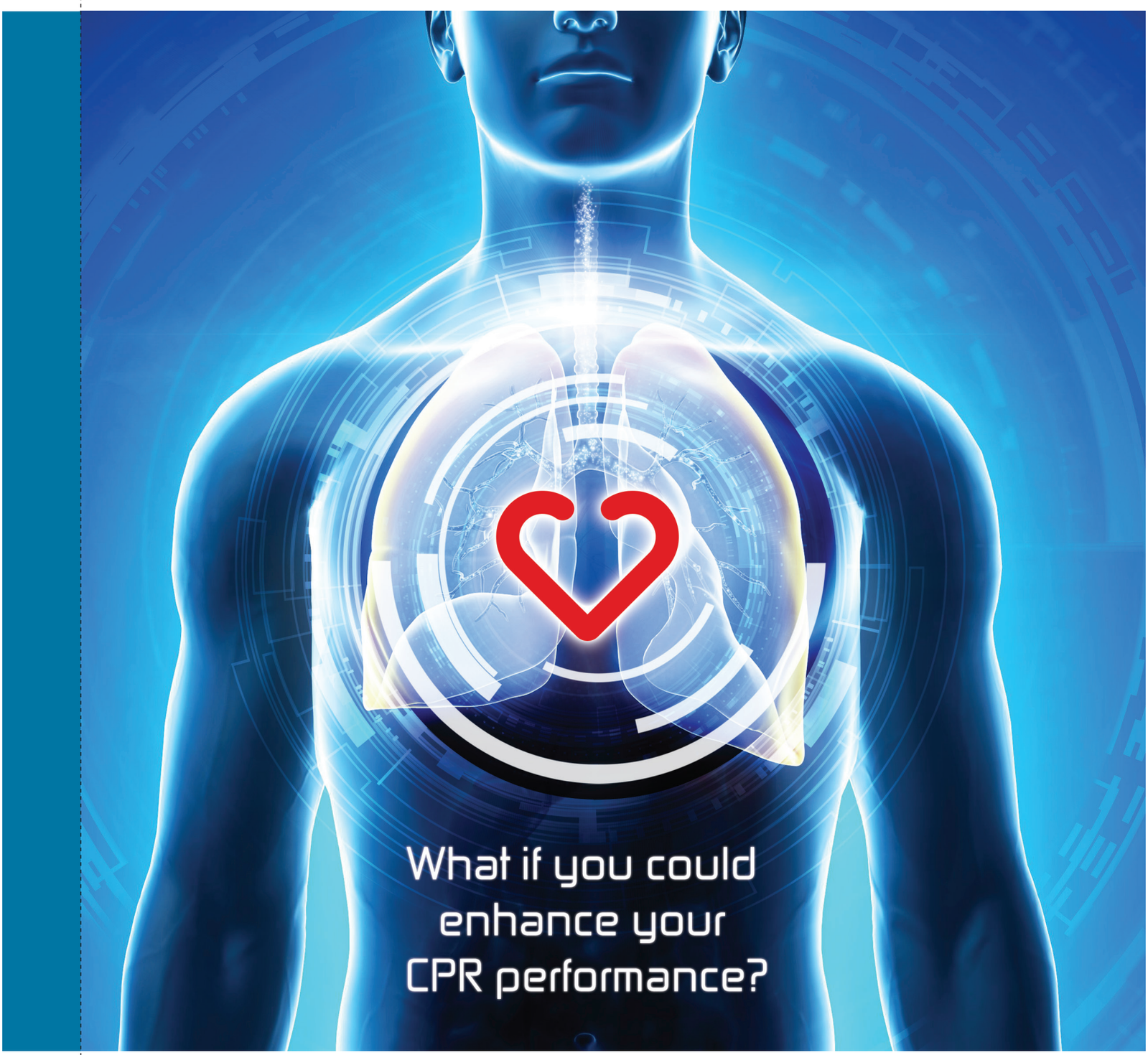
AIR LIQUIDE
Healthcare

CPV

CARDIO PULMONARY VENTILATION



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DEALING WITH CARDIO-RESPIRATORY ARREST:
Adequate ventilation is needed to preserve circulation

Ventilation can adversely affect circulation while delivering chest compressions (CCs). Its role is, however, crucial when cardiopulmonary resuscitation (CPR) is prolonged. To meet CPR requirements, in line with international guidelines, ventilation should include high-quality CC and optimal oxygenation.[1,2]

The need for ventilation is low when CPR is prolonged, whereas optimal oxygenation is critical. The use of tracheal intubation, well-established as the "gold standard" of care in emergency, is currently being debated. Ventilation with mask interfaces is recommended, as long as the risks associated with bag valve ventilation are avoided.[3,4]

AIR LIQUIDE MEDICAL SYSTEMS' COMMITMENT

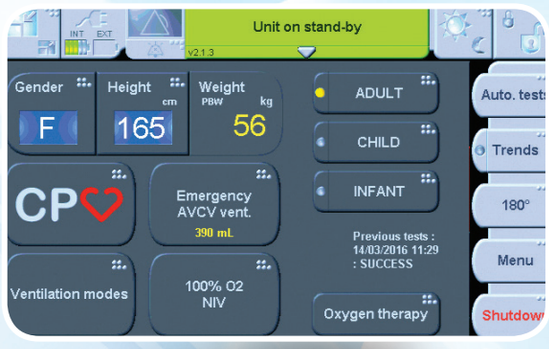
For 40 years, Air Liquide Medical Systems has committed its expertise to healthcare professionals and patients to create and provide innovative medical devices, notably in respiratory care (ventilators and patient interfaces for intensive care, emergency, transport and patients' home).

To this end, Air Liquide Medical Systems developed the CPV (Cardio Pulmonary Ventilation) solution. The solution is dedicated to managing cardiac arrest and can be used with the well-established emergency transport ventilator Monnal T60. CPV offers technical innovations for each stage of cardiopulmonary resuscitation (CPR) that are specifically designed for rescuers. The solution can be used by mobile intensive care units, during inter- and intra-hospital transports, and by specialized services.

1. European Resuscitation Council Guidelines for Resuscitation, 2010 ; 2. American Heart Association (AHA) Guidelines for CPR and ECC, 2010 ; 3. Hasegawa K et al. JAMA 2013; 309 : 257–266 ; 4. Segal N et al. Resuscitation 2015; 86 : 62–66.

CPV, THE SOLUTION FOR A SYNCHRONIZED VENTILATION

Developed with professional rescuers to meet their expectations



ONE TOUCH to start

LIMITS the risks associated with bag valve ventilation

ENHANCES circulation

LIMITS alarms

GUIDES users to CPR

What is it?

- The CPV (Cardio Pulmonary Ventilation) mode is an innovative solution in cardiac arrest management. It can be provided with the emergency transport ventilator Monnal T60
- Its goals are to easily perform ventilation and improve circulation at the same time
- It facilitates CPR management

How to use it & how it works?

- The single button, displayed on the home screen, immediately launches the CPV mode under preset settings in line with international guidelines

These settings can be modified according to clinical requirements, when necessary

- The CPV solution assists users throughout the entire process of CPR, from the early stages of CPR, such as ventilation with mask interfaces (to avoid the risks associated with bag valve ventilation), until the more demanding technical stages, such as tracheal intubation
- The CPV solution ensures that the CC and return of spontaneous circulation (ROSC) phases switch when necessary, and so facilitates ventilation management

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CARDIO PULMONARY VENTILATION

CPV, PROVIDING SYNCHRONIZED VENTIL A

Just a single touch to combine ventilation with h

Real-time performance feedback on CC quality to guide you in the management of CPR

- CC quality is known to affect patient survival. The use of a real-time monitoring system to report on indicators of external cardiac massage during CPR is an essential step forward
- The CPV solution, which is available on the emergency transport ventilator Monnal T60, offers immediate assistance to deliver high quality CPR
- Four essential parameters are detected in real time:
  - fCC, chest compression frequency
  - no CC, cumulative time during which no CCs were performed
  - P-P, indicator of CC strength
  - $etCO_2$, concentration of exhaled CO_2

CPV, the solution for a synchronized ventilation:

- detects CCs, monitors essential CC parameters to obtain immediate feedback on the quality of CPR performance
- synchronizes ventilation with CCs for optimal circulation

L ATION FOR CPR
h high-quality chest compressions

Ventilation is actively synchronized with CCs for optimal circulation

- The CPV mode includes a specific synchronization algorithm for high and low pressures, which, for the first time, magnifies intrathoracic positive pressure (ejection) during CCs and negative intrathoracic pressure (venous return) generated by chest recoil
- The CPV solution guarantees sufficient oxygenation without interrupting external cardiac massage (ECM) and maintains sufficient alveolar ventilation

- CPV helps you focus your attention and efforts on patient outcomes
- CPV aids you in performing CPR within the recommended range of international guidelines:
  - You are given a continuous feedback loop to evaluate the quality of your actions and are guided throughout the entire process to improve CPR in real time
  - The CPV synchronized ventilation is designed to offer better oxygenation and improve patient hemodynamics

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Essential CC indicators to help you when perfo

Frequency (fCC)

- Critical parameter reflecting CPR efficacy
- Helps target and maintain optimal CC frequency

YOUR SUPPORT

On screen: frequency of chest compressions per minute

Goal: 100/min

Exhaled CO_2 monitoring ($etCO_2$)

- Indicator of circulation function

YOUR SUPPORT

Detects correct intubation and CPR efficacy

ROSC indicator

L ATION FOR CPR: IN PRACTICE
erforming CPR

Detection of compression interruptions (no CC)

- Indicator of cumulative time during which no CCs were performed

YOUR SUPPORT

Encourages the rescuer not to interrupt CCs

Strength (P-P)

- Indicator of CC efficacy (indirectly shows the pressure transmitted to the thorax)
- Ensures regularity of compression amplitude

YOUR SUPPORT

Encourages the rescuer to maintain the pressure intensity of compressions or ask a colleague to take over

Insufflated tidal volume (VTi)

- Monitoring of insufflated tidal volume while performing continuous chest compressions

Ventilation settings zone

- Two levels of pressure-controlled ventilation synchronized with CCs
- Initial preset parameters in line with international guidelines:
  - FiO_2: 100%
  - Frequency: 10 cycles/min
  - Duration of insufflation: 1 seconde

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Contact

Air Liquide Medical Systems
Parc de Haute Technologie
6, rue Georges Besse
92182 Antony Cedex, France
Tel. : +33 (0)1 40 96 66 00
Fax : +33 (0)1 40 96 67 00
infoCPV@airliquide.com

AIR LIQUIDE Healthcare

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