

# IntelliSync<sup>®</sup>+

## Keep an eye on patient-ventilator synchrony

Significant patient-ventilator asynchronies occur in more than 25% of all mechanically ventilated patients<sup>1</sup>, and are associated with increased work of breathing<sup>2</sup>, prolonged ventilation time<sup>1</sup>, and higher mortality<sup>3</sup>.

The well-trained eye of a ventilation expert is capable of detecting asynchronies by analyzing the waveform shapes of either the flow or the pressure waveforms. However, the expert cannot always be at the bedside, and the patient condition can change from breath to breath.

That is where IntelliSync+ takes over. This new technology mimics the expert's eye to identify signs of patient effort (trigger) or relaxation (cycling), thus replacing conventional trigger settings for inspiration and expiration.

1 Thille AW, Intensive Care Med. 2006 | 2 Tassaux D, Am J Respir Crit Care Med. 2005 | 3 Blanch L, Intensive Care Med. 2015

# Detection of patient-ventilator asynchronies

The analysis of flow waveforms (Fig.1-4) is a valuable tool for clinicians to identify the asynchronies in patient-ventilator interaction<sup>4,5</sup>. However, the expert can only adjust the triggers based on the previous breath and cannot be at the bedside 24/7. Real-time optimization is impossible to achieve with this method.

4 Georgopoulos D., Intensive Care Med. 2006. | 5 Mojoli F., Intensive Care Med. 2016

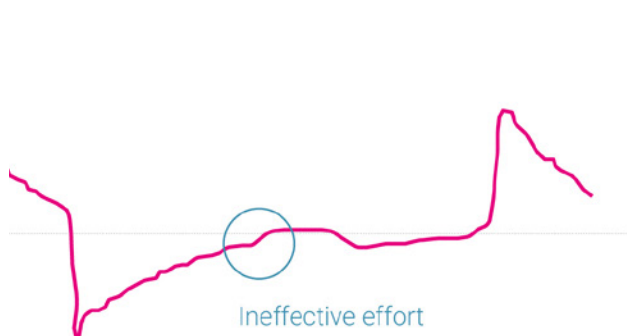


Fig. 1: Ineffective effort

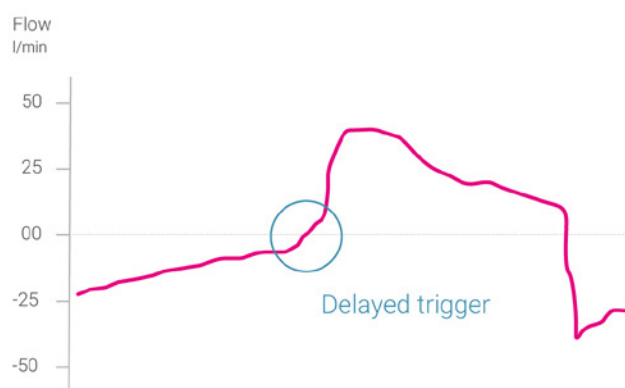


Fig. 2: Delayed trigger

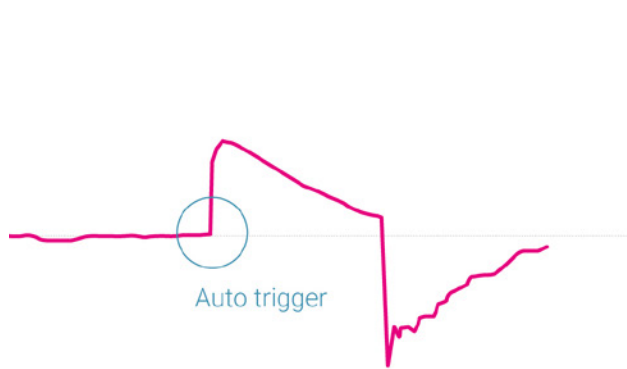


Fig. 3: Auto trigger

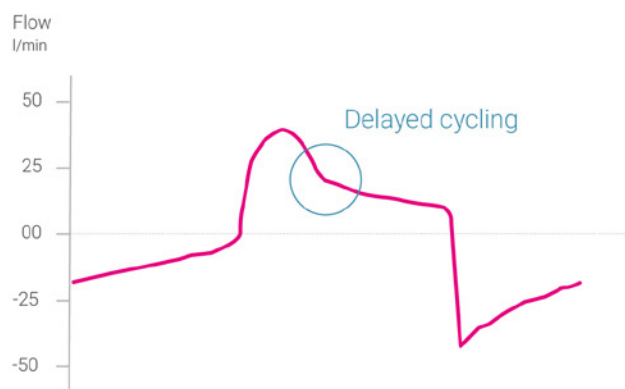


Fig. 4: Delayed cycling

### Current practice of fixed trigger settings for inspiration and expiration

In current practice (Fig. 5), the inspiratory trigger is set at a fixed positive flow or negative pressure. The initiation of expiration (cycling) occurs when the flow drops below a user-defined percentage of the maximum flow of the breath (expiratory trigger sensitivity – ETS).

Such fixed settings have severe limitations because constantly changing patient conditions and leaks are not taken into account. Inspiratory efforts can occur during negative flow and remain undetected by conventional triggers, resulting in delayed triggered breaths, delayed cycling or missed inspiratory efforts.

### Continuous, real-time patient-ventilator synchronization

The IntelliSync+ technology mimics the expert's eye by continuously analyzing waveform shapes at least a hundred times per second. This allows IntelliSync+ to detect patient efforts immediately, and to initiate inspiration and expiration in real-time (Fig. 6).

For maximum flexibility, IntelliSync+ can be activated to automate either the inspiratory trigger or the expiratory trigger, or both. Features of IntelliSync+:

- ✓ For invasive or noninvasive ventilation modes
- ✓ During inspiration and expiration
- ✓ Noninvasive method
- ✓ No additional hardware or accessories required



Fig. 6: Flow curve with Intellisync+ activated



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Analyzing waveform shapes is a reliable, accurate, and reproducible method for assessing patient-ventilator interaction. Automation of this method may allow continuous monitoring of ventilated patients and/or improved breath triggering and cycling<sup>5</sup>.

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### Availability

IntelliSync+ is currently available as an option for selected Hamilton Medical ventilators.