

The Impact of Pressure Ulcers on Patient Care

A new device helps ensure higher levels of adherence with standard prevention measures in an effort to prevent pressure ulcers.

Abstract

Pressure ulcers are a vast and growing problem in the United States and account for ~ \$10 billion dollars in annual health care spending. In 2008, the Centers for Medicare & Medicaid Services discontinued reimbursement for hospital-acquired pressure ulcers (HAPUs), thus increasing the demand for early-stage prevention. Each year, over 1 million patients will suffer from a hospital-acquired pressure ulcer.

Pressure ulcers occur most commonly in the elderly, which is the fastest-growing segment of the population. As a result, the number of patients at risk for developing pressure ulcers is expected to increase dramatically in the coming decades. Given the tremendous burden that pressure ulcers place on the healthcare system, there is a substantial need for improved prevention methods.^{1,2}

Background

Pressure ulcers, also known as bedsores, form when there is sustained pressure on a given area of the body. This unrelieved pressure causes compression of tissues and impairs blood flow to affected areas. If the surface pressure is not relieved, the resulting shortage of blood flow can lead to localized tissue damage and cell death. Pressure ulcers initially appear as areas of reddened skin, but can quickly develop into large open wounds if left untreated.

Pressure ulcers are a source of significant morbidity and mortality for patients. Pressure ulcer treatment begins with a comprehensive review of a patient's general health and an assessment of their wound. General treatment principles include positioning patients such that little or no pressure is placed on the ulcer, using pressure-relieving support surfaces, optimizing nutritional status, and utilizing a myriad of advanced wound care modalities and wound dressing technologies. More specific treatment goals depend on the stage of the pressure ulcer, and range from applying skin protective dressings to surgical closure of the wound and skin grafting.³ Stage 1 and 2 pressure ulcers will generally heal within several weeks, while Stage 3 and 4 ulcers can take months or years to completely heal.⁴ The development of a hospital-acquired pressure ulcer should highlight the need to review, refine and intensify an institution's pressure ulcer prevention procedures.

Pressure Ulcer Prevention: The Importance of Turning Protocols

To prevent pressure ulcers, the currently accepted standard of care is to turn high-risk patients at least every 2 hours, day and night.⁵ In many healthcare facilities, such a turning schedule can be difficult to maintain.

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To prevent pressure ulcers, the currently accepted standard of care is to turn high-risk patients at least every 2 hours, day and night.⁵ In many healthcare facilities, such a turning schedule can be difficult to maintain. Studies have estimated that caregiver adherence with established patient turning protocols ranges from 30% to 66%, and thus a significant number of patients are not being turned appropriately.^{6,7,8}

Potential explanations for this low adherence include difficulty monitoring patient position, ineffective turn reminders/alerts, and sub-optimal caregiver staffing ratios—all of which hinder efforts to prevent pressure ulcers. To further exacerbate the problem, as the population ages, the percent of patients requiring turning is increasing, and yet there is a growing shortage of nursing staff, making it increasingly difficult to maintain high levels of adherence with prescribed turning schedules.

To address the need for improved pressure ulcer prevention and treatment methods, Leaf Healthcare has developed the Leaf Patient Monitoring System. This innovative patient monitoring system is designed to improve both system efficiency and patient care by monitoring and coordinating patient turning. The Leaf Patient Monitoring System provides caregivers with information regarding a patient's position over time, thus enabling them to easily identify which patients are turning adequately on their own and which patients are in need of a caregiver-assisted turn. In such a manner, the system allows caregivers to focus their attention on those who need it most, while at the same time ensuring that no patient is neglected. Furthermore, the system can intelligently optimize and coordinate turning schedules for a large group of patients and help prioritize patient turning needs.

New Device Helps Optimize and Ensure High Levels of Adherence with Turning Protocols

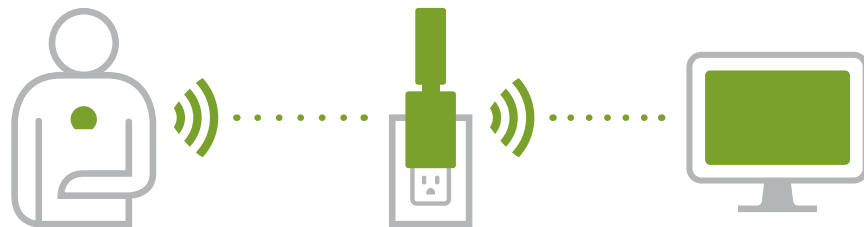
The system is designed to ensure that all monitored patients are turned according to their prescribed turning schedules, and it does so in a way that minimizes caregiver work burden.

The Leaf Patient Monitoring System is a medical device designed for use in hospitals, nursing homes, or other patient care facilities. The system features a small, single-use, electronic sensor that is adhesively affixed to a patient, such that the patient's orientation, movements, and other care parameters can be monitored. Data collected by the sensor is then communicated wirelessly to nearby relay antennas. The relay antennas then wirelessly transmit this data to central monitoring stations or mobile devices, such that data for a group of patients can easily be viewed and caregivers can be notified when a patient requires an assisted turn. The system is designed to ensure that all monitored patients are turned according to their prescribed turning schedules, and it does so in a way that minimizes caregiver work burden.

Conclusion

Despite the growing emphasis placed on pressure ulcer prevention, pressure ulcers continue to be the most common preventable hospital-acquired condition. The continued prevalence of HAPUs may reflect inadequate, ineffective, or poorly implemented preventative measures. The Leaf Patient Monitoring System has been recognized as a valuable tool that enables caregivers to efficiently and effectively maintain high levels of adherence with established guidelines for patient turning in an effort to prevent pressure ulcers. The monitoring system is designed to allow caregivers to focus their attention on those that need it most, while at the same time ensuring that no patient is neglected. In such a fashion, the Leaf Patient Monitoring System improves system efficiency and enhances patient care.

High level schematic representation of the Leaf Patient Monitoring System



Leaf Patient Sensor

The wireless, disposable sensor attaches to patients using an industry-leading, medical grade adhesive. Simply remove the adhesive backing and place the sensor on a patient's upper chest. The sensor automatically recognizes when it is attached to a patient and immediately begins monitoring the patient's position and activity.

Leaf Antennas

Leaf antennas can be plugged into any unused wall outlets. The antennas automatically self-assemble into a wireless mesh network, which is highly redundant to ensure data integrity. The patient sensors will automatically communicate with antennas that have the highest signal strength to optimize data transmission.

Leaf User Interface

Patient data can be viewed on desktop computers, tablets, or smartphones. The interface provides useful information at a glance, with patient turn priority and actionable items clearly displayed in a manner that avoids contributing to nuisance alarms and alarm fatigue.

References

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**Leaf Healthcare****About Leaf Healthcare, Inc.**

Leaf Healthcare creates wireless patient monitoring solutions for health care providers who are seeking more efficient and cost effective ways to improve patient safety and clinical outcomes.

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