



Fast facts

- PaceWave™ Adaptive Servo-Ventilation (ASV) therapy is the latest-generation technology for the effective, personalised and comfortable treatment of a range of central breathing disorders.
- It personalises treatment by learning, predicting, responding and optimising ventilation, to suit each patient's own unique breathing pattern.
- PaceWave™ is the only ASV therapy to target a patient's Minute Ventilation (MV) (the amount of air a person breathes in a minute), which allows it to make precise, accurate adjustments according to real-time data.
- Through intelligent, adaptive breathing control, PaceWave™ helps to improve sleep quality and has been shown to improve cardiac function in heart failure (HF) patients with central sleep-disordered breathing (SDB).^{1,2,3}
- The effect of PaceWave™ therapy on patients with stable HF and central SDB is currently being investigated in SERVE-HF; the largest international randomised trial of its type.

Adaptive Servo-Ventilation (ASV) therapy

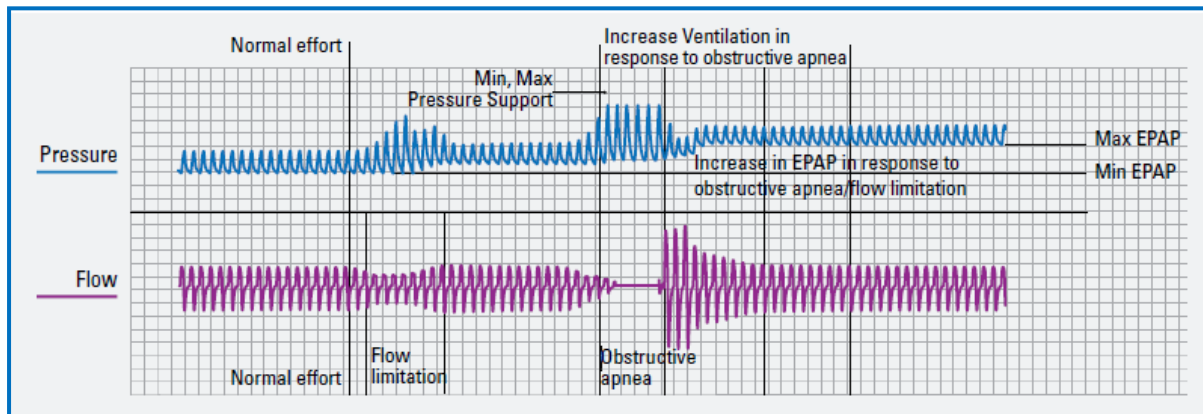
- Adaptive Servo Ventilation (ASV) refers to a therapy specifically designed to treat Central Sleep Apnoea with Cheyne Stokes Respiration (CSA-CSR), in which a patient's ventilation is monitored and stabilised through adaptive positive airway pressure, supplied via a mask worn by the patient.
- PaceWave™ is the latest-generation form of ASV therapy.

About PaceWave™

- PaceWave™, developed by ResMed, is an advanced ASV technology for the effective, personalised and comfortable treatment of central SDB (CSA-CSR), which can often be difficult to treat.
- It is the most clinically studied and proven ASV therapy and the only one of its kind to target MV.
- Monitoring MV allows precise, accurate adjustments to be made to a patient's ventilation, based on real-time data.

- The only ASV therapy to target the patient's own MV, PaceWave's™ unique technology constantly monitors and learns a patient's breathing pattern, measuring ventilation directly and setting ventilation targets and air pressure accordingly to stabilise breathing.
- PaceWave™ calculates inspiratory (breathing in) and expiratory (breathing out) frequency as well as expiratory pauses, making it able to adjust air pressure support to suit an individual patients' needs.
- This helps to improve sleep quality and outcomes in HF patients with central SDB by stabilising breathing, quickly restoring optimal oxygen levels and reducing stress on the heart.¹

Pacewave™ stabilises the upper airway to treat and prevent obstructions with expiratory positive airway pressure (EPAP)



PaceWave™ in HF

- SDB is one of the most common co-morbidities in HF, estimated to occur in 50-75% of these patients.^{4,5} Between 30-50% of patients with HF will have central SDB (CSA-CSR).^{6,7,8}
- PaceWave™ ASV therapy has been extensively researched in HF, proving that it efficiently normalises breathing patterns and stabilises ventilation in HF patients, thus reducing induced stress on the heart.⁹
- Evidence from a number of studies indicates that PaceWave™ ASV therapy improves cardiac function.^{1,2}
- In HF patients, quality of life can typically be poor, often due to fatigue and diminished ability to perform physical functions.
- Studies have shown that treatment of SDB in these patients improves physical performance,^{2,3} increases energy and vitality and improves heart-specific quality of life.¹⁰

- The impact that treatment of central SDB with PaceWave™ ASV therapy can have on HF patients' quality of life, morbidity, mortality, cardiac function and hospitalisation rate is currently being investigated in the SERVE-HF trial; the largest randomised study of its type to date, taking place across 80 centres in Europe and Australia.

For more information on ResMed's PaceWave™ ASV therapy, please visit:
http://www.resmed.com/uk/products/s9_vpap_series/asv.html?nc=patients

References

-
- ¹ Bitter, T., et al., Adaptive servoventilation in diastolic heart failure and Cheyne-Stokes respiration. *Eur Respir J*, 2010; 36(2):385-92.
 - ² Oldenburg O. et al. Adaptive servoventilation improves cardiac function and respiratory stability. *Clin Res Cardiol*, 2010; 100:107-115.
 - ³ Karavidas, A. et al. The impact of positive airway pressure on cardiac status and clinical outcomes in patients with advanced heart failure and sleep-disordered breathing: a preliminary report. *Sleep Breath* 2011; 15:701-709.
 - ⁴ Oldenburg O, Lamp B, Faber L, Teschler H, Horstkotte D, Topfer V. Sleep-disordered breathing in patients with symptomatic heart failure: a contemporary study of prevalence in and characteristics of 700 patients. *Eur J Heart Fail*. 2007;9:251–257. [PubMed]
 - ⁵ Schulz R, Blau A, Börgel J, Duchna HW, Fietze I, Koper I, Prenzel R, Schädlich S, Schmitt J, Tasci S, Andreas S. working group Kreislauf und Schlaf of the German Sleep Society (DGSM) Sleep apnoea in heart failure. *Eur Respir J*. 2007;29:1201–1205. [PubMed]
 - ⁶ Woehrle H, Weinreich G, Wegscheider K, Erdmann E, Teschler H. Prevalence and sleep characteristics of sleep-disordered breathing in German patients with chronic heart failure. *Am J Respir Crit Care Med* 2010;181(Suppl):A2478.
 - ⁷ Woehrle H, Weinreich G, Wegscheider K, Teschler H. SchlaHF register: prevalence of sleep-disordered breathing in German patients with chronic heart failure. *Eur Heart J* 2010; 31(Suppl):568.
 - ⁸ Akiko N, Seiko M and Yoshinari Y. Therapeutic Strategies for Sleep Apnoea in Hypertension and Heart Failure. *Pulm Med*, 2013; 2013:814169.
 - ⁹ Thompson R, Richards GN, Woehrle H, Benjafield AV. PaceWave Therapy: An Overview of Minute Ventilation Targeted Adaptive Servo-Ventilation (MV ASV). ResMed Science Center 2012.
 - ¹⁰ Topfer V. et al. [Adaptive servoventilation: effect on Cheyne-Stokes- Respiration and on quality of life. *Pneumologie* 2004; 58:28-32.