

# Comfort assessment with different trigger systems during helmet NIV: pilot study on healthy volunteers

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Argomento: Insufficienza respiratoria acuta e ventilazione meccanica

**Introduction:** It is often difficult to obtain a good patient-ventilator synchrony during helmet NIV; new generation triggers implemented in modern ICU ventilators aim to improve this issue.

**Aim:** to test the differences between standard flow trigger with default settings, standard flow trigger optimized by an expert clinician and the automatic waveform-guided trigger Intellisync+ on healthy volunteers ventilated with helmet NIV by a Hamilton C6 (Hamilton Medical, Bonaduz, Switzerland).

**Methods:** a Hamilton C6 ventilator equipped with Intellisync+ was used to ventilate eleven healthy volunteers; three trigger settings were randomly tested: standard flow trigger with default settings (ITS 2L/min, ETS 25%, Ramp 70ms), standard flow trigger clinically optimized and Intellisync+ (activated in both inspiration and expiration). PEEP was set at 5 cmH<sub>2</sub>O, Pressure Support at 8 cmH<sub>2</sub>O. Each trigger setting was tested with and without leaks (obtained by opening the helmet caps). During each phase volunteers were asked initially to breath normally, then to talk, to hold their breath and finally to breath as fast as possible. Volunteers had to fill in a questionnaire during ventilation, describing the quality of the assistance and asynchronies in each tested phase.

**Results:** preliminary data obtained from the volunteers questionnaires show that the overall comfort during ventilation was good with all tested triggers (fig.1), with a slightly better performance of standard trigger; this difference could be explained by the higher rate of early cycling perceived with Intellisync+ (72% of volunteers felt it with Intellisync+ vs. 36% with both the other triggers). However, Intellisync+ was less affected by autotriggers (54% of volunteers felt it with Intellisync+ vs. 100% with other triggers) with leaks in the circuit during the apneic phase (fig.2).

**Conclusions:** the waveform-guided trigger doesn't seem to improve comfort during helmet NIV ventilation, but is less affected by autotriggers, even with huge leaks in the circuit.

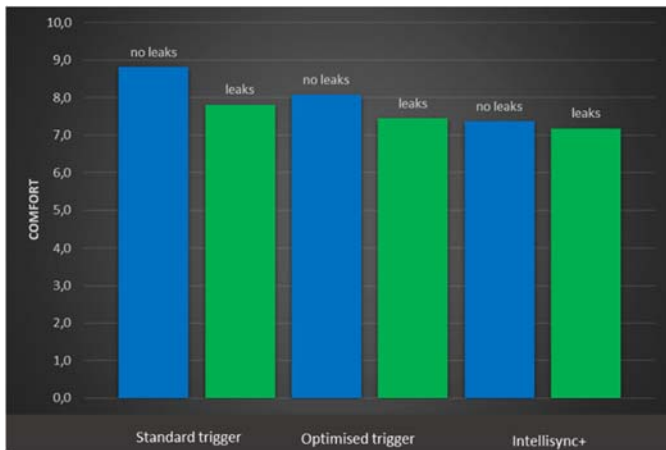


Fig.1: comfort on a scale from 0 to 10 with the three tested triggers, with and without leaks.

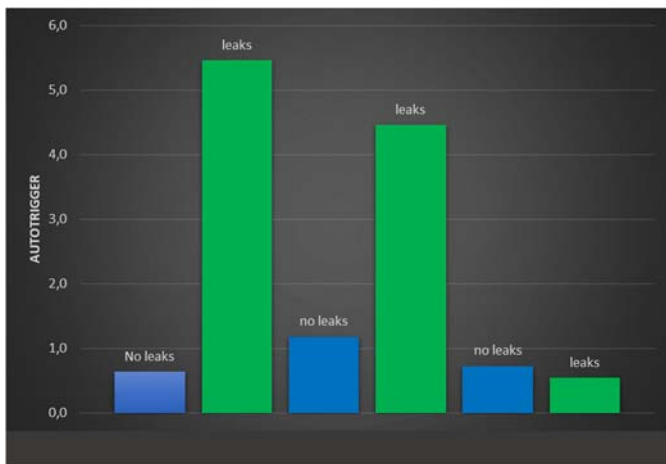


Fig.2: number of autotrigger recognized by volunteers in a 1-minute-apnea period, with and without leaks.