



Predictive  
decision support.  
Smart. Innovation.

Acumen Hypotension Prediction Index Software



Edwards

# Predicting hypotensive events

• Predict • Review • Respond



## Innovation for proactive management of hypotensive events

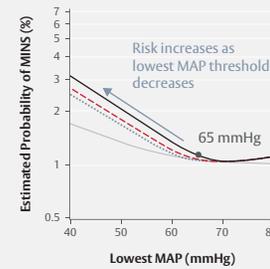
Developed in partnership with clinicians across the world and the first in a new category of products, Acumen Hypotension Prediction Index software offers the only predictive monitoring parameter for hypotension that is available in Europe. This first-of-its-kind predictive decision support software detects the likelihood of a hypotensive event\* before the event occurs, and provides you with insights to understand the root cause and inform a potential course of action for your patient management.

Using the predictive index and continuously updated hemodynamic pressure and flow parameters, you are empowered with both knowledge and ability to take action before a hypotensive event occurs.

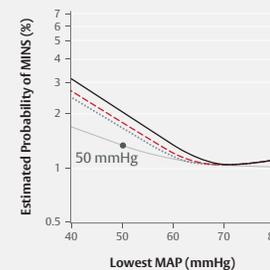
## The risks of hypotensive events

In noncardiac surgery patients, research findings have revealed strong associations between intraoperative hypotension and elevated risk of both acute kidney injury (AKI) and myocardial injury after noncardiac surgery (MINS).<sup>1,2,3</sup>

- MINS – the most common cardiovascular complication that occurs after noncardiac surgery – is the leading cause of mortality within one month following surgery.<sup>1,4</sup> It is a substantial public health issue.<sup>4</sup>
- More than 1 in 12 patients (8 million people globally) over 45 years old experience MINS each year.<sup>4,5,6</sup>



Once a patient's mean arterial pressure (MAP) reaches 65 mmHg, it takes just 10 minutes of exposure to see higher associations between intraoperative hypotension and MINS.<sup>1</sup>



Once a patient's MAP reaches 50 mmHg, it takes only one minute for the risk of MINS to increase significantly,<sup>1</sup> making early identification of a hypotensive event critical.



\* A hypotensive event is defined as MAP <65 mmHg for a duration of at least one minute.

1. Salmasi, V., Maheshwari, K., Yang, G., Mascha, E.J., Singh, A., Sessler, D.I., & Kurz, A. (2017). Relationship between intraoperative hypotension, defined by either reduction from baseline or absolute thresholds, and acute kidney injury and myocardial injury. *Anesthesiology*, 126(1), 47-65.
2. Sun, L.Y., Wijeyesundera, D.N., Tait, G.A., & Beattie, W.S. (2015). Association of Intraoperative Hypotension with Acute Kidney Injury after Elective non-cardiac Surgery. *Anesthesiology*, 123(3), 515-523.
3. Walsh, M., Devereaux, P.J., Garg, A.X., Kurz, A., Turan, A., Rodseth, R.N., Cywinski, J., Thabane, L., & Sessler, D.I. (2013). Relationship between Intraoperative Mean Arterial Pressure and Clinical Outcomes after non-cardiac Surgery. *Anesthesiology*, 119(3), 507-515.
4. Khan, J., Alonso-Coello, P., Devereaux, P.J., Myocardial injury after noncardiac surgery, *Curr Opin Cardiol*, 2014, 29: 307-311.
5. Sellers, D., Srinivas, C., Djaiani, G. (2018). Cardiovascular complications after non-cardiac surgery. *Anaesthesia*, 73 (Suppl. 1), 34 - 42.
6. van Waes, J., Nathoe, H., Graa, J., Kemperman, H., de Borst, G., Peelen, L., van Klei, W. (2013). Myocardial Injury After Noncardiac Surgery and its Association With Short-Term Mortality. *Circulation*, 127, 2264 - 2271

# The Acumen Hypotension Prediction Index software is comprised of three key elements



## HPI parameter

The HPI parameter displays as a value ranging from 0 to 100, with higher values indicating higher likelihood of a hypotensive event.\*

The proprietary algorithm – developed using data from almost 59,000 hypotensive events and over 144,000 non-hypotensive events – coupled with machine learning techniques detects potential hypotensive trending of a patient's mean arterial pressure (MAP). The HPI parameter updates every 20 seconds, providing continuous insights into developing hypotensive events.

The diagnostic performance of the HPI parameter was assessed through clinical validation studies. The higher the value of the HPI parameter, the greater the likelihood of a hypotensive event will occur.



## HPI high alert popup

The HPI high alert popup alerts you when your patient is trending toward or experiencing a hypotensive event.

If the HPI parameter value exceeds 85 for two consecutive 20-second updates or reaches 100 at any time, the HPI high alert popup window will appear, prompting you to review the patient hemodynamics using the HPI secondary screen.



## HPI secondary screen

The advanced hemodynamic pressure and flow parameters provided on the HPI secondary screen allow you an opportunity to investigate and identify the root cause of potentially developing hypotensive events.

The HPI secondary screen is accessed through the HPI high alert popup, by touching the HPI Information Bar when enabled, by pressing the button on the HPI Key Parameter, or at any time through the Clinical Actions menu on the monitor.

### Preload: Stroke volume variation (SVV)

- The percent difference between minimum and maximum SV during a respiratory cycle; serves as an accurate marker of position status on the Frank-Starling curve

### Contractility: $dp/dt$

- A sensitive measure of changes in the contractility of the left ventricle

### Afterload: Dynamic arterial elastance ( $Ea_{dyn}$ )

- The ratio of pulse pressure variation to stroke volume variation (PPV/SVV)

\*Data on file

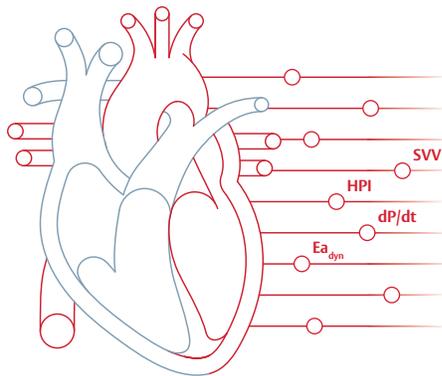
# The Acumen IQ sensor: unlocking predictive decision support



The Acumen IQ sensor – developed from the legacy of the APCO algorithm – unlocks the Acumen Hypotension Prediction Index software.

The Acumen IQ system automatically updates advanced parameters every 20 seconds, reflecting rapid physiologic changes in moderate-to high-risk surgery. The minimally invasive Acumen IQ sensor connects to any existing radial arterial line.

Model	Description	Length	Unit of measure
AIQS8	Acumen IQ sensor standalone	84 in / 213 cm	EA
AIQS85	Acumen IQ sensor standalone (5-pack)	84 in / 213 cm	5
AIQS8R	Acumen IQ sensor standalone with red cap	84 in / 213 cm	EA
AIQS8R5	Acumen IQ sensor standalone with red cap (5-pack)	84 in / 213 cm	5
AIQS6	Acumen IQ sensor standalone	60 in / 152 cm	EA
AIQS65	Acumen IQ sensor standalone (5-pack)	60 in / 152 cm	5
AIQS6R	Acumen IQ sensor standalone with red cap	60 in / 152 cm	EA
AIQS6R5	Acumen IQ sensor standalone with red cap (5-pack)	60 in / 152 cm	5



## Predictive decision support

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Through ongoing collaboration with clinicians, providing continuous education, and our dedication to purposeful innovation, Edwards continues to develop smart hemodynamic management solutions that enable proactive decision support.

**For professional use. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.**

Edwards Lifesciences devices placed on the European market meeting the essential requirements referred to in Article 3 of the Medical Device Directive 93/42/EEC bear the CE marking of conformity.

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