

Chronische NIV bij stabiele COPD patiënten

1. is alleen effectief als er sprake is van hypercapnie
2. is alleen effectief als door de NIV de CO_2 daalt
3. als aan beide (1 en 2) wordt voldaan
4. is nooit effectief

Casus COPD/obesitas

Man, 56

Voorgeschiedenis: COPD

2014 Opname IC respiratoire insufficiëntie

2017 April/ Juni / Juli: Exacerbatie COPD

Metingen

Spirometrie

FEV1 0,88(19%pred), FEV1%FVC 37

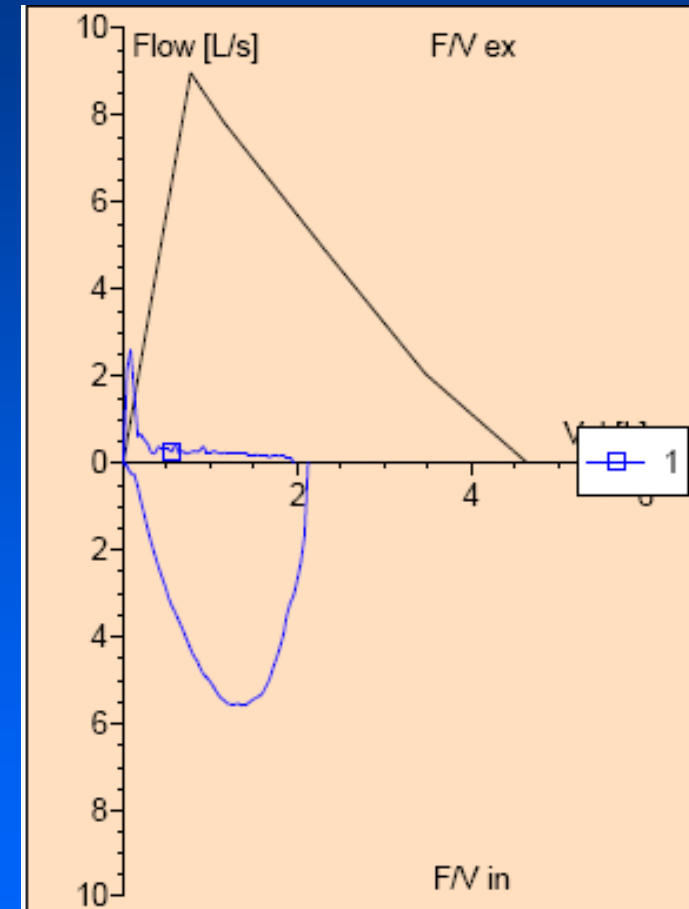
BGA (zonder zuurstof)

pH 7,38; pCO2 9,7 kPa; pO2 5,2 kPa,

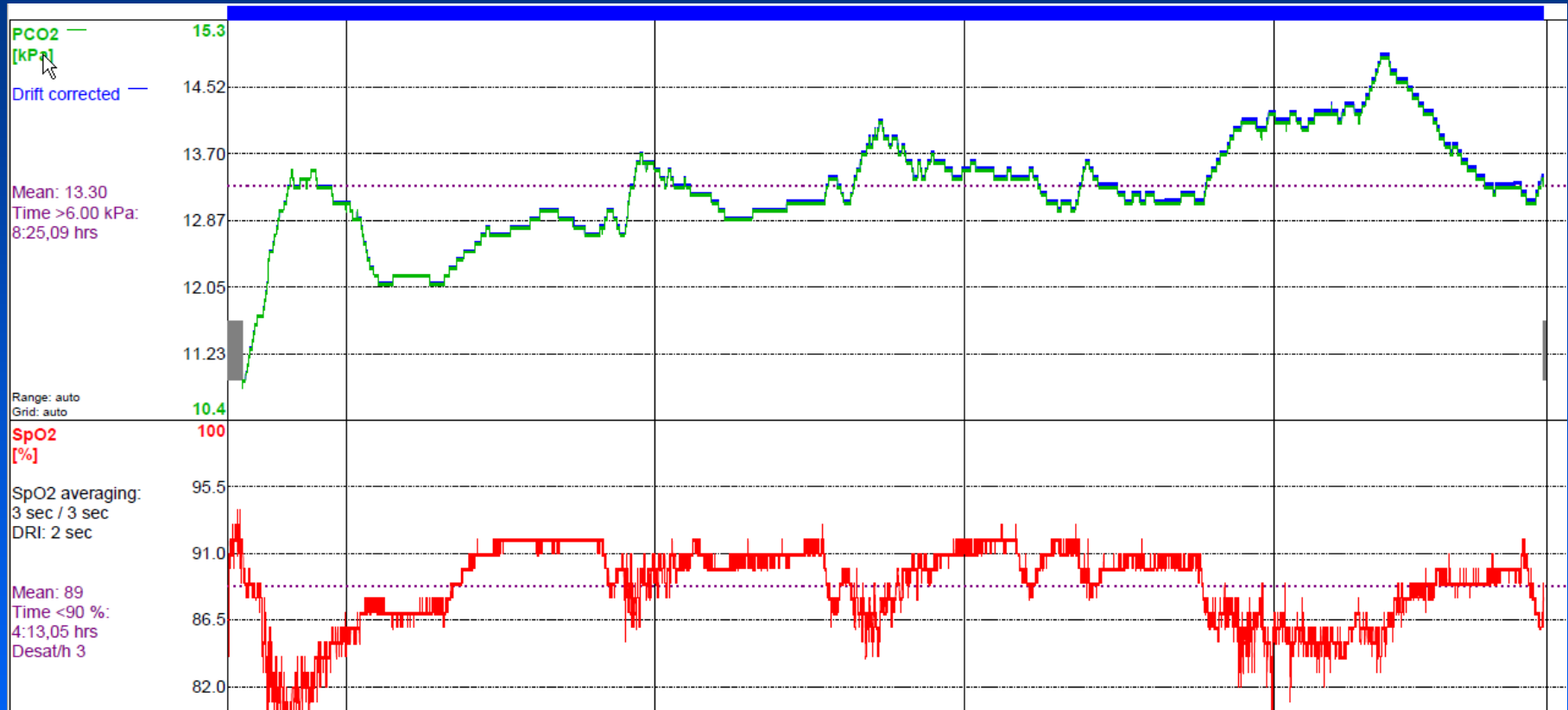
sat 81% HCO3 43 mmol/L

BMI = 35 kg /m²

*Medicatie : prednison / theophylline/
spiriva/ foradil / flixotide/ diuretica / zuurstof*



Nachtelijke registratie



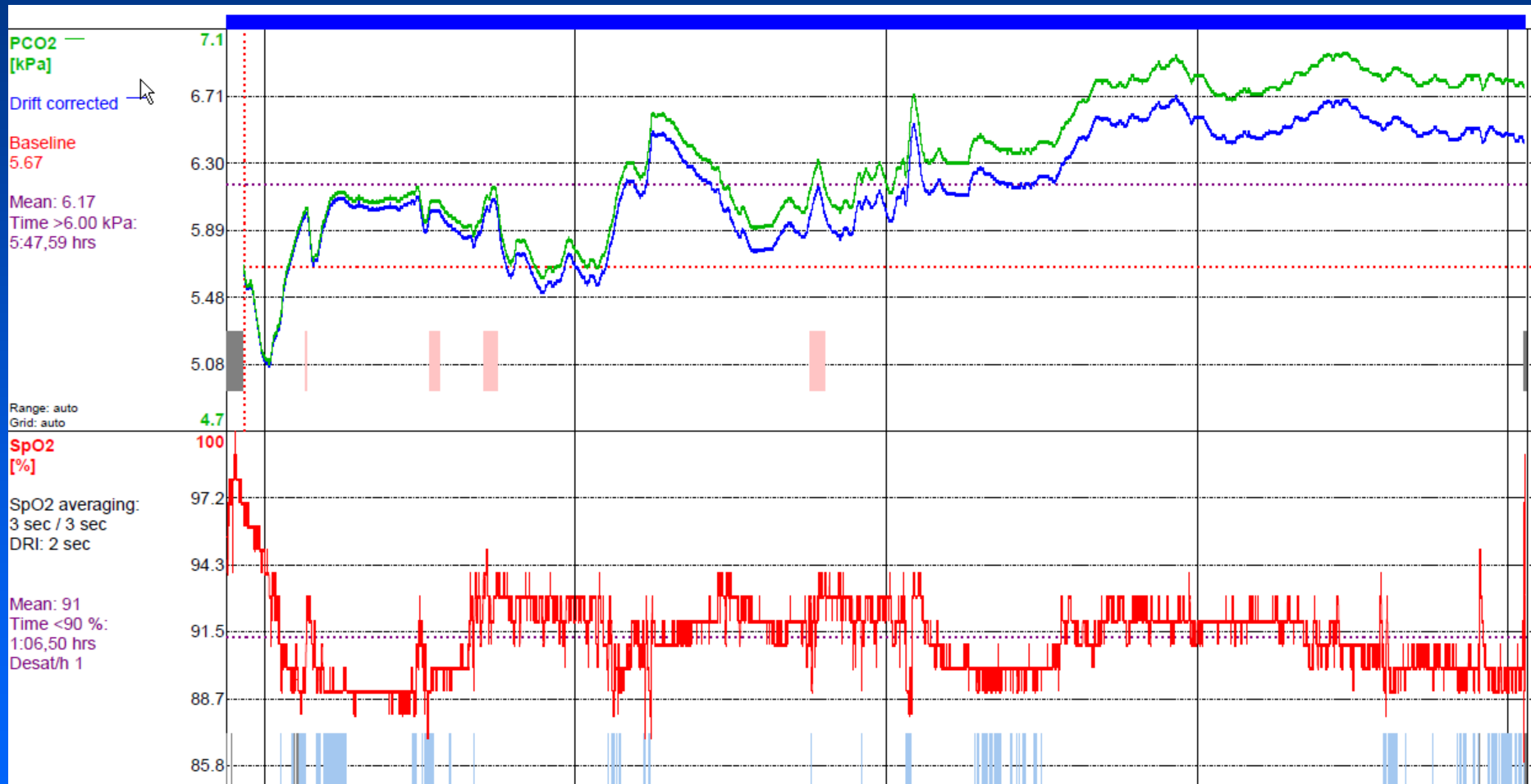
Oktober 2017

Wat zou u nu doen ?

Start NIV

- BiPAP A30 met FFM:
 - Modus S/T switch to PC
 - IPAP/ EPAP: 24/4; RR 12; Insp time 1 sec.
 - O₂ 2 ½ L bij NIV. Spontaan 1 ½ L
- Practice schedule
 - 3 times 1 hr during daytime
 - Nocturnal as long as possible

Nocturnal assessment with NIV



BiPAP IPAP 26 , EPAP 6, freq 12/min, January 2018

ZUURSTOF

LTX

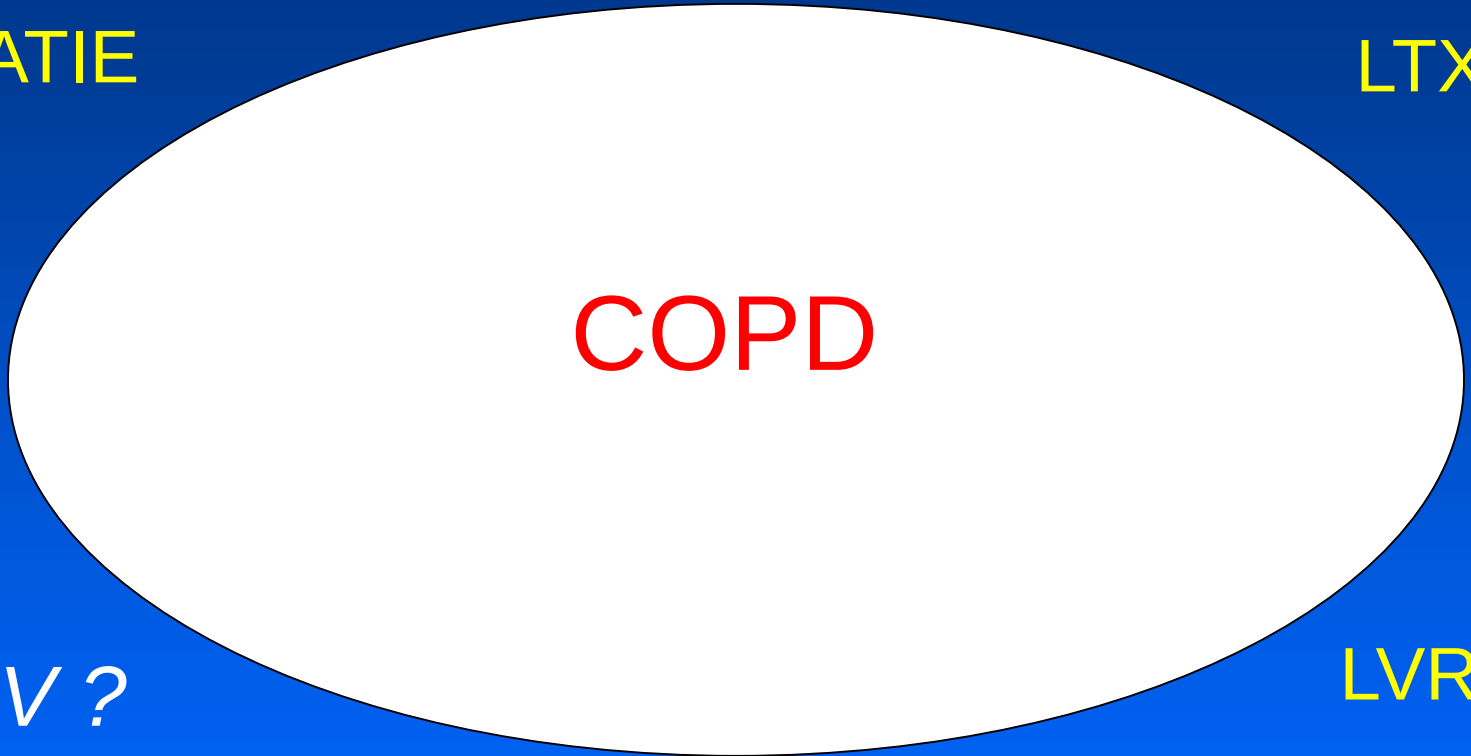
LVRT

REVALIDATIE

NIV ?

COPD

MEDICATIE



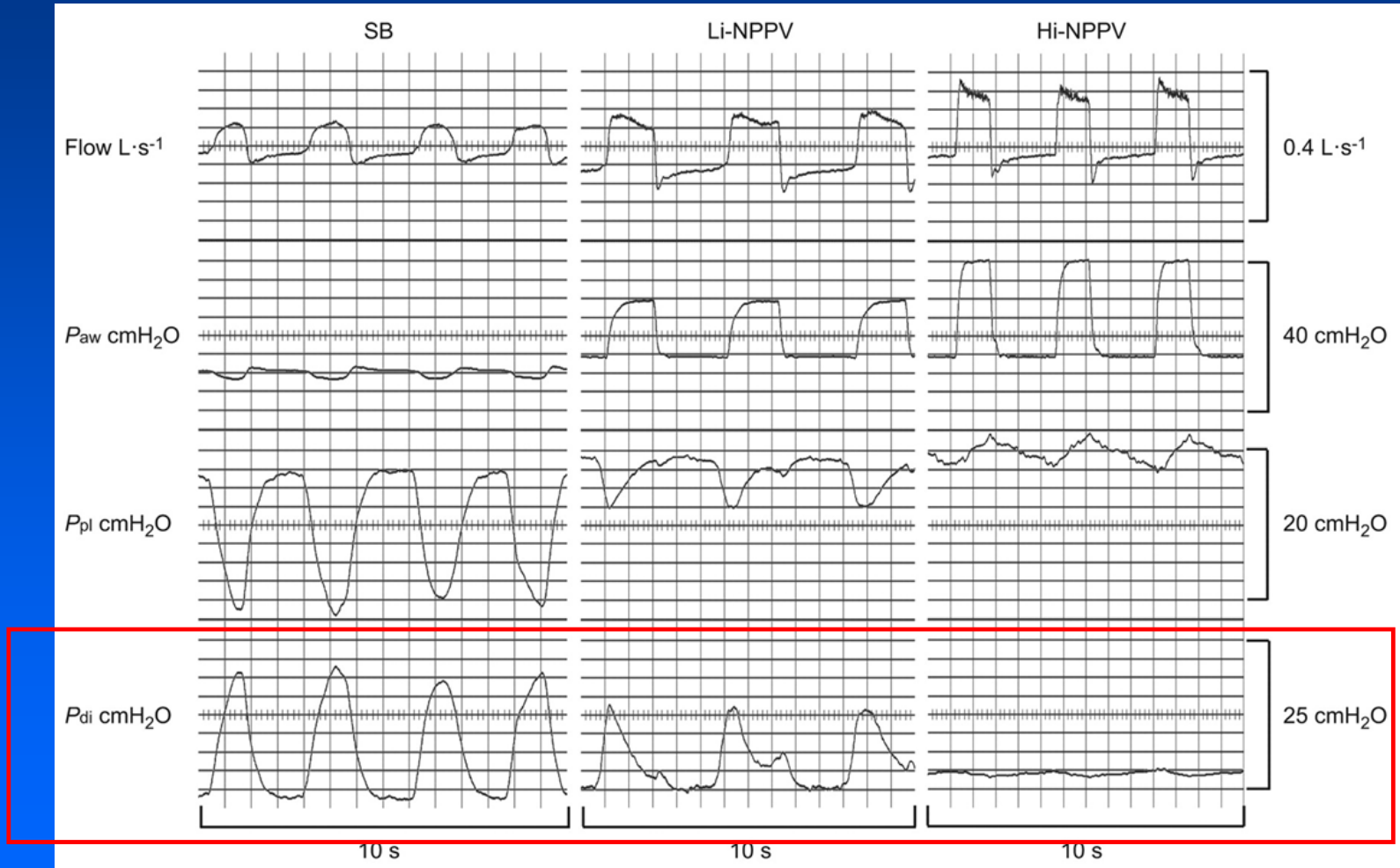
Chronische NIV bij COPD

- *Waarom* zou het werken?
- *Wanneer* kan het effectief worden?
- *In welke situatie is het effectief ?*

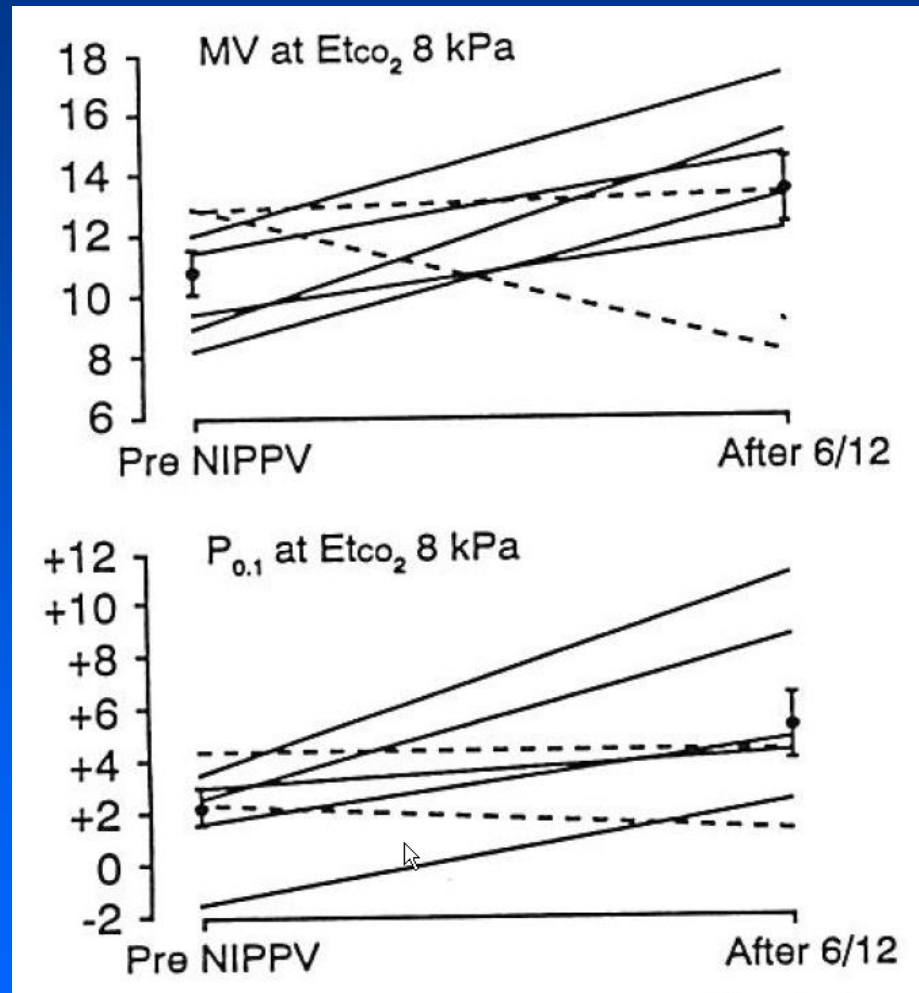
Verbeterde slaap

	Baseline	O ₂	O ₂ + NIPPV
TST, min	203	260*	339*#
Efficientie, %	51	69*	81#
Wakker, %	38	30	20*#

Uitrusten v/d AH spieren



Verbeterde chemosensitiviteit



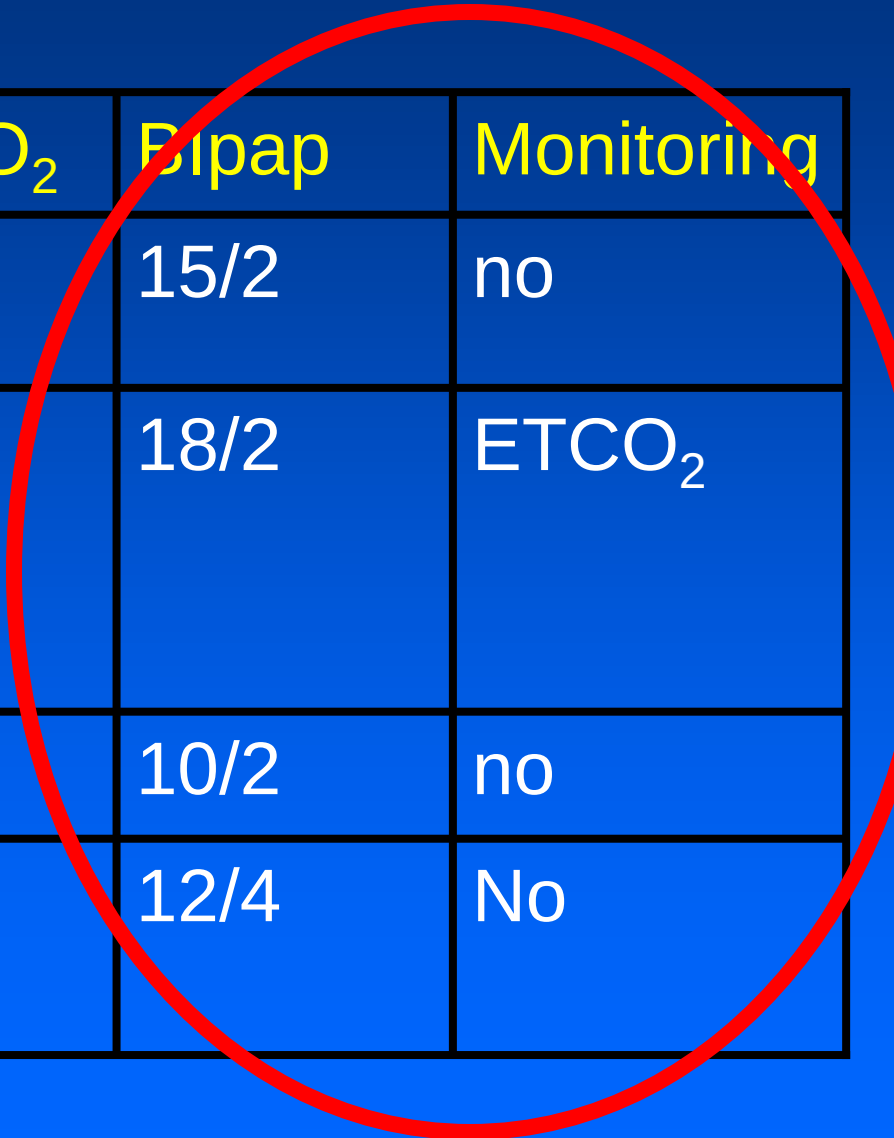
Chronische NIV bij COPD

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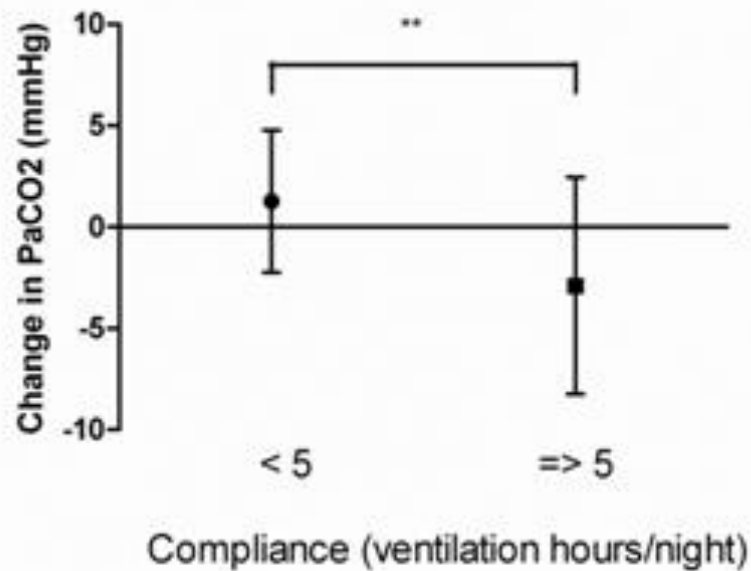
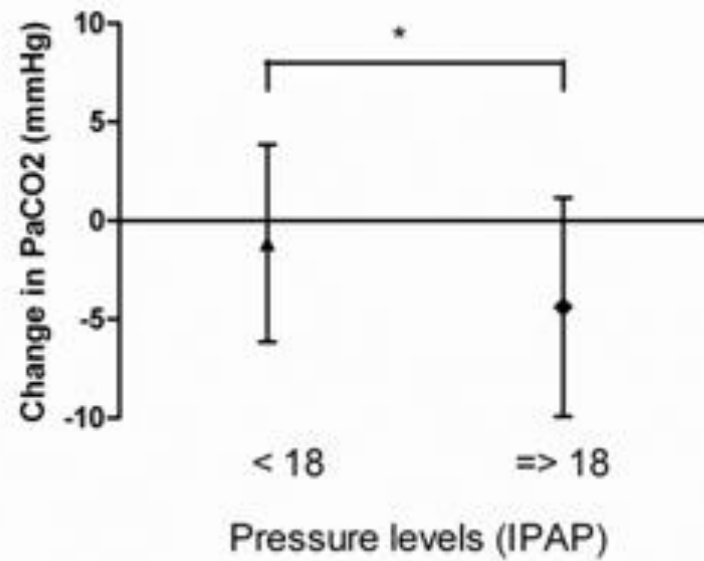
Uitkomst	Aantal	Effect gemiddelde	Effect 95 % CI
FVC, L	33/33	-0.01	-0.14 , 0.13
Pimax, cm H ₂ O	24/24	6.2	0.2 , 12.2
Pemax, cm H ₂ O	24/24	18.4	-11.8 , 48.6
PaO ₂ , mmHg	33/33	0.0	-3.8 , 3.9
PaCO ₂ , mmHg	33/33	-1.5	-4.5 , 1.5
6-MWD, m	12/11	27.5	-26.8 , 81.8
Sleep eff., %	13/11	-4.0%	-14.7 , 6.7

Details van de onderzoeken

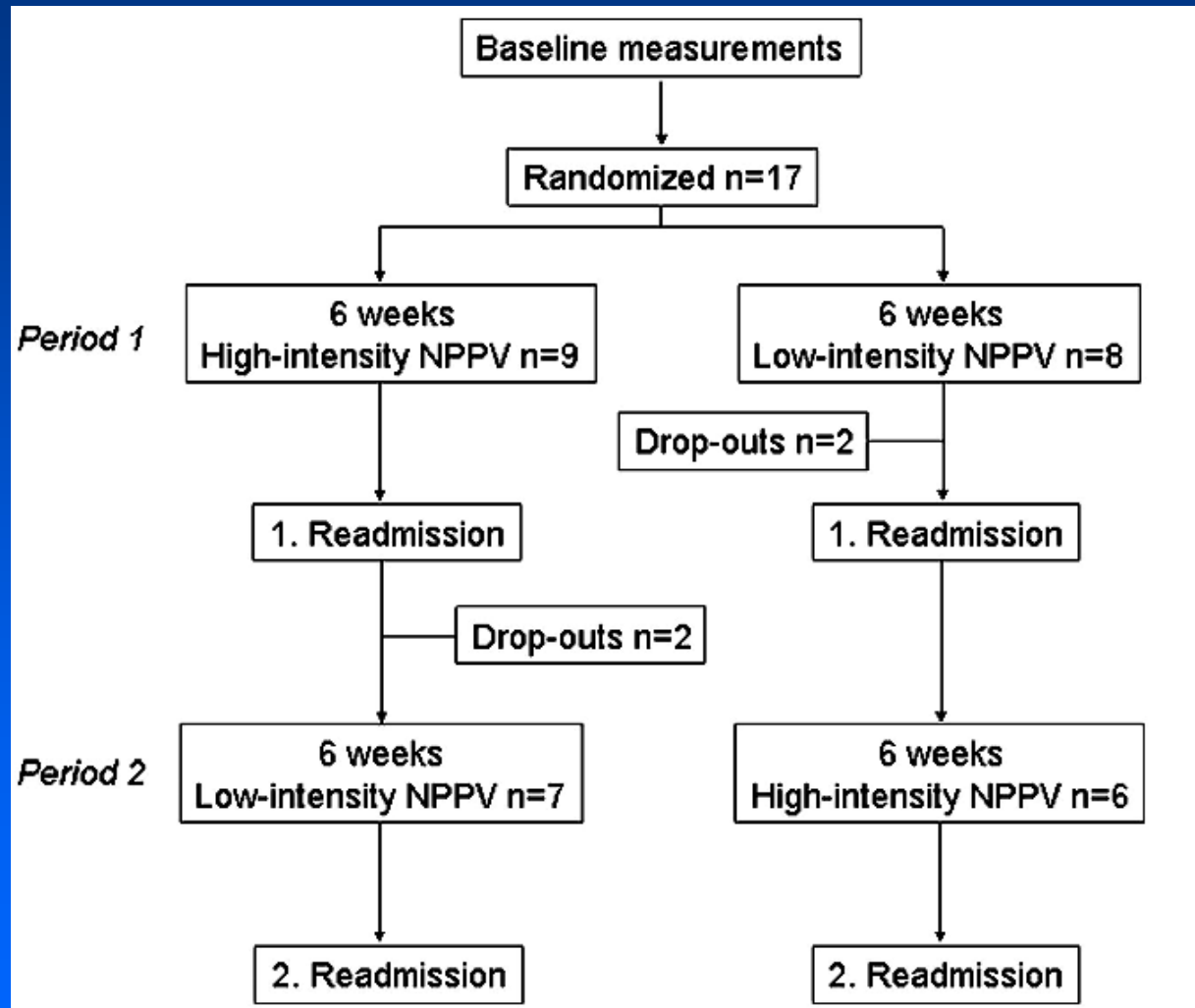
Study	FEV ₁	PaCO ₂	Bipap	Monitoring
Strumpf ¹⁹⁹¹	0.54	6.5	15/2	no
Meecham Jones ¹⁹⁹⁵	0.86	7.4	18/2	ETCO ₂
Gay ¹⁹⁹⁶	0.68	7.3	10/2	no
Casanova ²⁰⁰⁰	0.85	6.7	12/4	No



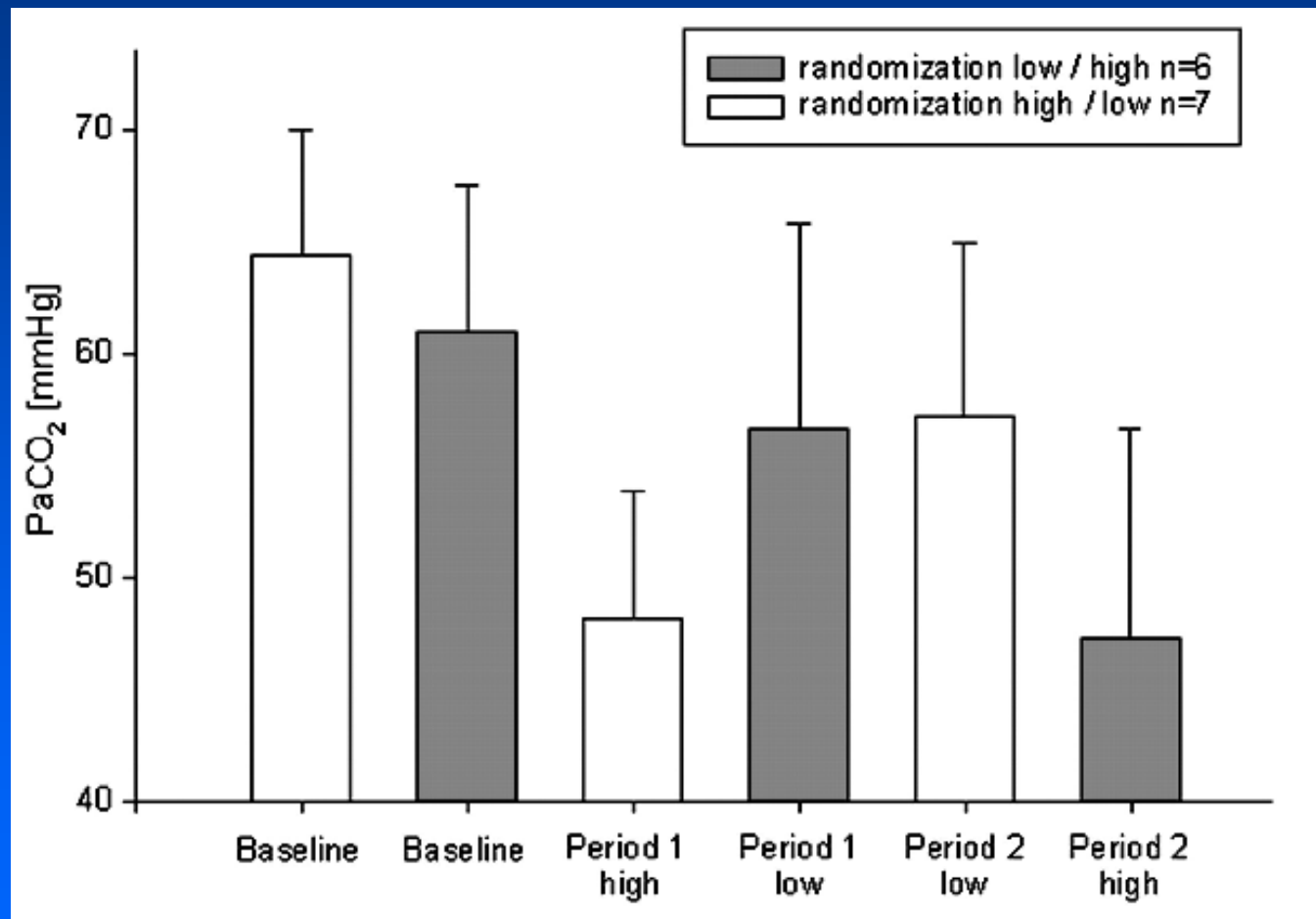
Uitkomst	Aantal	Behandel effect	Behandel effect
		gemiddelde	95 % CI
<i>Korte termijn</i>			
PaO ₂ , mmHg	79/83	1.3	-0.7, 3.3
PaCO ₂ , mmHg	79/83	-2.5	-5.3 ,0.3
<i>Lange-termijn</i>			
PaO ₂ , mmHg	62/56	-1.8	-8.6 , 5.1
PaCO ₂ , mmHg	62/56	-1.0	-3.6 , 1.6



Hoog versus lage druk beademing



Hoog versus lage druk beademing

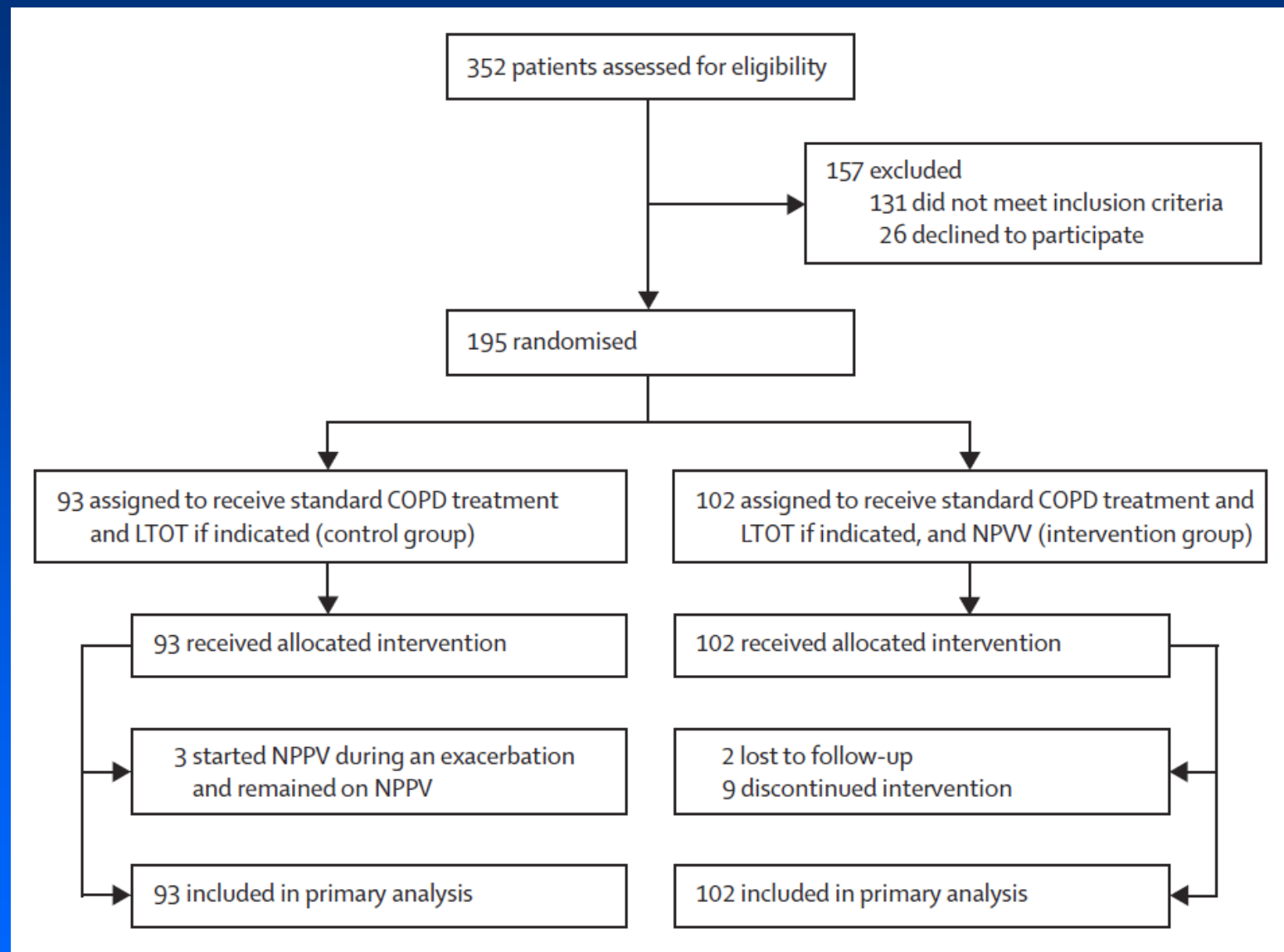


Dus wanneer effectief ?

- Voldoende ondersteuning (IPAP $\uparrow$, CO₂ $\downarrow$)
- Goede monitoring
- Voldoende aantal uren
- Geduld

Chronische NIV bij COPD

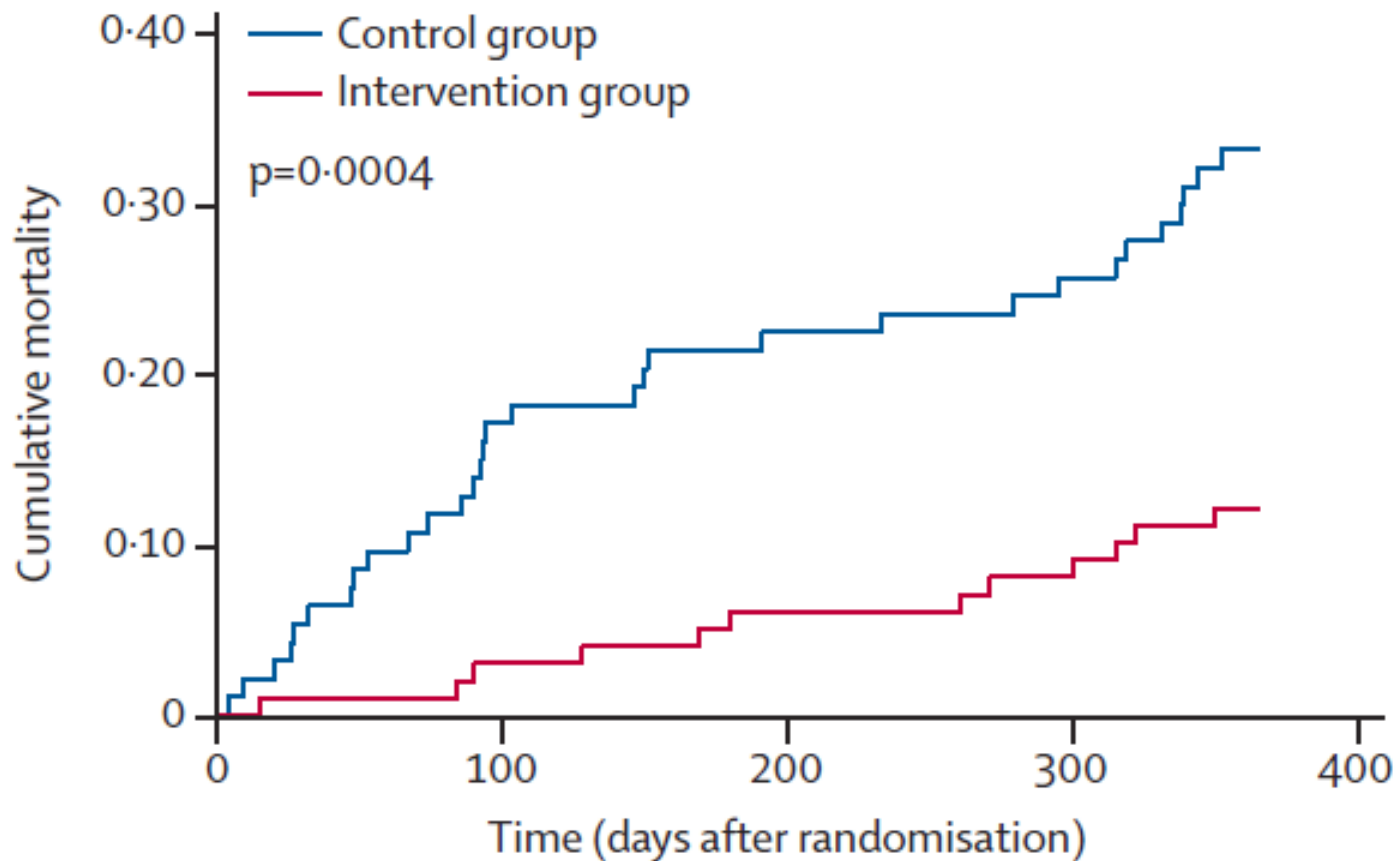
- *Waarom zou het werken?*
- *Wanneer kan het effectief worden?*
- *In welke situatie is het effectief ?*



	Baseline	14 days	3 months	6 months	9 months	12 months
All patients	7.9 (0.8)	7.0 (1.1)	7.0 (1.1)	6.7 (1.0)	6.8 (0.9)	6.9 (1.1)
Control group	7.9 (0.7)	7.5 (1.1)	7.4 (0.9)	7.1 (1.0)	7.3 (0.8)	7.4 (1.2)
Non-invasive positive pressure ventilation group	8.0 (0.8)	6.6 (0.9)	6.6 (1.1)	6.4 (0.9)	6.4 (0.9)	6.5 (0.9)

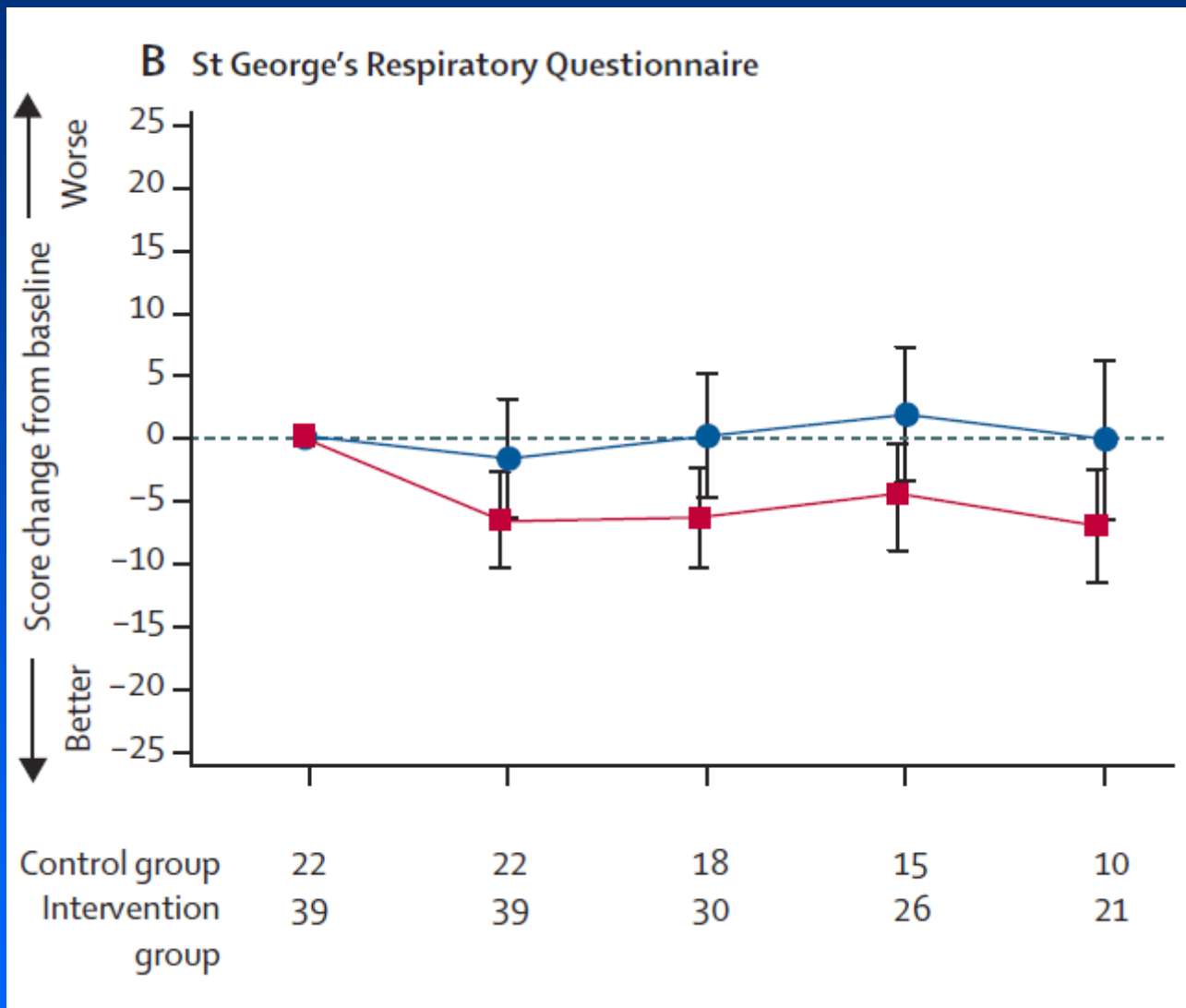
Values are mean (SD).

Table 4: Arterial carbon dioxide pressure (kPa) during the 1-year study



Number at risk

Control group	93	77	72	69
Intervention group	102	95	92	90



ZUURSTOF

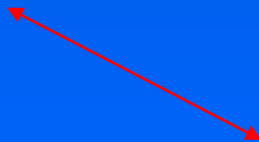
LTX

LVRT

COPD

REVALIDATIE

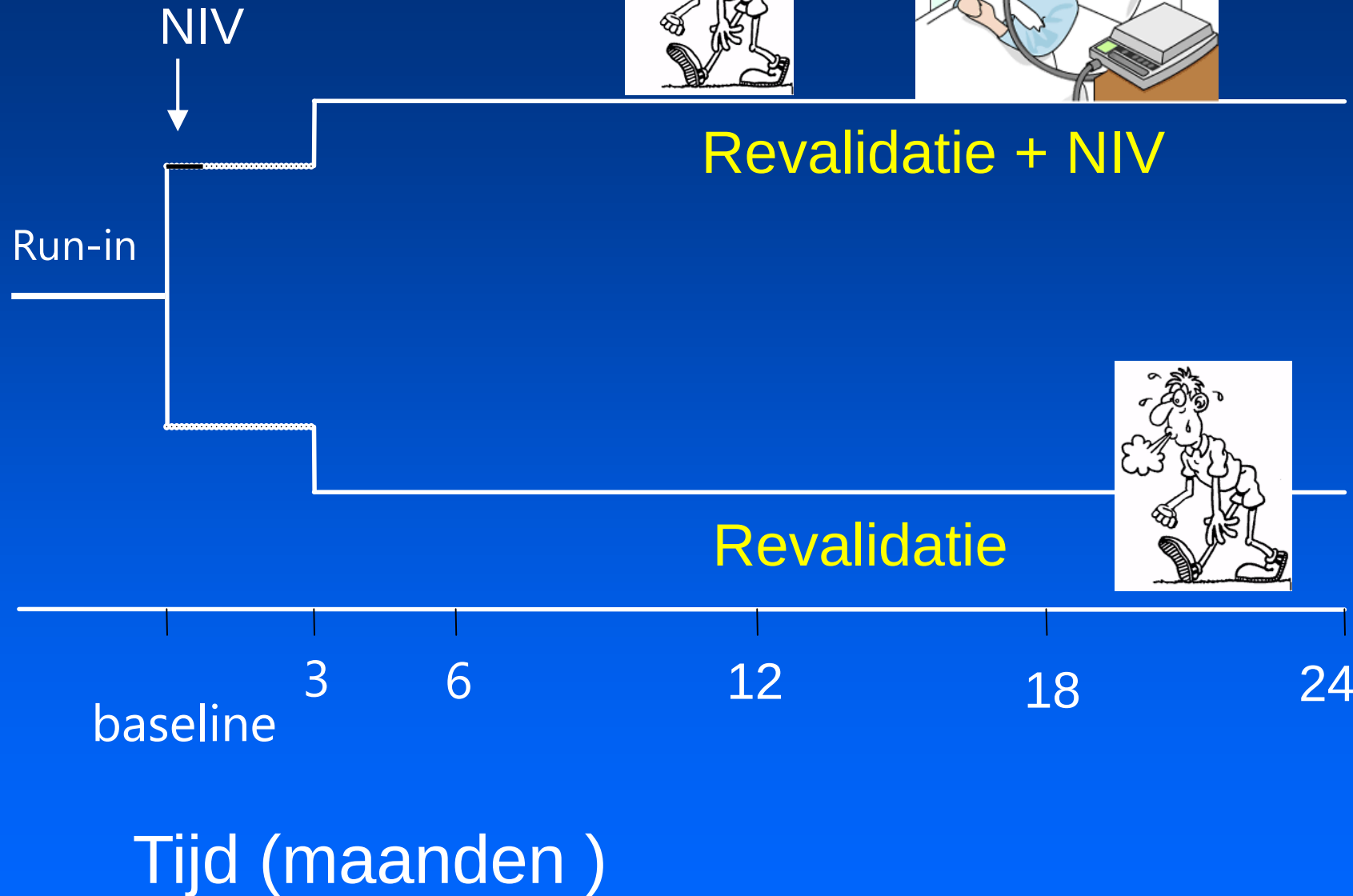
NIV ?



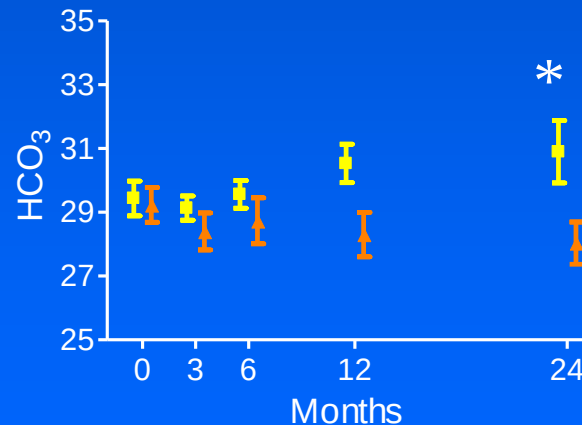
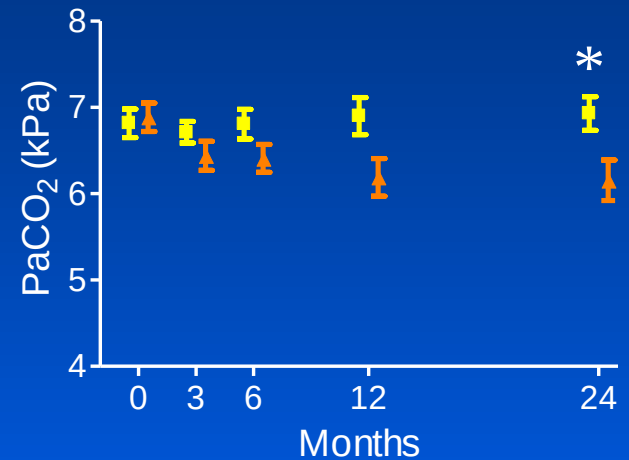
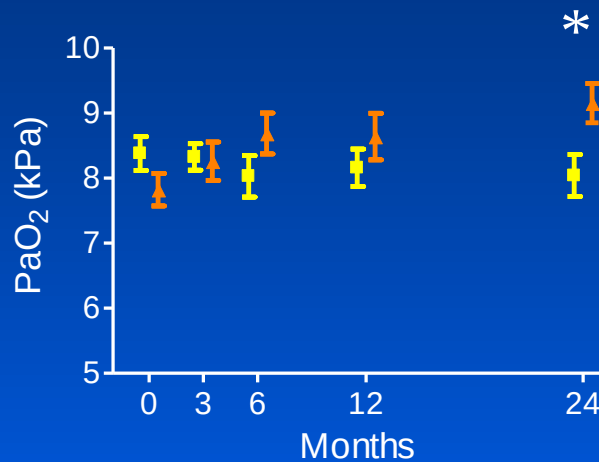
MEDICATIE



&

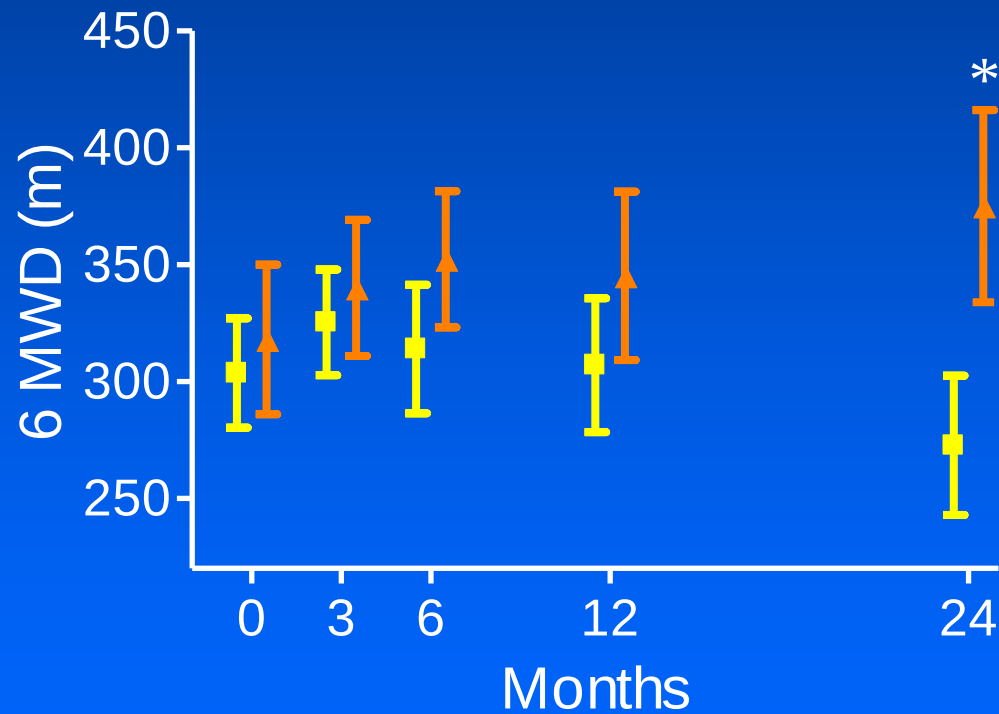


Arteriele bloedd gassen (overdag)



■ Revalidatie
▲ NIV + Revalidatie

6-minuten loop test



■ Revalidatie

▲ NIV + Revalidatie



Chronische NIV na acuut respiratoir falen

1. is altijd effectief
2. is alleen effectief indien 2-4 wk na stoppen van de acute interventie er nog steeds hypercapnie is
3. Is alleen effectief als het direct na de acute interventie gecontinueerd wordt
4. is nooit effectief

ZUURSTOF

MEDICATIE

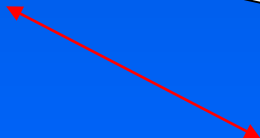
LTX

COPD
en exacerbaties

NIV ?

LVRT

REVALIDATIE

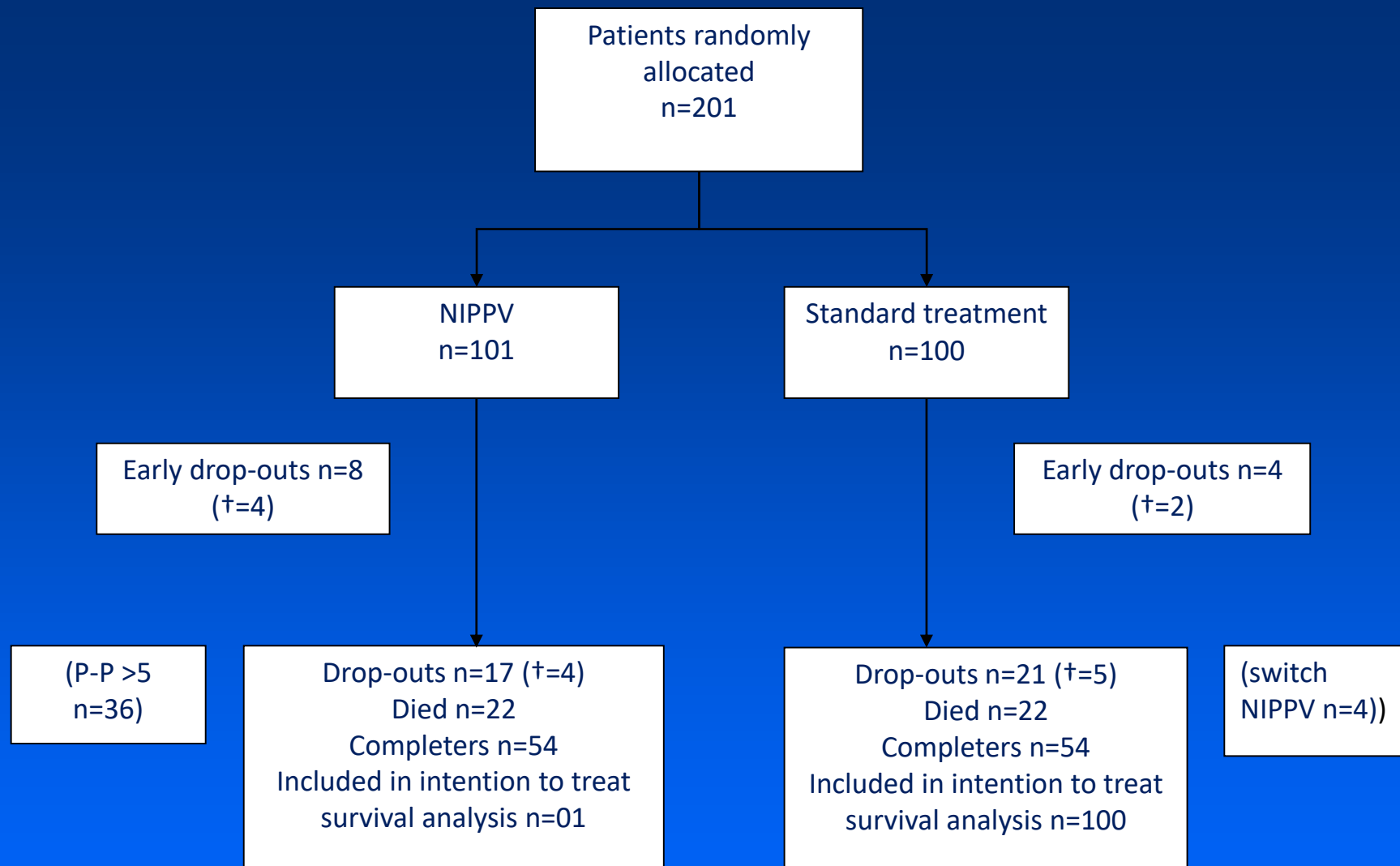


RESCUE studie

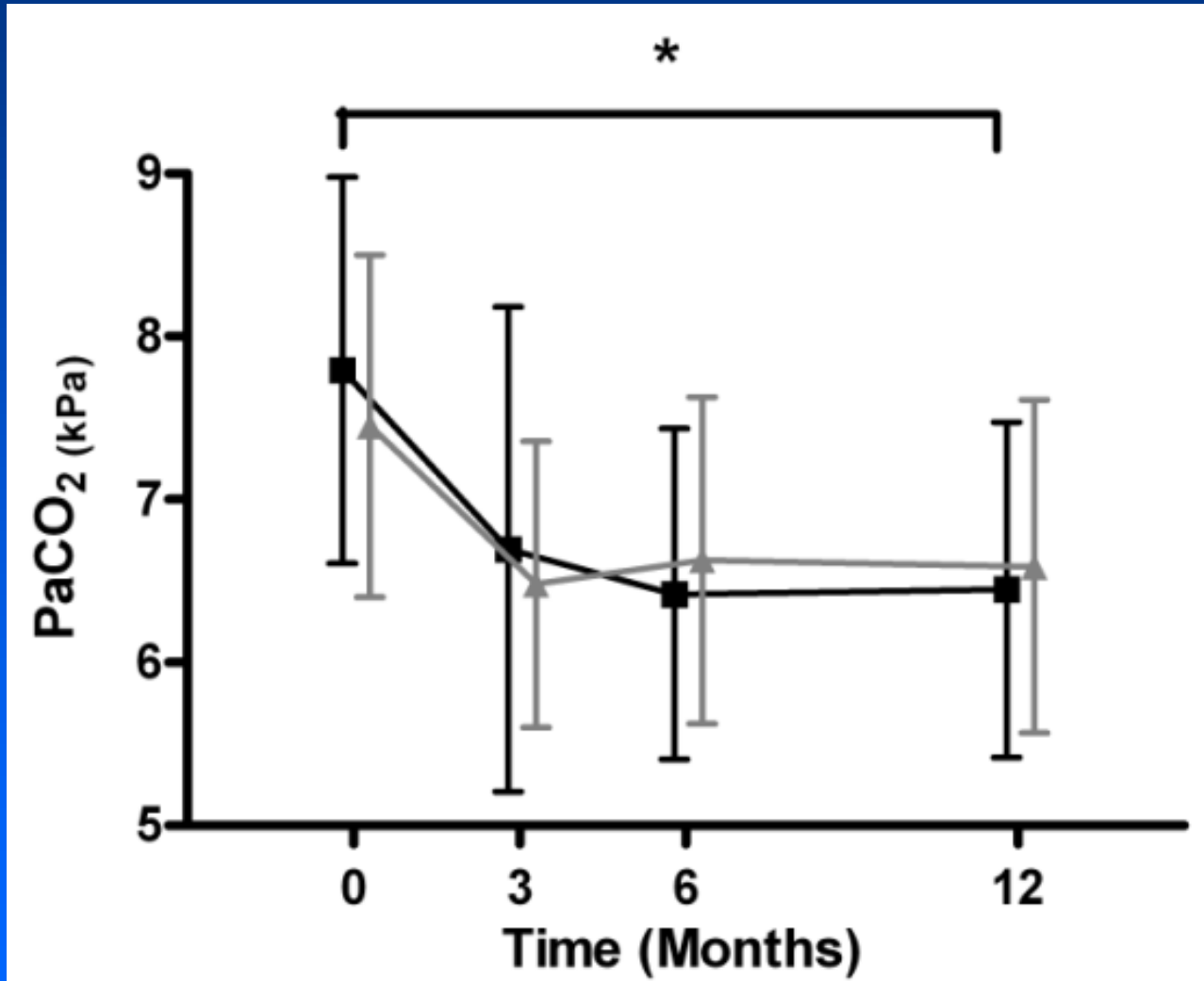
- Multicentre, prospectieve, gerandomiseerde, gecontroleerde nederlandse studie
- 3 CTB's
- 200 patienten doen mee



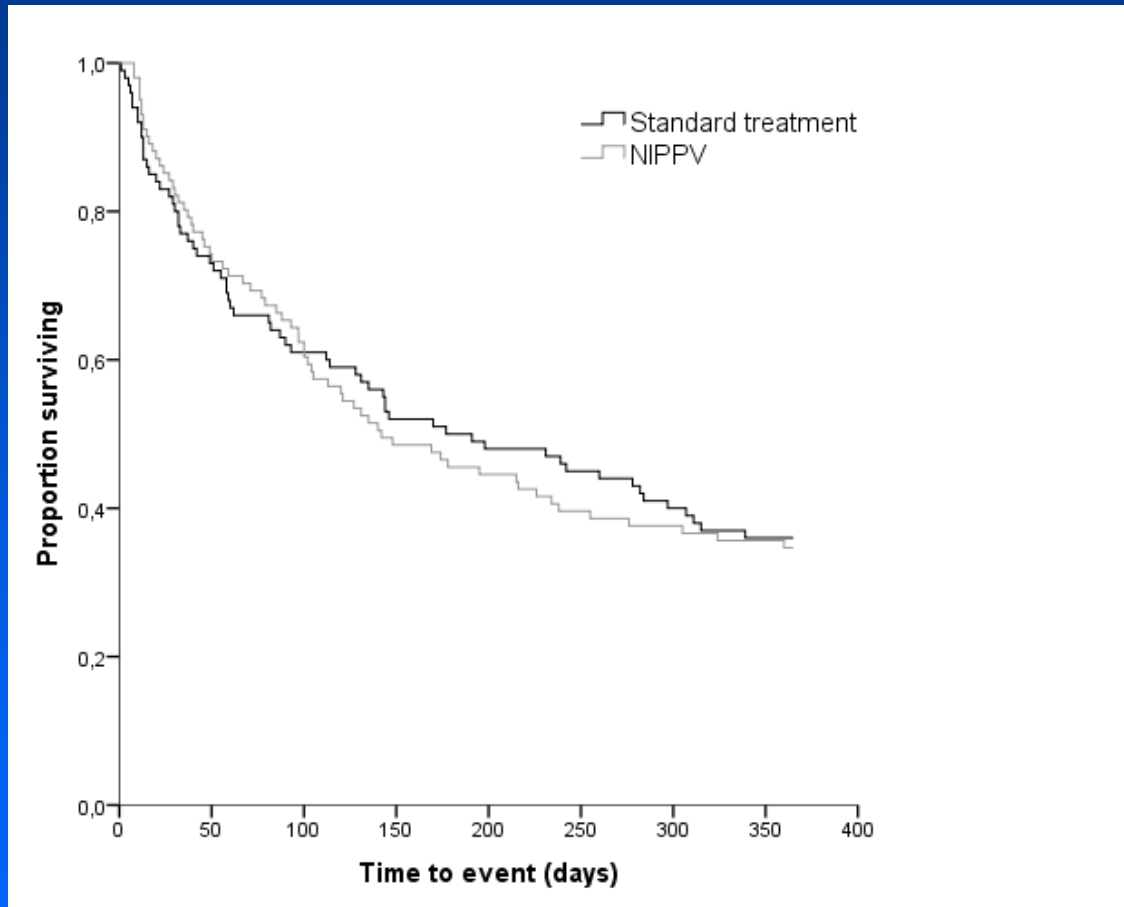
Funded by Philips/Respironics, MediqTefa, Dutch Astma Foundation and UMCG



Gaswisseling



Primaire uitkomst : tijd tot volgend event



NIPPV: 65%
Controls: 64%

Mean number of
days

NIPPV: 192
Controls: 198

JAMA | Original Investigation

Effect of Home Noninvasive Ventilation With Oxygen Therapy vs Oxygen Therapy Alone on Hospital Readmission or Death After an Acute COPD Exacerbation

A Randomized Clinical Trial

Patrick B. Murphy, PhD; Sunita Rehal, MSc; Gill Arbane, BSc (Hons); Stephen Bourke, PhD; Peter M. A. Calverley, PhD; Angela M. Crook, PhD; Lee Dowson, MD; Nicholas Duffy, MD; G. John Gibson, MD; Philip D. Hughes, MD; John R. Hurst, PhD; Keir E. Lewis, MD; Rahul Mukherjee, MD; Annabel Nickol, PhD; Nicholas Oscroft, MD; Maxime Patout, MD; Justin Pepperell, MD; Ian Smith, MD; John R. Stradling, PhD; Jadwiga A. Wedzicha, PhD; Michael I. Polkey, PhD; Mark W. Elliott, MD; Nicholas Hart, PhD

2021 Patients assessed for eligibility

1905 Excluded

- 419 Arterial blood gas levels did not meet inclusion criteria^a
- 252 Unable to wean from noninvasive ventilation (pH <7.30)
- 237 Unable to provide consent
- 157 Admission not due to an acute exacerbation of chronic obstructive pulmonary disease
- 131 Unable to tolerate noninvasive ventilation
- 128 Died prior to screening
- 96 Body mass index >35^b
- 76 Had obstructive sleep apnea
- 51 Post decannulation or extubation during index admission
- 46 Unable to complete assessment within 4 wk of resolution of exacerbation
- 8 Decompensated with oxygen therapy^c
- 8 Eligible but not randomized due to clinician preference
- 296 Refused to participate

116 Randomized

57 Randomized to receive home oxygen therapy plus home noninvasive ventilation
56 Received intervention as randomized
1 Did not receive intervention as randomized (declined)

0 Lost to follow-up
5 Withdrew

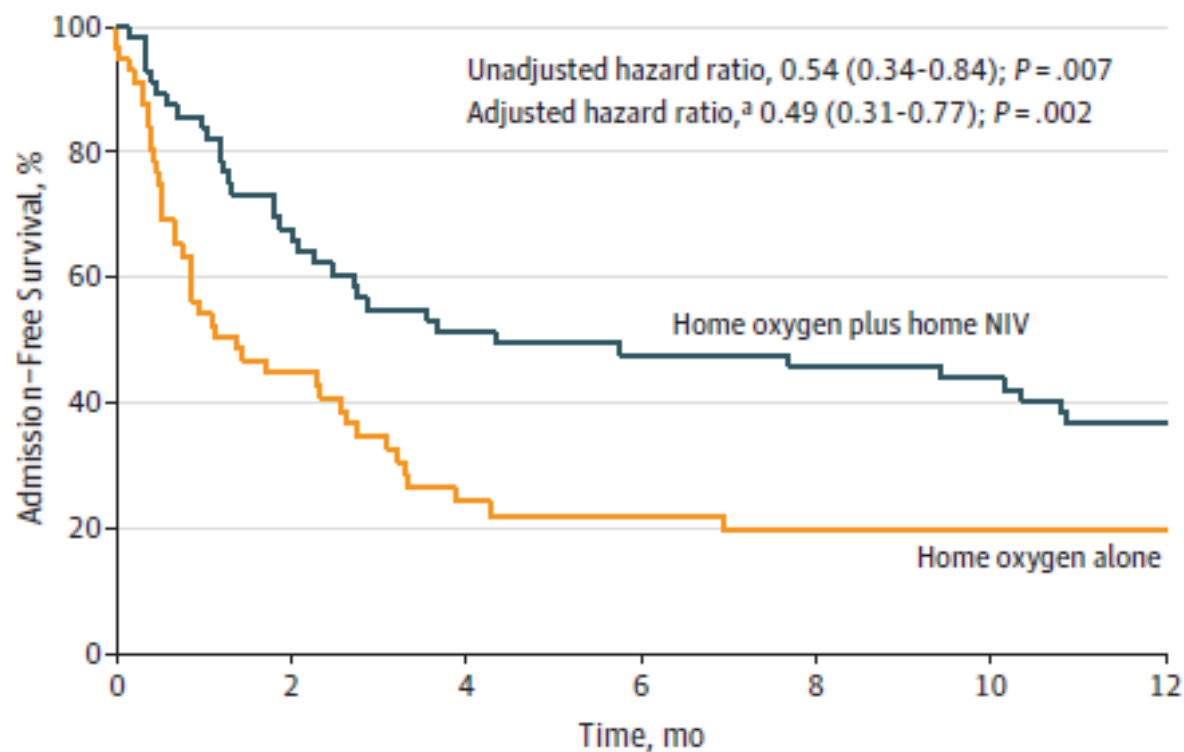
57 Included in primary analysis

59 Randomized to receive home oxygen therapy alone
59 Received intervention as randomized
18 Home noninvasive ventilation added to oxygen therapy during trial^d

0 Lost to follow-up
13 Withdrew

59 Included in primary analysis

Overlevings curve van tijd tot volgend event



No. at risk

Home oxygen plus home NIV

57

37

28

26

25

24

16

Home oxygen alone

59

23

11

10

8

8

6

JAMA. 2017;317(21):2177

Chronisch NIV na acuut resp falen

	Engeland	Nederland
leeftijd	66(10)	64(9)
BMI (kg/m ²)	22(19-25)	25(5)
LTOT (%)	70%	75%
FEV1 (% pred)	24(9)	26(8)
PaCO ₂ (kPa)	7.9(1)	7.9(1)
Wachten tot start NIV	2-3 wks	2 days
Aantal exacerbaties	> 3	1-2

Conclusies

- Meerdere redenen waarom Chronische NIV bij stabiele COPD patiënten effectief kan zijn
- Effectief indien
 - Voldoende ondersteuning, soms hoge druk, PaCO_2 moet dalen
 - Voldoende aantal uren
 - Goede monitoring
- Chronische NIV na acuut respiratoir falen geïndiceerd bij juiste timing van de start

COPD en chronische beademening



Bel het CTB !!!

Voorlopig bij CTB

Veel expertise

24/7