**Development of a versatile ventilator alarm haptic transmitter to improve safety and comfort of Ondine patients, their parents and their caregivers.**

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Young adults suffering from central congenital alveolar hypoventilation (CCAH) are liable to leave their parents' home and live alone. French parents expressed concern about their children not reliably being awoken by the alarm of their ventilator. Preliminary polysomnographic data have indeed shown that adult CCAH patients tend to have more stage 4 sleep than healthy control during a typical night. In the absence of respiratory interoception, a major characteristic of the disease, not hearing the ventilator alarm represents a real danger. Yet, parents also reported that the vibration of a cellular telephone seemed more efficient in awakening their children. With this in mind, an alarm transmitter was developed, with the aim of transforming the acoustic alarm into an haptic signal, first tactile and then nociceptive. The system comprises a listening device that is capable to recognize the alarm of the ventilator. This device includes learning capabilities, in the event of a change in ventilator. When activated, the listening device sends a signal to a remote receiver, in the form of a watch bracelet. The receiver in turn emits vibrations of increasing intensity, which transform into a nociceptive electrical stimulation after an adjustable time if the ventilator alarm has not been deactivated before. Other relays can be activated simultaneously, such as a video device or a call system (emergency service or telemedicine platform). To date, a prototype has been designed (patent pending) and tested with different ventilators. No false negatives have been detected, and the rate of false positives is below 2 percent. Future projects include clinical validation of the efficiency of the device to wake up adult CCAH patients. The impact of the haptic transmitter on the quality of life of the patients and their caregivers will also be studied.