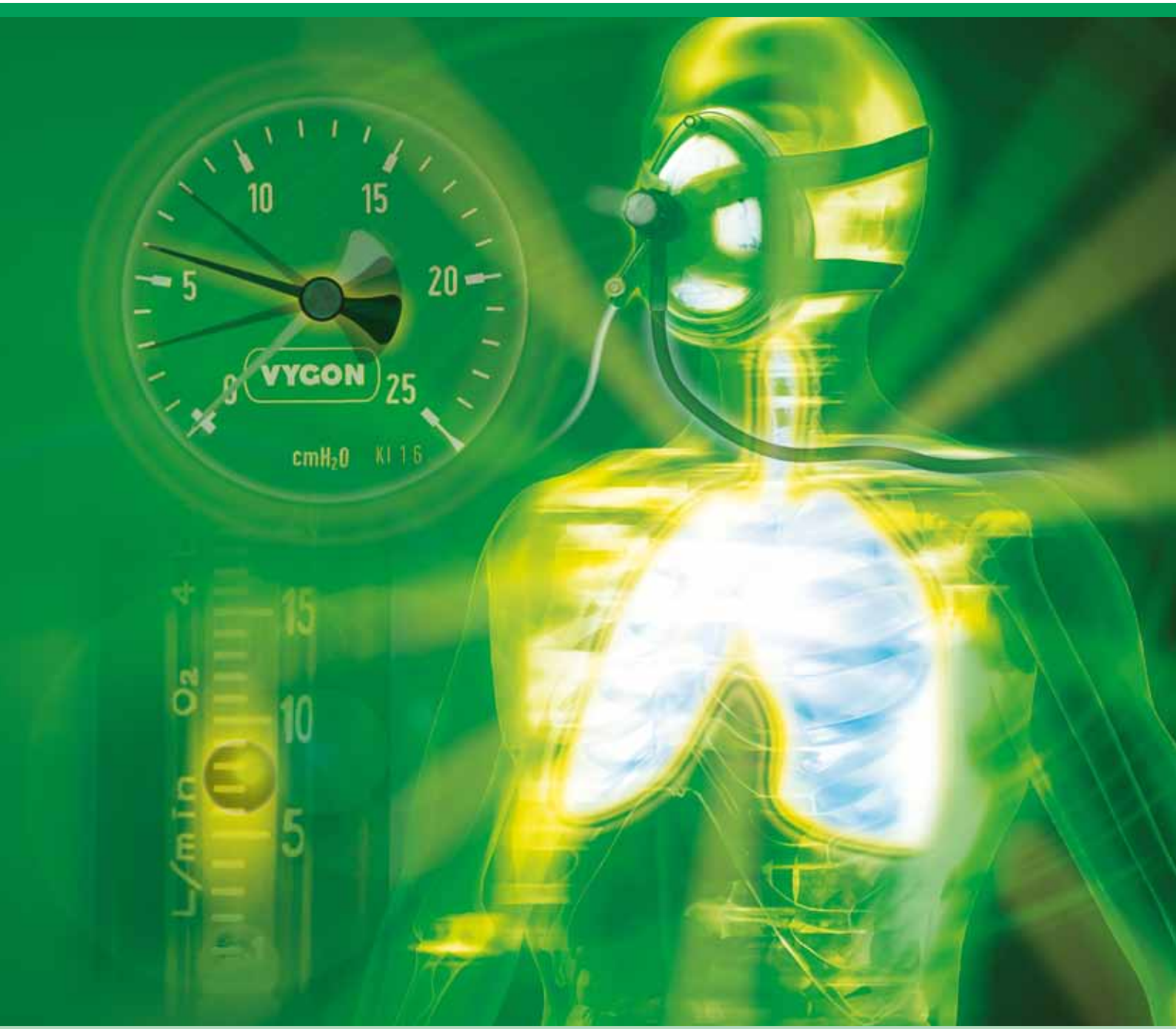
Boussignac CPAP System

For Acute Therapy



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Introduction

Continuous Positive Airway Pressure (CPAP) has always been associated with expensive, bulky and complicated equipment. This has been tolerated because of the ventilatory support it gives patients, reducing intubation rates and relieving symptoms.[1,2] Reduced intubation rates and a relieving of patient symptoms have a significant impact on the cost of patient care. Recent studies have estimated overall savings of approximately €3800 (£3000) per patient with Boussignac CPAP compared to conventional treatment.[3]

In addition to cost savings, Boussignac CPAP has also overcome previous limitations of using CPAP. The design has allowed CPAP to become simple,[4] lightweight and cost effective yet still perform as effectively as much larger and more expensive equipment.[5]

Background

The Boussignac CPAP System began its journey to the medical marketplace on July 11th, 1973. On that day, a Varig Airlines Boeing 707 experienced a cabin fire and crashed at Orly Airport, Paris. Three severely compromised respiratory patients were transported to the Henry Mondor Hospital in Paris where Dr Georges Boussignac was the anaesthesiologist in charge of the ICU. Dr Boussignac determined that these patients needed high-flow oxygen and improvised a system to deliver CPAP. He secured a plastic bag and supplied it with low-pressure, high-flow oxygen around the patient's head and placed an outlet hose in an 8-10cm column of water. This set-up maintained pressure against airway structures, keeping them open, whilst allowing the patients to breathe independently. The amount of pressure was regulated by changing the depth of the outlet hose within the column of water.

Understanding that most people would be uncomfortable with the concept of a plastic bag being secured around their head, Dr Boussignac then worked on a method of providing CPAP with a more open system. The result was the Boussignac CPAP valve, a 10oz plastic device that uses the physics of fluid dynamics to increase pressure when attached to a standard, well-fitting oxygen face mask.

Original CPAP set-up by Dr Georges Boussignac

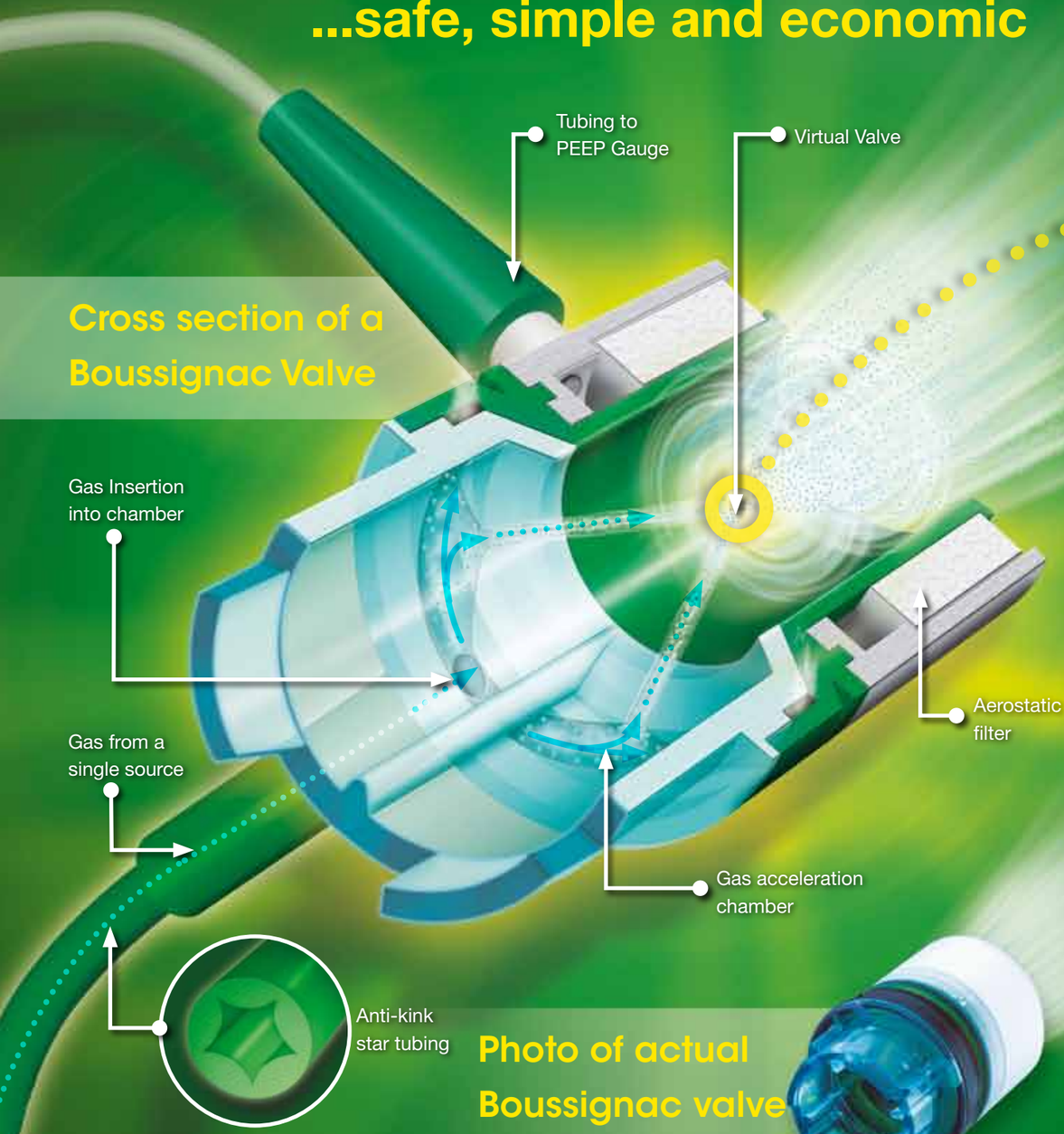
Boussignac CPAP is feasible, medically effective and cost effective in the treatment of acute cardiogenic pulmonary oedema[3]

Contents

How Does the Boussignac Valve Work?

The Boussignac valve takes gas from a **single source** and **splits** it to create **four high flow jets**. These jets, travelling at the **speed of sound**, converge in the chamber creating **turbulence**. It is the turbulence that creates a **virtual valve**, providing resistance for the patient to breathe against. Increased gas flow causes increased turbulence and so creates a higher pressure.
Unlike most CPAP devices, this system requires **no valves or moving parts** making it very...

...safe, simple and economic

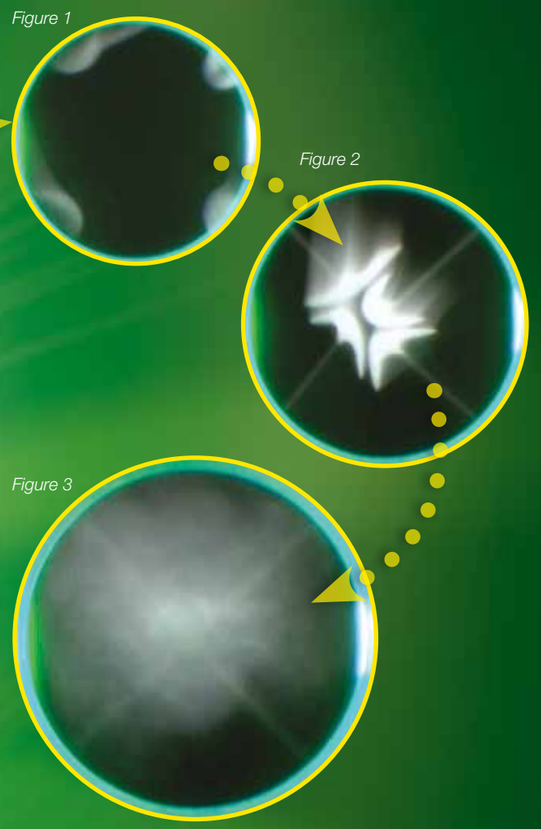


Cross section of a Boussignac Valve

Photo of actual Boussignac valve

Bernoulli Principle

The virtual valve works using the Bernoulli principle, which states that as a gas passes through a pipe that narrows or widens, the velocity and pressure of the gas varies. In the case of the Boussignac valve, as the pipe narrows, the gas flows more quickly.



The images above show the Boussignac valve. Oxygen has been replaced by smoke so you can visualise the virtual valve. In figure 1 you can see the emergence of four small jets of air, the flow rate here is low. In figure 2 the four jets are about to converge, the flow rate now has increased. In figure 3 the flow rate is high and you can see that the four jets have converged to create the virtual valve.

Key Benefits

✓ The only complete open system

- Tolerated better by patients as it is less claustrophobic.
- Reduces risk of barotraumas.
- Eliminates re-breathing.
- Accommodates sudden changes in patient respiratory flow.
- Allows use of a suction catheter.

✓ Gas flow driven system

- Set-up time less than 2 minutes.
- PEEP adjusted simply by changing gas flow.

✓ Does not require a flow generator

- No investment in capital equipment.
- No service or repair bills.
- No expensive valves and masks.

✓ Star tubing

- Eliminates risk of kinking.

✓ Small and lightweight

- Easy to transfer patients.
- Used in and out of the hospital environment.

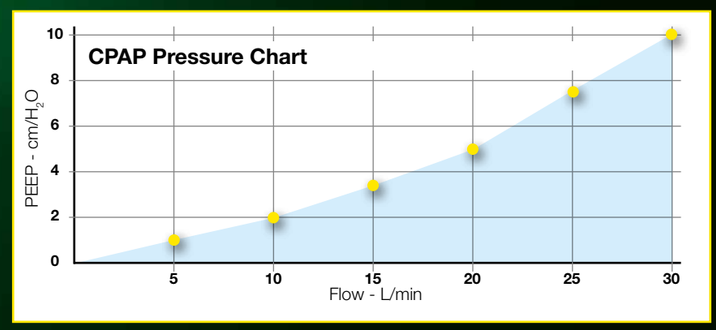
Directions for Use

Using 100% Oxygen

Simple to set-up and
ready to use in **less than 2 minutes**

Set-up in less than 2 minutes

1. Select the appropriate size of mask kit. Attach the Boussignac valve to the mask*.
2. Connect main line tubing to 30L/min oxygen flowmeter.
3. Attach PEEP gauge tubing to secondary port.
4. Attach narrow tubing into PEEP gauge.
5. With mask fitted to the patient adjust the oxygen flow rate to obtain the desired PEEP level using the CPAP pressure chart below.
6. Disconnect PEEP gauge tubing.
7. Re-cap port.



* The Boussignac valve can also be used on endotracheal tubes [6,7] and tracheostomy tubes.

The Added Value of Training

What is the added value of training?

The added value of training is our commitment to you in support of 'Best Practice' programmes employed within your NHS Trust. Customer Service is foremost in Vygon's approach. This extends to our product support and education programmes.

"our commitment to you"

- ✓ Bespoke In-Service Training
- ✓ Certificates
- ✓ Human Resources
- ✓ CD-ROM/Videos/DVDs
- ✓ Workshops
- ✓ Night Training
- ✓ Technical Support
- ✓ Literature
- ✓ Posters

Why is training of added value?

With the Government's priority for health, demands on NHS Trusts are high. We can help you meet the training requirements set by the Department of Health for all grades of staff.

Our Sales Executives are educated to a standard that enables them to promote 'Best Practice' in line with current clinical guidelines. This means that in relation to our products, your staff can be updated and informed of changes relating to current evidence-based practice and guidelines.

Bespoke In-Service Training

Vygon can offer bespoke in-service training, in accordance with your Trust's policies and procedures. This means that staff will not only learn about our products, but how they fit into every day patient care.

Certificates

Vygon understand the importance of record keeping with regard to the training of staff on new products. Vygon can provide staff with personalised certificates of attendance and competence on completion of our workshops.

Human Resources

Each customer has the support of their Sales Executive, Regional Sales Manager, Business Development Manager and Sales Support Agent to ensure training meets all needs and expectations. Our teams have the expertise and experience to ensure smooth implementation of your custom-designed programme, encompassing the requirements of your NHS Trust, Hospital, Department, Clinicians, Procurement and the Patient.

CD-ROM/Videos/DVDs

Vygon provides training aids in the form of presentations and videos/DVDs to accommodate personal preferences for training.

Workshops

Vygon can organise workshops for your NHS Trust to help you disseminate current practice guidelines, involving guest speakers and professionals from relevant fields.

Night Training

Upon introduction of new products, Vygon can ensure your night staff are fully supported with education and training.

Technical Support

Our Technical Support Department handles technical enquiries about products, procedural advice and regulatory device issues.

Literature

As well as supplying you with product information and order purchasing codes, our literature also has valuable educational information. This includes: practice information, instructions for use and clinical references.

Posters

Posters can be tailor-made to your requirements to ensure your NHS Trust's protocol and policies are promoted in line with current practice guidelines.

Hospital CPAP Kit

The Boussignac CPAP system comes conveniently packaged in a foam padded case. This means that in an emergency all the items needed to provide CPAP can be found in one place. The case protects the equipment so that nothing is damaged and so that nothing gets lost.

The case has space for three disposable Boussignac sets: a small, medium and large. Each disposable set contains a Boussignac valve, one piece of PEEP gauge tubing, a harness and a face mask. This makes the process of setting up CPAP simpler, quicker and reduces waste.

Having all the disposables in one kit makes ordering simpler and means that you are not left with too many of any one component. This can save you a significant amount of money on unnecessary disposables.

Kit Contents

Small Boussignac Set
Medium Boussignac Set
Large Boussignac Set
30 Litre O_2 Flow Meter
PEEP Gauge
Directions For Use
Carry Case

Ordering information

Product Code	Description and Contents	Box Quantity	NPC Code
Hospital CPAP Kit			
CPAPKIT/HOSP	**Hospital CPAP Kit** 1 x Small Boussignac Set 1 x Medium Boussignac Set 1 x Large Boussignac Set 1 x 30 Litre O_2 Flow Meter 1 x PEEP Gauge 1 x Directions For Use 1 x Carry Case	1	**Direct Orders Only**
Boussignac CPAP Sets			
5562.303	**Boussignac CPAP Paediatric Set** 1 x Valve 1 x Mask size 3 1 x Harness & Tubing	1	FDD774
5562.403	**Boussignac CPAP Small Adult Set** 1 x Valve 1 x Mask size 4 1 x Harness & Tubing	1	FDD288
5562.503	**Boussignac CPAP Medium Adult Set** 1 x Valve 1 x Mask Size 5 1 x Harness & Tubing	1	FDD289
5562.603	**Boussignac CPAP Large Adult Set** 1 x Valve 1 x Mask Size 6 1 x Harness & Tubing	1	FDD290
5572.403	**Boussignac CPAP Small Adult Set + Nebuliser** 1 x Valve 1 x Mask size 4 1 x Harness & Nebuliser	1	FDD1120
5572.503	**Boussignac CPAP Medium Adult Set + Nebuliser** 1 x Valve 1 x Mask Size 5 1 x Harness & Nebuliser	1	FDD1121
5572.603	**Boussignac CPAP Large Adult Set + Nebuliser** 1 x Valve 1 x Mask Size 6 1 x Harness & Nebulser	1	FDD1122
Boussignac Accessories			
0527.01	**Boussignac CPAP PEEP Pressure Gauge**	1	FDE122
0555.01	**Boussignac CPAP Adaptor Mask - 15/22mm tube**	20	FDD279
5566.01	**Boussignac CPAP FiO_2 Adaptor**	5	FDE492
5569.01	**Boussignac CPAP Nebuliser**	10	FDE491
5563.31	**Boussignac CPAP Flowmeter - 30 litre air**	1	FDD341
5563.41	**Boussignac CPAP Flowmeter - 30 litre oxygen**	1	FDD292
0008.CPAP/SIZE	**Boussignac CPAP Mask Sizing Pad**	1	FDE493

References

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2. Fabienne Moritz, et al. (2007) Continuous positive airway pressure versus bilevel noninvasive ventilation in acute cardiogenic pulmonary edema: A randomized multicenter trial. *Annals of Emergency Medicine*; Vol 50 (December) No. 6, pp. 666-75.

3. Willem Dieperink, et al. (2007) Boussignac continuous positive airway pressure for the management of acute cardiogenic pulmonary edema: Prospective study with a retrospective control group. *BioMed Central*; Vol 70 No. 40.

4. Francoise Templier, et al. (2003) Boussignac continuous positive airway pressure system: Practical use in pre hospital medical care unit. *European Journal of Emergency Medicine*; Vol 2.

5. Peter Leman, et al. (2005) Simple lightweight disposable continuous positive airways pressure mask to effectively treat pulmonary oedema: Randomized controlled trial. *Emergency Medicine Australasia*; Vol 17, pp. 224-230.

6. Williem Dieperink, et al. (2006) Chapter 6: Walking with continuous positive airway pressure. *European Respiratory Journal*; Vol 27, pp. 853-855.

7. Williem Dieperink, et al. (2007) Chapter 7: Boussignac CPAP for weaning with tracheostomy tubes. *Respiration*; 25 July 2007.

Further Reading

8. M Monchi Mehrad. (1997) Comparison of 5 spontaneous ventilation systems with continuous positive airway pressure, on a mechanical lung. *Thesis for doctorate in medicine qualification in general medicine;* January 20th.

9. Thomas Gaszynski, et al. (2007) Boussignac CPAP in the postoperative period in morbidly obese patients. *Obesity Surgery*; Vol 17, pp. 452-456.

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0008.CPAP Content correct as of 01/09