

Hes·SO

Haute Ecole Spécialisée
de Suisse occidentale
Fachhochschule Westschweiz
University of Applied Sciences and Arts
Western Switzerland



Analyse des courbes de ventilation

Jean-Bernard Michotte PT, MSc, PhD
Jean Roeseler PT, MSc, PhD

Haute Ecole de Santé Vaud, 1011 Lausanne – Suisse

E-mail : jean-bernard.michotte@hesav.ch

Les modes ventilatoires

Réglages

Paramètres contrôlés

Objectifs

Volume

Débit (V/T_I)

Volume

Temps inspiratoire

Pression

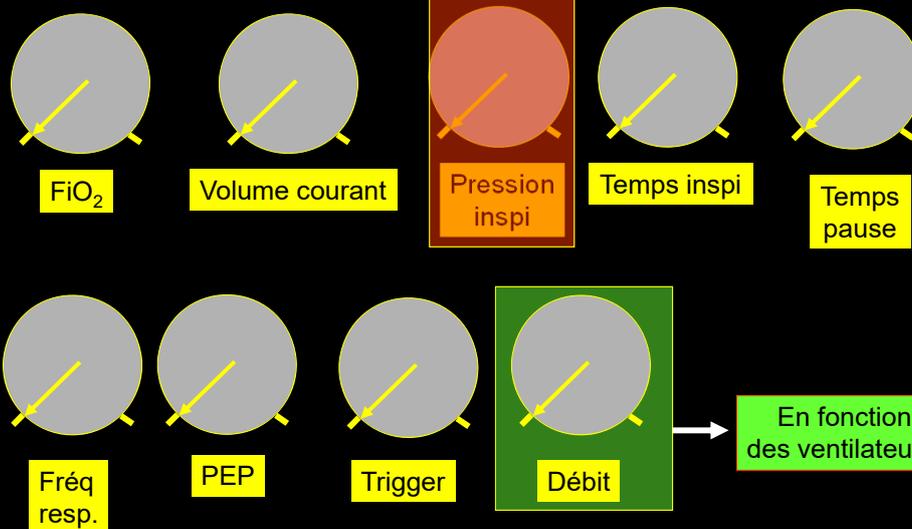
Pression

Pression

Temps inspiratoire

Ventilation assistée contrôlée en volume contrôlé (VC)

Ventilation à volume contrôlé



Les réglages

S P_{PEAK} 15 V_{TE} 572 f_{ROT} 18 I:E 1:1.7 P_{MEAN} 9.3 $V_{E\ TOT}$ 10.1 $V_{TE\ MAND}$ -- $P_{I\ END}$ 15

Config. **Vent** Type ventilation Invasive VNI Mode A/C SIMV SPONT BiLevel CPAP

Type contrôlé PC VC VC+

Type déclenchement P-Trig V-Trig

f 15 V_T 500 V_{MAX} 47 V_{SENS} 0.2 O_2 21 TP_{PEAK} 60

T_{PL} 0.7 Carré E_{SENS} 1 $PEEP$ 5.0

59 kg (130lb) Apnée Alarms Réglages suppl. 59 kg 8.47 mL/kg

Annuler Accepter TOUT

Adulte SPONT PS 59 kg 6.02 mL/kg Insp. manuelle V_I 355 mL f 15 V_T 500 V_{MAX} 30 P_{SENS} 2.0 O_2 21 $PEEP$ 5.0

10:23:21am

C P_{PEAK} 17 V_{TE} 522 f_{ROT} 15 I:E 1:1.2 P_{MEAN} 9.0 $V_{E\ TOT}$ 7.73 $V_{TE\ MAND}$ 522 $P_{I\ END}$ 13

VC normal

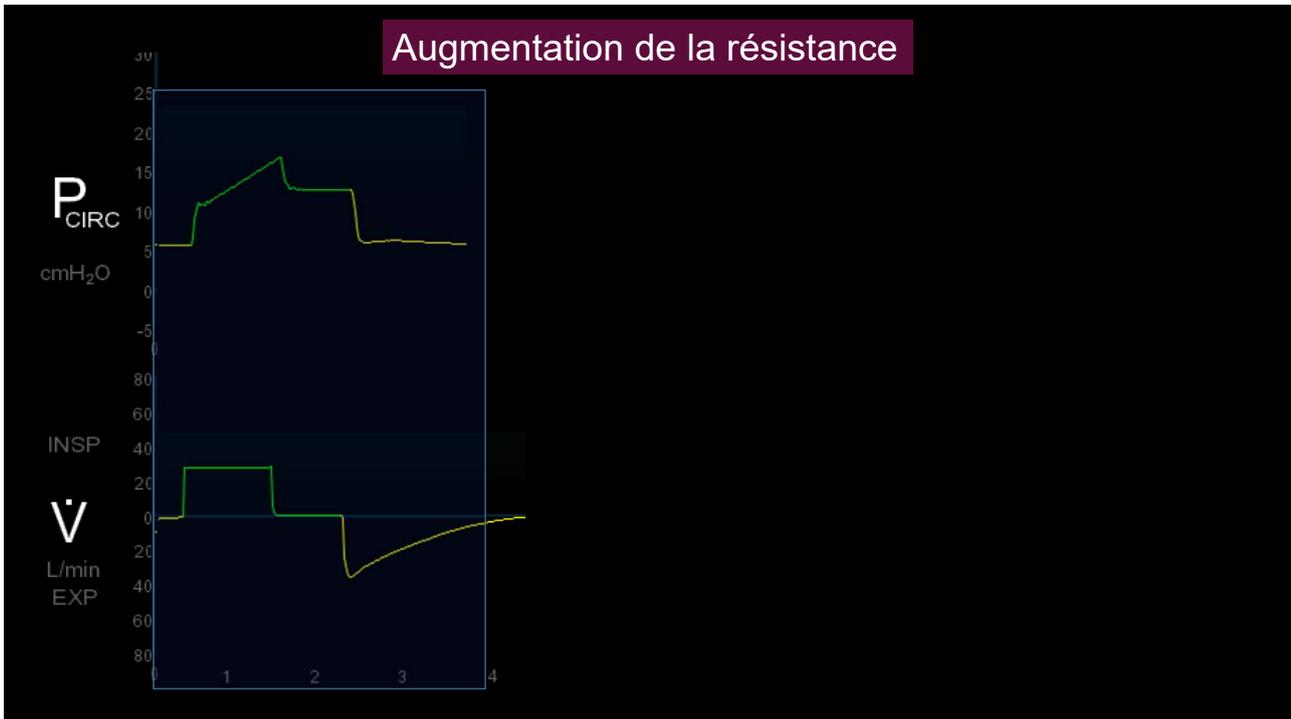
P_{CIRC} cmH₂O

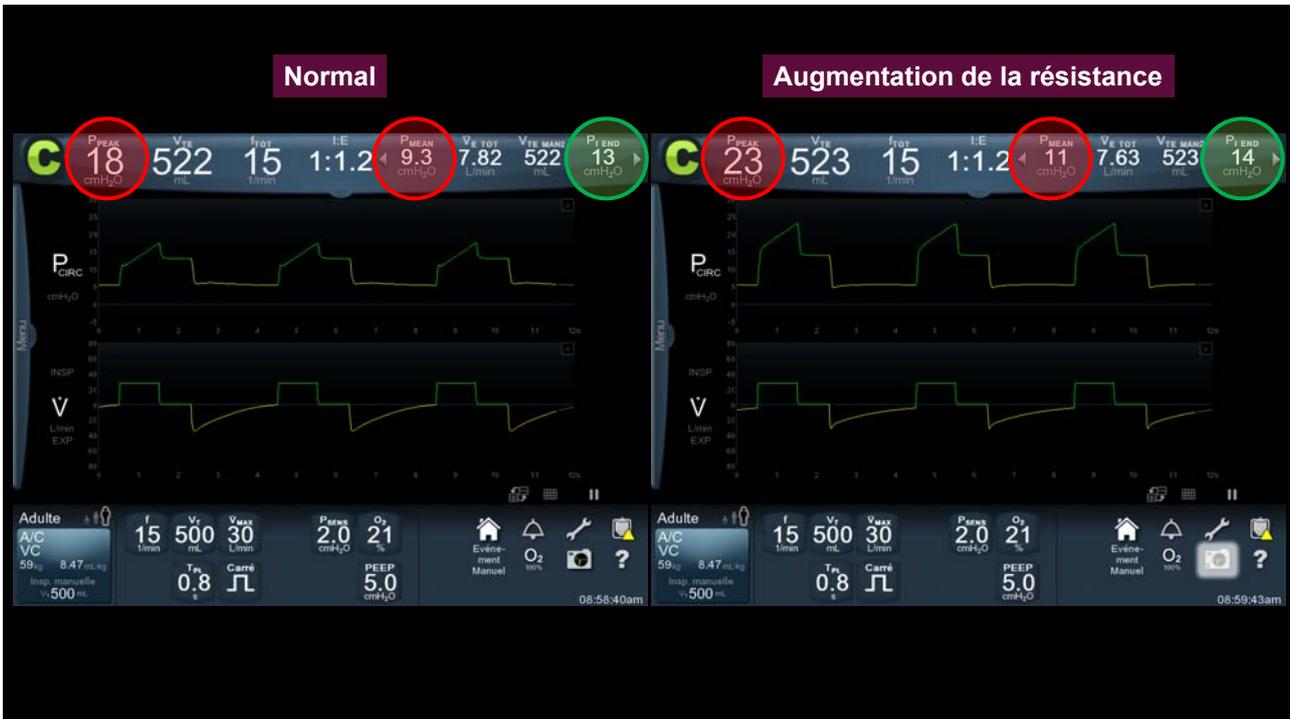
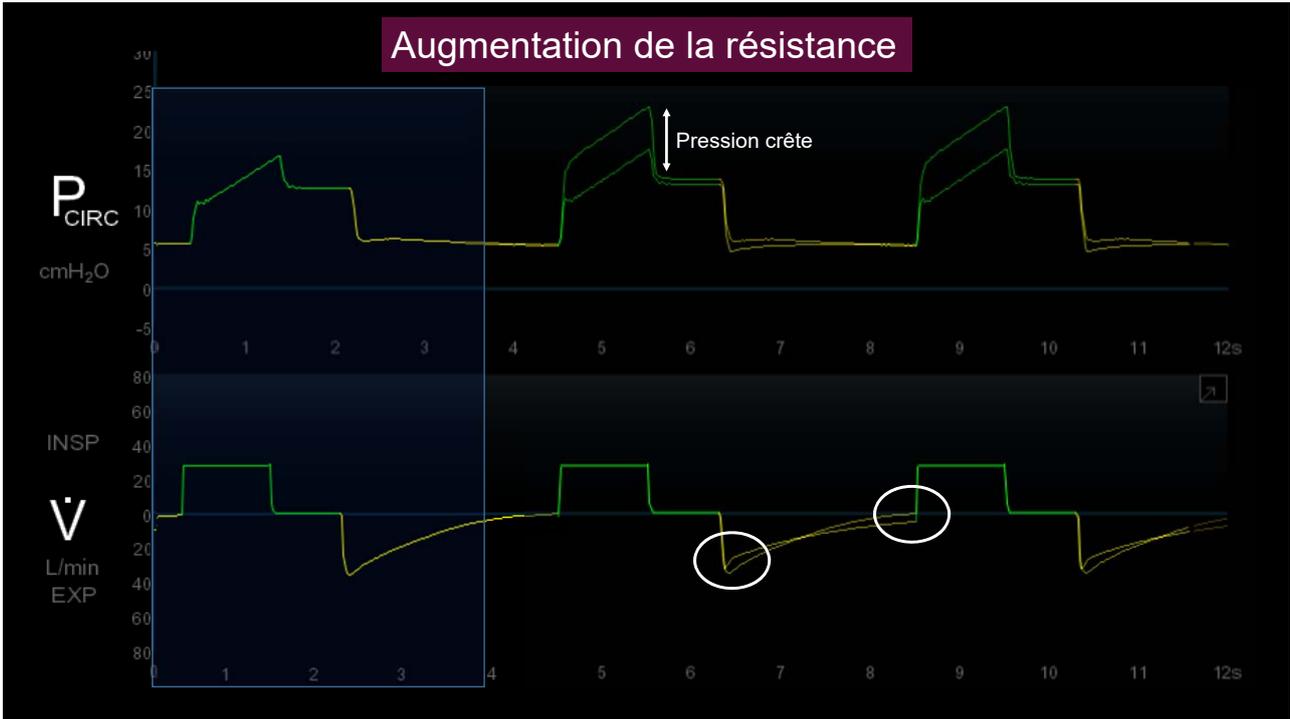
INSP V L/min EXP

V_T mL

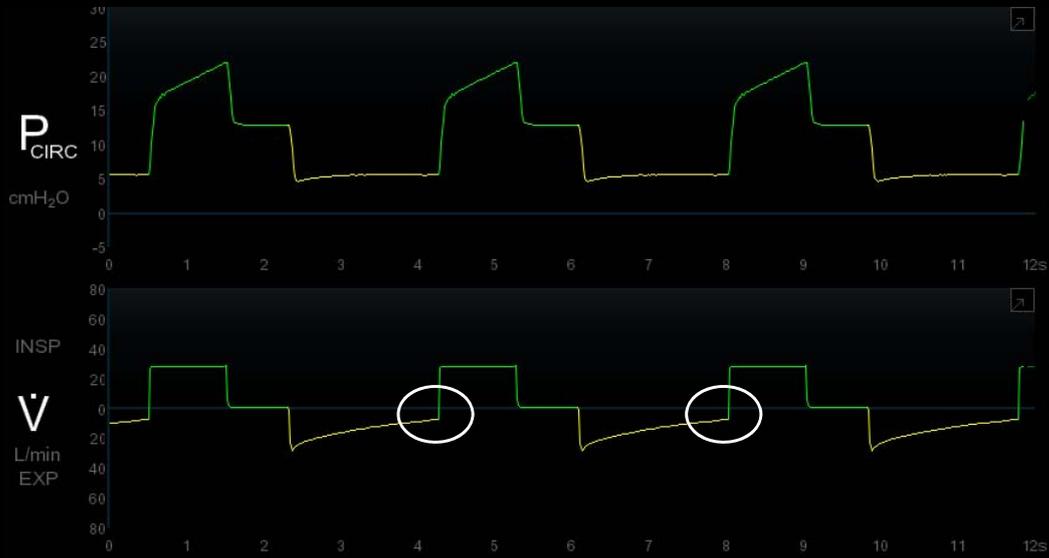
Adulte A/C VC 59 kg 8.47 mL/kg Insp. manuelle V_I 500 mL f 15 V_T 500 V_{MAX} 30 P_{SENS} 2.0 O_2 21 $PEEP$ 5.0

08:53:10am





Augmentation de la résistance + auto PEP

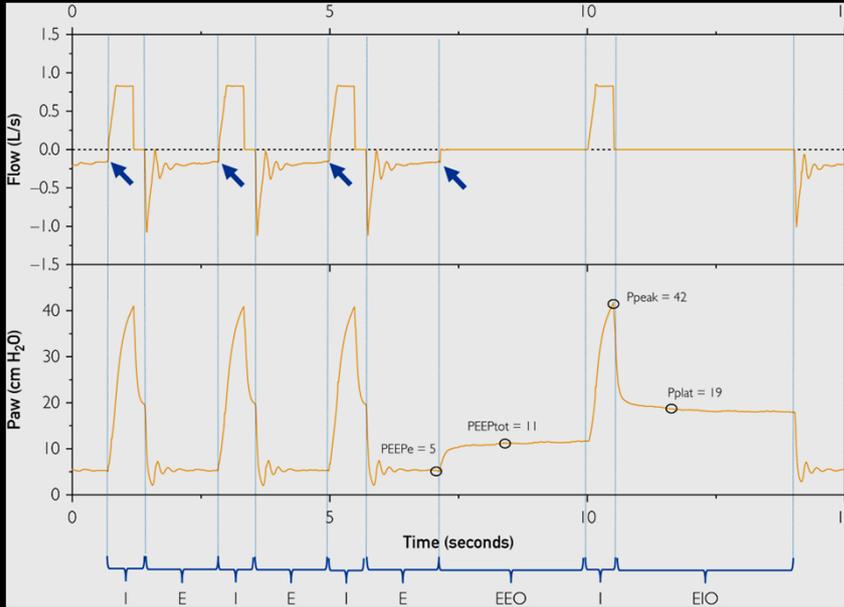


Augmentation de la résistance + auto PEP

The screenshot displays a ventilator control interface with the following elements:

- Top Status Bar:**
 - C** (Circuit status)
 - P_{PEAK}** : 22 cmH_2O
 - V_{TE}** : 518 mL
 - f_{TOT}** : 15 /min
 - I:E**: 1:1.1
 - P_{MEAN}** : 11 cmH_2O
 - $V_{E\ TOT}$** : 7.99 L/min
 - $V_{E\ MAND}$** : 518 mL
 - $P_{I\ END}$** : 13 cmH_2O
- Left Menu:**
 - Manœuvres respiratoires
 - Pause inspiratoire
 - Pause expiratoire
 - Capacité vitale
 - P_{O_2}
 - NIF
- Main Display:**
 - Manœuvre de pause expiratoire
 - Graph: P_{CIRC} vs time (0-3s)
 - Message: "Manœuvre terminée"
 - Buttons: "Annuler", "DÉMARRER", "Fermer"
- Right Panel:**
 - Date: 09:03am 15-Oct-2015
 - $PEEP_{TOT}$** : 7.2 cmH_2O
 - $PEEP_I$** : 1.7 cmH_2O
 - Buttons: "Rejeter", "Accepter"
- Bottom Panel:**
 - Neutralisation de l'alarme en cours: Annuler
 - Mode: Adulte
 - f**: 16 /min
 - V_T** : 500 mL
 - V_{MAX}** : 30 L/min
 - P_{BENS}** : 2.0 cmH_2O
 - O_2** : 21 %
 - T_{PI}** : 0.8 s
 - Carré**: \square
 - PEEP**: 5.0 cmH_2O
 - Buttons: "Évènement Manuel", "O₂ 100%", "115", "09:03:36am"

Mesures physiologiques



Compliance :
 $\text{Volume} / (\text{Pplat} - \text{PEEPtot})$

Résistance :
 $(\text{Ppeak} - \text{Pplat}) / \text{Débit}$

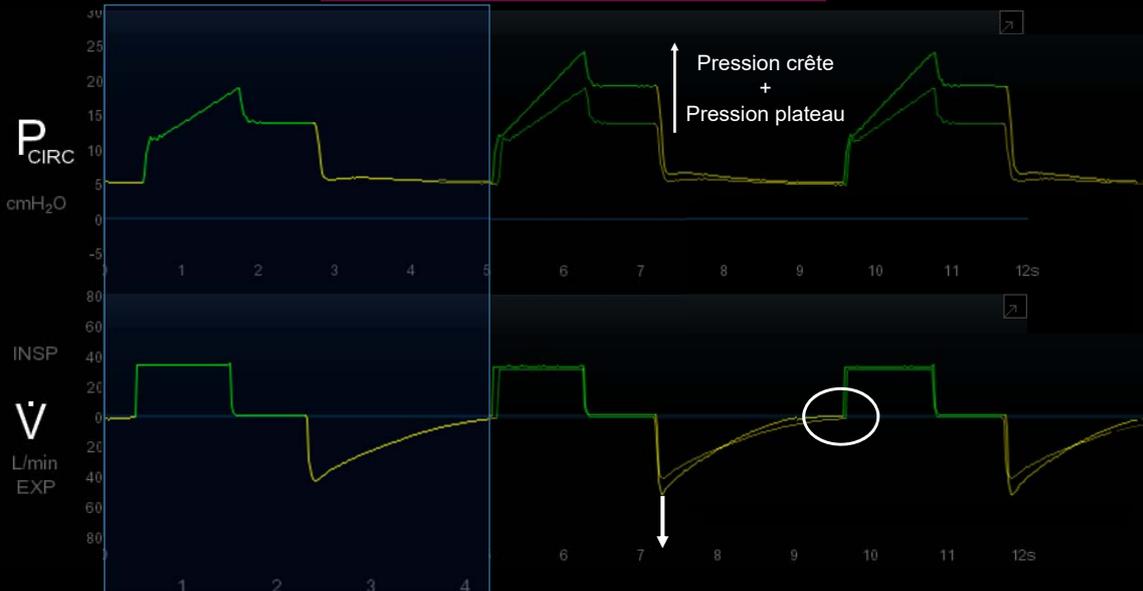
Pression motrice :
 $\text{Pplat} - \text{PEEPtot}$

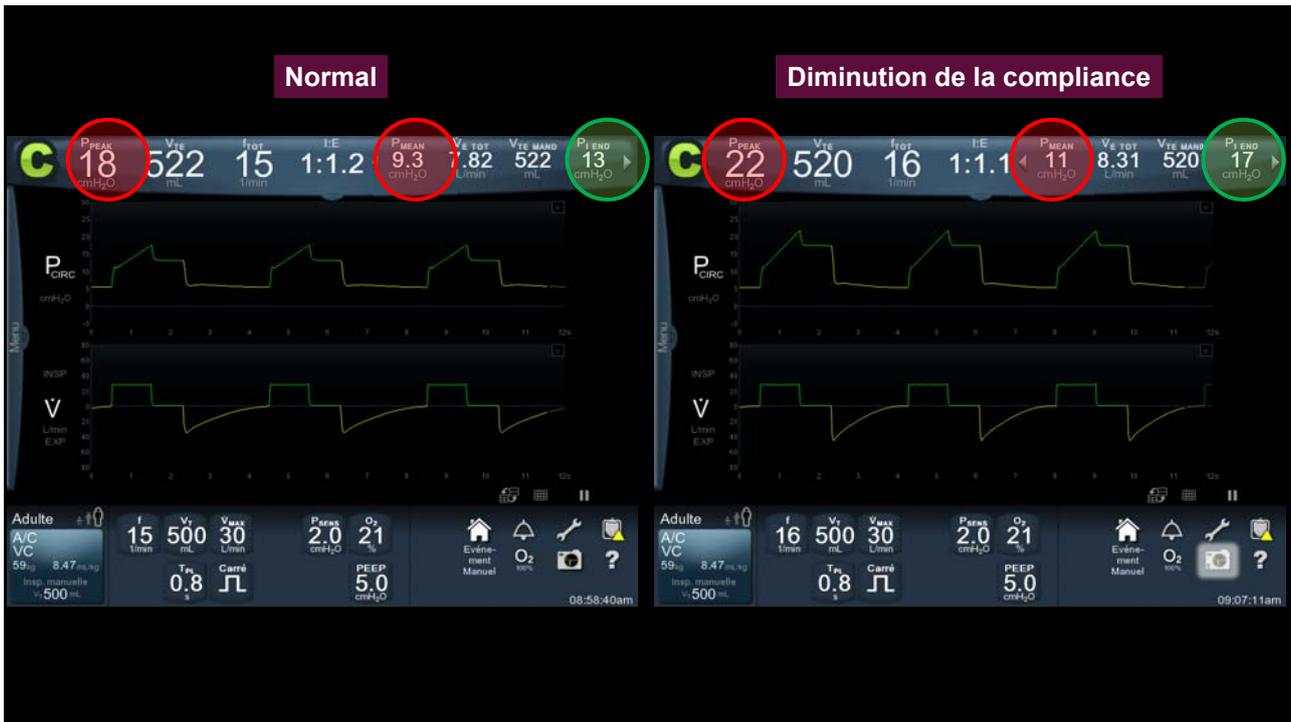


Diminution de la compliance



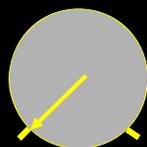
Diminution de la compliance





Ventilation assistée contrôlée en pression contrôlée (PC)

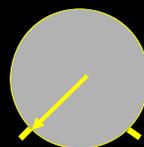
Ventilation à pression contrôlée



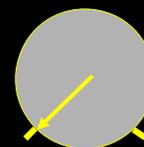
FiO₂



Volume courant



Pression
inspi



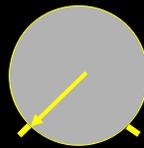
Temps
inspi



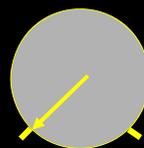
Temps
de
pause



Fréq
resp.



PEP



Trigger



Débit

Les réglages

Parameters:
 P_{PEAK} 15 cmH_2O | V_{TE} 591 mL | f_{TOT} 19 1/min | I:E 1:1.5 | P_{MEAN} 9.6 cmH_2O | $V_{E\ TOT}$ 10.4 L/min | $V_{TE\ MAND}$ 316 mL | $P_{I\ END}$ 15 cmH_2O

Configuration:
 Type ventilation: Invasive VNI
 Mode: A/C | SIMV | SPONT | BiLevel
 Type contrôlé: PC | VC | VC+
 Type spontané: PS | TC | VS | PAV+
 Type déclenchement: P-Trig | V-Trig

Other Settings:
 f 15 1/min | P_I 10 cmH_2O | T_I 1.06 s | $V_{A\ SENS}$ 0.2 L/min | O_2 21 % | $T_{P\ PEAK}$ 60 cmH_2O
 \dot{V}_P 50 % | $E_{S\ SENS}$ 1 % | PEEP 5.0 cmH_2O

Bottom Panel:
 Adulte SPONT PS | P_{SUPP} 10 cmH_2O | $V_{A\ SENS}$ 0.2 L/min | O_2 21 % | Événement Manuel | O₂ 100% | 10:22:36am

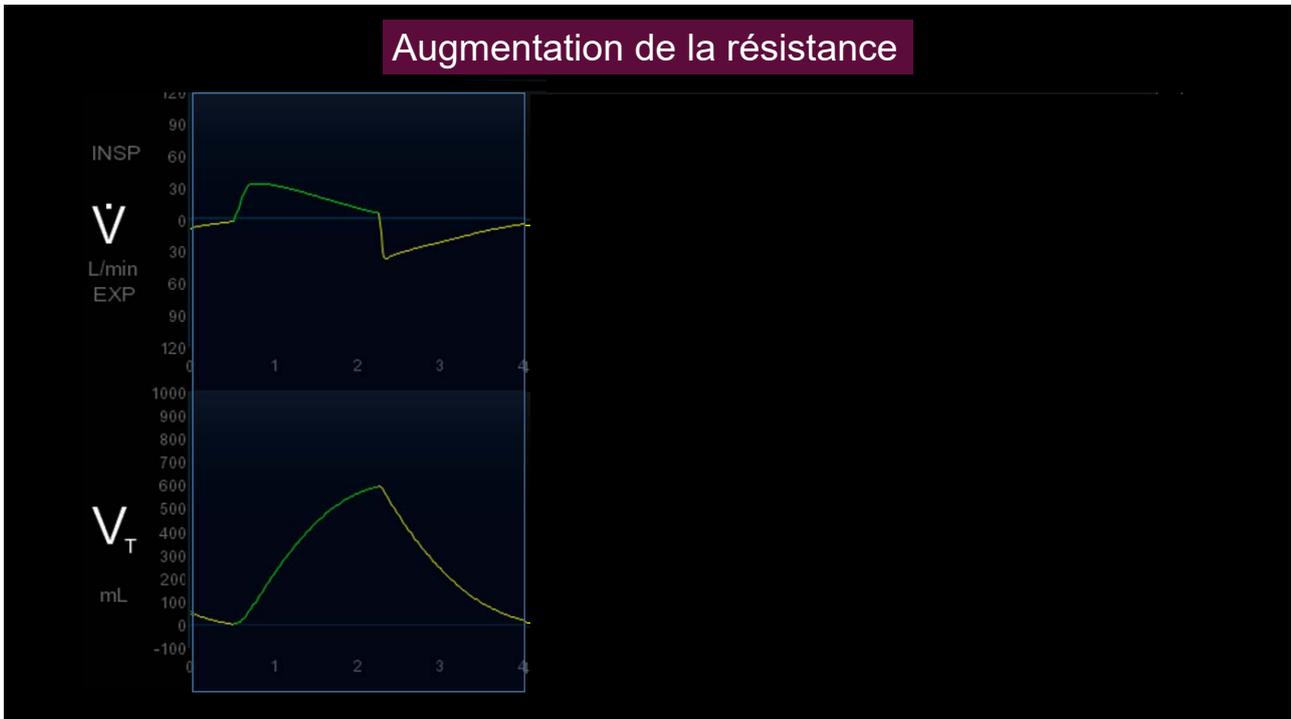
Parameters:
 P_{PEAK} 15 cmH_2O | V_{TE} 653 mL | f_{TOT} 16 1/min | I:E 1:1.1 | P_{MEAN} 9.7 cmH_2O | $V_{E\ TOT}$ 10.4 L/min | $V_{TE\ MAND}$ 653 mL | $P_{I\ END}$ 15 cmH_2O

Waveforms:
 - P_{CIRC} (cmH₂O): Shows pressure cycles with a peak of 15 cmH₂O.
 - V (L/min): Shows inspiratory and expiratory flow waves.
 - V_T (mL): Shows total volume breaths reaching approximately 650 mL.

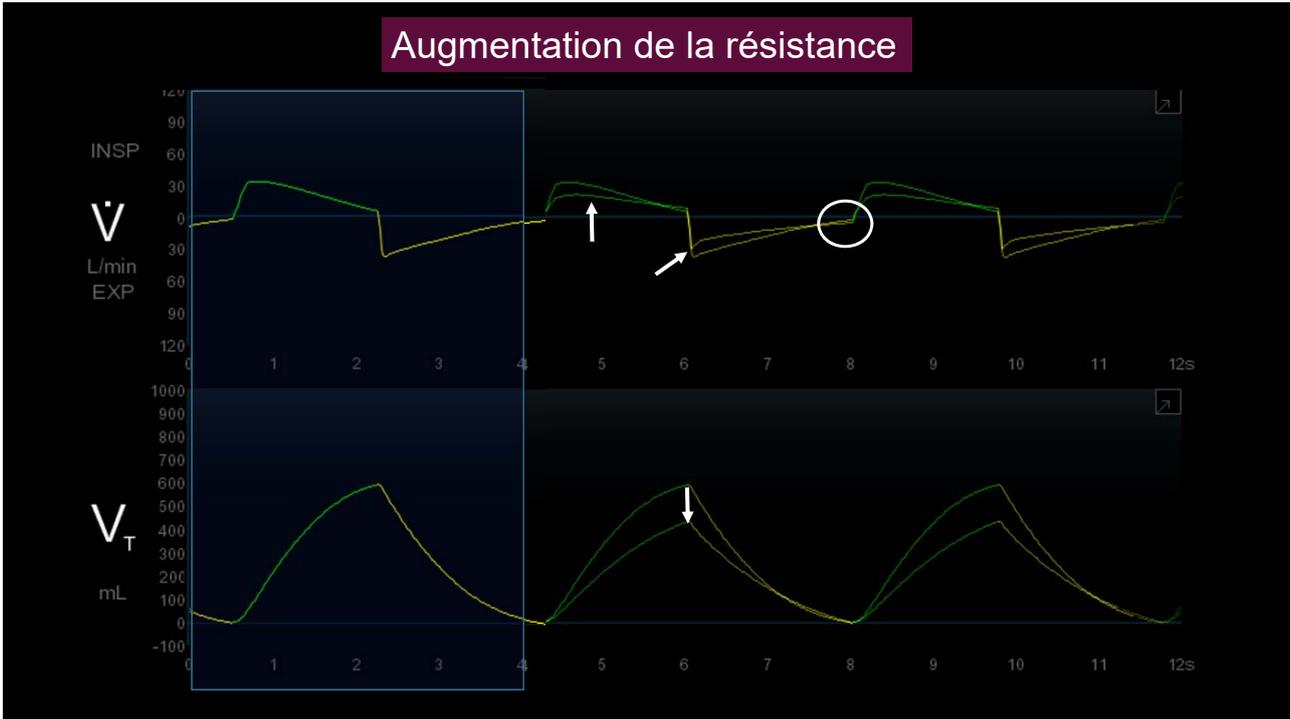
Configuration:
 Type ventilation: A/C PC
 Mode: A/C | PC | VC | VC+
 Type contrôlé: PC | VC | VC+
 Type spontané: PS | TC | VS | PAV+
 Type déclenchement: P-Trig | V-Trig

Other Settings:
 f 16 1/min | P_I 10 cmH_2O | T_I 1.76 s | P_{SENS} 2.0 cmH_2O | O_2 21 % | $T_{P\ PEAK}$ 60 cmH_2O
 \dot{V}_P 50 % | $E_{S\ SENS}$ 1 % | PEEP 5.0 cmH_2O

Bottom Panel:
 Adulte A/C PC | P_{SUPP} 10 cmH_2O | $V_{A\ SENS}$ 0.2 L/min | O_2 21 % | Événement Manuel | O₂ 100% | 09:22:39am

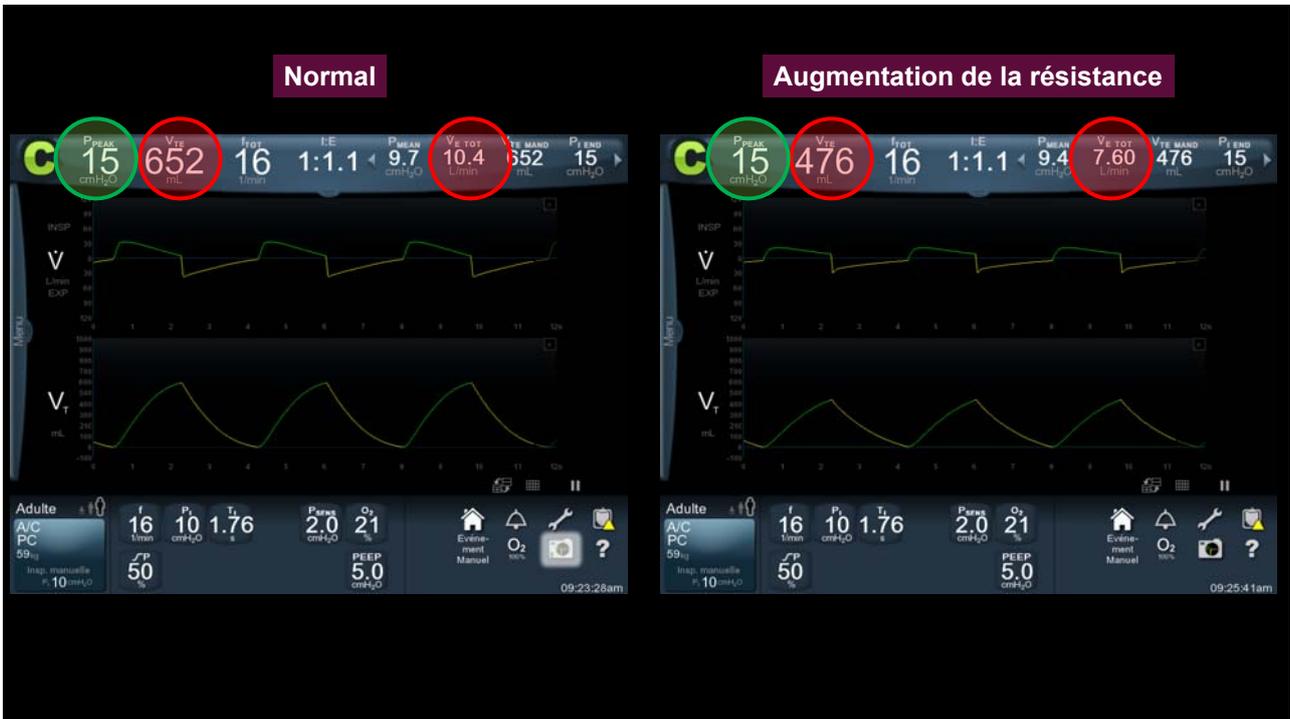


Augmentation de la résistance



Normal

Augmentation de la résistance





Diminution de la compliance



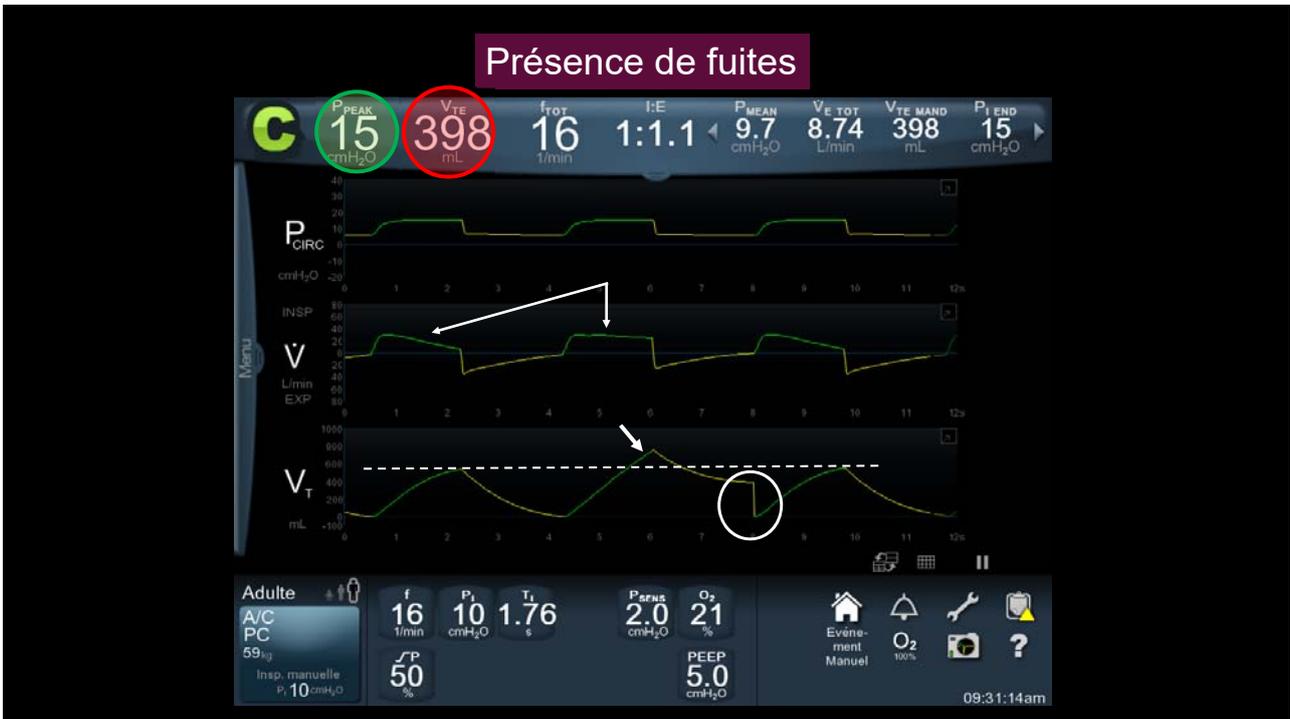
Diminution de la compliance



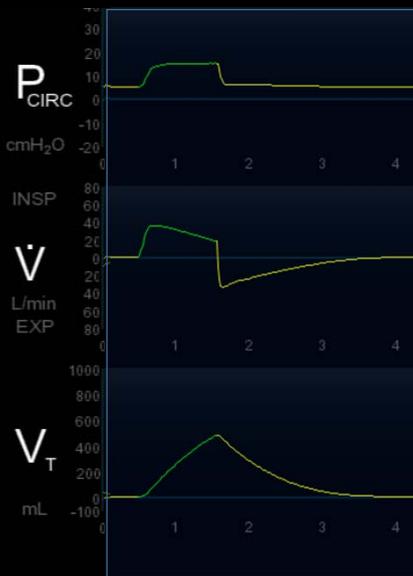
Normal

Diminution de la compliance

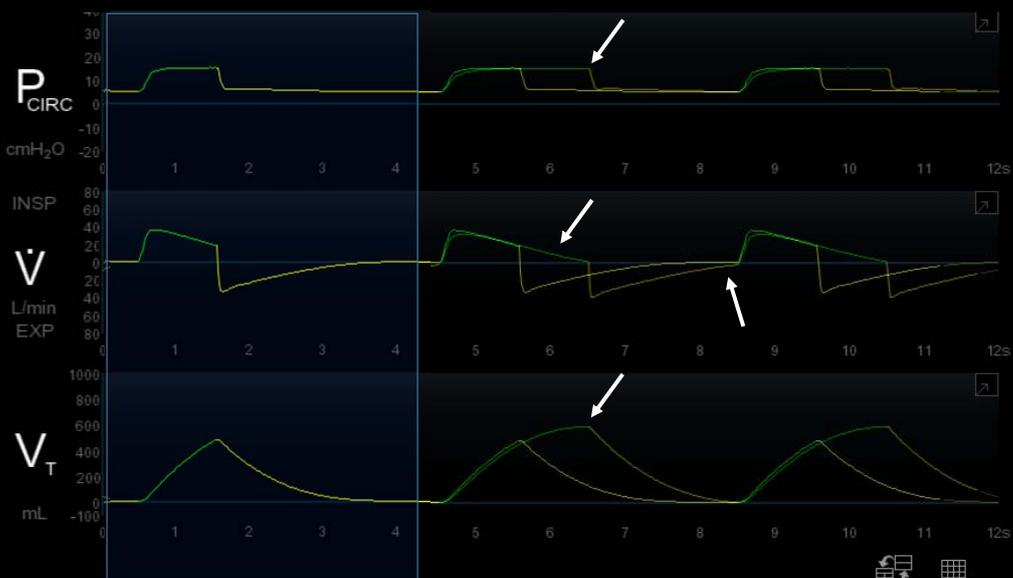


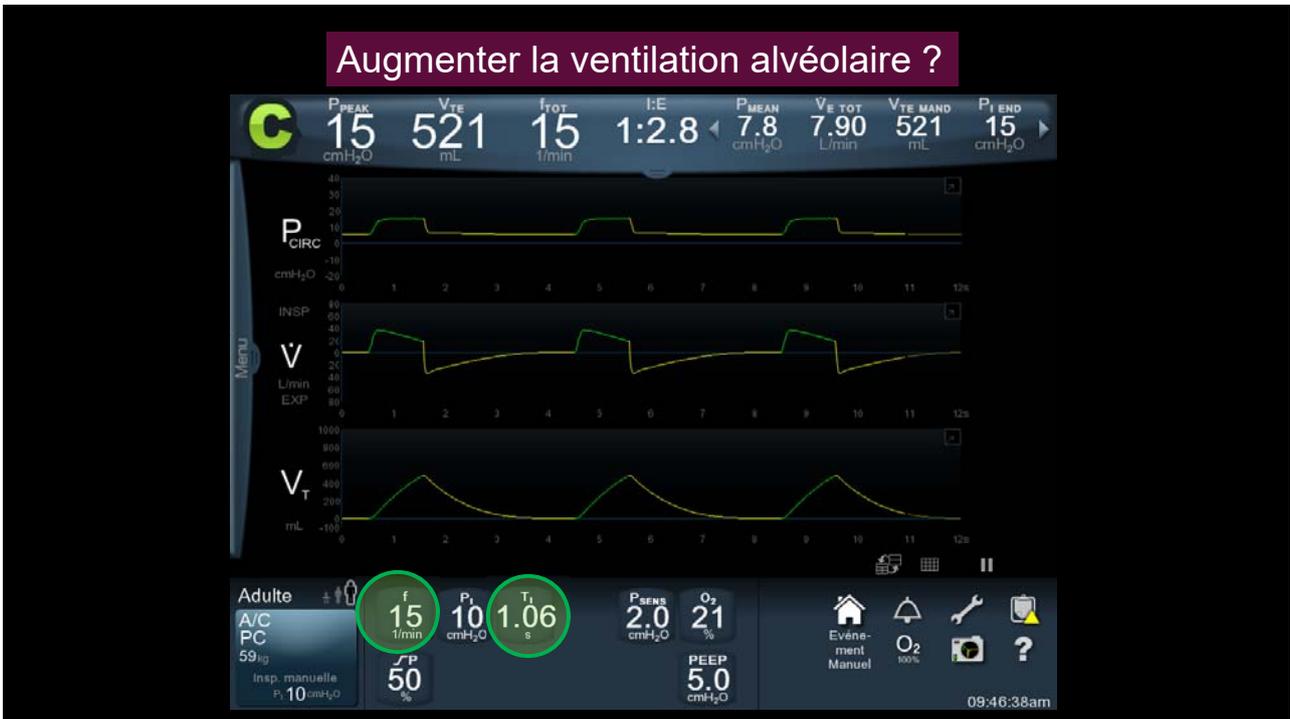
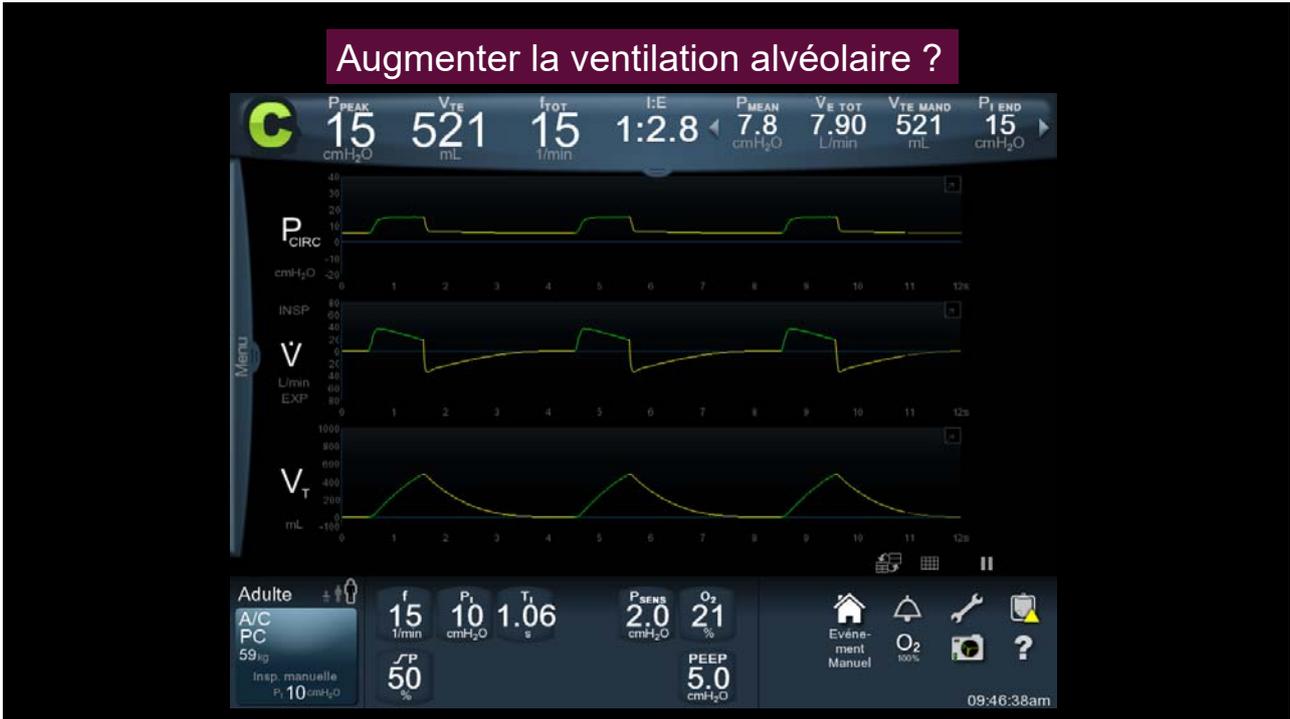


Optimisation de la courbe de débit/temps : réglage temps inspi



Optimisation de la courbe de débit/temps : réglage temps inspi





Augmenter la ventilation alvéolaire ?

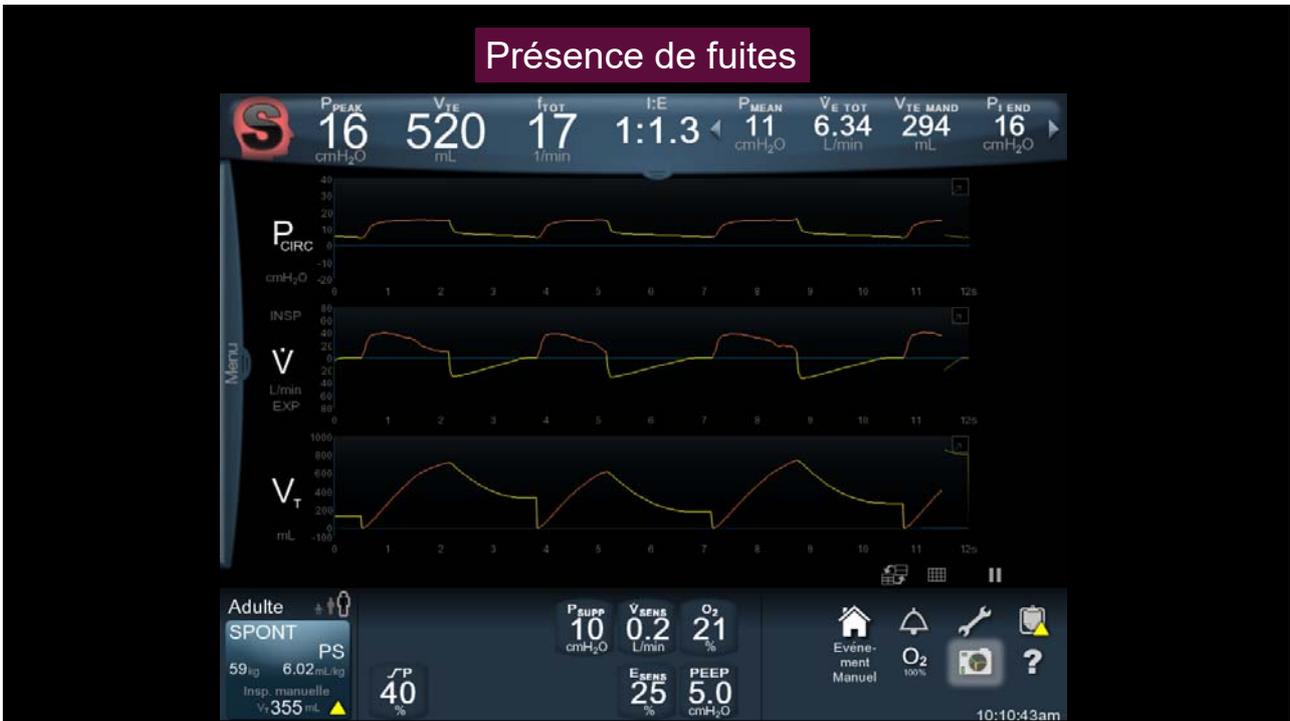


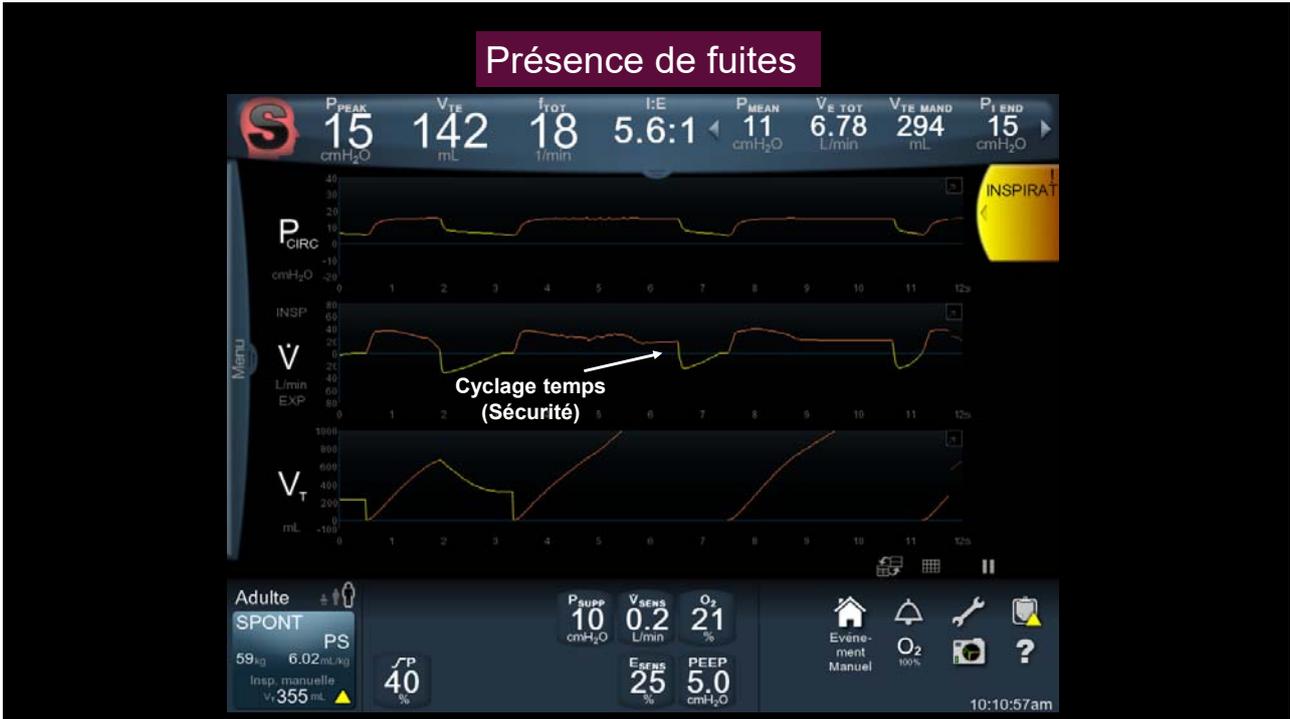
Augmenter la ventilation alvéolaire ?

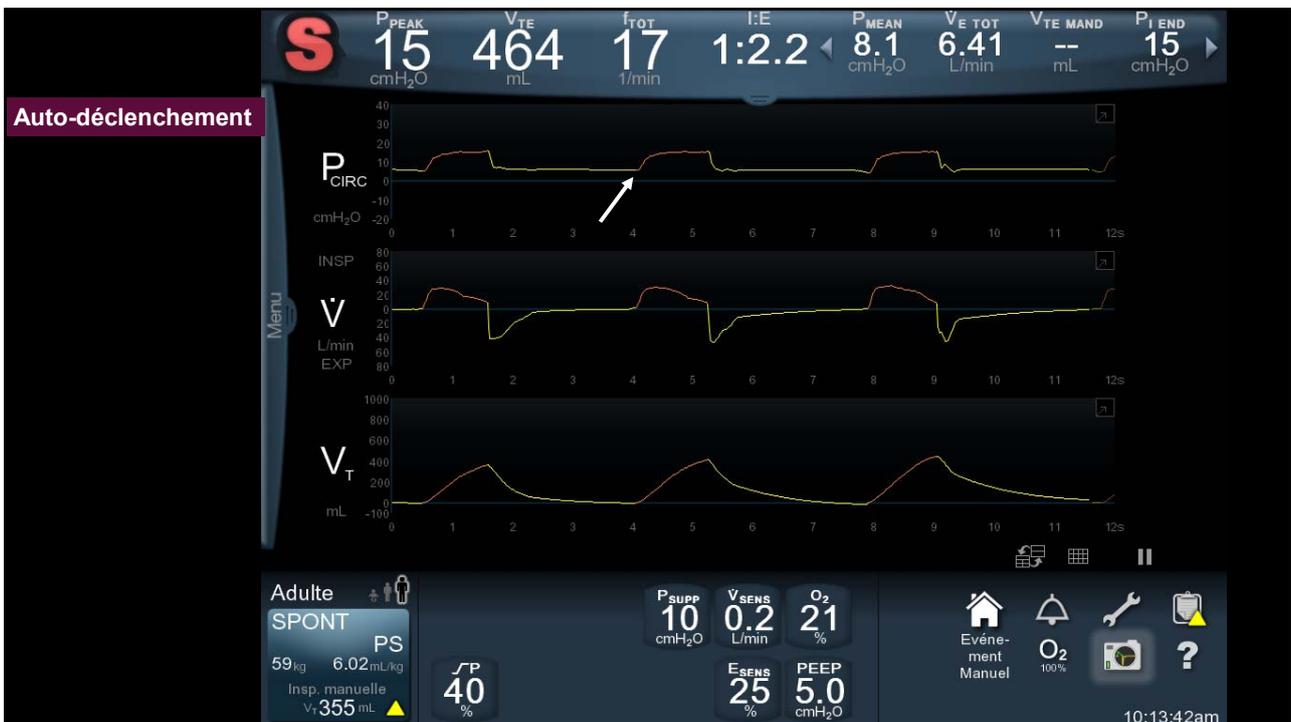


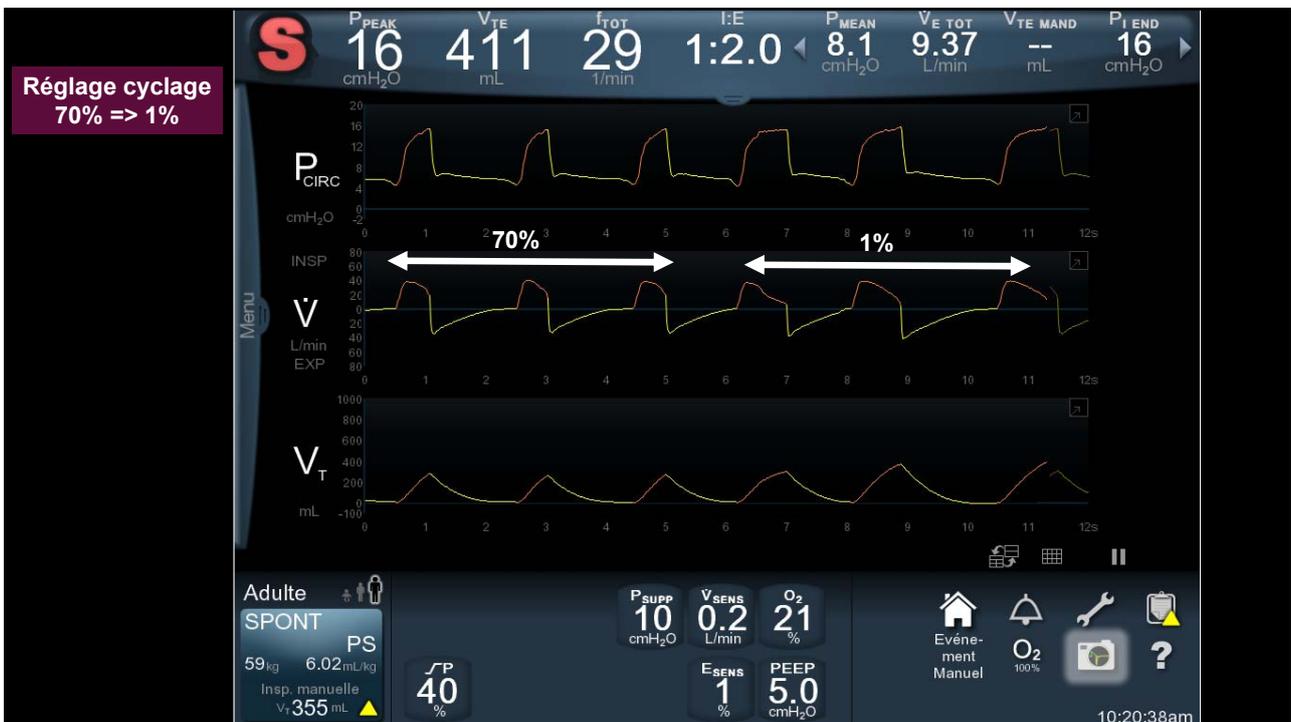
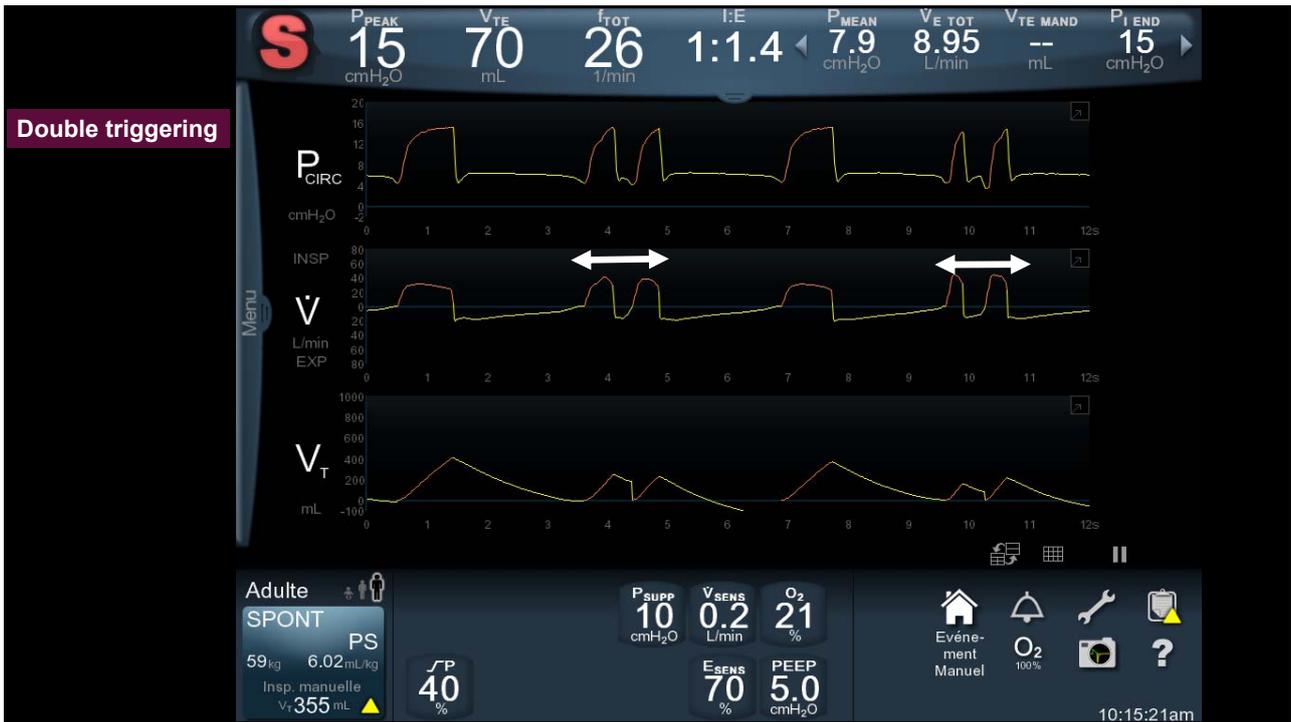
Ventilation spontanée en aide inspiratoire

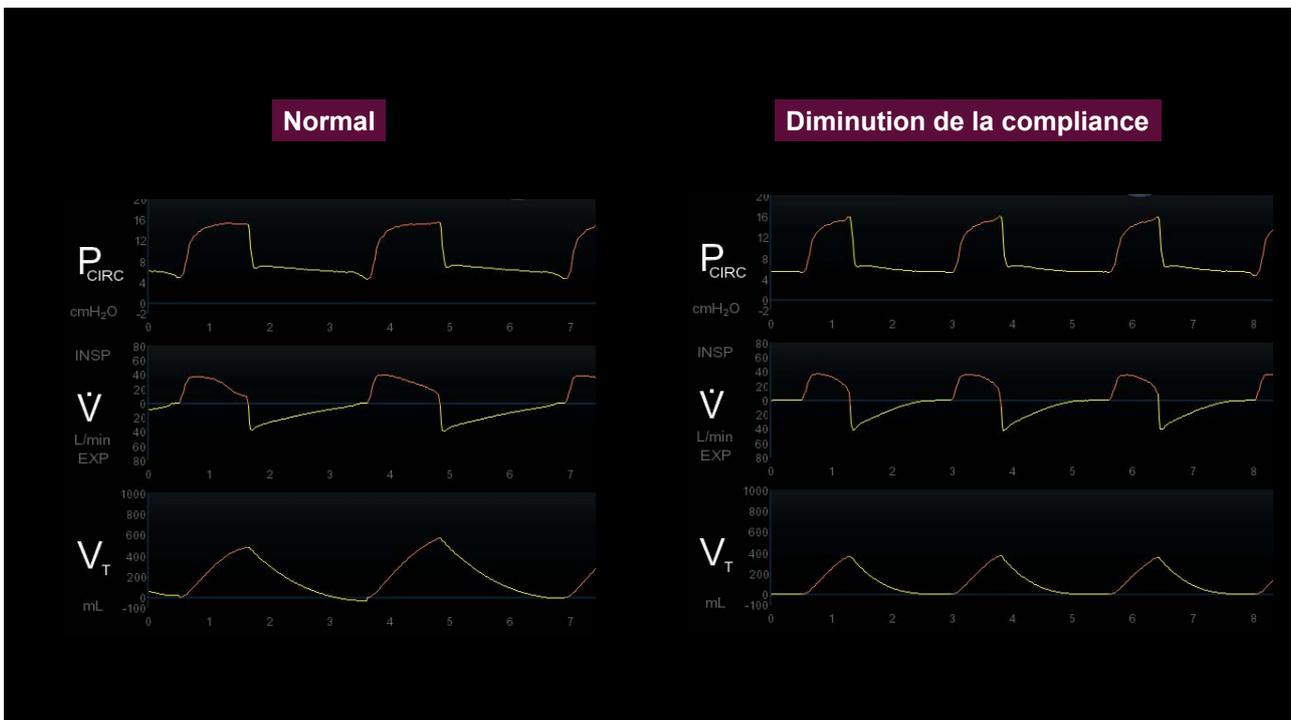
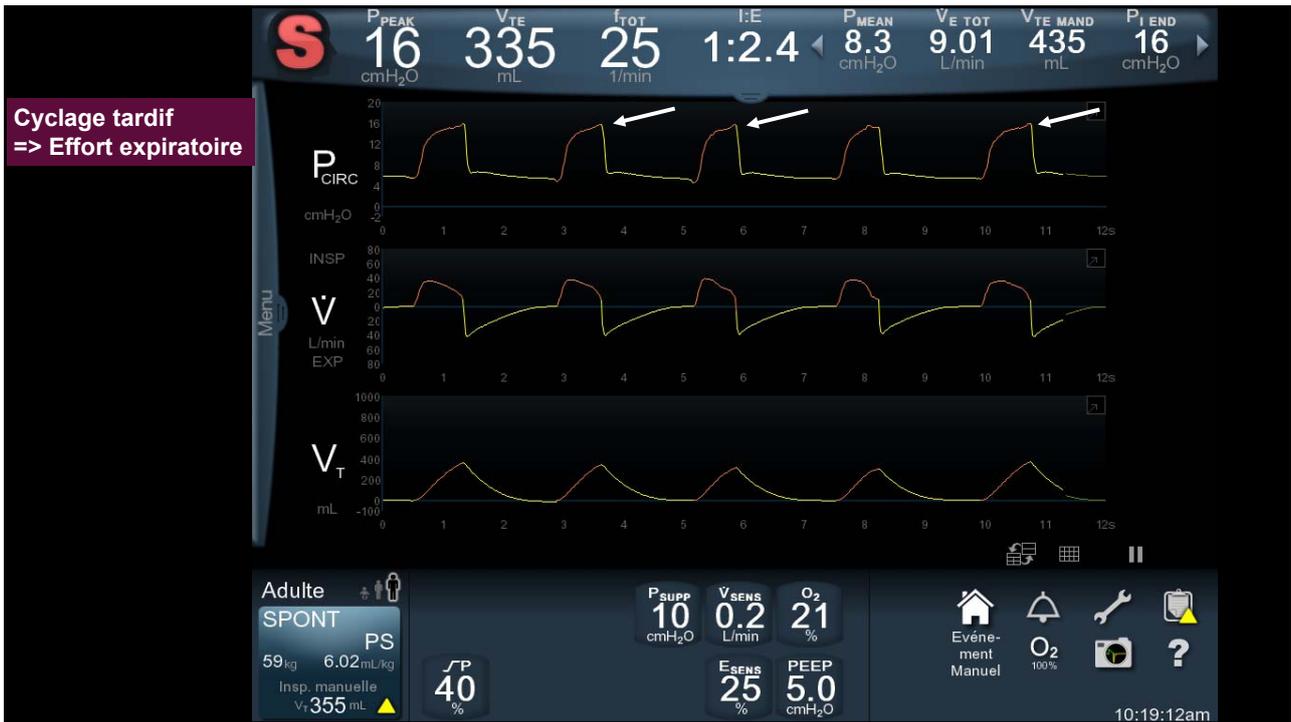












Cyclage 1%

Cyclage 70%

