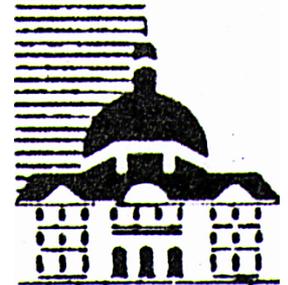
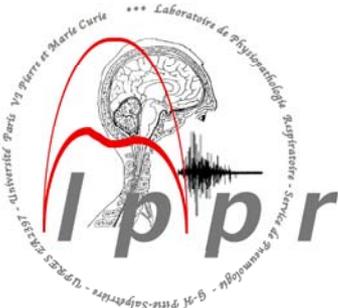


asynchronies patient-ventilateur en VNI

- du diagnostic au traitement -

Pr Alexandre DEMOULE

***Service de Pneumologie et Réanimation médicale,
groupe hospitalier Pitié-Salpêtrière
Université Pierre and Marie Curie
Paris, France***



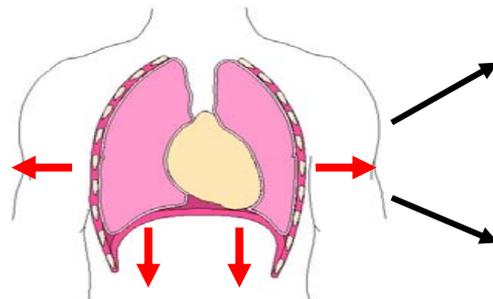
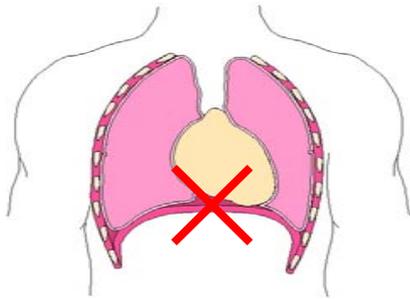


ventilation contrôlée vs. assistée

ventilation mécanique (VM)

contrôlée

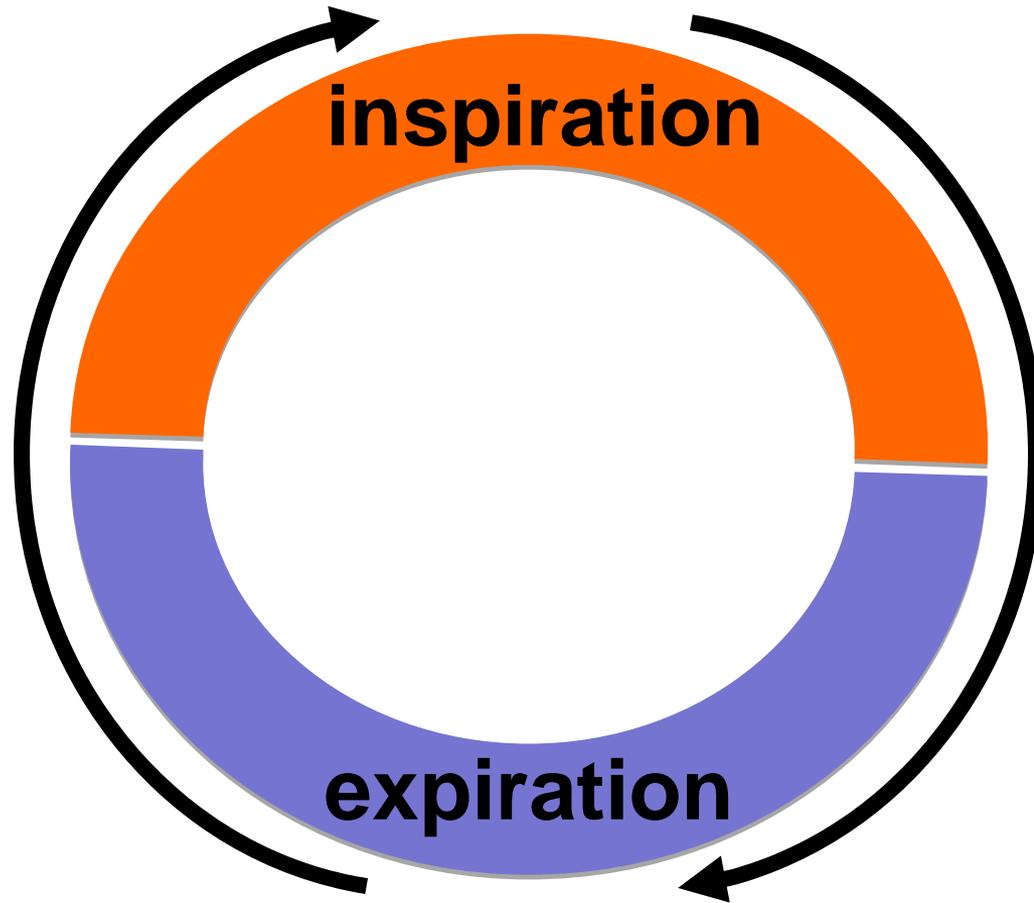
assistée



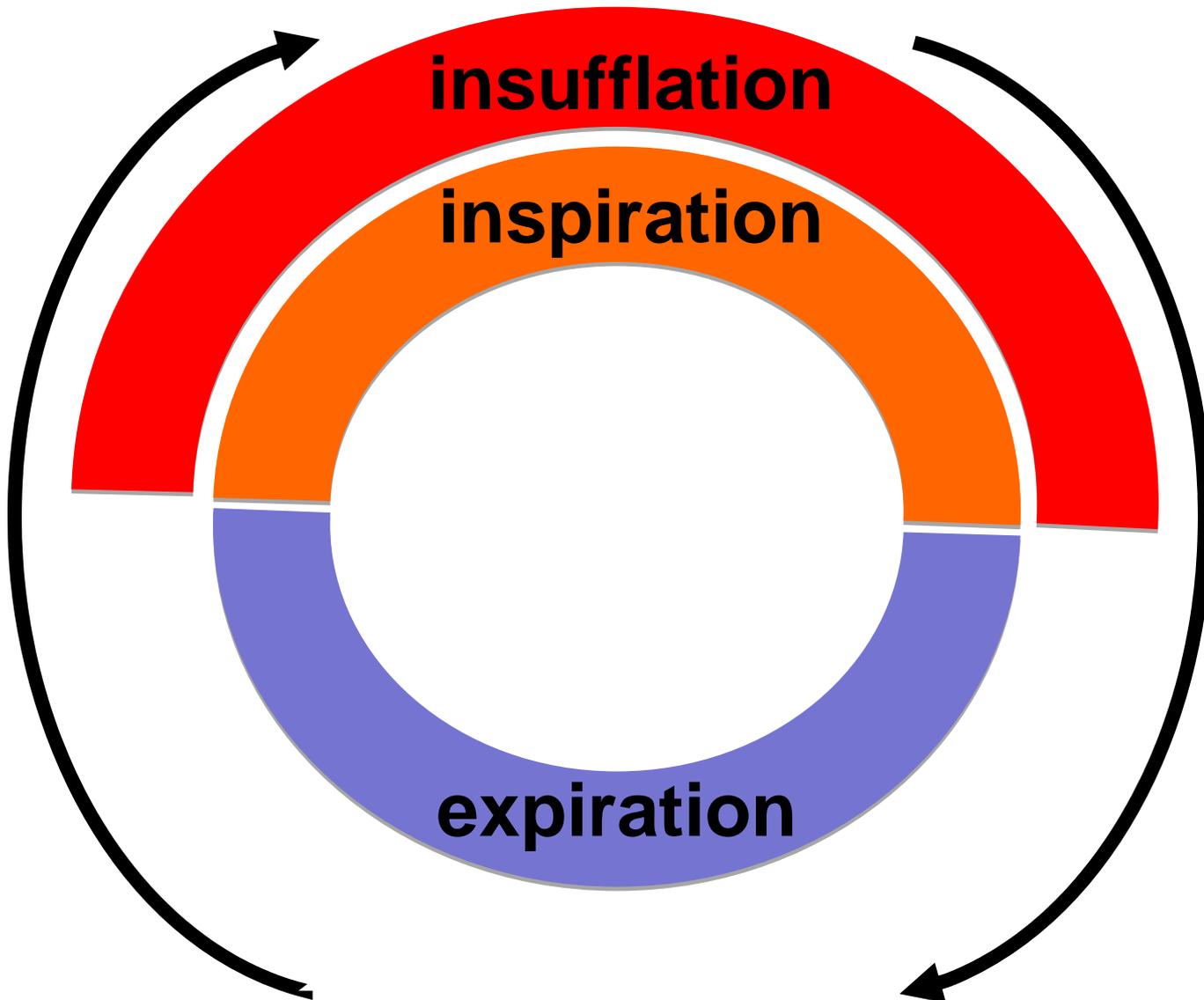
prévenir l'atrophie des muscles respiratoires

réduire la durée de ventilation mécanique

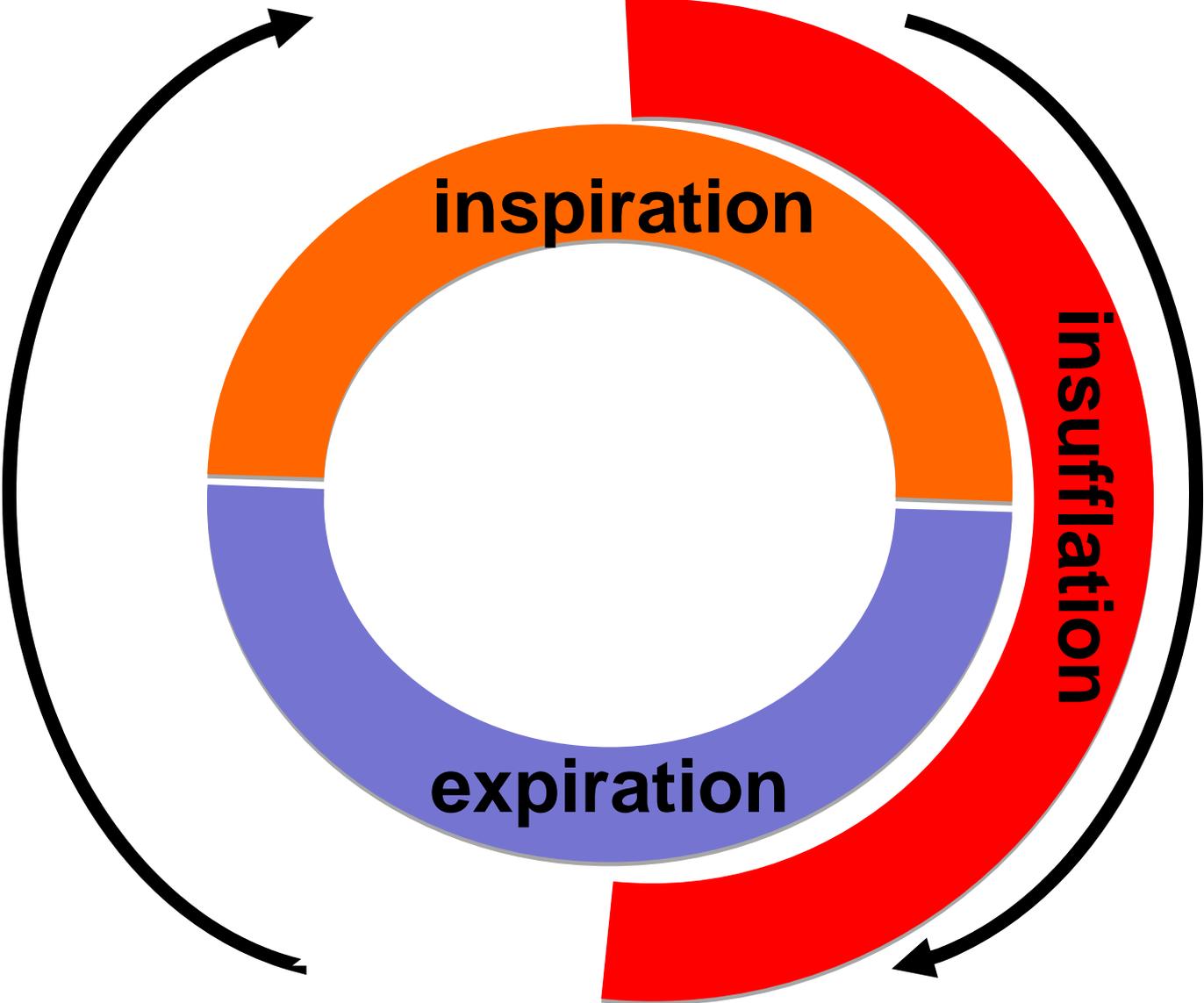
interaction patient-ventilateur



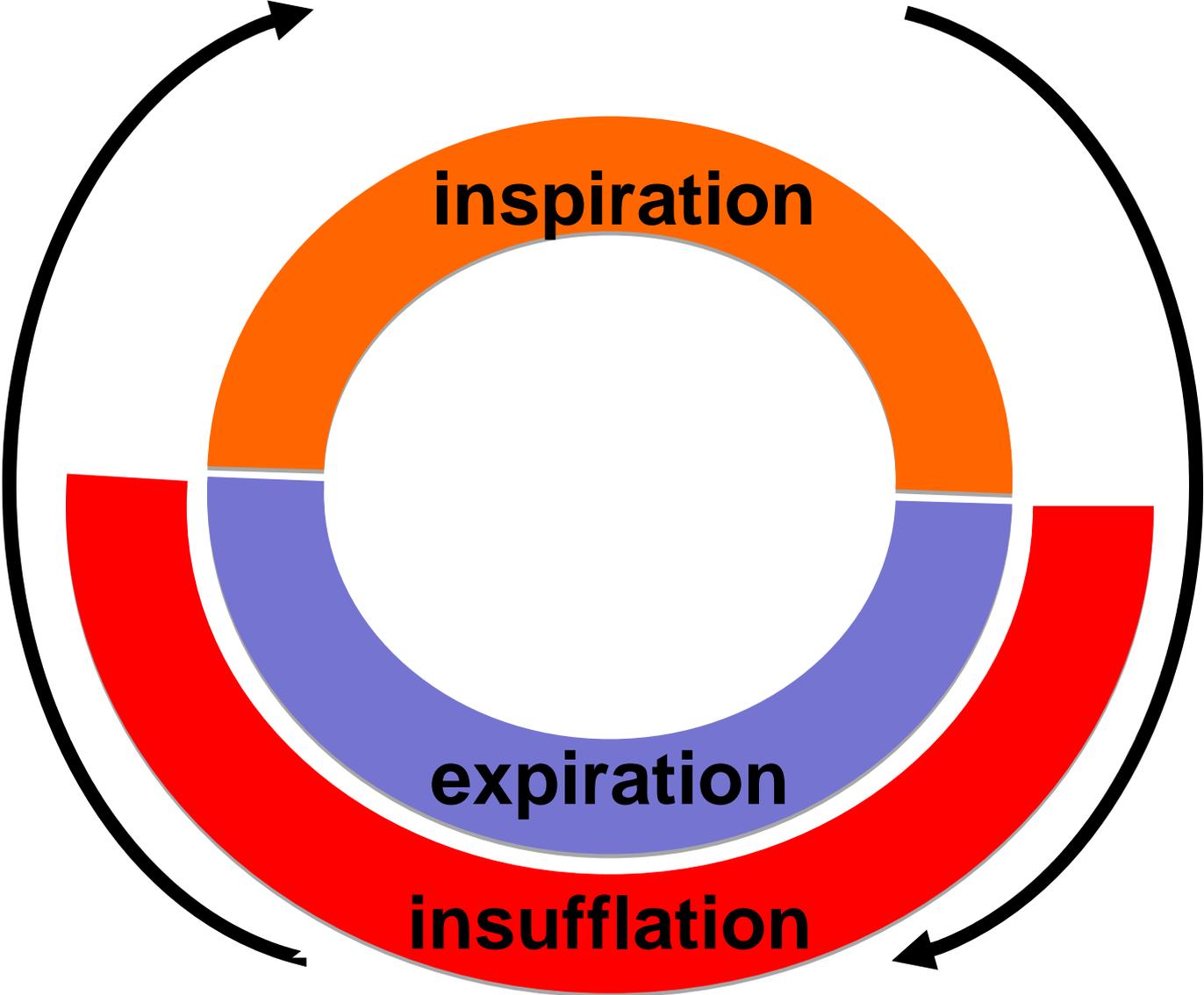
interaction patient-ventilateur



interaction patient-ventilateur



interaction patient-ventilateur



asynchronisme patient-ventilateur

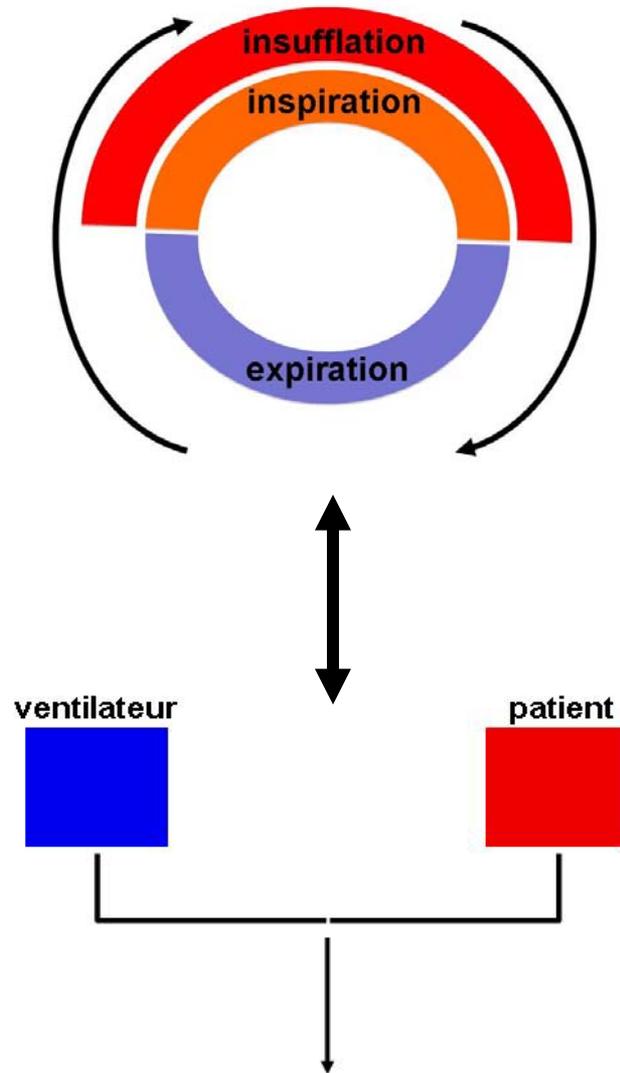
- **décalage de phase entre**
 - le cycle ventilatoire du patient
 - et
 - le cycle délivré par le ventilateur

Parfois en relation avec

- **inadéquation entre**
 - la demande ventilatoire du patient
 - et
 - l'assistance délivrée par le ventilateur

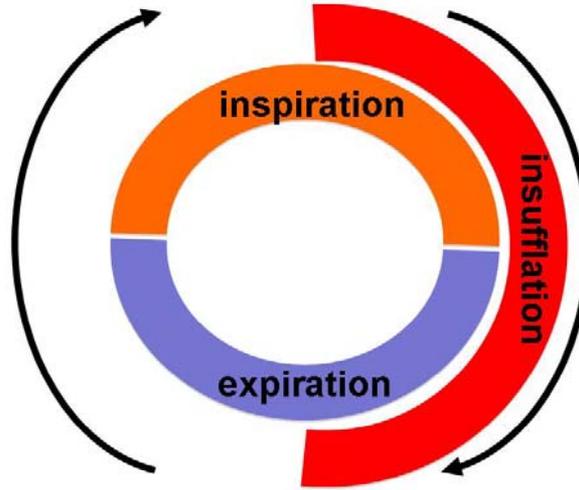
Synchronie vs. asynchronie

synchronie



Synchronie vs. asynchronie

asynchronie

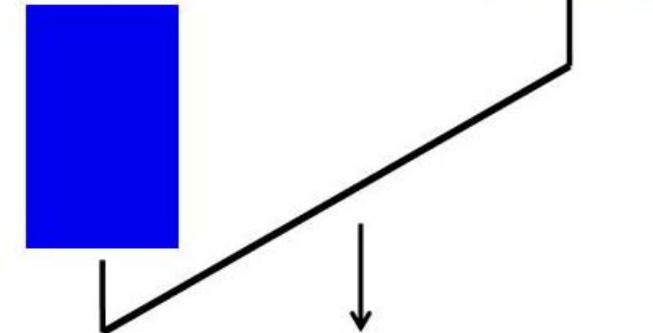


Demande

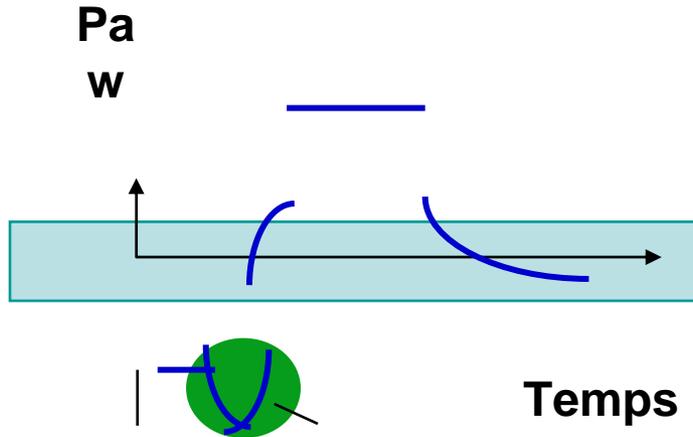
Assistance

Demande

Assistance



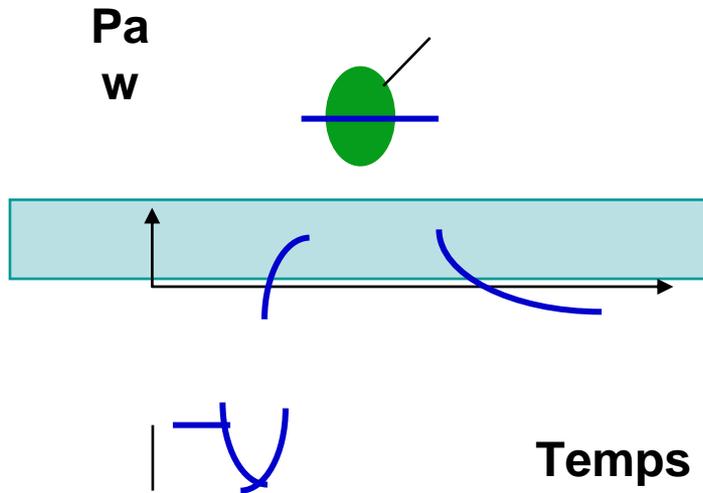
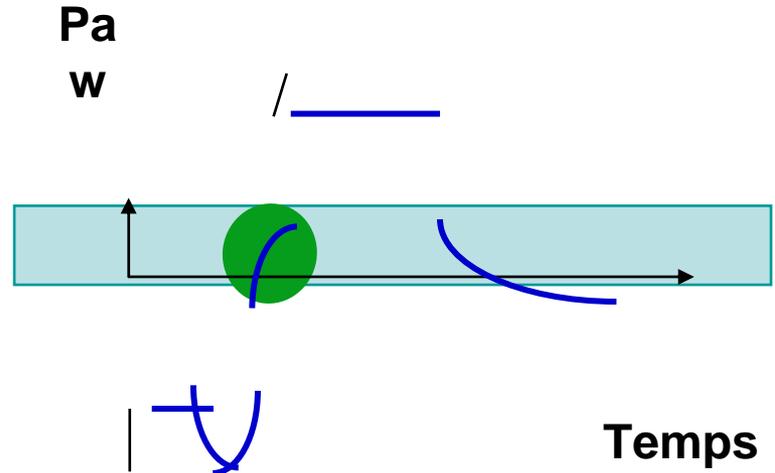
asynchronies : où et quand



déclenchement

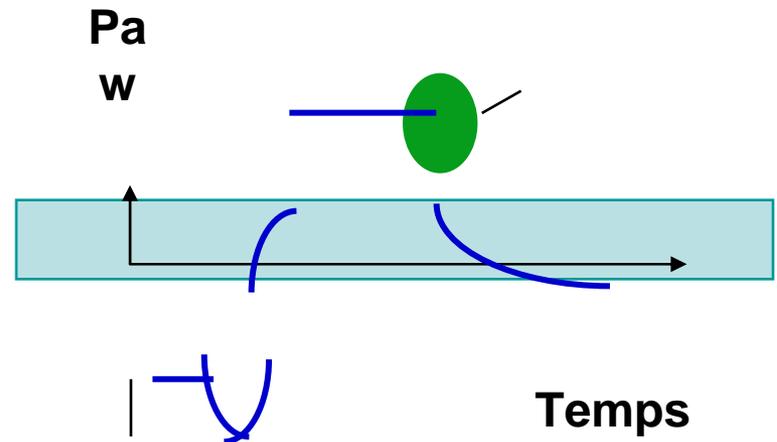
asynchronies : où et quand

pressurisation

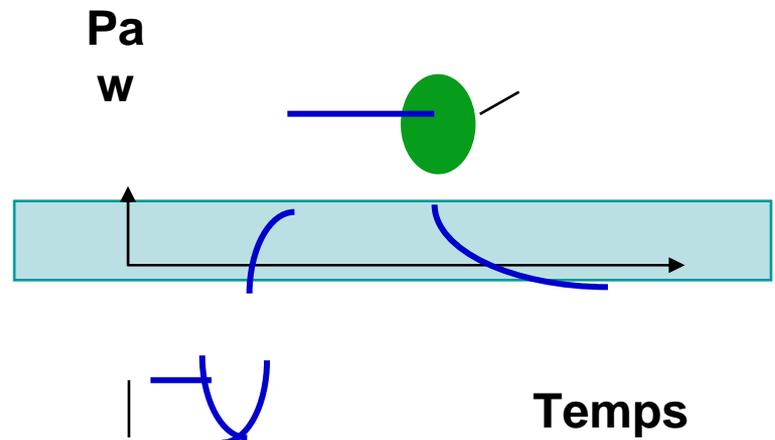
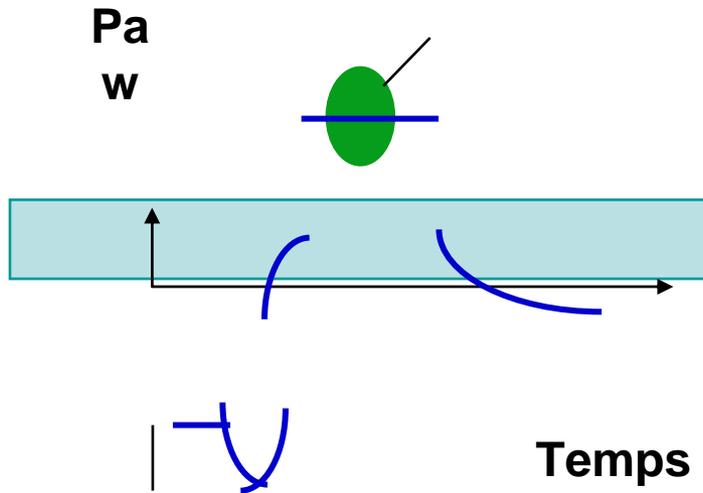
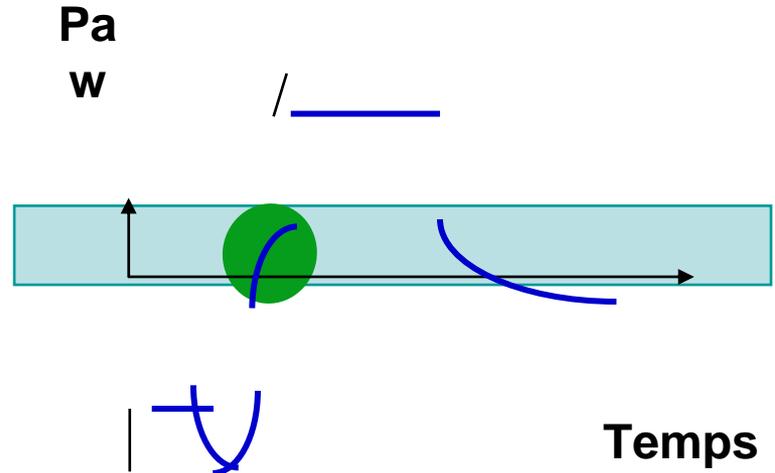
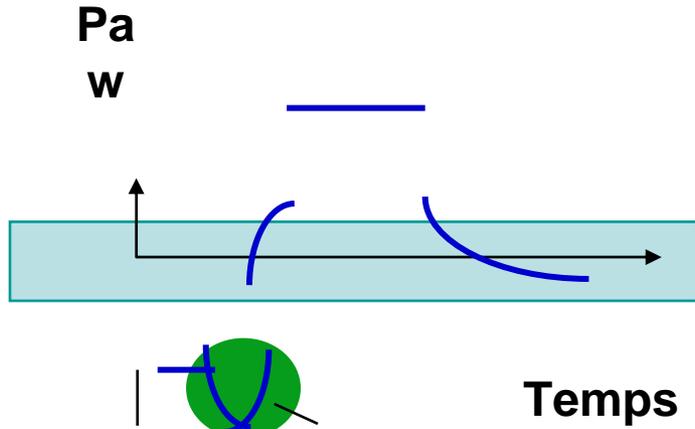


asynchronies : où et quand

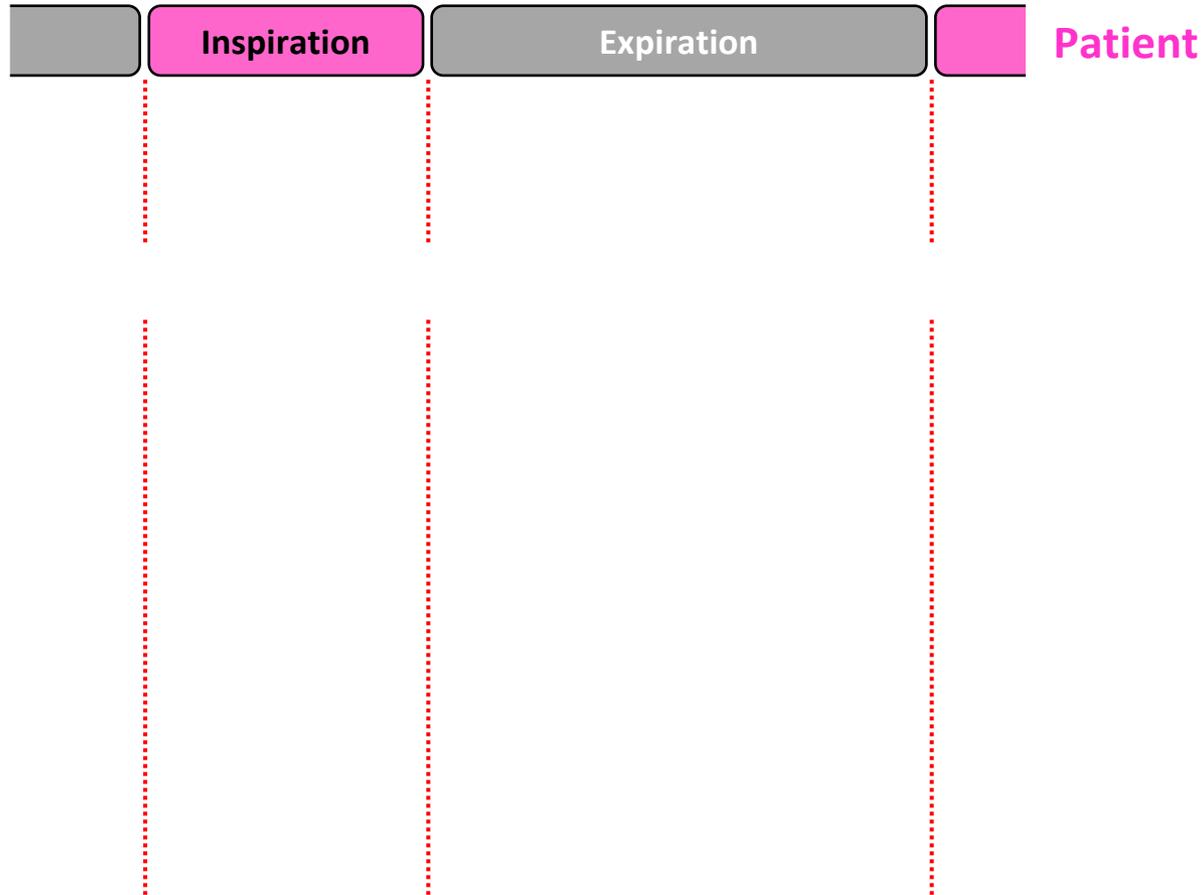
→ expiration



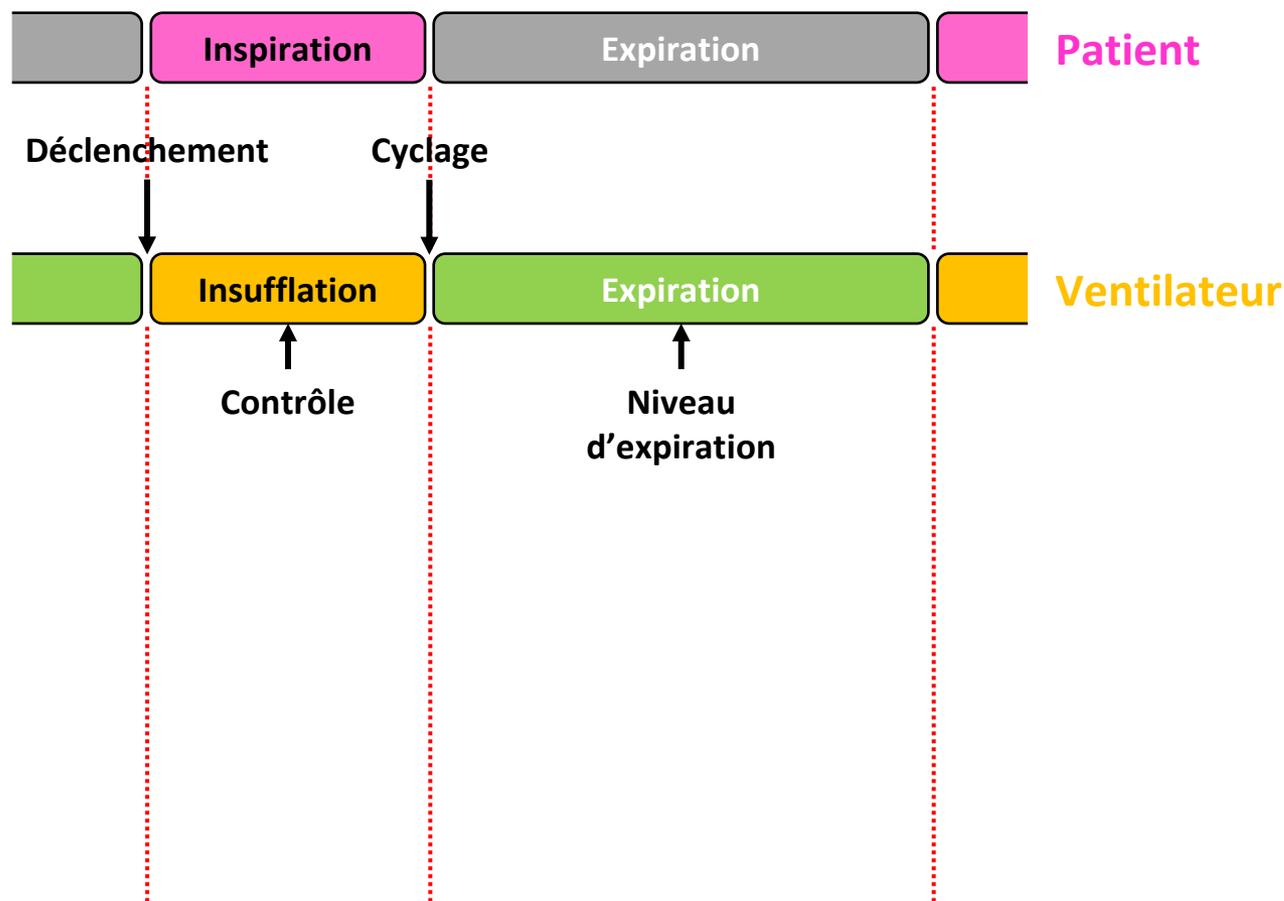
asynchronies : où et quand



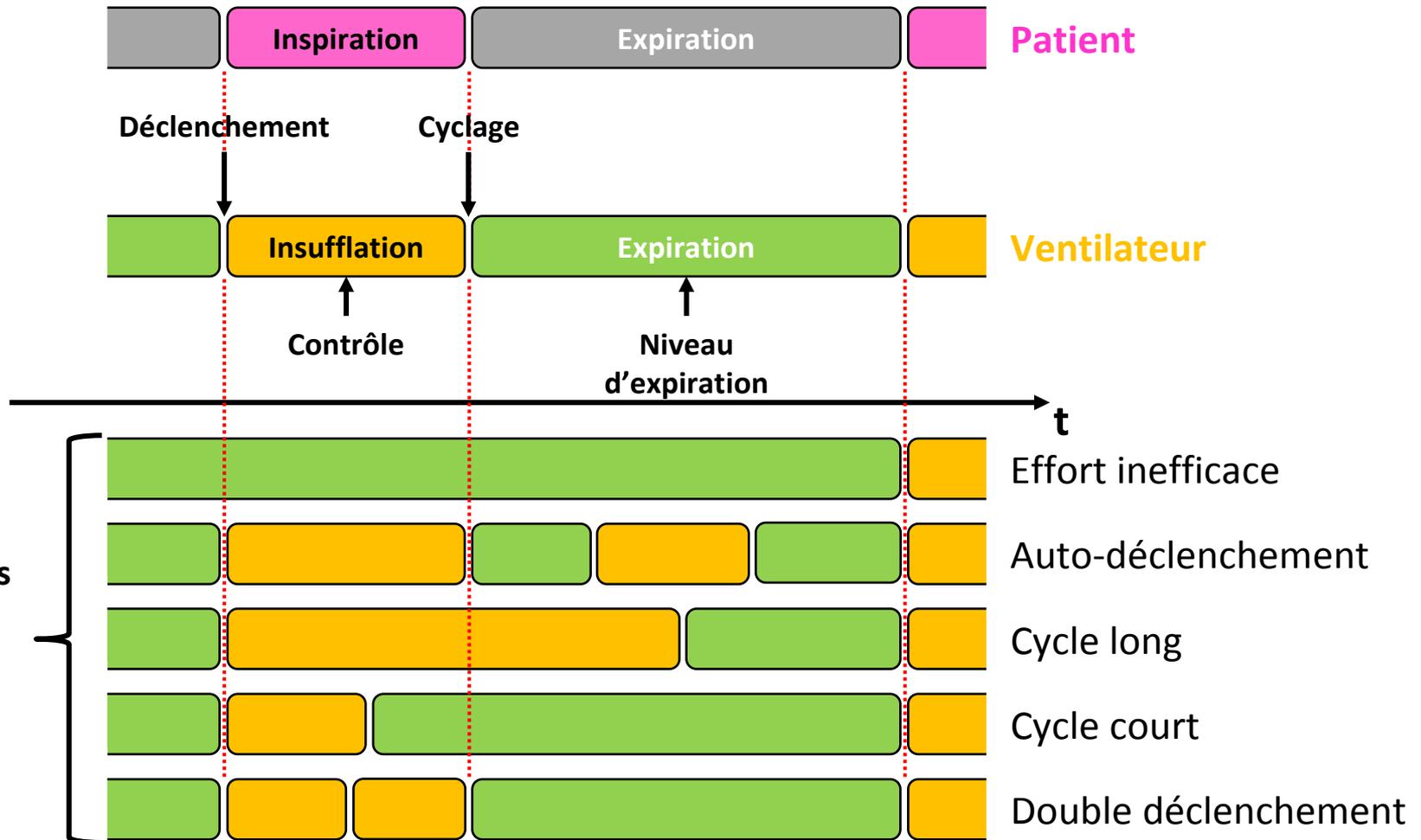
Principales asynchronies patient-ventilateur



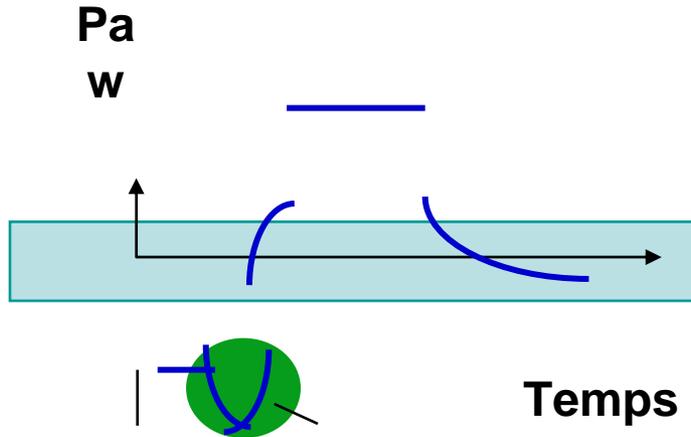
Principales asynchronies patient-ventilateur



Principales asynchronies patient-ventilateur



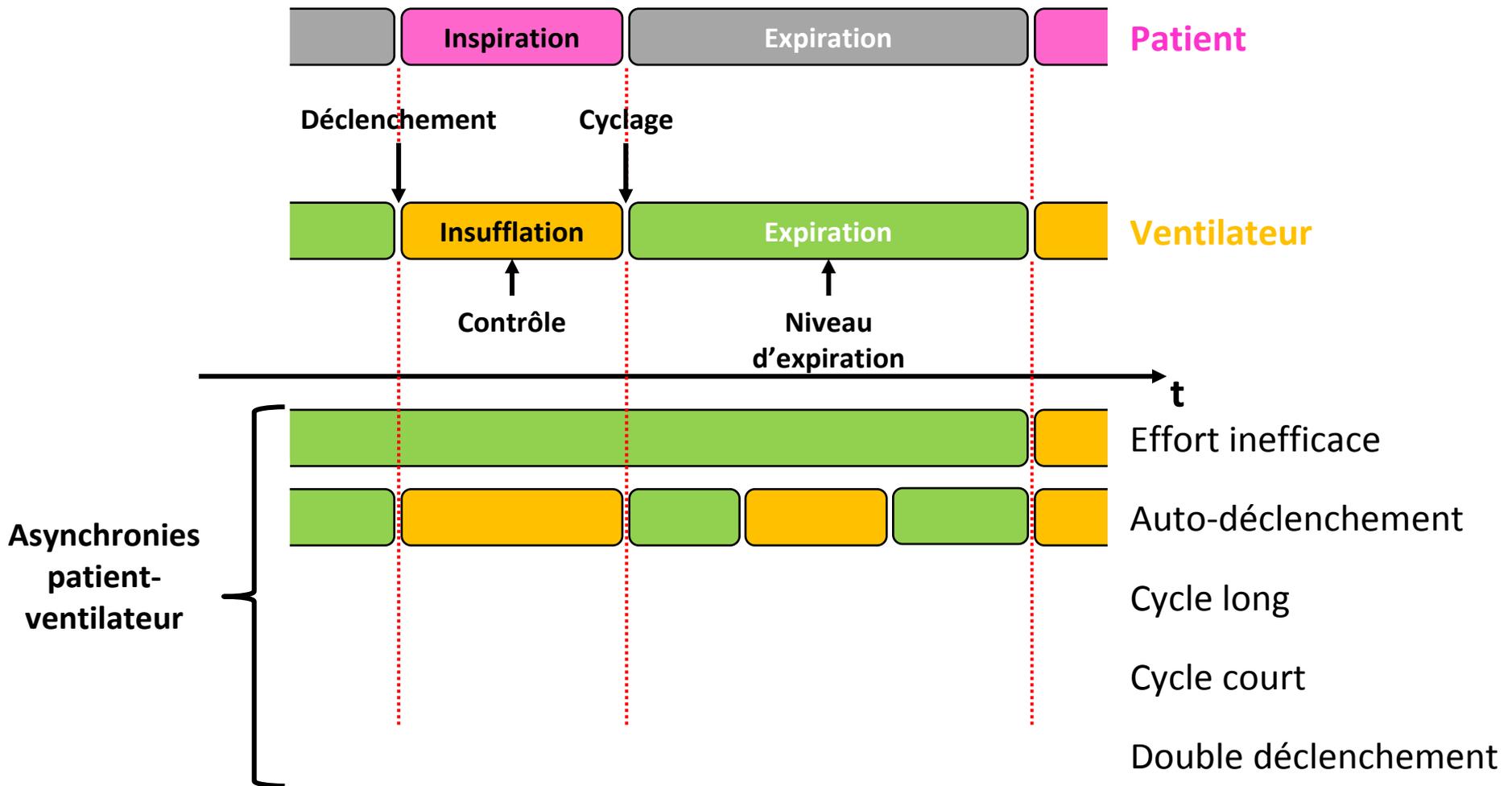
asynchronies au déclenchement



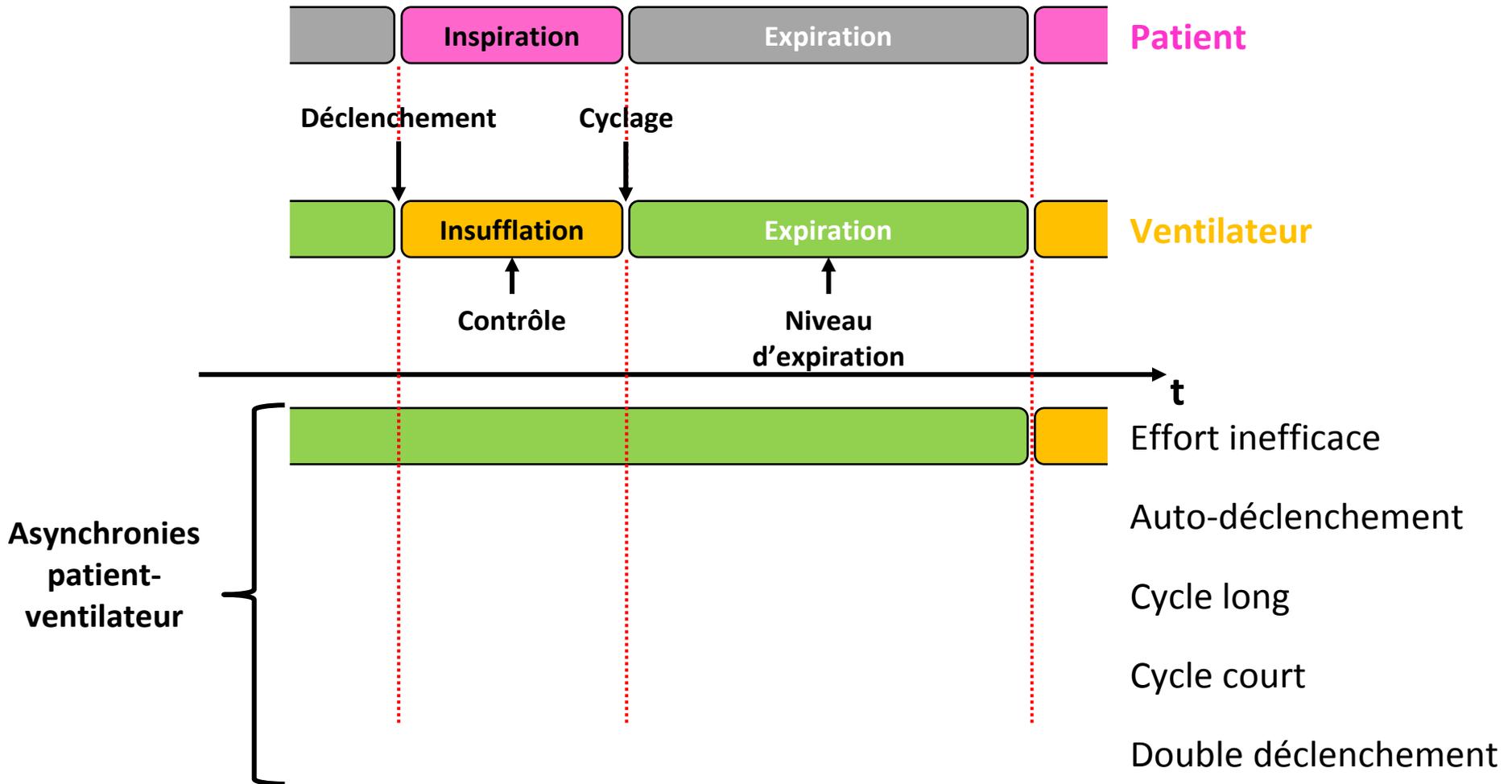
- appels inefficaces

- auto-déclenchements

Principales asynchronies patient-ventilateur



Principales asynchronies patient-ventilateur



Incidence des asynchronies en VNI

60 patients en VNI
Evaluation de la synchronisation patient-ventilateur durant 30 minutes

Index d'asynchronie > 10%

n= 26/60 (43%)

Effort inefficace

**Auto-
déclenchement**

**Double-
déclenchement**

**Cyclage
prématuré**

**Insufflation
prolongée**

8 (13%)

12 (20%)

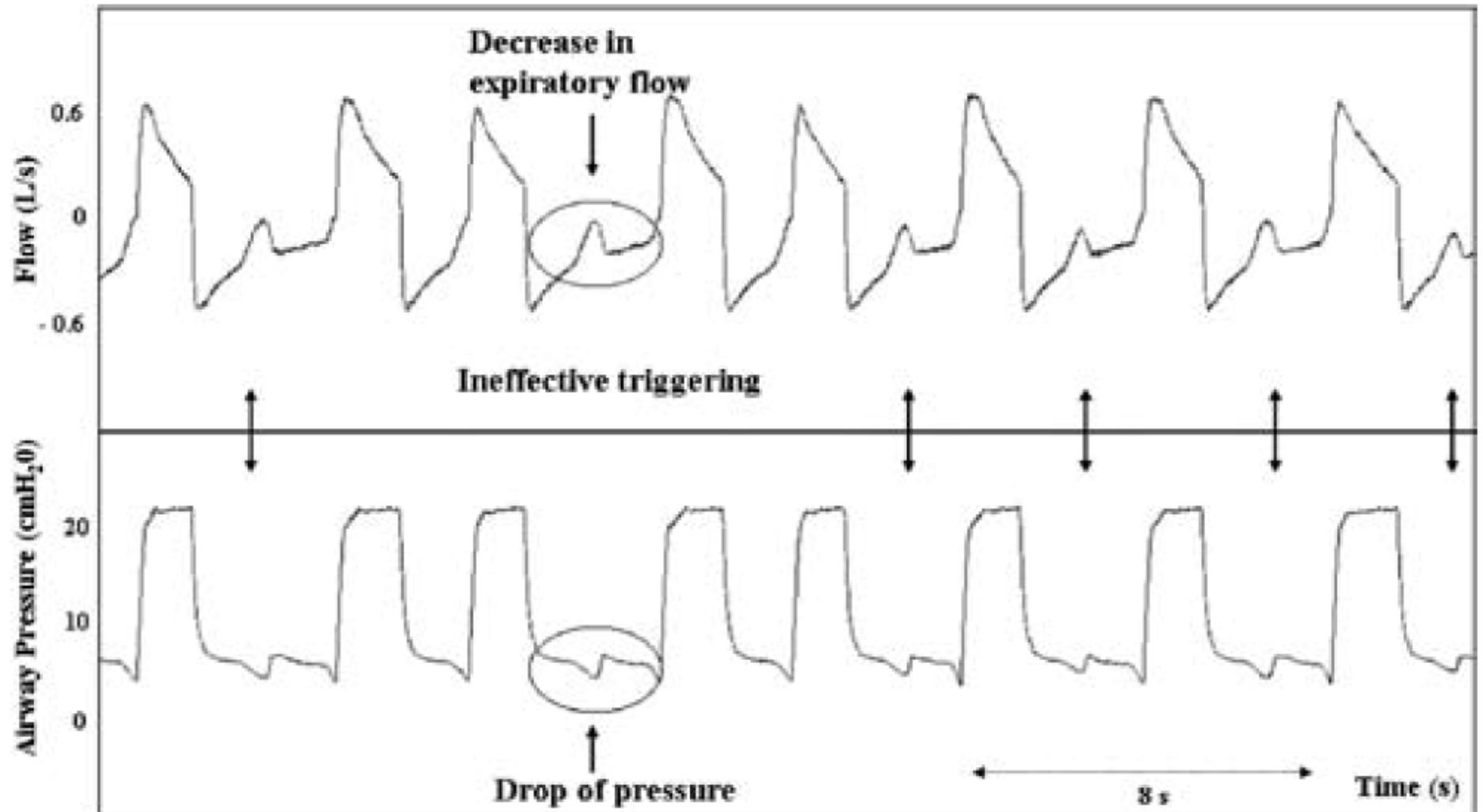
9 (15%)

7 (12%)

14 (23%)

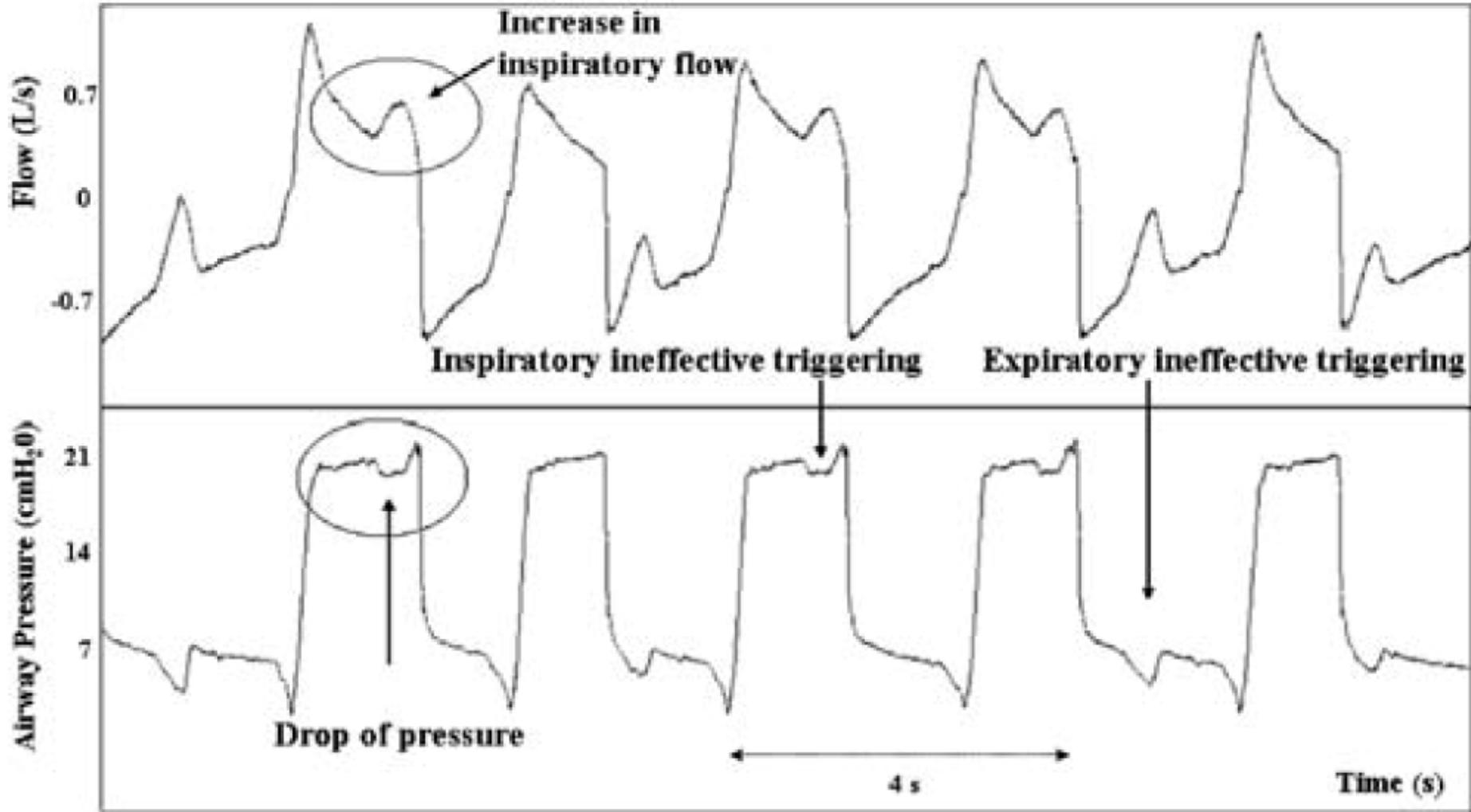
appel inefficace

effort inspiratoire sans déclenchement



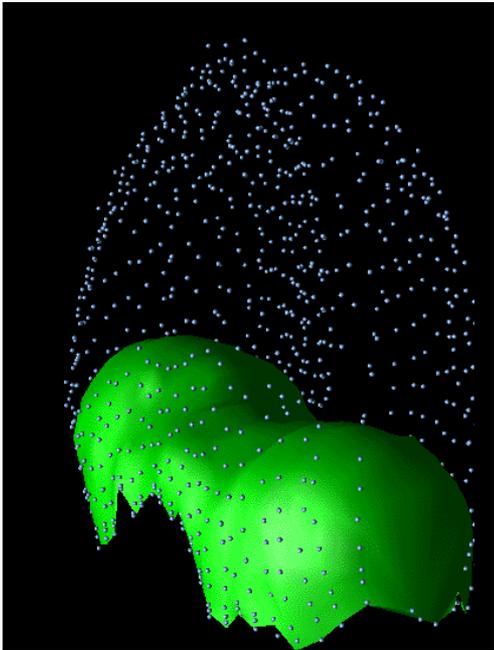
appel inefficace

appels inefficaces - insufflation

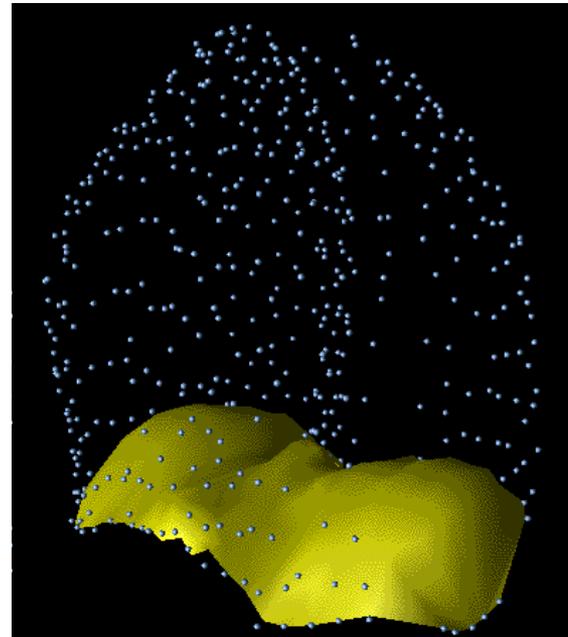


appel inefficace

sur-assistance - distension thoracique



sur-assistance
→
distension

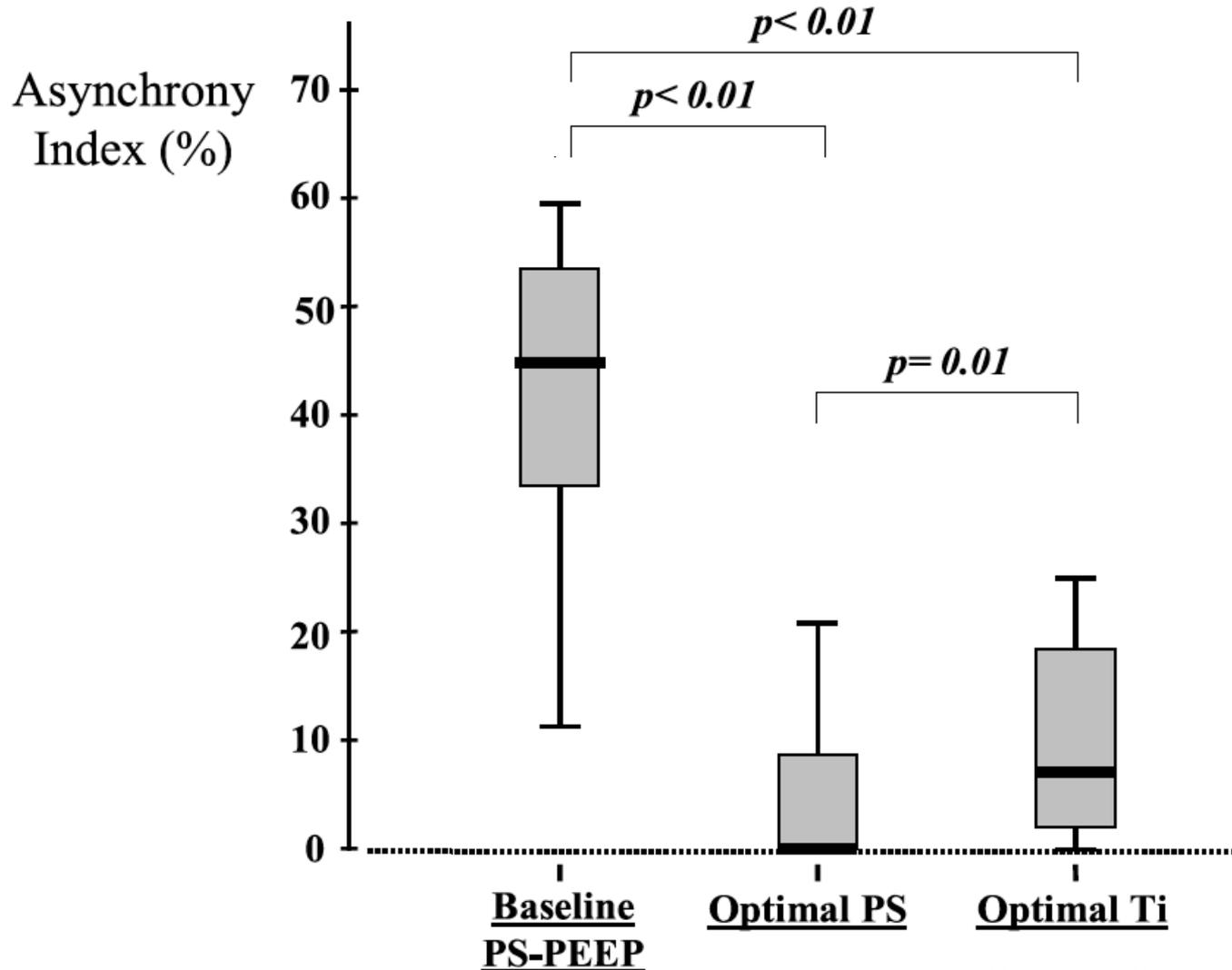


aplatissement du diaphragme

diminution force → pression

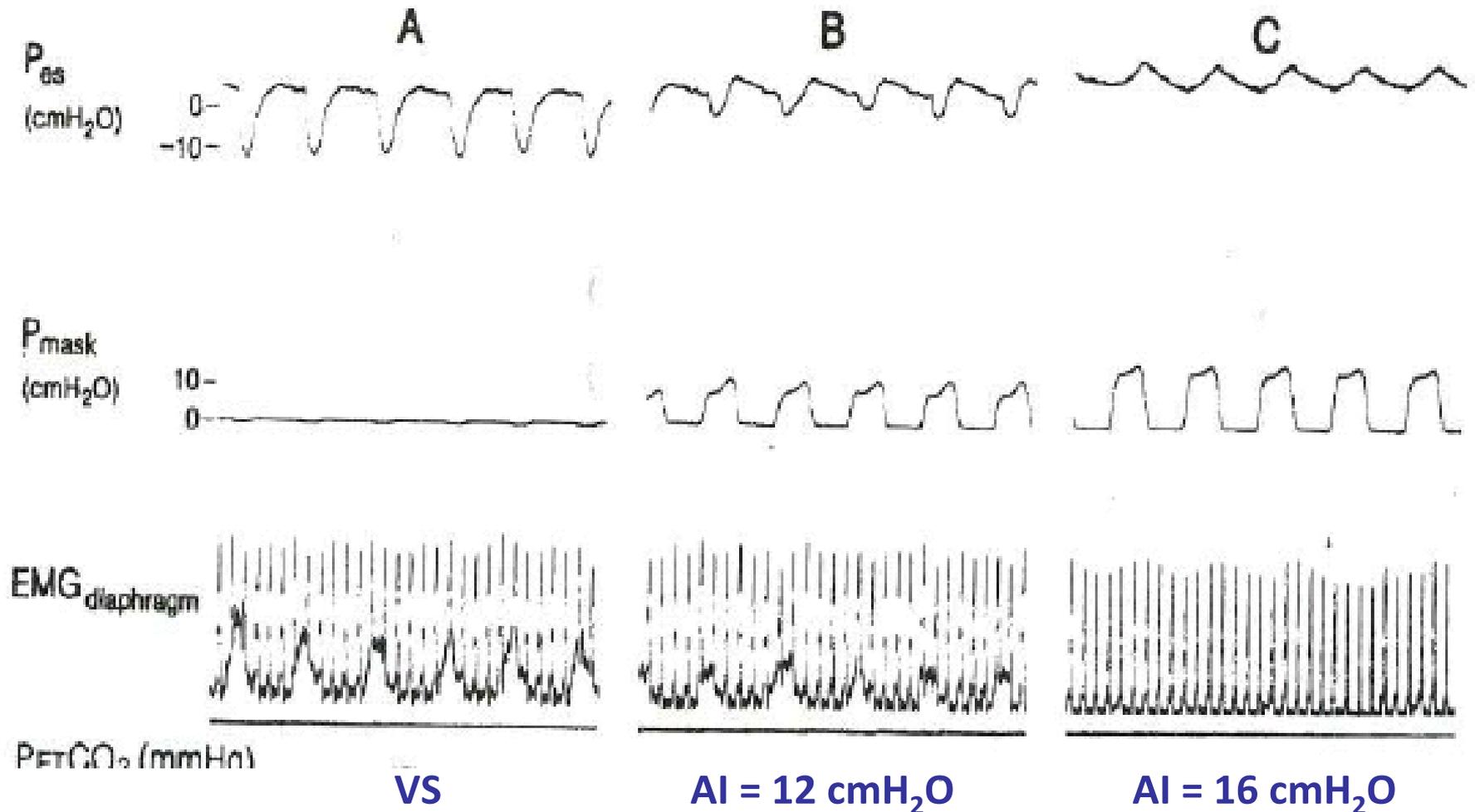
appel inefficace

réduction des appels inefficaces



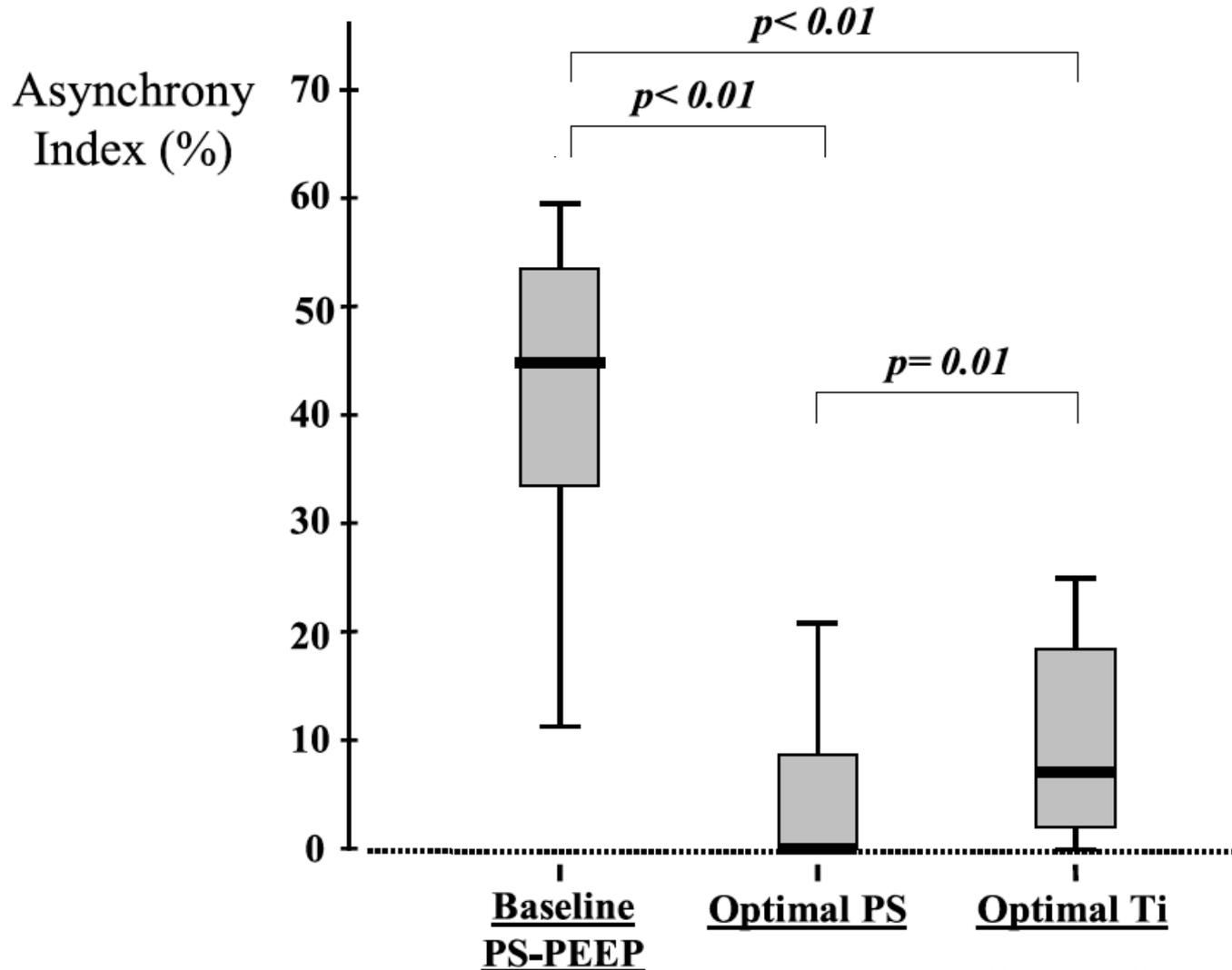
Niveau d'Aide Inspiratoire

BPCO stables : VNI → réduit la charge



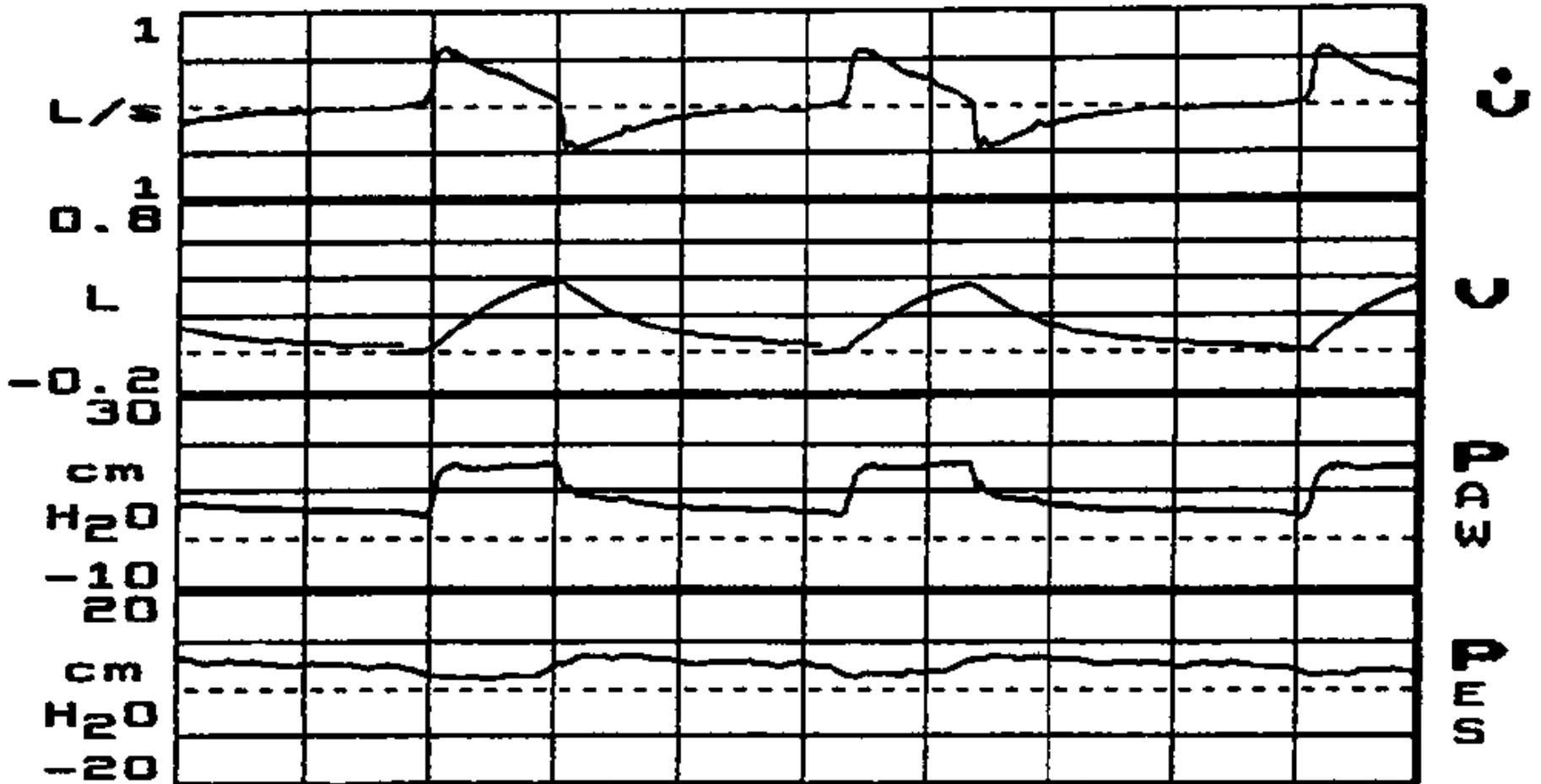
appel inefficace

réduction des appels inefficaces



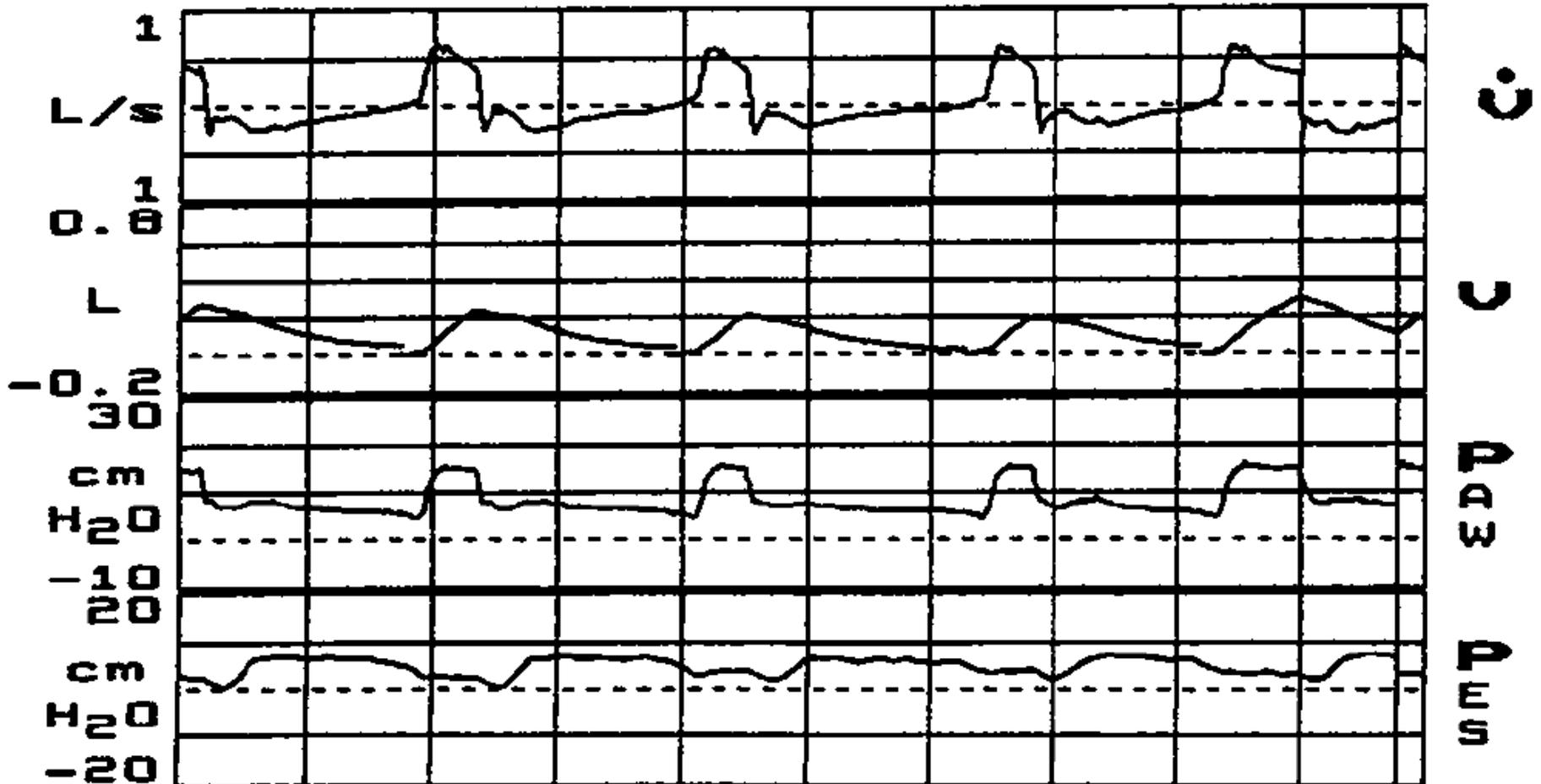
Niveau de Trigger Expiratoire

Termination Criterion 5%



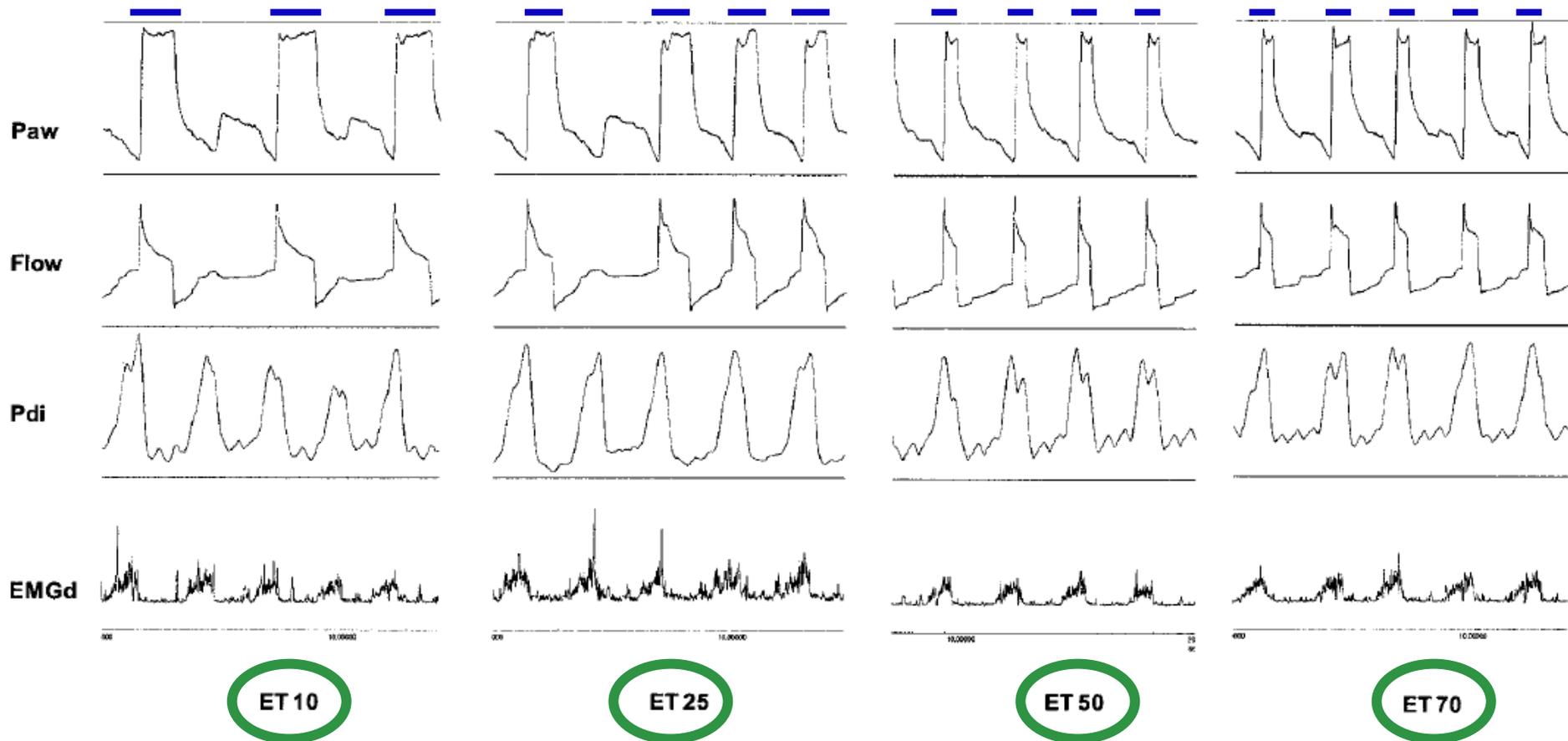
Niveau de Trigger Expiratoire

Termination Criterion 35%



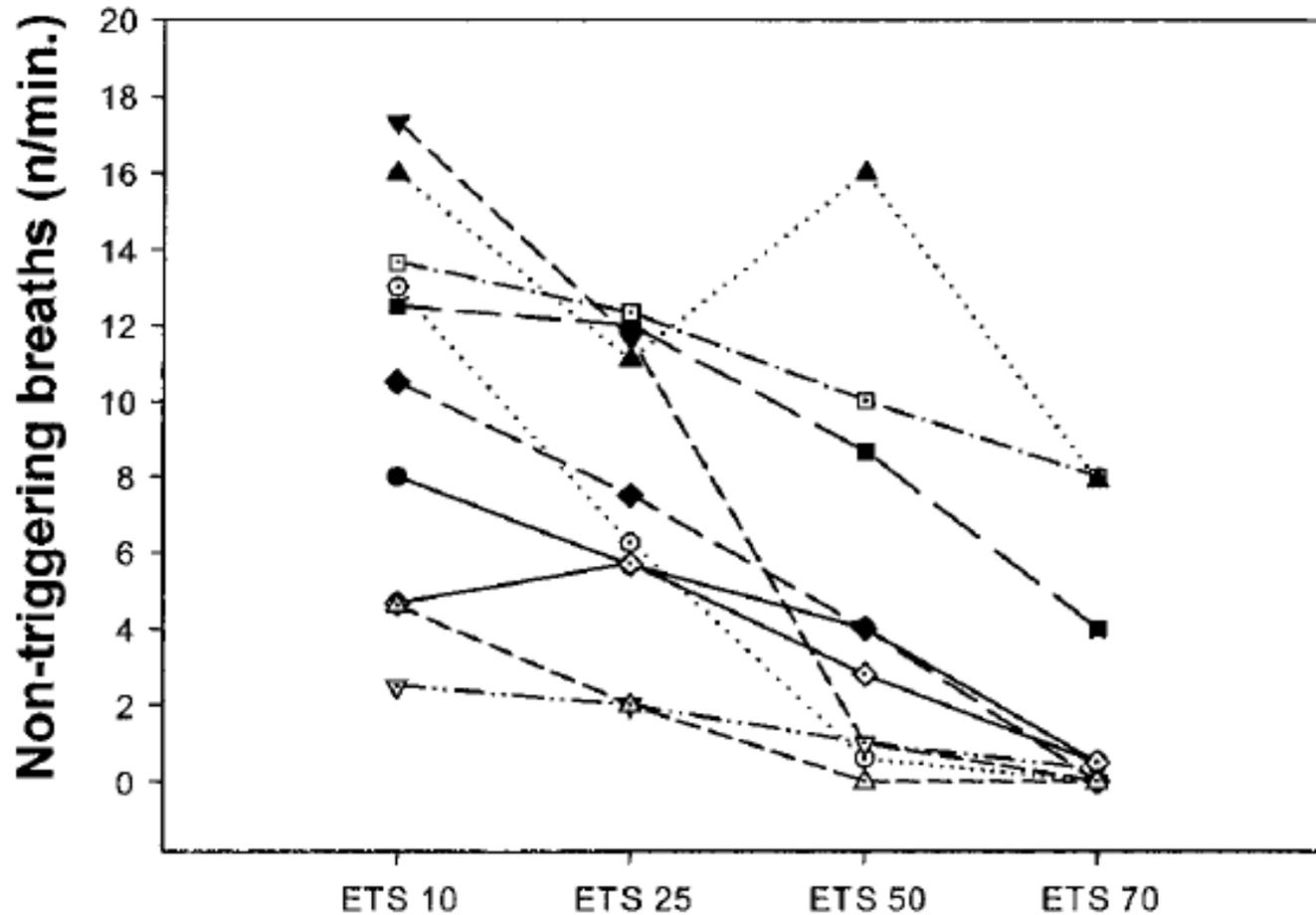
appel inefficace

augmenter le trigger expiratoire

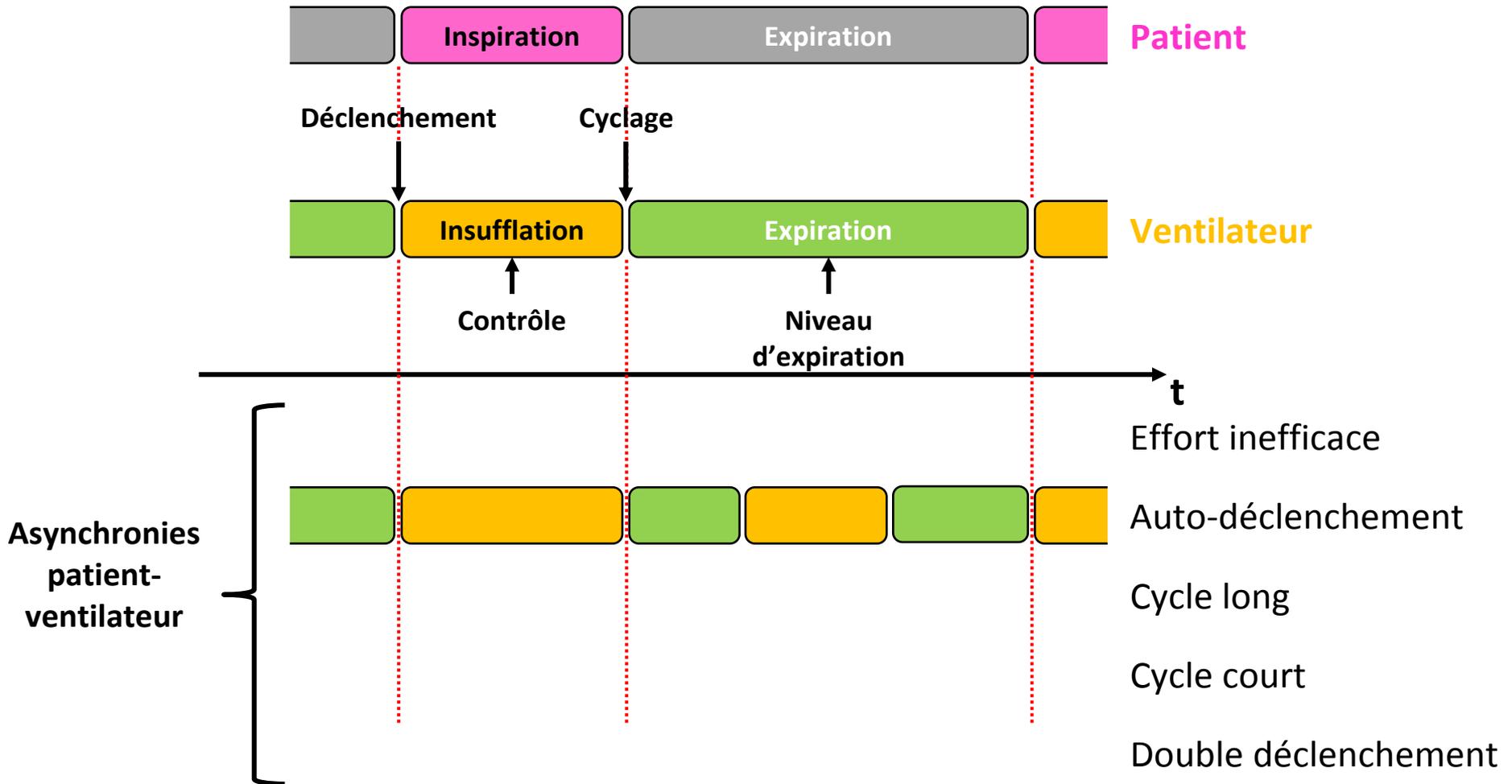


appel inefficace

augmenter le trigger expiratoire



Principales asynchronies patient-ventilateur



Incidence des asynchronies en VNI

60 patients en VNI
Evaluation de la synchronisation patient-ventilateur durant 30 minutes

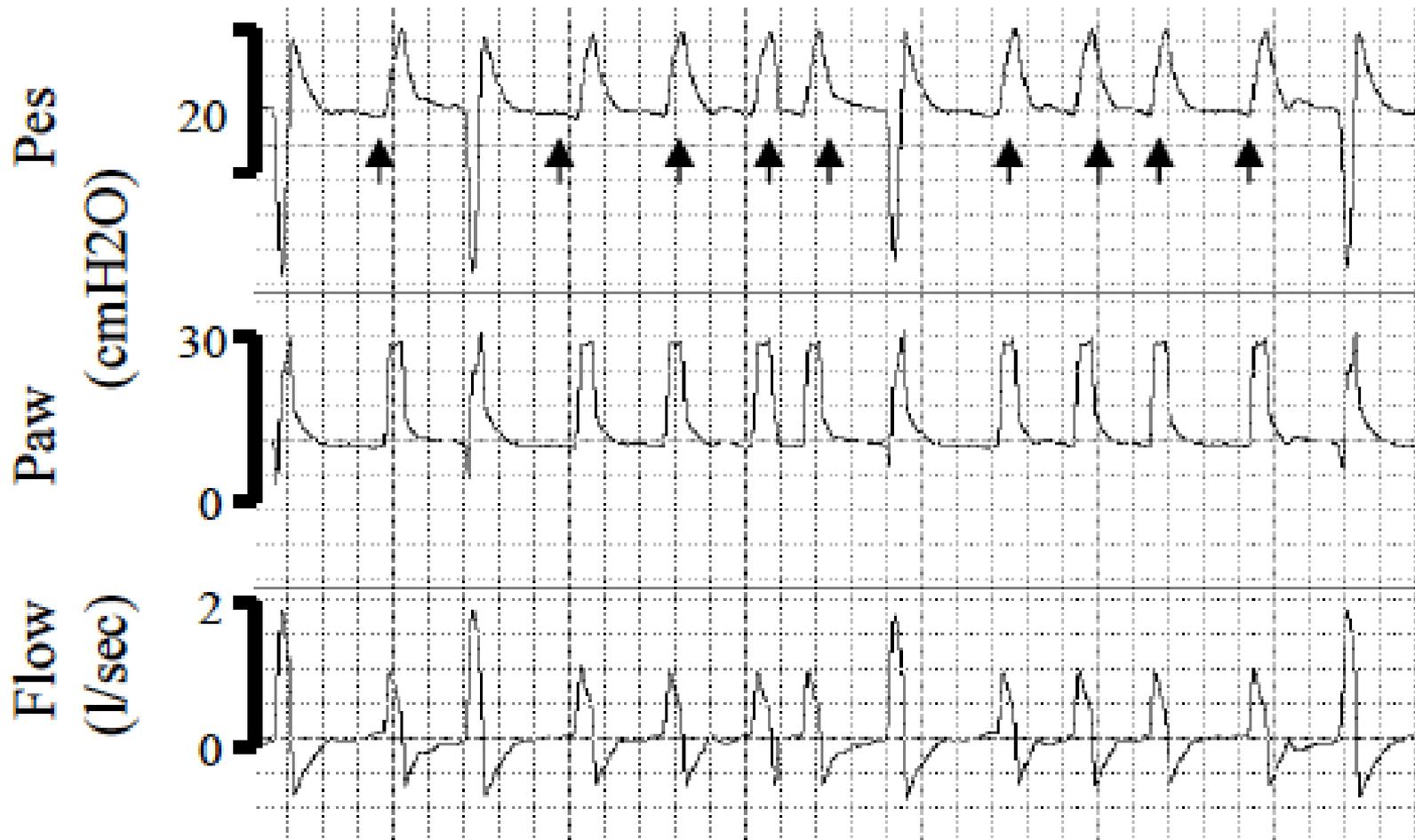
Index d'asynchronie > 10%

n= 26/60 (43%)

Effort inefficace	Auto-déclenchement	Double-déclenchement	Cyclage prématuré	Insufflation prolongée
8 (13%)	12 (20%)	9 (15%)	7 (12%)	14 (23%)

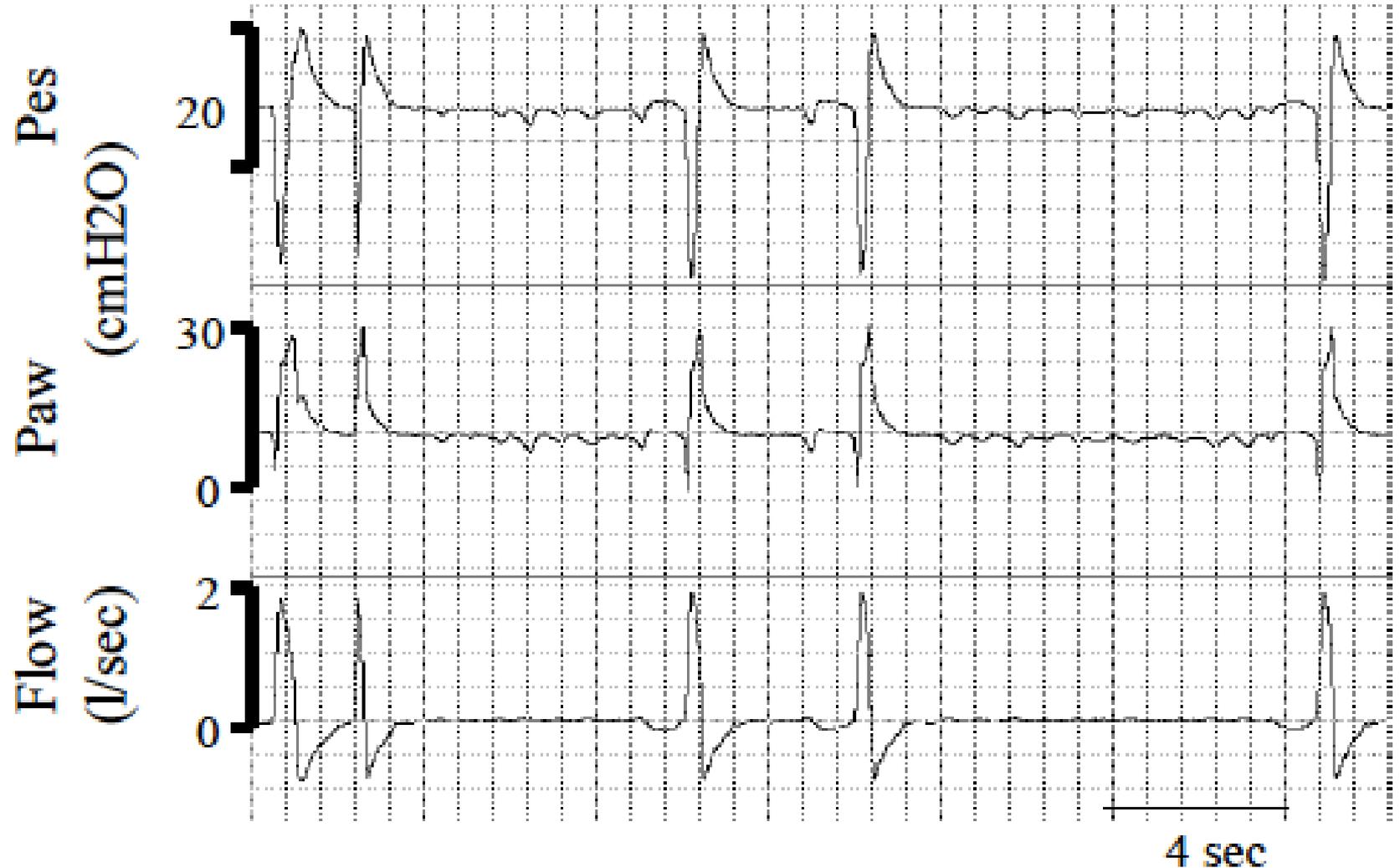
auto-déclenchement

fuites

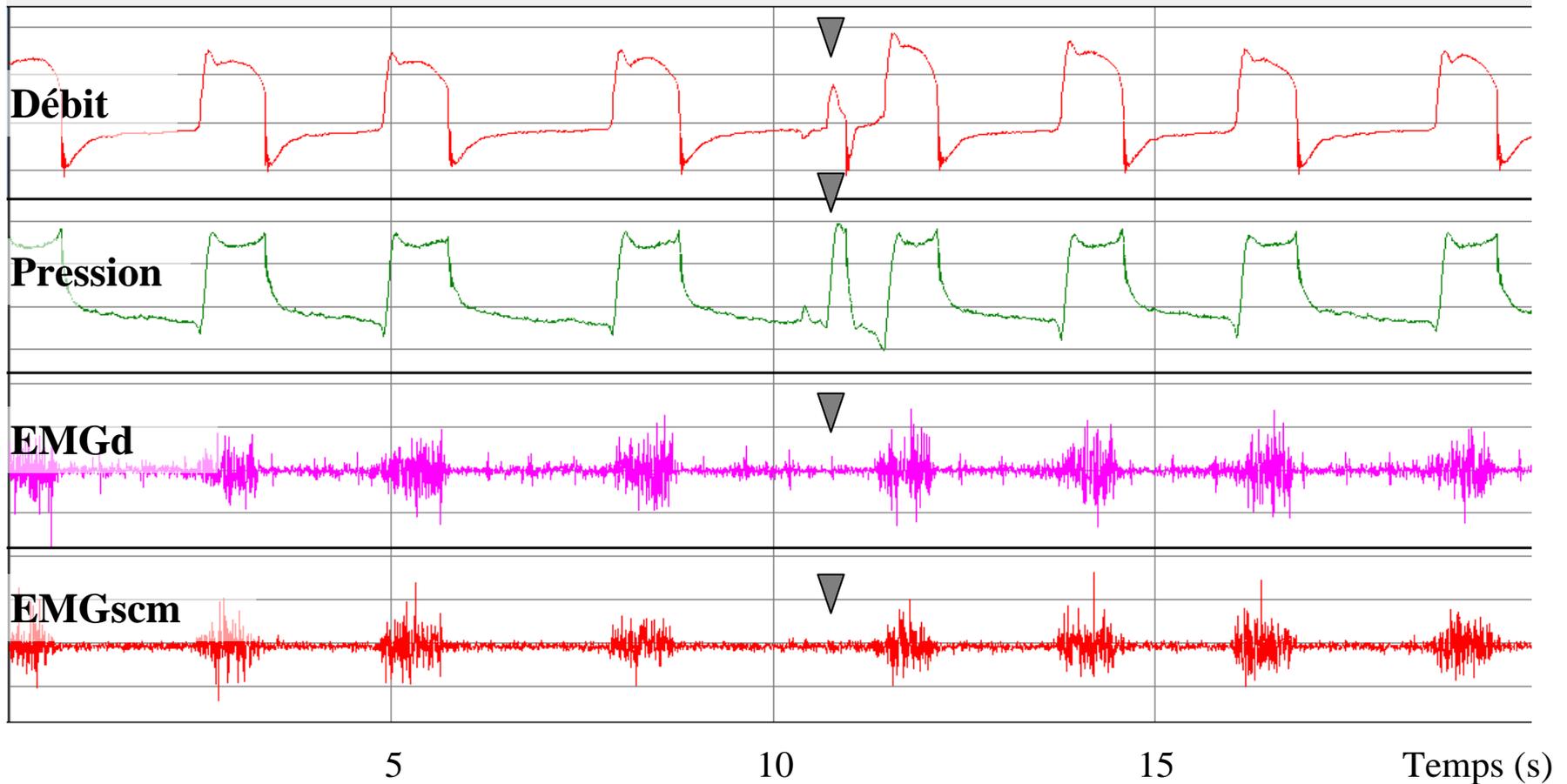


auto-déclenchement

fuites

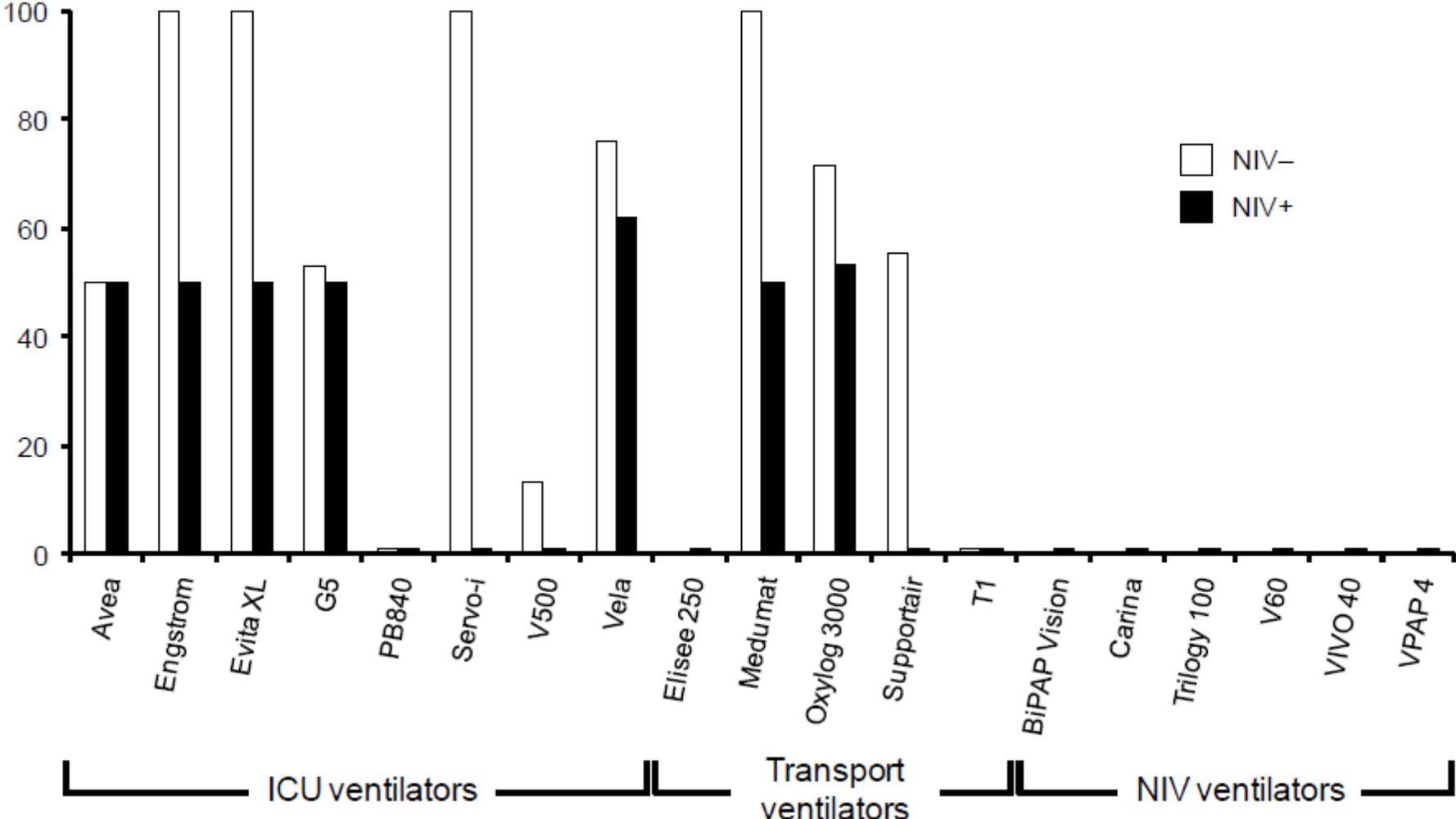


Auto-déclenchement



Bench Study - Auto-déclenchements

Auto-triggering (%)



asynchronies lors de l'insufflation

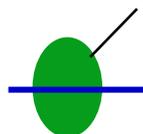
- double-déclenchement

Pa
w / _____



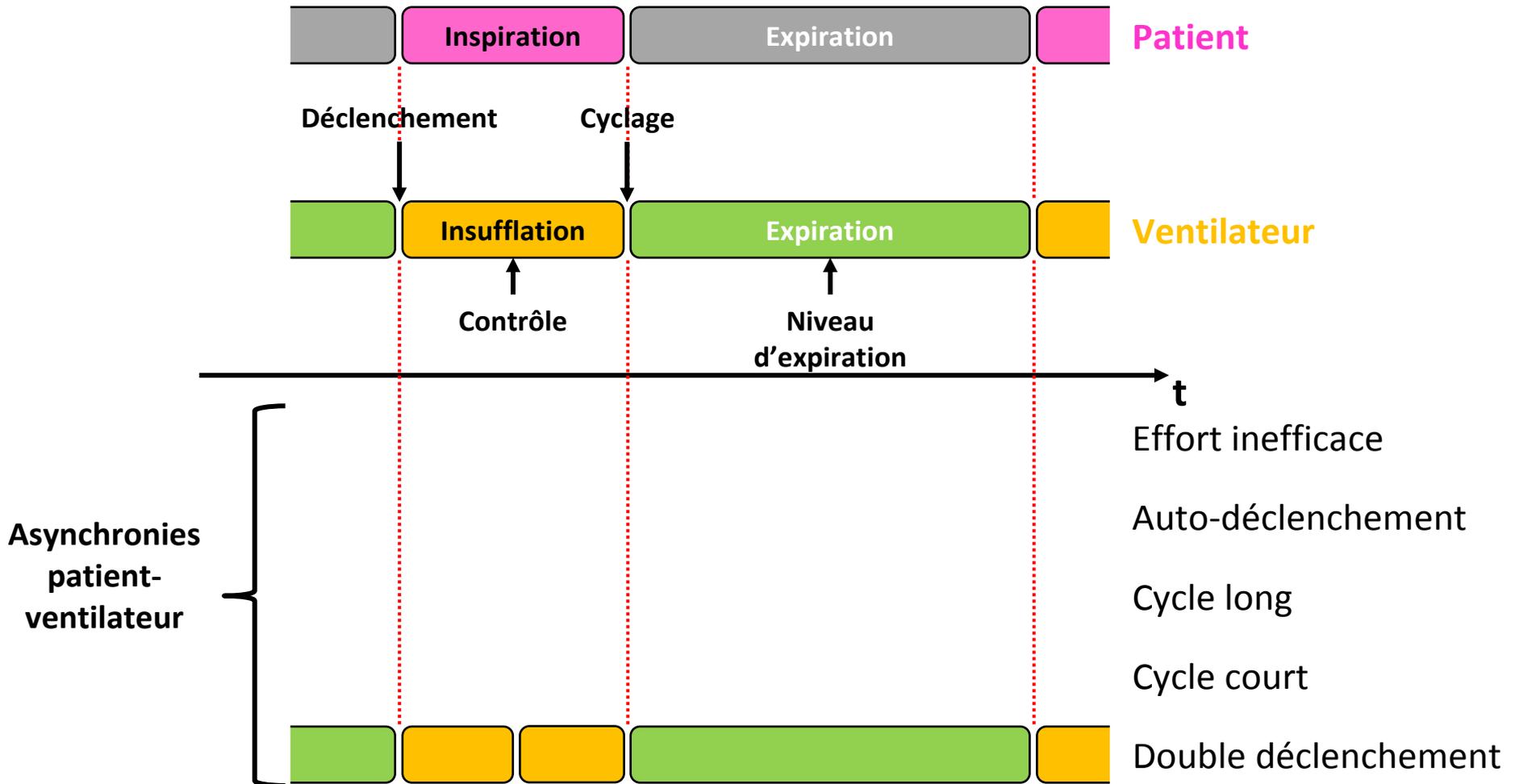
Temps

Pa
w



Temps

Principales asynchronies patient-ventilateur



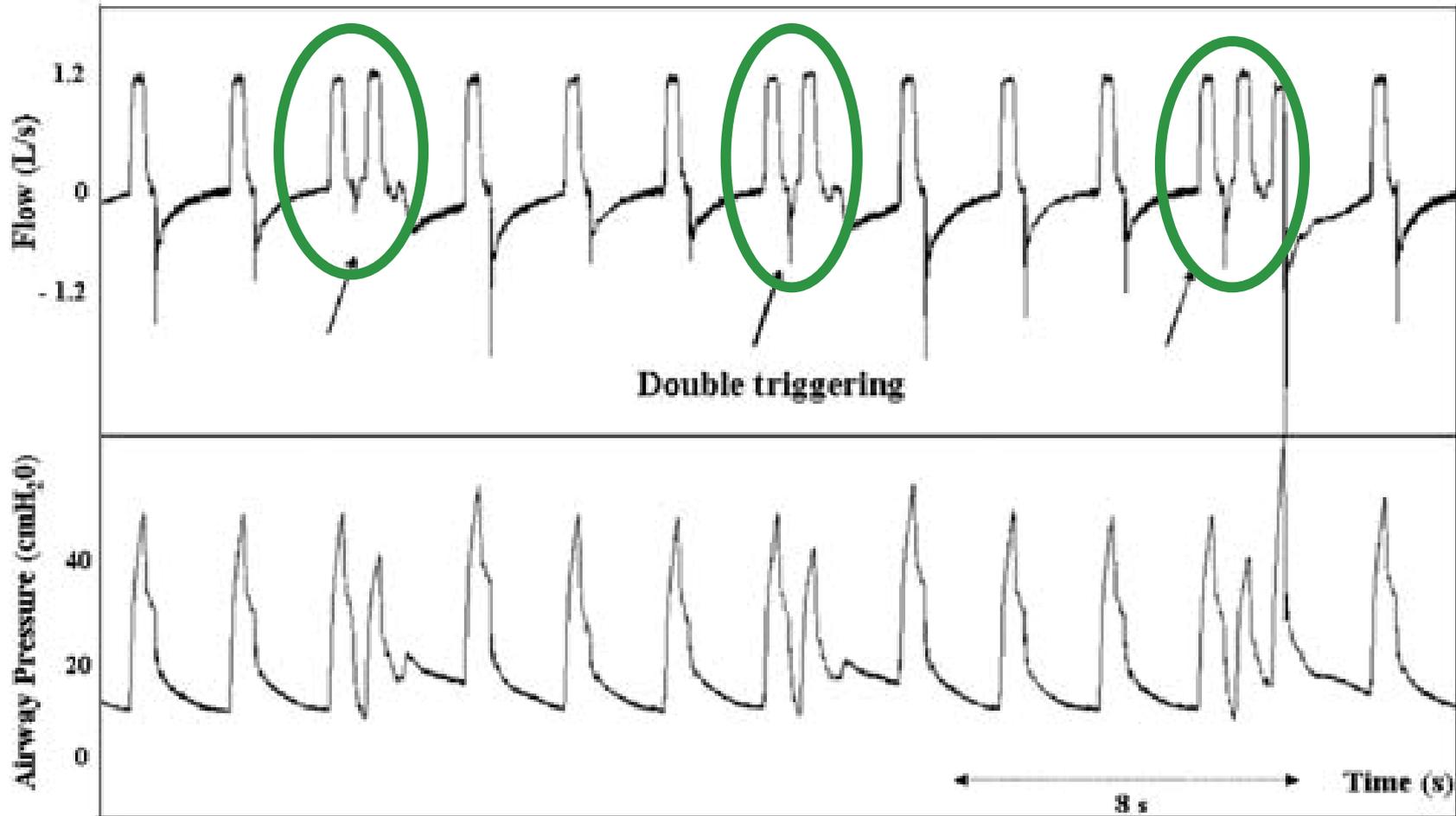
double-déclenchement

1 effort inspiratoire → déclenche 2 cycles



double-déclenchement

≈ sous-assistance



Incidence des asynchronies en VNI

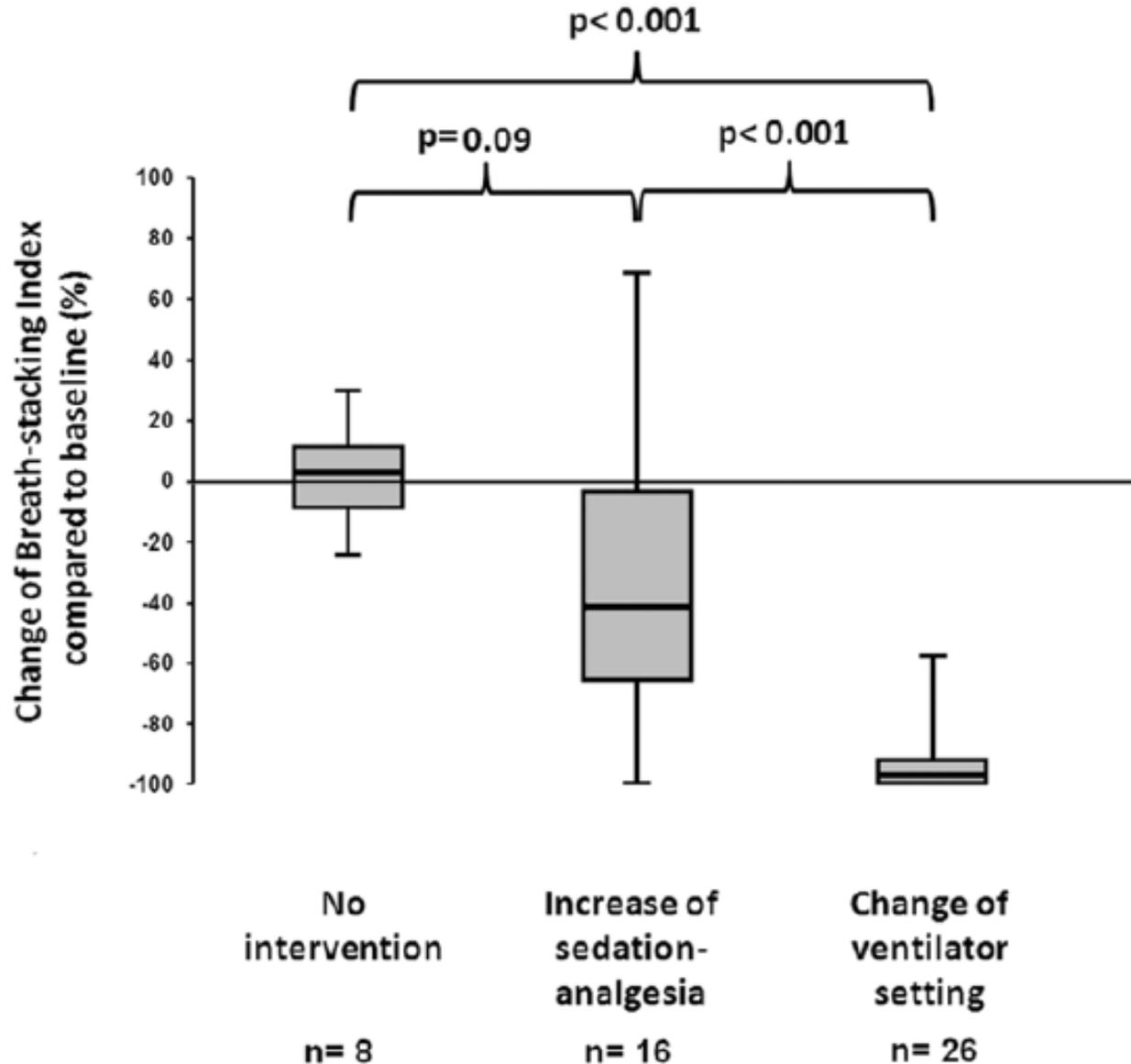
60 patients en VNI
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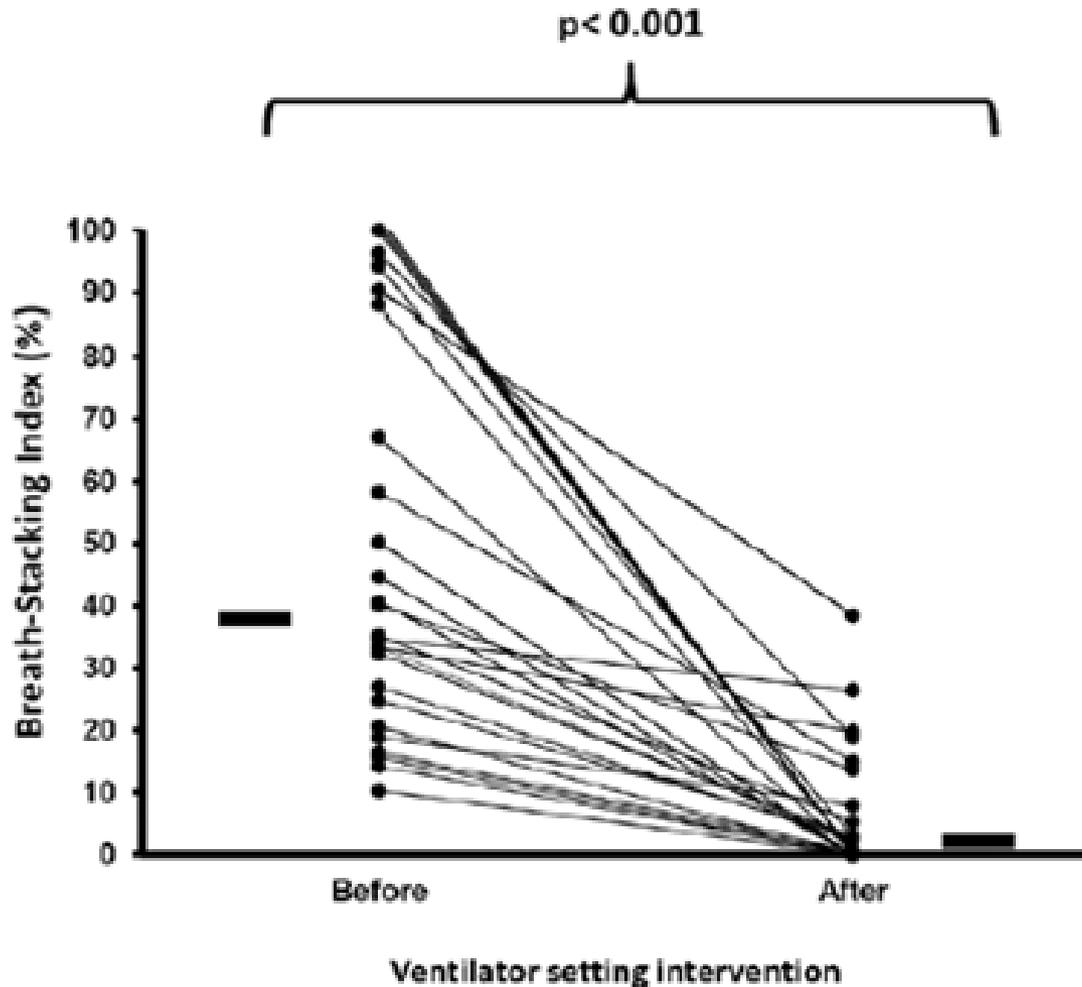
Effort inefficace	Auto-déclenchement	Double-déclenchement	Cyclage prématuré	Insufflation prolongée
8 (13%)	12 (20%)	9 (15%)	7 (12%)	14 (23%)

Double-triggering - Intervention



Double-triggering - Intervention

Ventilator settings

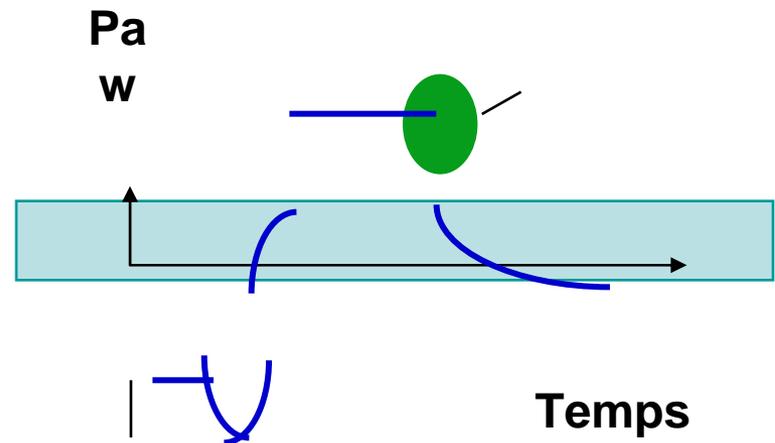


n= 26

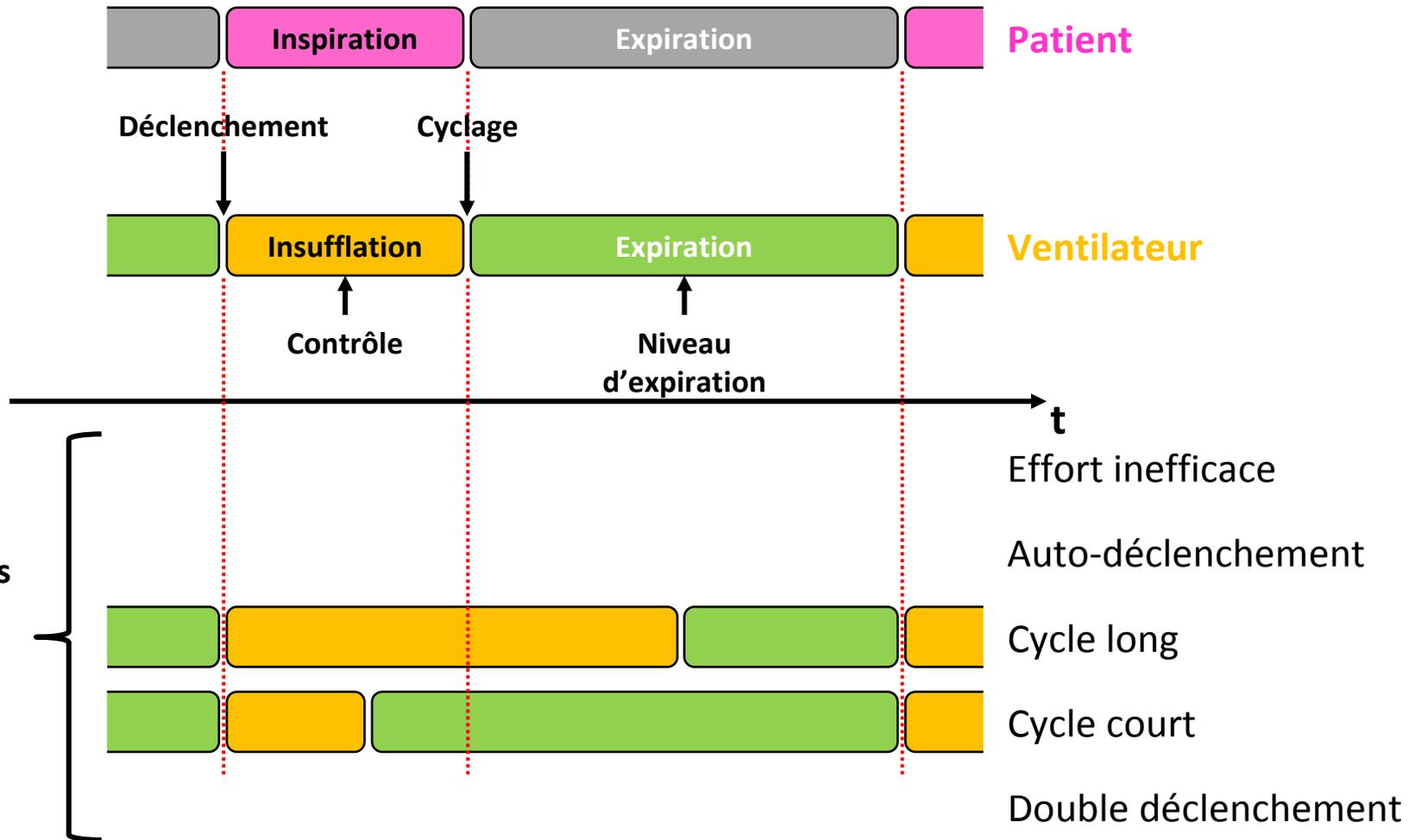
Chanques et coll. Crit Care Med 2013

asynchronie de fin d'insufflation

- **cycle court**
- **cycle long**



Principales asynchronies patient-ventilateur



Incidence des asynchronies en VNI

60 patients en VNI

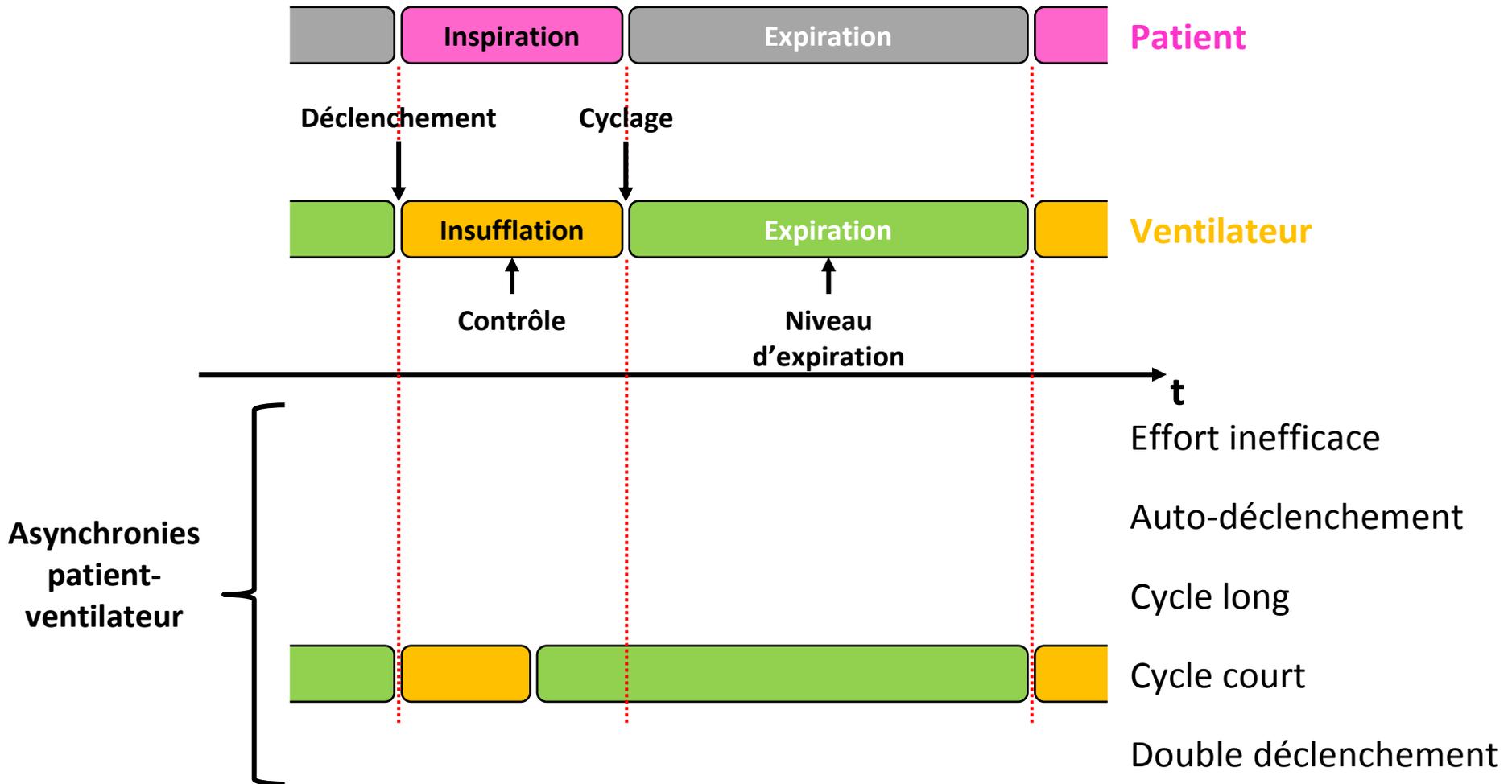
Evaluation de la synchronisation patient-ventilateur durant 30 minutes

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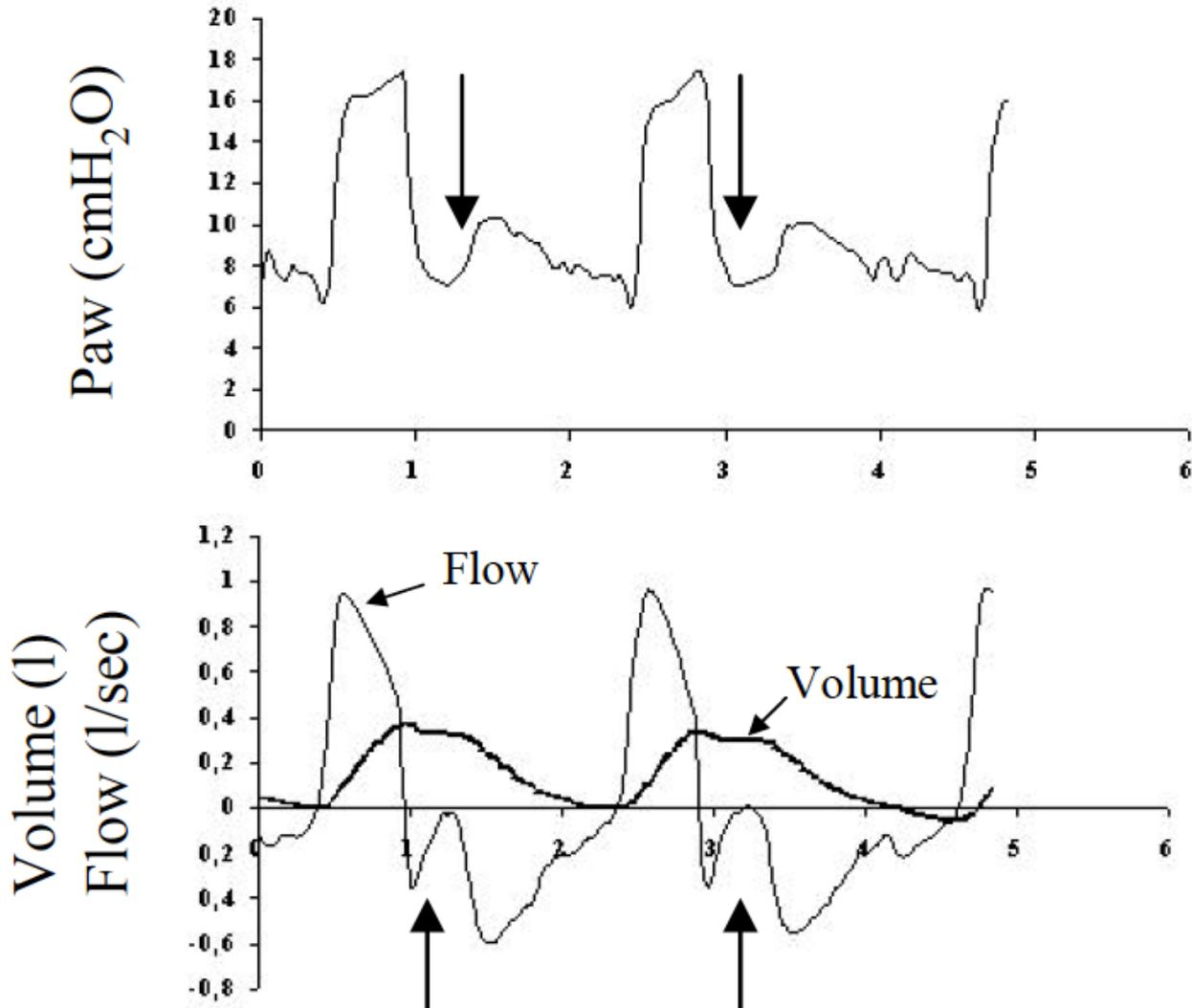
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Principales asynchronies patient-ventilateur



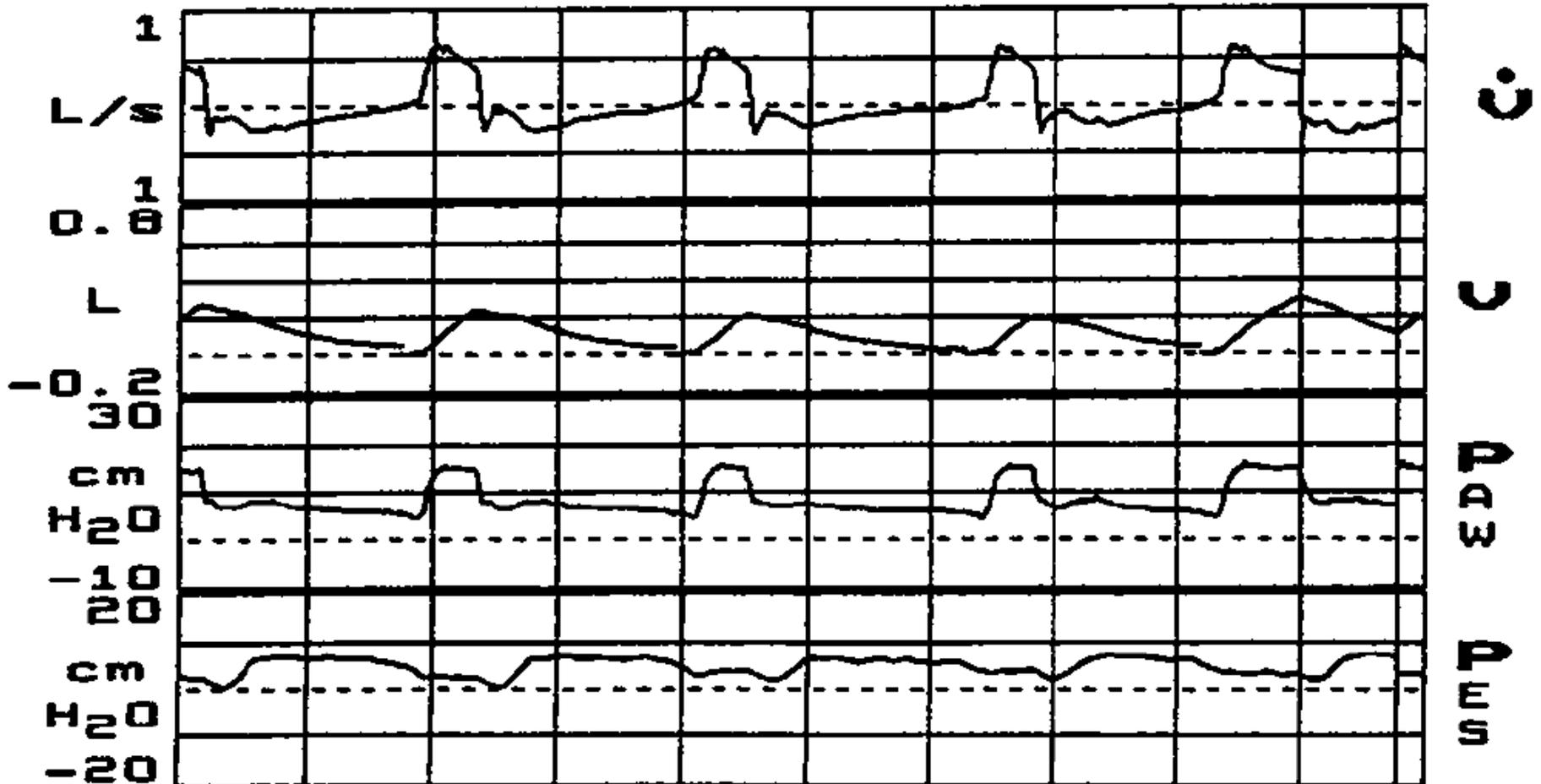
cycle court

durée < 50 % du Ti moyen



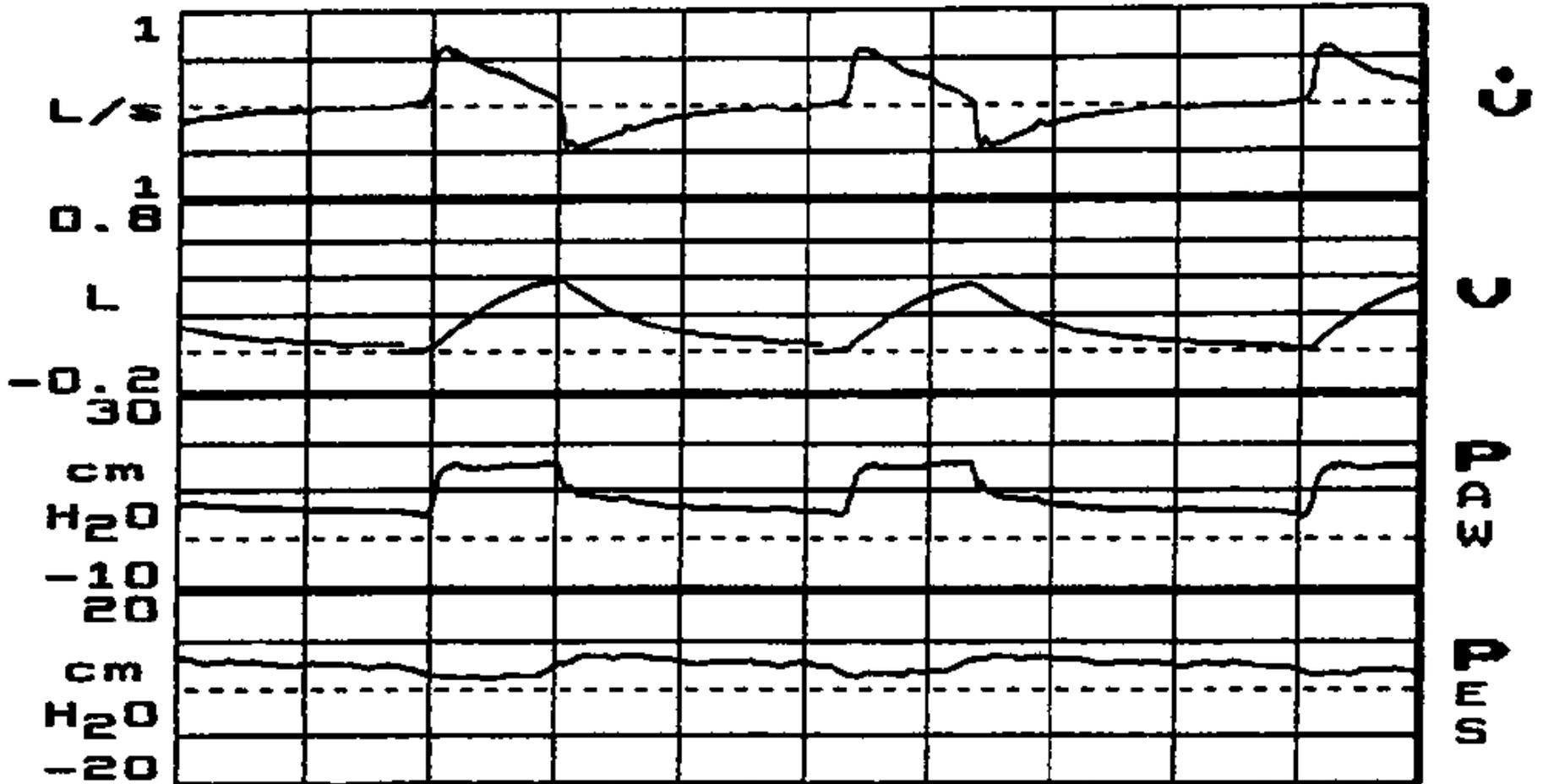
Niveau de Trigger Expiratoire

Termination Criterion 35%



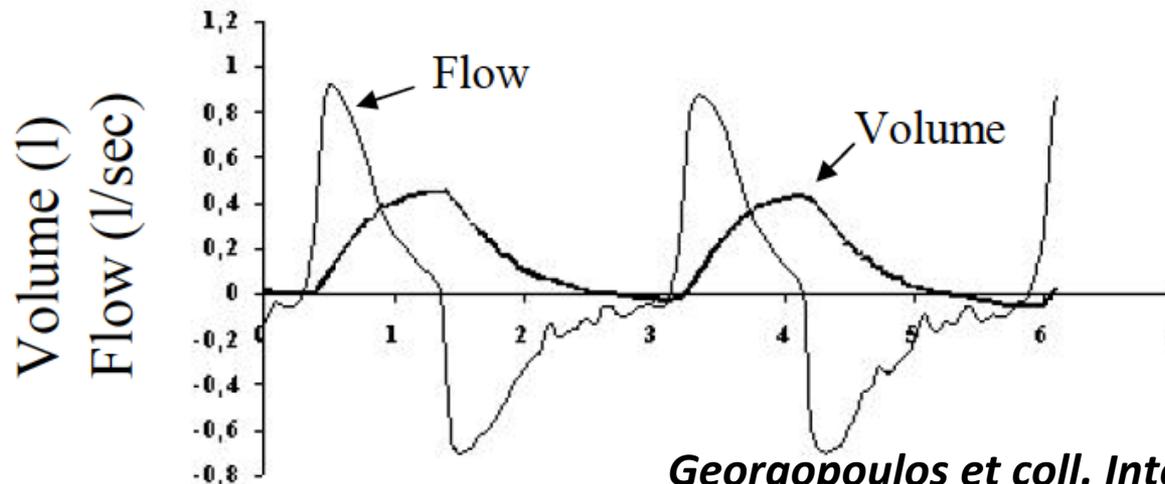
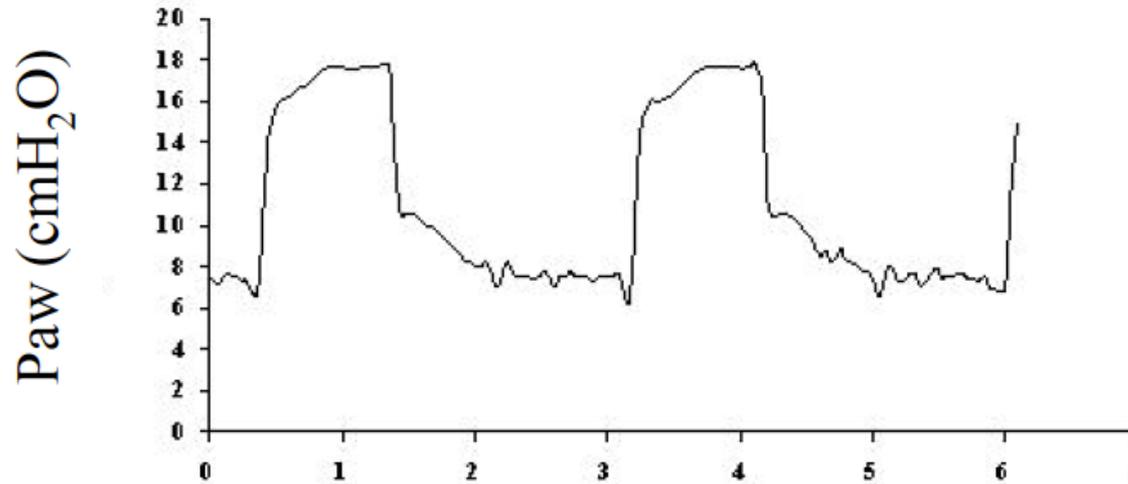
Niveau de Trigger Expiratoire

Termination Criterion 5%

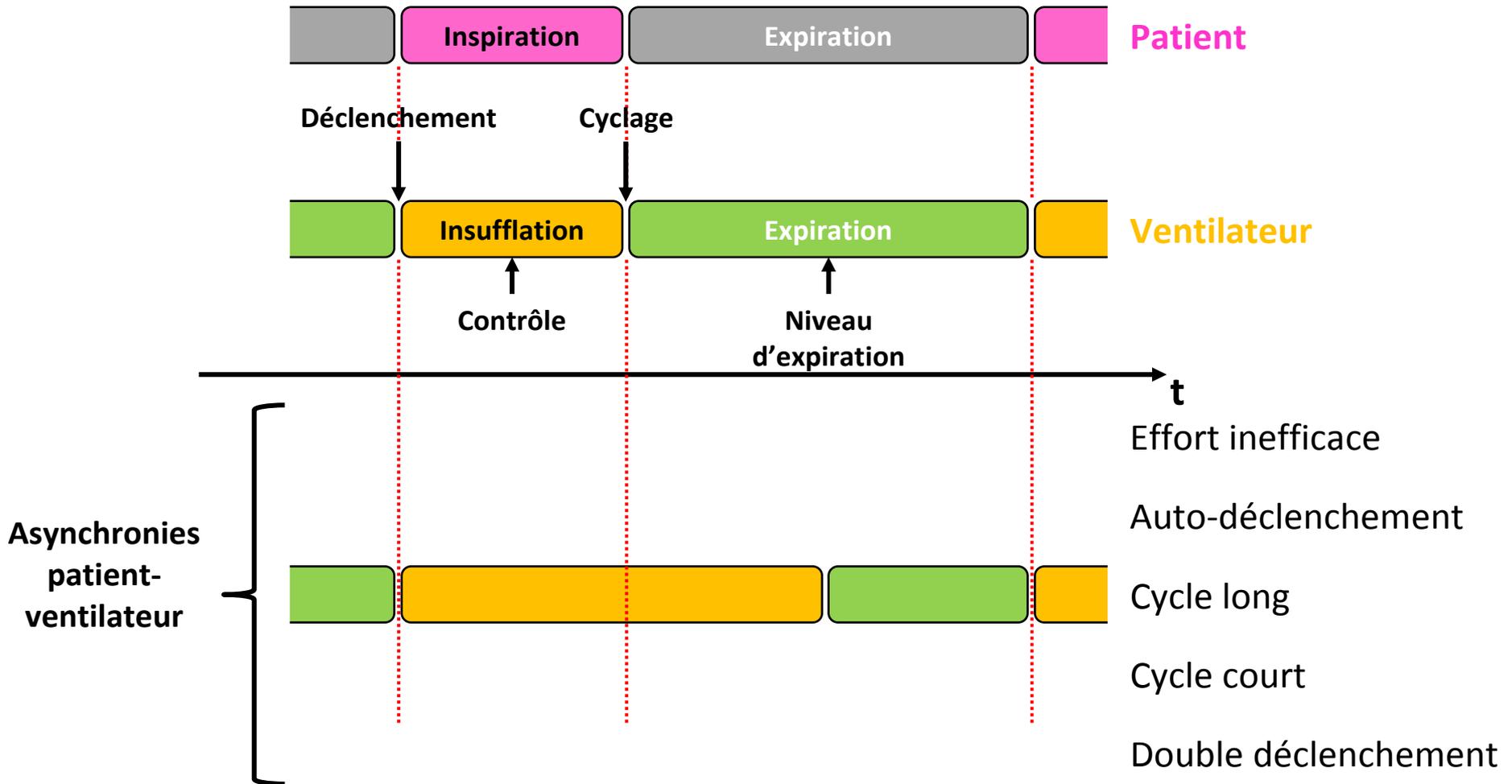


cycle count

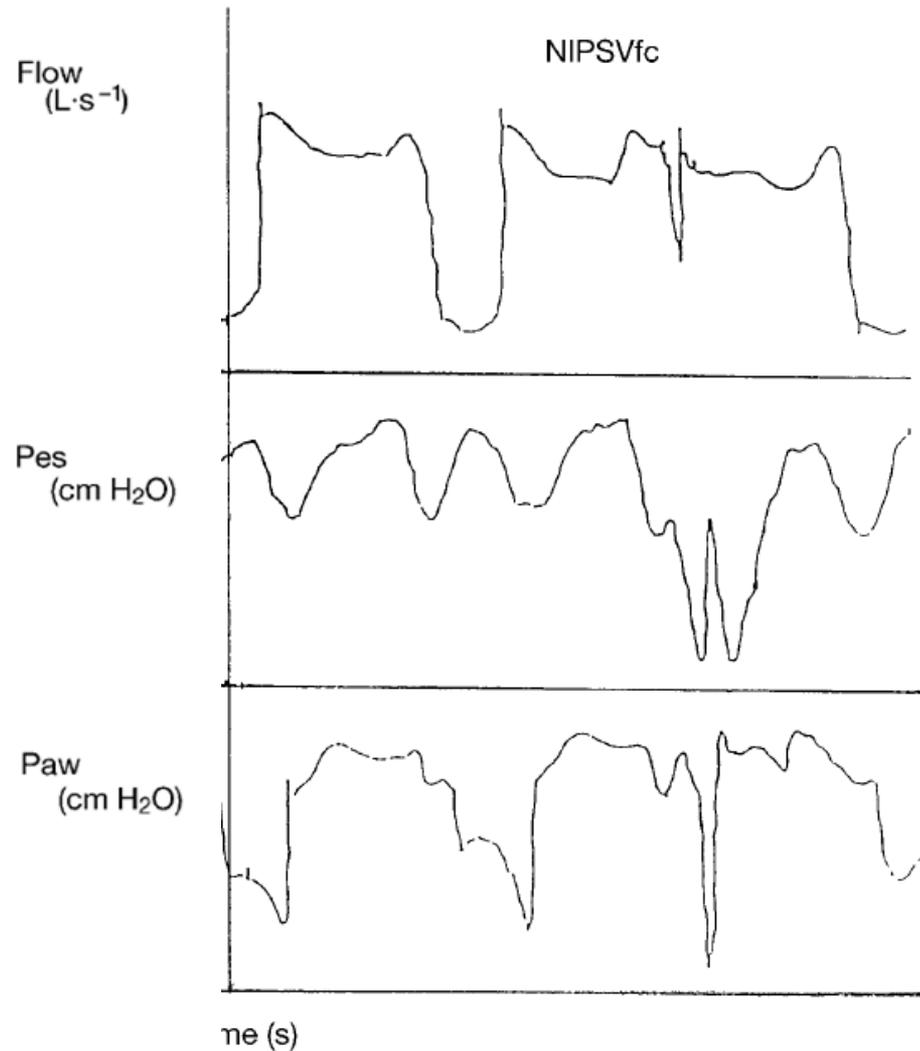
correction : ↓ trigger expiratoire



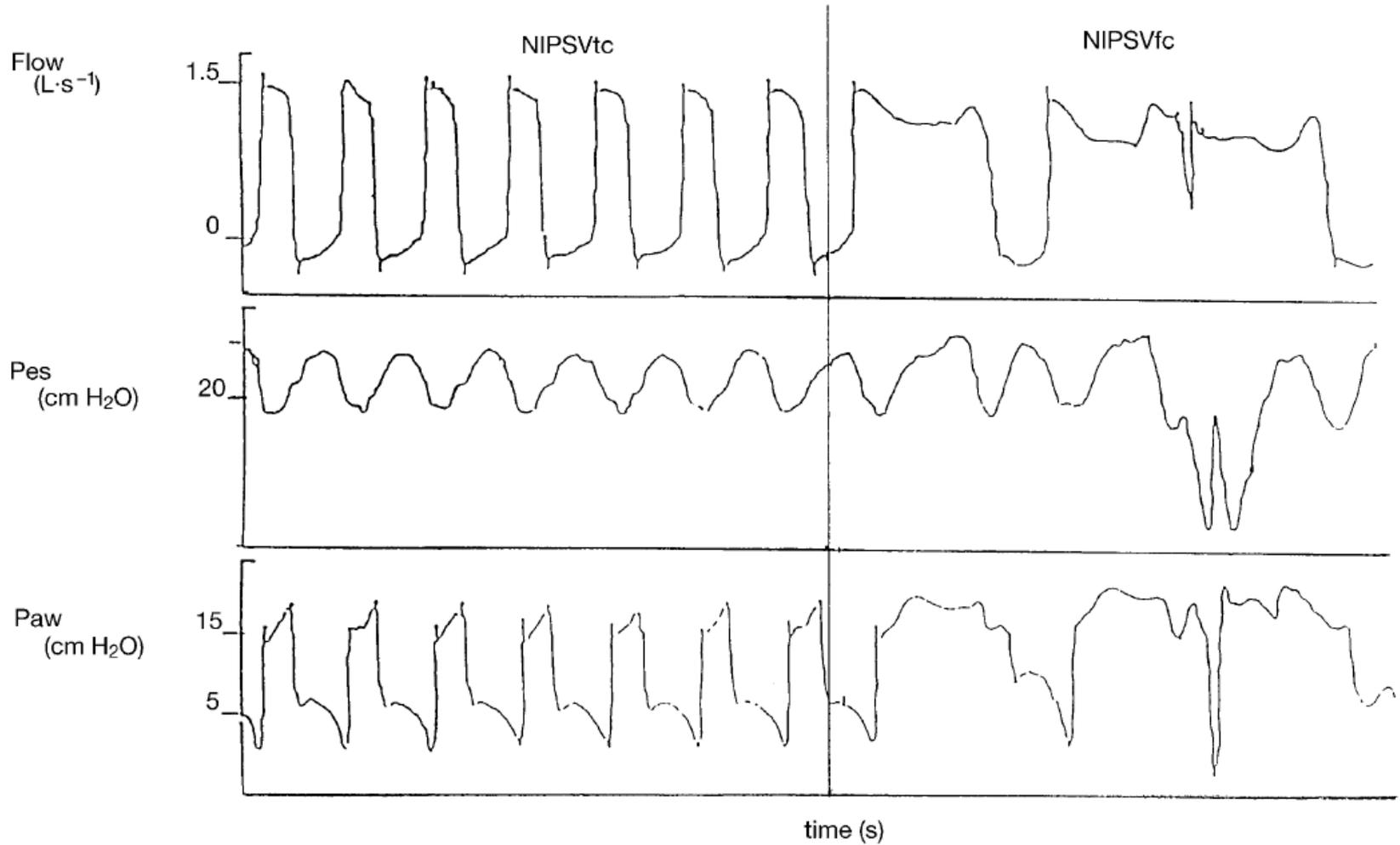
Principales asynchronies patient-ventilateur



Cycle long

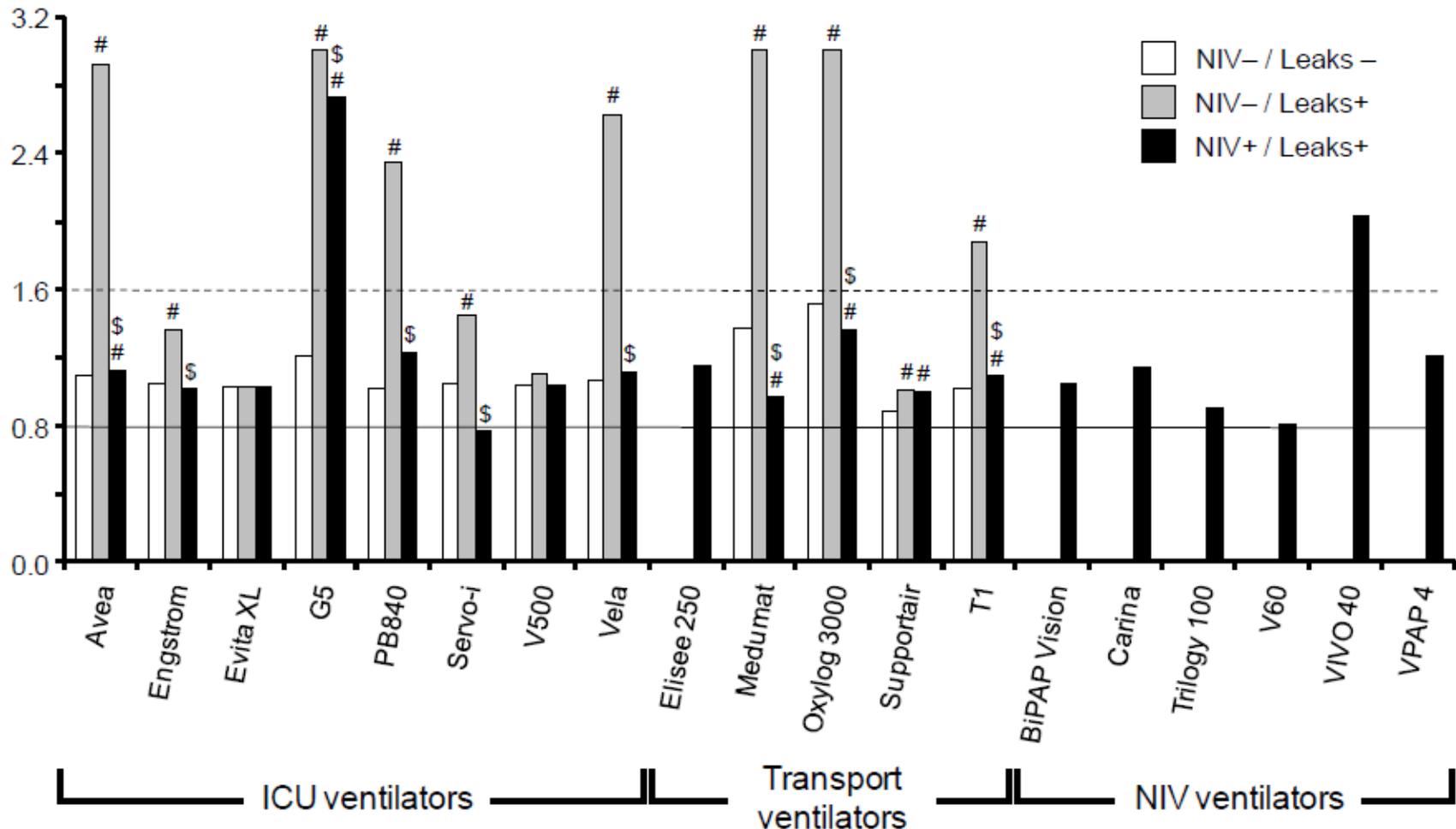


Cycle long



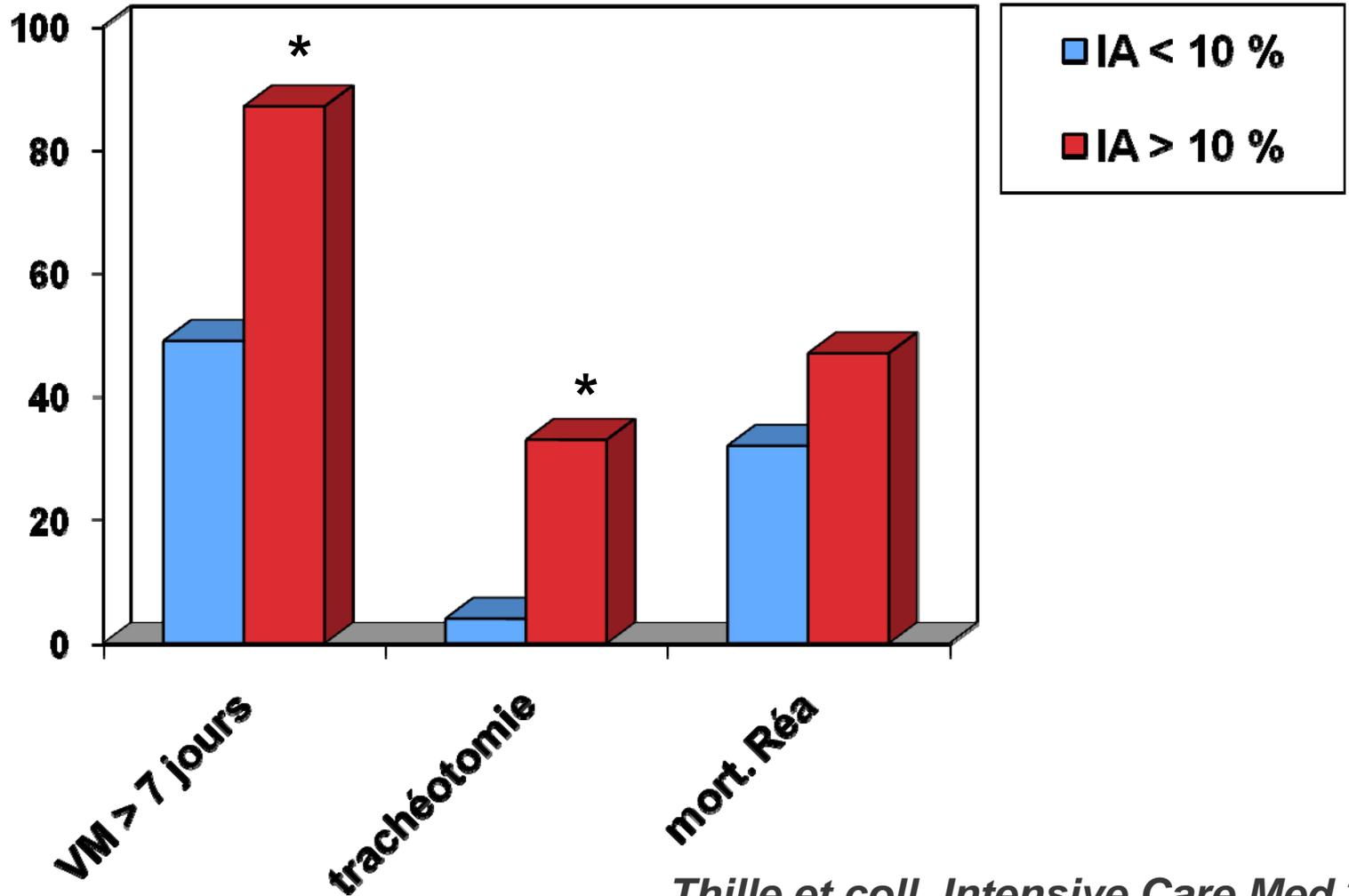
Bench Study - Insufflations prolongées

Insufflation time (s)



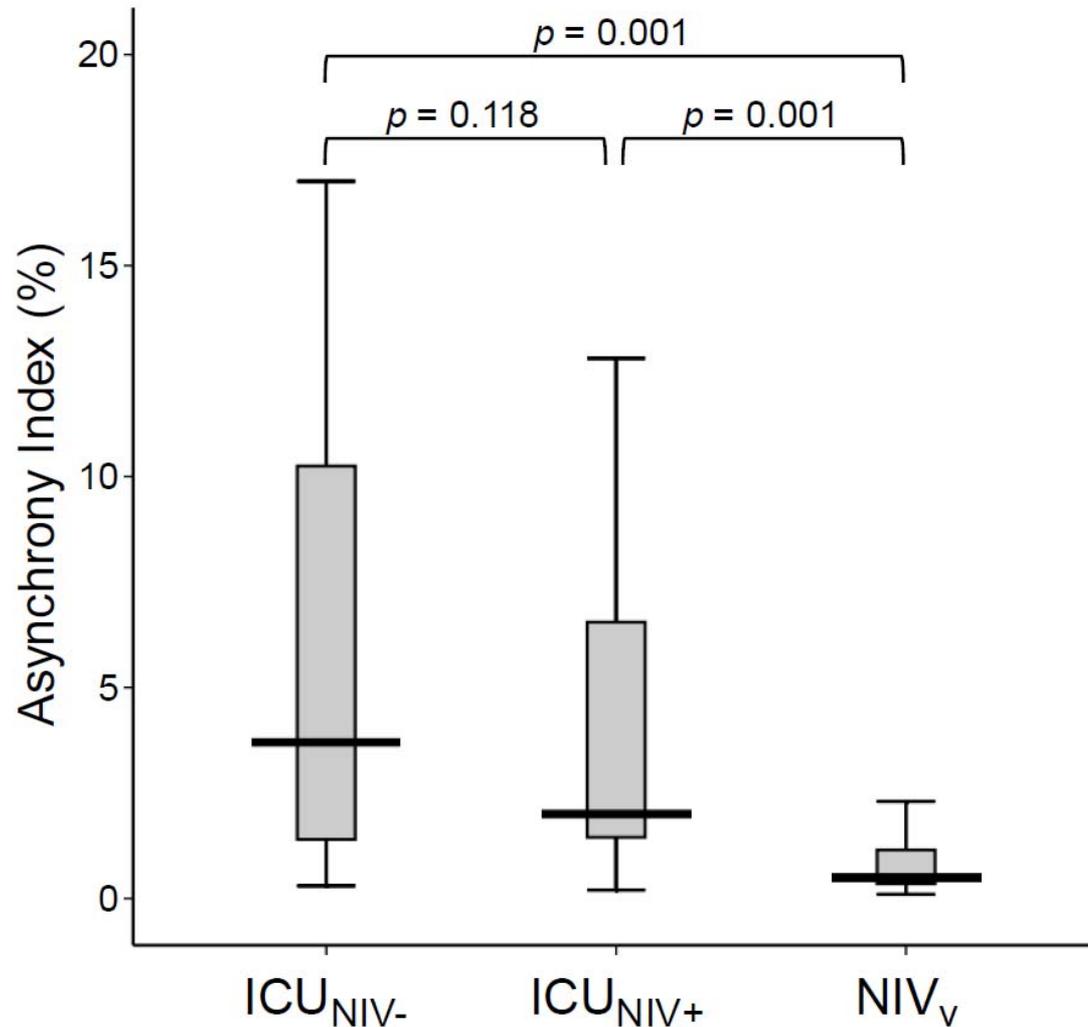
impact des asynchronies

pronostic

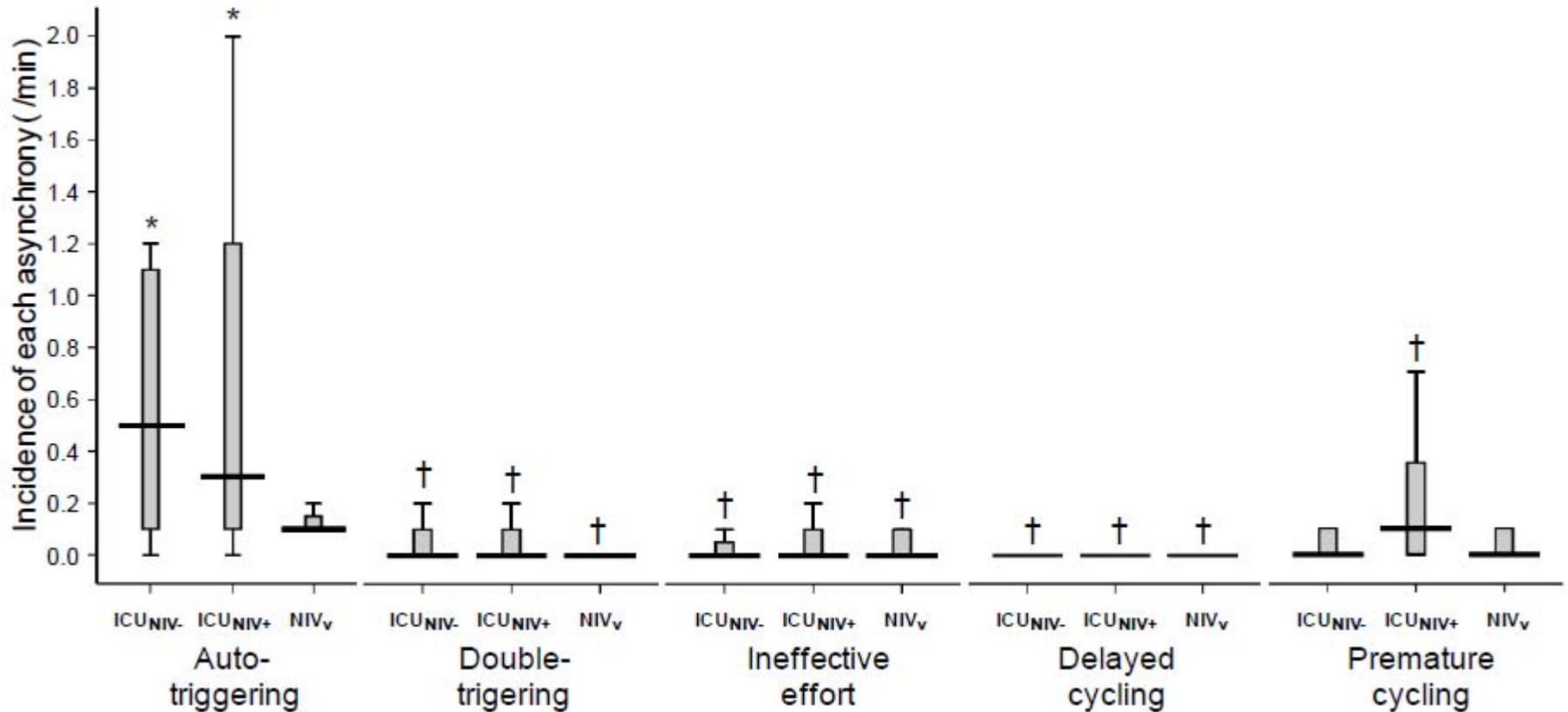


Clinical Study

Index d'asynchronie



Clinical Study - Incidence des asynchronie



conclusion

Les asynchronies en VNI

- **Fréquentes et variées**
- **Liées aux fuites, autres facteurs**
- **Améliorées par**
 - Ventilateur, algorithme
 - Optimisation des réglages, selon le patient
- **Conséquences ? Pronostic ?**