

# JIVA

Journée internationale en ventilation artificielle

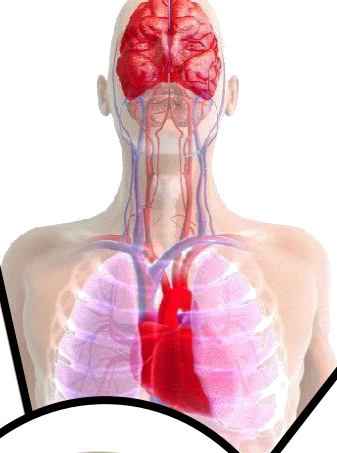
# ResQPOD<sup>®</sup>

## Valve d'impédance inspiratoire

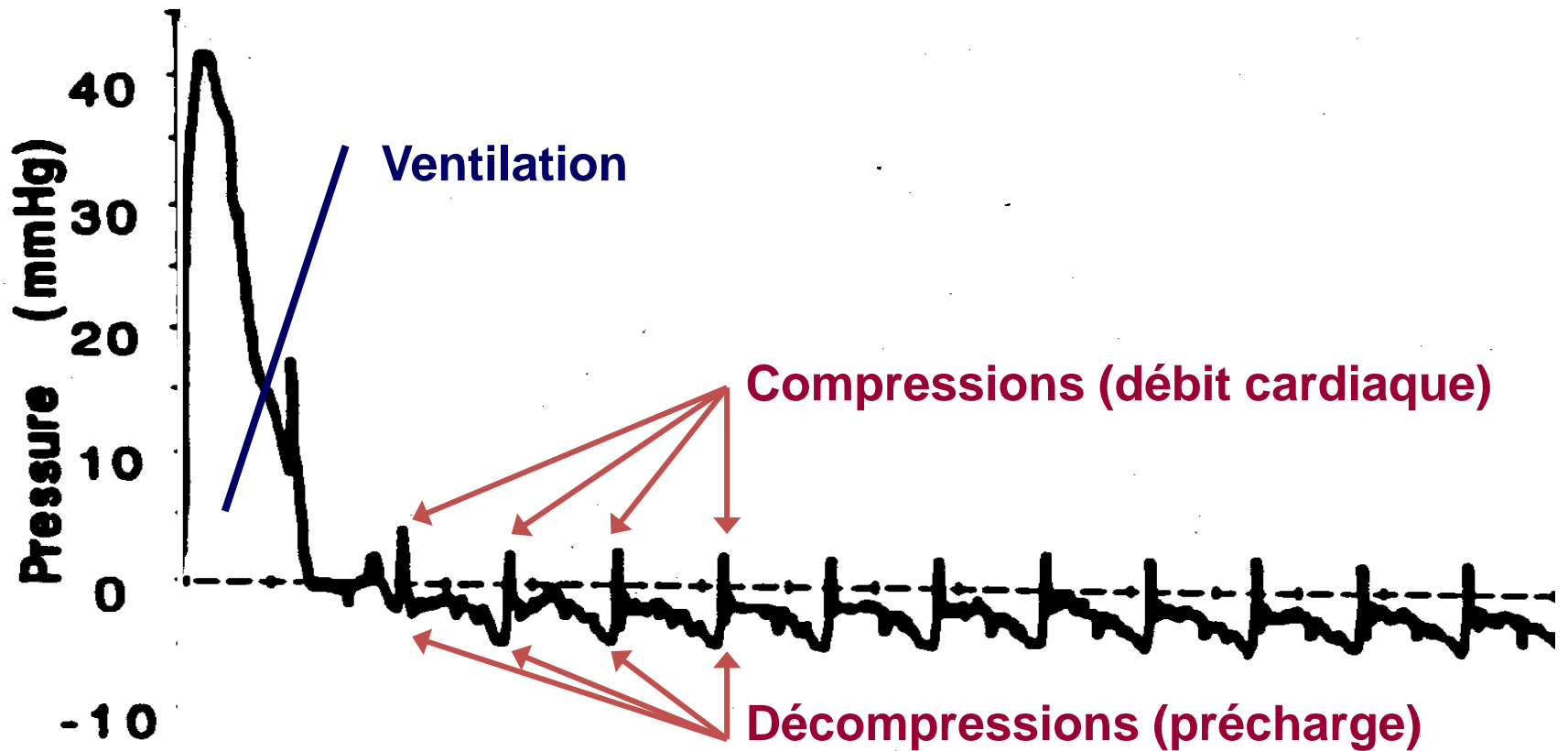
**Stéphane Delisle, Philosophiæ PhD, FCCM**  
**Professeur associé de la faculté de médecine du**  
**département universitaire de médecine de famille et de**  
**médecine d'urgence, UdeM**

# SIVA

Société Internationale en Ventilation Artificielle

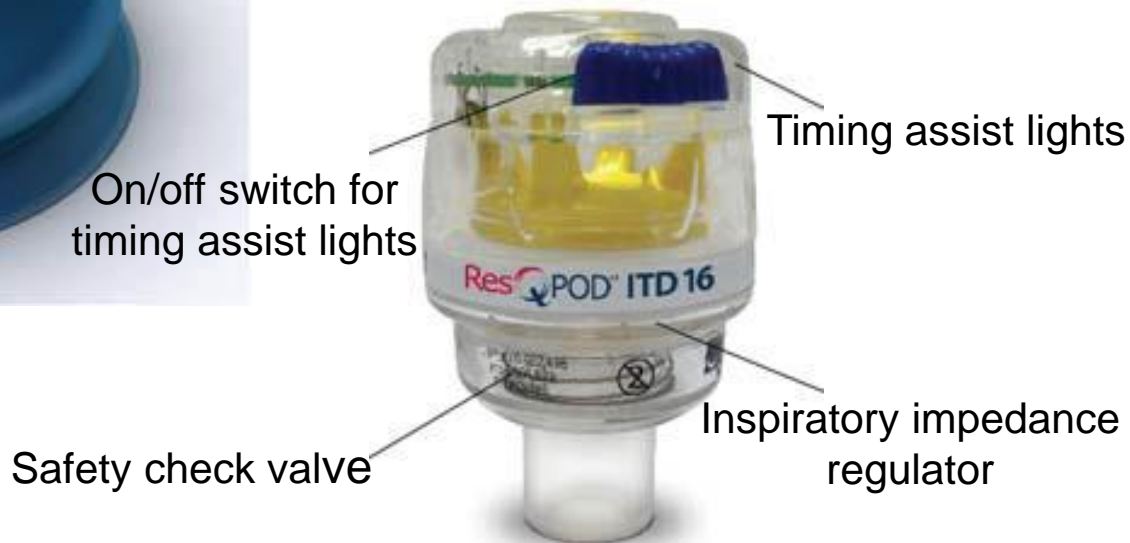
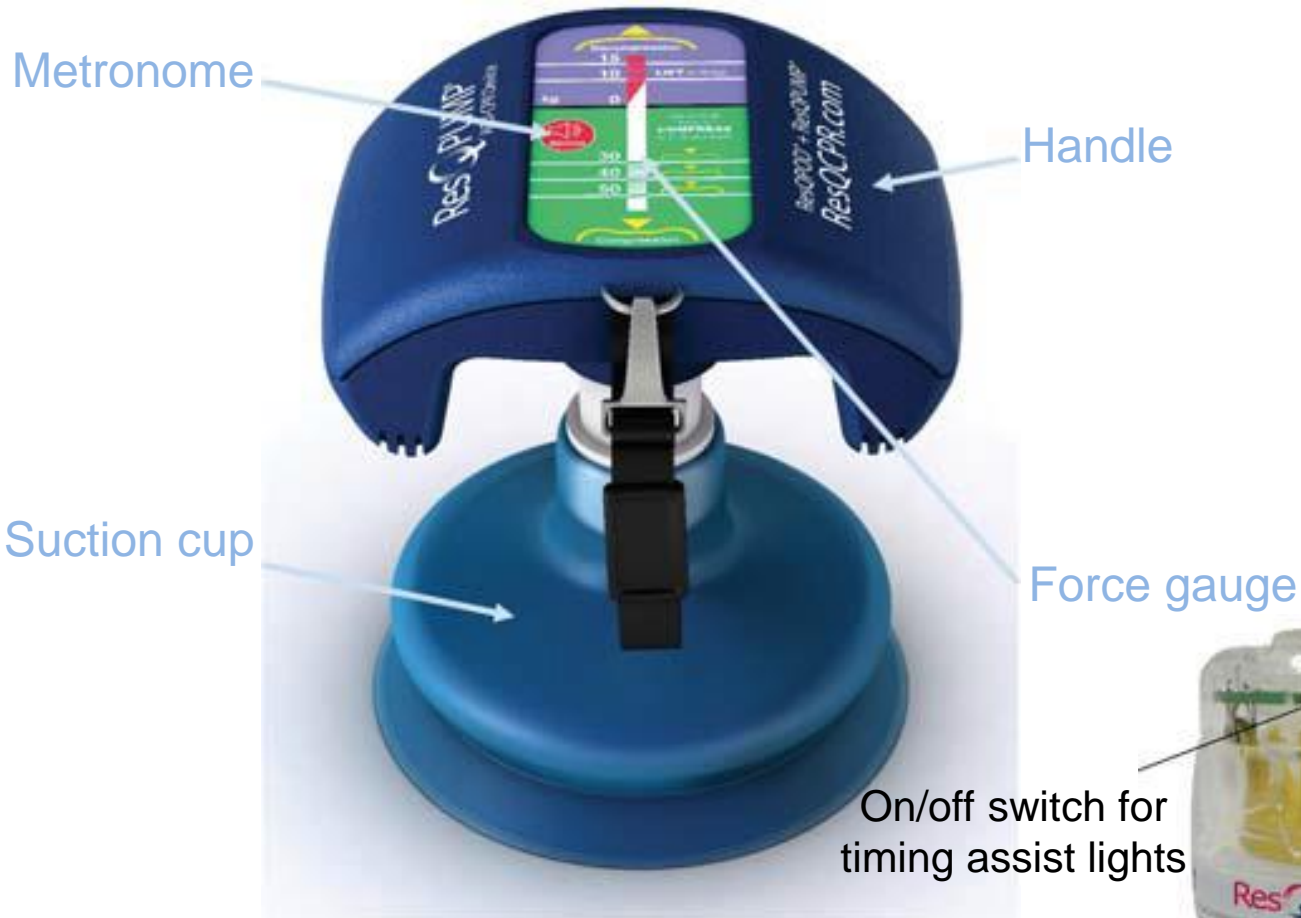


# Circulation du sang durant la RCR



# Zoll Medical's ResQCPR System

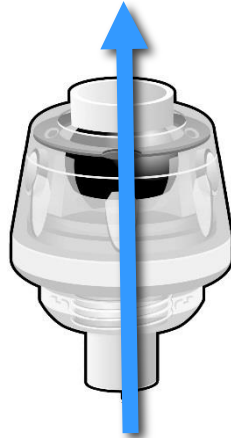
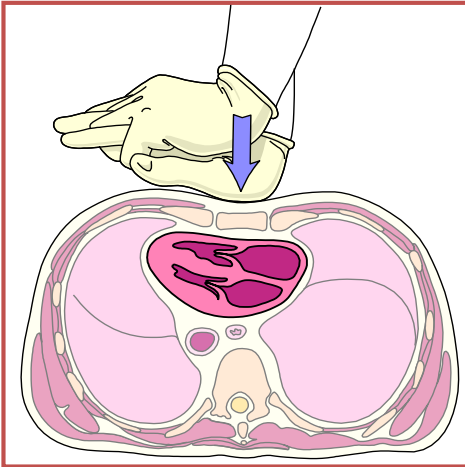
## ResQPUMP



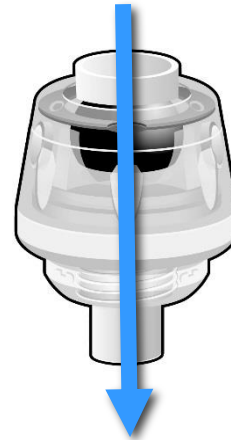


# ResQPOD

Compressions

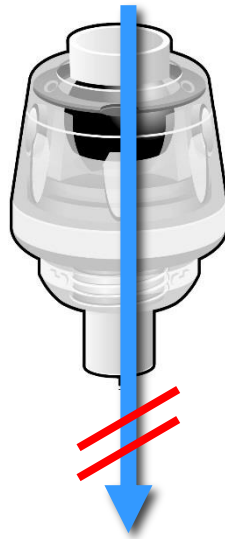
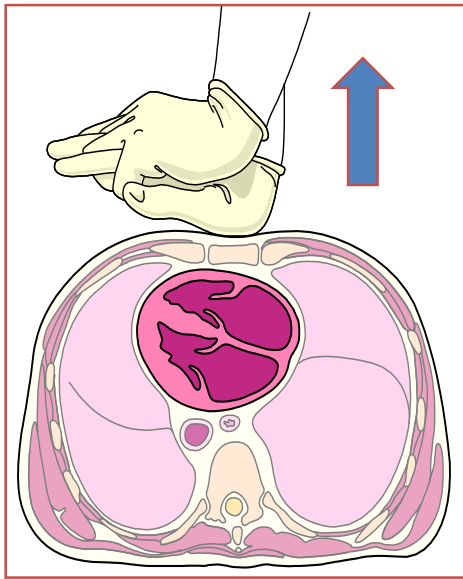


Ventilation Patient



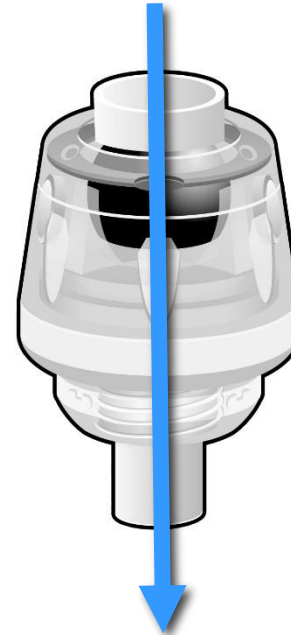
# ResQPOD

## Décompressions

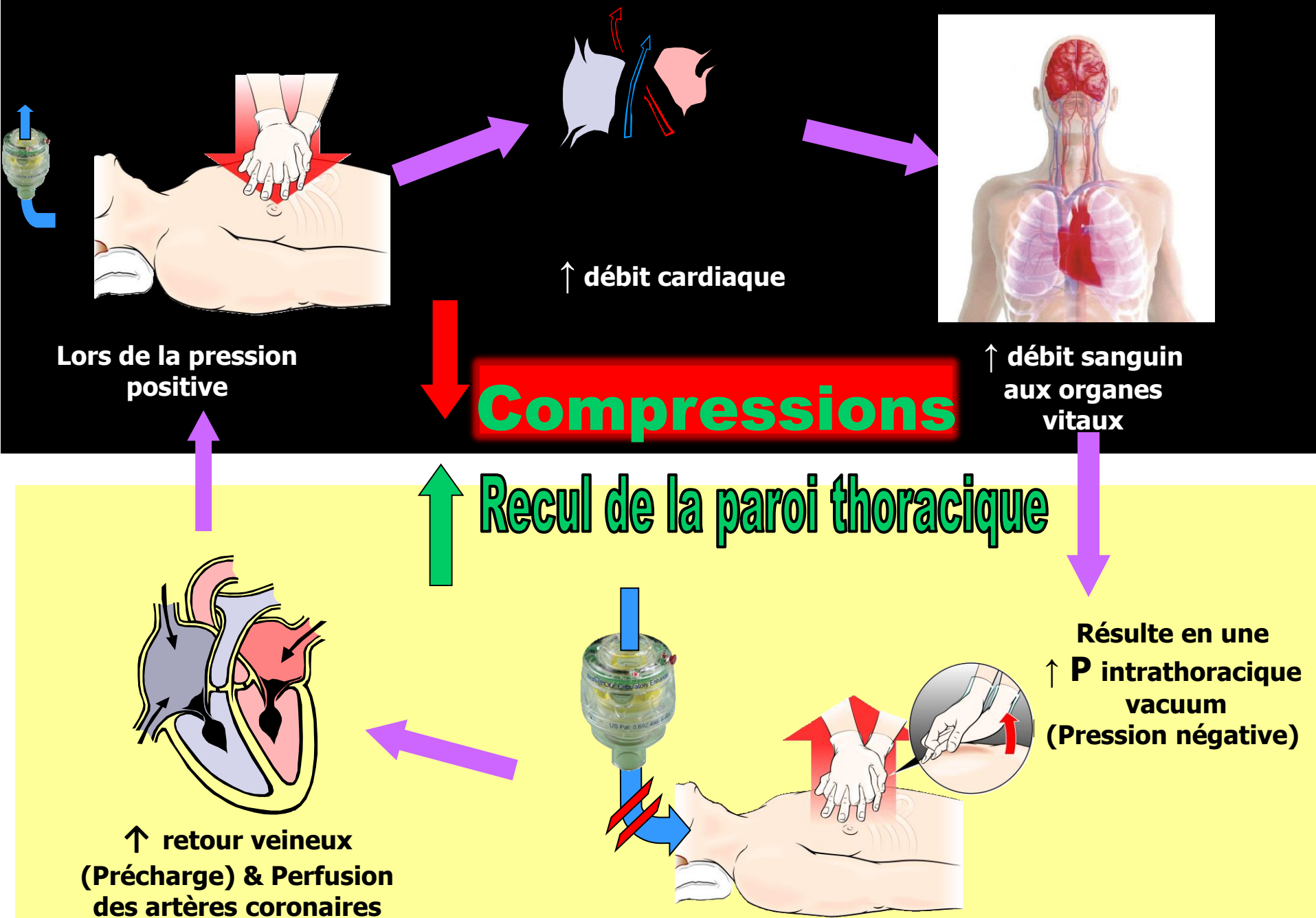


Occlusion de la valve lorsque la pression intrathoracique devient inférieure à la pression atmosphérique

## Respiration spontanée

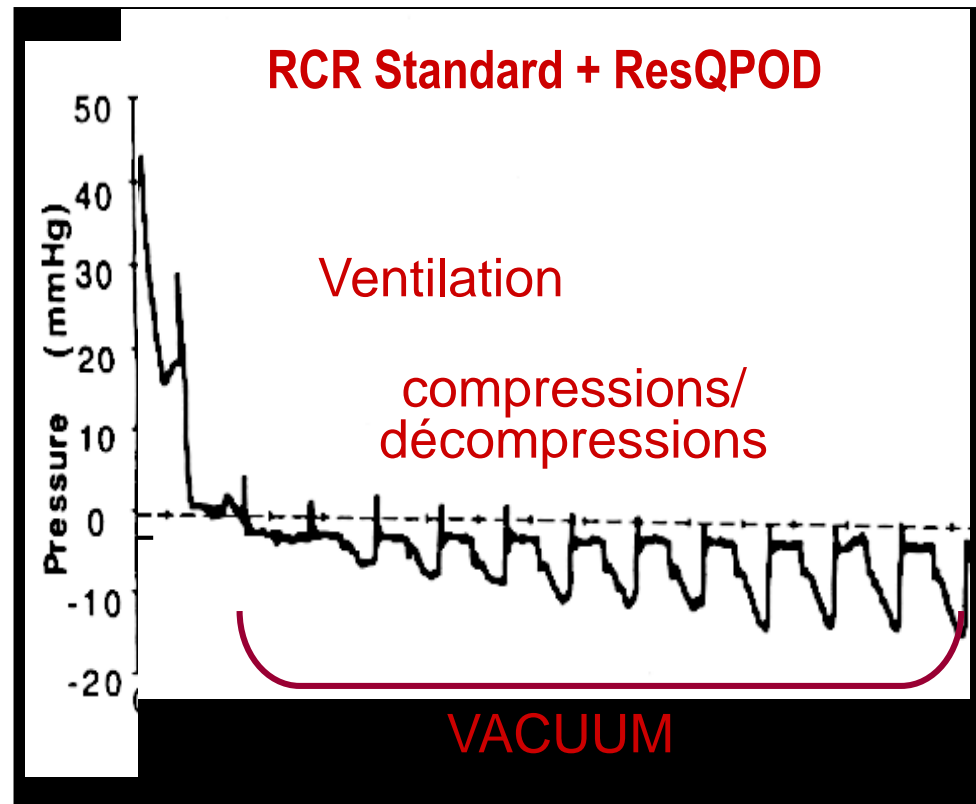
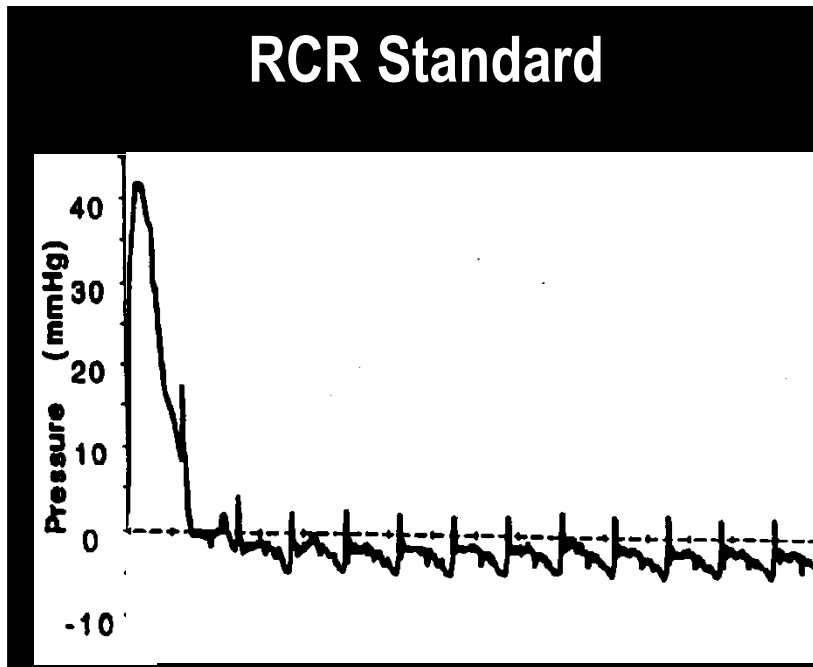


Ouverture de la valve lorsque le patient génère une pression supérieure à  $-10 \text{ cmH}_2\text{O}$



# Effet de l'impédance inspiratoire

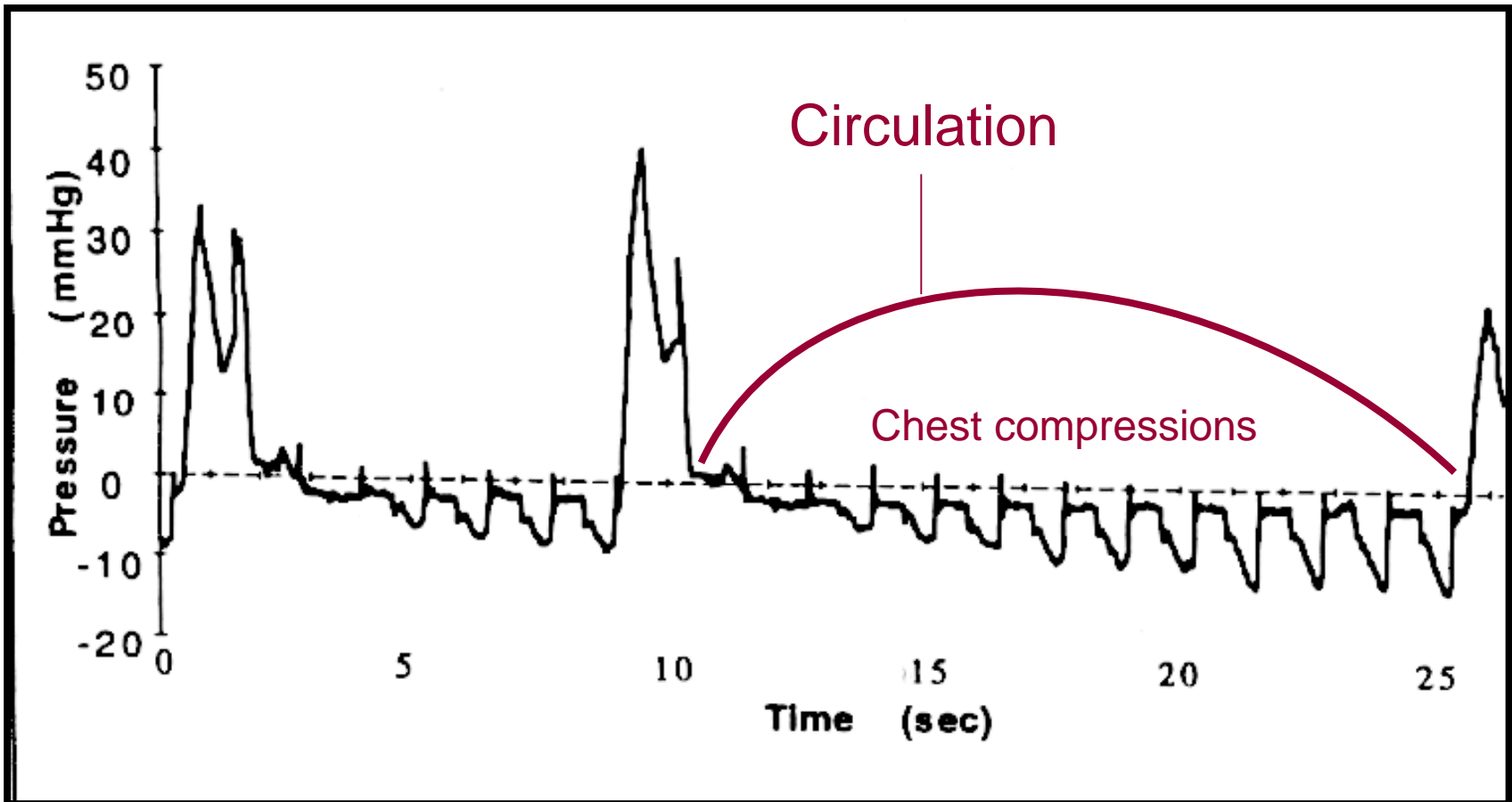
↑ vacuum (pression négative) dans le thorax  
durant les décompressions

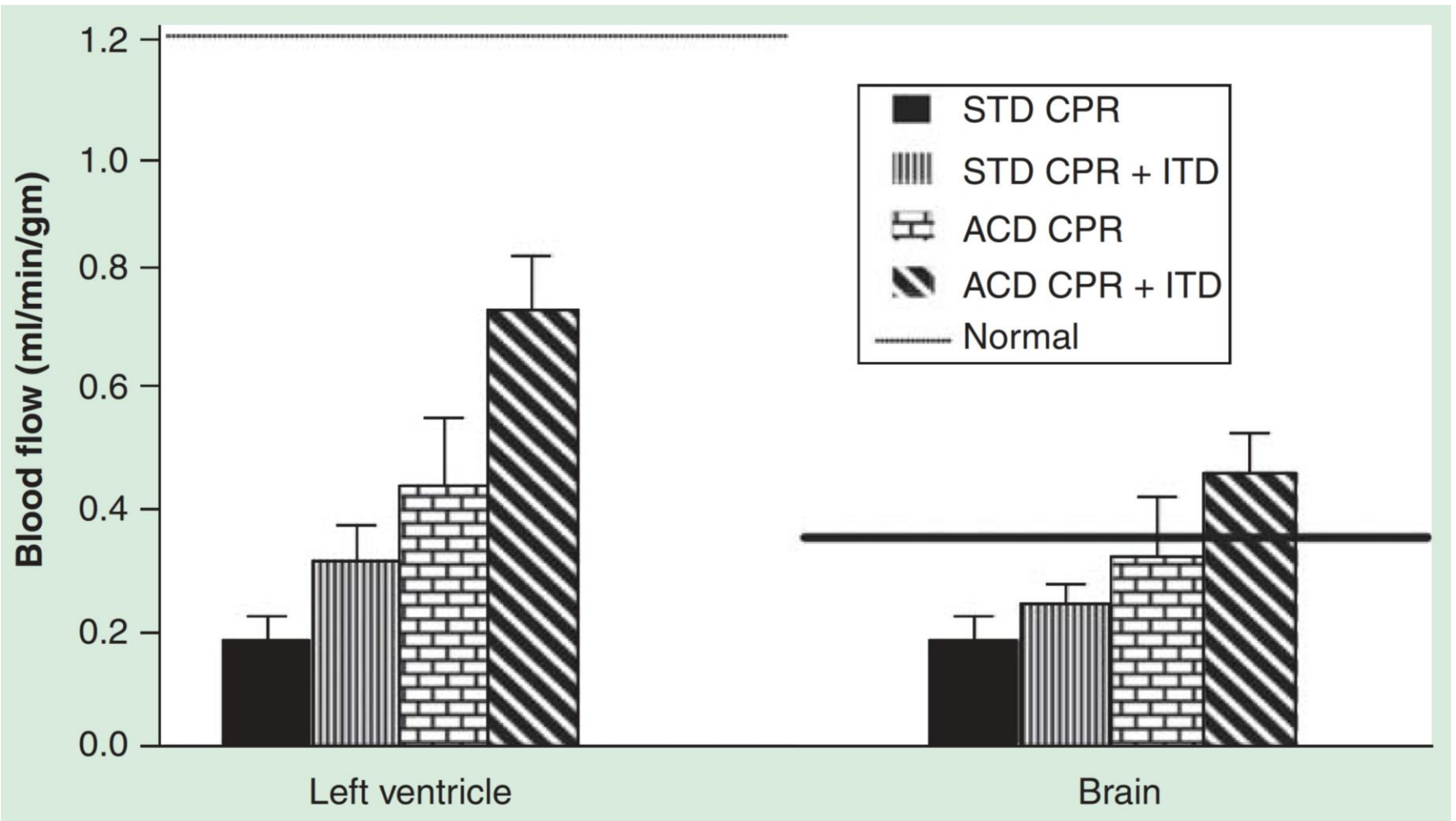




# Vacuum lors d'une ventilation au masque + VII

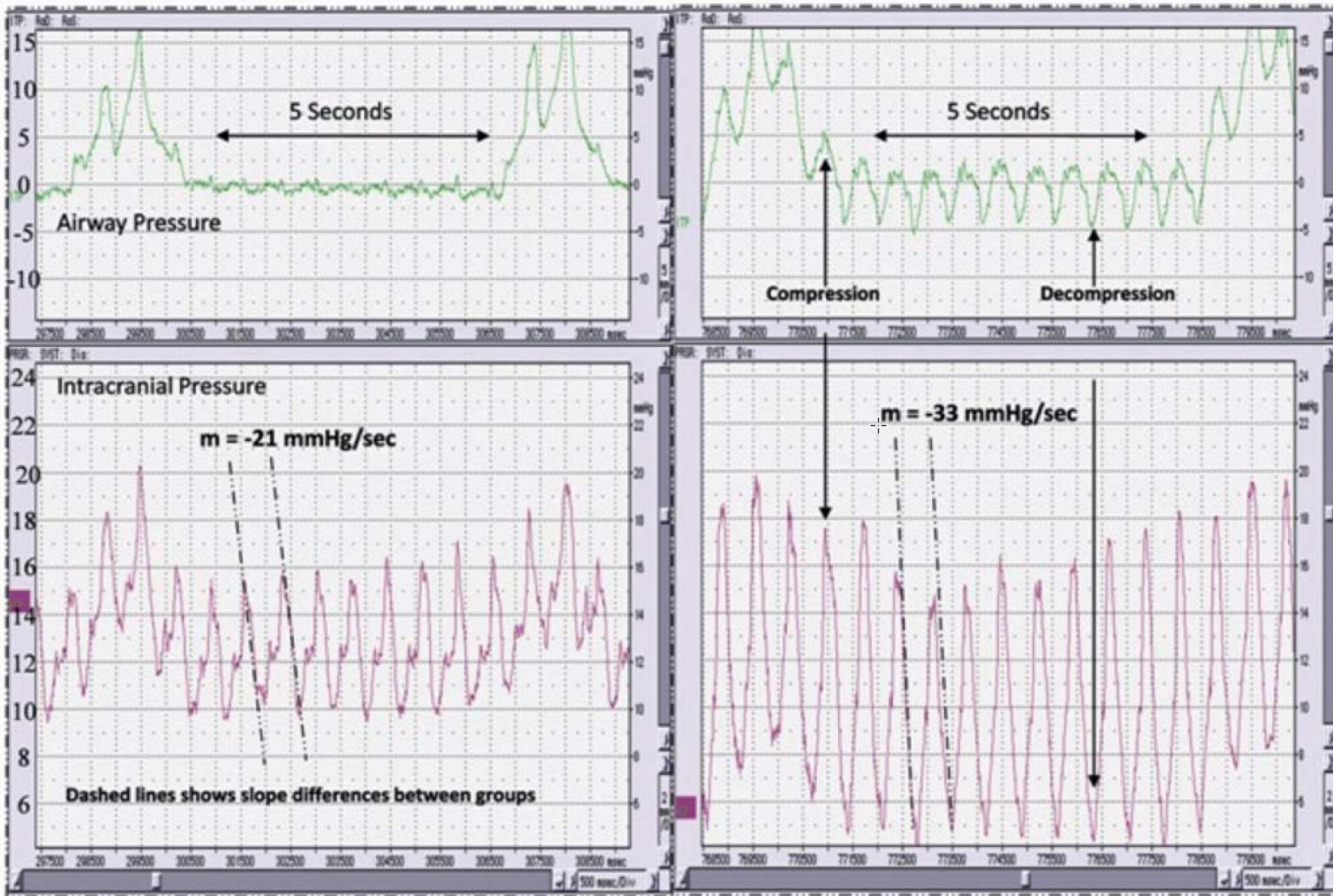
Avec un masque: 2 mains sur le thorax et 2 mains sur le masque !





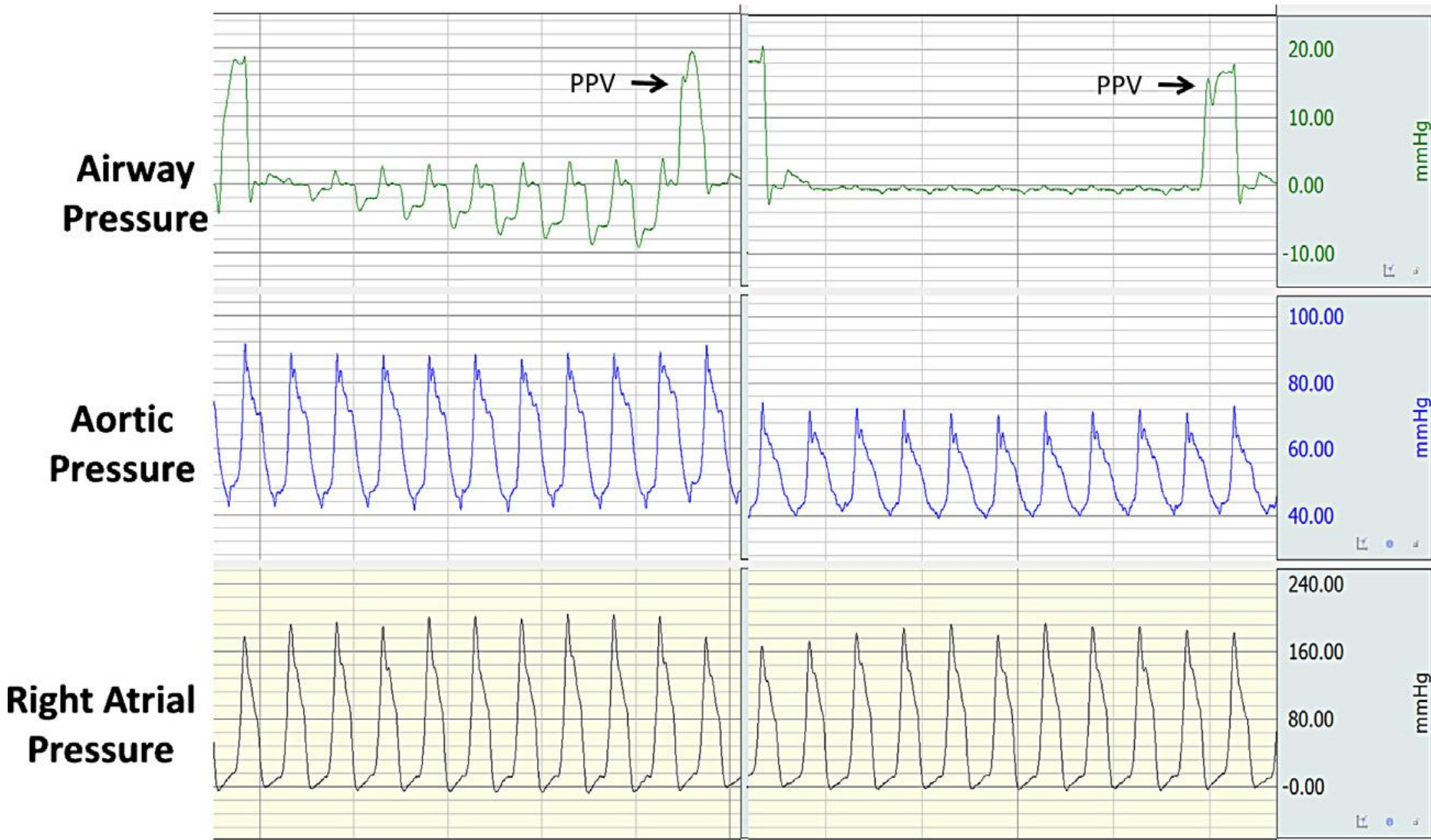
CPR @ 80 CC/min

ACD CPR + ITD



### LUCAS + Active ITD

### LUCAS + Sham ITD



## A Trial of an Impedance Threshold Device in Out-of-Hospital Cardiac Arrest

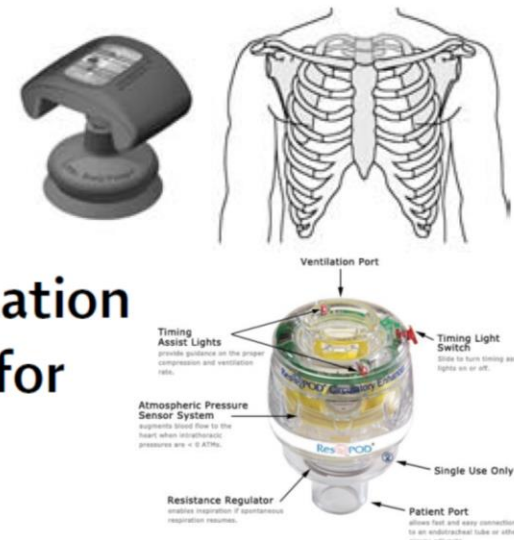
Aufderheide et al. *N Engl J Med.* 2011;365:798-806



We compared the use of an active ITD with that of a sham ITD in patients with out-of-hospital cardiac arrest who underwent standard CPR at 10 sites in the United States and Canada.

Outcome	Sham ITD (N=4345)	Active ITD (N=4373)	Percentage-Point Difference (95% CI)	P Value
<b>Modified ITT population</b>				
Transported to hospital — no. of patients (%)	2451 (56.4)	2448 (56.0)	-0.4 (-2.5 to 1.7)	0.69
ROSC on arrival at emergency department — no. of patients (%)	1206 (27.8)	1186 (27.1)	-0.6 (-2.5 to 1.2)	0.51
Survival to hospital admission — no. of patients (%)	1139/4335 (26.3)	1140/4370 (26.1)	-0.2 (-2.0 to 1.7)	0.84
Survival to discharge — no. of patients (%)	355 (8.2)	357 (8.2)	0.0 (-1.2 to 1.1)	0.99

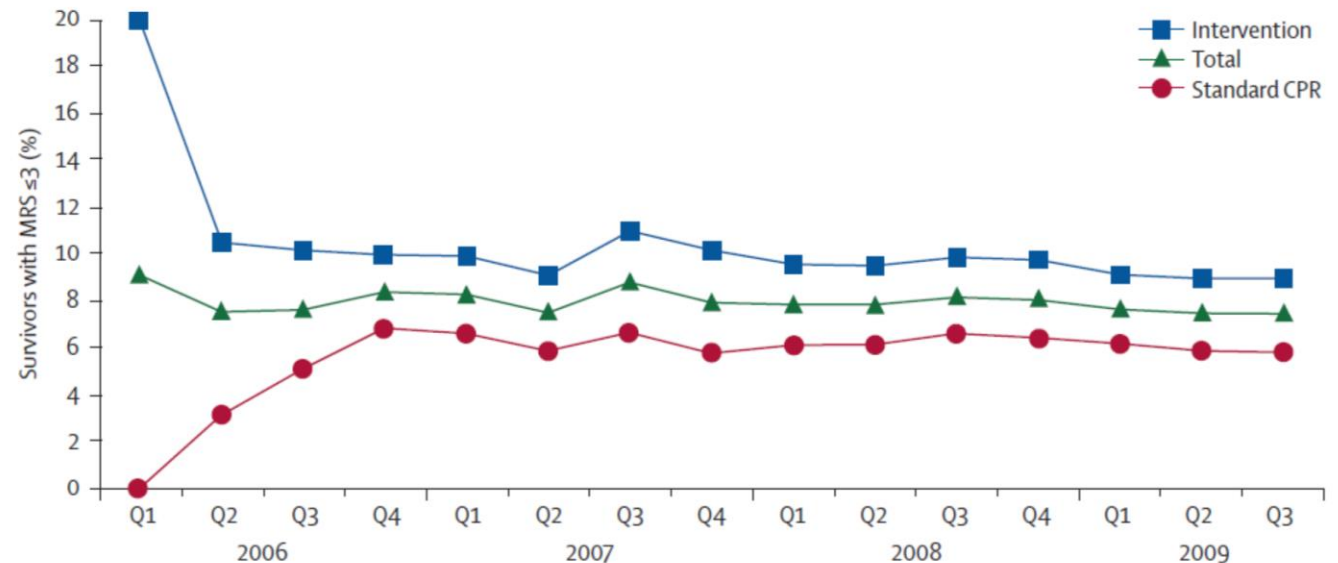
**CONCLUSIONS**—Use of the ITD did not significantly improve survival with satisfactory function among patients with out-of-hospital cardiac arrest receiving standard CPR.



## Standard cardiopulmonary resuscitation versus active compression-decompression cardiopulmonary resuscitation with augmentation of negative intrathoracic pressure for out-of-hospital cardiac arrest: a randomised trial

Tom P Aufderheide, Ralph J Frascone, Marvin A Wayne, Brian D Mahoney, Robert A Swor, Robert M Domeier, Michael L Olinger, Richard G Holcomb, David E Tupper, Demetris Yannopoulos, Keith G Lurie

813 (gpe contrôle) vs 840 (gpe valve d'impédance) en prospectif randomisé

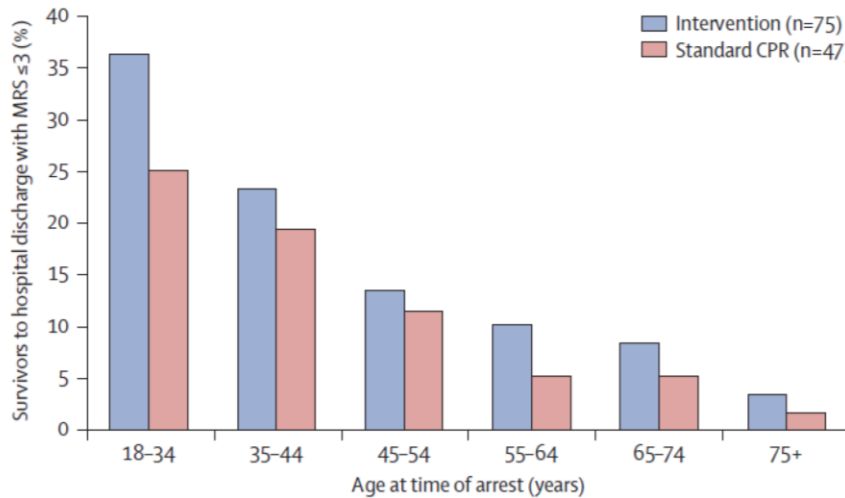


Intervention enrolment (cumulative)	5	172	387	713
Standard CPR enrolment (cumulative)	6	168	395	703
Total enrolment (cumulative)	11	340	782	1416

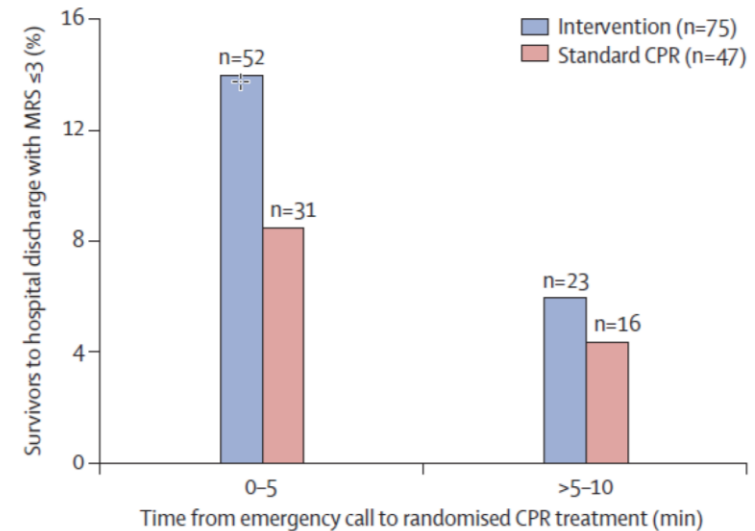
## Standard cardiopulmonary resuscitation versus active compression-decompression cardiopulmonary resuscitation with augmentation of negative intrathoracic pressure for out-of-hospital cardiac arrest: a randomised trial

Lancet 2011; 377: 301-11

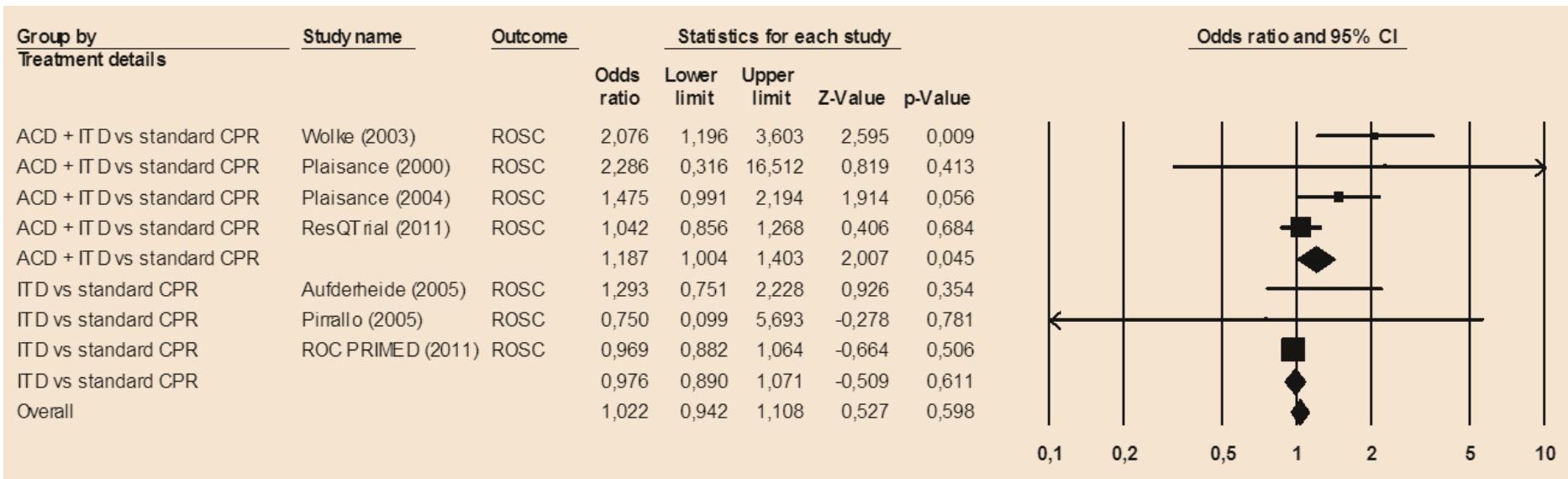
Tom P Aufderheide, Ralph J Frascone, Marvin A Wayne, Brian D Mahoney, Robert A Swor, Robert M Domeier, Michael L Olinger, Richard G Holcomb, David E Tupper, Demetris Yannopoulos, Keith G Lurie



Compared with standard CPR, treatment with ACD-CPR with augmentation of negative intrathoracic pressure **resulted in significantly increased survival to hospital discharge with favorable neurological function**. One year after OOHCA, survival was significantly higher in the intervention group and there was a similar restoration of neurologic function in survivors in both groups.

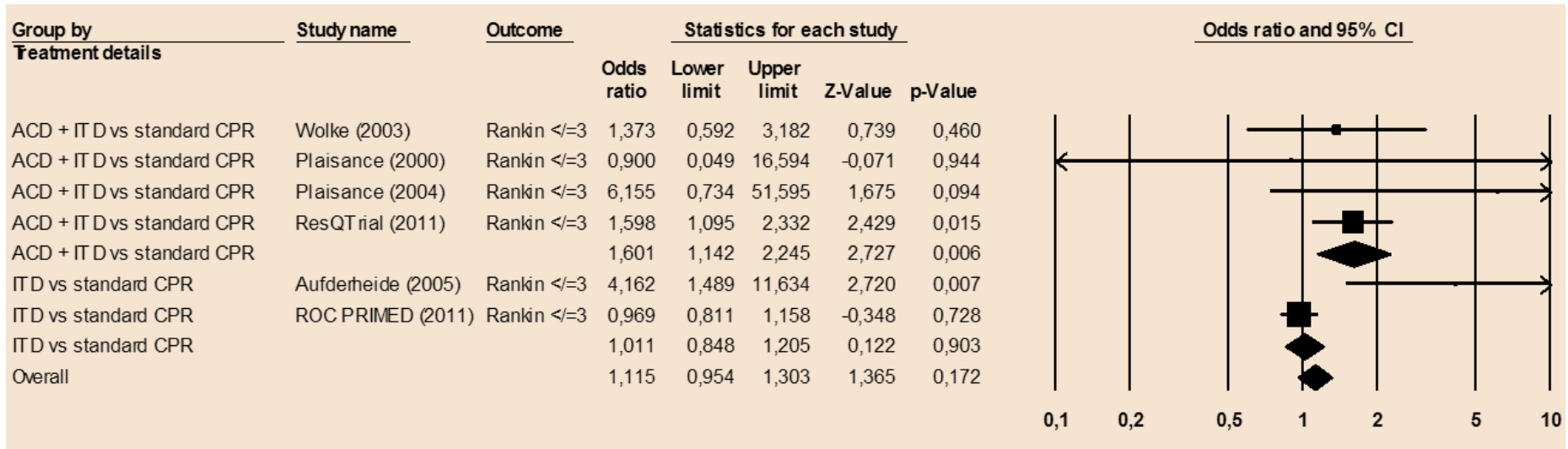


# Return of spontaneous circulation (ROSC)

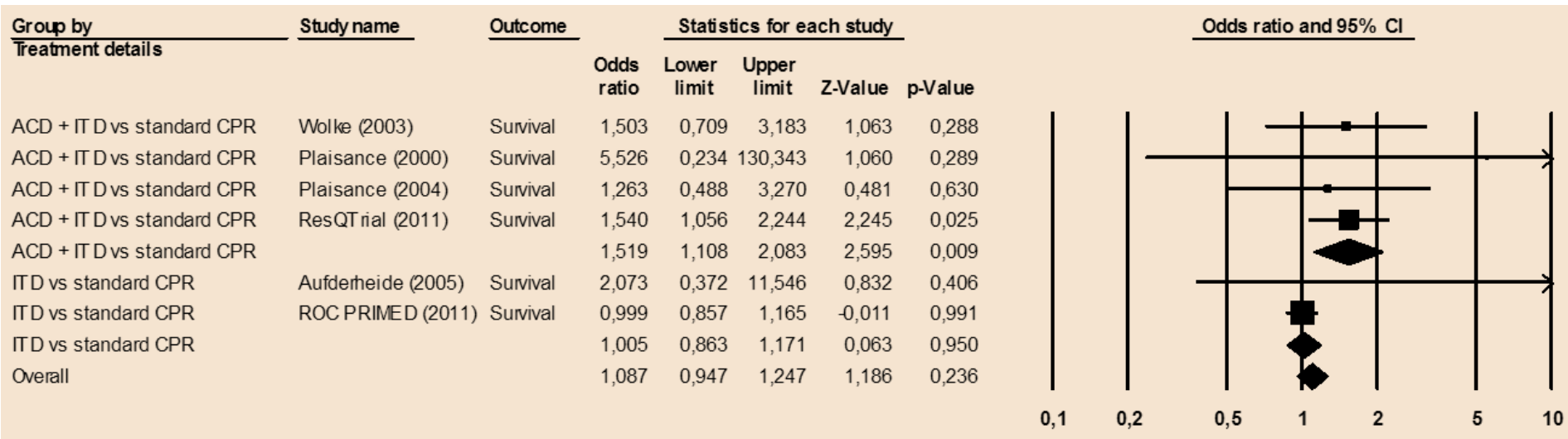


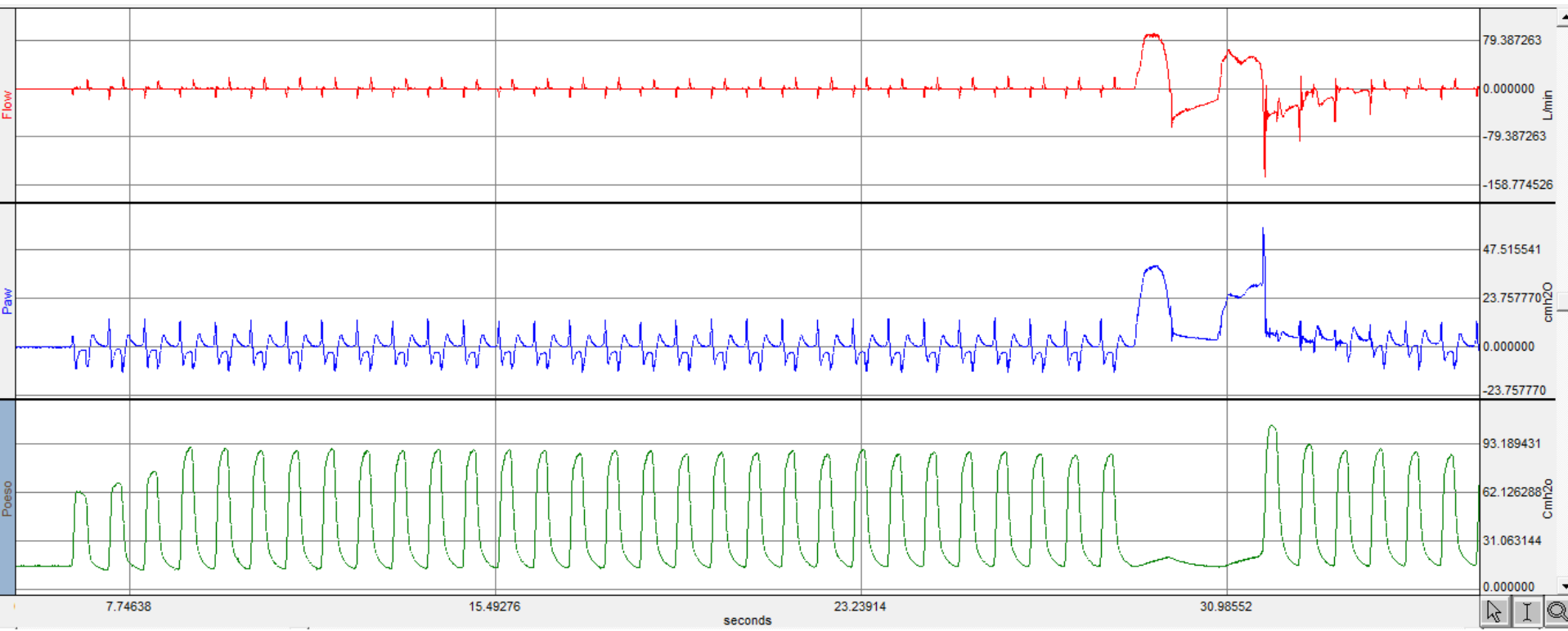


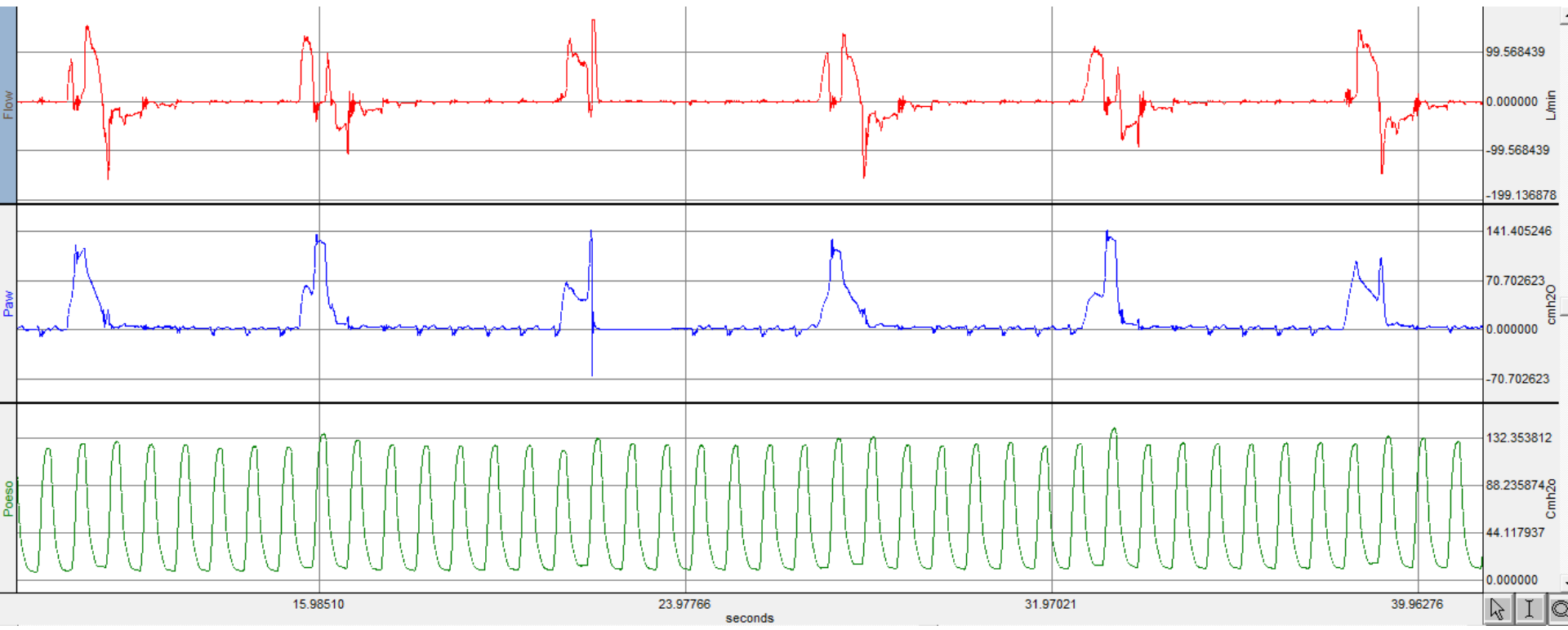
# Favorable neurologic outcome



# Survival at longest







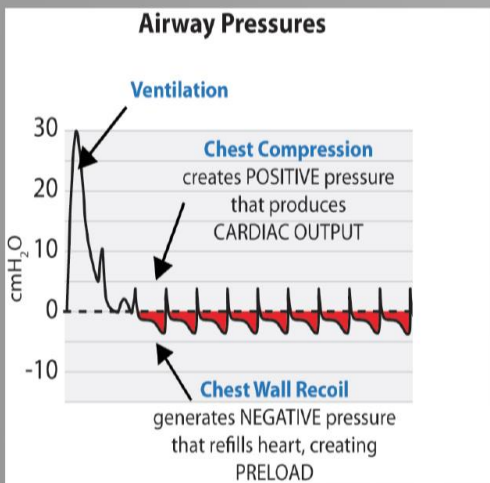
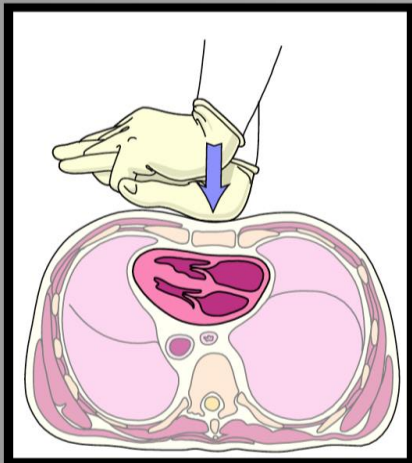


Figure 1: Airway pressure tracing during S-CPR

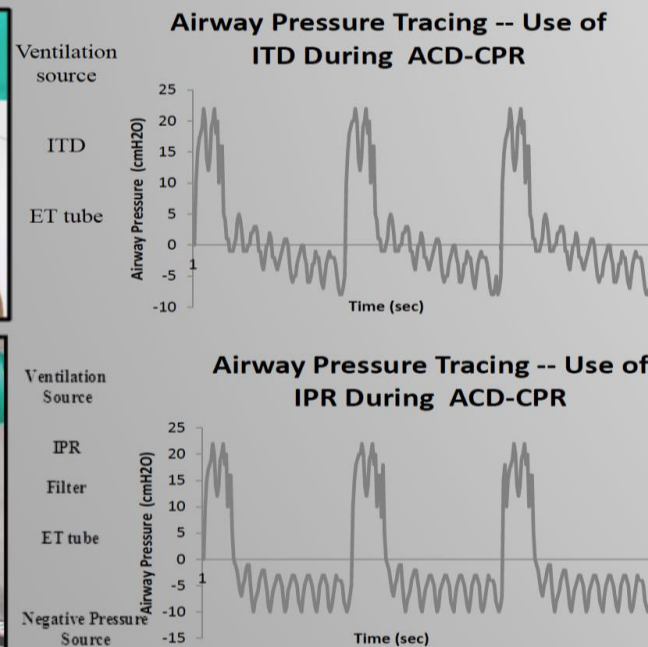


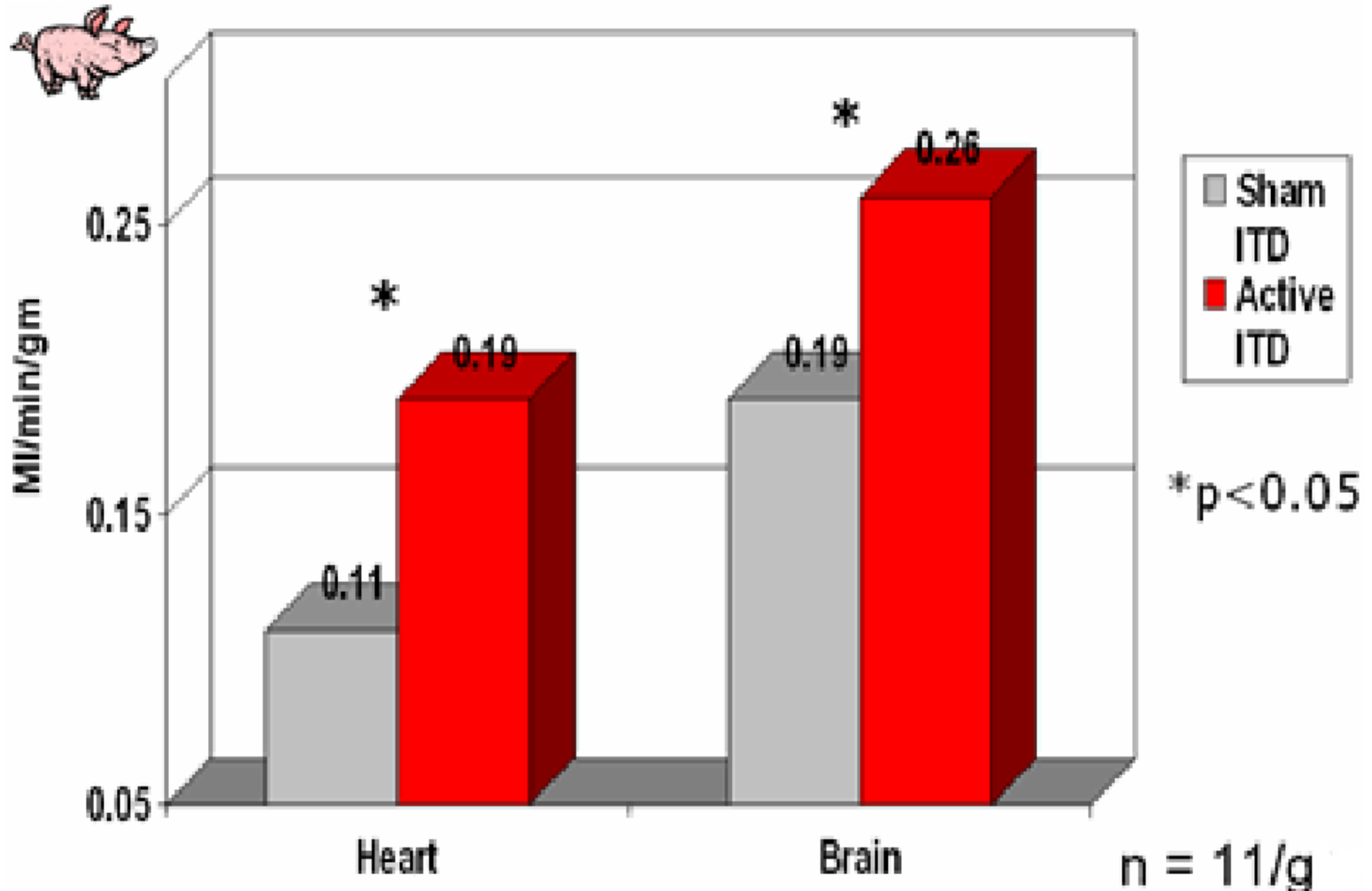
Figure 2: Airway pressure tracing during ACD+ITD or ACD +IPR

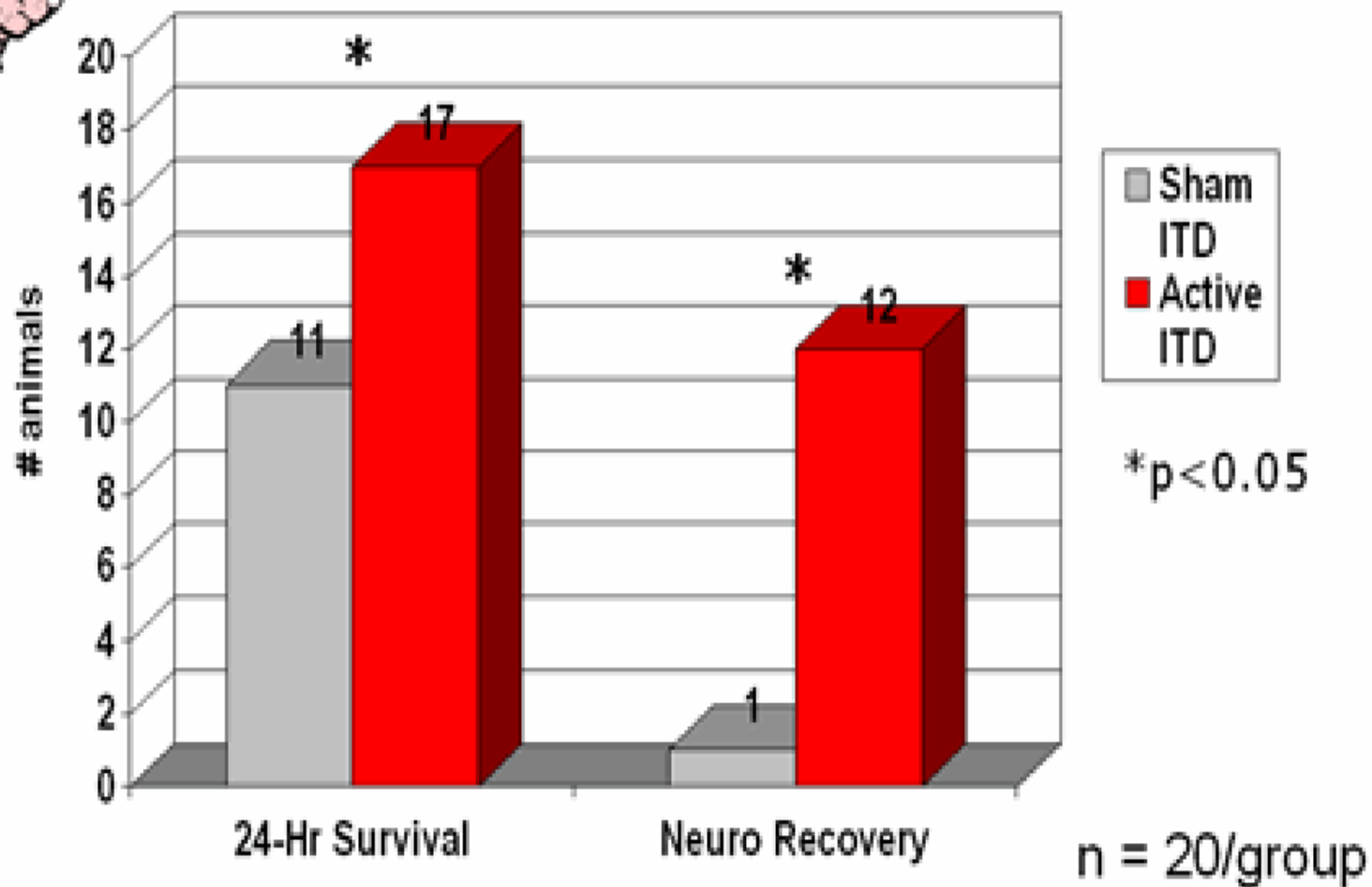
# Bénéfices cliniques

## Études animales

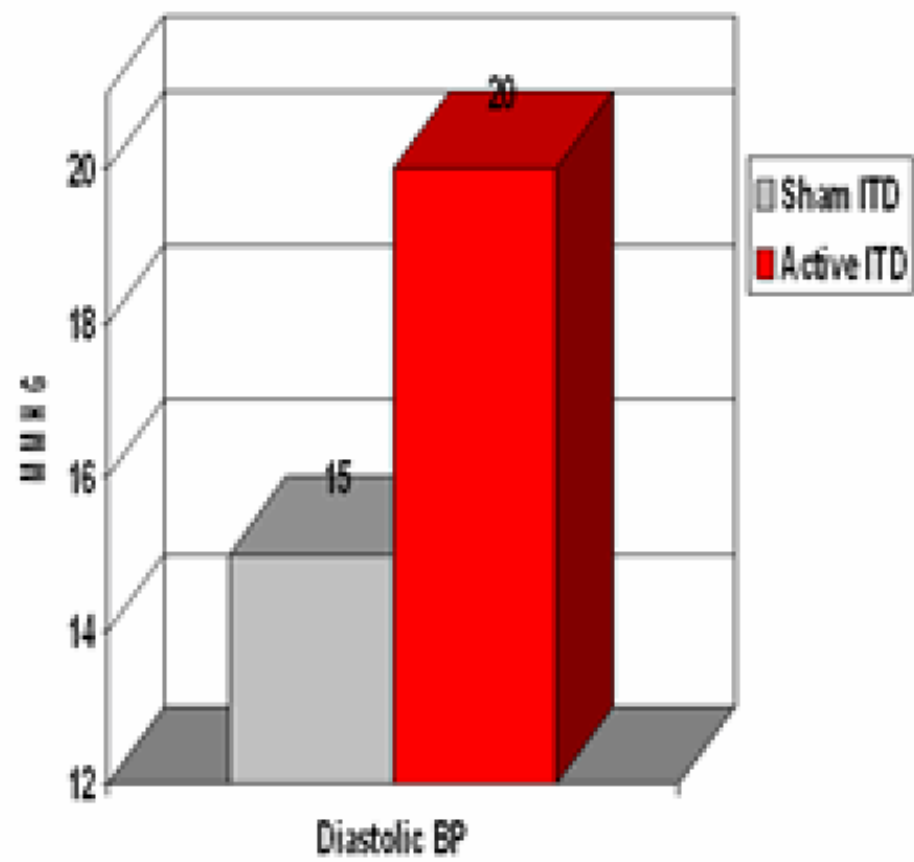
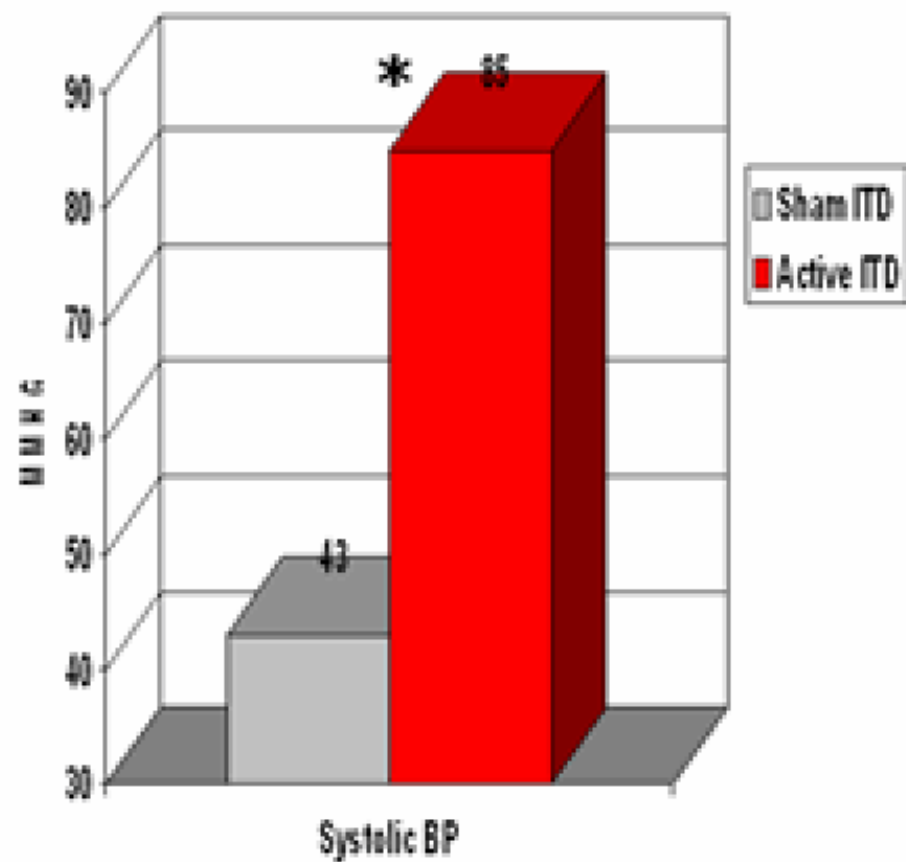
- ♥• Double le débit sanguin au niveau du coeur
- ♥• ↑ débit sanguin de 50% au cerveau
- ♥• Double la pression systolique
  - ↑ la survie

# Résultats chez l'humain







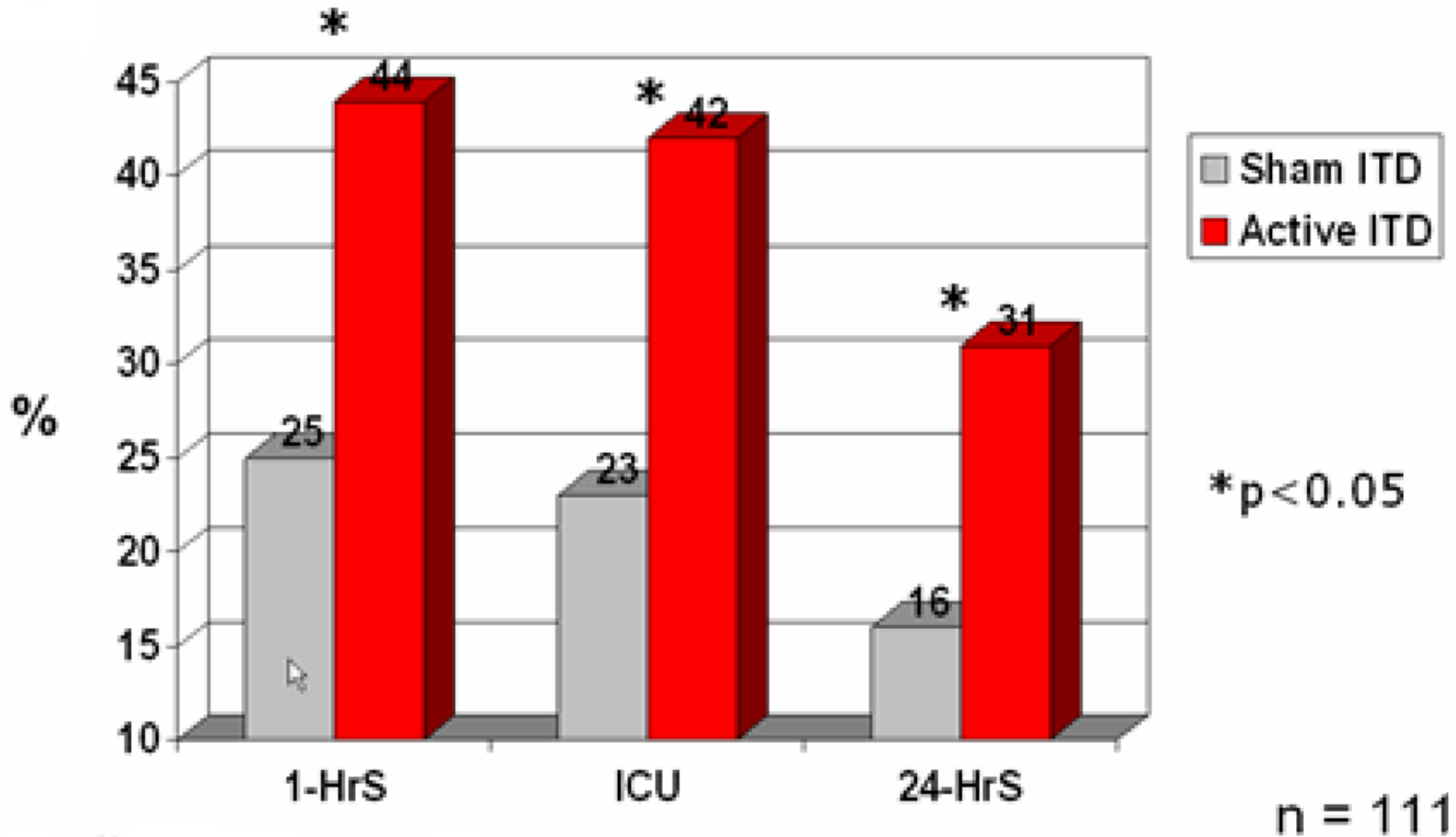


\*p<0.05

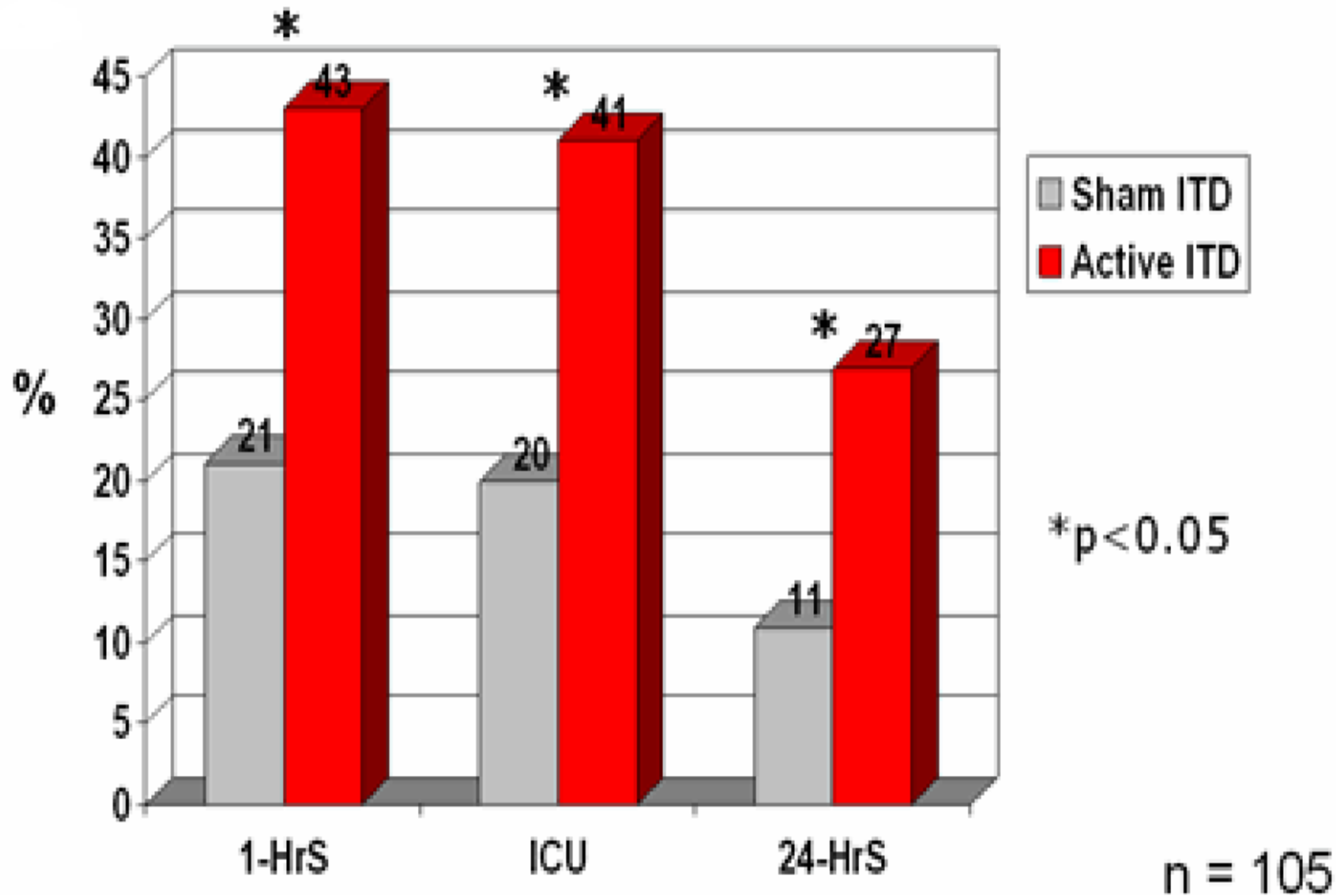
BP after 14 Minutes of ITD Use

n = 22

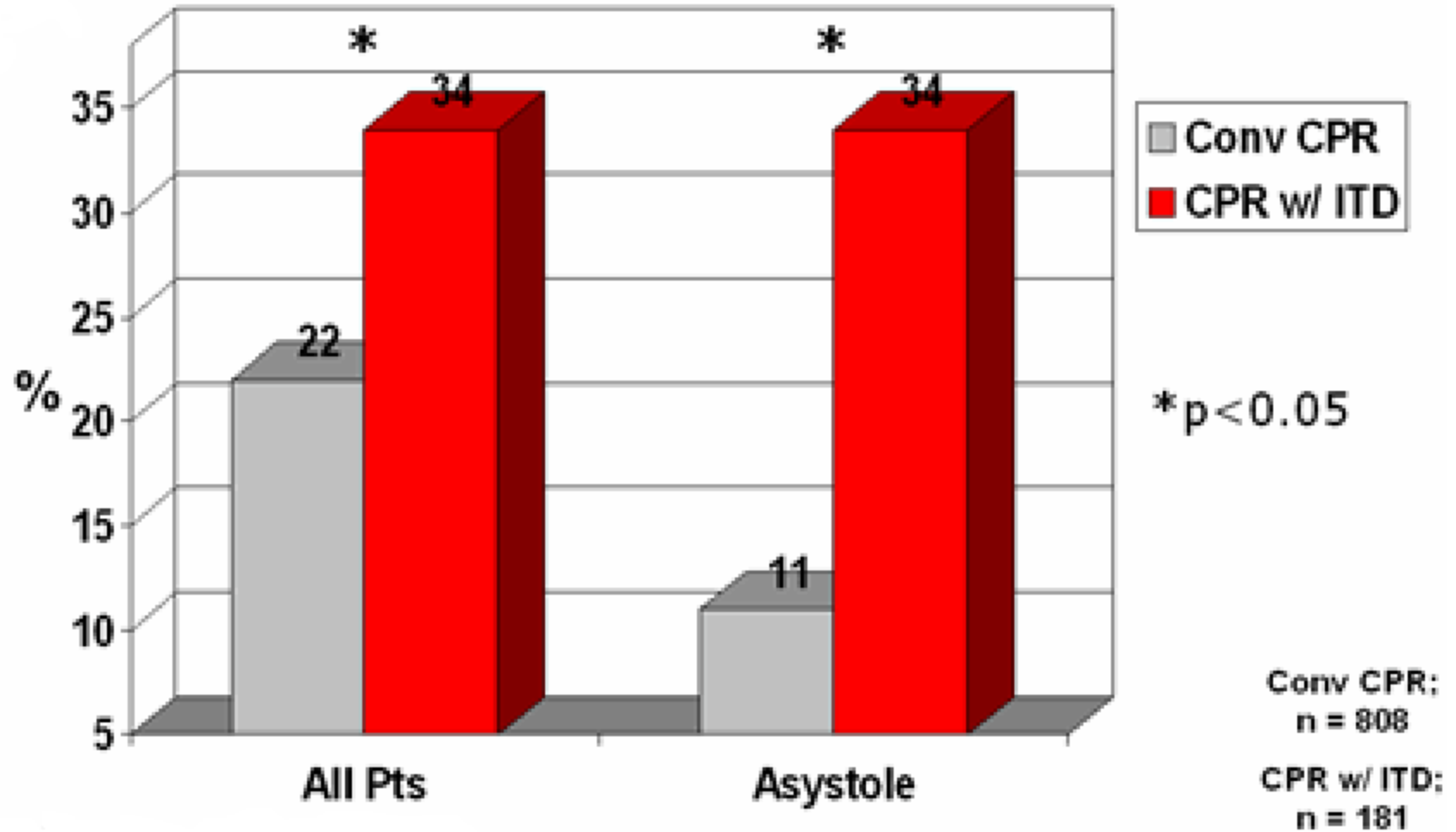
# Survie: FV – TV - AÉSP



# Survival ΔΕΣΔ



# Survive



# Étude animale (cochons)

## Groupe 1

- 7 cochons
- VF de 6 min
- Comp: 100/min
- **Vent: 30/min**
- RCR de 6 min
- Choc(s) est nécessaire

**Survie: 1/7 (14%)**



## Groupe 2

- 7 cochons
- VF de 6 min
- Comp: 100/min
- **Vent: 12/min**
- RCR de 6 min
- Choc(s) est nécessaire

**Survie: 6/7 (86%\*)**

