



CARL REINER® ■

TwinStream™ ICU –

Lung-protective Ventilation
in Intensive Care

Save lives - Gain time - Reduce costs

TwinStream™ ICU – The lung-protective ventilation in intensive care for acutely ill patients.

TwinStream™ ICU

offers oxygenation and ventilation with unsurpassed efficiency and safety. It is the only system on the market to offer pulsatile BiLevel Ventilation **p-BLV™** (see infobox). The **p-BLV™** module generates a pulsatile gas column. This facilitates optimal gas exchange, respiratory gas conditioning and transmission of the pressure wave amplitude into the lung. This represents a significant advantage over conventional ventilation systems.

TwinStream™ ICU

With **p-BLV™** provides the best ventilation method for patients with:

- *Acute respiratory distress syndrome (ARDS)*
- *Pneumonia (ALI - VILI)*
- *Severe chest trauma in the context of polytrauma*

TwinStream™ ICU – the best ventilation strategy for paediatric intensive care medicine.

TwinStream™ ICU

ensures efficient ventilation for each thoraco-abdominal system regardless of the maturity of the lung. During recruitment of non-ventilated areas of the lung, negative haemodynamic effects are significantly less than with other ventilation modes.

TwinStream™ ICU

Ideal for young patients with:

- *Primary or secondary acute lung injury*
- *Thoracic Trauma*

“In patients with severe thoracic trauma and acute lung injury, pulsatile BiLevel Ventilation can effectively improve oxygenation at low ventilation pressures as well as ensure impressive circulation stability. Additional clinically visible positive effects of this form of ventilation are improvement of the mobilisation of secretions whilst maintaining a low risk of barotrauma.”

Prof. Dr. Stefan Kleinschmidt

Dept. of Anaesthesia, Intensive Care and Pain Therapy, BG Trauma Clinic, Ludwigshafen, Germany



“Pulsatile BiLevel Ventilation with **TwinStream™ ICU** is very efficient in severe paediatric respiratory failure. This new ventilation system is easy to use in clinical routine and well accepted by the entire treatment team.”

OA Dr. Christian Scheibenpflug

Head of the Children's Intensive Care Unit, SMZ-Ost / Danube Hospital, Vienna, Austria



Advantages:

- Recruitment of unventilated alveoli
- Increase in functional residual capacity (FRC)
- Lower ventilation pressures
- Decreased transpulmonary pressure
- More effective gas exchange in comparison to conventional ventilation
- Avoids all forms of atelectasis and intra-alveolar oedema
- Improved gas exchange at lower ventilation pressures
- Stable haemodynamics without affecting fluid management
- Reduction of shear forces, resulting in reduced development of pulmonary and systemic inflammatory mediators
- Effective mobilisation of secretions
- Easy device preparation
- Easy to use

Infobox

Pulsatile BiLevel Ventilation *p-BLV*[™]

This innovative mode allows the application of a bi-phasic, time-cycled, pressure-controlled, variable flow ventilation, with or without a superimposed pulsatile component. The BLV of 1-100 breaths per minute can thus be supplemented with pulsations from 50 up to 1,500 per minute.

As a result of the pulsatile component, a forced mixing of the respiratory gases is produced at all levels of the respiratory system. The normal frequency (NF) pulse is primarily responsible for ventilation. The high frequency (HF) pulse provides oxygenation, additional alveolar recruitment and haemodynamic stability. See *Figure 1*

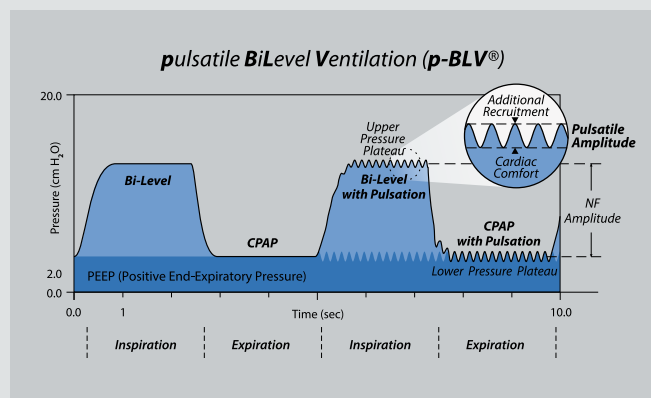
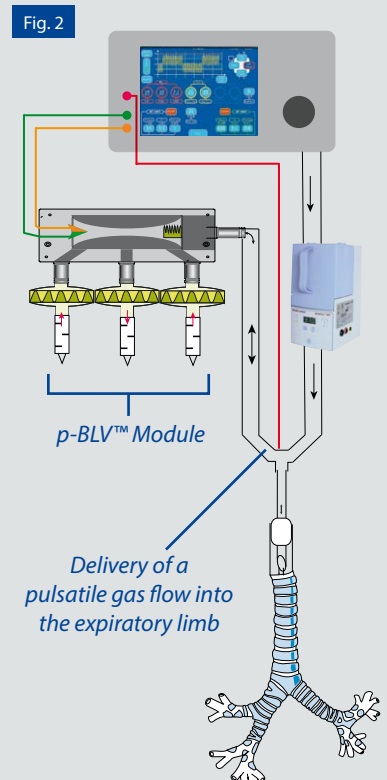


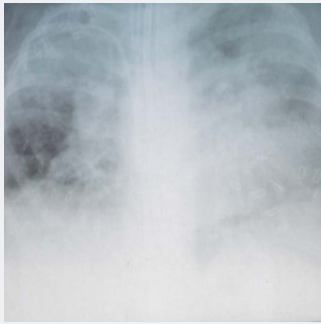
Fig. 1

Figure 2 shows the gas flow in a simple, half-open tube system. There is a background flow (bias flow) of humidified and heated gas at approximately 20 LPM into the inspiratory limb. Against this bias flow the *p-BLV*[™] module applies a counter pressure in the expiratory limb, with or without a pulsatile component. As a result, correctly conditioned inspiratory gas passes into the lungs with the optimal flow pattern. Even during long term ventilation adverse cooling or drying effects are not seen.

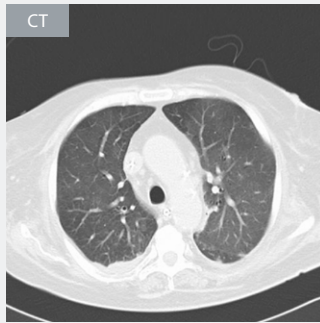


After 4 hours of ventilation with **TwinStream™ ICU**, a significant improvement of the pulmonary condition is seen.

Conventional ventilation



TwinStream™ ICU After 4 hours under *p-BLV™*



References:

1. VELMAHOS GC, CHAN LS, TATEVOSSIAN R, et al (1999)
High-frequency percussive ventilation improves oxygenation in patients with ARDS. Chest 116: 440-446
2. SALIM A, MILLER K, DANGLEBEN D, et al (2004)
An alternative mode of ventilation for head injured patients with adult respiratory distress syndrome. J Trauma 57: 542-546
3. SALIM A, MARTIN M (2005)
High frequency percussive ventilation. Crit Care Med 33 [Suppl. 3]: 241-245
4. KLEINSCHMIDT S, ROTHERMEL S
The use of percussive high frequency ventilation with the VDR-4G® Respirator for invasive ventilation therapy in patients with severe chest trauma - a retrospective analysis. From the Department of Anaesthesia, Intensive Care and Pain Therapy of the BG Trauma Clinic Ludwigshafen.

The new dimension of ventilation for acute respiratory failure

Contact

Manufacturer

CARL REINER®

CARL REINER GMBH
Mariannengasse 17
1090 Vienna, Austria
T: +43 (0)1 402 62 51 0
F: +43 (0)1 402 62 51 19
e-mail: twinstream@carlreiner.eu
Web: www.carlreiner.eu

Authorised Distributor