



## Application Spotlight: pH and Temperature Sensing Smart Bandage

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ADVANCING  
WOUND CARE  
THROUGH pH AND  
TEMPERATURE  
MONITORING

As digital health continues to transform medical monitoring, wound care is emerging as a key area where continuous data can drive better patient outcomes. Chronic wounds, pressure ulcers, and post-surgical sites often rely on visual inspection, making early infection detection and healing assessment challenging. There is a growing demand for smart, connected wound dressings that deliver real-time physiological data, reducing the need for manual intervention and supporting remote patient management.

Together, **Millar**'s robust pH sensing technology and **Gentian Health**'s connected wearable electronic patch offer a novel way to enable these advancements. Once fully integrated, the Smart Bandage platform will demonstrate how continuous pH and temperature sensing combined with digital connectivity can transform wound management, shifting from reactive to proactive treatment, improving patient outcomes, and reducing clinical workload. The proof of concept will serve as a foundation for future clinical and OEM collaborations exploring pH and temperature monitoring in wearable and implantable applications.

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### WOUND CARE CHALLENGES

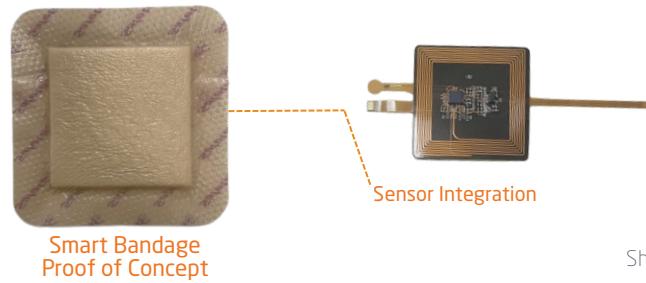
The next generation of wound care devices must overcome several persistent challenges, including:

- **Limited Objective Data:** Traditional wound assessment depends heavily on visual inspection and manual measurement, delaying early detection of complications.
- **Infection Risk and Healing Uncertainty:** Without biochemical insight, clinicians often rely on symptoms rather than quantitative data to guide treatment decisions.
- **Patient Compliance and Access:** Frequent clinic visits for wound monitoring are costly and inconvenient, especially for patients with mobility limitations or chronic conditions.
- **Data Integration:** Even when sensor data is available, a lack of connectivity and software infrastructure limits its clinical usefulness.

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### MILLAR & GENTIAN: PARTNERING FOR INNOVATION

This collaboration between Millar and Gentian Health represents a shared commitment to advancing connected care technologies. By combining Millar's precision sensing hardware and Gentian's expertise in wearable devices and digital health integration, the partnership showcases how multidisciplinary innovation can accelerate the development of next-generation medical solutions. Together, the teams are paving the way for smarter, more connected wound care systems that improve both patient outcomes and quality of life.



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## WOUND CARE APPLICATIONS



### CHRONIC WOUND MANAGEMENT

For diabetic ulcers, venous leg ulcers, and pressure sores, continuous pH monitoring enables clinicians to detect infection and assess healing progress remotely. Research shows that wound pH shifts are strong indicators of delayed healing or bacterial colonization.



### POST-SURGICAL HEALING

Monitoring pH and temperature provides an additional layer of objective biochemical data beyond traditional visual assessment. Early detection of pH and temperature deviation may enable intervention before complications escalate.



### PRESSURE INJURY PREVENTION

For patients at risk of developing pressure ulcers, such as those in critical care or long-term care settings, localized pH monitoring can identify tissue breakdown before visible signs appear. Continuous pH feedback enables clinicians to take preventive measures, such as repositioning or offloading, reducing the likelihood of hospital-acquired pressure injuries.



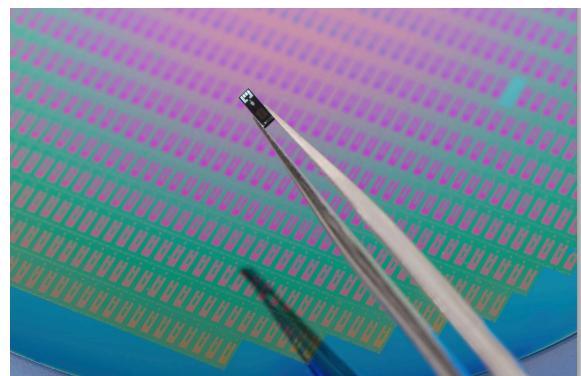
### BURN CARE & SKIN REGENERATION

In burn treatment and reconstructive procedures, continuous monitoring of pH and temperature within the wound environment provides early insight into infection, tissue viability, and graft success.

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## ISFET pH SENSING TECHNOLOGY

At the core of the smart bandage system is Millar's Ion-Sensitive Field-Effect Transistor (ISFET) pH sensing technology, a robust and glass-free alternative to traditional electrode sensors. The solid-state ISFET design allows for exceptional miniaturization, enabling seamless integration into compact, flexible, and wearable medical devices. Its long-term stability and low drift ensure consistent, accurate readings during continuous monitoring,



Millar's pH Sensor Wafer

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## GENTIAN'S PATCH PLATFORM

Gentian Health's patch platform is a combination of electronics, firmware and algorithms, medical-grade materials and industrial design. With proven patch solutions, mature firmware and validated algorithms, the patch platform is design tailored for any application and shortens project development leadtime

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