

UZ LEUVEN CMM fwo

Beademingsapparatuur: curves en loops

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1

Disclosure

Geen (potentiële) belangenverstrengeling	
Voor bijeenkomst mogelijke relevante relaties	Bedrijfsnamen
• Sponsoring of onderzoeksgeld	Geen
• Honorarium of andere (financiële) vergoeding	Geen
• Aandeelhouder	Geen
• Andere relatie, namelijk...	Geen

2

Grafische weergaven

Curves

Parameter versus tijd

- > Druk x tijd
- > Flow x tijd
- > Volume x tijd

Loops

2 parameters simultaan

- > Druk en volume
- > Druk en flow

3

Curves

Volume Modes

Volume Control (SIMV (V_T Control))

Pressure Modes

Pressure Control (PPSC (SIMV (P_{peak} Control)))
 Pressure Support (Volume Support)

4

Druk curve

Volume gecontroleerd

Zonder inspiratoire pauze

Met inspiratoire pauze

Druk gecontroleerd

Monitoring Mechanical Ventilation Using Ventilator Waveforms. Amal 2018

5

Equation of motion

$Resistance = \frac{\Delta pressure}{\Delta flow}$

$Compliance = \frac{\Delta volume}{\Delta pressure}$

Principles & Practice of mechanical ventilation, second edition. Tobin 2006

6

Equation of motion

Equation of motion
 $Pressure = \frac{volume}{compliance} + flow \times resistance$

$$P_{aw} - PEEP_{TOT} = (V/C) + (R \times flow)$$

Principles & Practice of mechanical ventilation, second edition, Tobin 2006

7

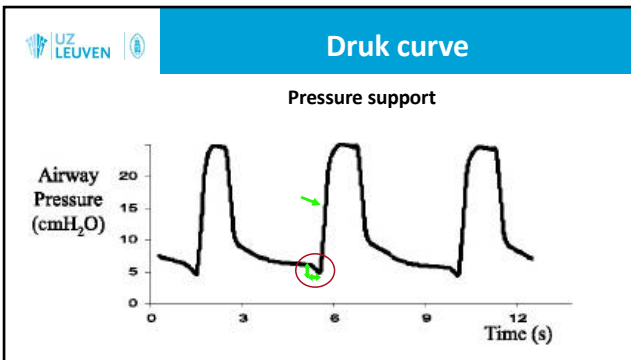
Druk curve

Equation of motion
 $P_{aw} - PEEP_{TOT} = (V/C) + (R \times flow)$

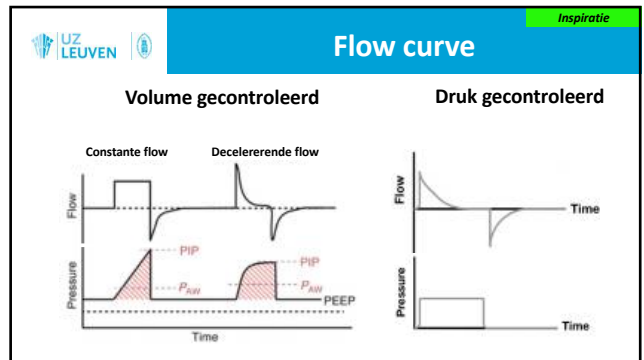
$$R = \frac{PIP - P_{plat}}{flow}$$

$$C = \frac{Vt}{P_{plat} - PEEP_{tot}}$$

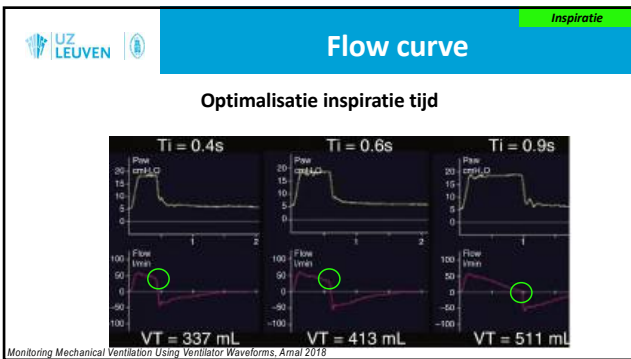
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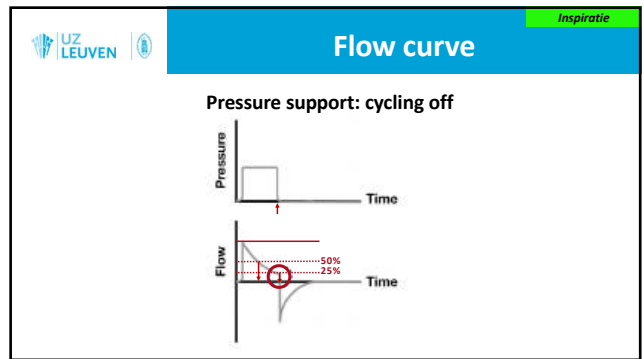
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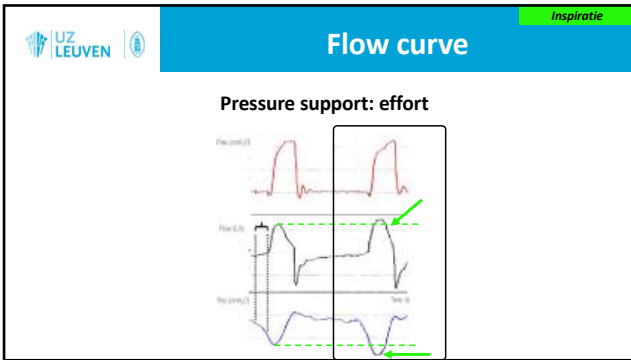
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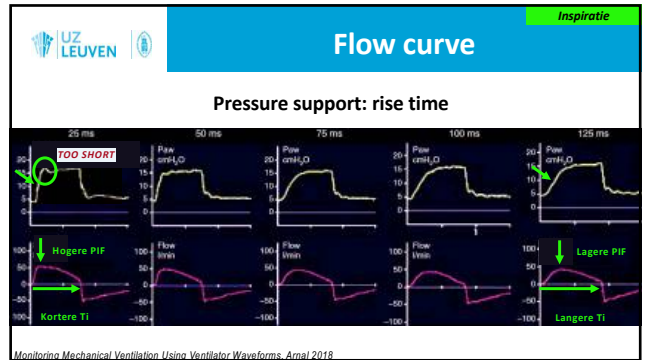
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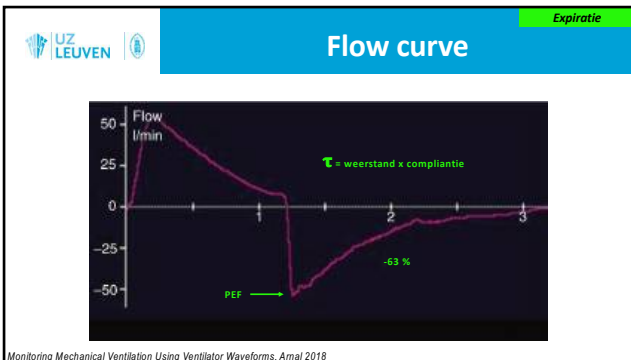
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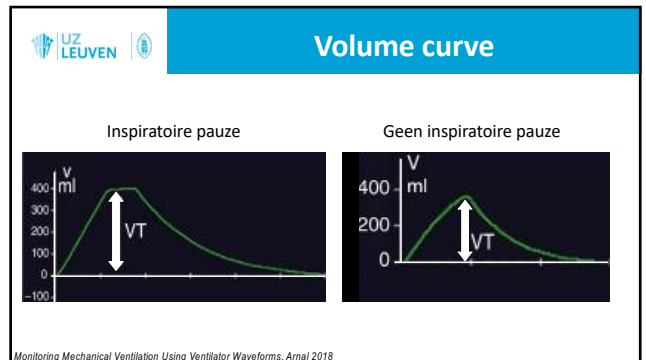
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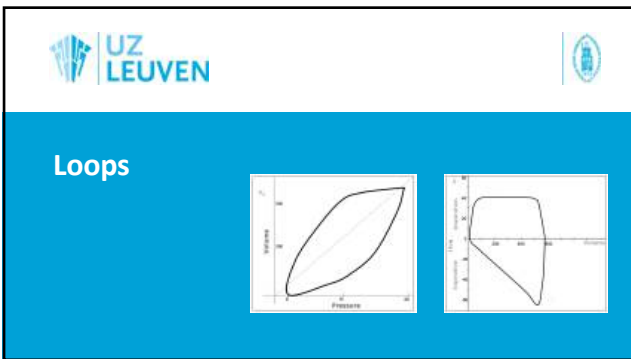
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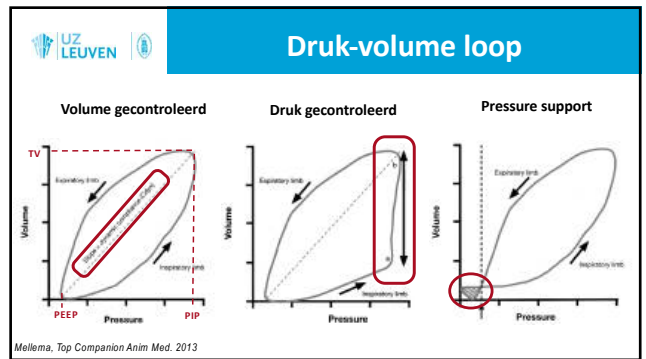
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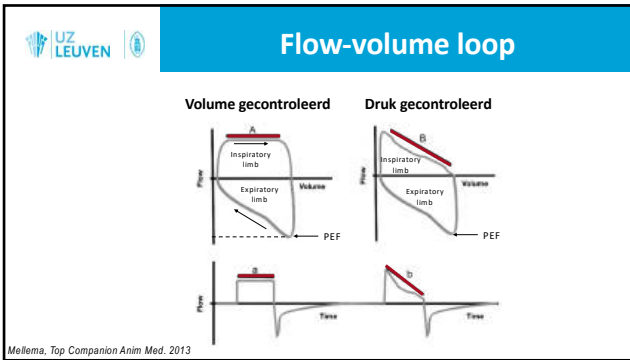
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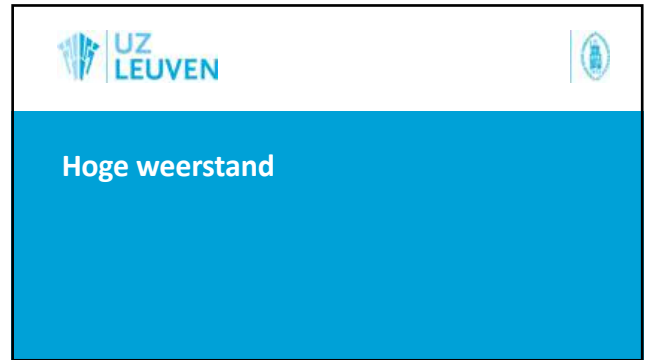
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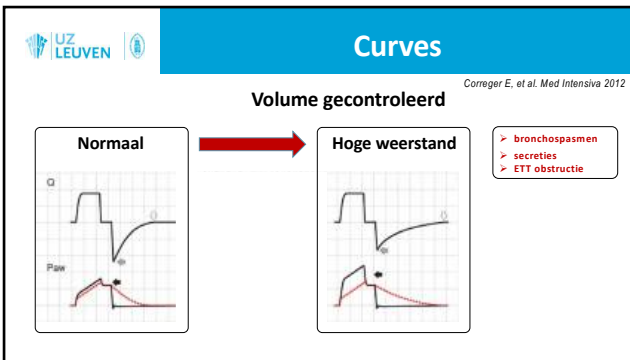
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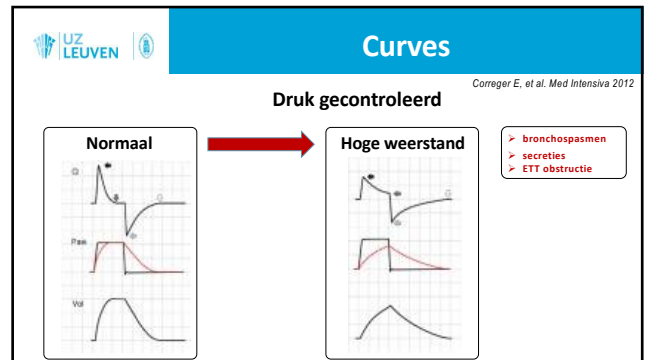
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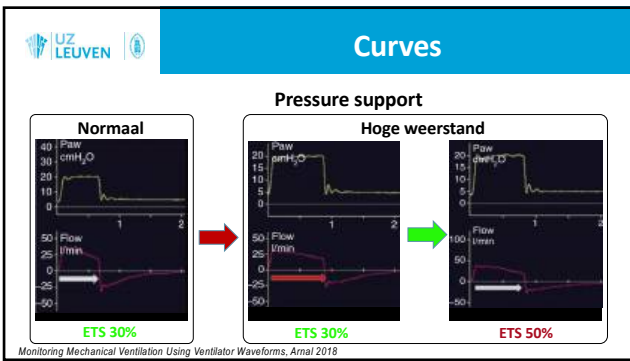
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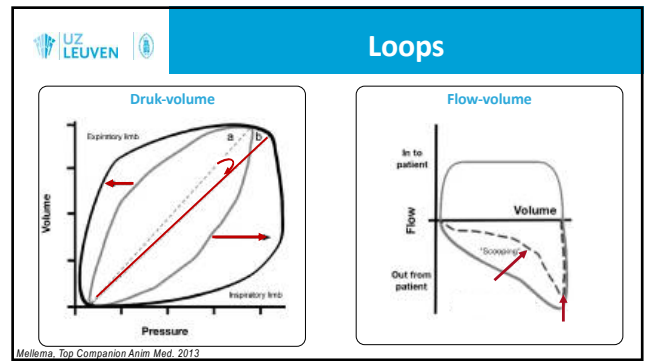
21



22



23



24

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AutoPEEP

25

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Curves en loops

Druk curve: Shows pressure over time with a red arrow pointing to the end-expiratory pressure labeled 'Auto PEEP'.

Volume curve: Shows volume over time with a red arrow pointing to the end-expiratory volume, labeled 'Volume loss due to gas trapping or circuit leaks'.

Flow curve: Shows flow over time with a red circle around the end-expiratory flow and a red arrow pointing to the end-expiratory pressure.

Flow-volume: Shows the relationship between flow and volume, with labels for Inspiration and Expiration.

Muller. Top Companion Anim Med. 2013; Dexter. Reso Care 2020.

26

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Lage compliantie

27

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Curves

Correger E, et al. Med Intensiva 2012

Volume gecontroleerd

- > atelectase
- > pneumothorax
- > longoedeem
- > re hoofbronchus
- intubatie
- > stijve thoraxwand
- > asynchronie
- > autoPEEP

28

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Curves

Correger E, et al. Med Intensiva 2012

Druk gecontroleerd

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29

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Curves

Pressure support

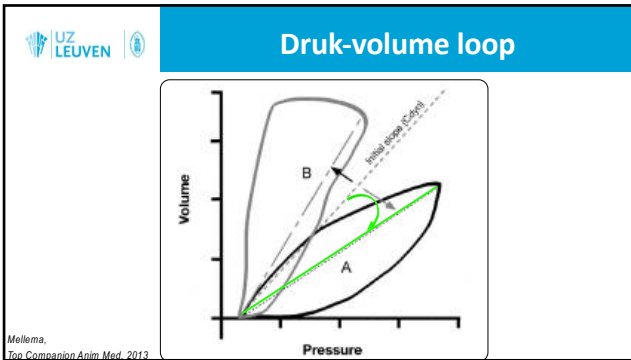
Normal: ETS 30%

Lage compliantie: ETS 30%

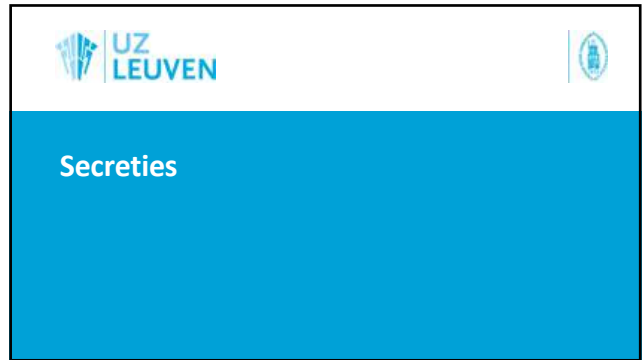
Lage compliantie: ETS 5%

Monitoring Mechanical Ventilation Using Ventilator Waveforms. Arnal 2018

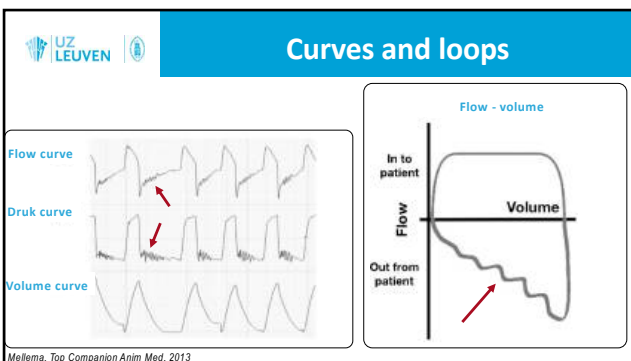
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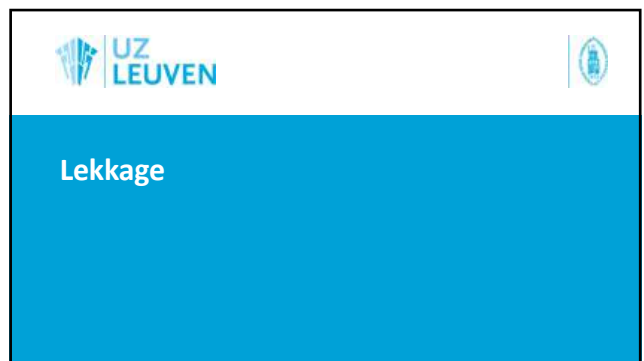
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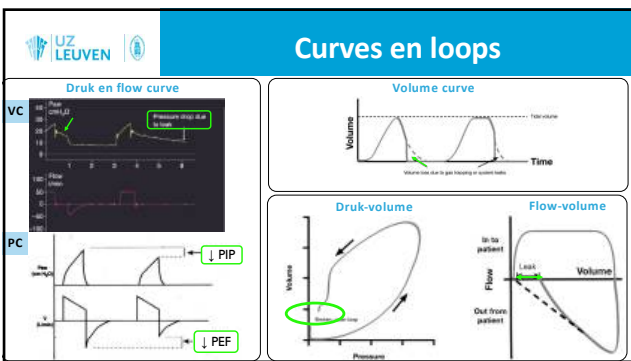
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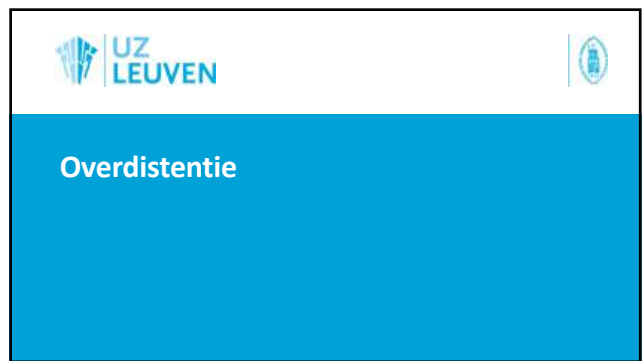
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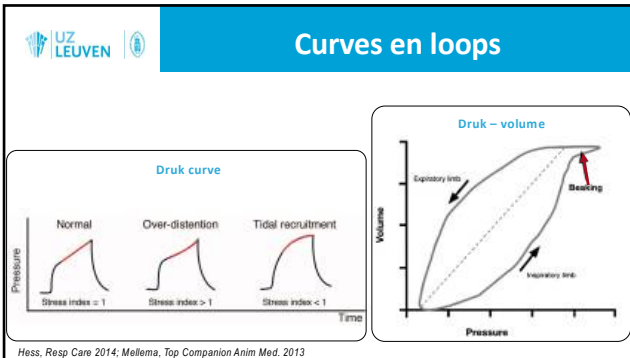
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35



36

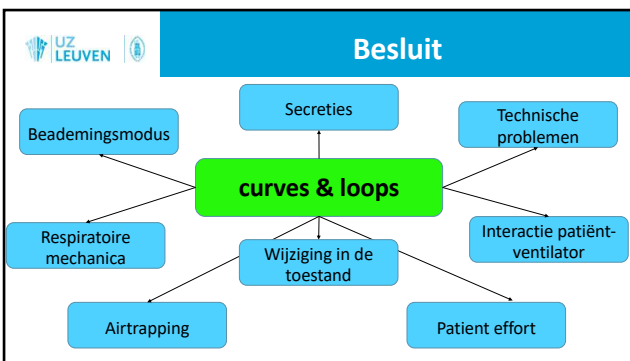


37

Asynchroniën

15:45 - 16:15 Patiënt vignet: dysynchronie
Leo Heunks | Intensivist - Longarts en hoogleraar experimentele intensive care | Amsterdam UMC | Amsterdam

38



39

Besluit

Kennis en interpretatie van grafische weergaven zijn essentieel om de ventilator instellingen te optimaliseren en gepaste acties te ondernemen!

40