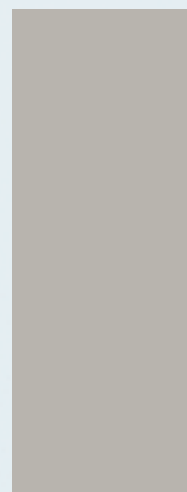
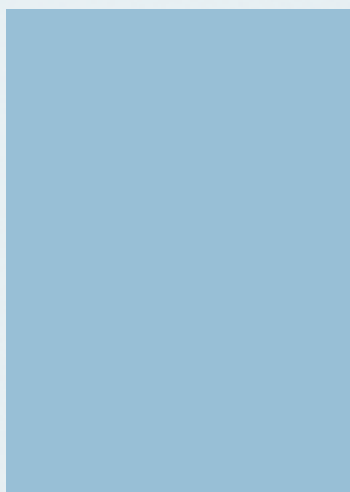




## Eyes that never miss a twitch

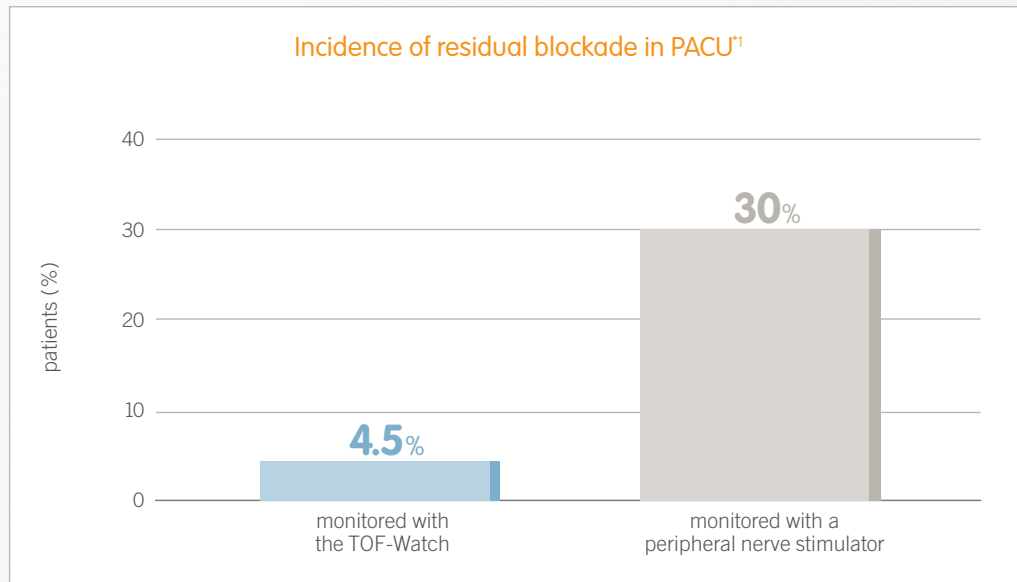
The TOF-Watch®—  
for accurate  
and reliable  
measurement of  
the depth of  
neuromuscular  
blockade



**TOF-Watch®**  
objective neuromuscular  
transmission monitor

## The TOF-Watch—more effective than subjective monitoring at detecting residual blockade

Patients monitored objectively with a TOF-Watch experienced a significantly lower incidence of residual blockade (train-of-four [TOF]  $\leq 0.9$ ) when compared with patients monitored subjectively by clinical exam alone or with a peripheral nerve stimulator lacking an objective display.<sup>1,2</sup>

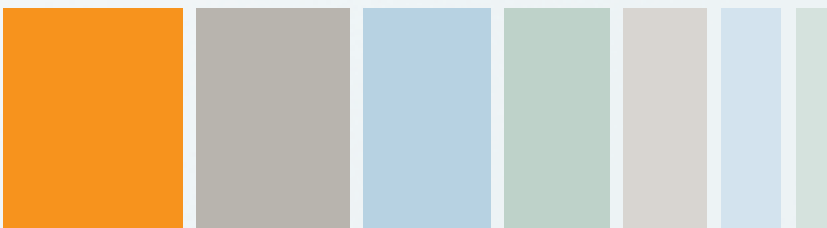


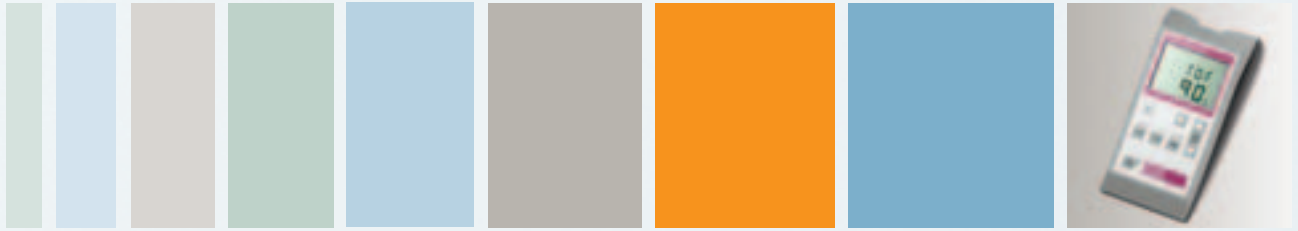
<sup>†</sup>Postanesthesia care unit.

### The limitations of subjective monitoring

- Research has also shown that visual or tactile evaluation with a peripheral nerve stimulator is ineffective in detecting fade greater than a TOF of 0.4.<sup>2,3</sup>

Objective monitoring with the TOF-Watch is key to avoiding residual blockade.<sup>1,2</sup>





## Acceleromyography—the most accurate and reliable method of objectively measuring neuromuscular blockade<sup>4</sup>

Acceleromyography (AMG) is a technique used by the TOF-Watch for recording evoked muscle responses. The TOF-Watch performs AMG by using a small piezoelectric transducer to convert measured acceleration into electrical signals, which are then processed and presented as clear and accurate measures of neuromuscular transmission.<sup>4,5</sup>

The advantages of the TOF-Watch for performing AMG include<sup>4,6</sup>:

- » Accuracy
- » Simplicity
- » Suitability for routine use during surgery and in the PACU

3

### A versatile partner

In addition to its ability to be used in various clinical settings, the TOF-Watch can be used at various anatomic sites, depending on the needs of surgery. The most common site for TOF measurement is the adductor pollicis (thumb). Alternative sites for measurement are the orbicularis oculi or the corrugator supercilii, above the eye, and the flexor hallucis brevis muscle, at the toe.<sup>5</sup>

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“[A]cceleromyographic monitoring should be used continuously from the induction of anaesthesia to the end of surgery rather than just at the end of the procedure.”

—Fuchs-Buder, *Anaesthesia*, 2009<sup>7</sup>

## What can your TOF-Watch do for you?

The TOF-Watch series consists of 3 monitors: TOF-Watch, TOF-Watch®S, and TOF-Watch®SX. All 3 monitors accurately measure the depth of neuromuscular blockade to help assess<sup>1,8</sup>:

- » Onset time of neuromuscular blocking agents (NMBAs)
- » The need for the administration of maintenance doses of NMBAs
- » When to administer a reversal agent
- » When to safely extubate

While all 3 monitors work to help ensure your patient maintains the appropriate level of blockade during surgery and reaches a TOF ratio  $\geq 0.9$  postsurgery, each TOF-Watch model differs in the total features provided.<sup>1</sup>

4



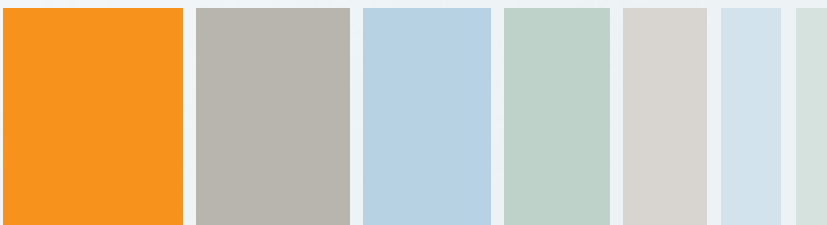
### TOF-Watch

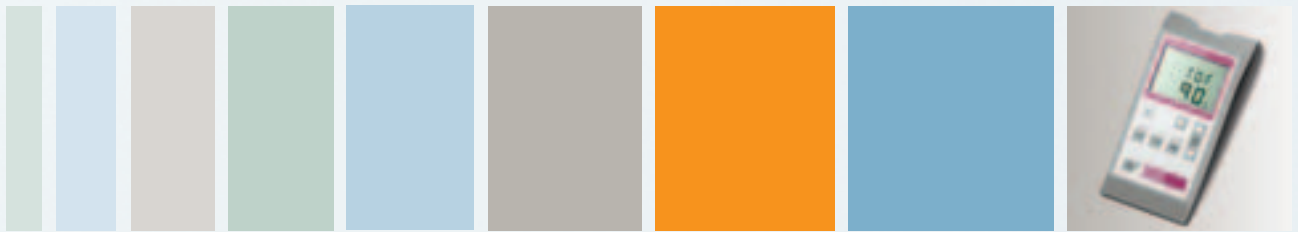
The standard model TOF-Watch applies the latest AMG techniques to accurately measure neuromuscular blockade. This model is especially suited to routine monitoring of neuromuscular transmission during surgical procedures.



### TOF-Watch S

This model has an added “Slow TOF” stimulation mode that enables the user to set the TOF repetition time intervals within a range of 1 to 60 minutes. The added capabilities of the TOF-Watch S make it particularly suitable for monitoring the effects of NMBAs postoperatively.





### **TOF-Watch SX**

The most sophisticated instrument in the TOF-Watch series, the TOF-Watch SX incorporates all the features offered by the TOF-Watch and TOF-Watch S along with added features such as a surface sensor for measuring skin temperature and the ability to connect with Philips® Monitors.



### **TOF-Watch SX Monitor Software**

The TOF-Watch SX is also compatible with monitor software that can be purchased separately and downloaded to a desktop or laptop computer. This software can be used to easily add comments to a patient's measured data recordings. These comments can later be edited, with changes logged in an audit trail (according to Good Clinical Practice).

The TOF-Watch SX Monitor Software makes viewing of the recorded data easy. Storing, printing, and exporting data to other programs are also facilitated. The program is username- and password-controlled.

5

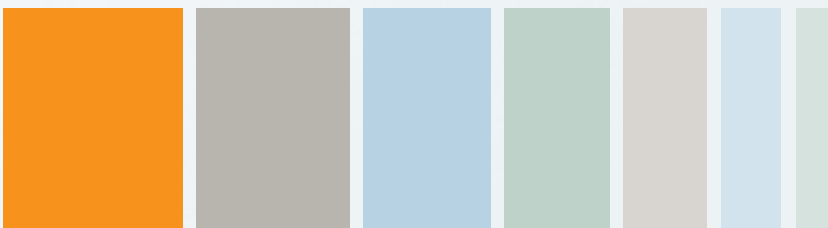
“[I]t is time to move from discussion to action and introduce objective neuromuscular monitoring in all operating rooms...”

—Eriksson, Anesthesiology, 2003<sup>9</sup>

**TOF-Watch®**  
objective neuromuscular  
transmission monitor

## Key features of the TOF-Watch

	TOF-Watch	TOF-Watch S	TOF-Watch SX
<b>Stimulation patterns</b>			
Train-of-four (TOF)	✓	✓	✓
Posttetanic count (PTC)	✓	✓	✓
Single twitch (ST) - 1 or 0.1 Hz	✓	✓	✓
Double-burst stimulation (DBS) - 3.3 or 3.2	✓	✓	✓
Tetanus (TET) - 50 or 100 Hz	✓		✓
Slow TOF (TOFs) programmable from 1 to 60 min		✓	✓
Stimulation current (0-60 mA at impedance $\leq 5$ kOhm)	✓	✓	✓
Stimulation pulse width monophasic 200 $\mu$ s	✓	✓	✓
Stimulation pulse width monophasic 300 $\mu$ s		✓	✓
Calibration with user-set current	✓	✓	✓
Calibration with automatically set supramaximal current		✓	✓
Manual transducer sensitivity setting		✓	✓
User-programmable upper and lower TOF/TOFs alarms (OFF, count, or % TOF)			✓
Automatic power switch off (after 2 hours of no operation)	✓	✓	✓
Surface temperature sensor (20°C-41.5°C)			✓
Interface for data upload to PC (fiber-optic to USB line)			✓
Nerve localization - LA (1 Hz stimulation) - Current 0-6 mA - Impedance $\leq 5$ kOhm - Pulse width 40 $\mu$ s monophasic	✓	✓	✓







## TOF ratio $\geq 0.9$ —the gold standard

Clinical studies are frequently defining recovery from neuromuscular blockade as a TOF ratio  $\geq 0.9$ , due to an increased recognition of the risks associated with a TOF ratio  $< 0.9$ .<sup>10-14</sup>

### Hypoxemia

- › A study using pancuronium showed that 60% of patients with a TOF ratio  $< 0.7$  experienced hypoxemia versus 10% of patients with a TOF ratio  $\geq 0.7$ .<sup>10</sup>
- › A separate study showed that patients with a TOF ratio  $< 0.9$  were significantly more likely to develop postoperative hypoxemia than those with a TOF ratio  $> 0.9$  (24 of 39 vs 7 of 30,  $P=0.003$ ).<sup>11</sup>

### Pharyngeal dysfunction

- › In a study using atracurium, pharyngeal dysfunction increased to 17% at a TOF ratio of 0.7 and to 20% at a TOF ratio of 0.8 from 6% in the control recordings.<sup>12</sup>
- › A study using vecuronium concluded that pharyngeal function is not normalized until a TOF ratio  $> 0.9$  is reached.<sup>13</sup>

### Respiratory dysfunction

- › A study using rocuronium showed that at a TOF ratio of 0.8, decreased FIV<sub>1</sub>,\* upper airway obstruction, and impaired ability to swallow were present.<sup>14</sup>

“[C]omplete recovery cannot be confirmed using either qualitative instrumental tests or clinical tests but requires the use of measured TOF ratio.”

—Debaene, Anesthesiology, 2003<sup>15</sup>

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transmission monitor

\*Forced inspiratory volume in 1 second.

## Never miss a twitch with the TOF-Watch

The TOF-Watch series offers an accurate and reliable method of objective acceleromyographic monitoring of neuromuscular blockade that overcomes the limitations of subjective monitoring.<sup>4</sup>

### Reliable detection of residual blockade

- » 4.5% incidence in the PACU for patients monitored with the TOF-Watch, versus 30% incidence for patients monitored subjectively<sup>1,2</sup>

### Avoids the risks associated with a TOF <0.9

- » Recovery to a TOF <0.9 has been associated with a wide range of side effects<sup>10-14</sup>
- » The TOF-Watch helps ensure patients are recovered to a TOF >0.9 before extubation<sup>1</sup>

### A versatile partner

- » Suitable for use during surgery or in the PACU
- » Can measure TOF ratios at the thumb, above the eye, and at the toe

The TOF-Watch provides simple and accurate measurement of TOF ratios for optimal neuromuscular blockade management.<sup>1</sup>

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**FOR MORE DETAILED INFORMATION, PLEASE SEE THE USER MANUAL THAT WAS INCLUDED WITH YOUR TOF-WATCH, TOF-WATCH S, OR TOF-WATCH SX MONITOR.**