

Erasmus MC

Universitair Medisch Centrum Rotterdam



NOVA LUNG

Dinis Reis Miranda

Anesthesioloog-intensivist

Casus

- Man 21 jaar, re-opname IC wegens resp insuff, 1 dag na bilobectomy (ROK en LOK)

VG:

2005 teratoom testis wv orchidectomy en chemokuur, metastasen LOK en ROK.

Casus

Na intubatie:

PCV: PEEP 14 mbar, PIP 42 mbar FiO_2 40%, 50x325ml

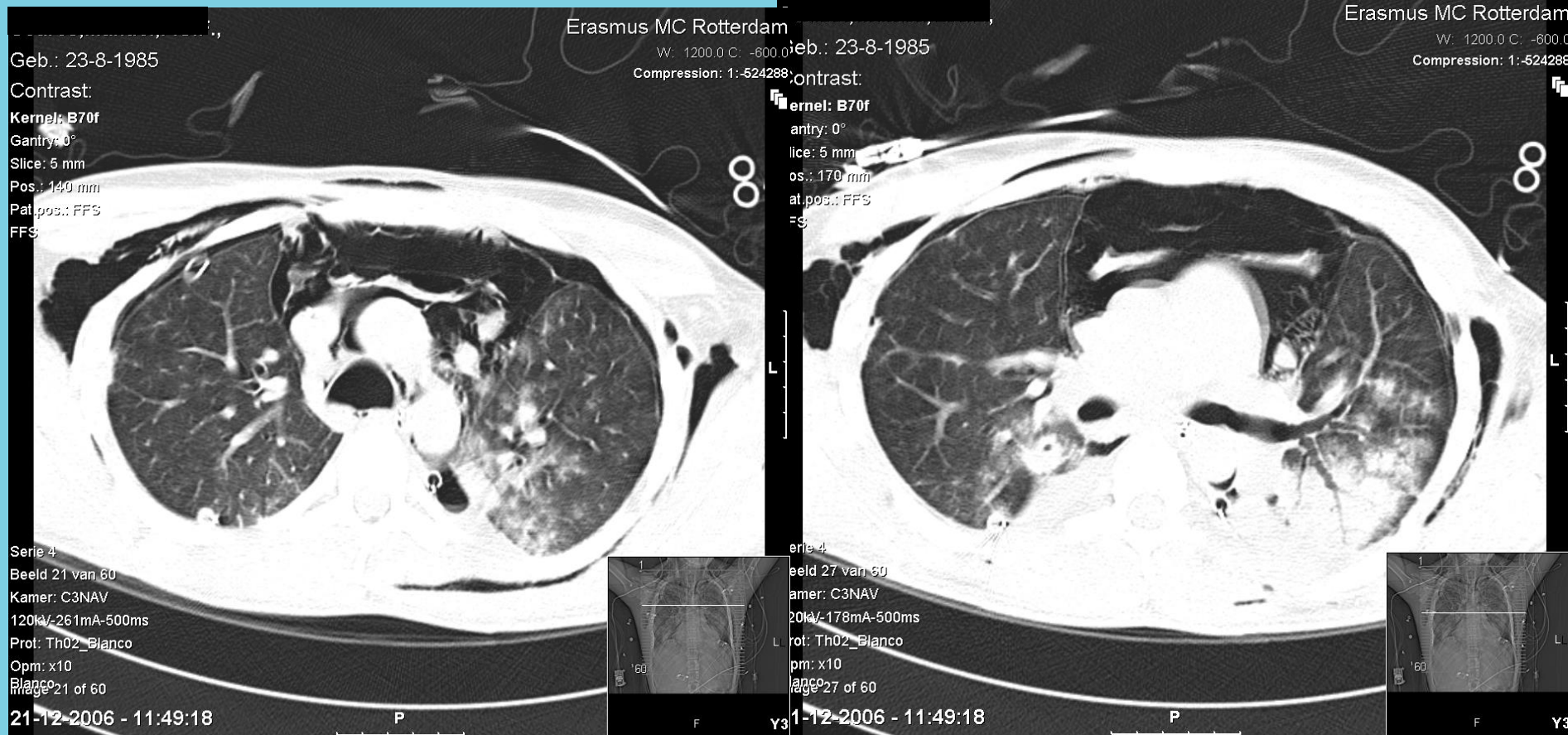
pH 7.39, PaO_2 8.2 kPa (61 mmHg) PaCO_2 7.3 kPa (55 mmHg)

Sputum kweek:

Multipel resistente

Pseudomonas aeruginosa





Casus

Dag 4: hypoxemie bij FiO_2 50% (bij bleomycine long?): buikligging

Bij buikligging + NO 10 ppm:

PCV PEEP 14 mbar, PIP 44 mbar, FiO_2 30%, 40x390ml

pH 7.56, PaO_2 12.7 kPa (95 mmHg), PaCO_2 4.4 kPa (33 mmHg)

Echter: persisterende, recidiverende pneumothorax.

Daarbij dus ook: thoraxempyeem met multipel resistente *Pseudomonas Aeruginosa*

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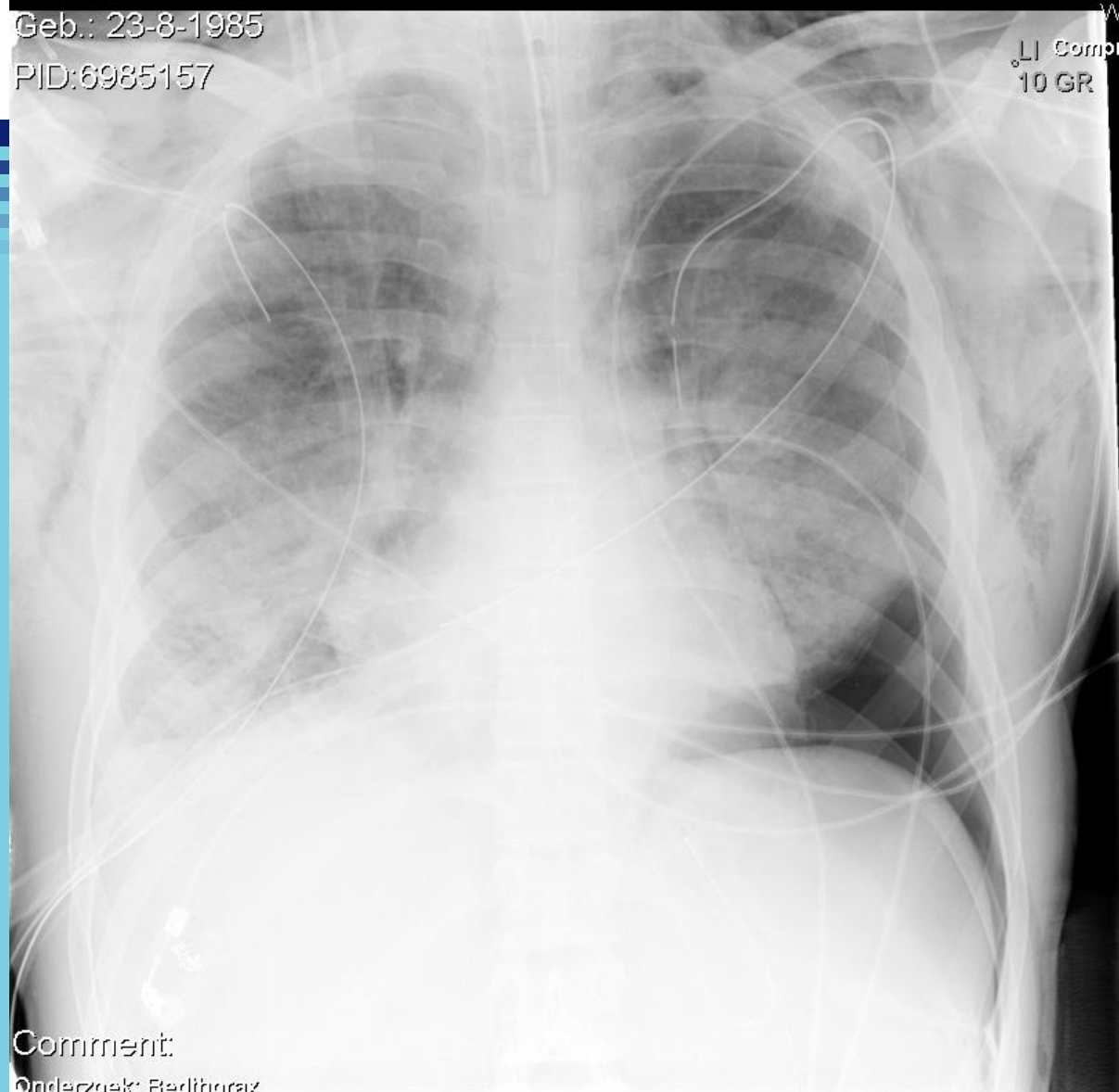
Geb.: 23-8-1985

PID:6985157

W: 2280.4 C: 1480.1

LI Compression: 1:-7532800

10 GR



Comment:

Onderzoek: Bedlhorax

29-12-2006 - 9:03:02

A1

Dag 25

- recidiverende pneumothorax
- Recidiverende episodes met koorts
- Nog immer *Pseudomonas* pneumonie en empyeem
- PSV, PEEP 7 mbar, PIP 34 mbar, FiO₂ 30% NO 3 ppm
pH 7.37
PaO₂ 12.1 kPa (91 mmHg),
PaCO₂ 6.2 kPa (47 mmHg)

Geb.: 23-8-1985

Contrast:

Kernel: B70f

Gantry: 0°

Slice: 5 mm

Pos.: -1000.5 mm

Pat.pos.: FFS

FFS

Serie 4

Beeld 40 van 58

Kamer: C2NAV

120kV-128mA-500ms

Prot: Th01_Algemeen

Opm: x46

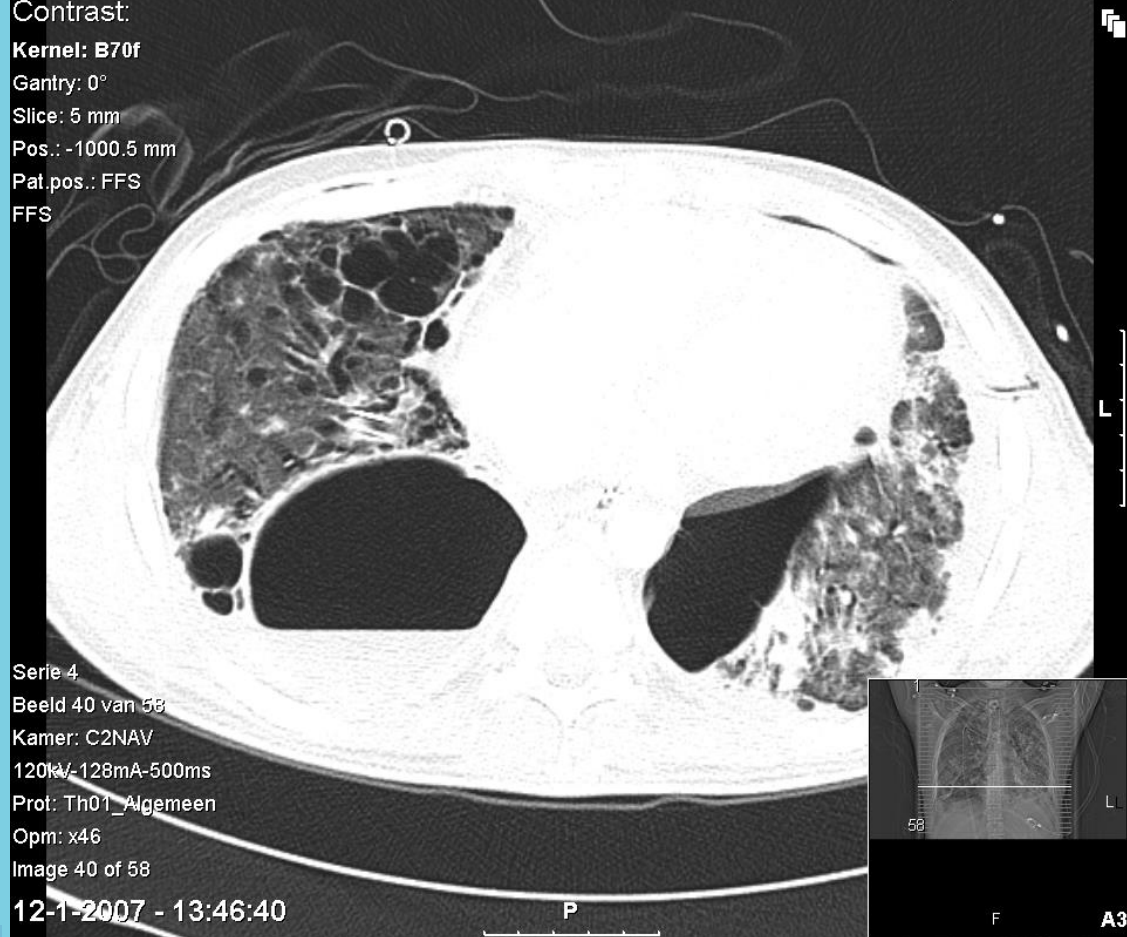
Image 40 of 58

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W: 1200.0 C: -600.0

Compression: 1:-524288



NOVA Lung

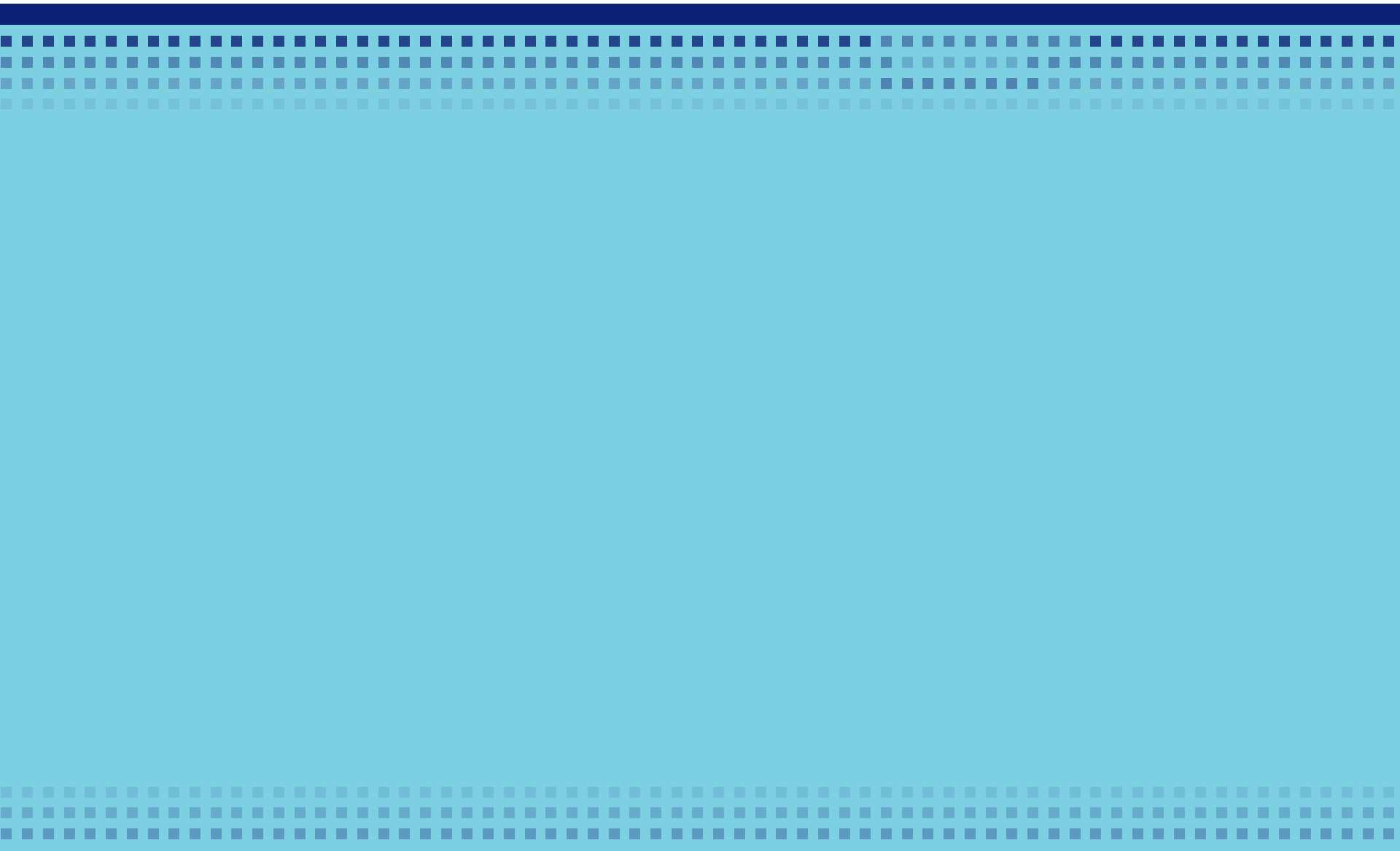
Wat is het en hoe werkt het?

NOVA LUNG

- Passieve membraan 'oxygenator'
- Bloedflow over membraan 1.3-2.0 l/min
- O₂ flow over membraan tot 15 l/min

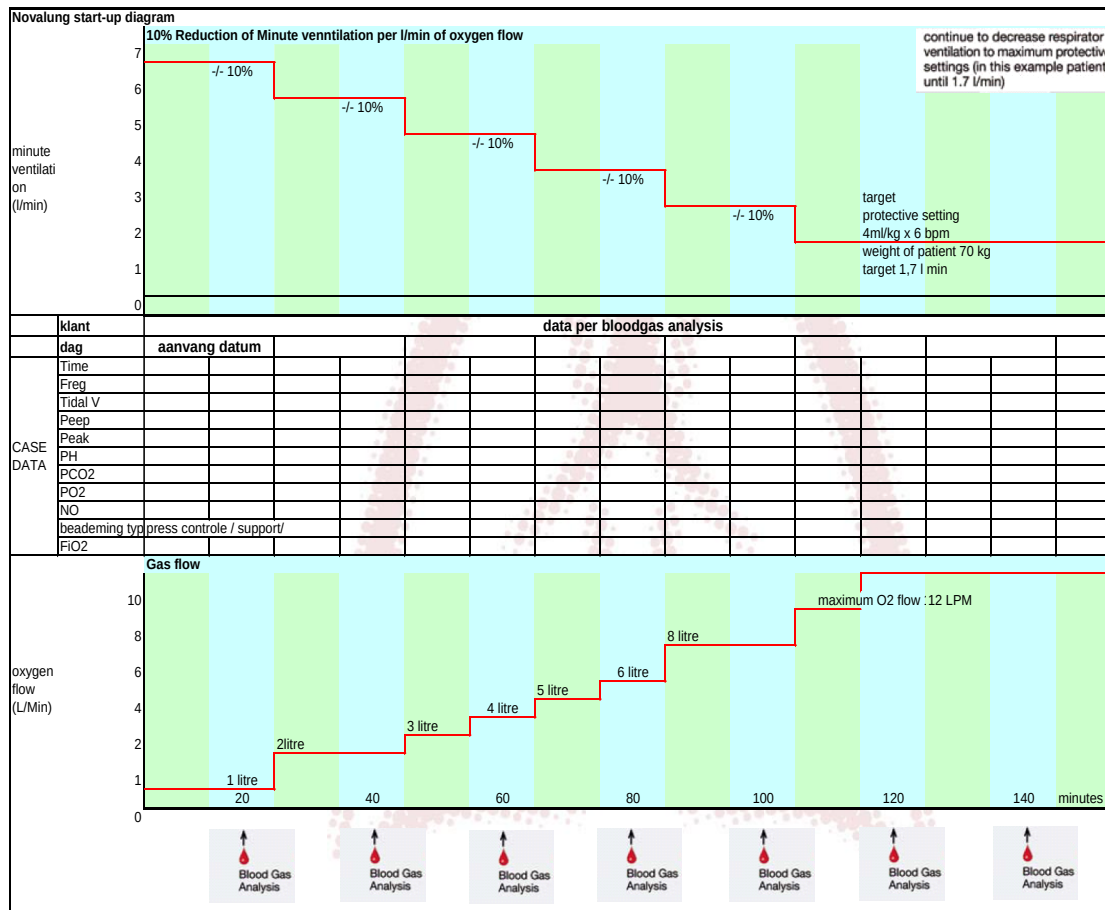
om CO₂ te klaren. Weinig effect op O₂.





Hoe te starten

Aanvang behandeling



NOVALUNG

Waar op te letten

- Bloedstolsels / luchtballen
- APTT 80-100 sec
- Bloedgas na iedere verandering O₂ flow
- A 8 uur O₂ flow op 25 l/min gedurende 20 sec
- Pulsaties beide benen
- Bloedflow (zou tussen 1.3 l/min en 2.0 l/min moeten zijn)

Contra-indicaties

- HIT
- Hemodynamische instabiliteit
- Ernstig perifeer vaatlijden
- Kinderen <20 kg

Werkt NOVA lung ?

In 8 jaar tijd 90 patienten met ARDS:
(gemiddelde Murray score 2.9)

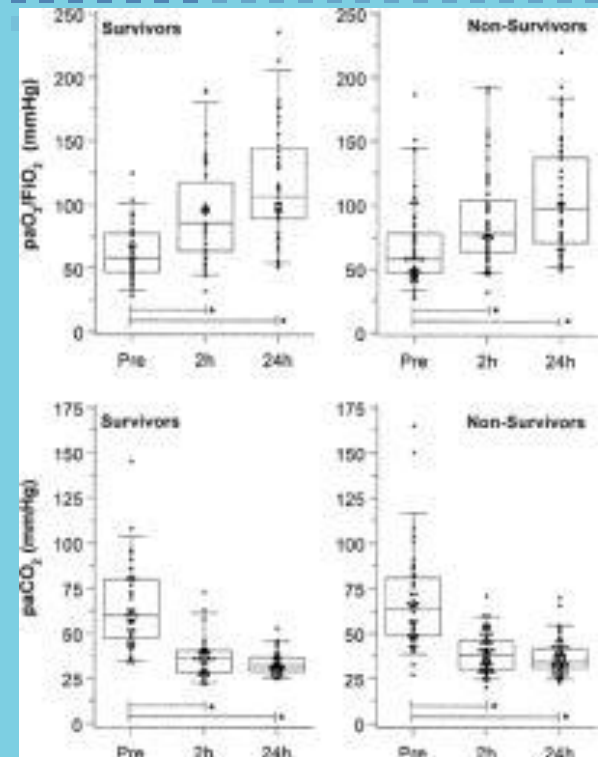
Mortaliteit 58%

Gemiddelde SOFA score 11

Table 3. Changes in respiratory variables before and during interventional lung assist in all patients

	Pre	2 Hrs	24 Hrs
F _{IO2}	1.0 (1.0–1.0)	0.9 (0.8–1.0) ^{a,b}	0.8 (0.69–0.9) ^c
Minute ventilation, L · min ⁻¹	13.0 (10.0–16.4)	11.0 (8.0–14.1) ^a	9.9 (8.0–14.8) ^c
Tidal volume, mL	430 (360–540)	410 (330–480) ^a	380 (320–470) ^c
Respiratory frequency, breaths/min	27 (21–43)	25 (20–40)	23 (17–39) ^c
Peak inspiratory pressure, cm H ₂ O	38 (35–40)	36 (32–39)	35 (31–39) ^c
PEEP, cm H ₂ O	15 (12–17)	15 (13–18)	14 (12–18)

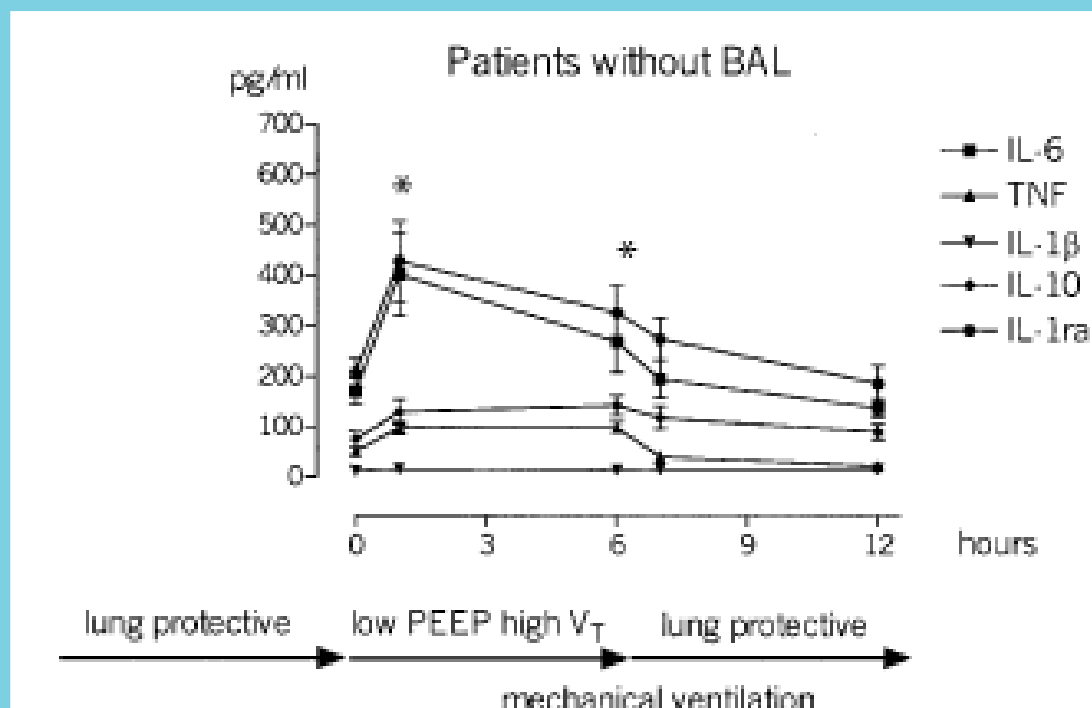
^a*p* < .05 2 hrs vs. pre; ^b*p* < .05 2 hrs vs. 24 hrs; ^c*p* < .05 24 hrs vs. pre.



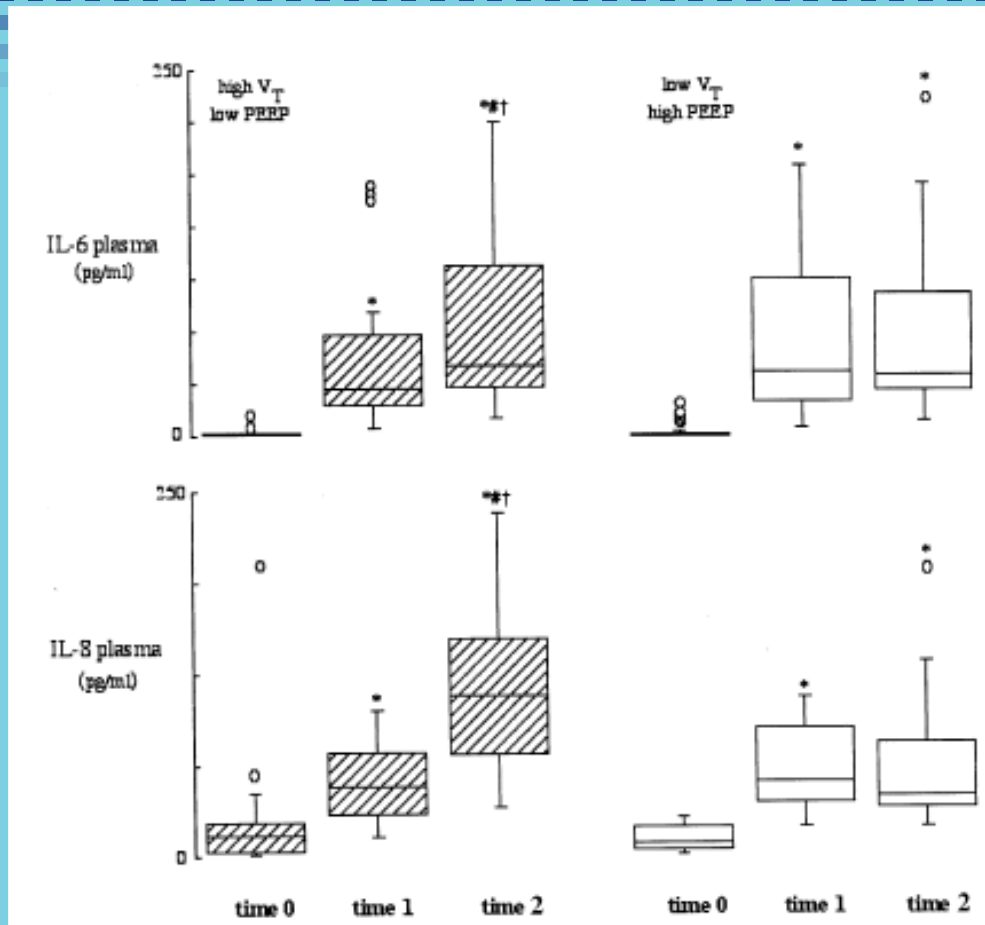
Complications

Table 5. Frequency of complications and side effects

Complication/Side Effect	No. of Patients
Ischemia of a lower limb after cannulation	9
Cannula thrombosis	4
Compartmental syndrome in a lower limb	4
Hematoma/aneurysm at cannulation site	2
Hemolysis	1
Intracerebral hemorrhage	1
Diffuse bleeding/shock syndrome during cannulation	1
All	22 (24.4%)



In cardiac surgery



*12 ml/kg, 2 cm H₂O PEEP
Vs
6 ml/kg, 9 cmH₂O PEEP*

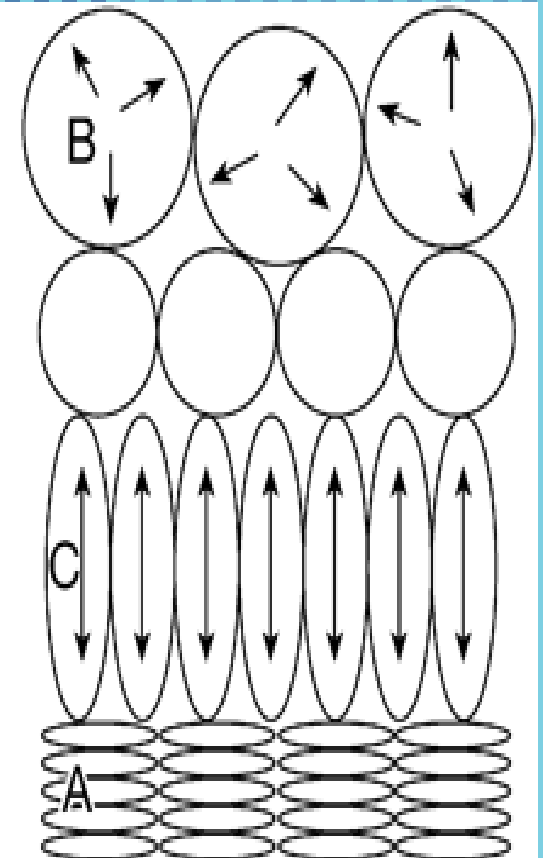
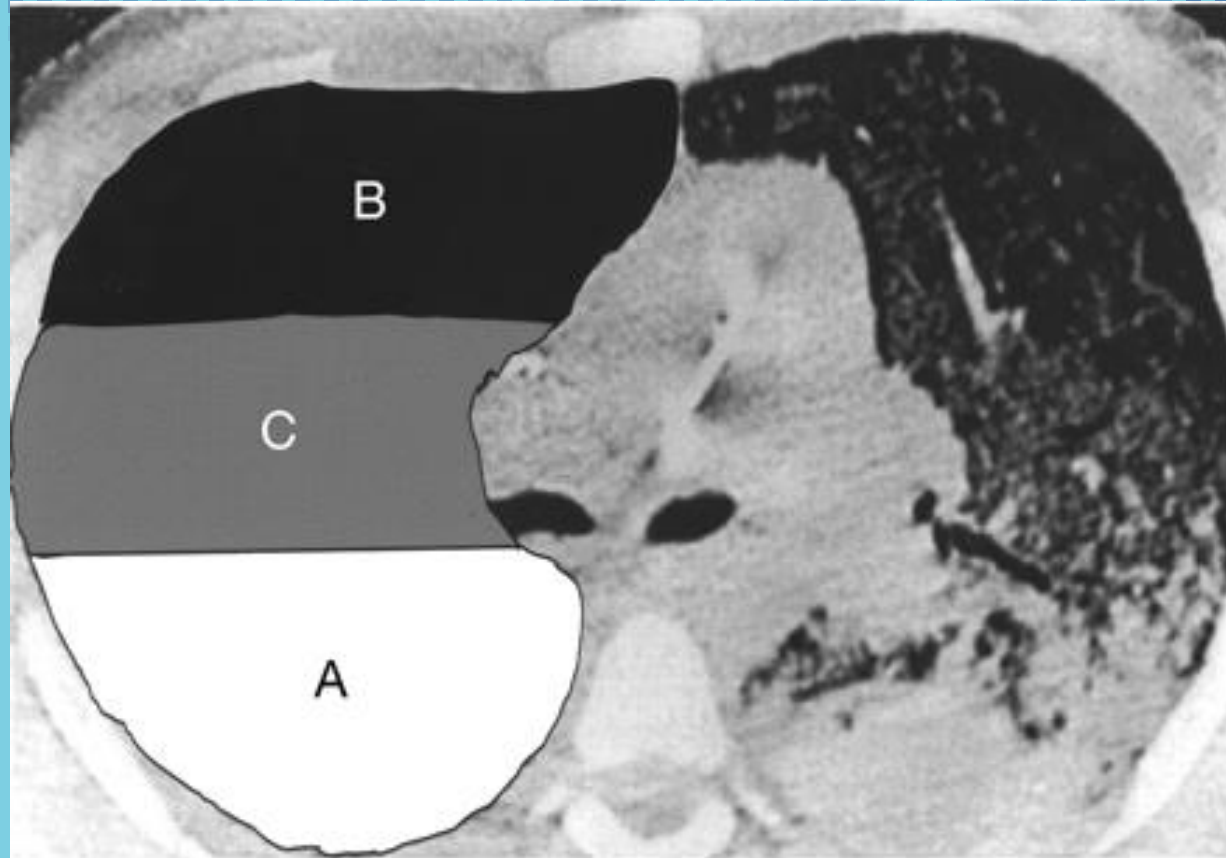
Lage Vt en Mortaliteit

860 ARDS patienten

6 ml/kg vs 12 ml/kg

Mortaliteit:

31.0% vs 38.9%



1. Hoge druk+hoge $V_t \Rightarrow$ longschade
2. Lage druk+hoge $V_t \Rightarrow$ longschade
3. Hoge druk+lage $V_t \Rightarrow$ *geen* longschade

Conclusie:

Longschade is meer volume gemedieerd
als druk gemedieerd

Dag 27

- NOVA LUNG:

PSV; PEEP 15 mbar, PIP 25 mbar 30x250 ml FiO_2 30%

Bloedflow NOVALUNG: 1.5 l/min.

O_2 flow NOVALUNG: 12 l/min

pH 7.39

PaO_2 13.9 kPa (105 mmHg)

PaCO_2 5.4 kPa (41 mmHg)



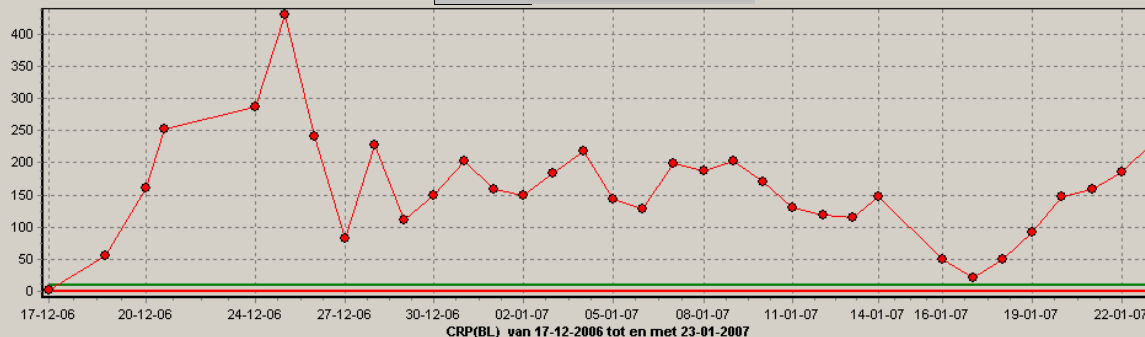
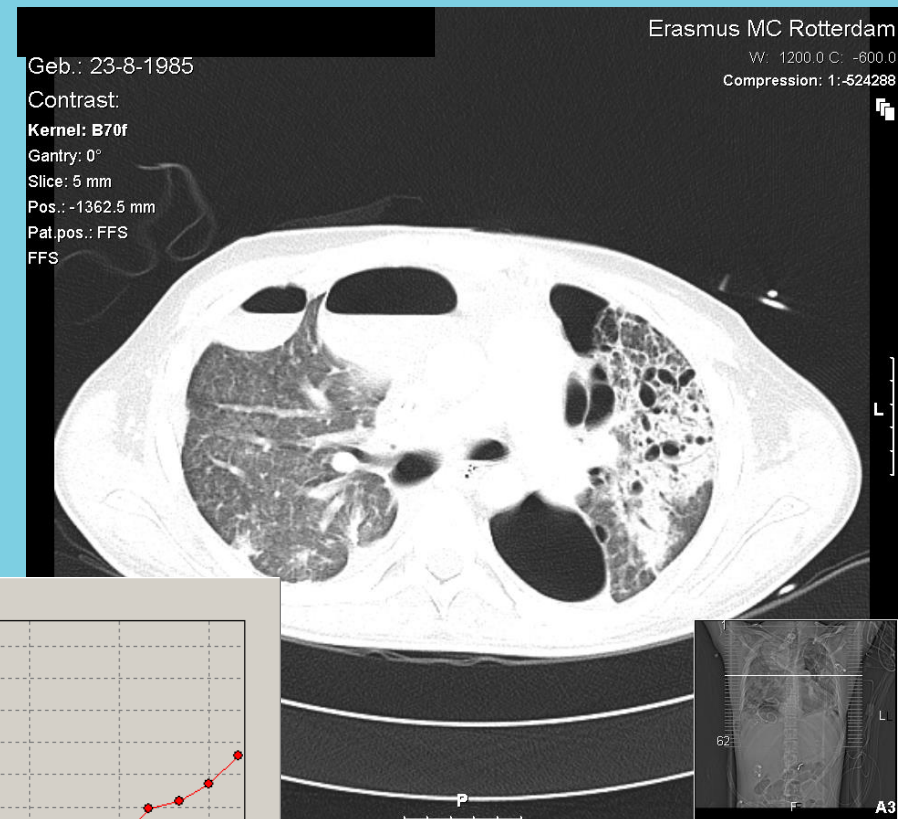
Dag 35

Dag 8 NOVALUNG

Respiratoir geen verbetering

Infectieus geen verbetering

Abstineren



Eind goed al goed

Geb.: 23-8-1985

Contrast:

Kernel: B70f

Gantry: 0°

Slice: 5 mm

Pos.: -93.5 mm

Pat.pos.: HFS

HFS

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W: 1200.0 C: -60

Compression: 1:524



Serie 4

Beeld 33 van 54

Kamer: C2NAV

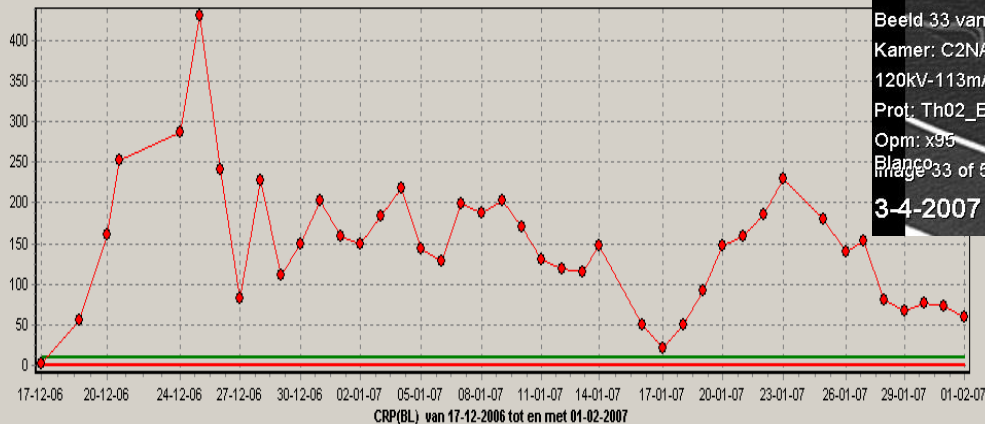
120kV-113mA-500ms

Prot: Th02_Blanco

Opm: x95

Blanco 33 of 54

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Conclusie

- NOVA lung laat tidal volume effectief zakken
- Gezien complicaties nog steeds 'rescue therapie'

