

**ABYLCAP**  
C O<sub>2</sub> R E M O V A L



Simplicity and Safety

Prevention

Efficiency and Biocompatibility

### Bibliography

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*The right therapy way*

**NEW**

# ABYLCAP

C O<sub>2</sub> R E M O V A L

**The therapeutic strategy aimed at protective ventilation**

**Simplicity and Safety**

**Prevention**

**Efficiency and Biocompatibility**

**ABYLE**<sup>®</sup>  
— Acute Bellico Line —



*The right therapy way*

# ABYLCAP

C O<sub>2</sub> R E M O V A L

## THE THERAPEUTIC STRATEGY AIMED AT PROTECTIVE VENTILATION

***Abylcap allows quickly, easily and effectively removing CO<sub>2</sub> in full safety at the same time optimizing the mechanical ventilation and protecting the patient's lungs. Bellco proposes this new method integrated with the Lynda system for elective treatment of patients suffering from ALI (Acute Lung Injury), ARDS (Acute Respiratory Distress Syndrome), possibly caused by other diseases, such as SEPSIS, MOF (Multi Organ Failure), COPD (Chronic Obstructive Pulmonary Disease) and MULTITRAUMA.***

### **VILI: Ventilator-Induced Lung Injury**

**Mechanical ventilation, a life support therapy for care of critical patients suffering from acute respiratory failure (ARF), poses some potential risks of lung injury** (even irreversible) induced by alveolar overdistention or by the inspiration/expiration cycle. These risks can in their turn lead to damage, such as barotrauma, volutrauma and atelectrauma. Further possible consequences are inflammation, not only of the pulmonary tissue, but also of other organs, such as the liver and the kidneys, because of damage to the alveolar-capillary barrier.

**These processes may be summarised as 'VILI' (ventilator-induced lung injury).** In order to prevent potential injury – as demonstrated by clinical studies – mechanical ventilation can be used at low pressure values (plateau pressure < 30 cmH<sub>2</sub>O) or exchange volumes (approx 6 ml/kg of ideal body weight) (8). This type of treatment is by now accepted for patients suffering from ARF (Acute Respiratory Failure), however, there is an associated risk of hypercapnia and respiratory acidosis.

**To facilitate the removal of excess carbon dioxide, extra-pulmonary devices are used to help the lungs function and to maintain an acceptable alveolar gaseous exchange.**

### **Why CO<sub>2</sub> removal systems**

The possibility of using **CO<sub>2</sub> removal systems represents a major clinical advantage to protect the lungs (and not only) from injury caused by mechanical ventilation** and, more in general, the patient from dangerous states of respiratory acidosis. The excess CO<sub>2</sub> removal systems are an important component for the survival of patients suffering from respiratory failure.

**A correct CO<sub>2</sub> value, apart from determining the basic acid balance, is an inescapable component of cellular respiration** and contributes to short-term regulation of the **local tissue blood flow** (microcirculation) in order to ensure and maintain an **appropriate blood flow** in terms of optimal perfusion of the organs.

### **Abylcap for the prevention of lung injury in patients in respiratory failure**

**Abylcap is intended for preventive CO<sub>2</sub> removal to reduce the aggressiveness of mechanical ventilation, contain VILI, favour weaning from mechanical ventilation and extubation, reduce the days of sedation and the risk of complications.** The treatment is suitable for patients that respond to oxygenation therapy but are unable to independently maintain a balanced CO<sub>2</sub>.

Abylcap functions according to a simple and safe mechanism: the blood aspirated from the patient is directed to the oxygenator, which by means of a special phosphorylcholine-coated membrane progressively removes the CO<sub>2</sub> bringing it to optimal values. In addition, the heater in the system allows recovering the heat lost mainly resulting from oxygen expansion, thus preventing patient hypothermia.

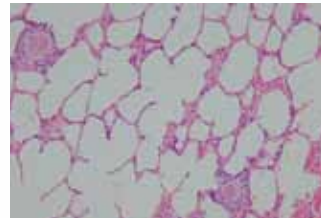
The operator has the possibility of removing the CO<sub>2</sub> using a mini-invasive treatment and the most suitable type of oxygenation: protective low-volume ventilation (Pplat < 30 cmH<sub>2</sub>O and VT = 6 ml/kg) or non-invasive ventilation (NIV).

# ABYLCAP

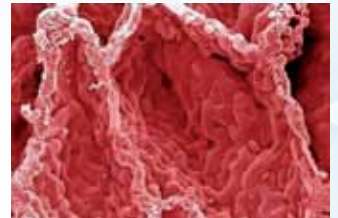
C O<sub>2</sub> R E M O V A L

***Abylcap integrates low ventilation volumes and CO<sub>2</sub> removal for the prevention of lung injury in patients suffering from respiratory failure***

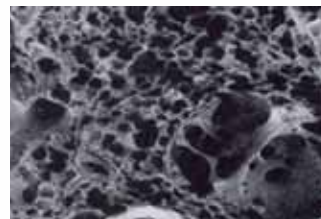
ABYLCAP IS THE THERAPEUTIC STRATEGY AIMED AT REDUCING INTUBATION INCIDENCE AND TIME, AN IMPORTANT CONDITION THAT CAN CONTRIBUTE TO IMPROVING PATIENT SURVIVAL. REDUCING THE NEED FOR OROTRACHEAL INTUBATION ALSO REDUCES THE RELATIVE SIDE EFFECTS, SUCH AS - AMONGST OTHERS - TRAUMA OF THE UPPER AIRWAYS, SPEECH AND SWALLOWING IMPAIRMENT AND ESPECIALLY PNEUMONIA, WHICH HAVE A **30%** INCIDENCE ON MORTALITY.



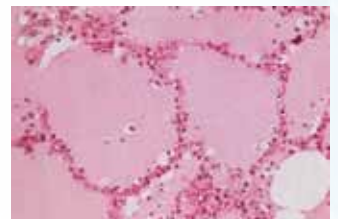
Healthy pulmonary tissue



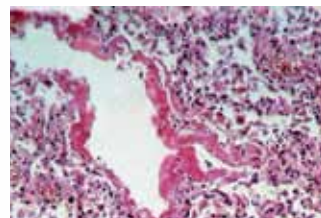
Healthy alveolus



Pulmonary emphysema



Acute pulmonary emphysema



Exudative phase of ARDS where there is a loss of alveolarepithelial cells and intra-alveolar hyaline and neutrophil membranes are present

## Simplicity and Safety

- **Preassembled kit system**  
Easy and fast installation and reduced risk of error.
- **Blood flow**  
Possibility of varying the blood flow rate up to a maximum of 450 ml/min.
- **Fully automatic preparation**  
Priming, filling, rinsing and air removal from the circuit.
- **Continual HCT and SO<sub>2</sub> measurement**  
Possibility of directly and continuously reading the hematocrit and oxygen saturation measurements.
- **Real-time safety monitoring**  
Possibility of representing the arterial pressure, reinfusion pressure and oxygenator input pressure trends at the inlet of the oxygenator by means of graphs in order to continuously monitor circuit efficiency and patient connection.
- **Plate heater**  
Heater for recovery of the heat lost as a result of oxygen expansion and CO<sub>2</sub> removal on oxygenator membrane level.

## Prevention

- **Mini-invasive and personalised CO<sub>2</sub> removal**
- **Reduced need for intubation**
- **Containment of side effects**
- **Potential to improve survival**

## High Performance and Biocompatibility

***Oxygenator Lilliput 2 ECMO\*, developed for carbon dioxide removal with a mini-invasive approach***

- **High biocompatibility**  
Polymethylpentene membrane coated with a phosphorylcholine-based biomimetic treatment (PH.i.S.i.O coating system) for greater membrane hemocompatibility and containment of thrombotic effects.
- **High gaseous exchange capacity**  
Gas transfer occurs by diffusion (not in direct contact with the blood) through a membrane not subject to hydrophilization. This membrane is as thick as the alveolar membrane.
- **Four consecutive days of treatment guaranteed**  
The system is guaranteed for four consecutive days of treatment thanks to the properties of the membrane that does not alter its performance.

### Lilliput 2 ECMO stands out for:

Low priming volume (90 ml)

Gas exchange surface area (0.67 m<sup>2</sup>)

Heater surface area

Reduced 'synthetic' surface area in contact with the blood

Reduced activation of inflammatory response

Flexibility of use for a wide range of patients

Functionality and ease of use

\*manufactured by Sorin Group Italia – Mirandola