

## Validation of a new type of automatic BiLevel device with automatic backup frequency (SOMNOvent auto-ST)

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**Background:** Approximately 10 to 15% of patients in the sleep lab require BiLevel therapy. The causes are obstructive, mixed or complex sleep apnea accompanied by high pressure needs, poor CPAP compliance or OHS (Obesity Hypoventilation Syndrome). Standard BiLevel titration is time-consuming as the settings for ideal treatment of each patient are difficult to make, particularly when the patient has varying pressure needs. The auto-ST device (SOMNOvent auto-ST/WEINMANN) is based on the autoTriLevel principle. In addition to an automatically adapting BiLevel function (PDiff), an auto-CPAP function (EEPAP) is integrated. The innovation in this device is the option of setting a second automatic backup frequency which, depending on the therapy objective, supports the patient at a level slightly below his spontaneous breathing rate (Prio S) or guarantees additional support with a higher respiratory rate (Prio T).

**Methods:** The study was made of 15 patients (1 w, 14 m, aged 62.4±11, BMI 34.53±7.8kg/m<sup>2</sup>) with Obstructive Sleep Apnea Syndrome (OSAS) and/or central sleep apnea combined with OHS and Chronic Obstructive Pulmonary Disease (COPD). After a diagnostic night (Total AHI =56±33.8/hr., respiratory arousals =23±13.7/hr., SpO<sub>2</sub><90% = 42±48.2% of Total Sleep Time (TST) patients were treated during a PSG-monitored therapy night by SOMNOvent auto-ST.

**Results:** All therapy parameters lay in the required target range (Total AHI=5±4.0/hr., respiratory arousals = 2±1.5/hr., SpO<sub>2</sub><90% = 17±35.0% of TST) and showed a significant reduction from diagnostic night measurements. The therapy was well accepted by the patients.

**Conclusions:** This novel BiLevel device effectively treats patients with obstructive, mixed and complex sleep apnea or minor cases of respiratory insufficiency. Depending on the therapy objective, settings based on regulation principles and limits are made which allow the device to automatically regulate EEPAP, pressure difference and backup rate and thus efficiently and continuously adapt to the needs of the patient.