

**EIRUS**  
CONTINUOUS GLUCOSE MONITORING  
SET THE STANDARD

Mind  
the  
gaps

**LACTATE MONITORING**

**2**

analytes:  
glucose and lactate

**GLUCOSE MONITORING**

**1**

catheter,  
multiple functions

**0:00:01**

one measurement  
every second

**0**

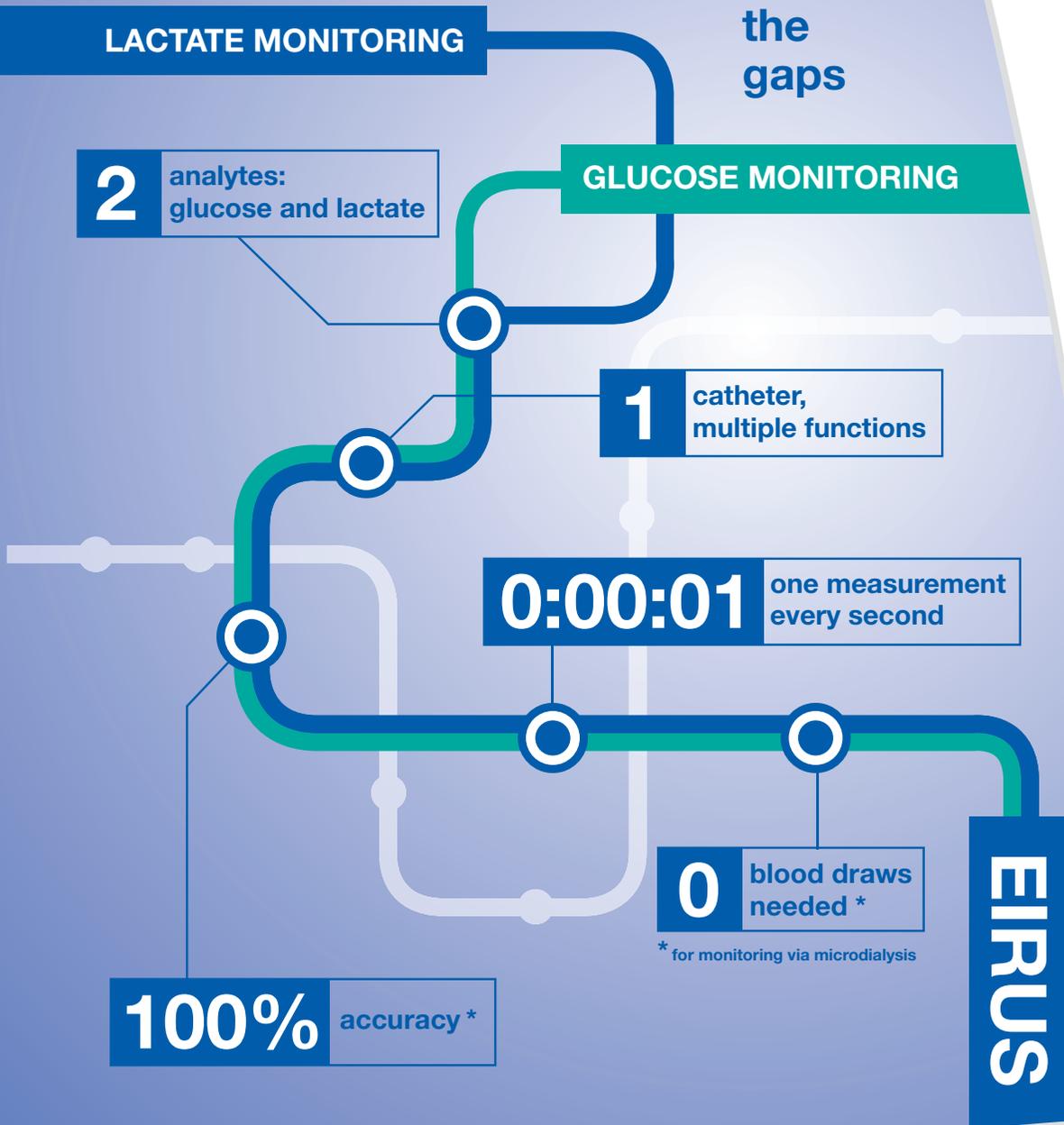
blood draws  
needed \*

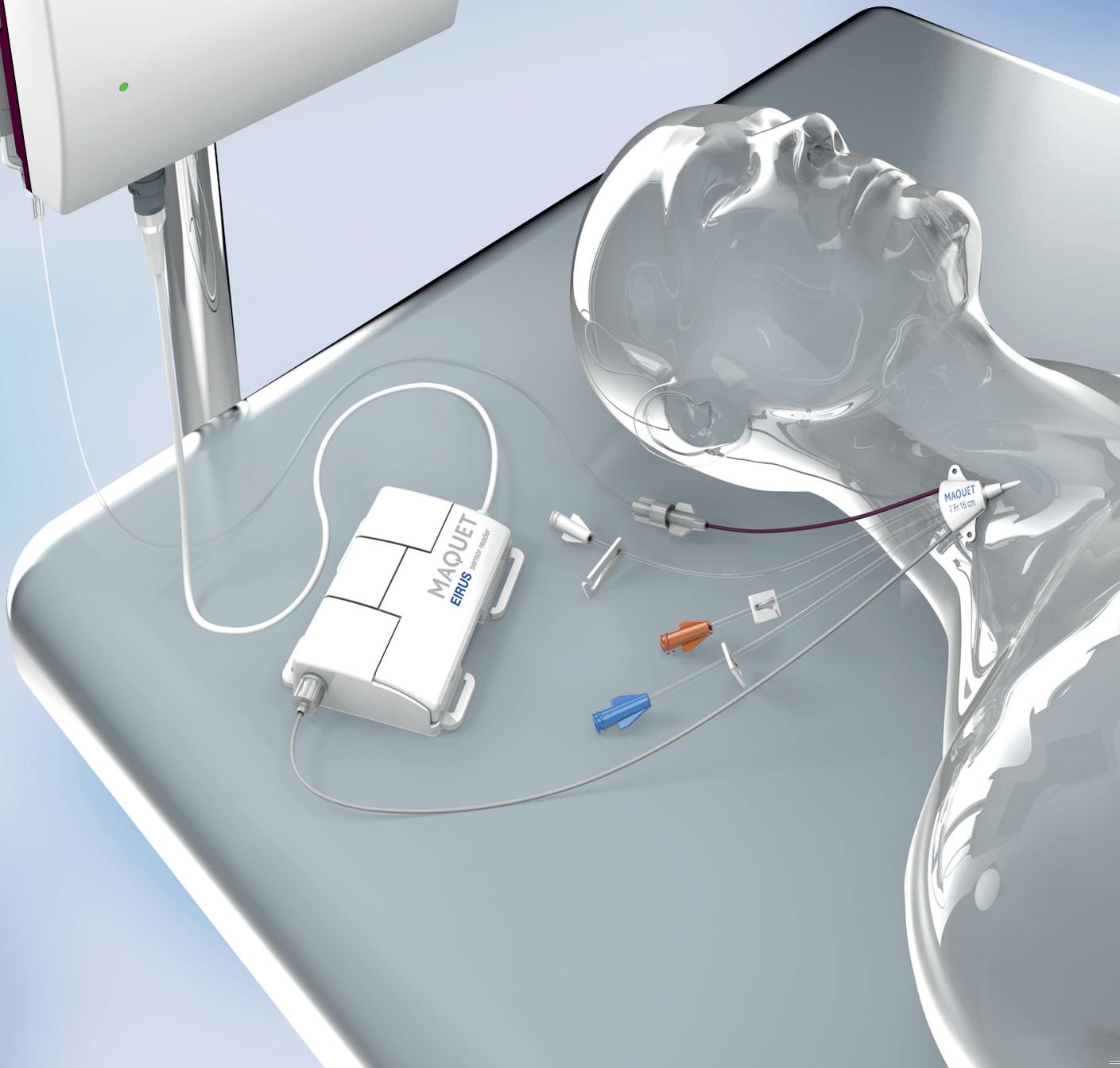
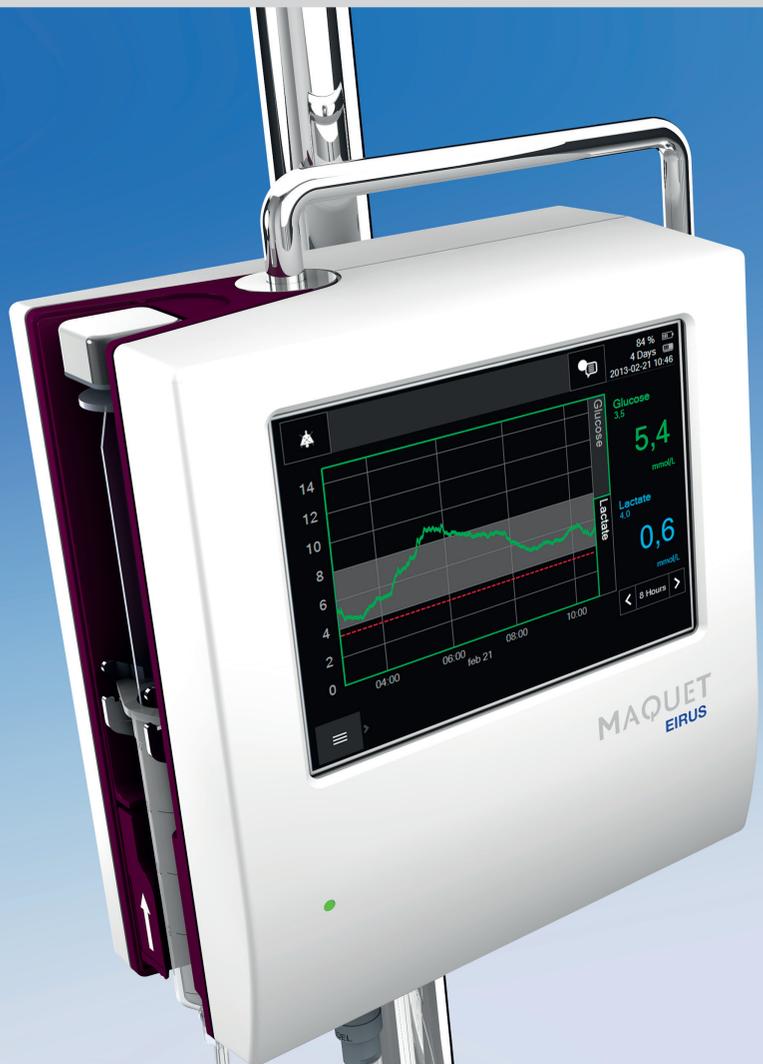
\* for monitoring via microdialysis

**100%**

accuracy \*

**EIRUS**





## EIRUS™ – SETTING THE STANDARD FOR CONTINUOUS GLUCOSE AND LACTATE MONITORING

**The ability to accurately** monitor blood parameters is essential for the optimal management of critically ill patients. Now there is a smart, accurate and convenient option, which is setting the standard for continuous glucose and lactate monitoring to improve the quality of patient care.

**EIRUS is a blood analyte monitoring platform specifically developed for the needs of critical care.**

Its unique microdialysis-based technology offers truly continuous glucose monitoring (CGM), eliminating the risk of trend gaps. Additionally, EIRUS provides continuous lactate monitoring, which allows for ongoing patient assessment to guide diagnostic and therapeutic interventions. The system's multipurpose catheter provides central venous access and reduces the need for additional lines and frequent blood draws. The platform provides continually updated glucose and lactate levels on an easy-to-read screen and includes integrated alarms for peace of mind.

EIRUS – raising the bar for glucose control and lactate monitoring in critical care.

**For you. For patients. For better care.**

*"Continuous measurement is interesting because hypoglycemia must be avoided"*

ICU nurse

## CONTINUOUS GLUCOSE MONITORING – A PREREQUISITE FOR ADEQUATE GLUCOSE CONTROL

Today, glucose control has become standard of care in intensive care unit (ICU) treatment, however, various challenges have hindered its optimal implementation.

Stress-induced hyperglycemia is frequently observed in critically ill patients and is believed to contribute to poor outcomes.<sup>1-3</sup> The Leuven I trial demonstrated for the first time the beneficial effects of establishing an upper limit to glucose levels in ICU patients through insulin therapy.<sup>4</sup> This landmark trial demonstrated a reduction in mortality through tight glucose control; however, initial enthusiasm was tempered by the results of several follow-up studies with less favorable outcomes.<sup>5,6</sup> Nonetheless, while there is still debate around the optimal tightness of glucose control, clinical experts agree that an upper limit to safe glucose levels exists and that avoiding hypoglycemic episodes should be prioritized.

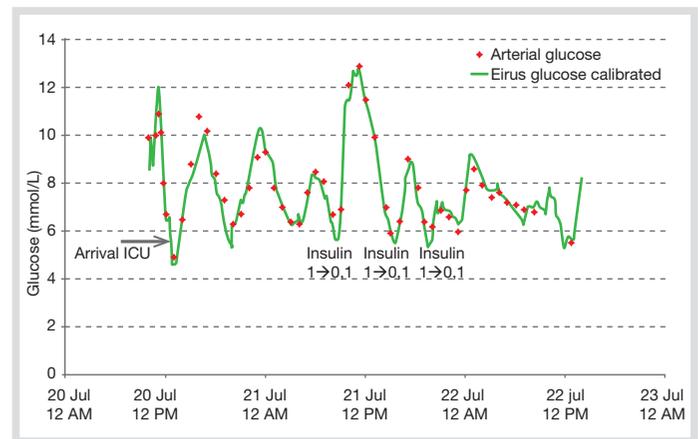
Applying adequate glucose control remains a challenge. Intermittent assessment methods such as arterial blood gas analyzers and hand-held glucometers may fail to detect fluctuations or hypoglycemic episodes. In addition, frequent blood draws may be inconvenient for the patient and adds to the workload of nursing staff.

*“A continuous system would be good as insulin would be more easily regulated.”*

ICU intensivist, The Netherlands

Truly continuous glucose monitoring with EIRUS, reports glucose levels automatically, every minute, without additional blood draws\*, and alerts staff when out-of-range values are detected. This allows for assessment of the patient’s glycemic condition at a glance, while at the same time offering greater patient convenience. Rapid assessment of glucose levels with EIRUS also ensures the ability for prompt treatment, allowing for the proactive management of glucose levels.

Setting the standard of care for continuous glucose monitoring, EIRUS will be instrumental in keeping patients within an individually-defined target glucose range, enabling safe and convenient glycemic control while minimizing the risks associated with insulin therapy.



This is an example of a patient (diabetic patient with high insulin sensitivity) where correct treatment requires very frequent blood gas measurements to keep track of the glucose levels. EIRUS will provide constant surveillance so that no blood glucose excursions remain undetected.

\*Reference blood samples are required to calibrate the system, but blood samples drawn for other purposes can be used.

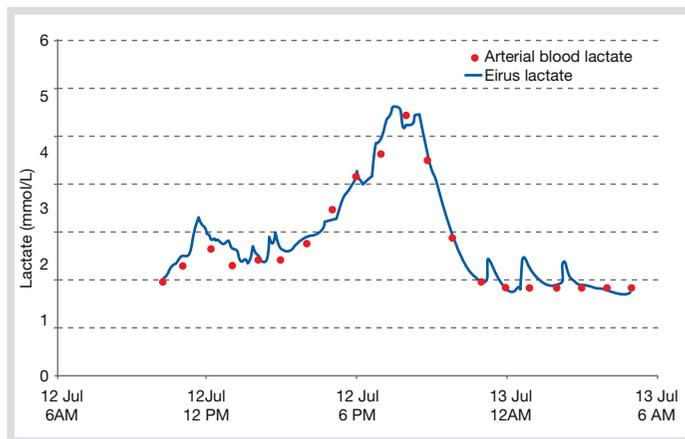
## THE BENEFITS OF LACTATE MONITORING IN CRITICALLY ILL PATIENTS

### Lactate levels act as a warning signal in patients at risk.

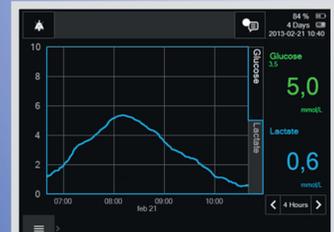
Changes in lactate levels can aid evaluation of ongoing therapy and the need for additional diagnostics and potential therapeutic interventions.<sup>7</sup>

Elevated levels of blood lactate (hyperlactatemia) are common in critically ill patients, and irrespective of the exact underlying mechanisms, generally reflect increased morbidity and mortality. Clinical studies underscore the importance of monitoring lactate levels and confirm that lactate-directed resuscitation therapy is beneficial in critically ill patients.<sup>8-10</sup>

**Changes in lactate levels over time** can be used in the assessment of the patient's overall condition and response to therapy. Continuous monitoring with EIRUS tracks this important clinical parameter at a glance.



*Case study: A patient who had undergone heart surgery showed normal to moderate lactate levels over a certain period of time, but then developed hyperlactatemia. This increase in blood lactate levels correlated with the diagnosis of post-operative bleeding. The patient was taken back to the operating room where the bleeding was stopped and lactate levels normalized. This example demonstrates how continuous monitoring of lactate levels can help guide patient management in critical care.*



Truly continuous second-by-second measurement of both glucose and lactate

# 2

hours direct nursing time per patient and day required to implement a tight glycemic control protocol using hourly point-of-care measurements.<sup>11</sup>

## EIRUS - HIGHLY ACCURATE TECHNOLOGY TO IMPROVE QUALITY OF CARE



**EIRUS combines state of the art technology** of bedside analyte monitoring with the reliability and convenience needed in critical care. The system addresses the need for continuous monitoring of glucose in critically ill patients and adds the additional unique feature of continuous lactate monitoring.

- **EIRUS uses microdialysis**, a well-proven technology for measurement of blood metabolites, requiring no additional blood draws for ongoing monitoring.
- **The EIRUS monitoring platform** consists of a monitor (1), a disposable biosensor (4) and a specialized multi-lumen central venous catheter, of which 3 lumen can be used as a conventional TLC and 2 lumen facilitate microdialysis (2).
- **Saline is infused** through the microdialysis inlet of the catheter (yellow arrow).
- **Small metabolites** (blue and green dots) like glucose and lactate pass through the semi-permeable membrane (3), generating equilibrium between the blood and the infused saline.
- **The resulting dialysate** is pumped through the microdialysis outlet (green arrow) and over the biosensor (4). Metabolites are measured enzymatically in the sensor.
- **Values are measured every second** and updated onscreen, numerically and as a trend curve, at least every minute – ensuring no gaps in trends.

EIRUS has been studied in several clinical and experimental trials. Blood glucose and lactate data obtained with EIRUS are in excellent agreement with arterial blood gas reference samples.<sup>12-19</sup>

EIRUS is a unique solution that allows the accurate assessment of glucose over a wide range of concentrations and continuous lactate monitoring to improve quality of care.<sup>20</sup> In addition, it is a compact and portable device, which ensures ease of use in the critical care setting.

Blood draws  
required for  
continuous  
analyte  
sampling  
using micro-  
dialysis:

# ZERO

## MAQUET – THE GOLD STANDARD

### **A heritage of innovation**

MAQUET, a trusted partner for hospitals and physicians for over 175 years, is the global leader in providing medical systems that meet the needs of the most medically challenging patients. MAQUET designs, develops and distributes innovative therapy solutions and infrastructure capabilities for high-acuity areas within the hospital including the operating room (OR), hybrid OR/cath lab and intensive care unit (ICU) as well as intra- and inter-hospital patient transport.

### **A commitment to education and training**

MAQUET offers a complete range of service training programs for all its systems and products. These programs give hospital technicians and engineers a good understanding of product functionalities, leading to successful maintenance and servicing in close partnership with the MAQUET global service organization.

**MAQUET MCare®** services provide innovative solutions to ensure every purchase will always operate at peak performance throughout its lifecycle. The comprehensive service offering MCare ensures that your products function at their peak performance throughout their lifecycle. This modular offering goes beyond genuine MAQUET service parts and full service contracts. Unique online services and ongoing equipment upgrades complement classical training, service and maintenance offerings to suit your needs in the most efficient way.

### **Smart solutions to improve patient care**

EIRUS is a powerful and adaptable platform. Upgrades and new functionalities, such as additional analyte measurement capabilities, can be added as they become available. The system requires minimal staff training as it is easy to learn and use. Its convenient multipurpose catheter enables blood sampling and administration of infusions and medication while simultaneously providing continuous blood analyte monitoring. The automated platform enables easy assessment of glucose and lactate levels, freeing up staff time while improving glycemic control, patient safety and, ultimately, clinical outcomes.

For you. For patients. For better care.

# MAQUET

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**The product EIRUS may be pending regulatory approvals to be marketed in your country. Contact your MAQUET representative for more information**

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