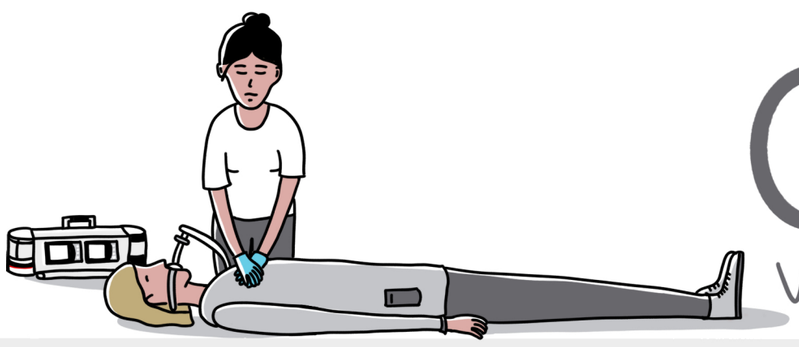
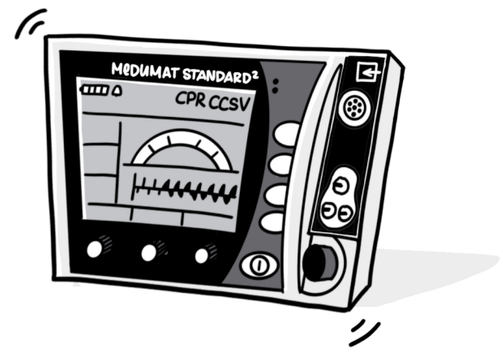


CCSV

CHEST COMPRESSION SYNCHRONIZED VENTILATION

VENTILATION FOR RESUSCIATION

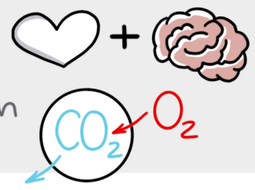


CARDIAC ARREST-WHAT TO DO?

1. Perform alternate chest compressions & ventilation! — 30 : 2
2. Secure the airway and carry on with continuous ventilation! — 10/min, 6-7 ml/kg BW

OBJECTIVES OF RESUSCIATION

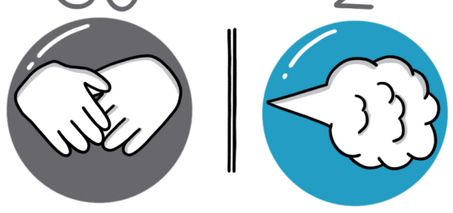
1. Maintaining a minimum circulation
2. Oxygenation of the internal organs and the brain
3. Adequate alveolar ventilation



STANDARD PROCEDURE

Chest compressions & ventilation are carried out independently of each other.

30 : 2



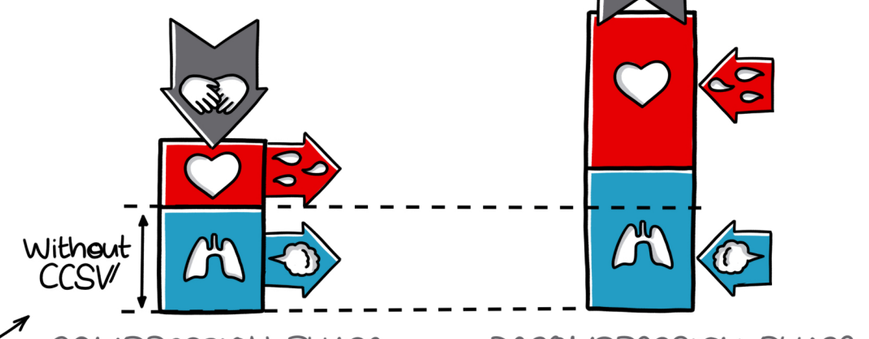
DISADVANTAGE OF THIS PROCEDURE

Gas escapes from the lungs during the compression phase, reducing the intrathoracic pressure.

Heart and lung vessels are compressed.

Blood is pumped into the circulation. At the same time, air is pressed out of the lungs.

Blood flows back into the heart, and a small amount of air into the lungs.

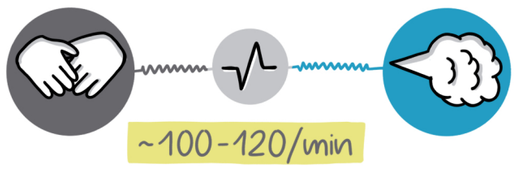


HOW DOES CCSV HELP WITH RESUSCIATION?

CCSV is an innovative ventilation mode that was specially developed for use in cardiopulmonary resusciation.

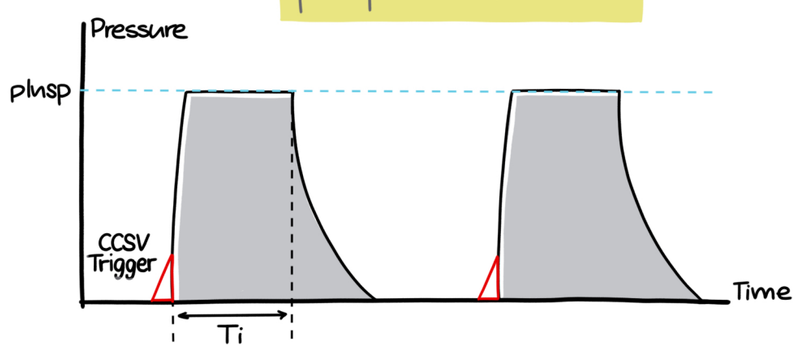
With CCSV, the mechanical breaths are precisely coordinated with the chest compressions. This synchronization ensures that every chest compression is immediately supported by a mechanical breath.

The ventilation rate in CCSV mode is linked to the frequency of the chest compressions.



With CCSV, the gas flow out of the lungs generated by chest compressions is detected by the ventilator and used as an inspiration trigger.

The coordination leads to:
- very short inspiratory times — Ti = 205 ms
- an inspiratory pressure of pInsp — pInsp = 40 - 60 mbar

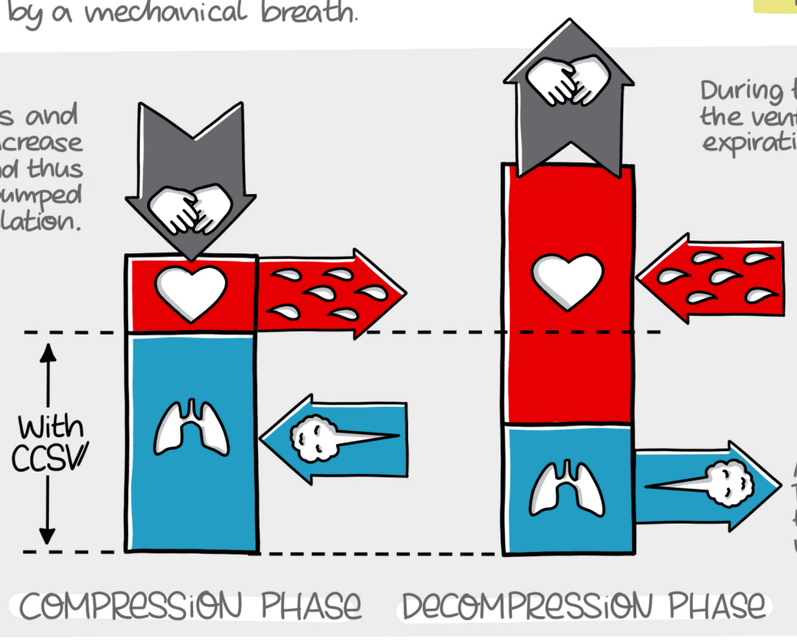


Chest compressions and simultaneous ventilation increase the pressure on the heart and thus the amount of blood pumped into the circulation.

Maximization of intrathoracic pressure during compression. Cardiac output increases.

During the decompression phase, the ventilator switches to expiration.

Air escapes from the lungs. The venous return flow to the heart can take place without any hindrance.



This interaction enables more efficient heart compression and thus a better cardiac output plus improved gas exchange.

90 % of users recommend CCSV.*6

93 % of users rate CCSV as helpful in their work.*6

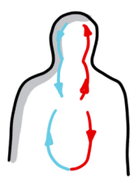
150 Over 150 emergency medical service providers and hospitals already use CCSV- and the trend is rising!*7

61,8 % Prehospital ROSC was achieved in 21 out of 34 CCSV patients.*5

14,7 % 5 out of 34 of CCSV-patients were discharged from hospital alive.*5

3:03 h Longest CCSV ventilation time of a patient requiring CPR and able to leave hospital.*5

MEDICAL EFFICACY OF CCSV COMPARED TO CONVENTIONAL VENTILATION

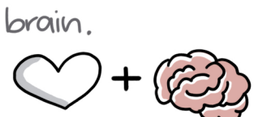


▸ HEMODYNAMICS

Significant increase in arterial blood pressure and the difference between arterial and central venous blood pressure, which is largely responsible for cardiac and cerebral perfusion pressure.

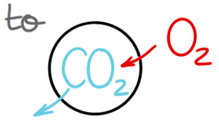
▸ OXYGENATION

Increased oxygen supply for heart and brain.



▸ ADEQUATE ALVEOLAR VENTILATION

Improved elimination of CO_2 (decarboxylation) and maintenance of an arterial carbon dioxide partial pressure that is as close to normal as possible to prevent respiratory acidosis.

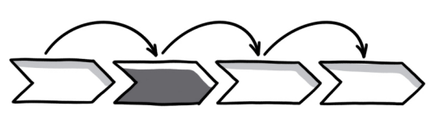


FURTHER BENEFITS OF CCSV?

▸ INTERRUPTION-FREE CHEST COMPRESSIONS

Following airway management, MEDUMAT Standard² automatically detects every chest compression in CCSV mode.
If compressions are interrupted, the device stops automatically. If compressions are recommenced, the device immediately resumes CCSV mode and ventilation.

This assists the workflow enormously.



▸ CONTINUOUS MONITORING & THERAPY

CCSV as a bridge to further treatment in hospital.

SUMMARY

Maximizing intrathoracic pressure in the compression phase by means of chest compression with synchronous ventilation (CCSV) produces demonstrably more effective and efficient resusciation compared to traditional resusciation.

USERS PLEASE NOTE:

Correct use of CCSV requires both extensive training and practical experience - especially when it comes to dealing with ventilators and CCSV-compatible chest compression devices.

*Are you interested in the scientific findings on CCSV?

An overview of all relevant studies can be found here:

WEINMANN medical technology

CONTACT

Do you have any questions? Then contact us direct and we will be happy to help!

VISUAL BY ANNA BREUER