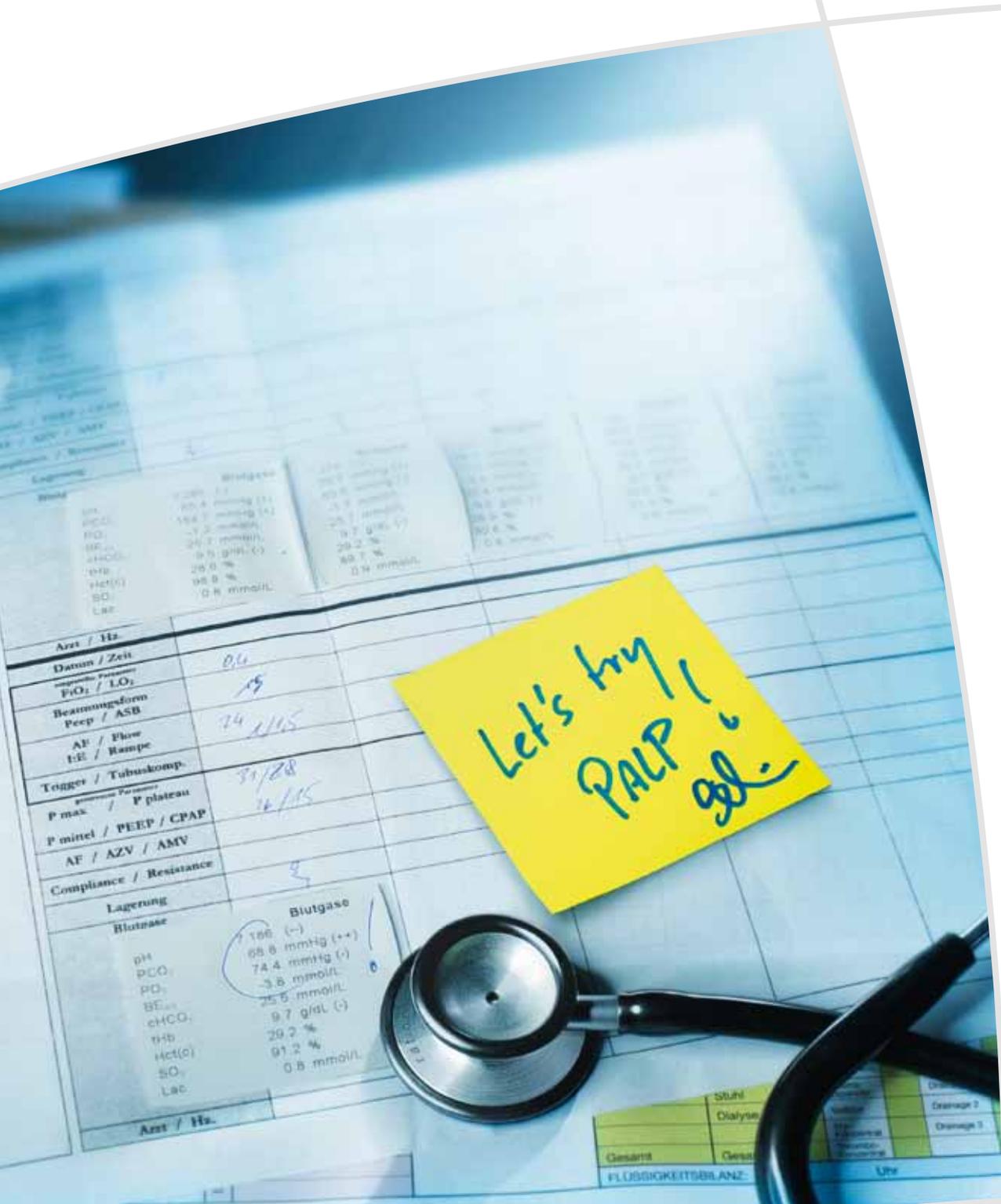


COMING SOON:
LOW FLOW CO₂ REMOVAL – PALP
CARDIOHELP SYSTEM



Let's try
PALP!
[Signature]



FLÜSSIGKEITSBLANZ:		Uhr	
Gesamt	Gesamt	Stuhl	Drainage 1
		Dialyse	Drainage 2
		Ureter	Drainage 3
		Blutentzug	
		Bluttransfusion	
		Blutentwurf	



ADDING A NEW RESPIRATORY STRATEGY PUMP ASSISTED LUNG PROTECTION MAQUET – THE GOLD STANDARD



A trusted partner for hospitals and clinicians since 1838:

MAQUET is a global leader in medical systems that advance critical care, cardiovascular procedures and surgical interventions. A close partnership with the medical community ensures that MAQUET develops new treatment solutions that specifically address the needs of clinicians across the spectrum of disciplines to improve outcomes for all patients.

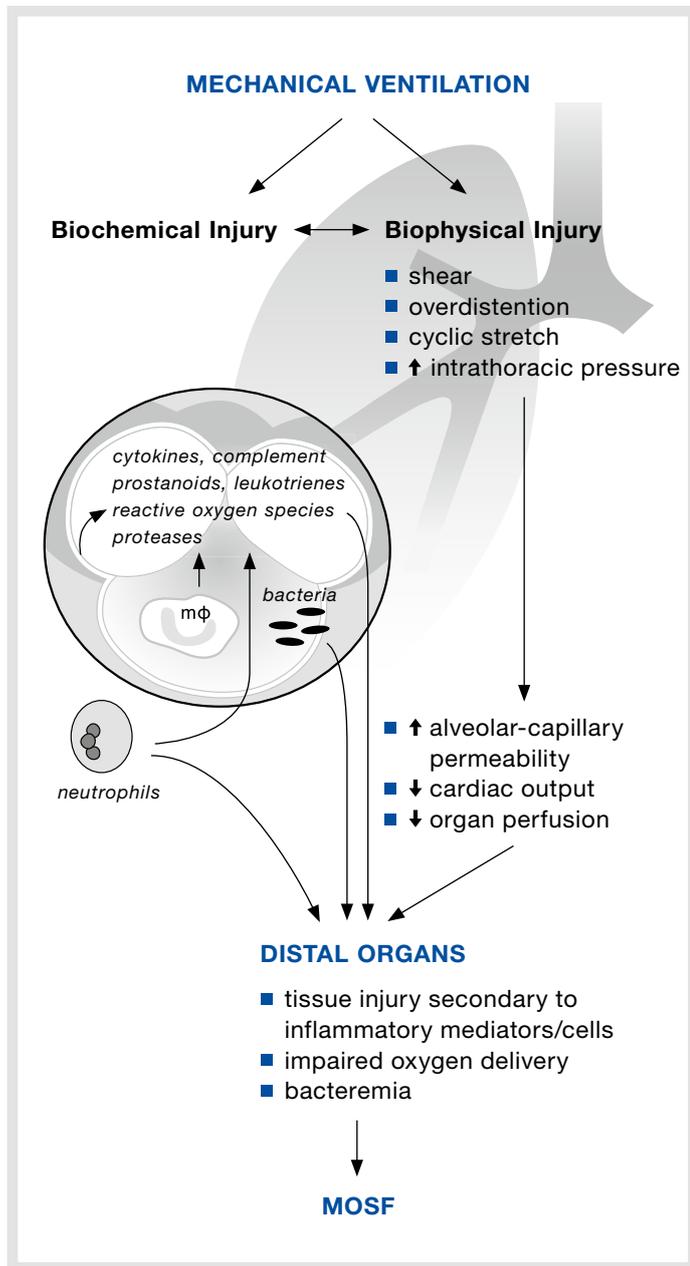
New perspectives in lung protection:

With the introduction of PALP – Pump Assisted Lung Protection – MAQUET complements the range of respiratory therapy solutions. PALP stands for continuous low flow CO₂ removal therapy and can

- support highly protective ventilation settings
- support all stages/phases of ventilation therapy
- support spontaneous breathing in all stages of hypercarbic respiratory failure.

MAQUET – The Gold Standard.

HYPERCARBIC RESPIRATORY FAILURE CHALLENGES TO SOLVE



In the year 2005 more than 3 million people died from COPD worldwide, and the problem only appears to be worsening. The World Health Organization (WHO) estimates that by 2030 it will be ranked as the third leading cause of death globally¹.

The annual cost of COPD care in the US is nearly \$50 billion annually². 70 % of the cost of COPD care is secondary to exacerbations requiring hospitalization with treatment in the intensive care unit being most costly^{3,4,5}. A significant portion of the costs associated with COPD exacerbations revolve around taking care of an intubated patient in the ICU. There are savings approx. between \$ 16,000 and 31,000 per patient associated taking care of a COPD exacerbation in the ICU that is not intubated⁶.

Invasive mechanical ventilation for severe exacerbation of COPD is indicated for progressive respiratory acidosis or clinical deterioration. Despite advancements in management of severe exacerbations with non-invasive positive pressure ventilation (NPPV), up to 50 % of patients requiring NPPV will require mechanical ventilation⁷. However, the use of the mechanical ventilator poses several hazards. These multiple risks are reflected in a high in-hospital mortality of 25 % and a 5-year mortality rate of 76 % for patients with COPD exacerbation requiring mechanical ventilation for respiratory failure⁸. Thus, a management strategy that reduces ventilator injury, minimizes the need for sedation, and allows for early physical therapy may improve outcomes.

Slutsky et al: Multiple System Organ Failure: Is Mechanical Ventilation a Contributing Factor? *Am J Respir Crit Car Med*, Vol 157: 1721-1725, 1998

References:

(1) World Health Organization: Chronic respiratory diseases – Burden of COPD; <http://www.who.int/respiratory/copd/burden> accessed on 01/24/2012

(2) National Heart Lung and Blood Institute, <http://www.nhlbi.nih.gov/> accessed on 4/15/2011

(3) Strassels SA, Smith DH, Sullivan SD, Mahajan PS. The costs of treating COPD in the United States. *Chest* 2001;119:344-52.

(4) Sullivan S, Ramsey D, Lee, T. The Economic Burden of COPD. *Chest* 2000;117:5S-9S.

TIME TO BREATHE IN ALL STAGES OF HYPERCARBIC RESPIRATORY FAILURE

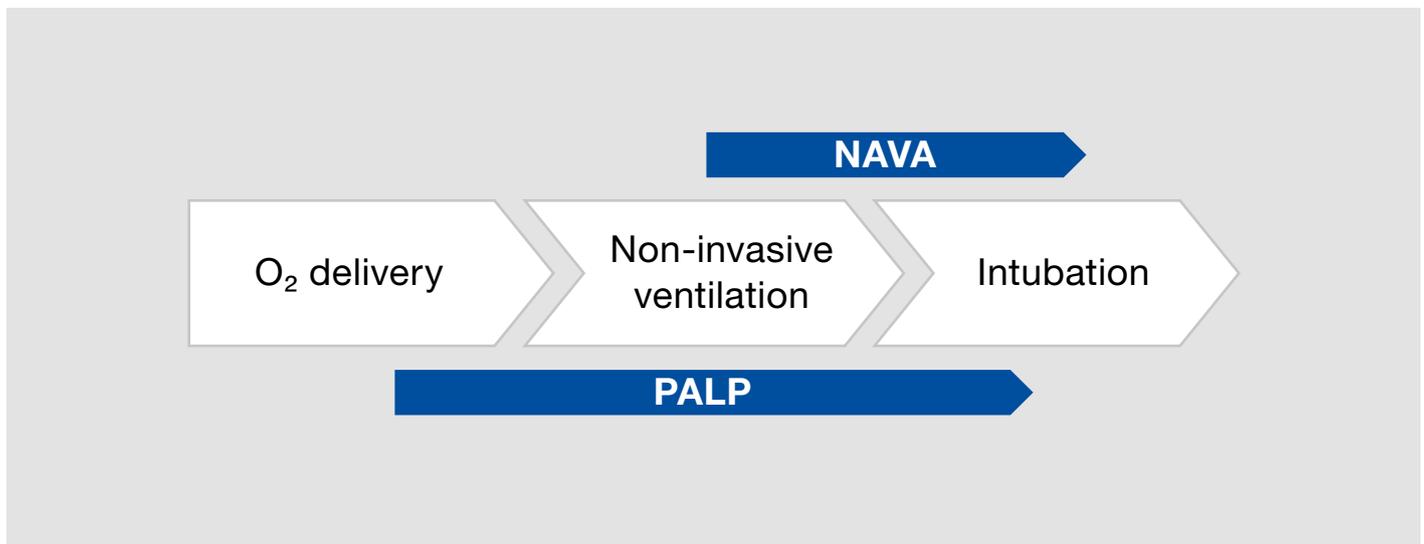
Today, great importance is attached to lung-protective ventilation therapy concepts. In terms of ALI and ARDS, appropriate ventilation strategies have already been established which comply with the guidelines of the relevant associations, e.g., ARDS network. Implementation, however, is often limited by critical variations of the blood gases, in particular due to the effects of permissive hypercapnia in the form of respiratory acidosis. The use of state-of-the-art ventilation therapies with the SERVO-i combined with extracorporeal CO₂ elimination using the CARDIOHELP system marks the dawn of a new era for patient care that can counter the disease progression at an early stage.

The treatment of chronic obstructive pulmonary diseases often demands ventilation therapy early on due to the ventilation induced disorder resulting in hypercapnia and respiratory acidosis. Non-invasive ventilation (NIV) is to be

regarded as state-of-the-art in intensive care today. Failure of this treatment type in spite of the modern intensive care ventilator SERVO-i, or the need for more support can frequently be avoided thanks to CO₂ elimination. The combination of the two MAQUET devices, SERVO-i and CARDIOHELP, ensures optimal support for the patient and operation is intuitive and easily accessible for the user.

The use of Neurally Adjusted Ventilatory Assist (NAVA) is an established ventilation therapy to provide synchronized and comfortable NIV and to be used for a smooth transition from invasive to non-invasive ventilation. Here, PALP and CARDIOHELP enable safe management of difficult situations.

SERVO-i and CARDIOHELP – reliable partners for hi-tech modern intensive care.



(5) Foster TS, Miller JD, Marton JP, Caloyer JP, Russel MW, Menzin J. Assessment of the economic burden of COPD in the U.S.: a review and synthesis of the literature. *COPD* 2006;3:211-218.

(6) Dalal A A, Shah M, D'Souza A O, Pallavi R, Cost of COPD exacerbations in the emergency department and inpatient setting; *Respiratory Medicine* (2011) 105, 454-460.

(7) Keenan S, Sinuff T, Cook D, et al., Which Patients with Acute Exacerbation of Chronic Obstructive Pulmonary Disease Benefit from Noninvasive Positive-Pressure Ventilation? A Systematic Review of the Literature. *Ann Intern Med.* 2003;138:861-870.

(8) Ai-Ping C, Lee K, Lim T. In-Hospital and 5-Year Mortality of Patients Treated in the ICU for Acute Exacerbation of COPD. *Chest* 2005; 128:518-524.

A NEW THERAPY OPTION PALP – APPLICATION BASED ON CARDIOHELP

PALP is a CARDIOHELP therapy application (thApp) based on the principle of low flow extracorporeal circulation which is similar to CRRT. Blood is drained from a vein and returned to a vein. The PALP tubing circuit (PALP Set) consists of a blood pump and a gas exchange module which eliminates CO₂. The complete PALP Set is refined with a biocompatible coating (BIOLINE Coating/SOFTLINE Coating) which minimizes the deleterious effects of blood coming into contact with foreign surfaces. Vascular access is achieved using either peripheral cannulae or a double lumen catheter.

Exemplary user friendliness: The combined drive and control unit comes with a compact, functional design and is ready for operation quickly. The PALP Set can be connected easily to the CARDIOHELP System. With just a single rotary knob and a touch screen, it is convenient to use.

CARDIOHELP System comprises all parameters necessary for use in intensive care and during patient transport:

- Venous probe for the measurement of venous oxygen saturation, hemoglobin, hematocrit and the venous temperature
- Connection cable for integrated sensors of the PALP Set: venous, arterial and internal pressure
- Flow/bubble sensor
- Bubble sensor
- Display can be switched to a night mode
- Ward call system can be integrated



PALP Module



CARDIOHELP on Sprinter Cart

LUNG PROTECTIVE THERAPY POWERED BY CARDIOHELP SYSTEM & SERVO-i

The CARDIOHELP System is the world's smallest portable heart-lung support system. It represents a platform for powering various extracorporeal respiratory and cardiac support applications. CARDIOHELP is ideal for use in intensive care units, the cardiac catheter laboratory, the operating room and the emergency room. Furthermore, it is the perfect solution for safe and effective intra and inter-hospital patient transport. The necessary product and system transport approvals are available.



CARDIOHELP, a therapy platform with various disposables for various therapy applications (thApps)

All-in-one ventilation platform: SERVO-i combines a highlevel of clinical performance for invasive, non-invasive or neutrally controlled ventilation with outstanding mobility and cost efficiency. It features all the modes you would expect from an advanced ventilation system in one adaptable platform.

A flexible solution: The SERVO-i ventilation platform can satisfy the ventilator needs of every patient, from the most acute phases of respiratory distress through the recovery to the weaning phase. It continuously delivers outstanding ventilator treatment as gently as possible thanks to its ventilator performance, monitoring capabilities, treatment options and tools.



SERVO-i

CARDIOHELP DEVICE AND PALP SET

TECHNICAL DATA



PALP Module on CARDIOHELP

Technical Data	CARDIOHELP-i
Dimensions (H x W x D) Guard closed	315 x 255 x 427 mm
Weight	Approx. 10 kg
Display	5.7" LCD Touchscreen
Sensor values	4 x External pressures 3 x Internal pressures 2 x External temperatures 2 x Internal temperatures 1 x Venous oxygen saturation 1 x Hemoglobin 1 x Hematocrit 1 x Flow sensor with integrated bubble sensor 1 x Bubble sensor 1 x Level sensor
Operating voltage range	11 – 28 Volt DC 100 – 240 Volt AC / 50 – 60 Hz
Interfaces for	1 x USB for Memory Stick 1 x USB for External Data Recording 1 x Connection for alarm output (ward call) Ethernet connection*, External Drive*, CAN connection*, ECG signal*
Battery operation time	min. 90 min (fully charged batteries)
Technical Data	PALP Set
Blood flow	0.2 – 2.8 l/min
Surface area gas exchange membrane	0.98 m ²
Priming volume PALP Module	80 ml
Priming vol. PALP Set with 2 x 2.2 m tubing length	247 ml
Membrane	Diffusion membrane (PMP)
Coating	BIOLINE Coating (SOFTLINE Coating available)
Integrated measuring cell	– venous oxygen saturation SvO ₂ – hemoglobin – hematocrit – venous temperature
Integrated sensors	3 pressures – venous – arterial – internal
Duration of use	PALP Set with BIOLINE coating max. 30 days PALP HIT Set with SOFTLINE coating max. 5 days

*Not available in the current release



For local contact:

Please visit our Website
www.maquet.com

MAQUET

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GETINGE GROUP is a leading global provider of products and systems that contribute to quality enhancement and cost efficiency within healthcare and life sciences. We operate under the three brands of ArjoHuntleigh, GETINGE and MAQUET. Arjo-Huntleigh focuses on patient mobility and wound management solutions. GETINGE provides solutions for infection control within healthcare and contamination prevention within life sciences. MAQUET specializes in solutions, therapies and products for surgical interventions, interventional cardiology and intensive care.