Les courbes du ventilateur

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LIENS D’INTÉRÊTS

Aucun

PLAN

1. Les courbes en volume assisté contrôlé
2. Les principales pressions à connaître et monitorer
3. Cas cliniques 1 & 2
4. Les courbes en ventilation spontanée avec aide inspiratoire
5. Cas cliniques 3 & 4

Les courbes en volume assisté contrôlé

ECRAN DU VENTILATEUR

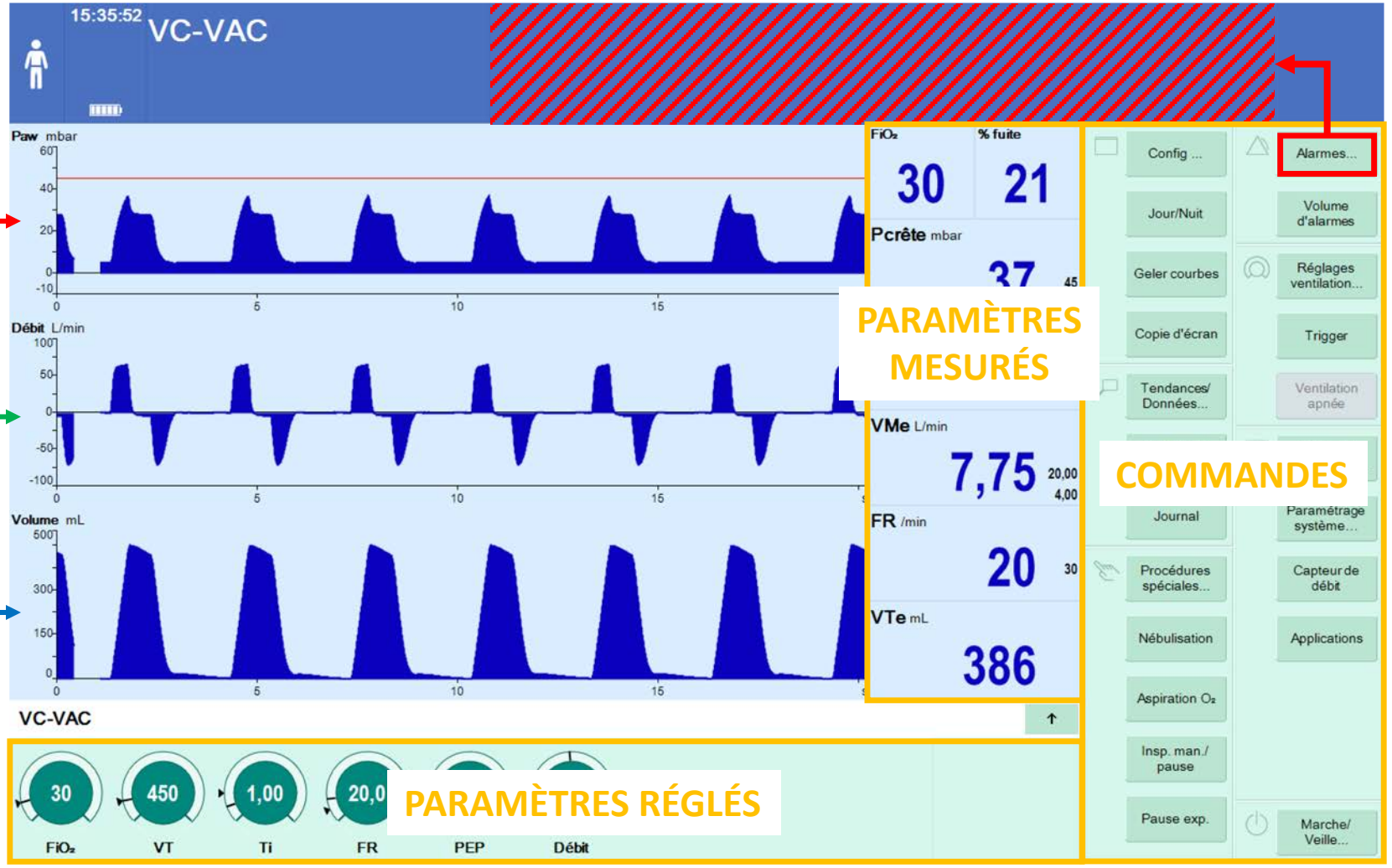
ECRAN DU VENTILATEUR

3 COURBES

Pression

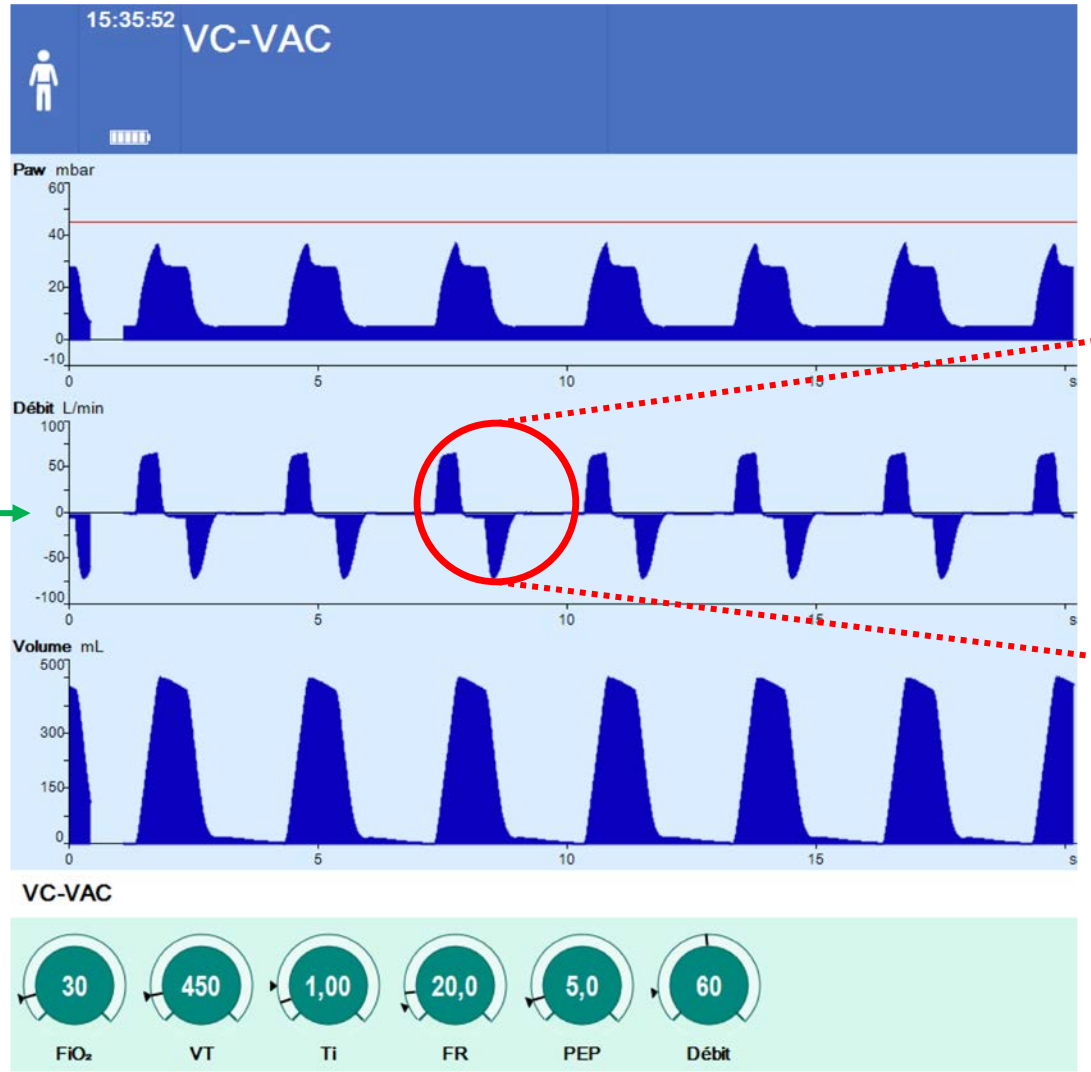
Débit

Volume

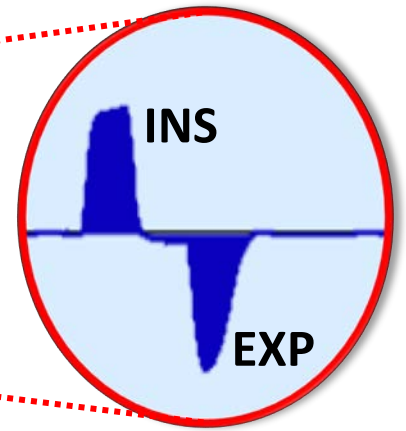


VENTILATION EN VOLUME (ASSISTÉ) CONTRÔLÉ

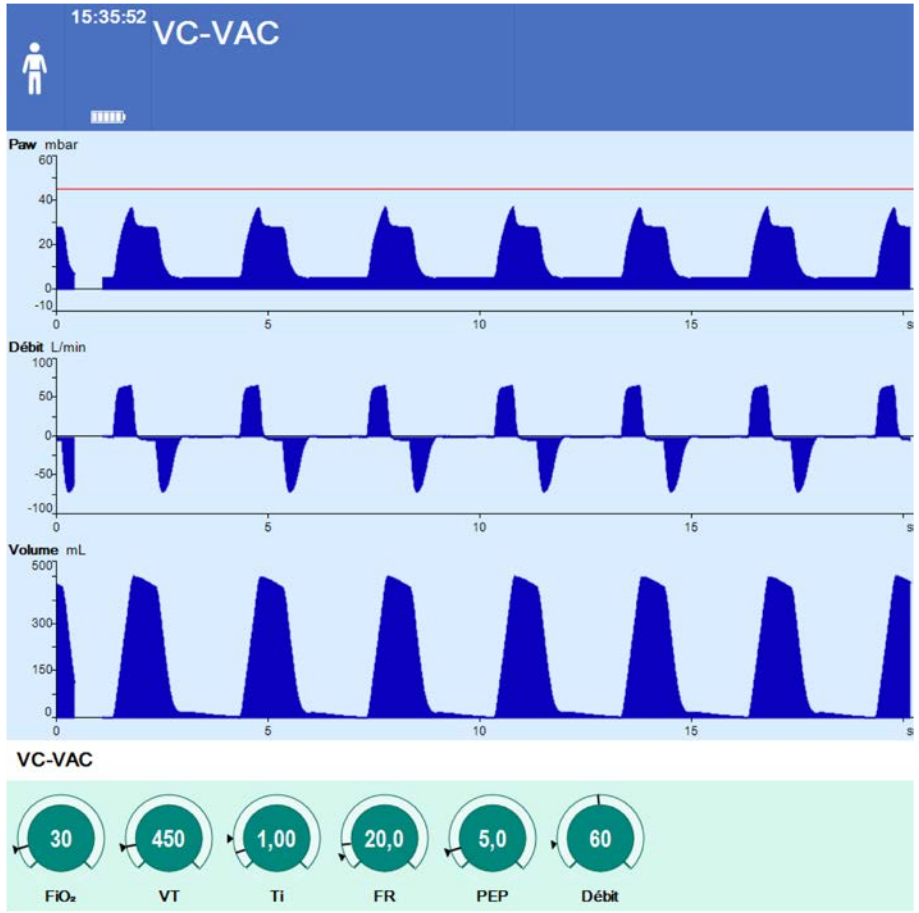
Débit

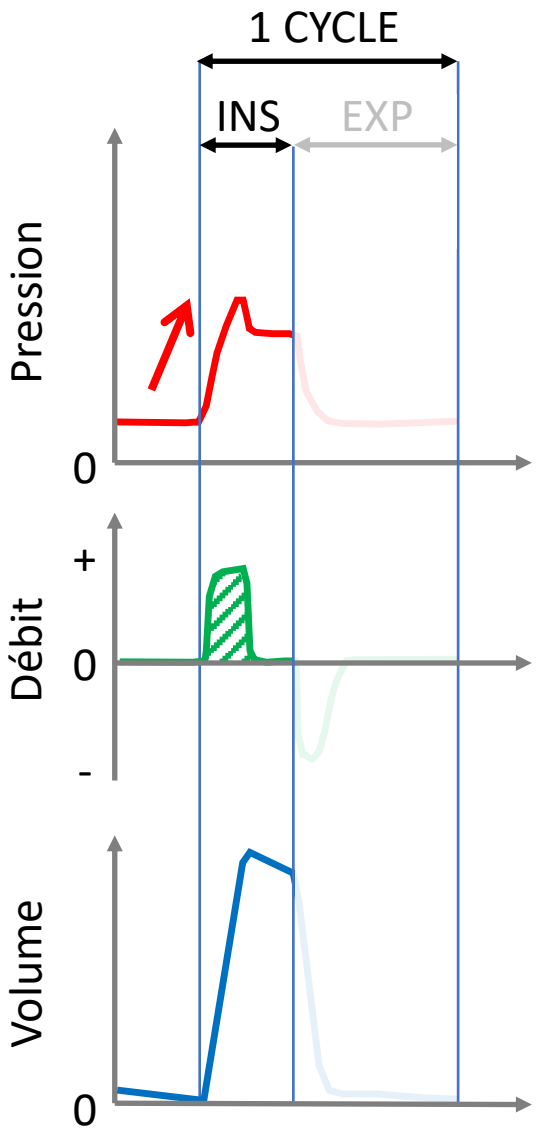


1 cycle respiratoire



VENTILATION EN VOLUME CONTRÔLÉ : phase inspiratoire





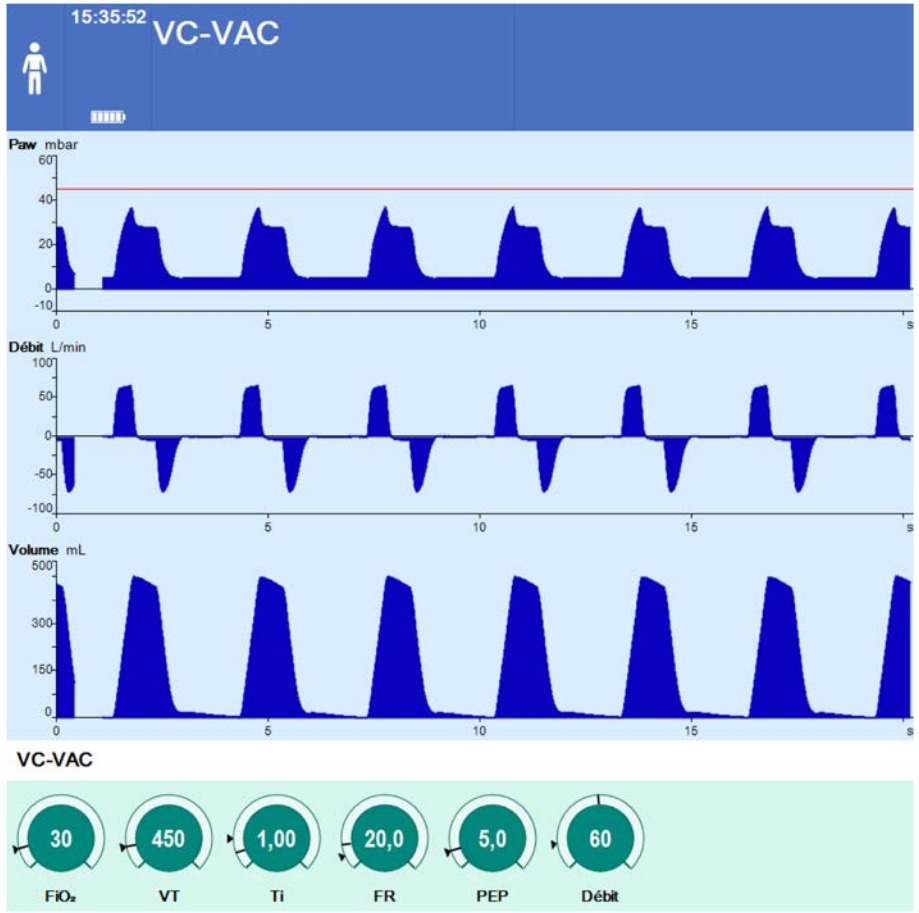
Surveillance +++

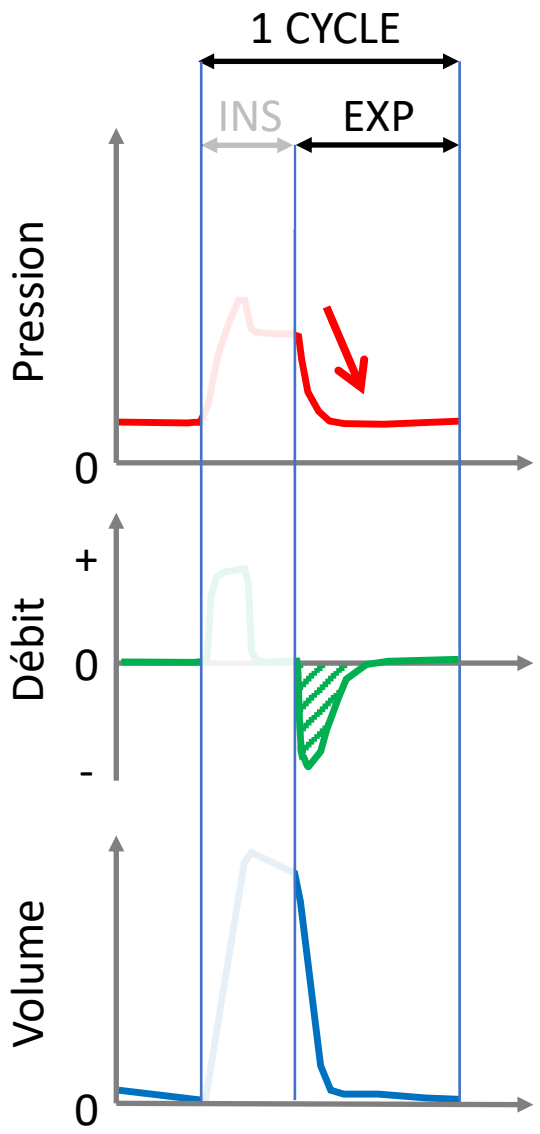
Augmentation Paw

Débit :
- Positif (vers le haut)
- Constant (carré)

Génération du Vt

VENTILATION EN VOLUME CONTRÔLÉ : phase expiratoire





Diminution Paw

Débit :
- Négatif (vers le bas)
- Passif

Vidange du Vt

VENTILATION EN VOLUME CONTRÔLÉ : équation du mouvement

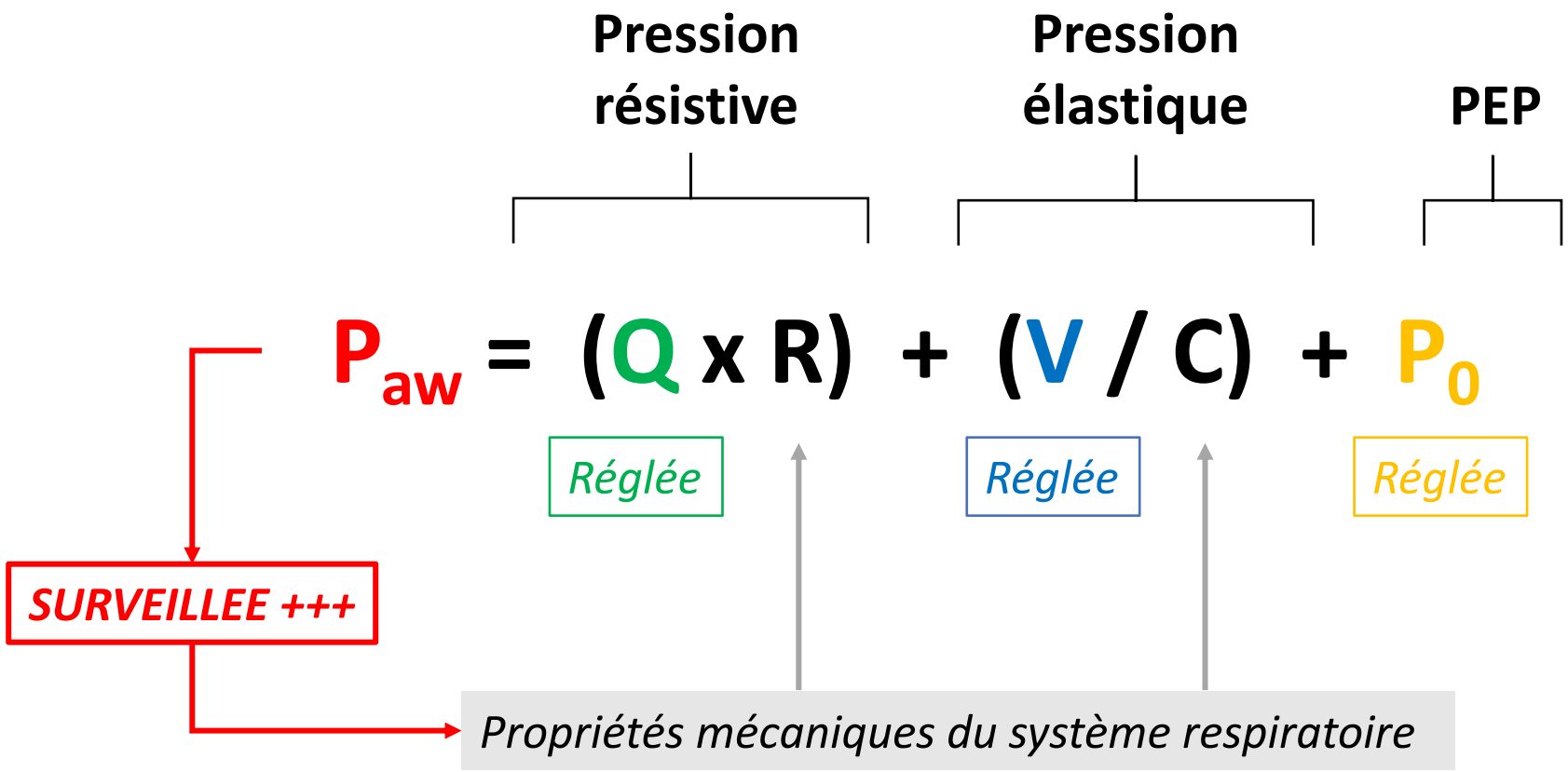
Equation du mouvement du système respiratoire

Pression résistive | Pression élastique | PEP

$$P_{aw} = (Q \times R_{rs}) + (V / C_{rs}) + P_0$$

VENTILATION EN VOLUME CONTRÔLÉ : équation du mouvement

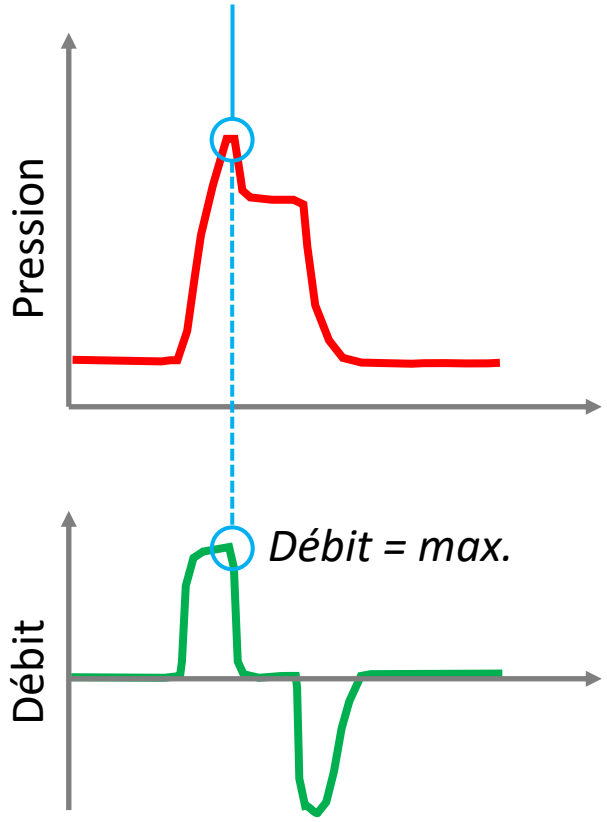
Equation du mouvement du système respiratoire



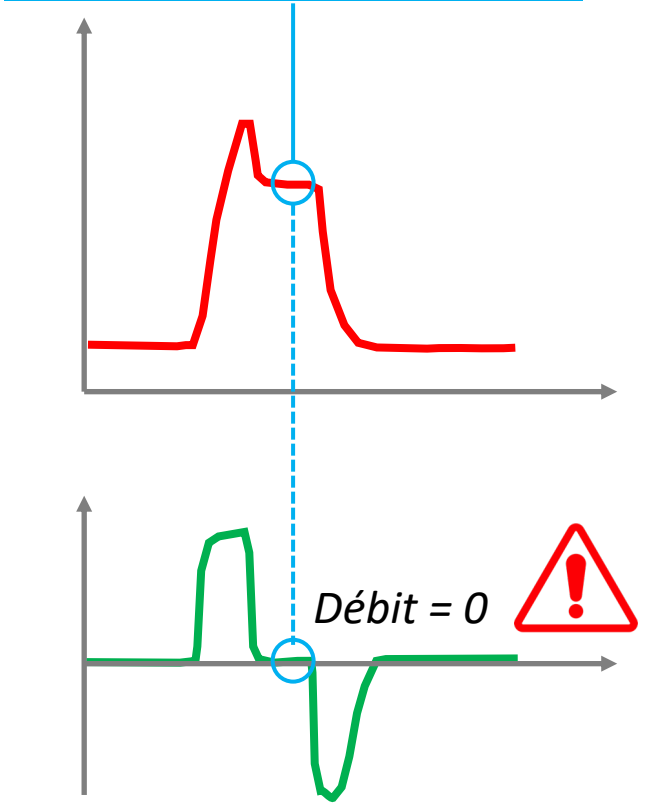
Les principales pressions à connaître et monitorer

PRESSION DANS LES VOIES AERIENNES

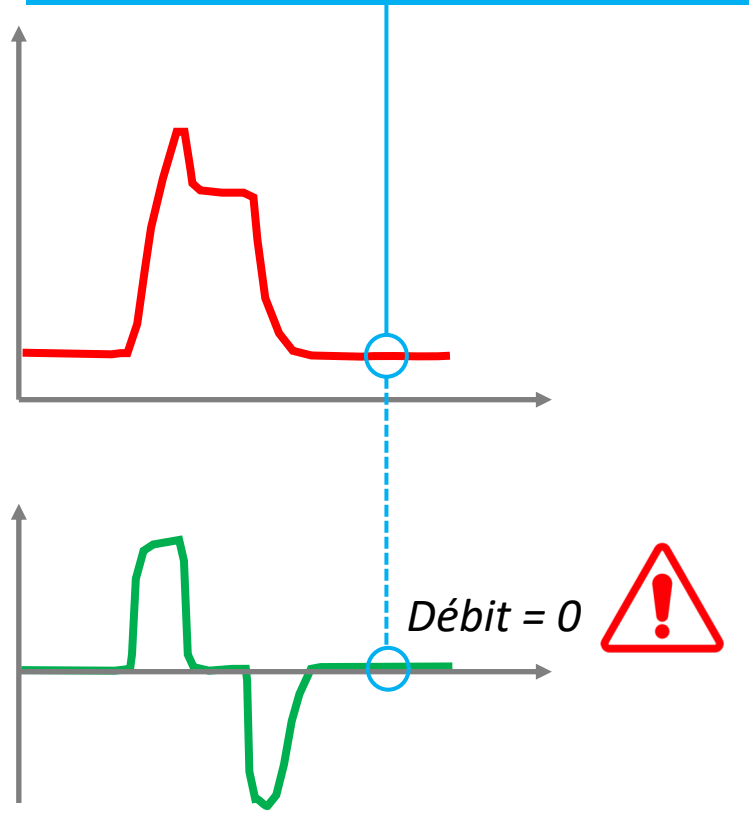
Pression de crête ($P_{crête}$)



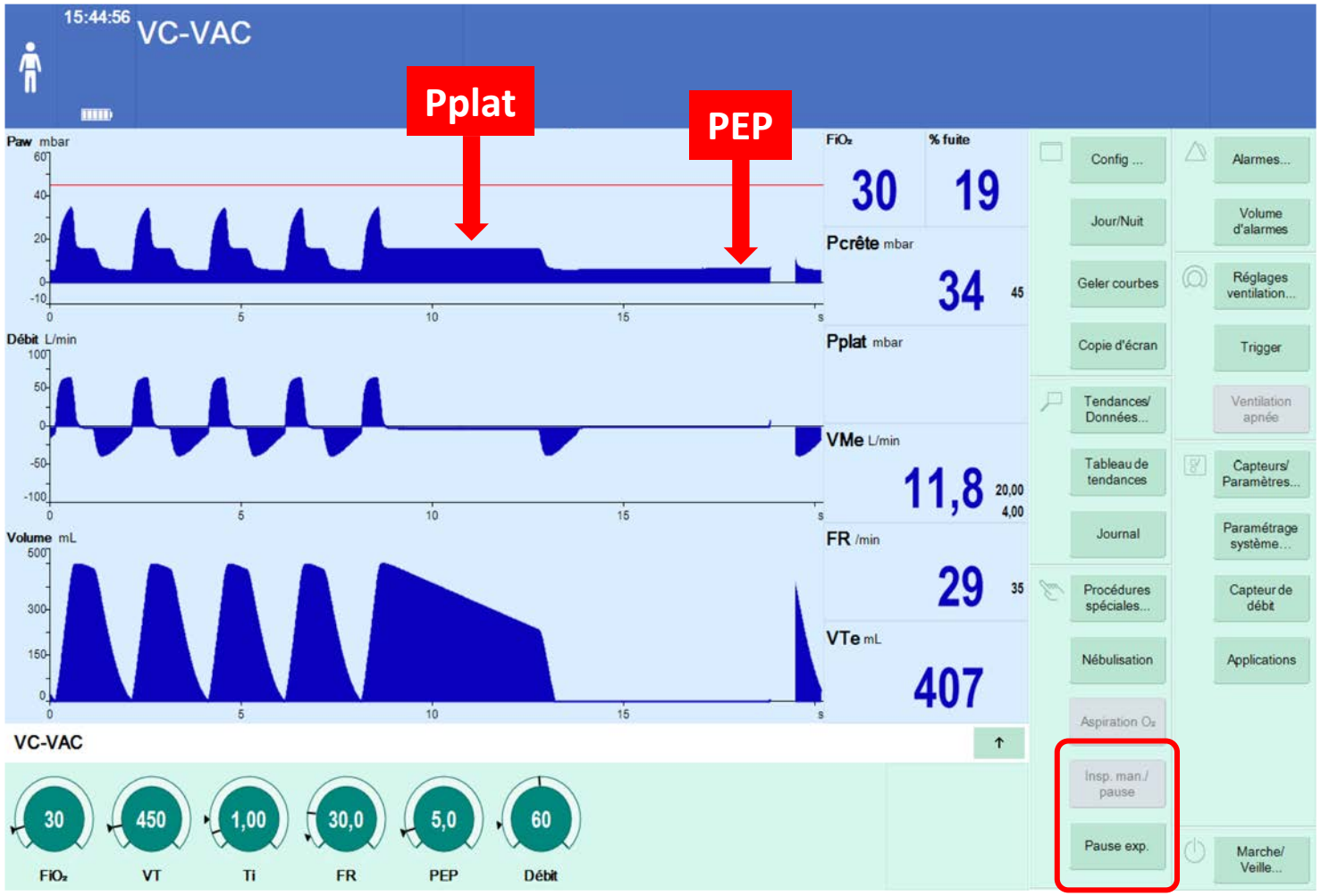
Pression de plateau (P_{plat})



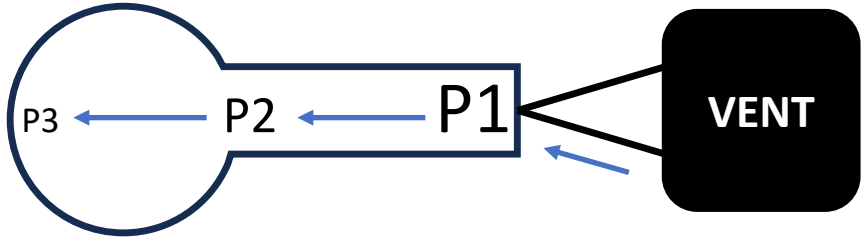
Pression expiratoire positive (PEP)



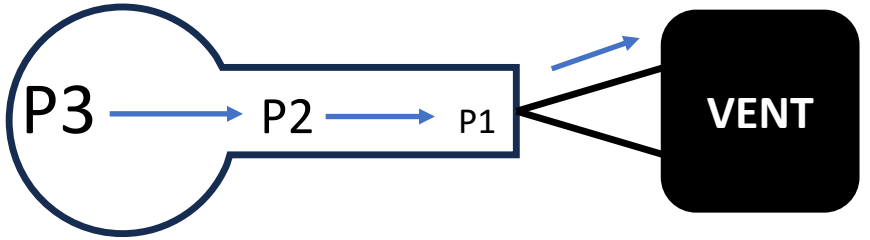
VENTILATION EN VOLUME CONTRÔLÉ



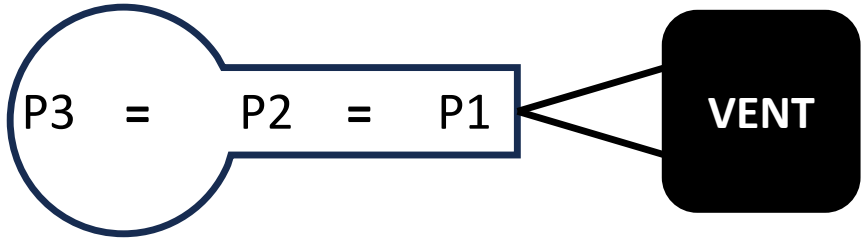
INSPIRATION



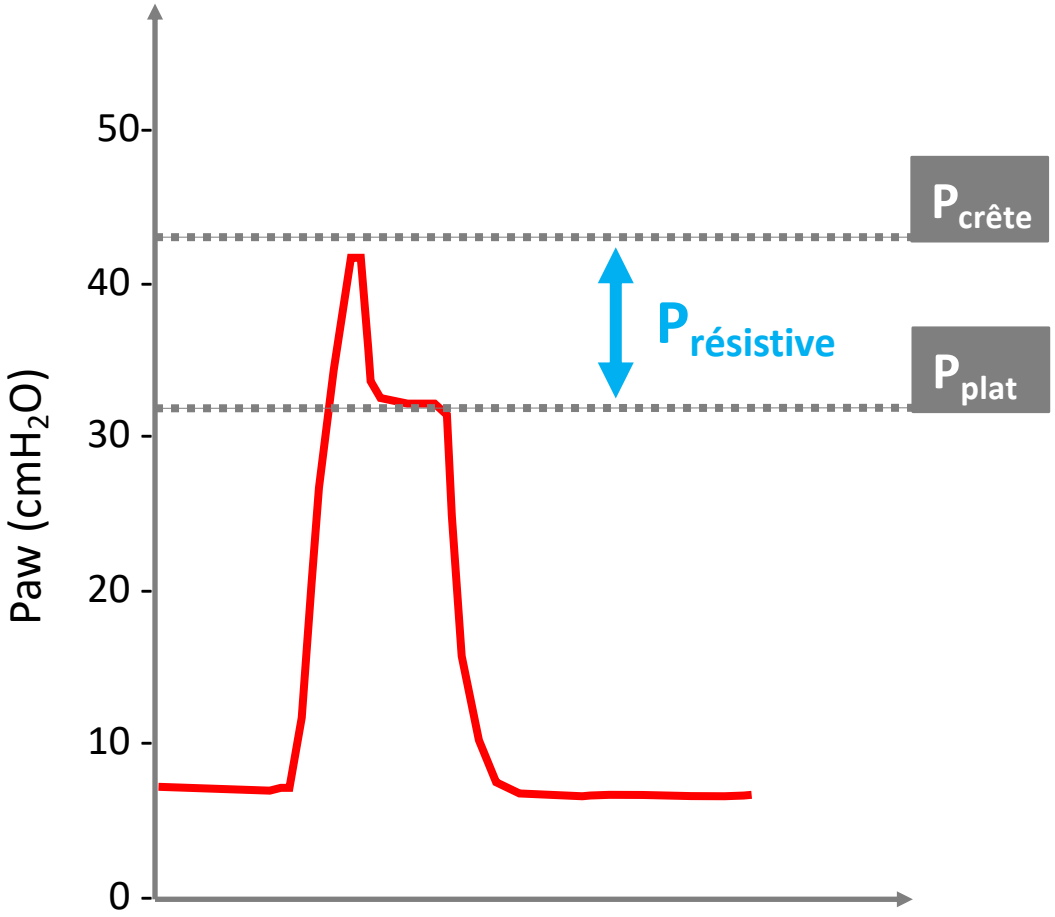
EXPIRATION



OCCLUSION

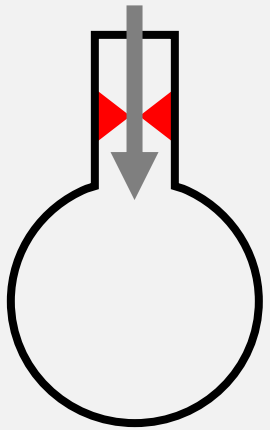


PRESSION RESISTIVE & RESISTANCE



$$P_{résistive} = Q \times \mathbf{R}$$

$$\mathbf{R} = \frac{P_{résistive}}{Q} = \frac{(P_{crête} - P_{plat})}{Q}$$

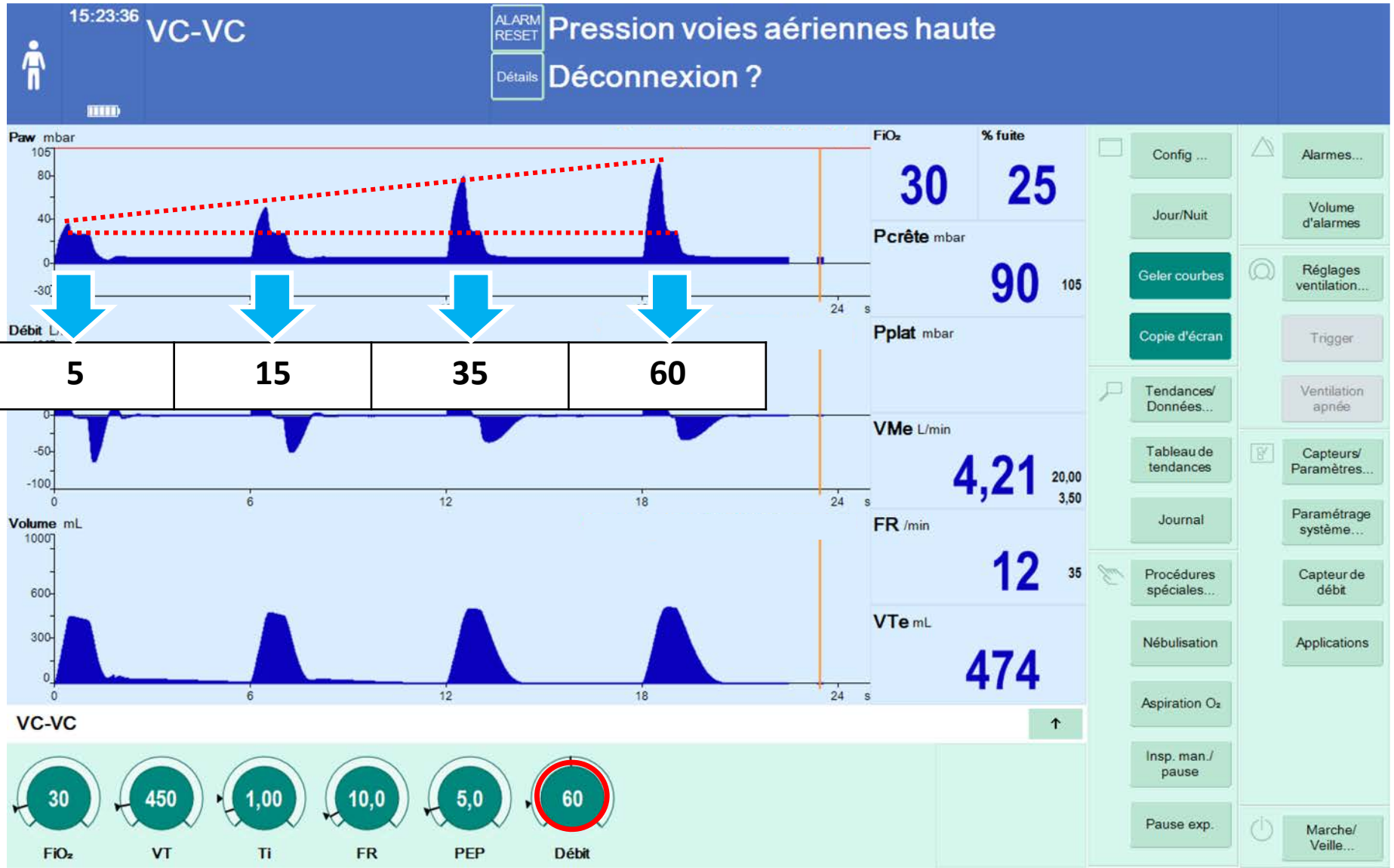


R = 5-10 $cmH_2O/L/S$

Augmentée si:

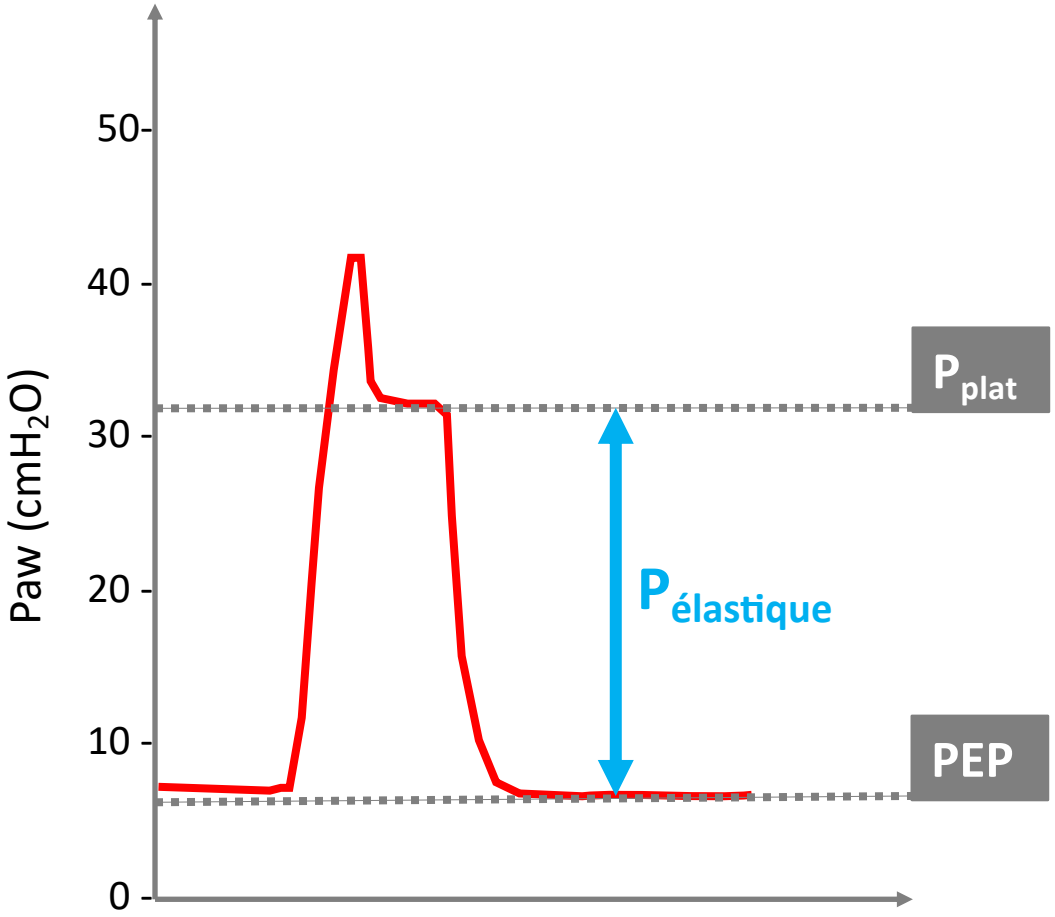
- Morsure de la sonde
- Bouchon muqueux
- Bronchospasme

PRESSION RESISTIVE & RESISTANCE



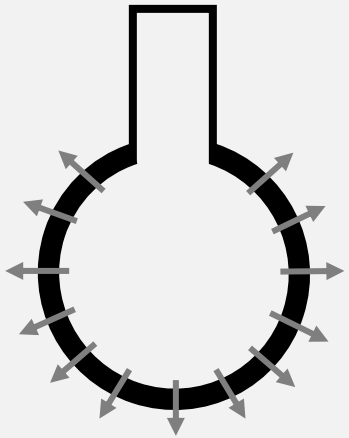
$P_{résistive}$ (cmH_2O)	5	15	35	60

PRESSION ELASTIQUE & COMPLIANCE



$$P_{élastique} = V \div \mathbf{C}$$

$$\mathbf{C} = \frac{V}{P_{élastique}} = \frac{V}{(P_{plat} - PEP)}$$



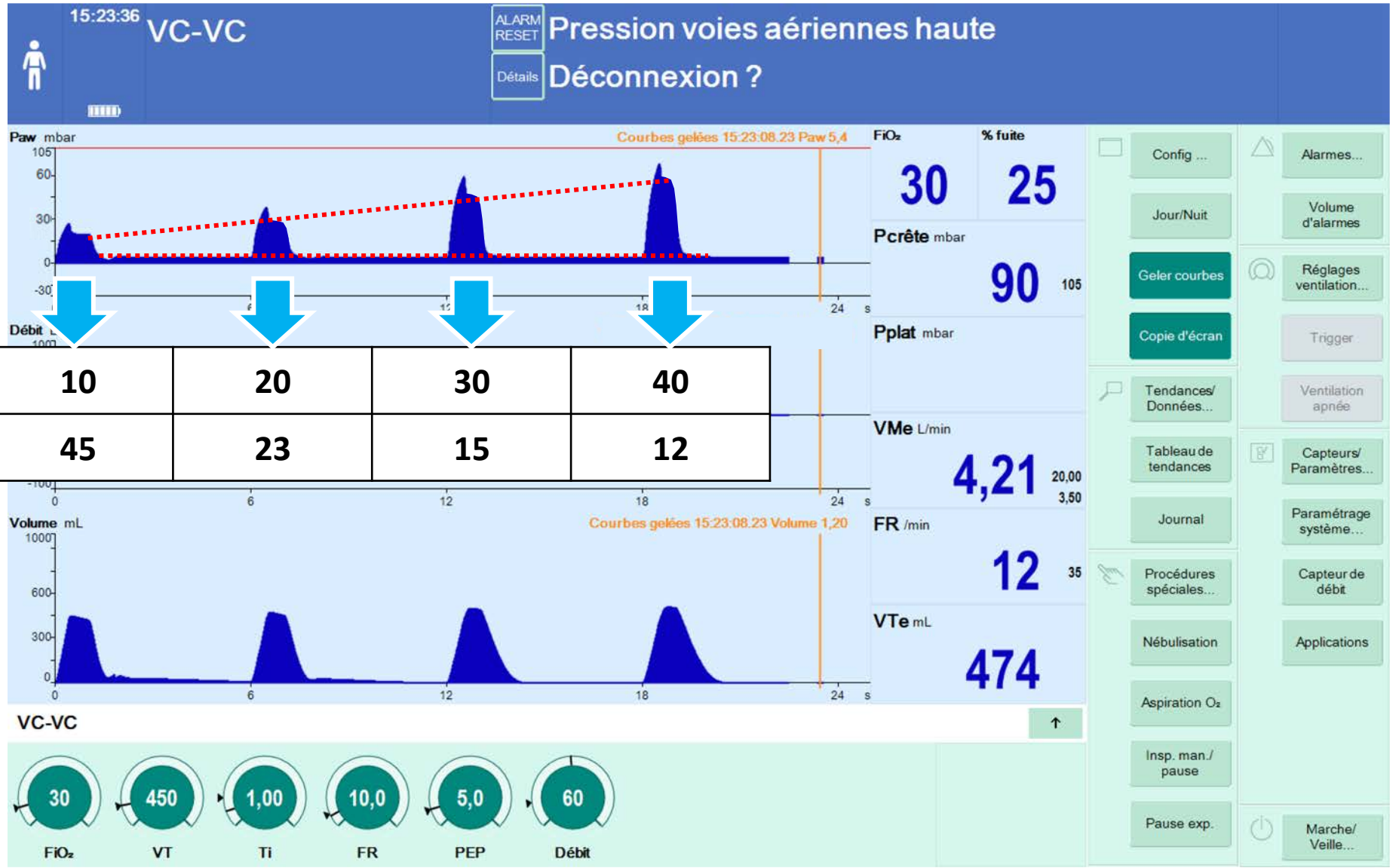
C = 50-80 mL/cmH$_2$O

Diminuée si:

- Pneumothorax
- Atélectasie
- SDRA

PRESSION ELASTIQUE & COMPLIANCE

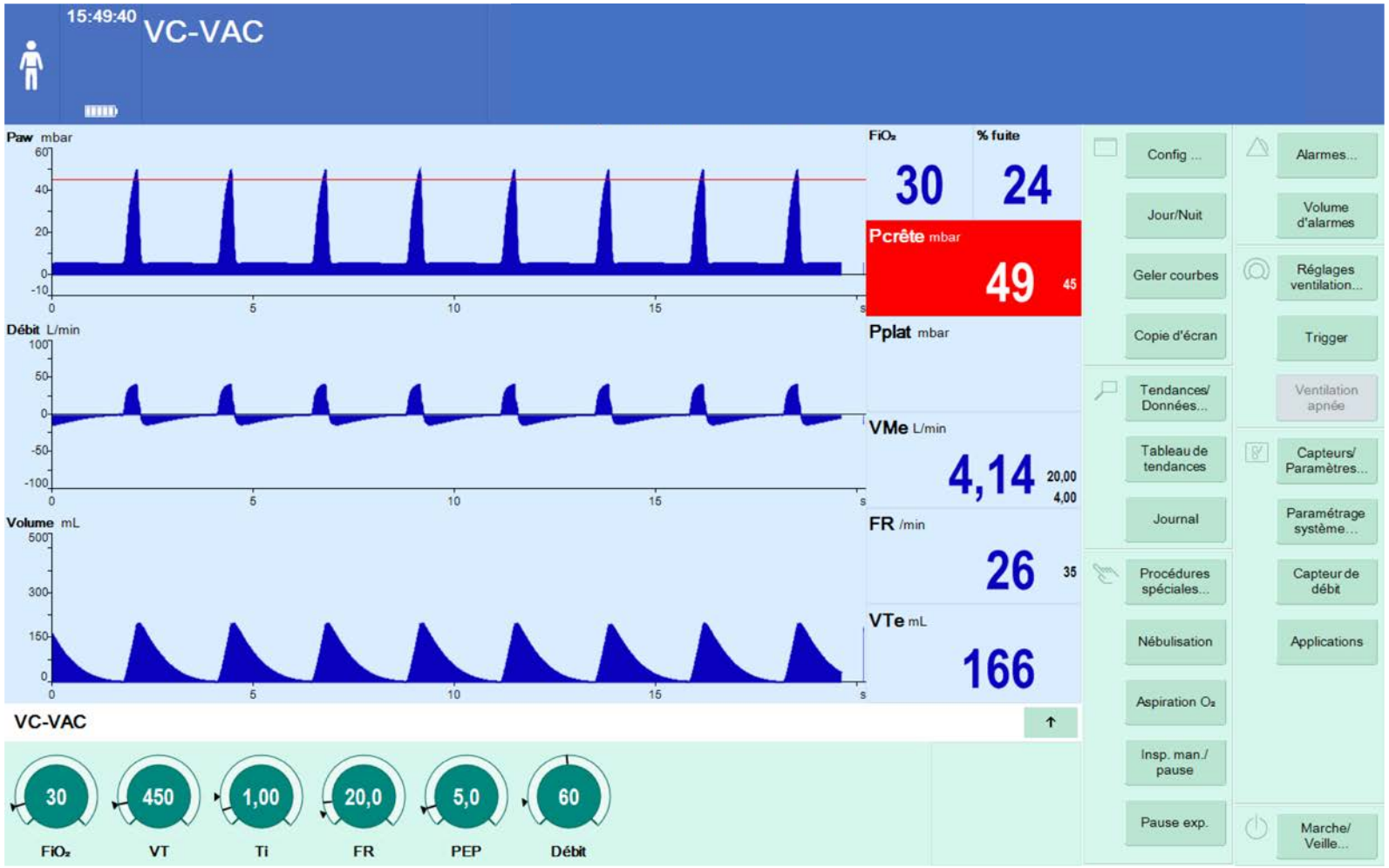
$P_{élastique}$ (cmH_2O)	10	20	30	40
Compliance (mL/cmH_2O)	45	23	15	12



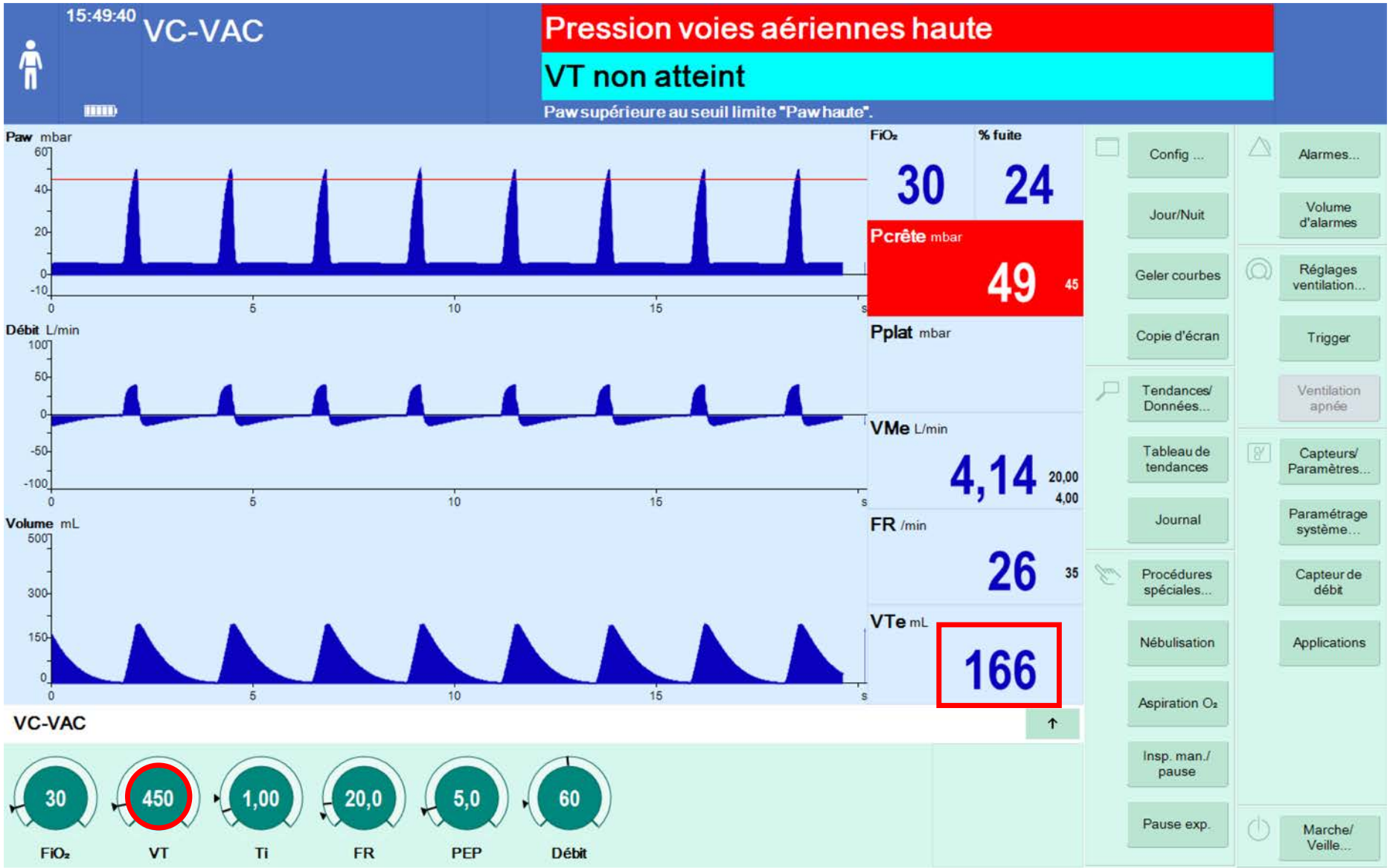
Cas clinique 1 & 2

CAS CLINIQUE #2

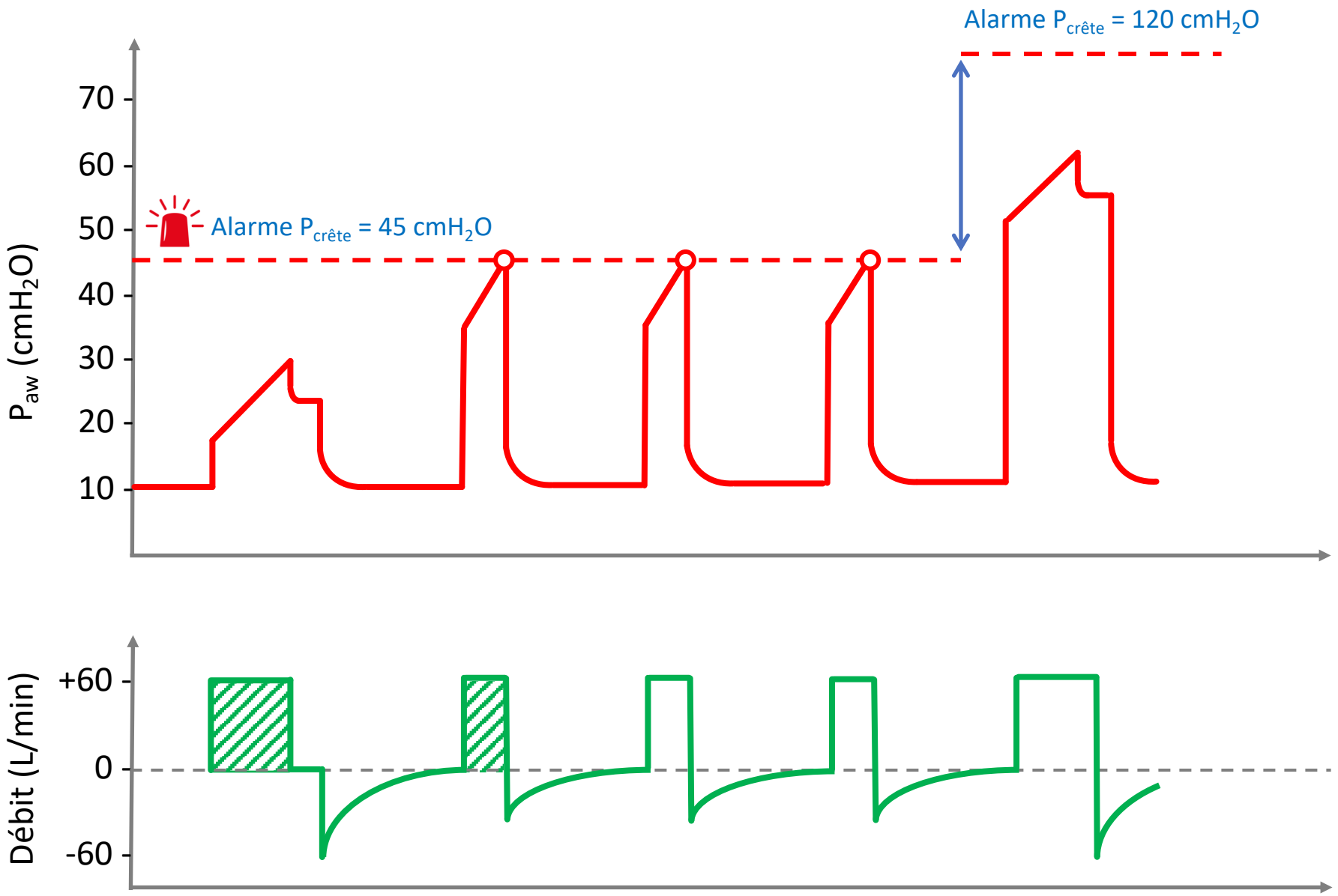
Coma calme (IMV au oxazepam), pneumopathie d'inhalation, RASS -4



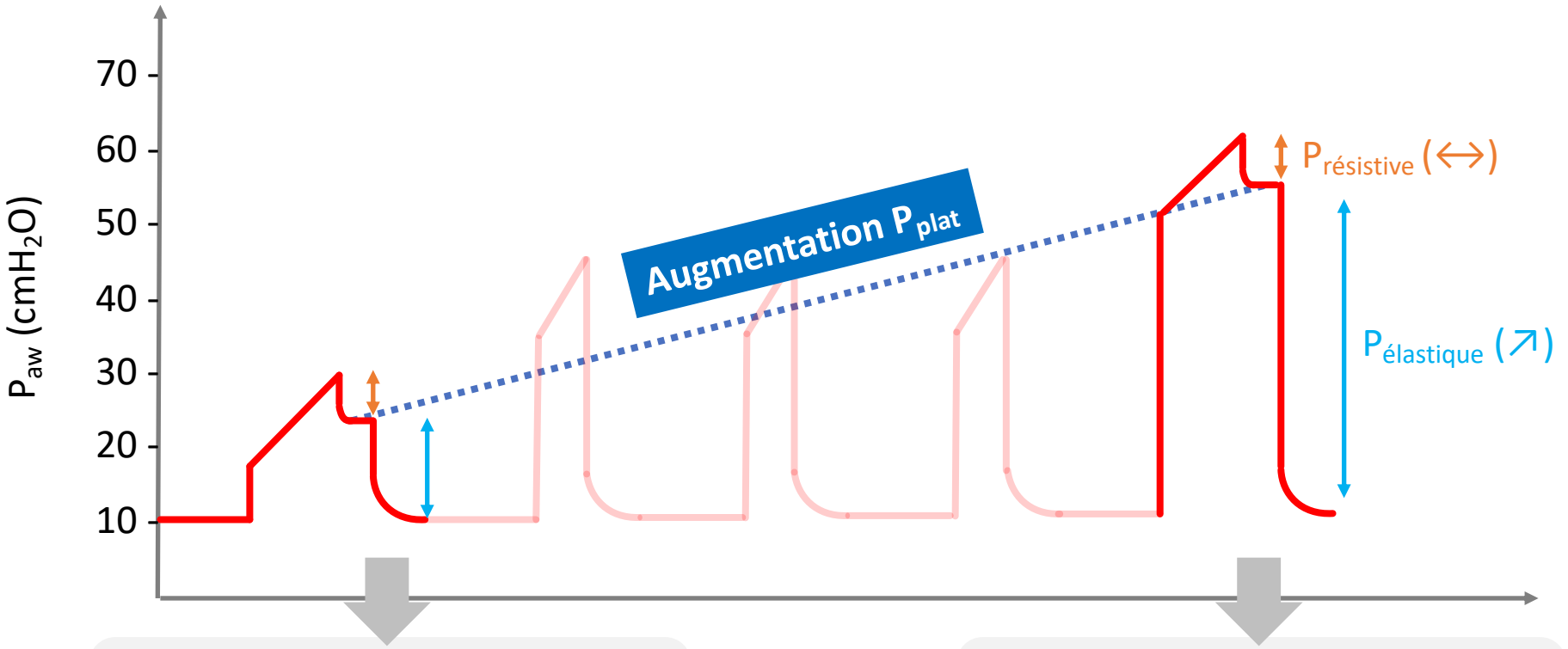
CAS CLINIQUE #2



CAS CLINIQUE #2



CAS CLINIQUE #2



Diminution compliance :

Atélectasie

Pneumothorax

Intubation sélective

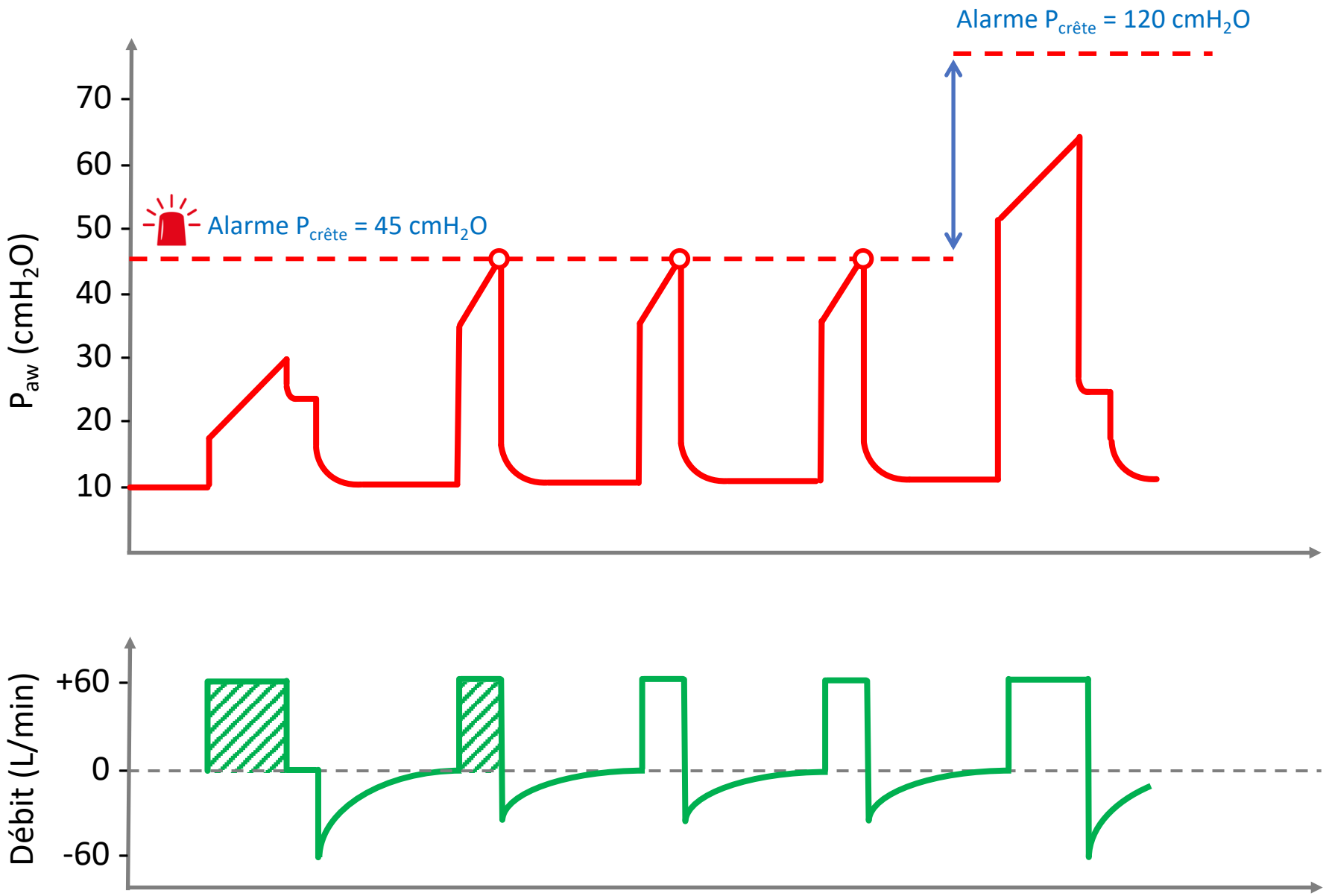
$P_{résistive} = P_{crête} - P_{plat} = 5$

$P_{élastique} = P_{plat} - PEP = 15$

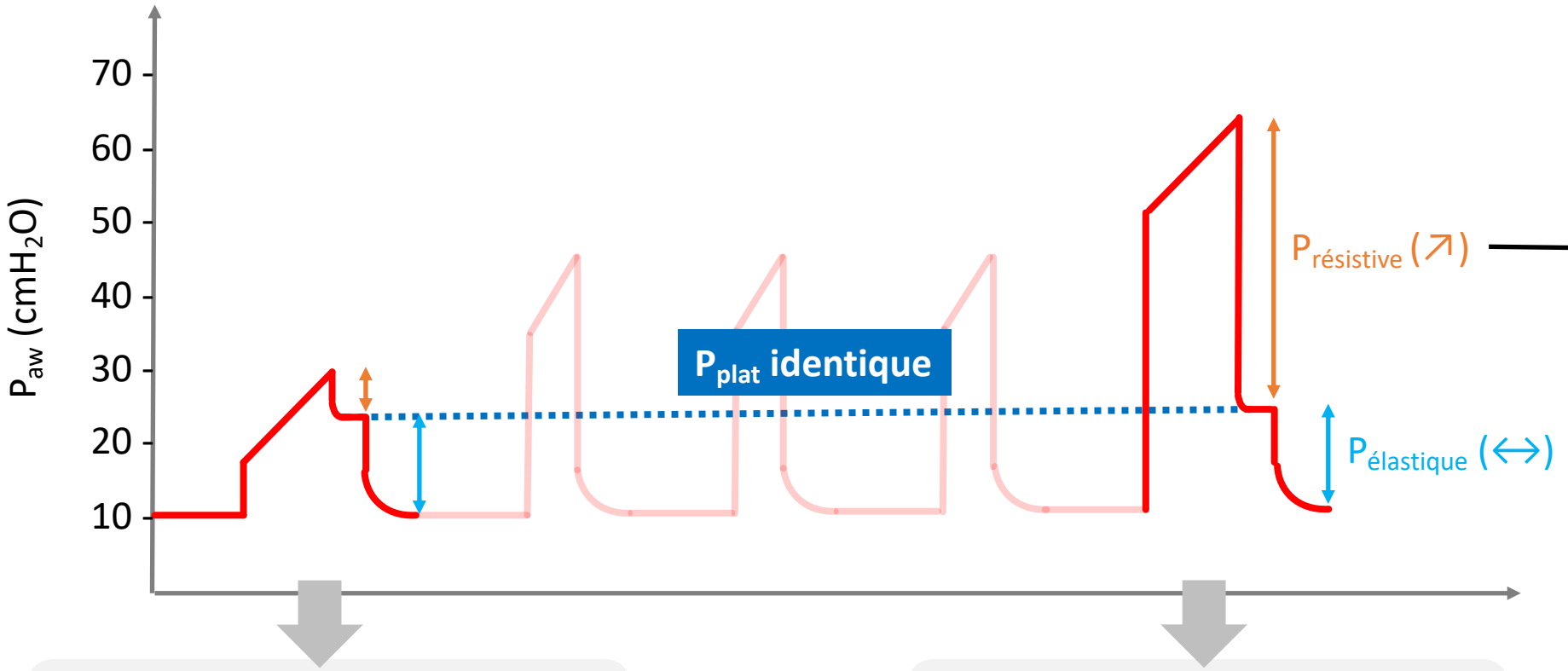
$P_{résistive} = P_{crête} - P_{plat} = 5$

$P_{élastique} = P_{plat} - PEP =$ **45**

CAS CLINIQUE #2



CAS CLINIQUE #2



Augmentation résistance :

Bronchospasme

Obstruction sonde

Morsure sonde

$P_{résistive} = P_{crête} - P_{plat} = 5$

$P_{élastique} = P_{plat} - PEP = 15$

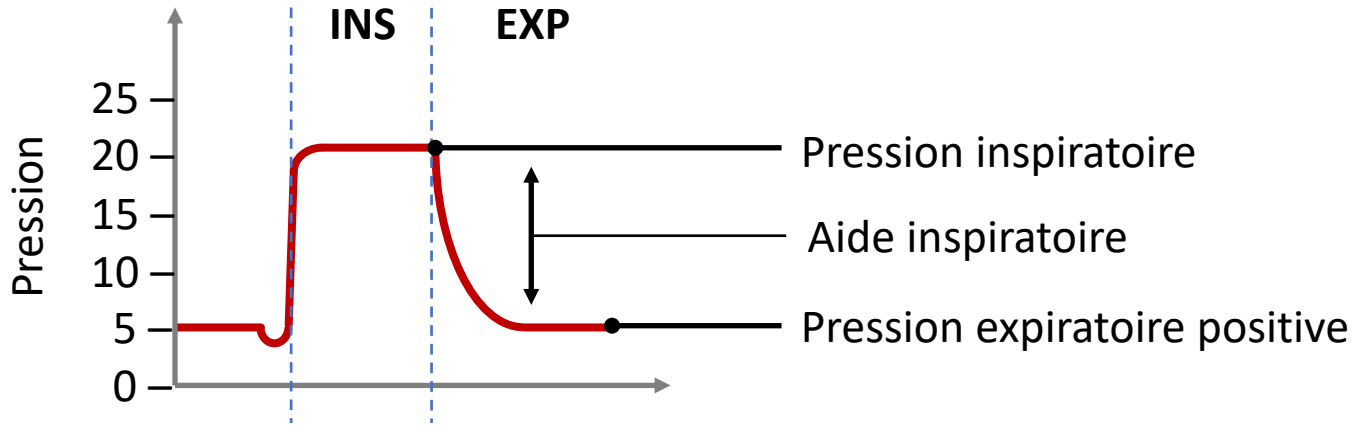
$P_{résistive} = P_{crête} - P_{plat} =$ **35**

$P_{élastique} = P_{plat} - PEP = 15$

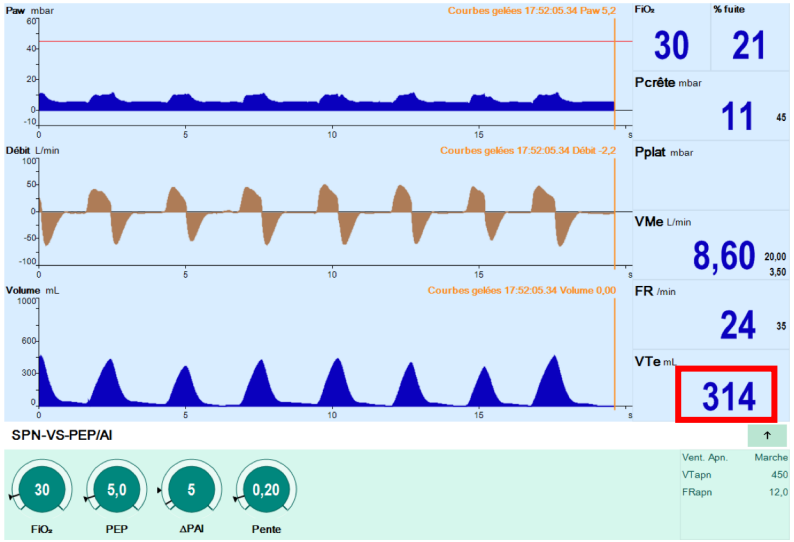
Ventilation spontanée avec aide inspiratoire

VENTILATION SPONTANEE AVEC AIDE INSPIRATOIRE

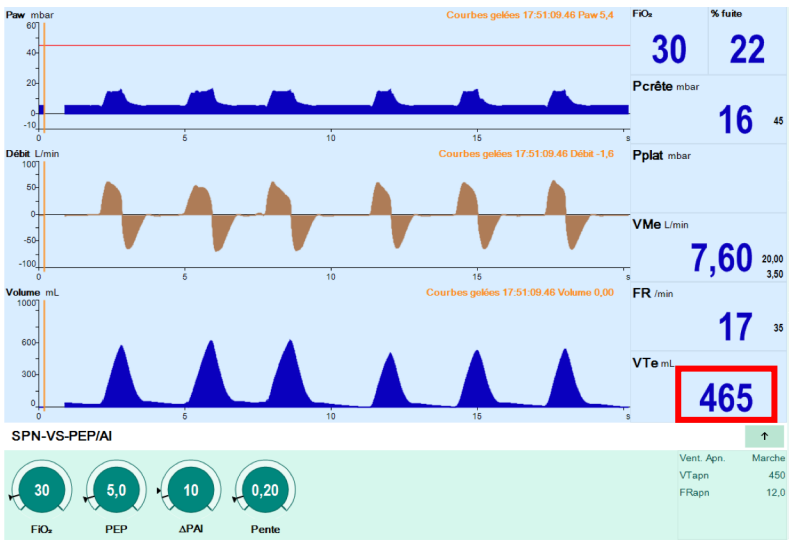
REGLAGE DE L'AIDE INSPIRATOIRE



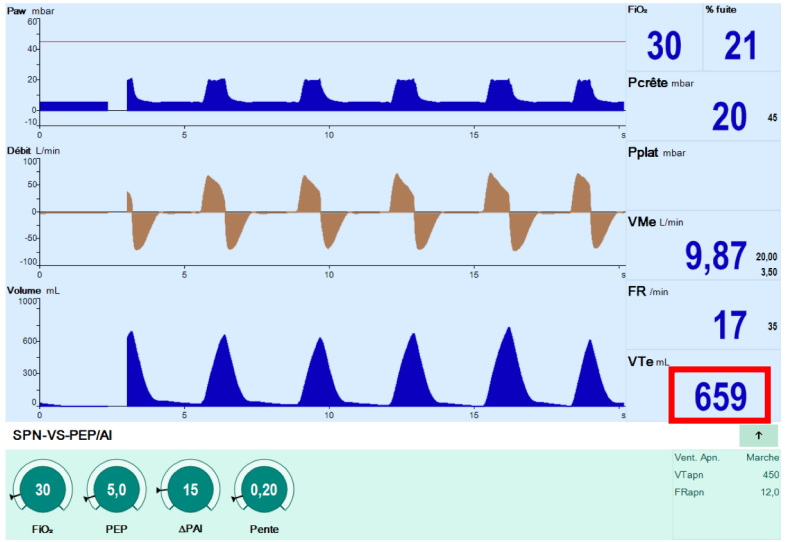
Ai = 5 cmH_2O



Ai = 10 cmH_2O



Ai = 15 cmH_2O

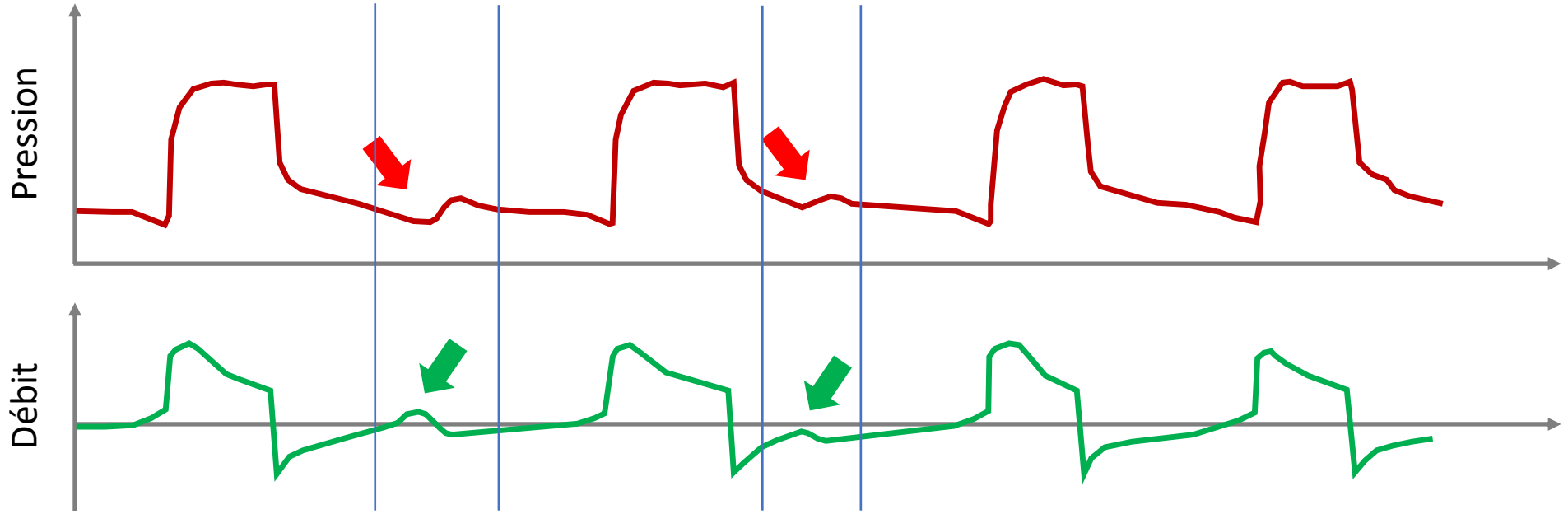


Cas cliniques 3 & 4

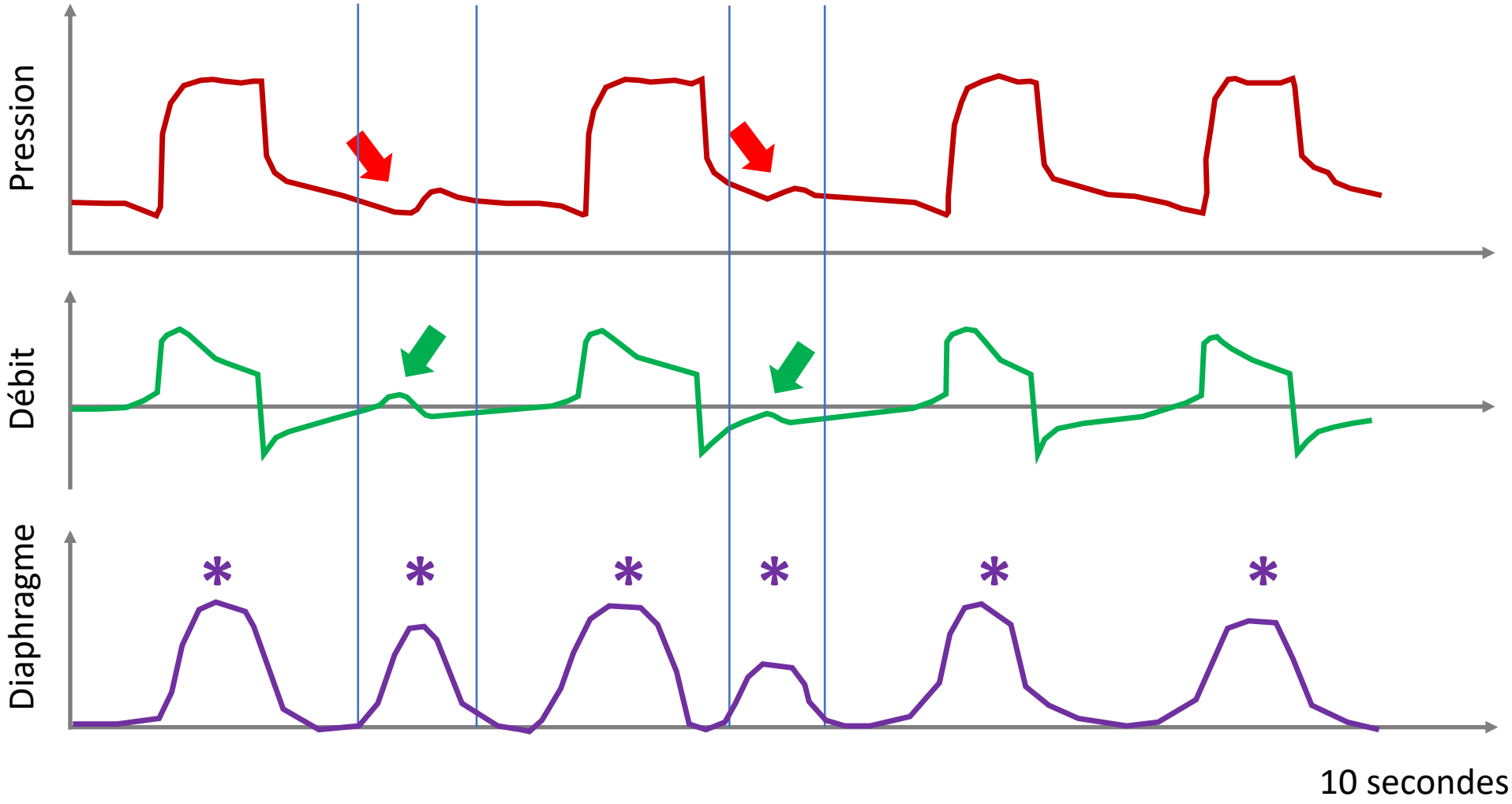
CAS CLINIQUE #3

Pneumopathie aiguë communautaire, RASS -1

VSAI 16 + 5 cmH_2O → FR 18/min et Vt 580 mL



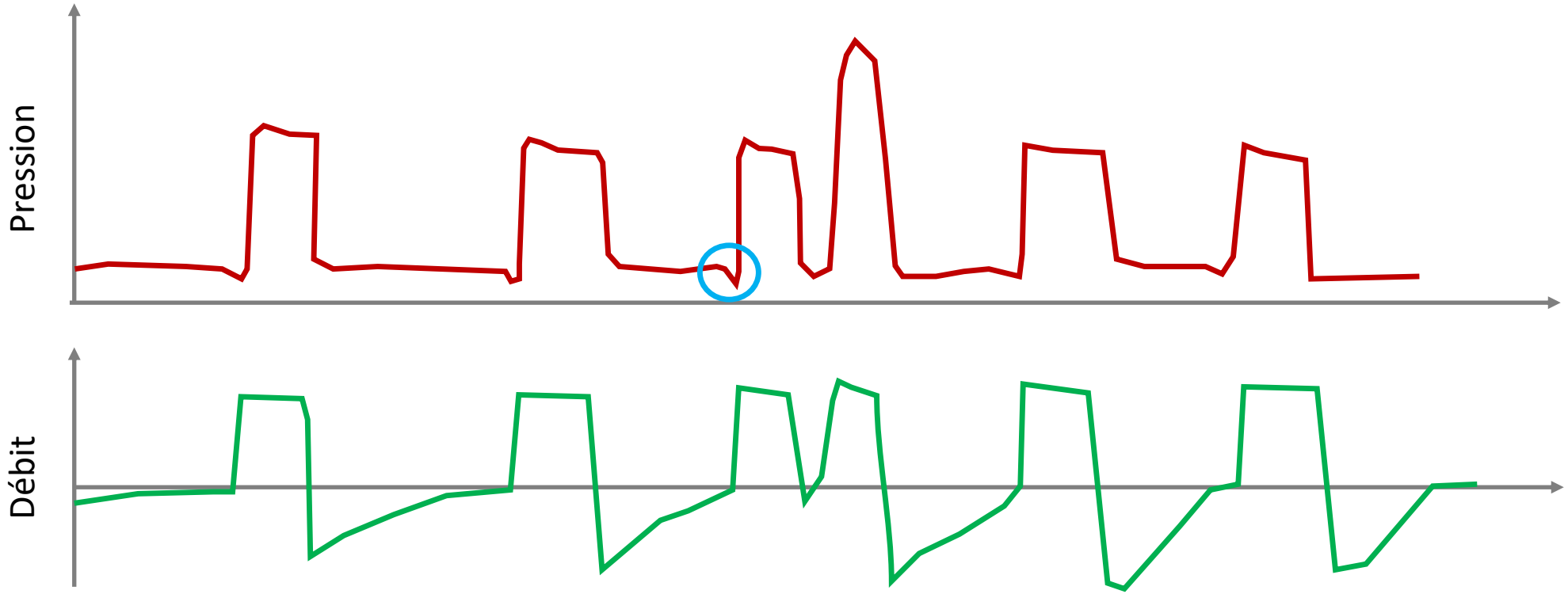
CAS CLINIQUE #3



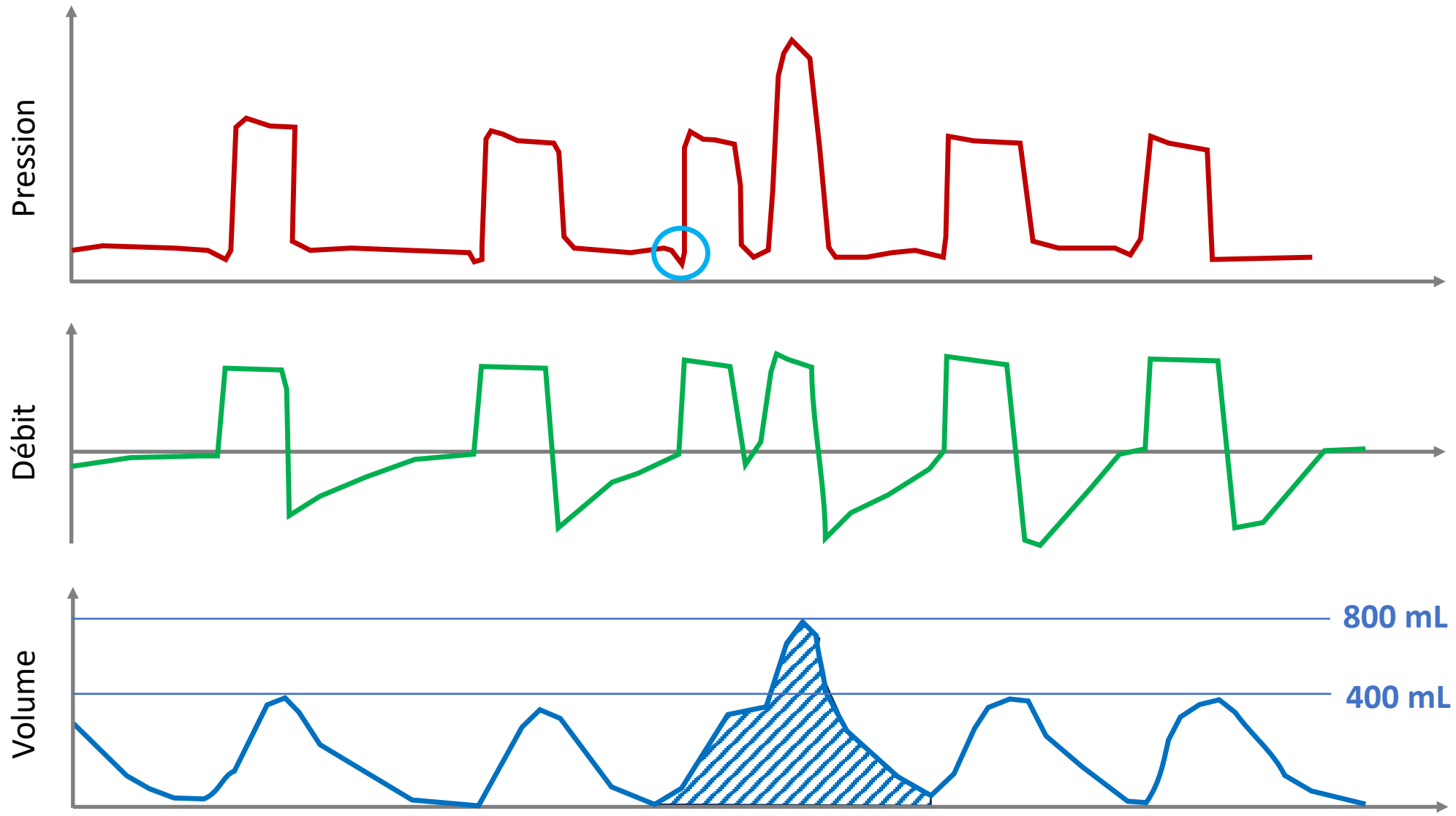
CAS CLINIQUE #4

SDRA modéré secondaire à une noyade, RASS -3

VAC 420 mL, FR 26 c/min, PEP 10 cmH_2O



CAS CLINIQUE #4



CONCLUSION

Courbes du ventilateur

→ Dépendent du mode ventilatoire (VAC et VSAI +++)

→ Monitorage des pressions ($P_{crête}$, P_{plat}, PEP) / volumes

→ Permettent de détecter :

- Variation de resistance (courbe pression en VAC)
- Variation de compliance (courbe pression en VAC)
- Hyperinflation dynamique et PEP intrinsèque (courbes debit et pression)
- Asynchronie patient-ventilateur