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Title: Impact of built-in software analysis on monitoring patients under home mechanical ventilation

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Body: INTRODUCTION: Ventilators for Home mechanical ventilation (HMV) has built-in software (BIS) that provide information about patient-ventilator interaction that could improve patient's management.

OBJECTIVE: To assess the impact of adding BIS to basic monitoring techniques (BMT) on the detection of unsatisfactory HMV. METHODS: Patients under HMV were included. BMT were: clinical interview, arterial blood gas (ABG) and home nocturnal oximetry (HNO). HMV was satisfactory (S-HMV) if the following criteria were met: 1-Comfort and improvement of symptoms, 2-ABG: pO₂>60 mmHg and pCO₂<46 mmHg, 3-HNO: SpO₂ time < 90% (T90) < 20%, and 4-BIS analysis: compliance >4 h/night, respiratory rate <25 breaths/min, average leak <60 L/min (facial mask) and <50 L/min (nasal mask), and asynchronies in <50% of the whole record (pressure slope). HMV was unsatisfactory (U-HMV) if any of the criteria fail. Changes in treatment were recorded. Vivo 30/40 and their BIS were used in all cases. RESULTS: Fifty patients aged 60(9) yrs, 60% male and 21(7) months under HMV were included. Conditions were: 29

Obesity-hypoventilation, 5 chest wall disorders, 4 neuromuscular diseases, 4 COPD and 8 mixed conditions. Thirteen cases (26%) were S-HMV. Seventy-nine U-HMV causes were detected, 34 by BIS and 45 by BMT. Fifty-nine changes were made in 33 patients: 15 interfaces, 15 ventilator settings, 11 harnesses, 5 added humidifier, 5 added O₂, 5 withdrew O₂ and 3 changes of ventilator. BIS detected 12 (32%) of the 37 U-HMV cases with no abnormalities in BMT. CONCLUSIONS: Applying simple criteria to the analysis of ventilator BIS increases our ability to detect U-HMV and promotes changes that could improve the quality of treatment.