B-CARD

NO PAUSE SHOULD BE YOUR CAUSE

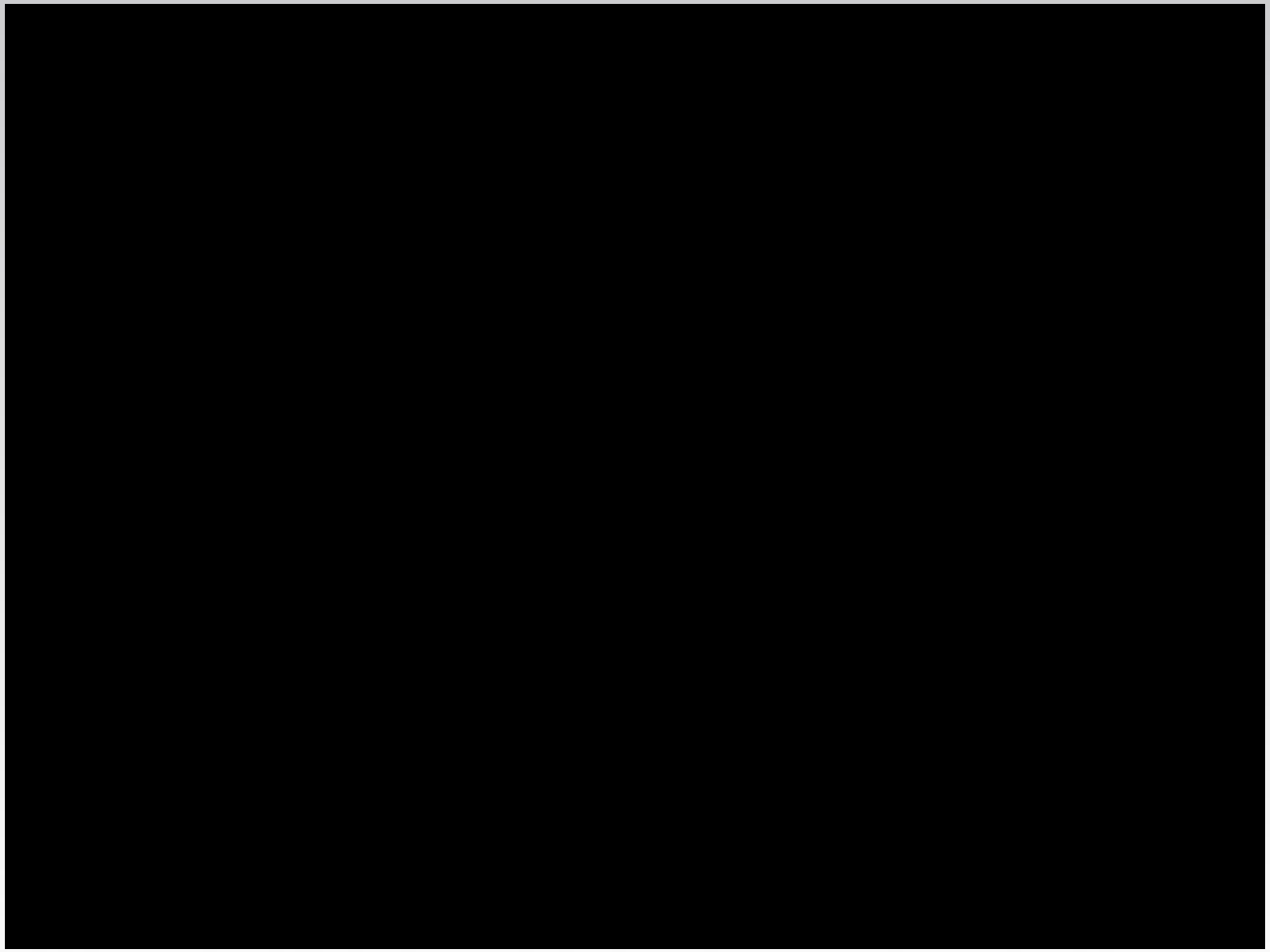
SIMEU Congress, 17-20 November,
Symposium
Georges Bousignac

VYGON
Value Life

Cardiac arrest: A new cutting edge treatment method by Dr. Boussignac

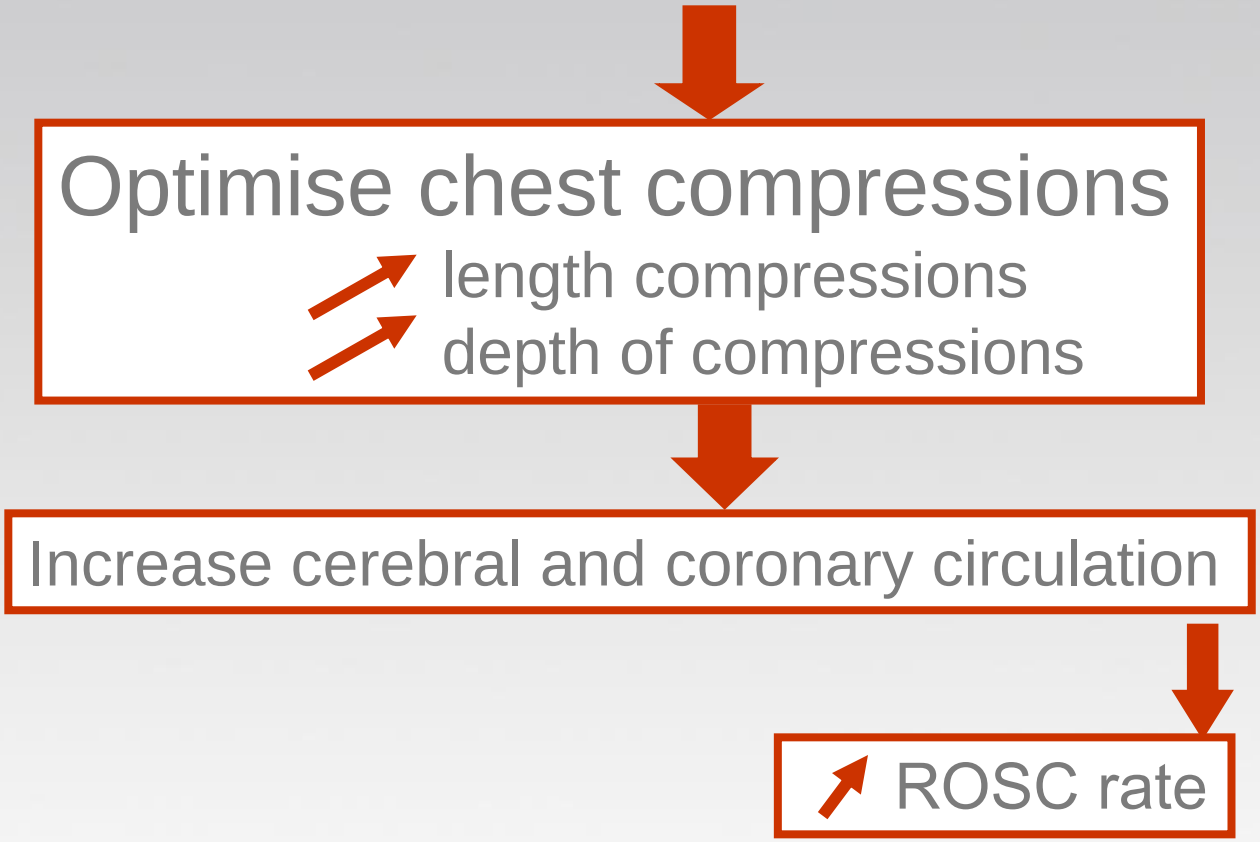
No Pause Should Be Your Cause

Cardiac arrest: A new cutting edge treatment method by Dr. Boussignac



Chest compressions or ventilation: both at the same time?

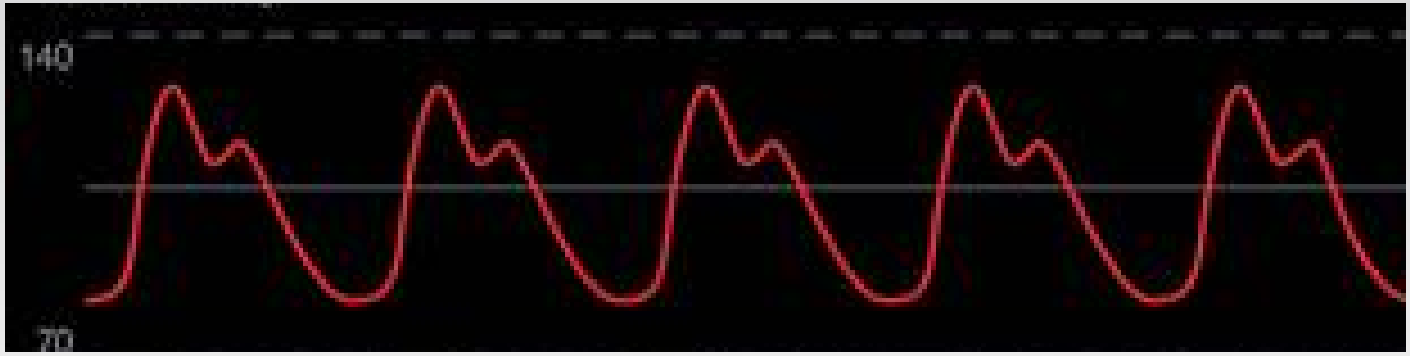
2015 ILCOR guidelines: similar to 2010 concerning major role of chest compressions



Brouwer T, Walker R, Chapman F, Koster, R.
Association Between Chest Compression Interruptions and Clinical Outcomes of Ventricular Fibrillation Out-of-Hospital Cardiac Arrest. *Circulation.* 2015;132:1030-1037.

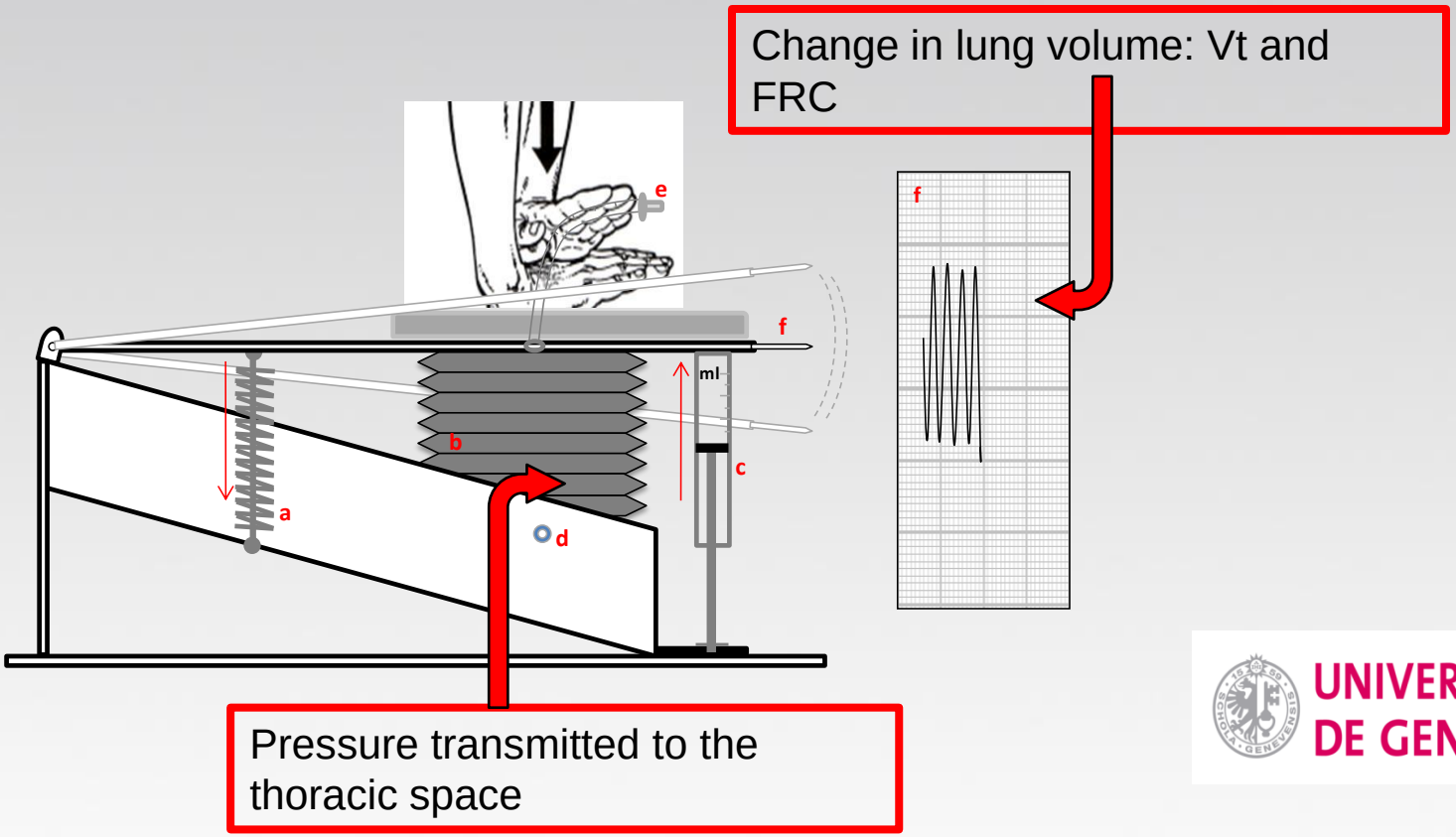
Prolonged interruptions in chest compressions, for reasons other than defibrillation, worsen clinical outcomes for out-of-hospital cardiac arrest patients with ventricular fibrillation

Increased heamodynamics



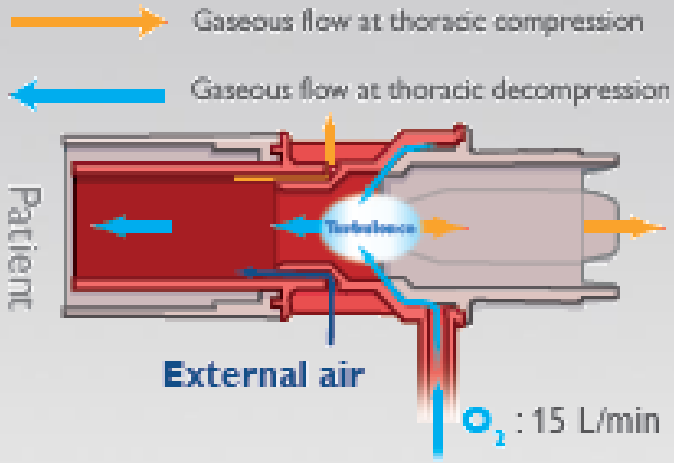
Impact of different ventilation strategies during chest compression. An experimental and clinical study

RL Cordioli, A Lyazidi, N Rey, JM Grannier, D Savary, L Brochard , JC M Richard.



UNIVERSITÉ DE GENÈVE

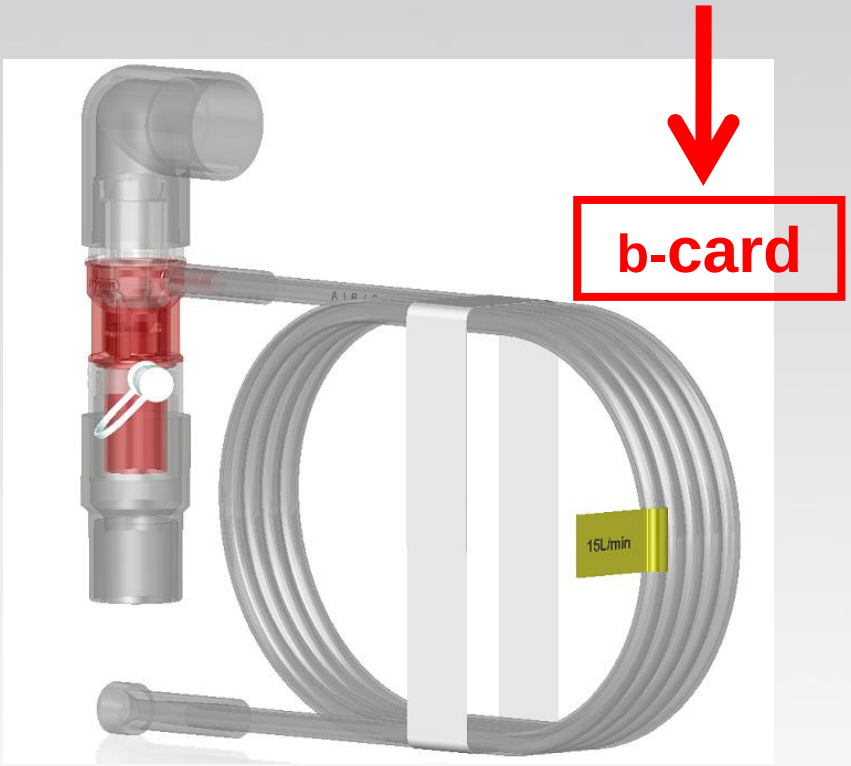
The concept of b-card

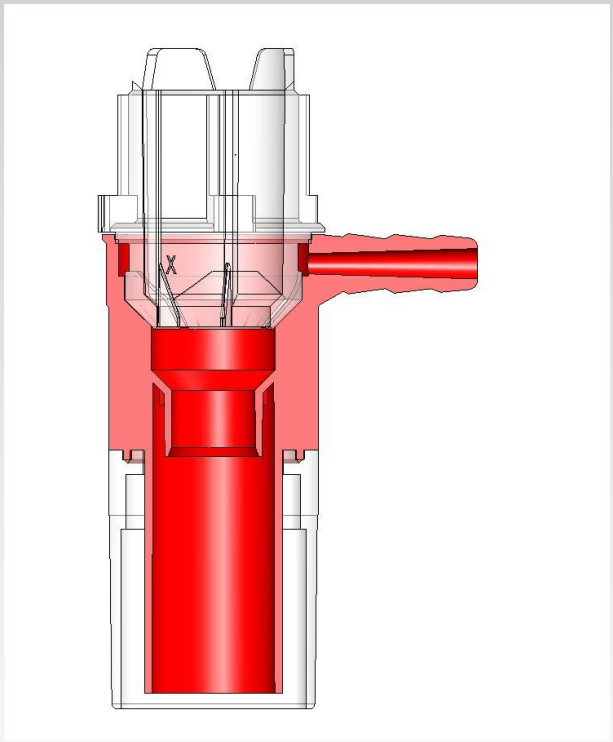


- Gas flow rate at 15L/min
- Turbulences (virtual valve) created in b-card
- Control the exit and entry of gas from the respiratory tract and lungs
- Creation of static lung pressure of 5 to 8 cmH2O

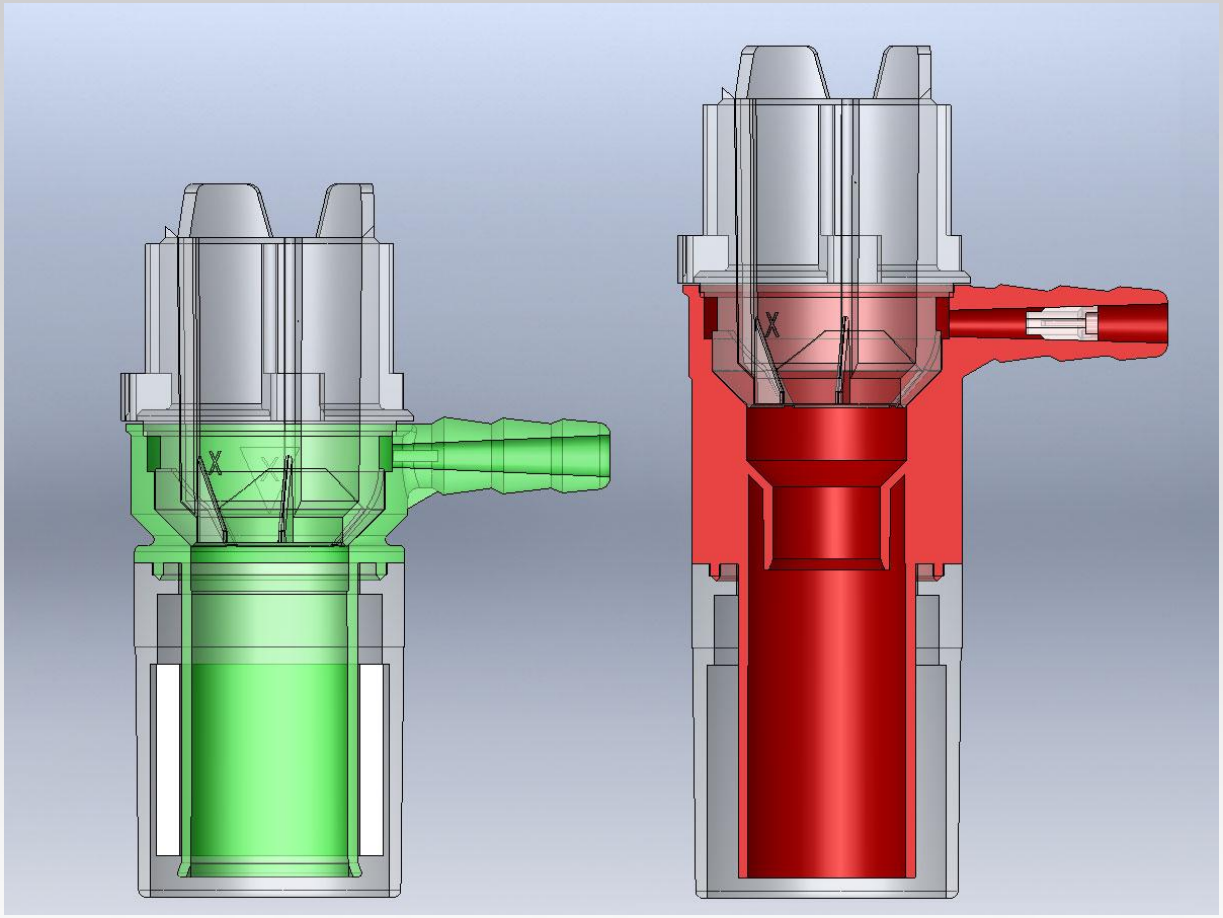
- The AV-CCC concept improves heamodynamics and ventilation

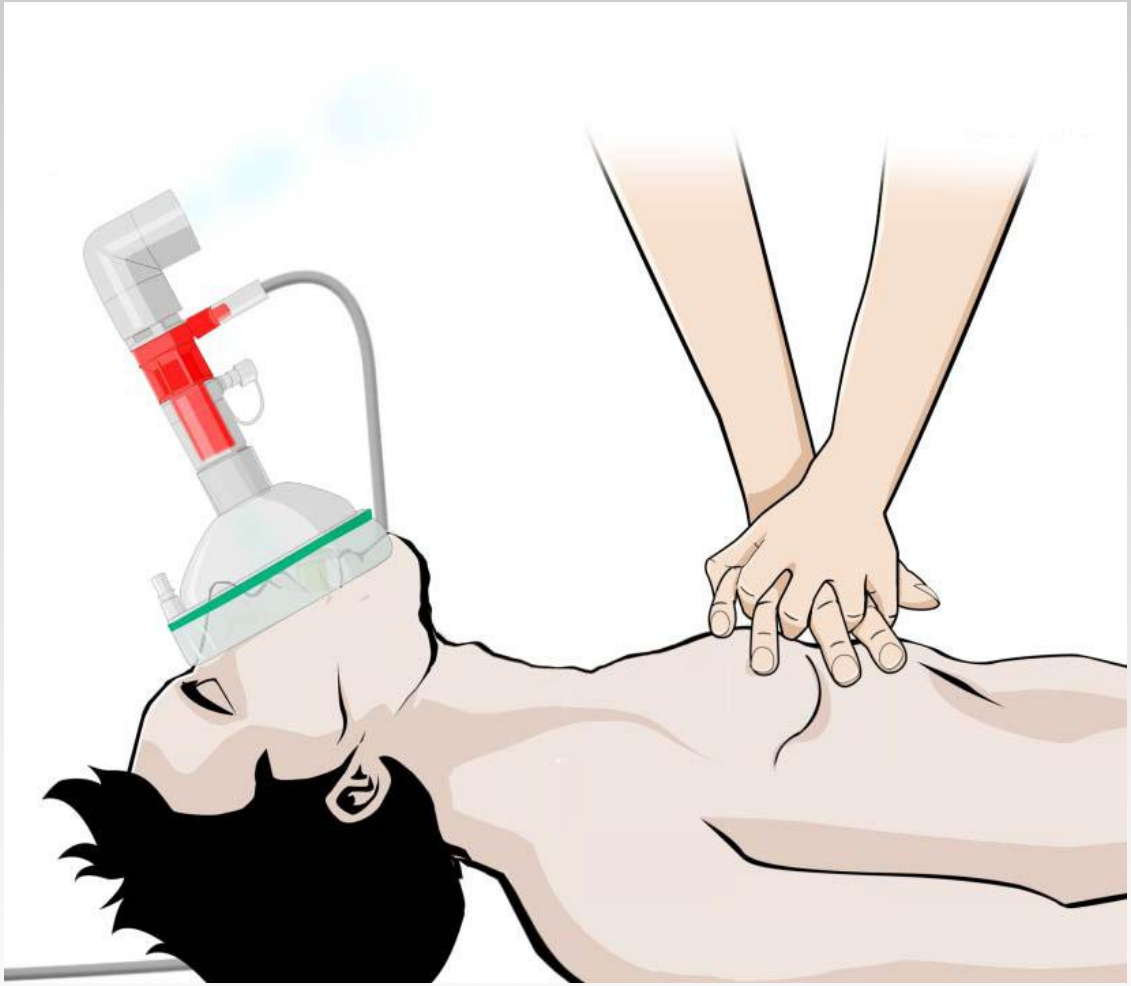
For first responders, and E.M.T.



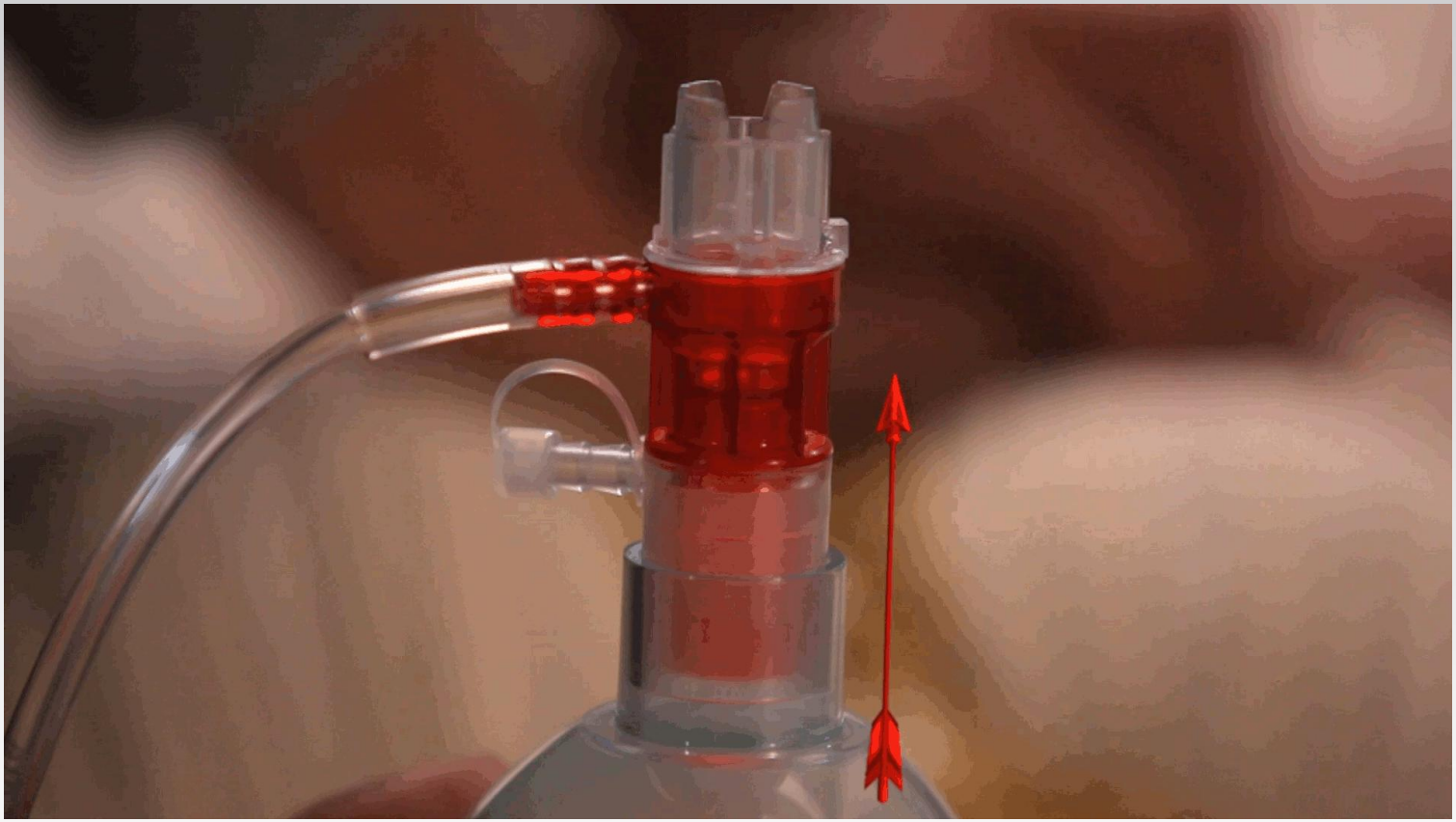


CPAP ≠ b-card





The concept of b-card



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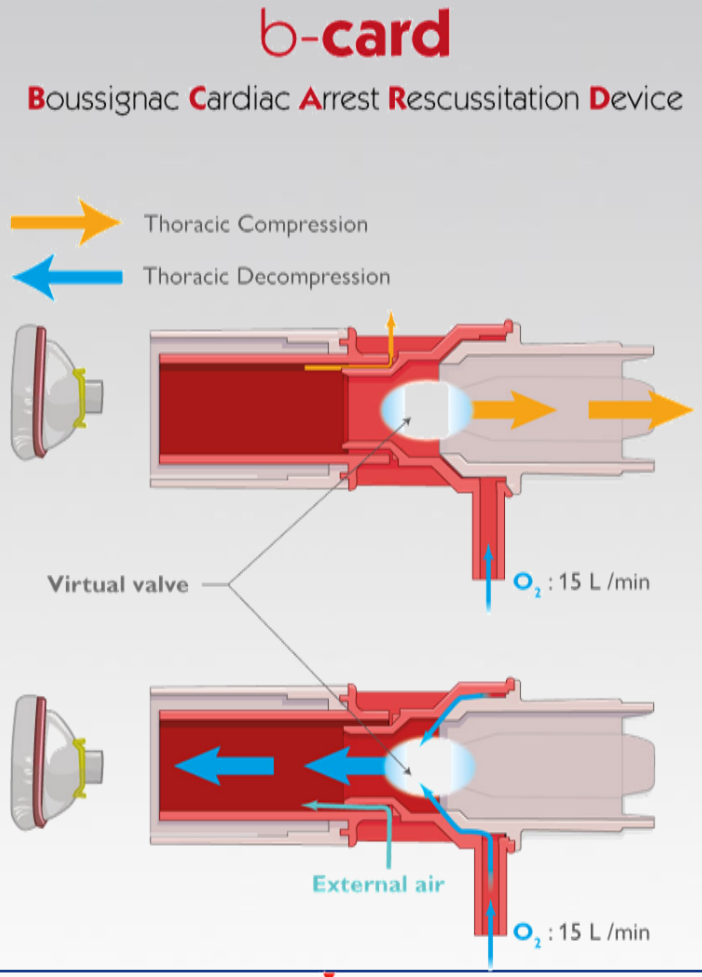

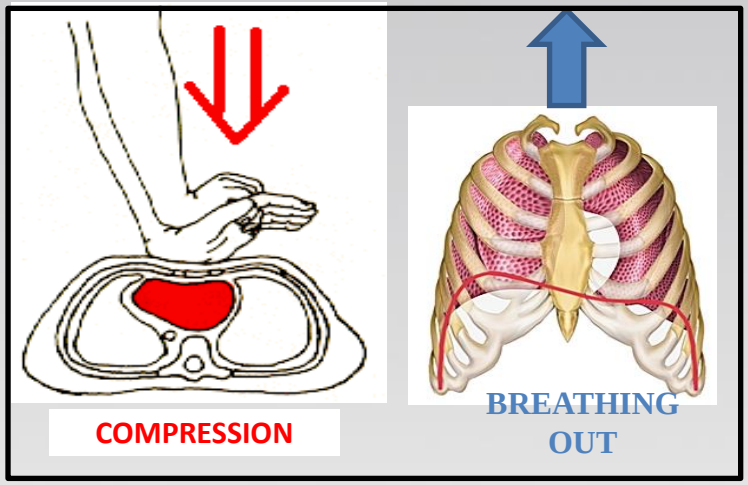

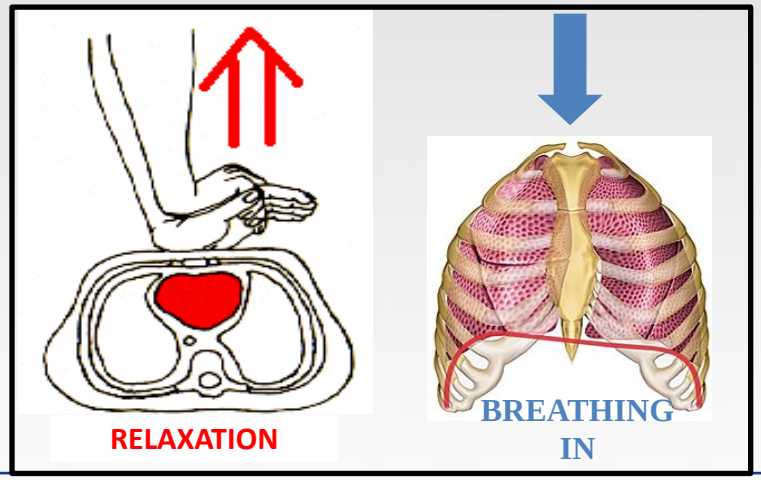

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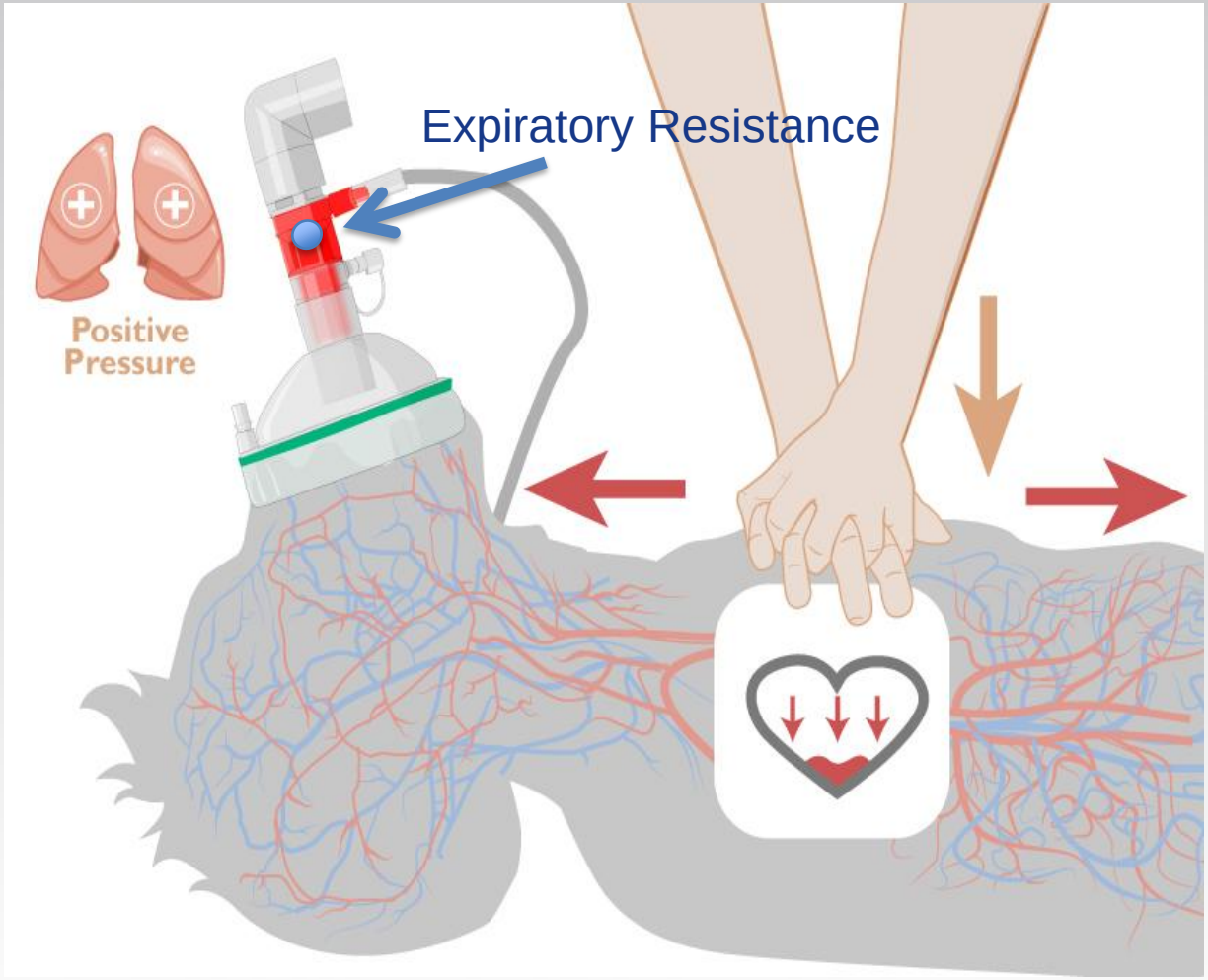


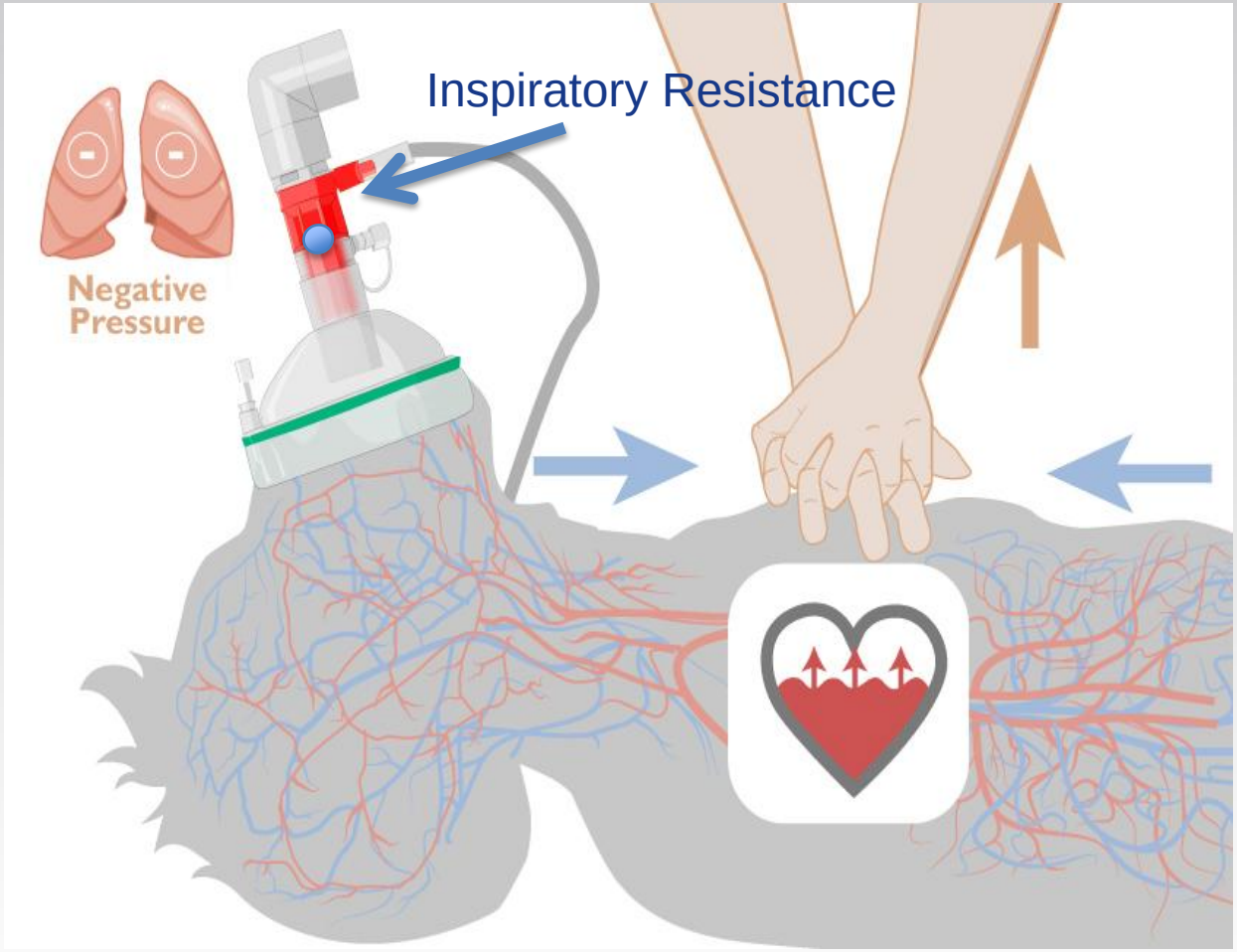
During Chest Compression

Optimised energy transmission from chest compressions to the circulatory system

Increased Intrathoracic Pressure

Improvemed Heamodynamics

The concept of b-card



During Chest Decompression

Negative Intrathoracic Pressure

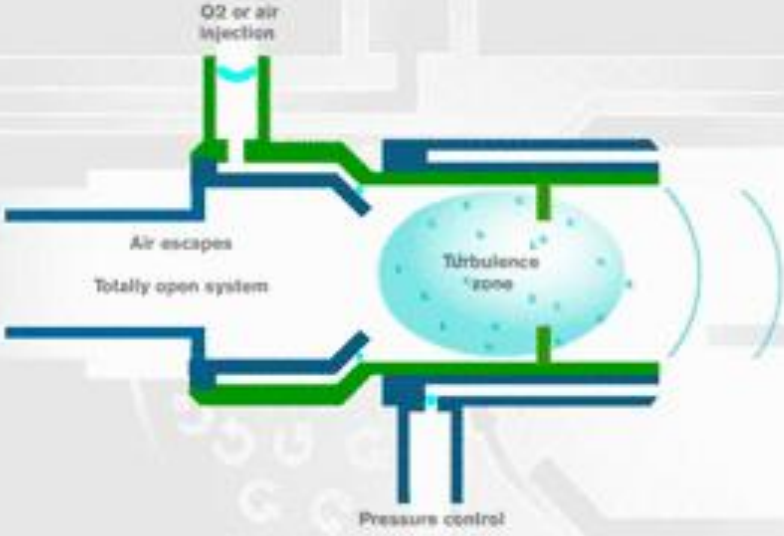
Venous return

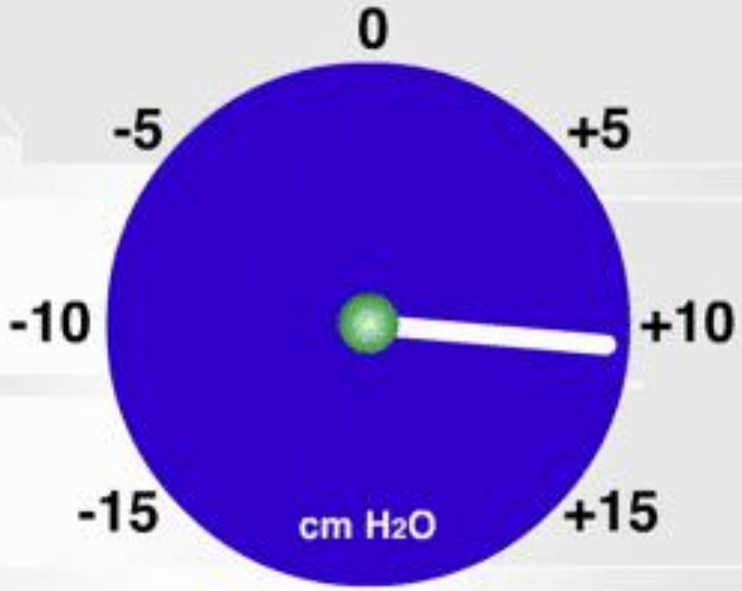
Increased pre-load

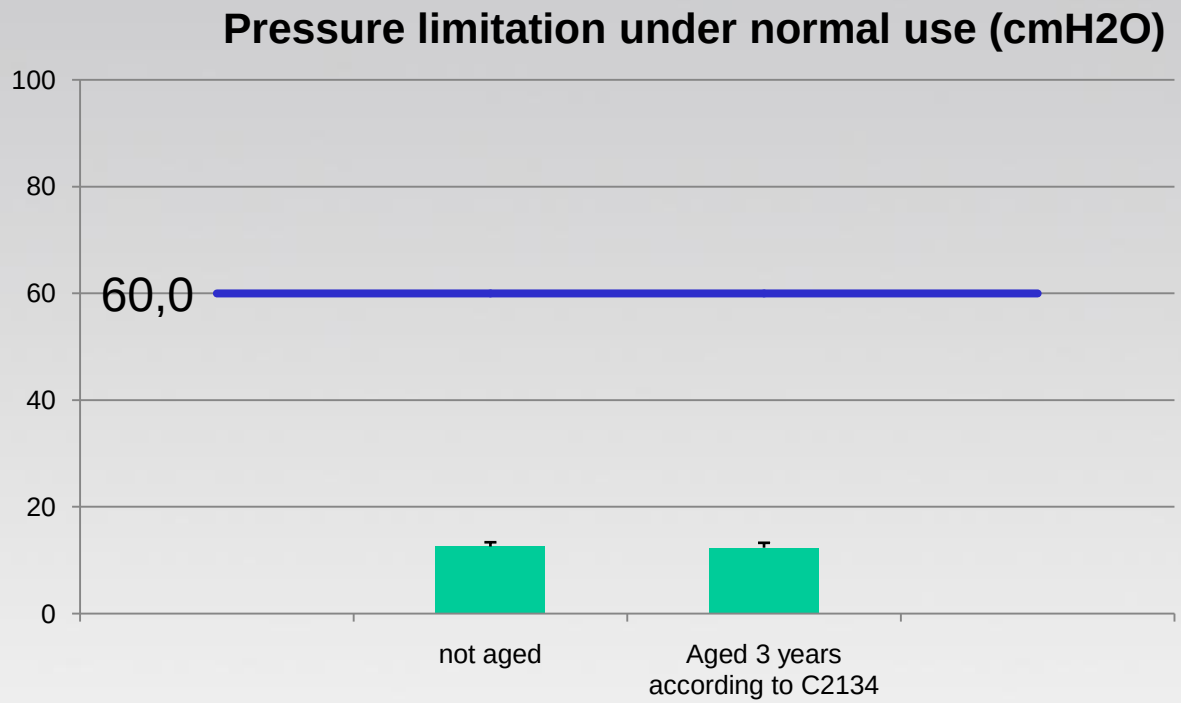
Increased cardiac output

The concept of b-card

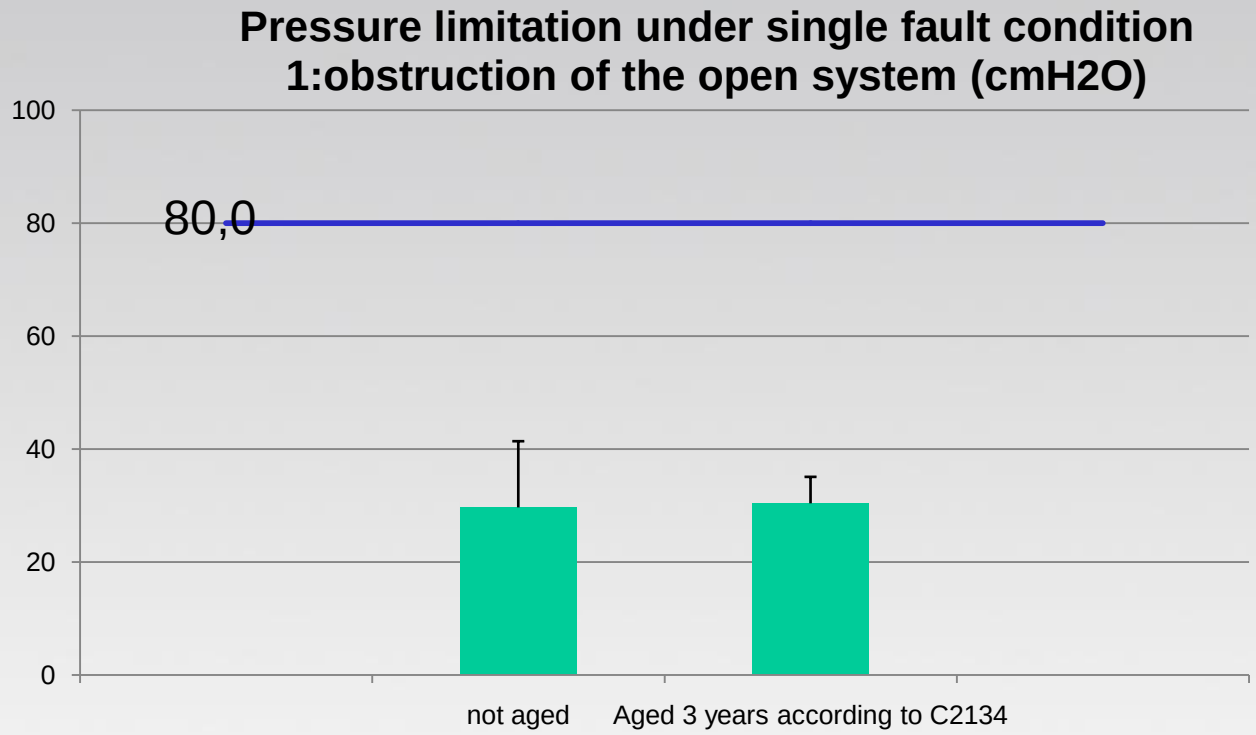
Open system with B-CARD generating expiratory and inspiratory resistance is made by continuous oxygen or air insufflation.





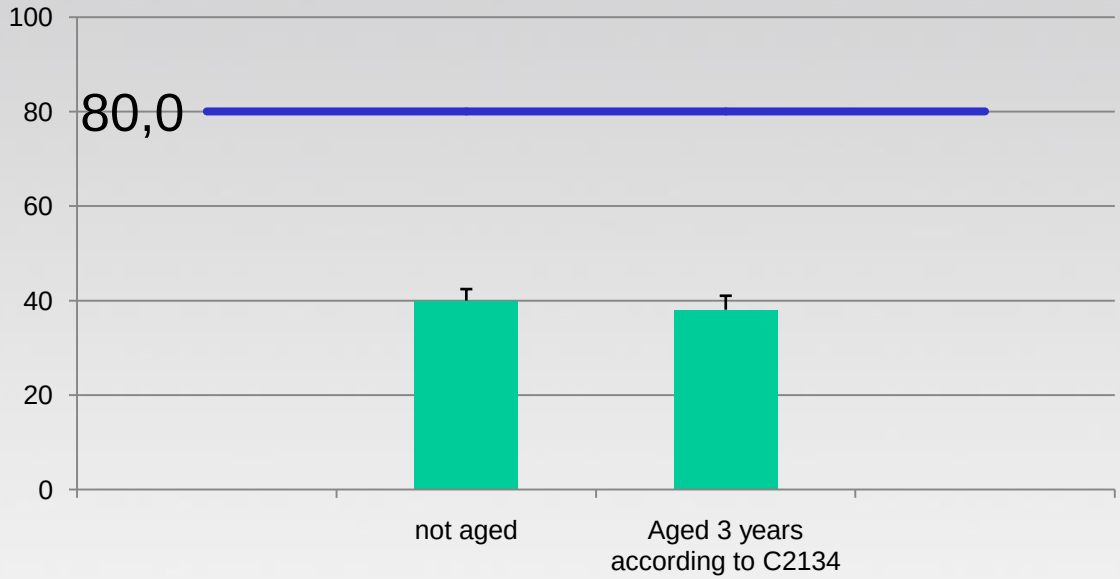


Based on the samples tested, the higher end value of the statistical interval is 13.4 cmH_2O compared to an acceptance criterion of maximum 60.0 cmH_2O



Based on the samples tested, the higher end value of the statistical interval is 41.4 cmH_2O compared to an acceptance criterion of maximum 80.0 cmH_2O.

Pressure limitation under single fault condition n°2: inappropriate flow rate setting (cmH_2O)



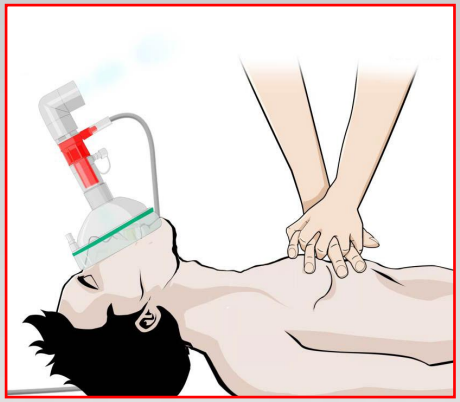
Based on the samples tested, the higher end value of the statistical interval is 42.4 cmH_2O compared to an acceptance criterion of maximum 80.0 cmH_2O.

Summary on curves bench test Angers University Laboratory

- This report proves that b-card creates a positive intra-thoracic pressure at compression and a negative intra-thoracic pressure at decompression which helps improve the venous return and heamodynamics to the whole body.
- Secondly, the tidal volume delivered is improved compare to Intermittent Positive Pressure Ventilation with Bag-Valve Mask (BVM). Indeed, the volume delivered at decompression is minimum 315 ml and maximum 369 ml.

Fire Brigade Training

1 - Connect the B-CARD to the face mask, the O2 and the manometer



2- Put the B-CARD mask on the face in impermeable manner with 2 hands. Put 2 knees on the ground and maintain the head in extension position

3- Observe the oscillations of the pressures on the manometer, to check the airflow during CPR

Initial pressure in **static** (without CC)

Maximal pressure in **compression**

Minimal pressure in **relaxation**

The concept of b-card

The concept of b-card

ROSC case with b-card

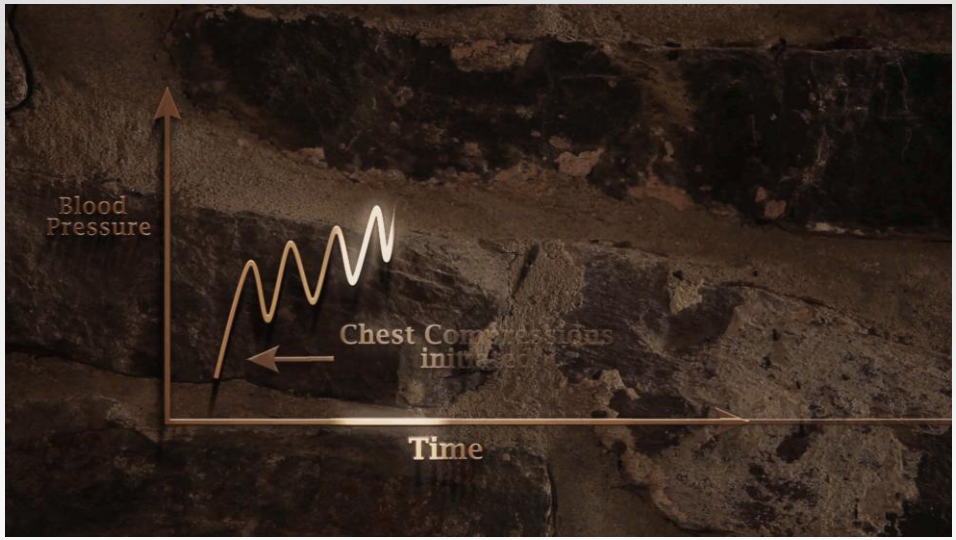
April 2016: Cardiac Arrest Evreux Hospital
Male 70 old. CPR with b-card : SpO2 at 80 % then 90%.

Continuous Chest Compressions + b-card

ROSC

The concept of b-card

- b-card maintains blood pressure by eliminating the need to stop chest compressions to ventilate
- Your hands become the ventilator so no need for BVM ventilation



Impact of different ventilation modalities on lung volumes and pressures during automatic cardio pulmonary resuscitation : a bench study

R. Cordioli[1], A. Lyazidi[2], V. Garelli[1], L Suppan[3], JM Granier[1], D Savary[4], M Niquille [4], N. Rey[1], L. Brochard[5], JCM. Richard[2]

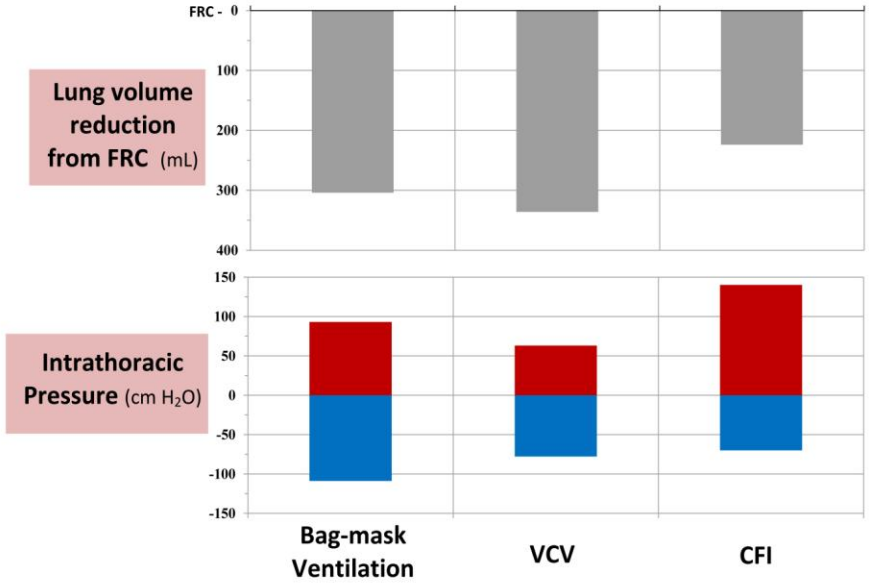
[1] University Hospital of Geneva, Intensive Care Unit, Geneva, Switzerland;
[2] University Hospital of Geneva, Intensive Care Unit and University of Geneva, Geneva, Switzerland
[3] University Hospital of Geneva, Cardiomobile, Geneva, Switzerland
[4] General Hospital of Annecy, Emergency department, France
[5] St Michael's Hospital, Toronto; University of Toronto, Canada

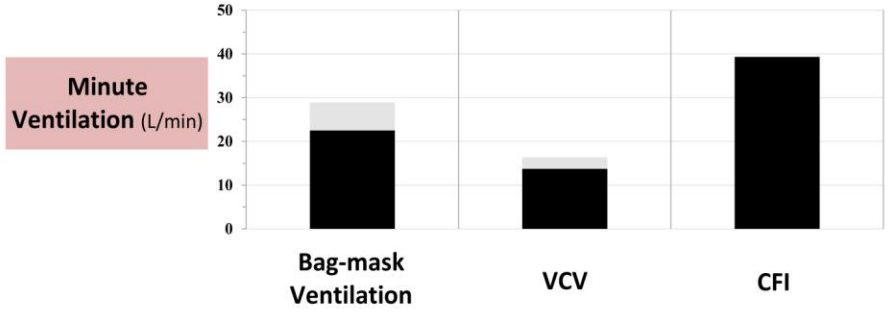
Introduction: During cardio-pulmonary resuscitation (CPR), the ventilation strategy applied may affect tidal volume (V_T), minute ventilation (VE), lung volume and hemodynamics. Also, by decreasing lung volumes, chest compressions (CC) can create lung injury.

Objective: This bench study aimed to evaluate current recommendations for ventilation during CPR and to compare it to continuous flow insufflation (CFI) with positive pressure.

Materials and methods: In a lung test model specifically designed to allow standardized chest compressions with an automatic device (LUCAS 2©), we evaluated manual bag ventilation (10 cycles/minute), volume controlled ventilation (VCV) mode using Oxylog 3000© (respiratory rate at 10/min, V_T = 500 ml and zero of end-expiratory pressure). We also tested CFI set at 10 cmH_2O - 12L/min of continuous flow of gas using CPR Boussignac® tube. Ventilation mobilized by CC (black in the figure) and by the conventional ventilatory strategies (gray in the figure), changes in intrathoracic pressure and dynamic lung volume reduction compared from FRC were measured.

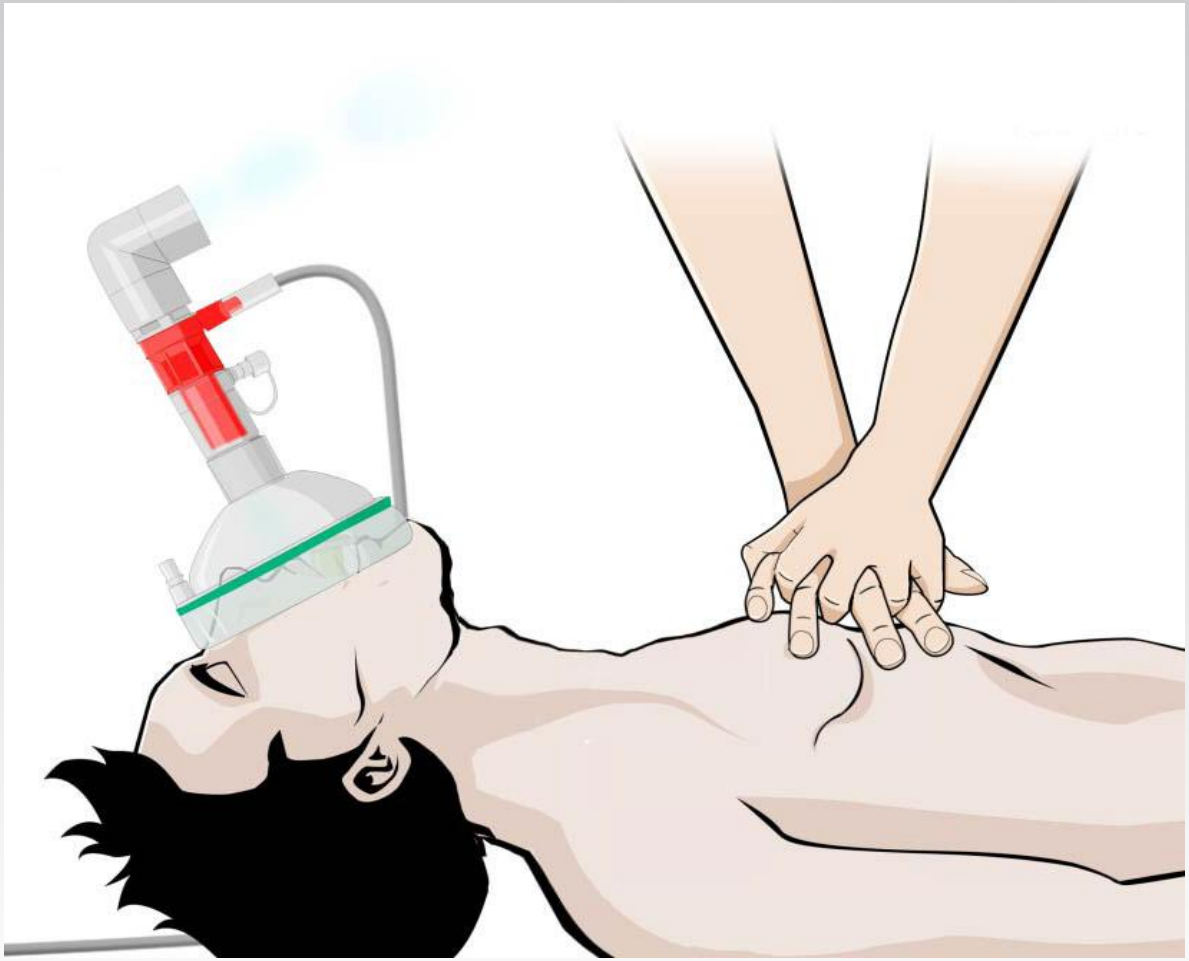
Results: With the two conventional ventilatory strategies, main part of minute ventilation was related to CC alone (84% for bag-mask ventilation and 78% for VCV) and lung volume was reduced far below FRC. With CFI, minute ventilation was significantly greater and the loss of lung volume was less important. Finally, with CFI the intrathoracic pressure during compression (red) was positive but remained negative (blue) during decompression thus preserving venous return.





Conclusion: With current conventional ventilatory strategies, ventilation was essentially due to CC and took place entirely below FRC. CFI was more efficient in terms of ventilation, FRC protection and intrathoracic pressure variation. These results show the predominant role played by CC in terms of ventilation and suggest that ventilation with CFI should be considered for CPR.

No Pause Should Be Your Cause!



Any Questions?