYA. REGISTRO VNICAT2

- 8 SU y PreHospitalaria.
- 184 pacientes reclutados
- Descriptivo con inclusión consecutiva.
- Edad: 79 (rango 67-84)

Pacients "real life"

URG I EXTRAH CATALANS

79 anys

58,2% hombres

38% EAP….

34,2% AEPOC……

9,8% NEUMONIA

Mortalidad IH* 27,8%

Mortalidad IH*12,1%

Catalogados como LET 42,9%

Y ese soporte ventilatorio *sólo* nos permite comprar tiempo!!!

TIEMPO CLINICO :

reducir los síntomas asociados a la I.R.A.

TIEMPO TERAPEUTICO …

que el tratamiento ESPECIFICO RESUELVA LA CAUSA

TIEMPO *al* CLINICO… el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

Y ese soporte ventilatorio *sólo* nos permite comprar tiempo!!!

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TIEMPO *al* CLINICO… el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

¿Es la EDAD un criterio para escalar o limitar el soporte ventilatorio?

SOCIETAT CATALANA DE GERIATRIA I GERONTOLOGIA

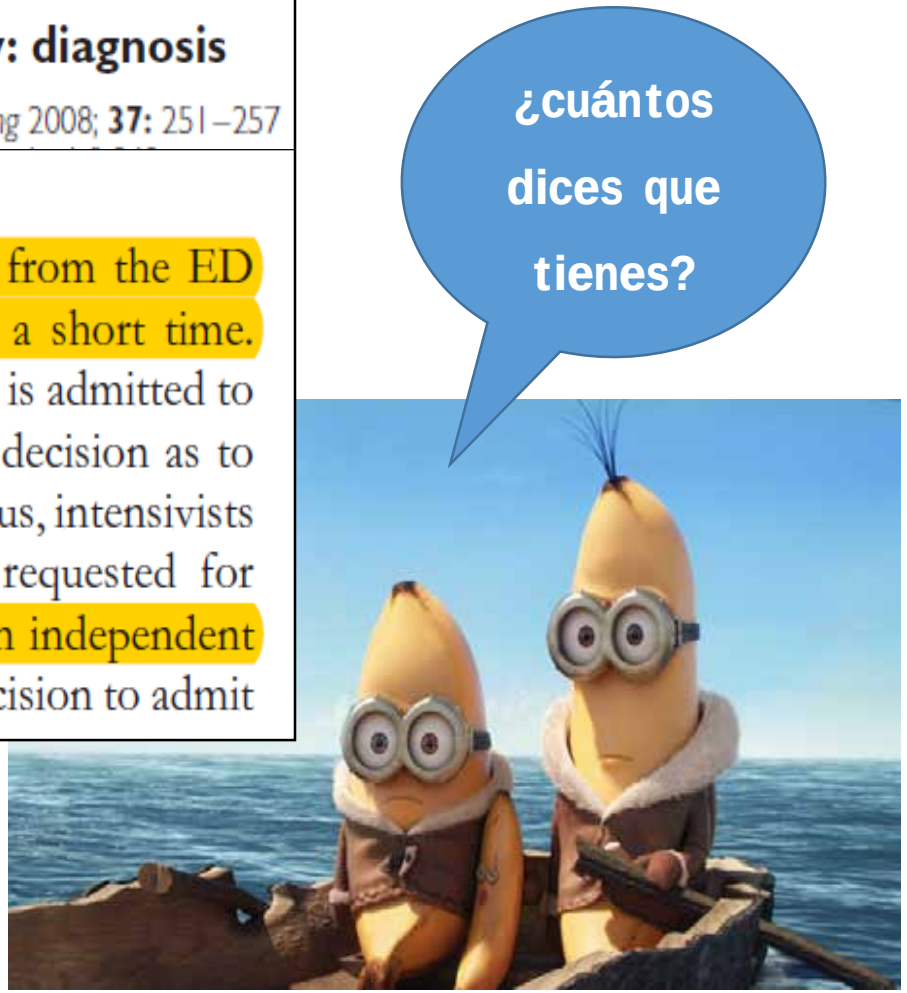
TIEMPO *al* CLINICO… el que nos permite conocer antecedentes del paciente * ***para valorar toma de decisiones*** **: ESCALAR O LIMITAR**

Acute respiratory failure in the elderly: diagnosis and prognosis

Age and Ageing 2008; **37:** 251–257

Ethical considerations

The decision to admit a patient to the ICU from the ED is challenging, as physicians must decide in a short time. When a patient potentially requiring ICU care is admitted to the ED, emergency physicians take the first decision as to whether to propose the patient to the ICU. Thus, intensivists are involved only if an ICU admission is requested for the patient. Age over 85 years seems to be an independent predictor of ICU refusal [30]. Actually, the decision to admit



Absence of ageism in access to critical care: a cross-sectional study

Age and Ageing 2003; **32:** 382–387

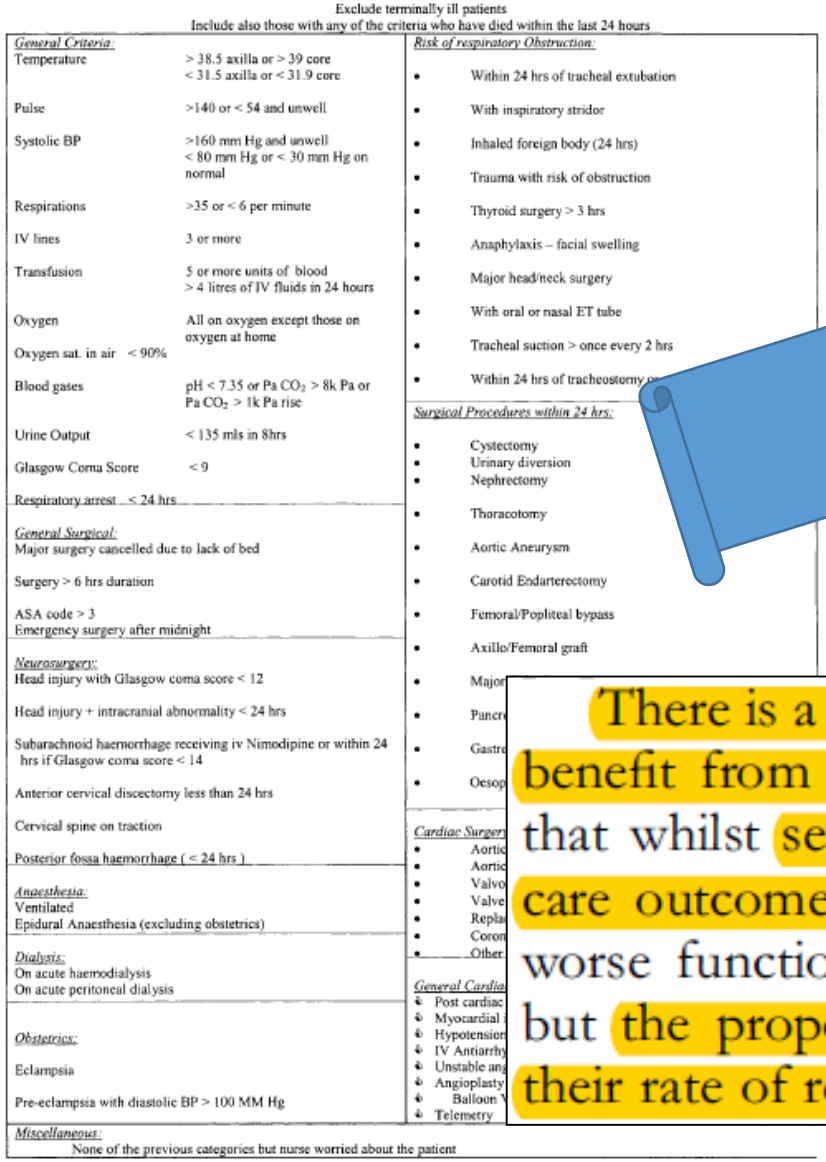
Table 1. Number of patients on a general ward considered suitable for critical care by intensivist panel

Age group (years)	Number of patients on a general ward (% for whom there was a consensus)	Number suitable for critical care	Percentage (95% C.I.)
<55	502 (89.4)	217	48.3 (43.7–53.0)
55–64	345 (91.0)	167	53.2 (47.7–58.7)
65–74	602 (89.4)	305	56.7 (52.5–60.9)
75–84	603 (87.9)	276	52.1 (47.8–56.3)
>85	233 (90.6)	119	56.6 (49.9–63.3)

Consideran *tributario* al 56,6% de >85 años

Absence of ageism in access to critical care: a cross-sectional study

Age and Ageing 2003; **32:** 382–387



Exclude terminally ill patients
Include also those with any of the criteria who have died within the last 24 hours

General Criteria:

Temperature	> 38.5 axilla or > 39 core < 31.5 axilla or < 31.9 core
Pulse	>140 or < 54 and unwell
Systolic BP	>160 mm Hg and unwell < 80 mm Hg or < 30 mm Hg on normal
Respirations	>35 or < 6 per minute
IV lines	3 or more
Transfusion	5 or more units of blood > 4 litres of IV fluids in 24 hours
Oxygen	All on oxygen except those on oxygen at home
Oxygen sat. in air	< 90%
Blood gases	pH < 7.35 or Pa CO_2 > 8k Pa or Pa CO_2 > 1k Pa rise
Urine Output	< 135 mls in 8hrs
Glasgow Coma Score	< 9
Respiratory arrest	< 24 hrs

General Surgical:
Major surgery cancelled due to lack of bed
Surgery > 6 hrs duration
ASA code > 3
Emergency surgery after midnight

Neurosurgery:
Head injury with Glasgow coma score < 12
Head injury + intracranial abnormality < 24 hrs
Subarachnoid haemorrhage receiving iv Nimodipine or within 24 hrs if Glasgow coma score < 14
Anterior cervical discectomy less than 24 hrs
Cervical spine on traction
Posterior fossa haemorrhage (< 24 hrs)

Anaesthesia:
Ventilated
Epidural Anaesthesia (excluding obstetrics)

Dialysis:
On acute haemodialysis
On acute peritoneal dialysis

Obstetrics:
Eclampsia
Pre-eclampsia with diastolic BP > 100 MM Hg

Miscellaneous:
None of the previous categories but nurse worried about the patient

Risk of respiratory Obstruction:
- Within 24 hrs of tracheal extubation
- With inspiratory stridor
- Inhaled foreign body (24 hrs)
- Trauma with risk of obstruction
- Thyroid surgery > 3 hrs
- Anaphylaxis – facial swelling
- Major head/neck surgery
- With oral or nasal ET tube
- Tracheal suction > once every 2 hrs
- Within 24 hrs of tracheostomy

Surgical Procedures within 24 hrs:
- Cystectomy
- Urinary diversion
- Nephrectomy
- Thoracotomy
- Aortic Aneurysm
- Carotid Endarterectomy
- Femoral/Popliteal bypass
- Axillo/Femoral graft
- Major
- Pancr
- Gastr
- Oesop

Cardiac Surgery
- Aortic
- Aortic
- Valvo
- Valve
- Repla
- Coron
- Other

General Cardia
- Post cardiac
- Myocardial
- Hypotension
- IV Antiarrhy
- Unstable ang
- Angioplasty
- Balloon
- Telemetry

SURGICAL PATIENTS!

There is a strong evidence base that older patients do benefit from critical care facilities. Studies have shown that whilst severity of illness is a predictor of intensive care outcome, age is not [21]. Older people may have worse functional ability at admission to intensive care, but the proportion of older patients who recover and their rate of recovery is the same as for younger patients

Age, invasive ventilatory support and outcomes in elderly patients admitted to intensive care units

Age and Ageing 2009; **38:** 515–520

JOSE MARCELO FARFEL[1], SUELENE AIRES FRANCA[2]

- 840 pacientes
- 69,2 +/- 8,7 (rango 55-99)
- ➢ 42% causa médica
- ➢ 58% causa quirúrgica:
  - 38,5% Qx electiva
  - 19,5% Qx emergente

Age, invasive ventilatory support and outcomes in elderly patients admitted to intensive care units

Age and Ageing 2009; **38:** 515–520

Table 1. Demographic, clinical characteristics and outcomes of the sample ($N = 840$)

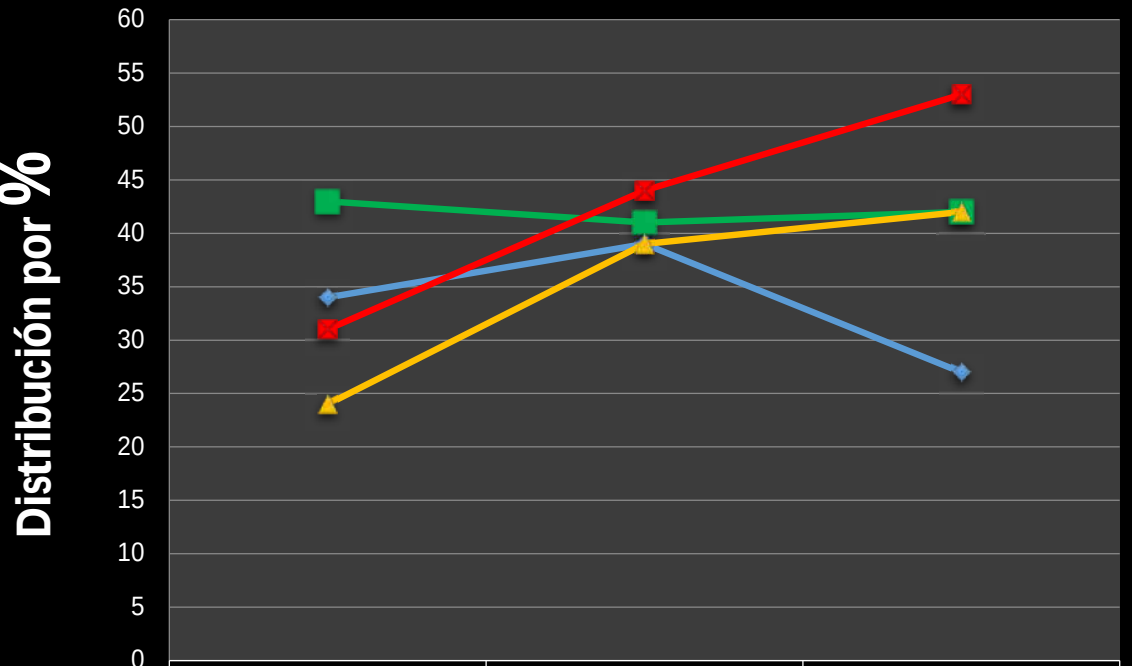
Characteristics	Age (years) 55–64	65–74	≥75	*P*-value
Number of patients (%)	284 (34)	326 (39)	230 (27)	
Age, mean (SD)	59.9 (2.8)	69.5 (2.7)	80.4 (4.7)	< 0.001
Female, *n* (%)	115 (40)	123 (38)	116 (50)	0.009
Died in ICU, *n* (%)	63 (24)	127 (39)	96 (42)	< 0.001
Died in the hospital, *n* (%)	89 (31)	143 (44)	121 (53)	< 0.001

Table 2. Variables independently predictive of in-hospital mortality by logistic regression

Variable	Odds ratio (95% CI)	*P*-value
Age (65–74 years)	1.68 (1.11–2.53)	0.013
Age (75–84 years)	2.44 (1.56–3.80)	< 0.001
Medical admission	3.30 (2.17–5.00)	< 0.001
Unscheduled surgery	2.08 (1.27–3.39)	0.003
APS, points	1.05 (1.03–1.07)	< 0.001
Invasive ventilatory support	6.12 (4.04–9.29)	< 0.001
Time hospital/ICU (days)	1.03 (1.01–1.05)	0.011

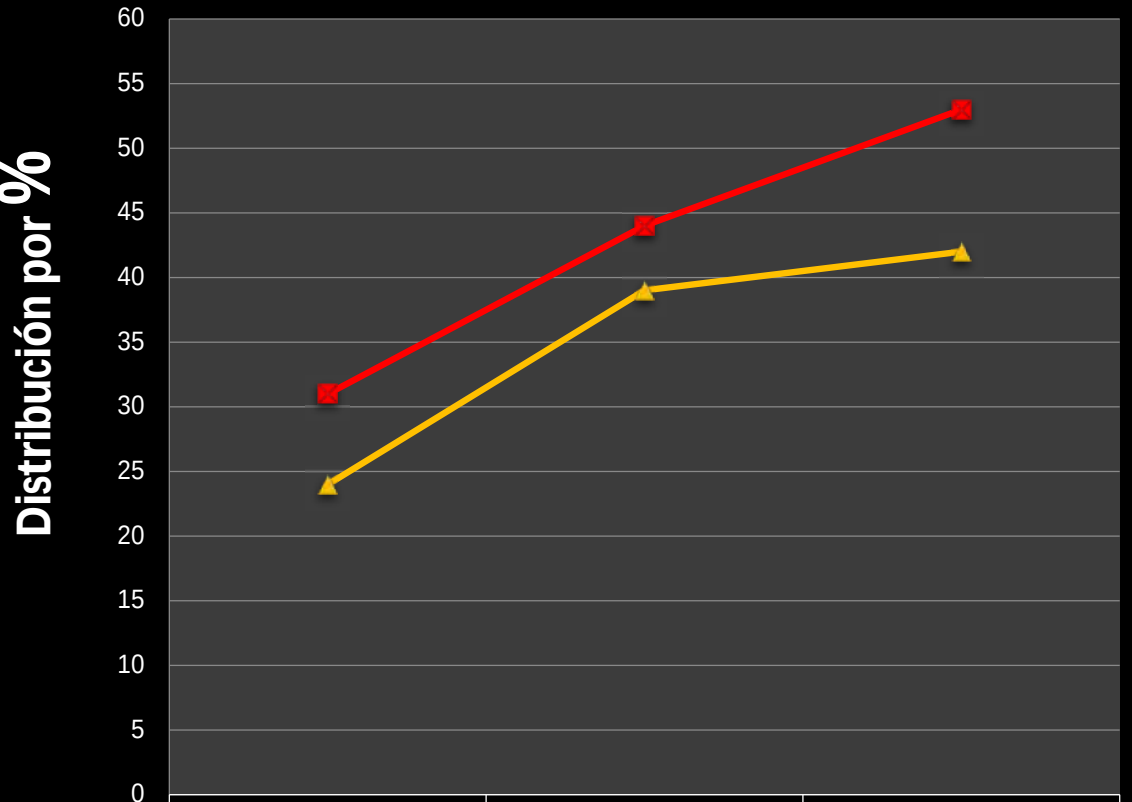
VM Invasiva OR: 6,12

Distribución por grupos de Edad



	55-64a	64-75a	>=75a
N	34	39	27
Médica	43	41	42
Mort UCI	24	39	42
Mort HOSP	31	44	53

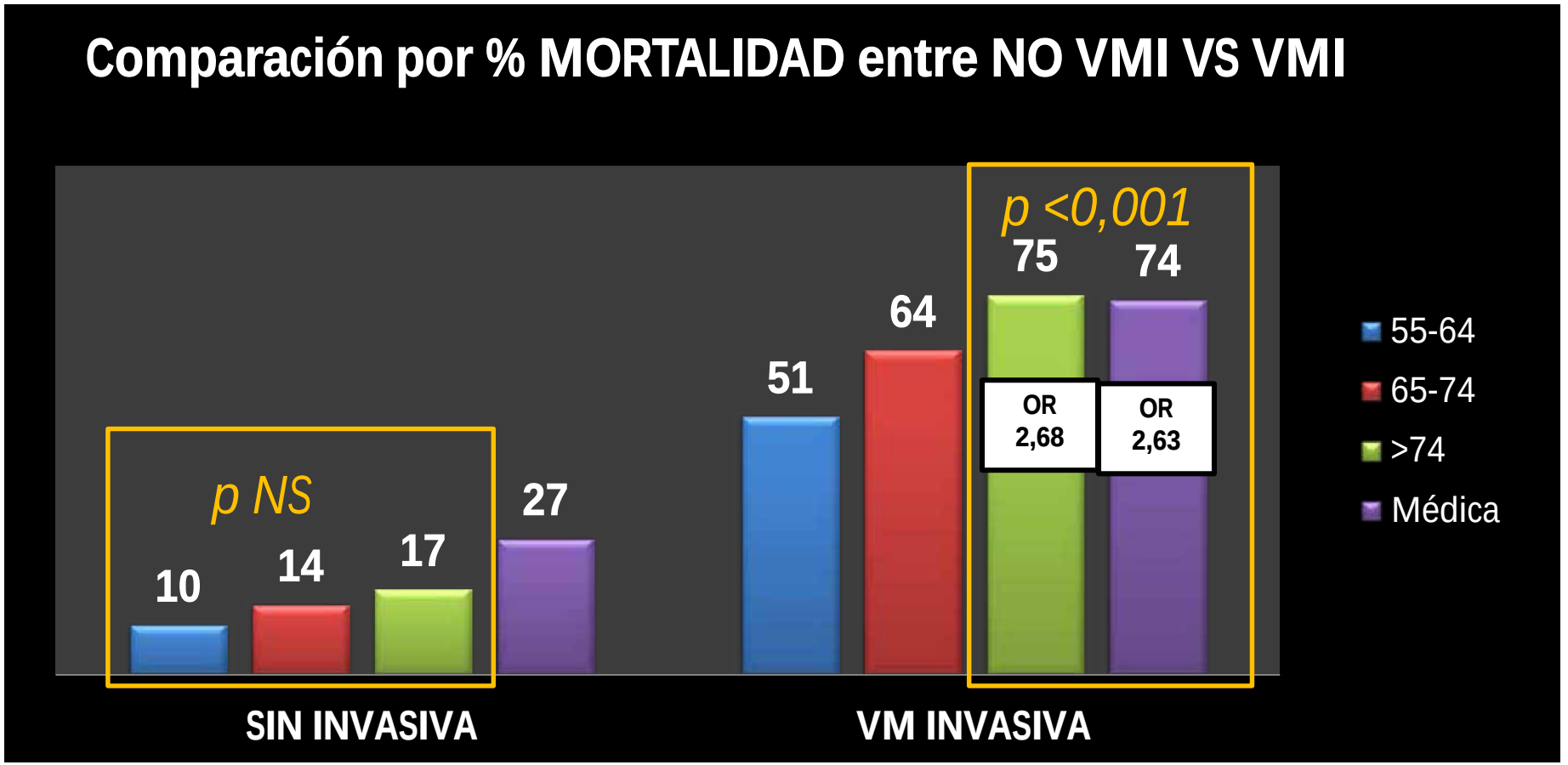
Distribución por grupos de Edad



	55-64a	64-75a	>=75a
Mort UCI	24	39	42
Mort HOSP	31	44	53

Table 3. Multivariate analysis for patients requiring and not requiring invasive mechanical ventilation

	Requiring invasive mechanical ventilation			Not requiring invasive mechanical ventilation		
	Mortality *N* (%)	Odds ratio (95% CI)	*P*-value	Mortality *N* (%)	Odds ratio (95% CI)	*P*-value
55–64 years	75 (51)	1.00	–	14 (10)	1.00	–
65–74 years	125 (64)	1.60 (1.01–2.54)	0.047	18 (14)	2.28 (0.99–5.25)	0.15
≥75 years	105 (75)	2.68 (1.58–4.56)	<0.001	16 (17)	1.95 (0.82–4.62)	0.48
Scheduled surgery	80 (57)	1.00	–	11 (6)	1.00	–
Unscheduled surgery	74 (67)	1.94 (1.13–3.34)	<0.001	4 (8)	1.16 (0.35–3.89)	0.81
Medical admission	170 (74)	2.63 (1.63–4.25)	<0.001	33 (27)	3.74 (1.73–8.05)	0.001
APS, points[a]	–	1.04 (1.02–1.06)	<0.001	–	1.08 (1.04–1.12)	<0.001

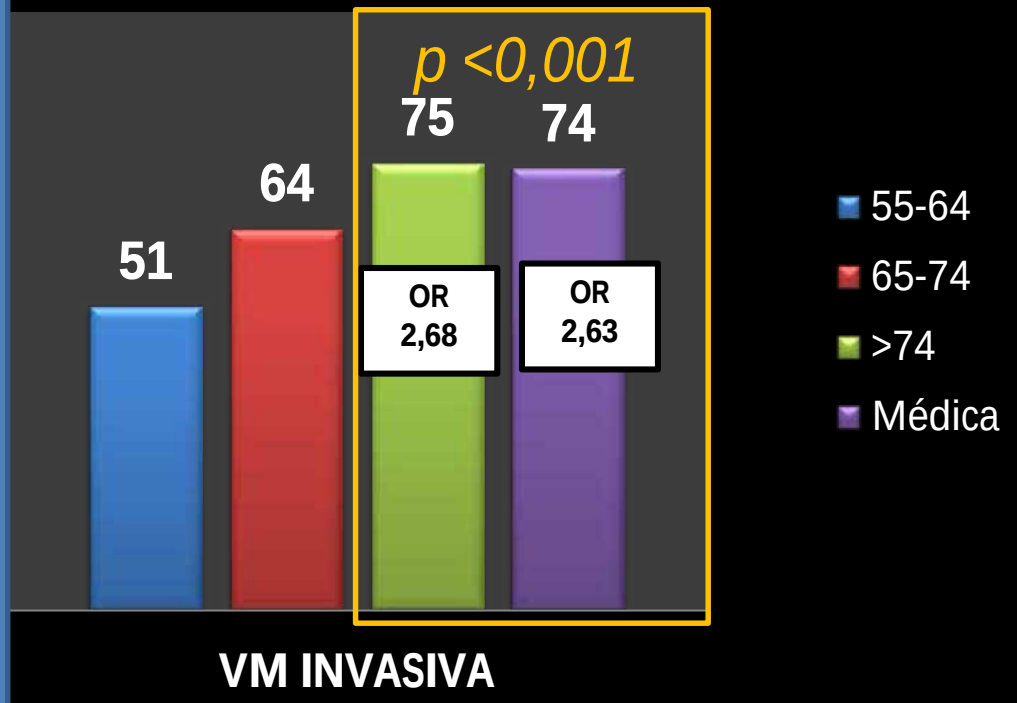


Comparación por % MORTALIDAD entre NO VMI VS VMI

Edad + VMI

=

MAYOR MORTALIDAD



The association of age and invasive mechanical ventilation is strongly related to mortality. These results constitute additional evidence for the liberal indication of non-invasive mechanical ventilation and for the development of novel and particular strategies of invasive mechanical ventilation for elderly patients admitted to the ICU with respiratory acute failure.

Edad avanzada + IOT

Key points

- Age worsens outcomes in elderly submitted to invasive mechanical ventilation.
- Age is not related to mortality in elderly not submitted to invasive mechanical ventilation.
- Severity of acute illness is a predictor of mortality in elderly admitted to ICU.
- Age is associated with severity of illness in elderly admitted to ICU.

DISPARA LA MORTALIDAD

Comparación por % MORTALIDAD entre NO VMI VS VMI

La Edad no aumenta la mortalidad en ausencia de VMI

55-64
65-74
>74
Médica

Furthermore, the age-related mortality found in the group aged 75 years or more was even lower than that in the group between 65 and 74 years old, showing that age should not be considered as a factor related to in-hospital mortality in elderly patients not requiring invasive ventilatory support in ICUs.

This study evaluated the importance of the time interval between hospitalisation and admission to the ICU for the elderly population. The literature reports that patients admitted from the emergency department have better prognosis than those admitted from other hospital wards, probably because of the prompt transfer to the ICU [26, 27]. Our results showed that a delayed transfer to the ICU is correlated with higher rates of in-hospital mortality. The lack of vacant beds on ICU was the major reason for delayed transfer.

The lack of vacant beds on ICU

VMNI en el paciente anciano

EL FACTOR EDAD

- La edad no es criterio de exclusión ni contraindica el soporte ventilatorio no invasivo ni invasivo
- La edad reflejada en la MBE (Unidades de Críticos) de la VMNI es 10 años inferior a la edad de la ***real practice*** de la VMNI en los Servicios de Urgencias.

ESCENARIOS CLINICOS ANCIANO Y ED VMNI

- La edad media de los pacientes sometidos a VMNI en ED supera los 75 a.

- Las causas más frecuentes de IRA en ED que requieren VMNI son:
  - Edema agudo de pulmón
  - EPOC agudizado
  - Neumonía .

EVIDENCIA CIENTIFICA ANCIANO Y ED VMNI

- La VMNI ha demostrado reducir la tasa de IOT y la mortalidad en los pacientes Acute on Chronic.
- La IOT en el paciente anciano aumenta su mortalidad, siempre que se relacione con el estado nutricional y comorbilidades.
- Los ancianos que desarrollan IRA suelen ser Acute on Chronic.

EPOC
EAP

OLD ROCKERS NEVER DIE

we stand in the MASK

Muchas gracias