

PAPER DELS DIFERENTS PROFESSIONALS EN LA VMNI: La fisioteràpia



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Situació fora de Catalunya?

Physiotherapy involvement in non-invasive ventilation hospital services: a British Isles survey

F. M. MORAN,¹ J. M. BRADLEY,¹⁻² J. S. ELBORN,²⁻³ A. J. PIPER⁴

© 2005 Blackwell Publishing Ltd *Int J Clin Pract*, April 2005, 59, 4, 453–456

The British Thoracic Society (BTS) guidelines suggest that ‘NIV facilities should be available 24 hrs per day in all hospitals likely to admit patients with acute hypercapnic respiratory failure’

Physiotherapists are routinely involved in the management of respiratory patients; however, to what extent they are involved in assessing patients for NIV, setting up patients on NIV or treating patients on NIV is unknown.

The **aim** of this study was **to assess the level of involvement** of physiotherapists in the **delivery of an NIV** service in hospitals throughout the British Isles, and to ascertain if there was any difference in the level of involvement between countries.





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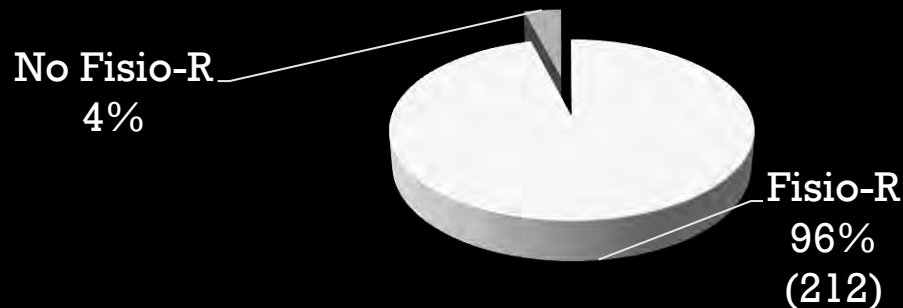
■ R ■ NO-R

100%

Ús VMNI

■ VMNI ■ no-VMNI

Fisioterapeuta involucrat en el maneig del malalt VM





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Ús de la VMNI

Patologia pulmonar i de VVAA	99%
Deformitats de la CT	53%

Mechanical aids to assist sputum clearance

*With NIV service
(n = 212)*

Flutter	96/212 (45%)
Intermittent positive pressure breathing	92/212 (44%)
Positive expiratory pressure	72/212 (34%)
Periodic continuous positive airway pressure	47/212 (22%)
Cough insufflator/exsufflator	23/212 (11%)
Comet	16/212 (8%)



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The current contribution of physiotherapy to NIV services in the British Isles is primarily focused on the treatment of patients on NIV rather than assessing a patient's needs for NIV or setting them up on NIV. This treatment role is provided outside normal working hours by the majority of physiotherapy staff.



VMNI - TTM
97% fora de l'horari

Rol del fisio VNI-UCI
→ especialitzats



unit (13). This European survey also found that physiotherapists were more likely to be involved in the implementation and supervision of NIV in the intensive care unit if they were specialists exclusively dedicated to the unit.



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Rol del Físio i VMNI

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Avaluació freqüent	Oximetria	96%
	Auscultació	97%
	Compliment	73%
	Síntomes	57%
	Força muscular	57%
Avaluació menys freqüent	Test d'exercici	17%
	Força muscular respiratòria	4%
	GA B/VMNI	13%
	Estudis de la son	1%
Educació	FT-R	76%
	Protocols	64%

up patients on NIV could be the
riately trained member of the multi-
er, few physiotherapists currently
h are the primary outcome meas-
id set up patients on NIV (1).
to develop specialist skills in order
management of patients on NIV.



Recomanacions a la literatura

Condition Technique Recommendation Comments

Appropriateness of respiratory care: evidence-based guidelines

Joël Rosière^a, John-Paul Vader^b, Marta Sokol Cavin^a, Kathleen Grant^a, Anna Larcinese^a, Rachel Voellinger^b,
Bernard Burnand^b, Jean-Pierre Revelly^c, Jean-William Fitting^d

Asthma	IPPB	Not recommended (C)	
	MIE	Not recommended (C)	
	NIV	Not recommended (A)	
	IPPB	Not recommended (C)	
Cystic fibrosis			
Hypercapnic respiratory failure	NIV	Recommended (C)	
Secretion retention	Non-instrumental airway clearance	Recommended (A)	
	PEP-mask	Recommended (A)	
	Flutter VRP1	Recommended (C)	
	Nasotracheal suctioning	Recommended (C)	If other techniques fail
	IPV	Uncertain (I)	If other techniques fail
	IPPB	Not recommended (C)	
	MIE	Not recommended (C)	
Upper airway obstruction	NIV	Recommended (C)	Indication: glottal oedema following extubation
Aerosol delivery	IPPB	Not recommended (C)	



Recomanacions a la literatura

Original article

SWISS MED WKLY 2009;139(27-28):387-392 · www.smw.ch

387

Peer reviewed article

Condition	Technique	Recommendation	Comments
Obesity hypoventilation syndrome	NIV	Recommended (C)	
Central hypoventilation	NIV	Recommended (C)	
Chest wall deformity with hypercapnic respiratory failure	NIV	Recommended (C)	
Neuromuscular disease			
Hypercapnic respiratory failure	NIV	Recommended (C)	
Impaired cough	MIE	Recommended (C)	
Spinal cord injury	IPPB	Not recommended (A)	For C5 – T6 lesions



Recomanacions a la literatura

Original article

SWISS MED WKLY 2009;139(27-28):387-392 · www.smw.ch

387

Peer reviewed article

Condition	Technique	Recommendation	Comments
Obesity hypoventilation syndrome	NIV	Recommended (C)	●
Central hypoventilation	NIV	Recommended (C)	●
Chest wall deformity with hypercapnic respiratory failure	NIV	Recommended (C)	●
Neuromuscular disease			
Hypercapnic respiratory failure	NIV	Recommended (C)	●
Impaired cough	MIE	Recommended (C)	●
Spinal cord injury	IPPB	Not recommended (A)	For C5 – T6 lesions



Recomanacions a la literatura

Original article

SWISS MED WKLY 2009;139(27-28):387-392 · www.smw.ch

387

Peer reviewed article

Recommendations for atelectasis, hypoxaemia and severe dyspnoea.

Condition	Technique	Recommendation	Comments
Pulmonary atelectasis	CPAP	Recommended (A)	●
	NIV	Not recommended (A)	Not superior to CPAP
Conclusion: Despite a marked heterogeneity of scientific evidence, the method used allowed us to develop commonly agreed local guidelines for respiratory care. In addition, this work fostered a closer relationship between physiotherapists and physicians in our institution.			
Terminal disease with severe dyspnoea	CPAP	Uncertain (I)	
	NIV	Uncertain (I)	
Terminal disease with severe dyspnoea	NIV	Recommended (C)	● As part of an integrated palliative care project To be discontinued in the absence of subjective benefit

MPOC i VMNI

Non-invasive ventilation improves peripheral oxygen saturation and reduces fatigability of quadriceps in patients with COPD

AUDREY BORGHI-SILVA,¹ LUCIANA DI THOMMAZO,¹ CAMILA B.F. PANTONI,¹ RENATA G. MENDES,¹
TANIA DE FÁTIMA SALVINI² AND DIRCEU COSTA³

This was a prospective, double-blind, RCT n:24 MPOC // n:18 controls

COPD

Conclusió Bi-level:



SpO2 perifèrica

Fatigabilitat del QM test isocinètic concèntric

VMNI juga un important paper en l'exercici de F d'alta intensitat en MPOC severs



MPOC i IPV

Intrapulmonary percussive ventilation in acute exacerbations of COPD patients with mild respiratory acidosis: a randomized controlled trial [ISRCTN17802078]

Frédéric Vargas^{1,2}, Hoang Nam Bui¹, Alexandre Boyer¹, Louis Rachid Salmi³, Georges Gbikpi-Benissan¹, Hervé Guenard², Didier Gruson¹ and Gilles Hilbert^{1,2}

Critical Care 2005, 9:R382-R389 (DOI 10.1186/cc3724)

HIPOTESIS

- IPV tècnica per afavorir DB
- Podria resultar eficaç per evitar el deteriorament funcional en el malalt MPOC aguditzat amb acidosi respiratòria moderada

Criteris d'inclusió:

n:33 A-MPOC

FR $\geq$ 25/min

Pa CO₂ > 45 mmHg

7.35 $\leq$ pH $\leq$ 7.38

G.Control (T_{tm} farmacològic estàndard)

G.IPV (2v/d 30' + t_{tm} estàndard)



MPOC i IPV

Clinical outcome of COPD patients assigned to receive intrapulmonary percussive ventilation or standard treatment

	IPV (n = 16)	Standard treatment (n = 17)	p-value
Worsening of exacerbation with pH < 7.35 (NIV required) (%)	0 (0)	6 (35.3)	<0.05
Hospital stay (days)	6.8 ± 1.0	7.9 ± 1.3	<0.05

Tècnica segura i ben tolerada i preveu el deteriorament fisiològic en casos d'agudització d'MPOC amb moderada acidosi respiratòria

Valu

	IPV (n = 16)		
	Inclusion	Post IPV session	p-value
Arterial pH	7.37	7.38	NS
PaCO ₂ (Torr)	57.6 ± 4.5	53.5 ± 2.3	<0.05
PaO ₂ (Torr) ^a	56.9 ± 3.0	61.0 ± 0.8	<0.05
RR (breaths/min)	36 ± 2	31 ± 2	<0.05



IRH i ACBT + VMNI

Active cycle of breathing techniques in non-invasive ventilation for acute hypercapnic respiratory failure

Australian Journal of Physiotherapy 2004 Vol. 50

Table 3. Total duration and length of time requiring non-invasive ventilation, and length of stay in the intensive care unit.

	ACBT (n = 17)	Control (n = 17)	Difference (95% CI)	p value
Total duration of NIV (hours)	64.9 ± 29.7	84.1 ± 36.6	19.3 (1.2 to 37.4)	0.15
Length of time requiring NIV (days)	5.0 ± 2.5	6.7 ± 2.6	1.7 (-0.3 to 3.8)	0.03
Length of ICU stay (days)	8.0 ± 3.9	9.4 ± 4.4	1.3 (-0.5 to 3.1)	0.31

Data are means ± SD. ACBT = active cycle of breathing techniques, NIV = non-invasive ventilation, ICU = intensive care unit.

Conclusion

The results of this study provide evidence that the use of ACBT in patients with acute hypercapnic respiratory failure is safe, and it could shorten the length of time required for NIV. Therefore, it may have positive effects on the



Cirurgia Toràcica + VMNI

Does non-invasive ventilation associated with chest physiotherapy improve outcome after lung resection?

Anne Freynet and Pierre-Emmanuel Falcoz

Interact CardioVasc Thorac Surg 2008;7:1152-1154; originally published online Sep 22, 2008;

In [patients undergoing lung resection surgery] is [noninvasive ventilation associated with chest physiotherapy] superior to [chest physiotherapy alone] in [preventing respiratory Complications]?

172 abstracts CEBP → 5 seleccionats

A favor de la VMNI com a coadjuvant de la FT-R per millorar variables després de la cirurgia de ressecció pulmonar

- Prevenció
- Tractament
- Reducció complicacions respiratòries



Atelectàssies en pediatria + IPV

Pediatrics International (2007) **49**, 502–507

doi: 10.1111/j.1442-200X.2007.02385.x

Original Article

Atelectatic children treated with intrapulmonary percussive ventilation via a face mask: Clinical trial and literature overview

THI KIM YEN HA,¹ THI DUNG BUI,¹ ANH TUAN TRAN,² PHILIPPE BADIN,⁴
MICHEL TOUSSAINT^{4,5} AND ANH TUAN NGUYEN³

No es descriuen efectes secundaris
En $\frac{3}{4}$ dels pacients es va resoldre l'atelèctasi
Milloria clínica i oxigenació arterial normalitzada

Limitació metodològica...



MNM i VMNI

The Addition of Mechanical Insufflation/Exsufflation
Shortens Airway-Clearance Sessions
in Neuromuscular Patients With Chest Infection

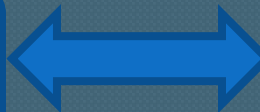
Michelle Chatwin PhD and Anita K Simonds MD

RESPIRATORY CARE • NOVEMBER 2009 VOL 54 NO 11

Cough Assist millora la higiene bronquial i augmenta PCF

MNM + VMNI

Fisio ACBT on
NIV + MI-E



Fisio ACBT on
NIV

Comparen el temps que requereix la teràpia d'HB amb o sense
Cough Assist

Conclusió:

Redueix el temps emprat

Aparell segur i ben tolerat pot aportar beneficis als MNM amb
infecció VVAA superior



MNMM + teràpia oscil·latòria

La tos asistida i mecànica ajuda als pacients amb afectació de la capacitat tussígena.

En casos no neuromusculars s'utilitzen dispositius com el flutter o l'acapella

Meca
despl

El se

La e
respi

En la

Potse

**No podem tractar un
MNMM
com un MPOC**

S'hauria de fer recerca sobre aquests dispositius per tal de provar la seva eficàcia en aquestes malalties



Oscillating physiotherapy for secretolysis. Pneumologie. 2008 Mar;62 Suppl 1:S31-4. [Brückner U.](#)

Restrictius i training + VMNI

Home exercise training with NIV in thoracic restrictive respiratory disorders: A randomised study.

We assessed the effects of exercise training and non-invasive ventilation (NIV) during exercise in patients with restrictive disorders.

16 patients underwent an 8-week home-based cycle exercise program.

9 with NIV / 7 without NIV

Before and after training, evaluations included incremental and constant-load cycling tests, a 6-min walking test and the Chronic Respiratory Questionnaire (CRQ).

For the whole group, training increased

walking distance ($+22 \pm 35$ m)

maximal cycling power output ($+5 \pm 9$ W)

cycling endurance ($+75 \pm 94\%$)

CRQ score ($+10 \pm 13$ pts).

We concluded that in patients with restrictive disorders (i) exercise training including NIV is feasible at home, (ii) whatever the modalities, exercise training induces significant benefits in exercise tolerance and quality of life, and (iii) in acute NIV responders, chronic use of NIV during exercise may lead to synergetic effects compared to traditional training.



Jean-Christian Bore. et al. [Respiratory Physiology & Neurobiology](#) Volume 167, Issue 2, 30 June 2009, Pages 168-173

VMNI i FQ

Non-invasive ventilation assists chest physiotherapy in adults with acute exacerbations of cystic fibrosis.

Thorax. 2003 Oct;58(10):880-4. [Holland AE](#), [Denehy L](#), [Ntoumenopoulos C](#), [Naughton MT](#), [Wilson JW](#).

Indiscutible la FT-R en pacients amb FQ → Causa fatiga i desaturacions durant el tractament.

L'objectiu: comprovar si l'ús de VMNI durant FT-R pot prevenir efectes negatius en adults durant agudització

Mètode: 26pa. 27 (6)a a

FEV1 34 (12)% pred.

Randomised crossover trial

Standard treatment (ACBT) Vs. ACBT + NIV

S'estudia PIM, PEM, espirometria, dispnea pre i post ttm,

SpO2 s'enregistra durant el TTM + Producció d'esput a les 4 i 24h del ttm

Conclusió:

Desaturació i reducció en la PIM durant la fisioteràpia està associat a la debilitat muscular i la severitat de la malaltia pulmonar en adults A-FQ.

La VMNI millora la funció del múscul inspiratori, oxigenació i la funció de les vvaa petites així com redueix la dispnea.

CONCLUSIONS

- Físio pot tenir molts camps de treball, més dels que ens pensem, però per poder fer les coses correctament hem d'anar preparats. **FORMACIÓ**
- Evidència científica dels beneficis que reporta la FR i la VMNI en moltes patologies **RECERCA**
- 24 h implicació del físio a la clínica **LABORAL**



Necessitat d'especialització!!

