



P0.1 en de correlatie met ΔP_{occ} en ΔP_I , maten voor P-SILI or Sily

Eindpresentatie opleiding tot Intensive Care Practitioner, uitstroomprofiel Ventilation

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Datum: 12-10-2023
Care Training Group, Ridderkerk

Introductie

Kees Poot

Intensive Care Practitioner i.o.

uitstroomprofiel Ventilation/ IC-Verpleegkundige

Praktijkopleider:

Ferdinand Snellen

Operationeel Leidinggevende:

Martijn Stijf

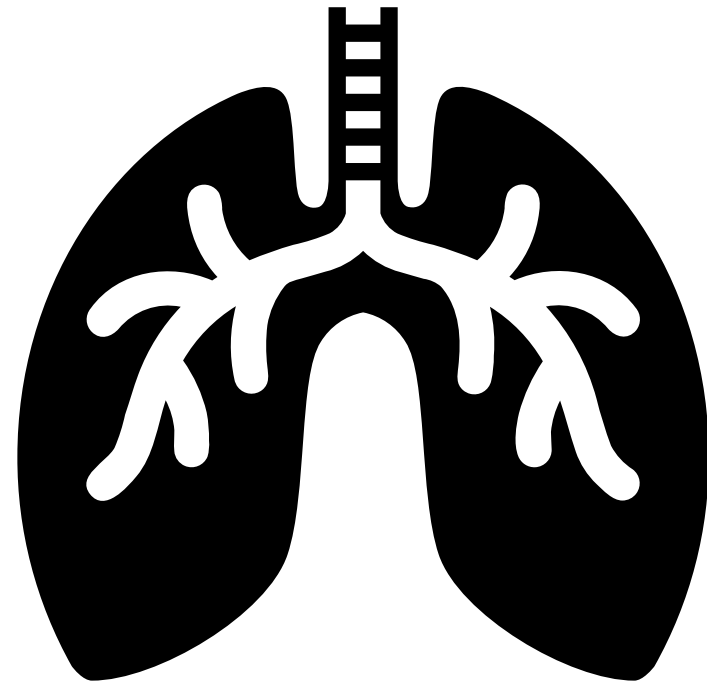
Data analyse:

Sander Spanjersberg

Indeling presentatie

- Setting
- Aanleiding
- Methode
- Resultaten

- Conclusie
- Aanbevelingen
- Functie Practitioner
- Samenvatting



Setting

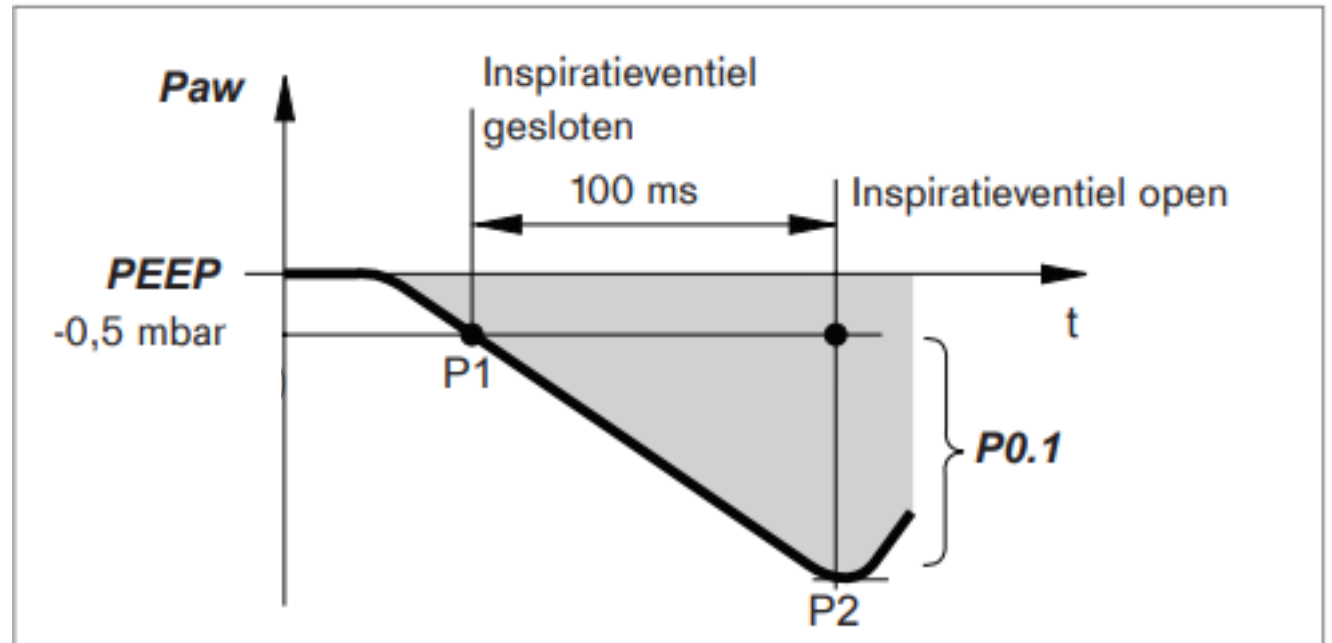
- Isala Zwolle
- Level 3 IC
- 32 level 3 IC bedden/ 8 level 1 IC bedden
- Trauma en ECLS-centrum
- 2900 opnames per jaar

- 190 IC-verpleegkundigen
- 18 Intensivisten
- 21 Arts-assistenten
- 4 Physician Assistents
- 1 Ventilation Practitioner



Aanleiding

- Monitoring spontaan invasief beademde patiënten.
- P0.1
- Alternatieven
- P-SILI (Patient Self Inflicted Lung Injury)



Bron: Dräger minihandleiding beademing

Bertoni et al 2019¹

RESEARCH

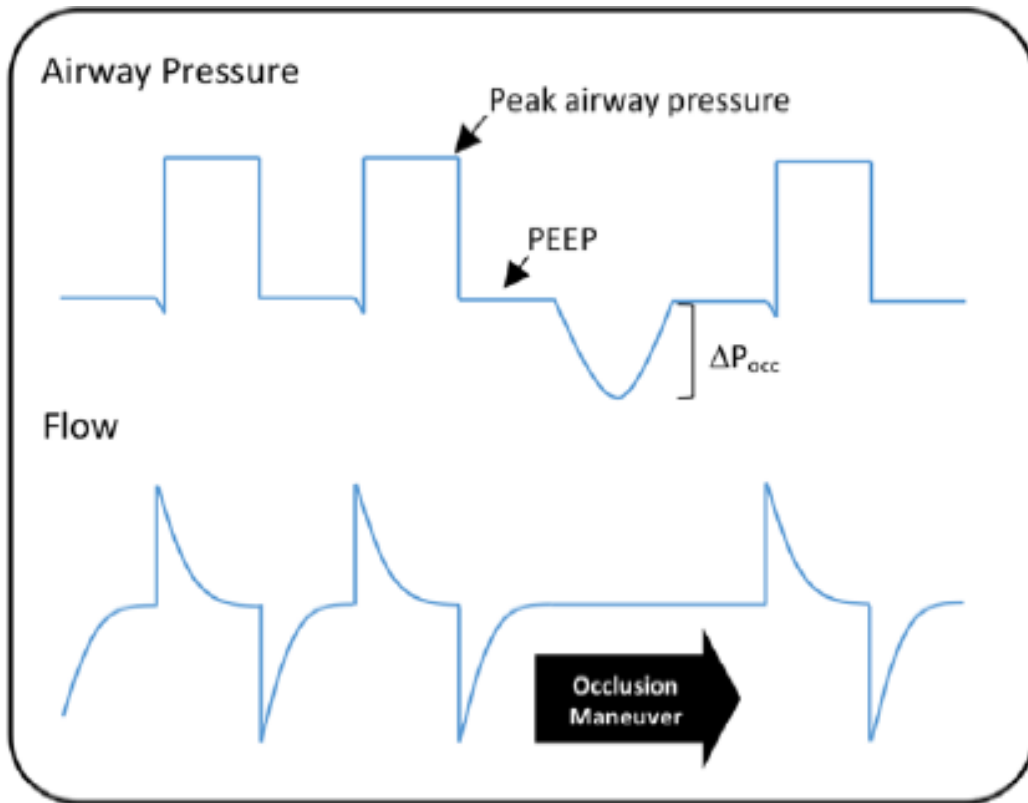
Open Access

A novel non-invasive method to detect excessively high respiratory effort and dynamic transpulmonary driving pressure during mechanical ventilation

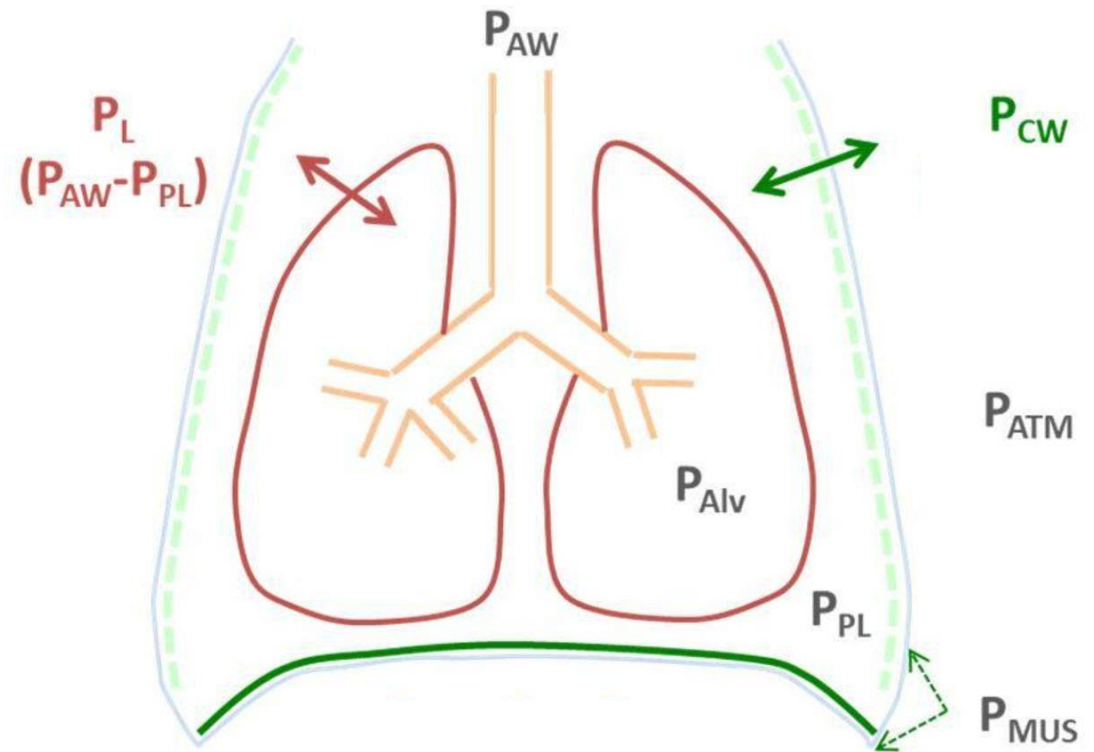


¹ Bertoni, M., Telias, I., Urner, M., Long, M., Del Sorbo, L., Fan, E., Sinderby, C., Beck, J., Liu, L., Qiu, H., Wong, J., Slutsky, A. S., Ferguson, N. D., Brochard, L. J. & Goligher, E. C. (2019). A novel non-invasive method to detect excessively high respiratory effort and dynamic transpulmonary driving pressure during mechanical ventilation. *Critical Care*, 23(1). <https://doi.org/10.1186/s13054-019-2617-0>

Occlusiedruk en transpulmonale driving pressure

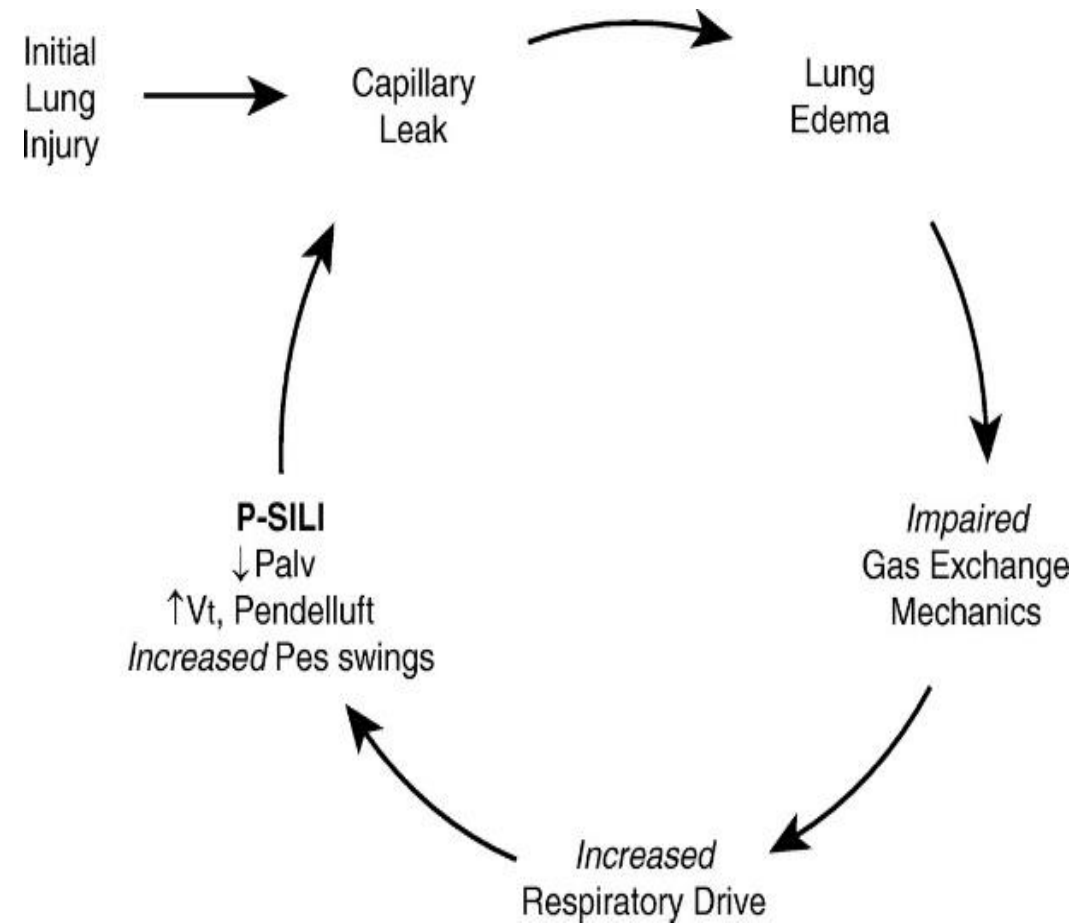


Bron: (Bertoni et al., 2019)



Bron: Vedrenne-Cloquet M, Khirani S, Khemani R, et al
Pleuraal and transpulmonary pressures to tailor protective ventilation in children
Thorax 2023;78:97-105

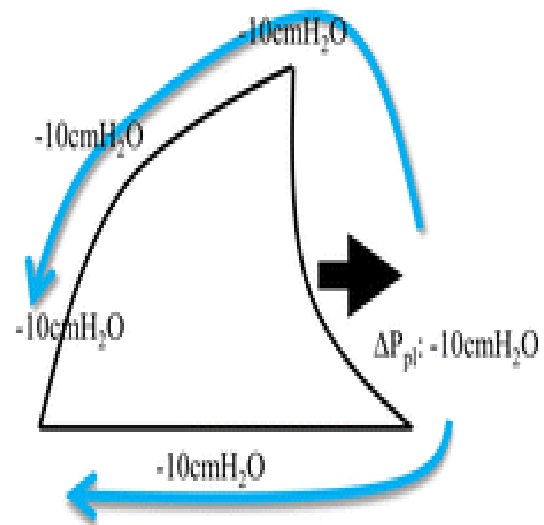
Principes P-SILI



Bron: (Brochard et al., 2017)

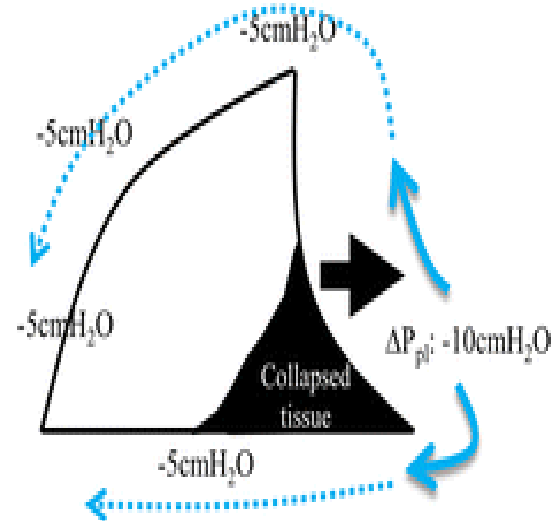
Pendelluft fenomeen

A Fluid-like behavior



Normal lung

B Solid-like behavior



Injured lung

Bron: (Yoshida et al., 2019)

METHODIEK



- Prospectief observationeel onderzoek
- 1 februari 2023 – 1 juni 2023
- Apparatuur Dräger Infinity V600/V800
- Statistische Analyse SPSS
- Goedkeuring verkregen Raad van Bestuur d.d. 3-2-2023 studienummer 20221214 niet-WMO plichtig onderzoek



Bron afbeelding: beeldbank Drägerwerck

Onderzoeksvraag



Is er een verband aantoonbaar tussen de $P_{0.1}$ en de ΔP_{occ} en de daarvan afgeleide berekende ΔP_i ?

Wat betekent dit voor de monitoring van de ademdrive van spontaan beademde patiënten op de IC in Zwolle?

Data

- P0.1
- Expiratory hold
- ΔP_{occ}
- Berekening ΔP_i ((Piekdruk – PEEP) – $2/3 \times \Delta P_{occ}$)
- Beademingsparameters
- Sedatiediepte
- Patiëntkenmerken

Formule $\Delta P_i ((\text{PIEKDRUK} - \text{PEEP}) - 2/3 \times \Delta P_{\text{occ}})$

PEEP:	5cm H ₂ O
Pressure Support	5cm H ₂ O
Piekdruk	10cm H ₂
P _{nadir}	-5cm H ₂ O
ΔP_{occ}	-10cm H ₂ O

$$10 - 5 = 5$$

$$5 + 6,67 = P_i = 11,67 \text{ cm H}_2\text{O}$$



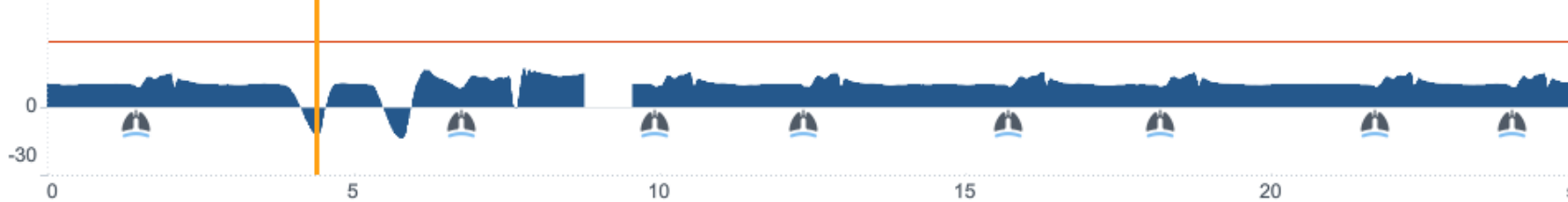
SPN-CPAP

Tube

14:23



50%

Paw cmH₂O

Flow L/min

CO₂ kPa

PIP

PEEP

16 11

MV: lekkage-gecompens.

RR

MV

20 13.3

VT: lekkage-gecompens.

VT

VCO₂

671 299

etCO₂

Vds/VTe

6.4 23

FIO₂

PEEP



ΔPsupp



Ramp

APN

VTapn 500 RRapn 15.0

PS



VC-SIMV

SPN-CPAP/PS

VC-AC

PC-BIPAP



Overige modi

Alarmen

Weergaven

Trends/data

Sensoren

Procedures

Systeem-configuratie

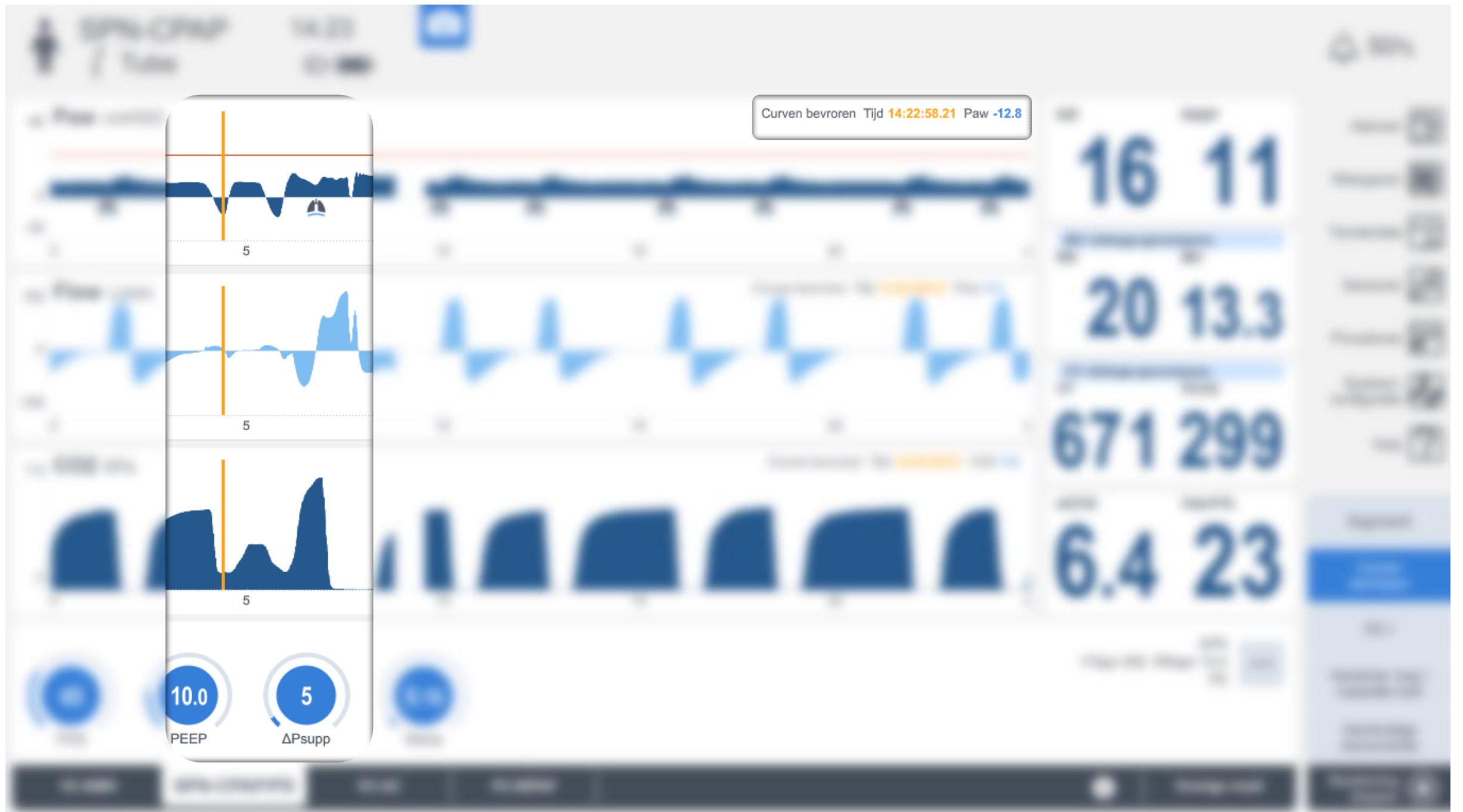
Hulp

Dag/nacht

Curven
bevrozen

P0.1

Handmat. insp./
inspiratie holdHandmatige
disconnectieBeademing
stoppen



Tabel 1 demografische kenmerken

Inclusiecriteria

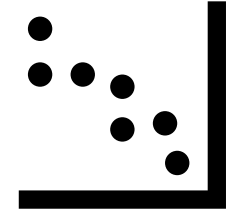
- Ondersteunende invasieve beademing (Pressure support/ASB)
- Leeftijd 18 jaar of ouder
- RASS 0 tot -5
- Beademingsduur >24u

Exclusiecriteria

- Gecontroleerde invasieve beademing (Pressure Control/VC-SIMV)
- Leeftijd <18 jaar
- Hemodynamisch instabiel, Noradrenaline >10ml/hr. (5mg/50ml)
- RASS-score +5 tot +1
- Intubatiereden obstructieve longaandoening.

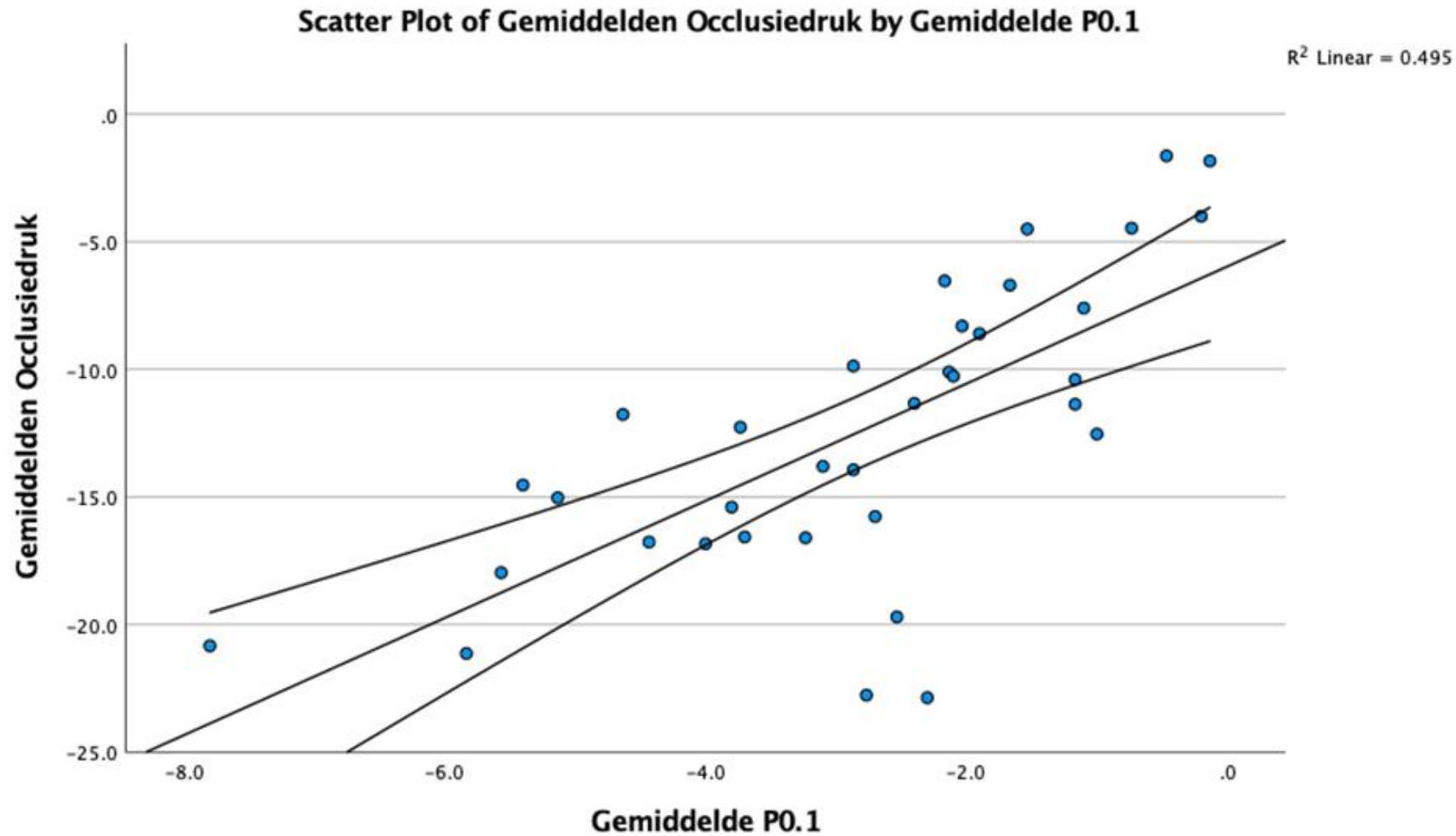
		Aantal	%	Mean	SD
Geslacht	m	23	65.7%		
	v	12	34.3%		
Leeftijd (jaren)				59	17
Lengte (cm)				177	10
Gewicht (kg)				77.4	13.3
IBW				70.54	11.33
Opnamereden	Circulatoir	11	31.4%		
	Pulmonaal	13	37,2%		
	Neurologisch	7	20.0%		
	Overig	4	11.4%		
Apache-II Score		35		16	7
RASS-score				-3	2
Beademingsduur (dagen)				11	7

Uitkomst metingen

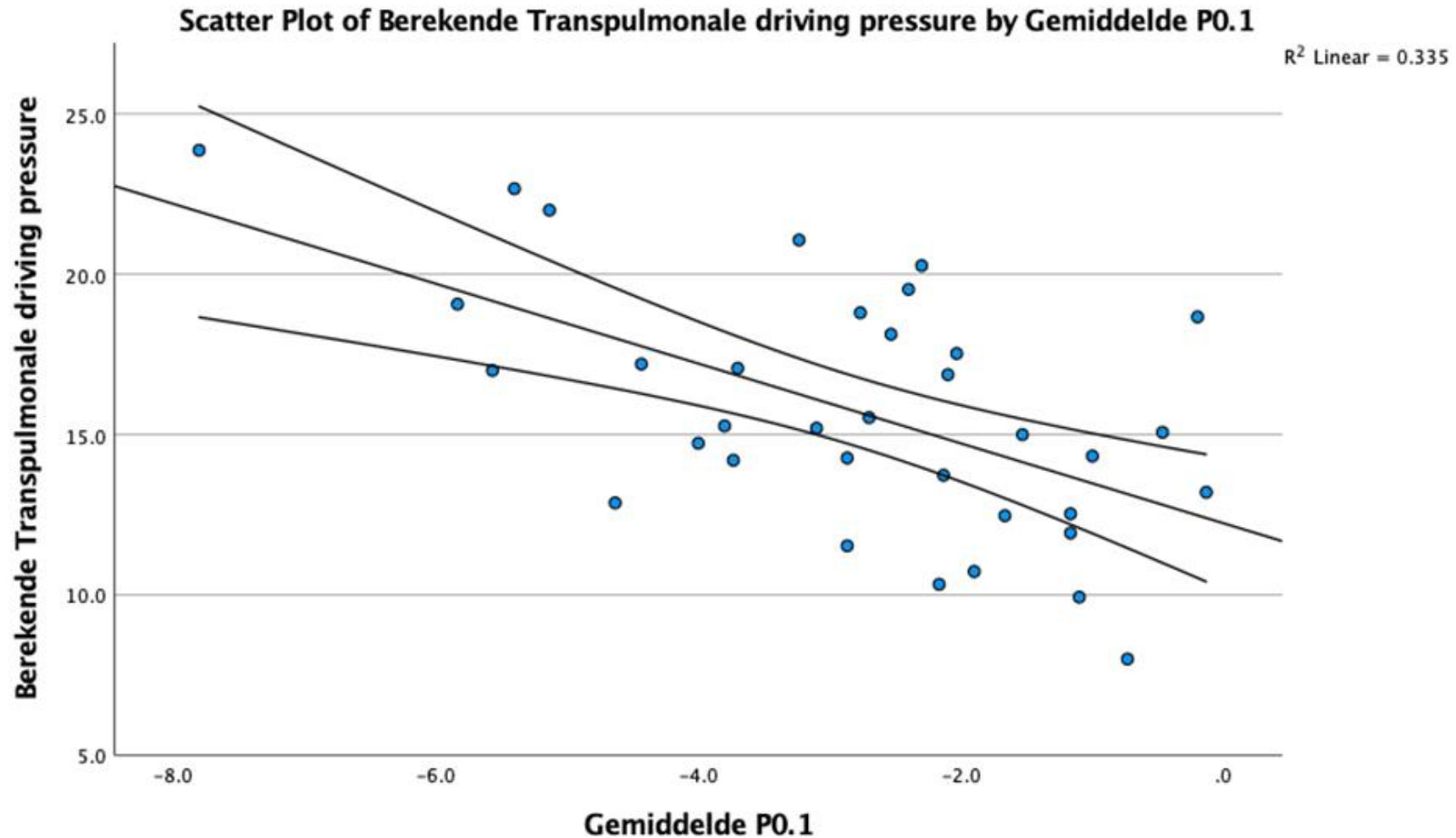


Meting n=105	gemiddelde
P0.1	-2,8 cm H ₂ O
ΔP_{occ}	-12,4 cm H ₂ O
ΔP_i	15.7 cm H ₂ O

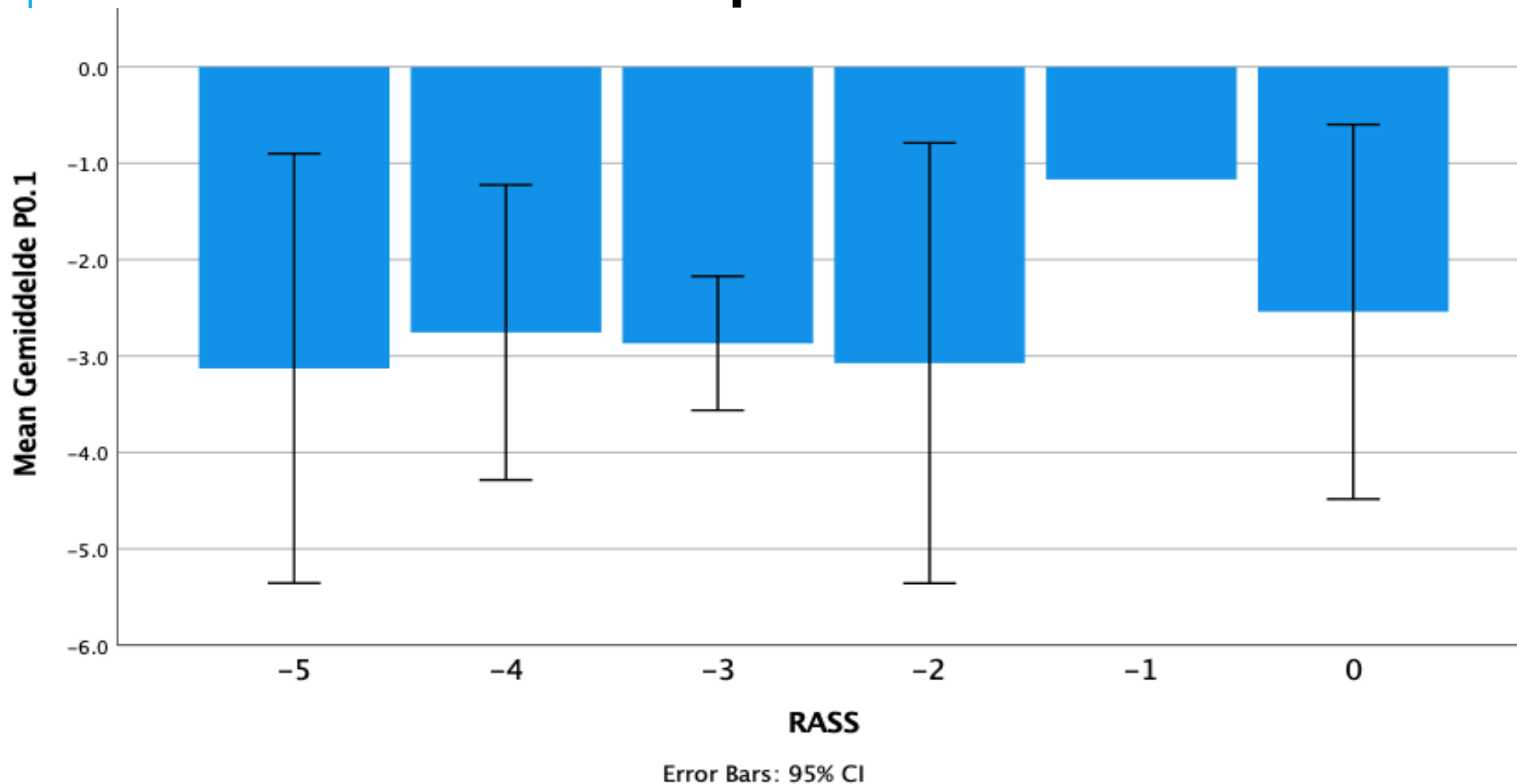
Correlatie P0.1 en ΔP_{occ}



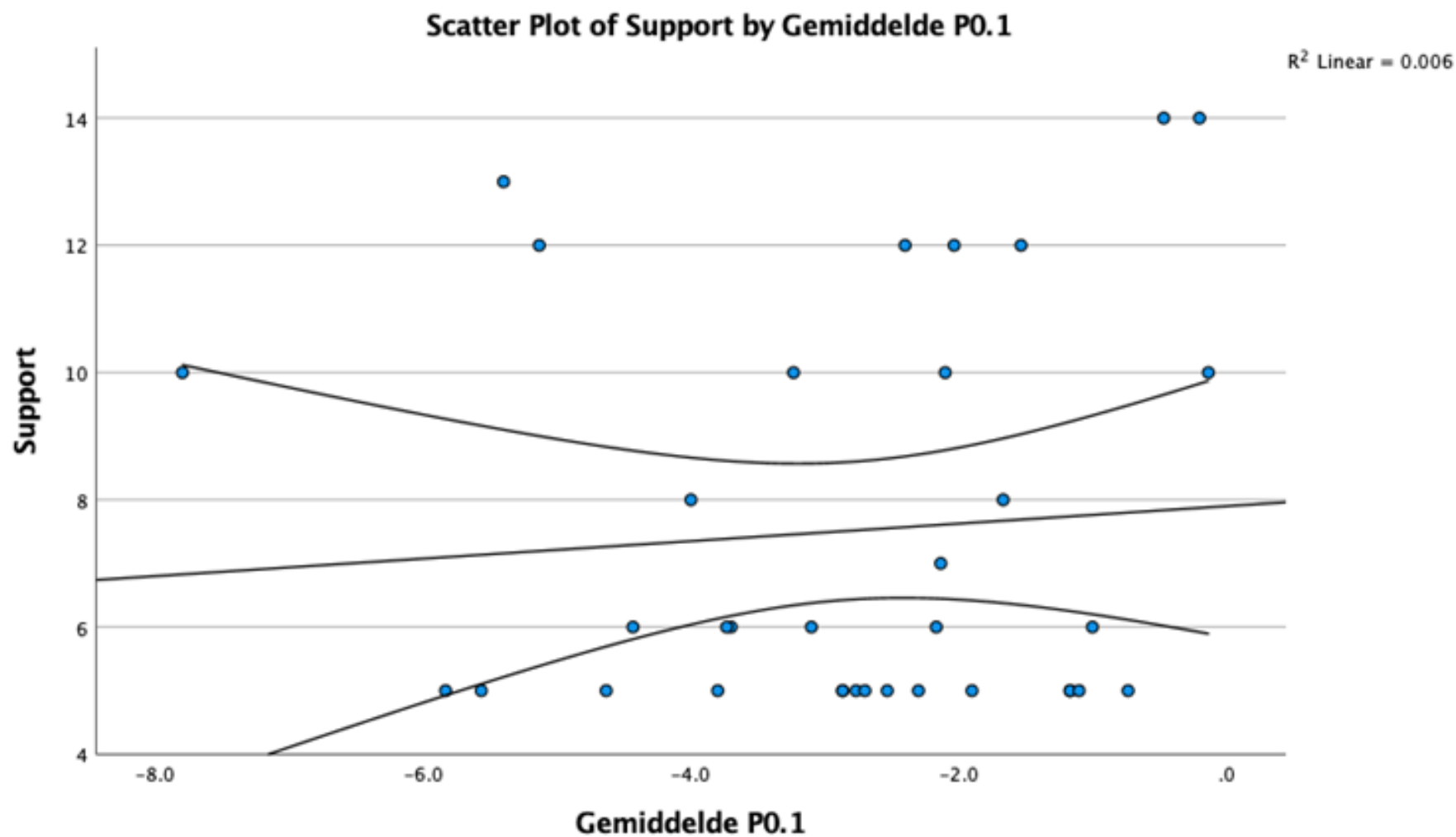
Correlatie P0.1 en berekende ΔP_i



P0.1 en sedatiediepte



P0.1 en support



Resultaten

- P0.1 en ΔP_{occ} : $r=0.703$ (95% CI 0.487-0.838) ($p<0.001$)
- P0.1 en ΔP_i : $r=-0.578$ (95% CI -0.762 - 0.309) ($p<0.001$)
- Significante correlatie

Discussie



- P-SILI of Sily
- Streefwaarden
- Berekend vs. Gemeten (P_{es})
- Single center onderzoek

Performance of Noninvasive Airway Occlusion Maneuvers to Assess Lung Stress and Diaphragm Effort in Mechanically Ventilated Critically Ill Patients

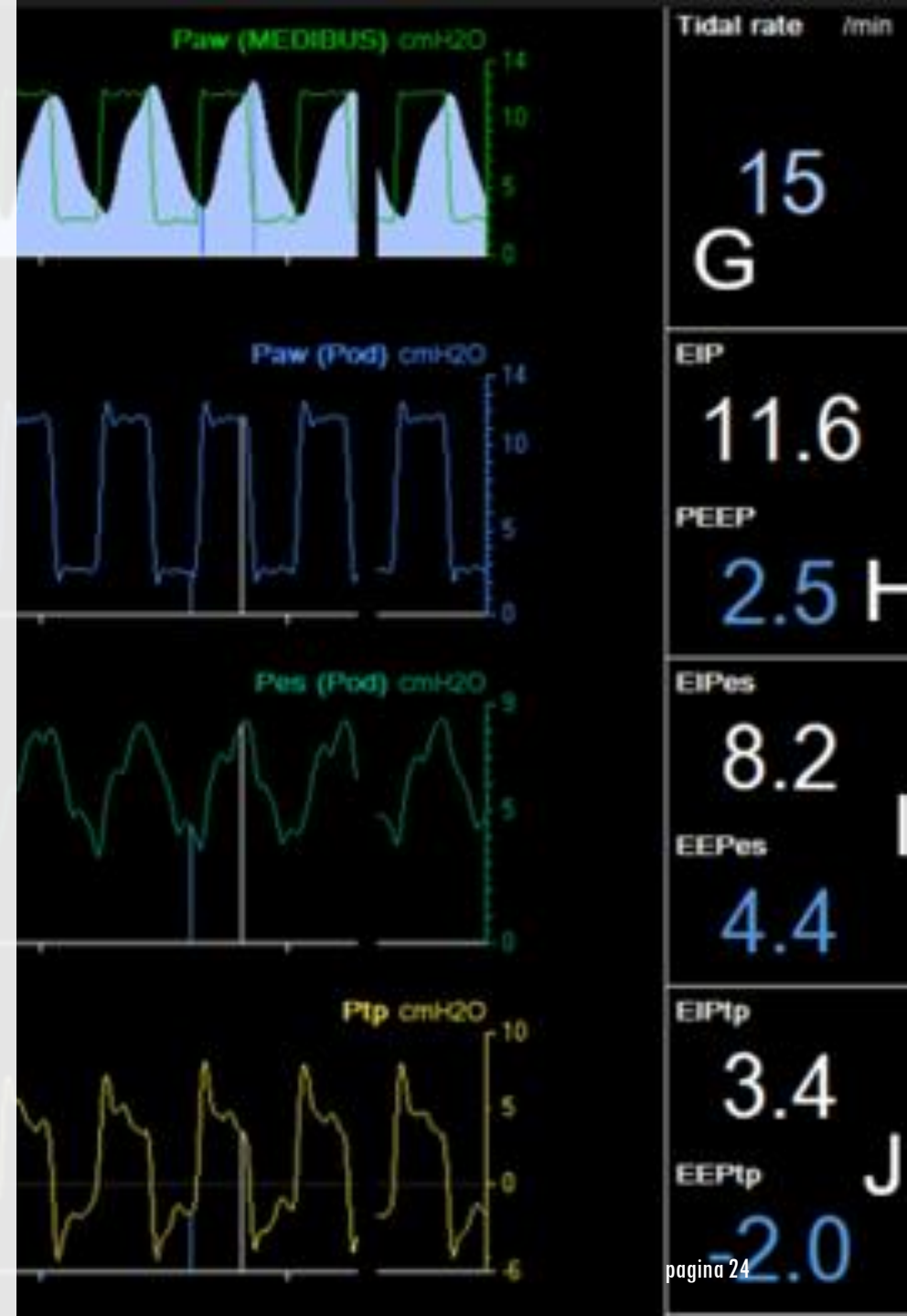
Heder J. de Vries, M.D., Pieter R. Tuinman, M.D., Ph.D.,
Annemijn H. Jonkman, Ph.D., Ling Liu, M.D., Ph.D.,
Haibo Qiu, M.D., Ph.D., Armand R. J. Girbes, M.D., Ph.D.,
YingRui Zhang, M.D., Angelique M. E. de Man, M.D., Ph.D.,
Harm-Jan de Grooth, M.D., Ph.D., Leo Heunks, M.D., Ph.D.

ANESTHESIOLOGY 2023; 138:274–88

Bron: (De Vries et al., 2023)

Conclusie en aanbevelingen

- Significante correlatie $P_{0.1}$ en ΔP_{occ} en ΔP_l
- In klinische setting $P_{0.1}$ voldoende
- Acties afwijkende waarden
- Op indicatie meting P_{es}
- Vervolgonderzoek



Functie Practitioner



Deskundigheidsbevordering

Bedside teaching
Educatie
Congressen
Symposia
Vakliteratuur
Netwerk

Implementaties
Innovaties
Verbinding
Research
Richtlijnen
Protocollen

Kwaliteitsbevordering

Patiëntenzorg

Diagnostiek
Consultfunctie
POCUS
Beleidsontwikkeling
MDO

SAMENVATTING

- Monitoring ademdrive (P-SILI)
- $PO.1$, ΔP_{occ} , ΔP_i
- Aanbevelingen
- Functie Practitioner

Take home message

Meten is weten!

Maar we behandelen mensen, geen
getallen!

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DANKWOORD

- Ferdinand Snellen
- Hans ter Haar
- Martijn Stijf
- Crista Leerentveld
- Sander Spanjersberg
- Collega's Intensive Care Zwolle