

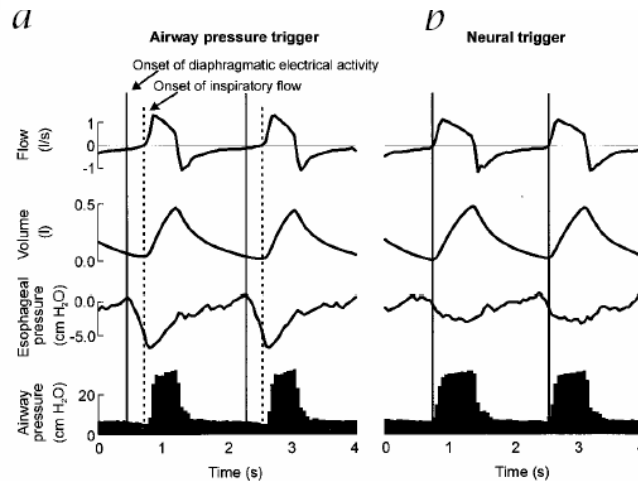
ACTUALITES EN VENTILATION

Progrès et pièges des nouveaux respirateurs

Professeur Jean-Christophe M Richard
UPRES EA 38 30
Rouen

Two decades of advances in MV...

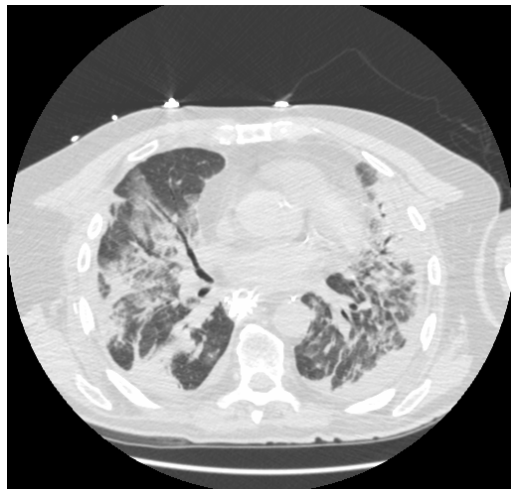
Patient-vent. interaction



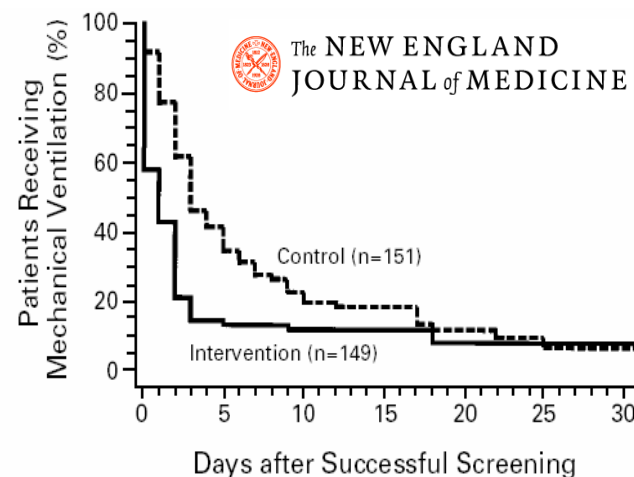
Noninvasive ventilation



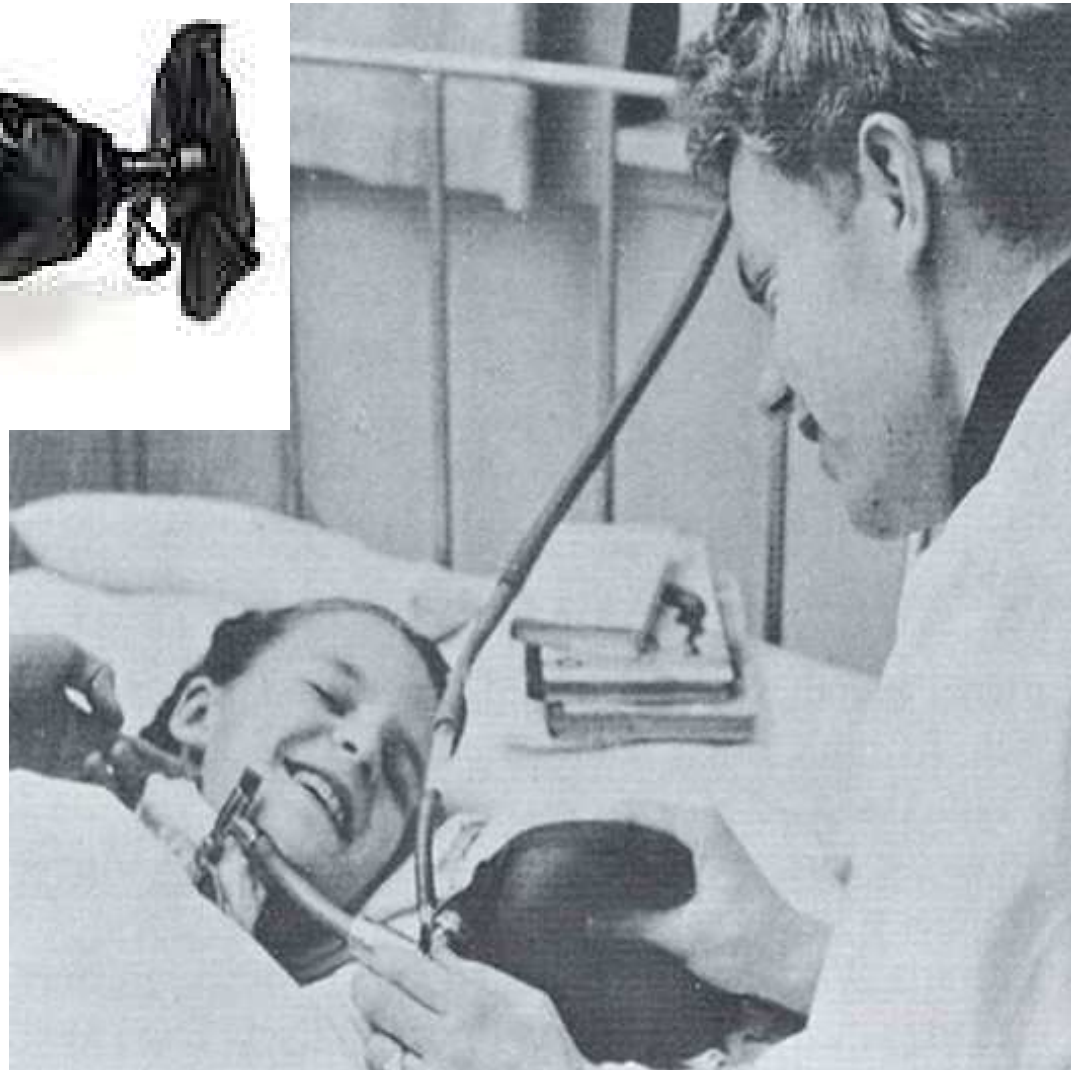
Protective ventilation



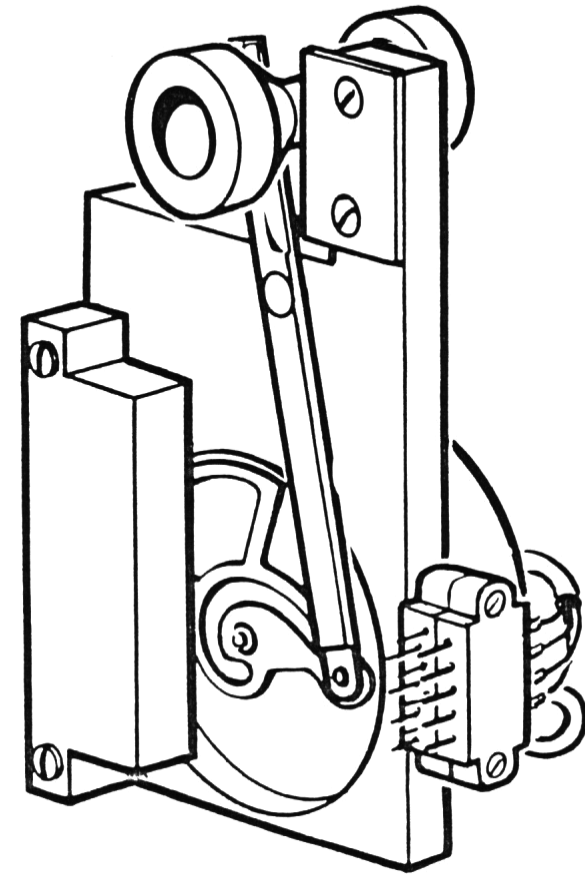
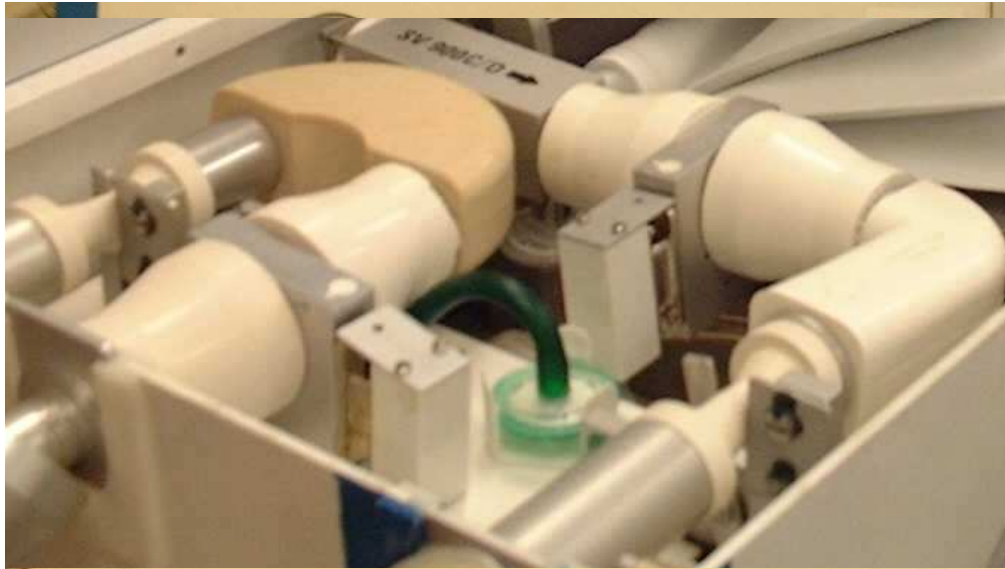
Weaning



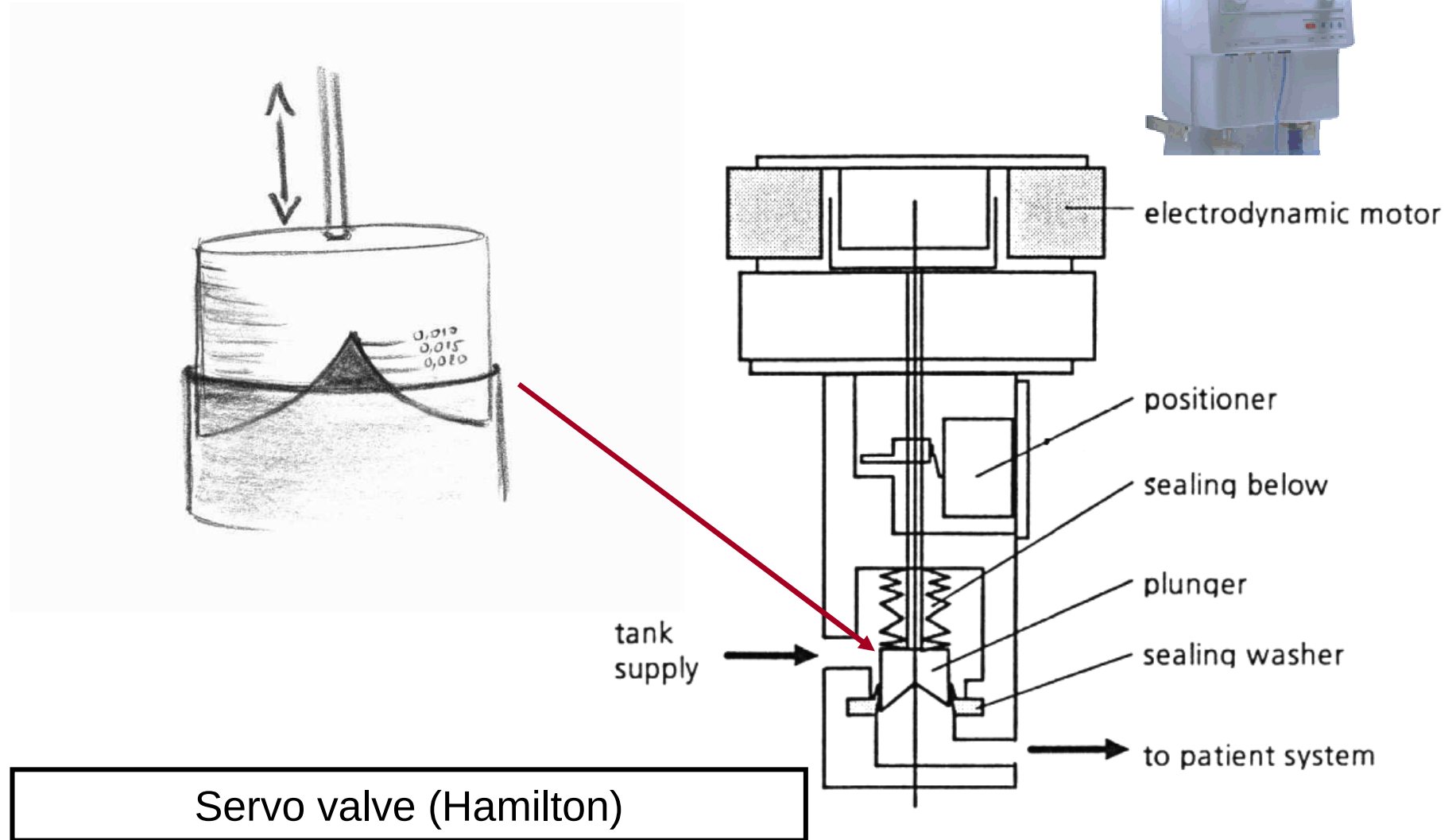
Severinghaus and Astrup, Copenhagen, 1952



Conventional scissor valve



Inspiratory valves on ICU ventilators

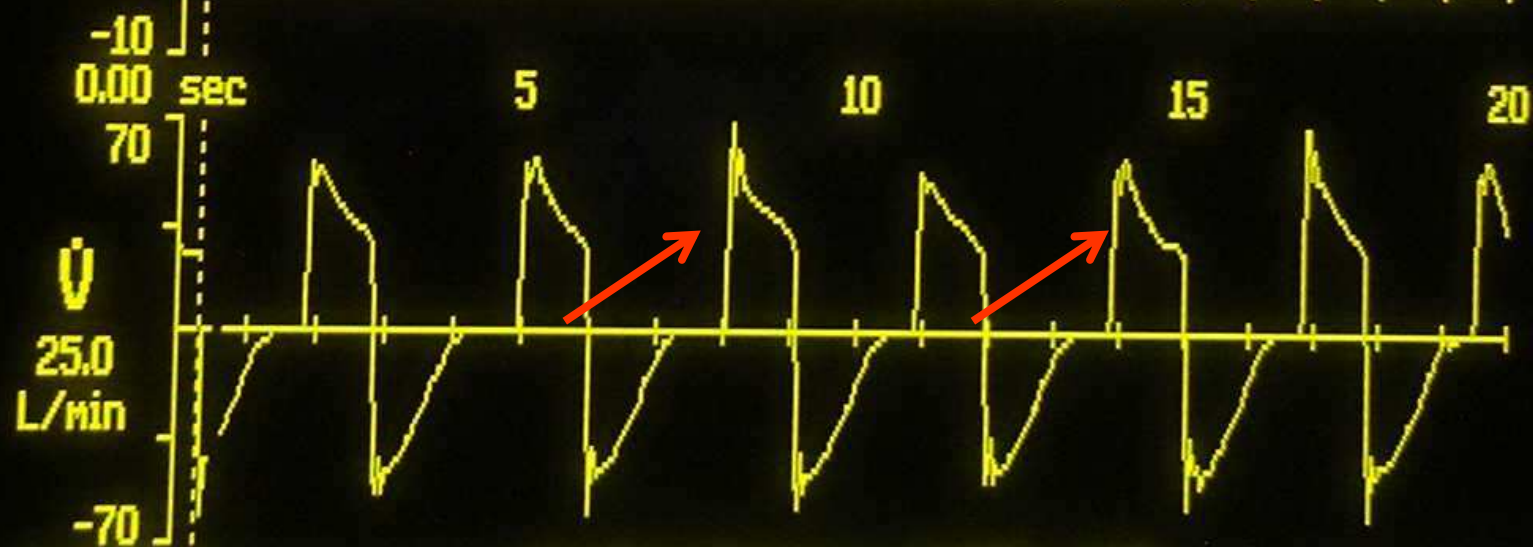


Turbine



Courbes Figees

9-4-02 11:26



Vt 507 mL

Courbes Figees à: 9-4-02 11:25

REDESSIN

CHOIX

← CURSEUR

CURSEUR →

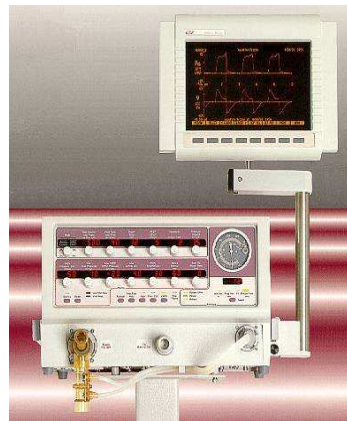
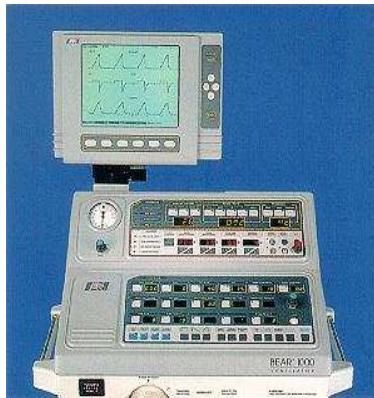
BOUCLE ?

REF/MEM

IMPRIMER

COURBES

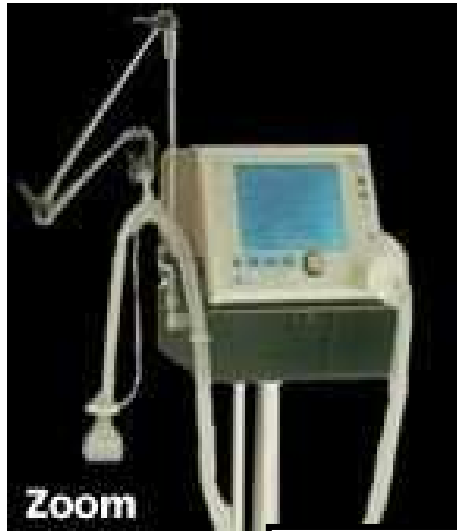
First generation of ICU ventilators



Last generation of ICU ventilators



Ventilators based on specific pressurisation system



Zoom

Turbine

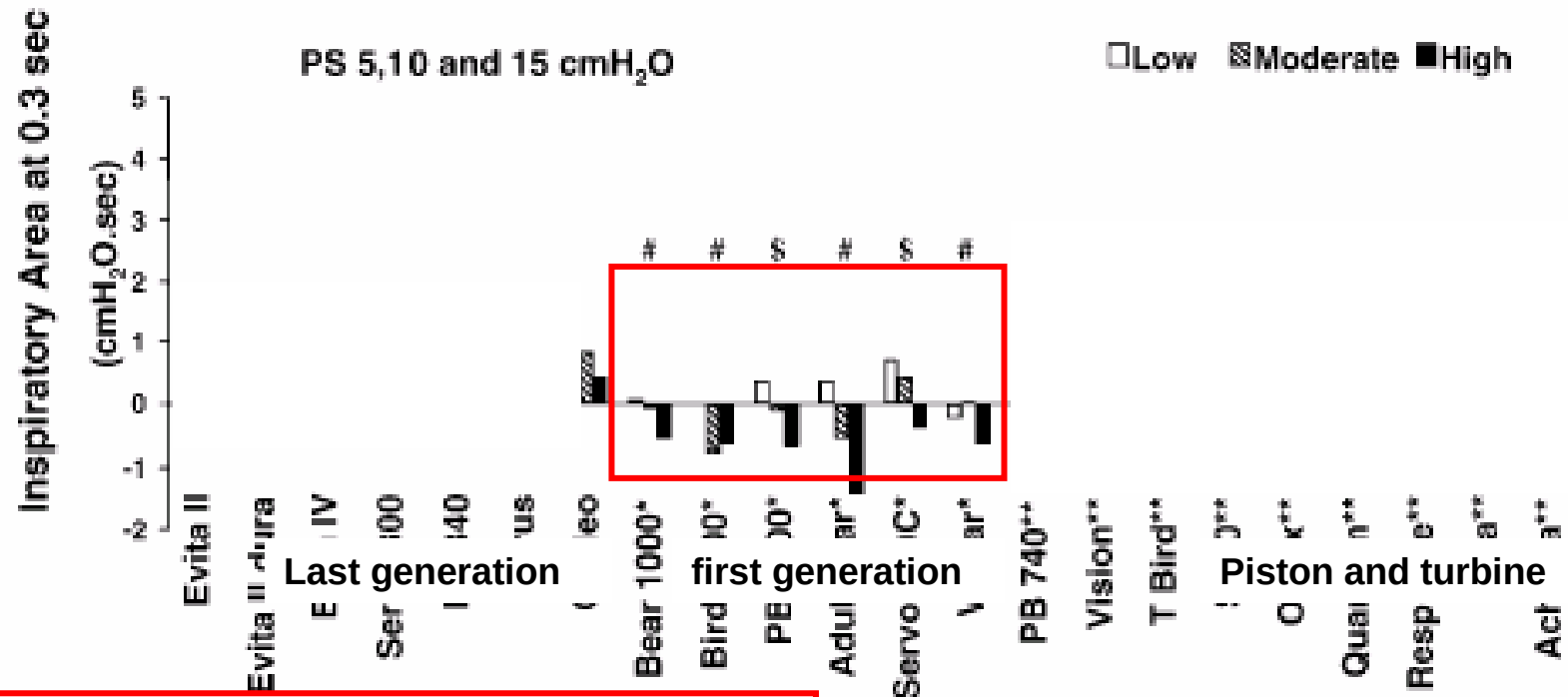
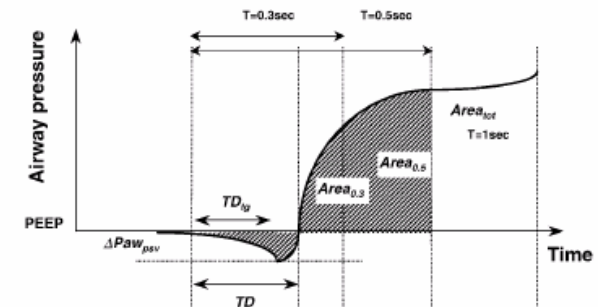


Piston

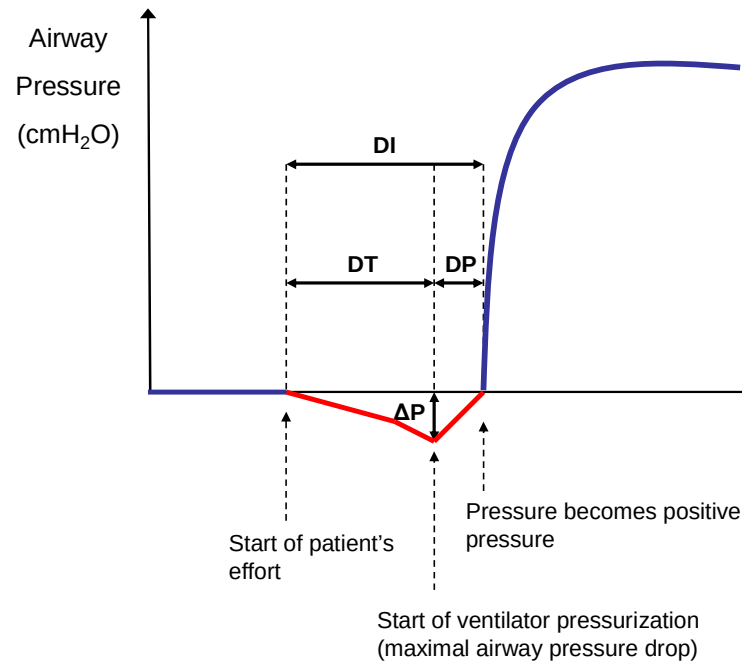


J.-C. Richard
A. Carlucci
L. Breton

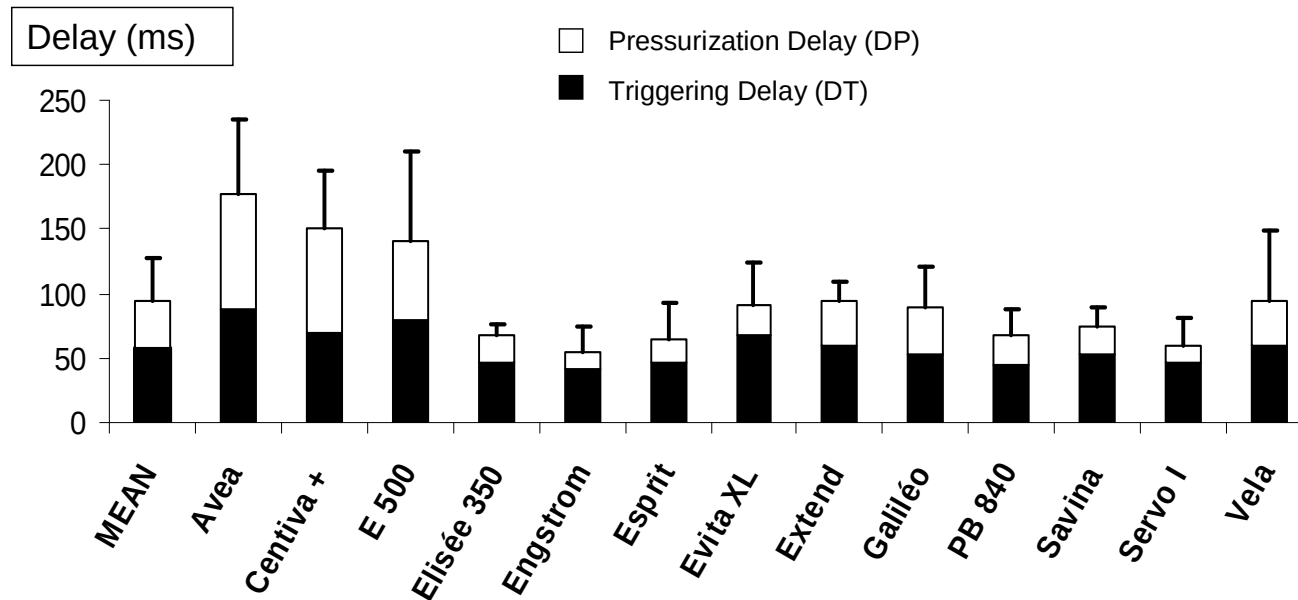
Bench testing of pressure support ventilation with three different generations of ventilators

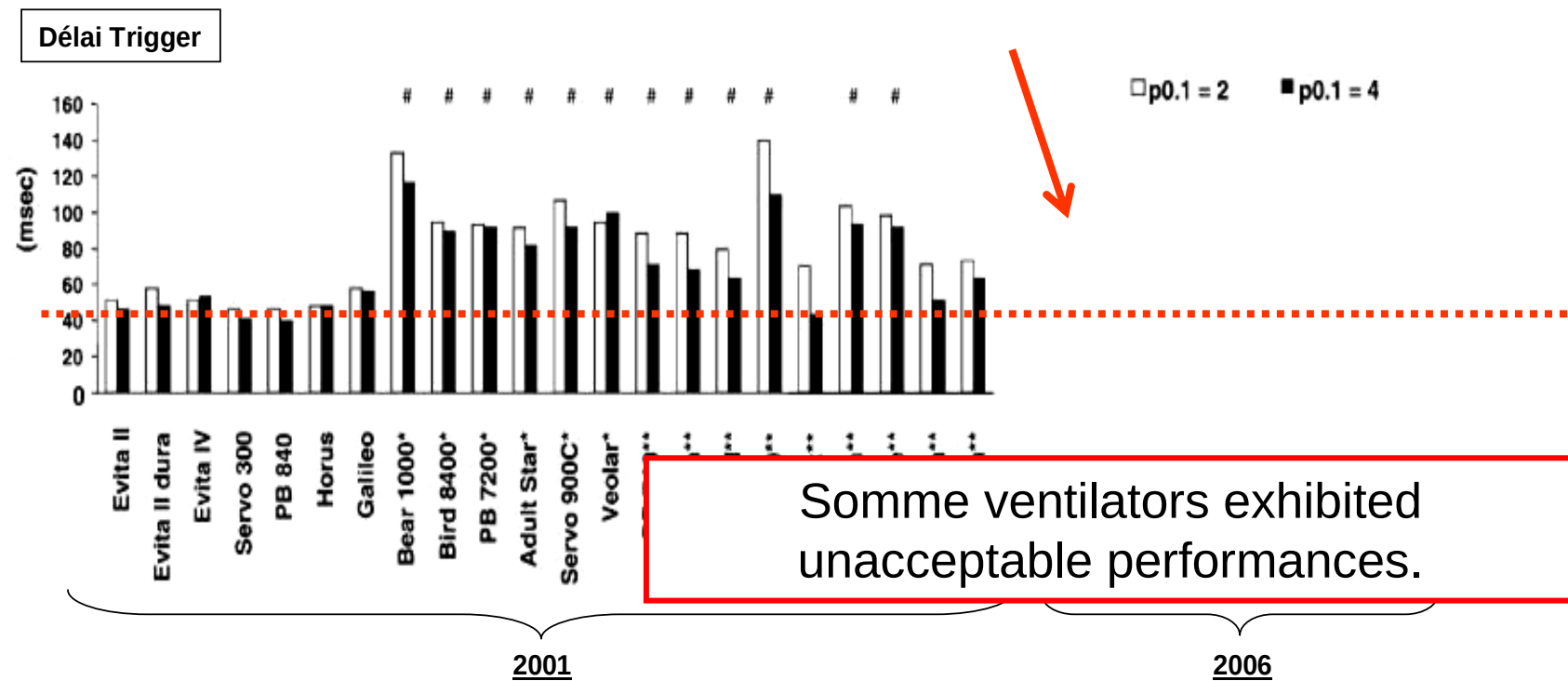


The higher the area under the pressure time curve the greater are the performances



The area under the curve depends on both the trigger delay and the pressurization delivered by the ventilator

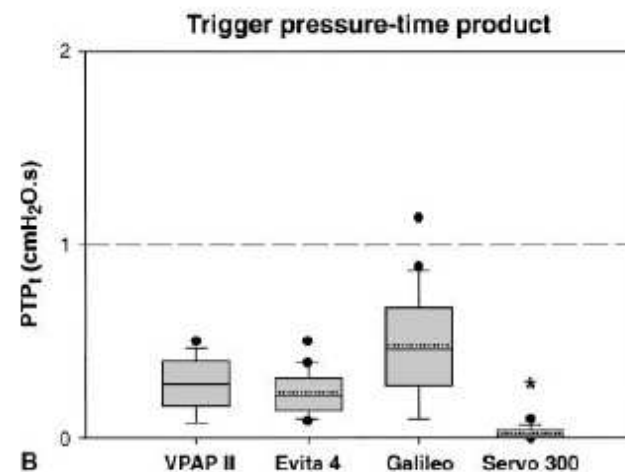
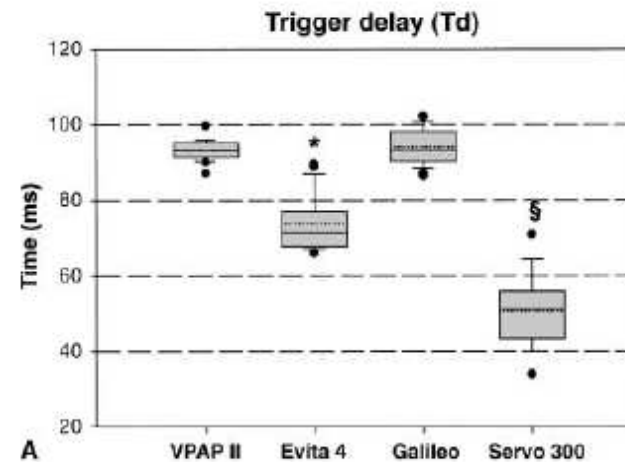
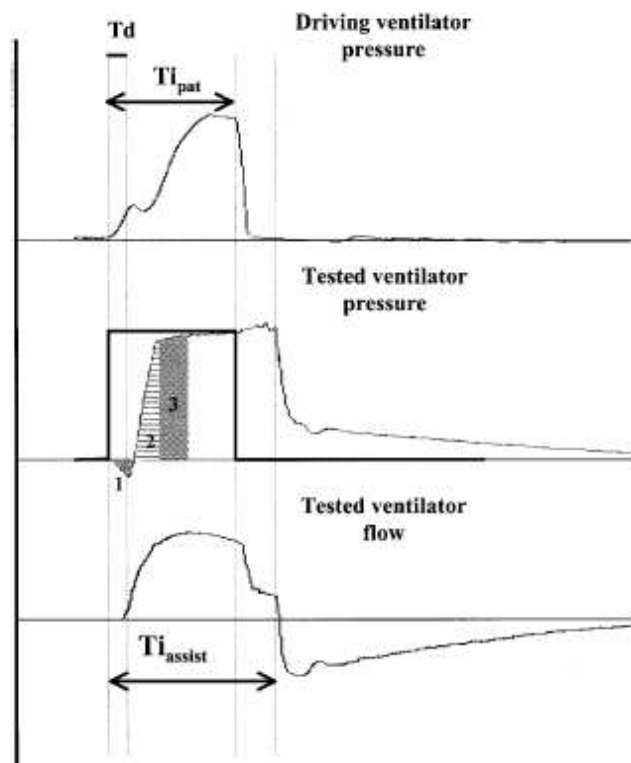




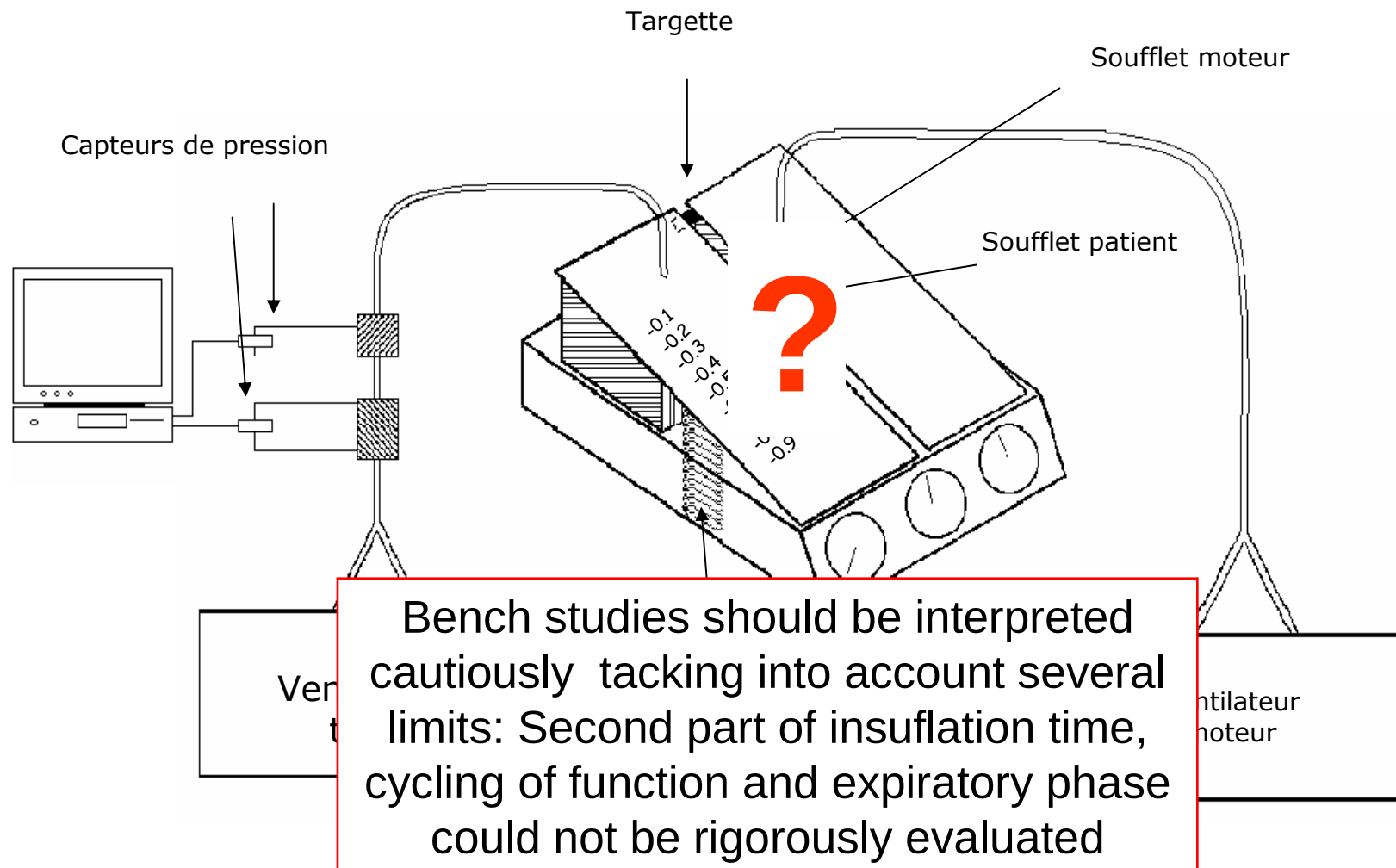
A Thille, A Liazidi, JC M Richard, L Brochard

Didier Tassaux
Susannah Strasser
Silvana Fonseca
Eric Dalmas
Philippe Jolliet

Comparative bench study of triggering, pressurization, and cycling between the home ventilator VPAP II and three ICU ventilators



Bench lung model



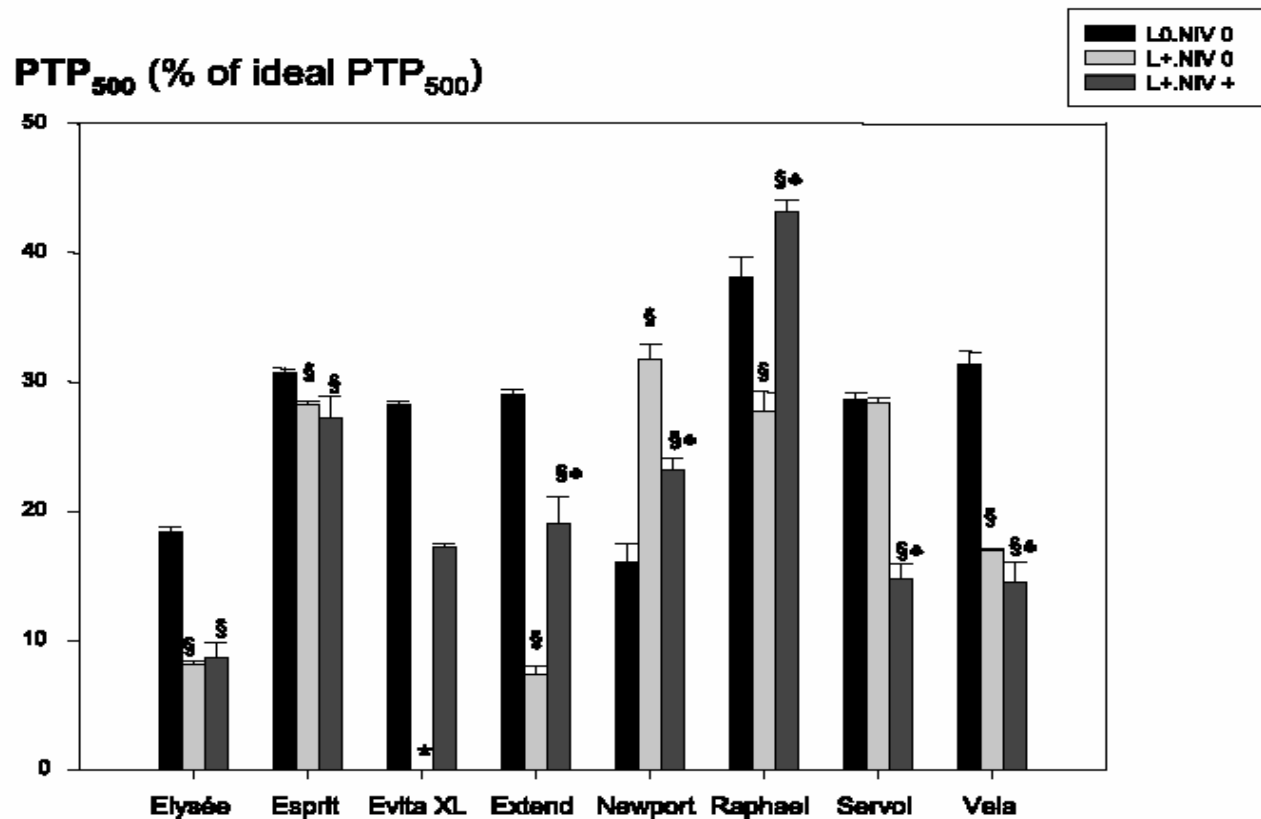


Laurence Vignaux
Didier Tassaux
Philippe Jolliet

Performance of noninvasive ventilation modes on ICU ventilators during pressure support: a bench model study

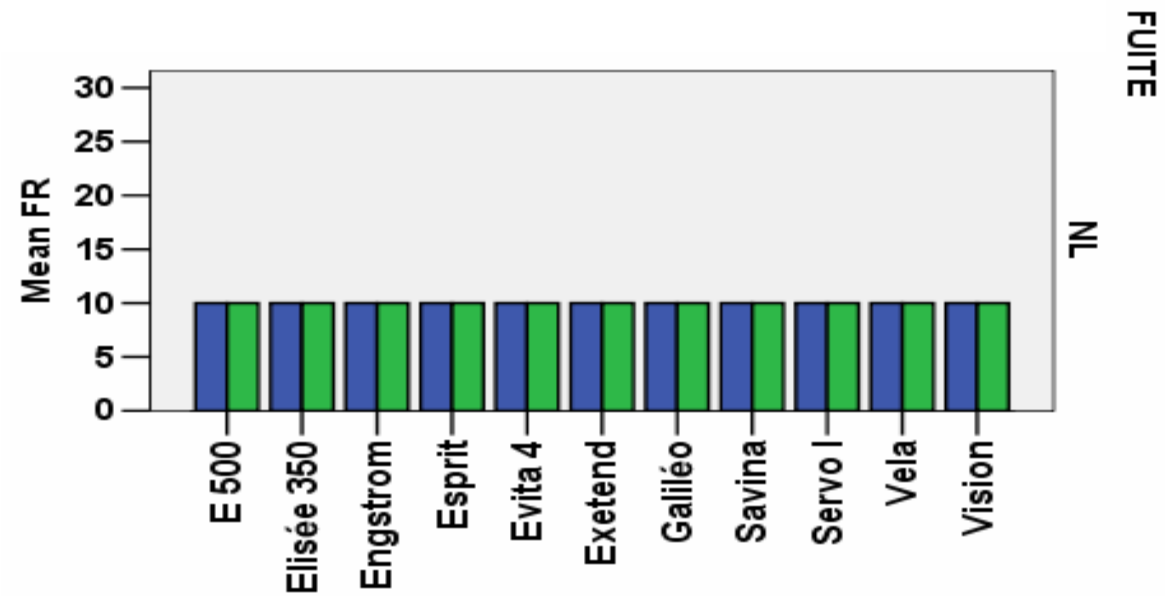
Fig. 4 Pressure time product at 500 ms (PTP_{500}) with the eight ICU ventilators tested under three conditions: no leaks and no NIV mode ($L0.NIV0$), leaks and no NIV mode ($L+.NIV0$), leaks and NIV mode ($L+.NIV+$). Histogram bars Mean $\pm$ SD. § $p < 0.05$ vs. $L0.NIV0$, * $p < 0.05$ vs. $L+.NIV0$ (analysis of variance), *impossible to measure because of autotriggering

PTP_{500} (% of ideal PTP_{500})



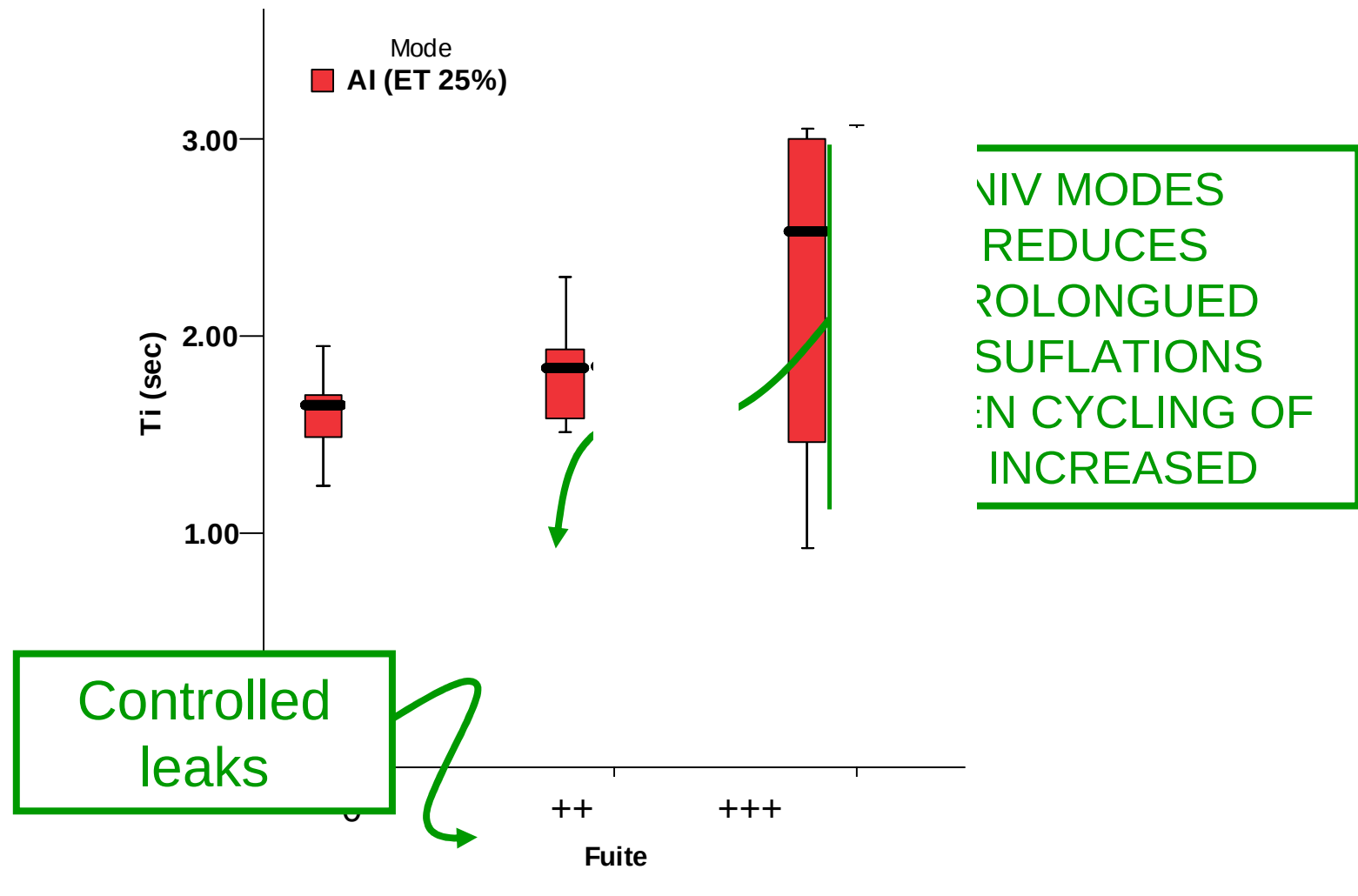
Self triggering with NIV modes

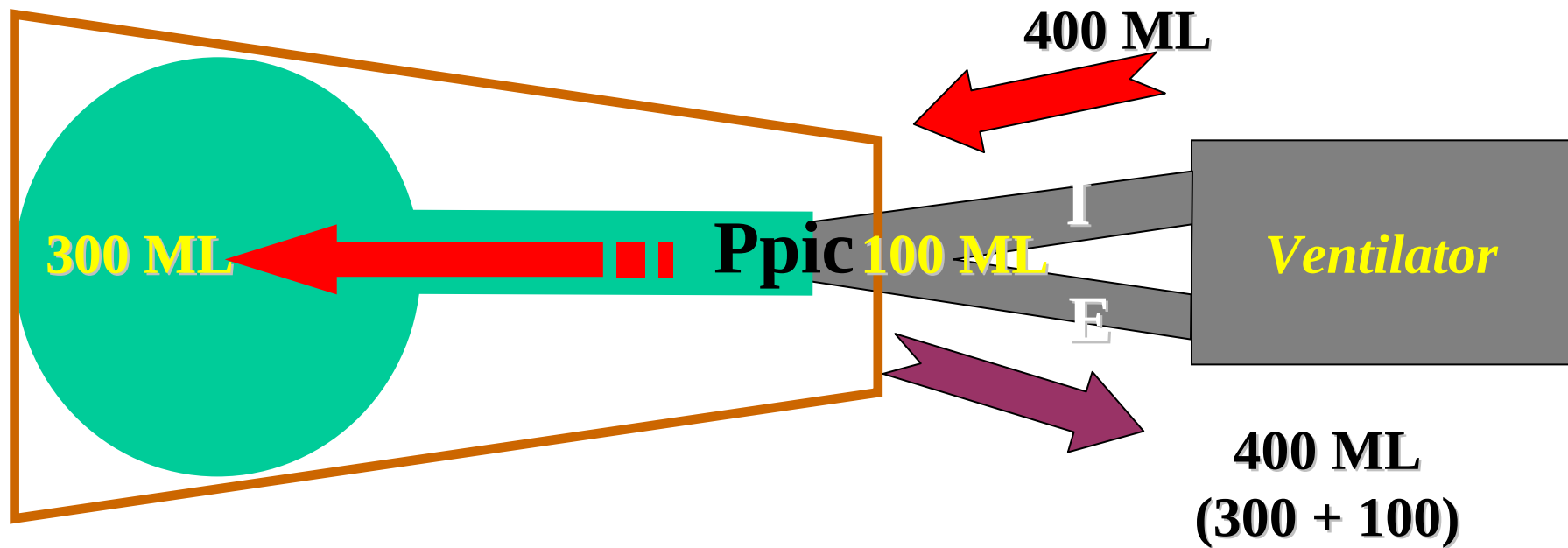
NIV mode reduces self triggering due to leaks



Impact of NIV mode on prolonged insufflation

11 ventilators (3 turbines et 8 conventionnels) on bench

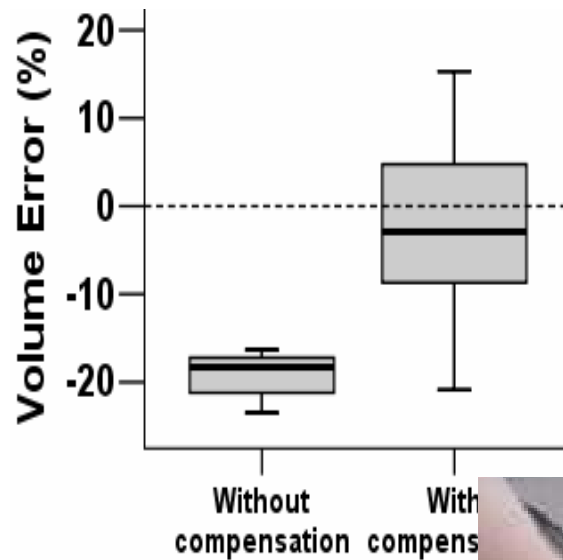




C circuit= 2 mL/cmH₂O
Ppic = 50 cm H₂O
Vol compressed = 100 mL

HOW ICU VENTILATORS COMPENSATE FOR COMPRESSED GAS VOLUME. A BENCH TEST

Modern technology allows to automatically compensate the volume compressed into the circuit



Error Vt 300 (ml)

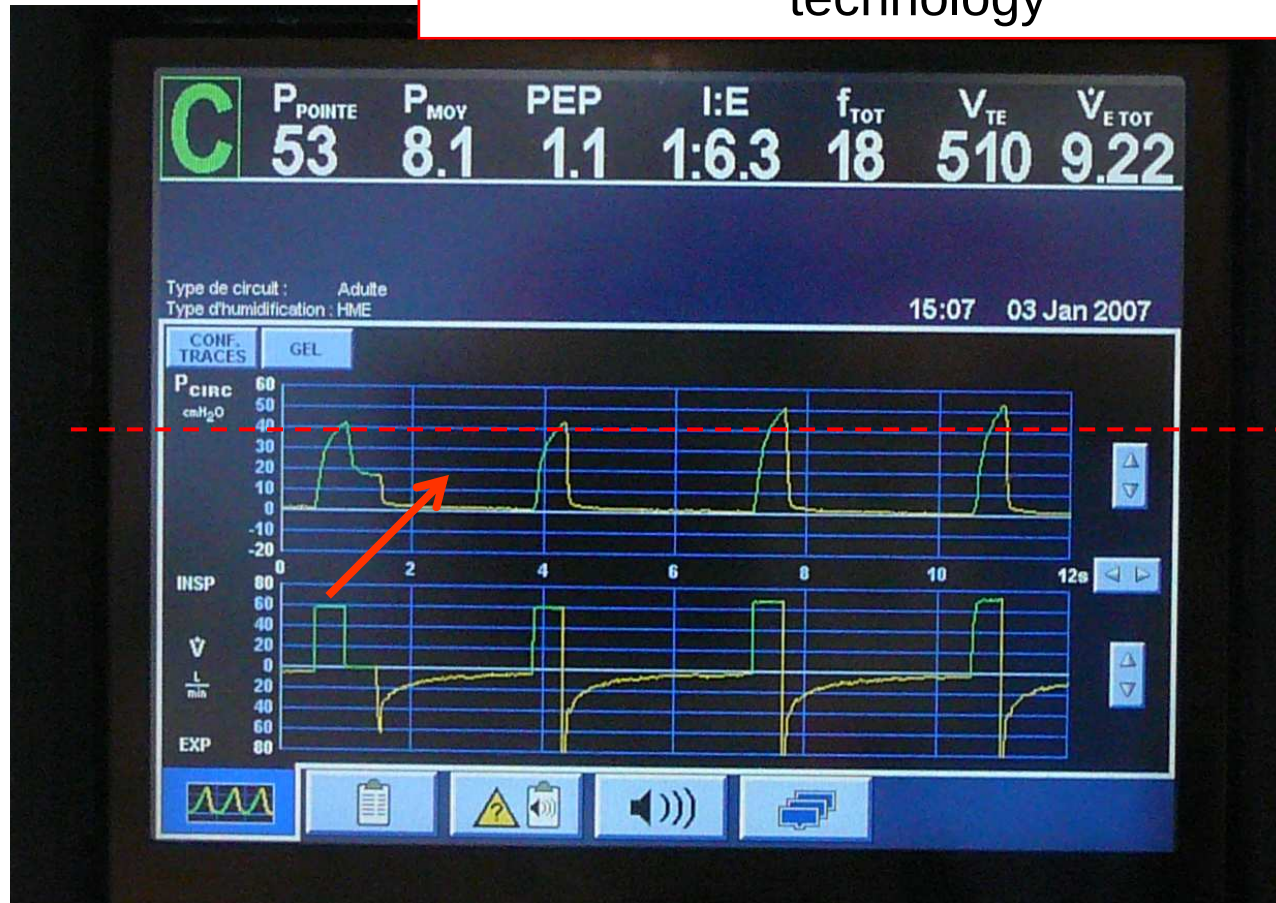


Bird

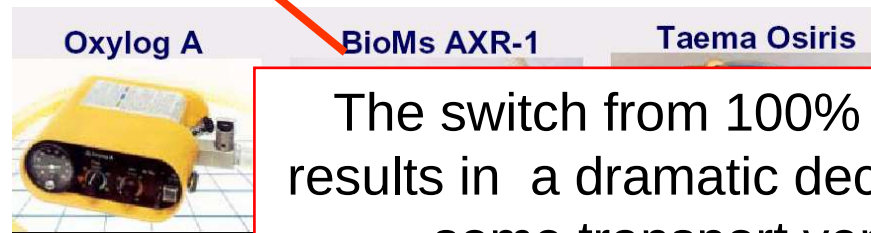
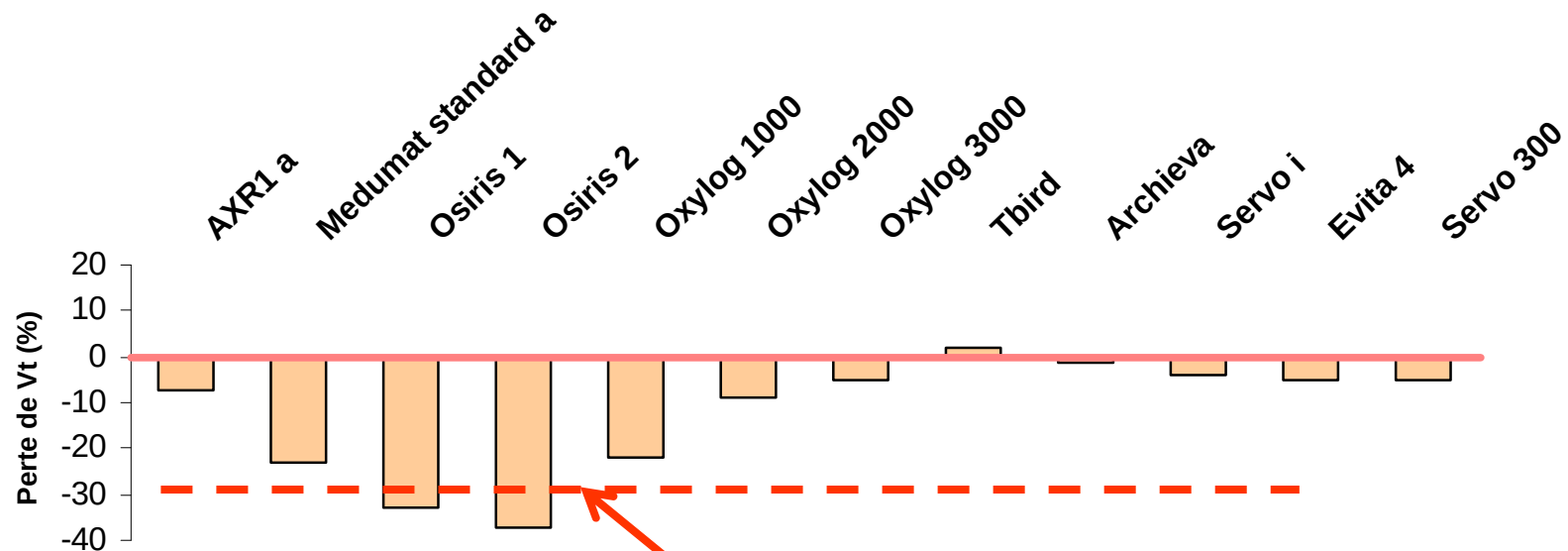
RC 5/15	RC 20/30
Galileo	

A. Lyazidi, J. C. Richard, A. W. Thille¹, G Beduneau, L. Brochard

The system is complex and may present some limits due to algorithm and technology

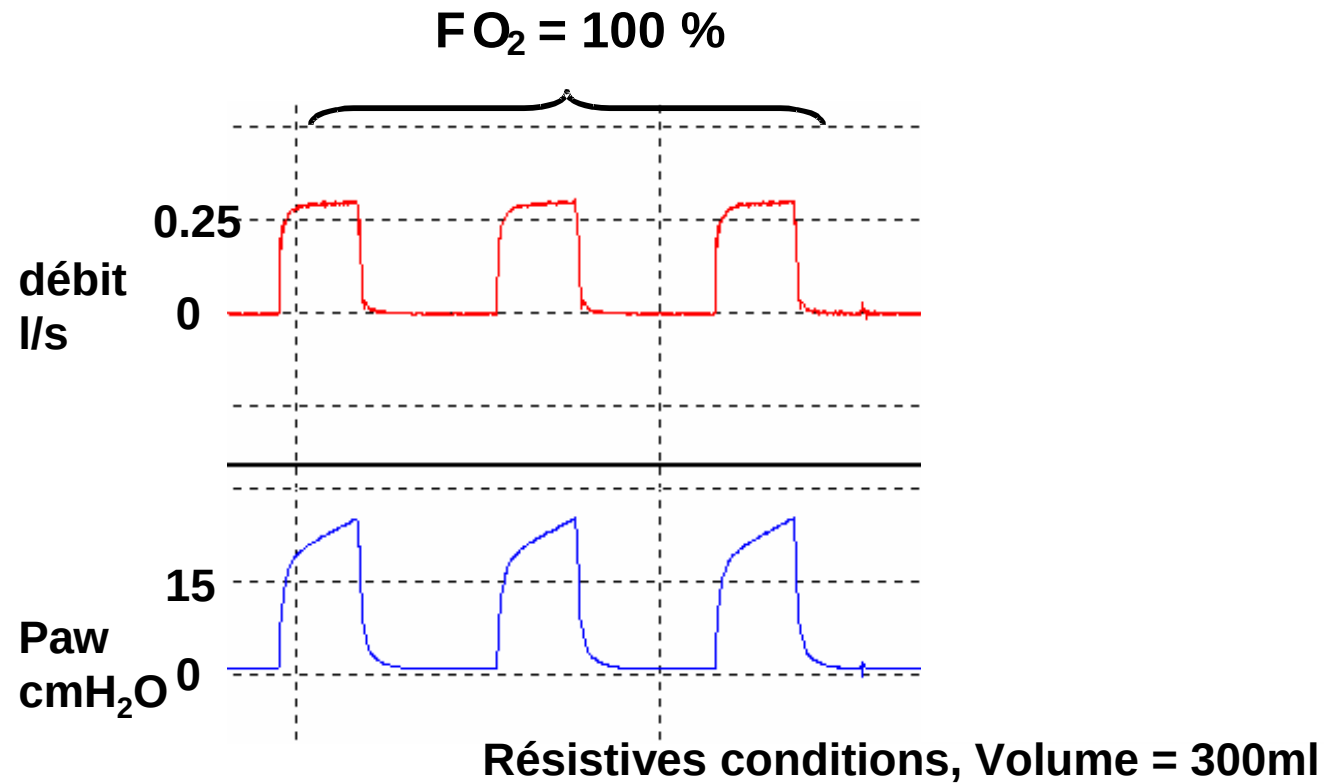


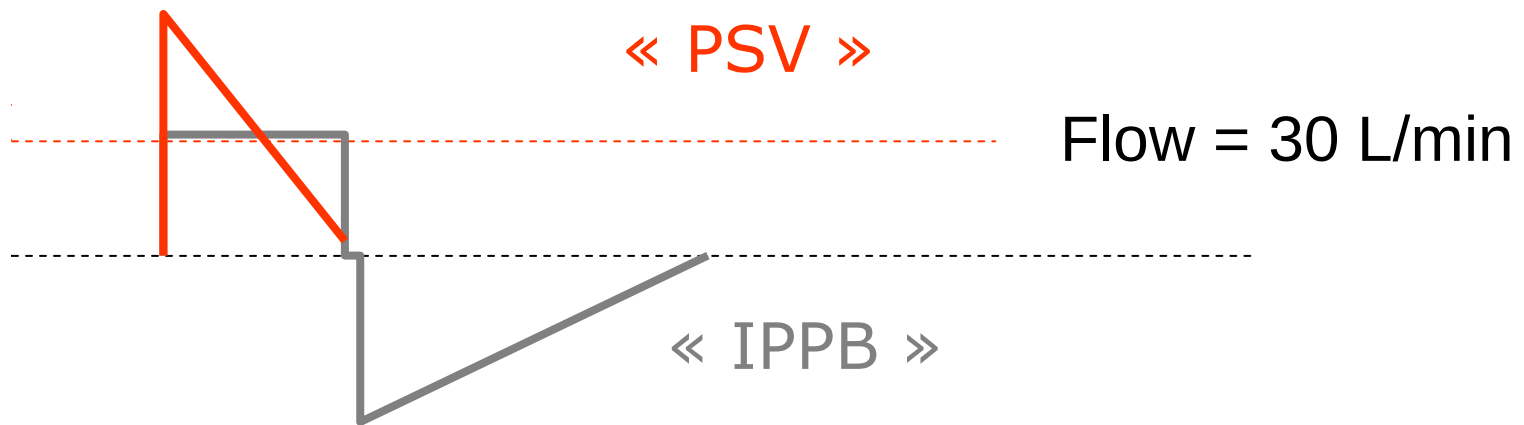
Vt reduction (%) after switching the FIO₂ from 100% and 60 % FiO₂



The switch from 100% to 60% FIO₂ results in a dramatic decreased in Vt in some transport ventilators !

Pb related to volume guaranty





PSV available in transport ventilators



Réglage de l'AI

