Introduction

Pressure ulcers place a significant financial burden on our healthcare system. Each year over 1 million Americans will suffer from a hospital-acquired pressure ulcer and the annual cost of treating these ulcers is estimated to be as high as $9 billion. Despite a growing emphasis on prevention, pressure ulcers continue to be one of the most common preventable hospital-acquired conditions. Given the significant pressure insult that occurs during surgery, perioperative patients are considered to be at a particularly high risk for developing pressure ulcers. It is well established that frequent and regular patient turning is a key element to pressure ulcer prevention. However, compliance with prescribed patient turning protocols has been shown to be low, and as a result, pressure ulcer rates have remained high. Prior studies have shown that national compliance with turning protocols is only 66%.2

Methods

A disposable, wireless sensor (Leaf Healthcare, Pleasanton, CA) adheres to a patient’s upper torso. The sensor continuously monitors a patient’s orientation and communicates this data wirelessly to a mesh network of relay antennas. A user-interface displays each patient’s position history and current status and alerts staff if any patient requires a caregiver-assisted turn. The “restricted side” feature helps staff ensure offloading of specific body regions. An IRB-approved clinical study was conducted to test the efficacy of the monitoring system. Turning protocol compliance was objectively measured before and after implementation of the system. The monitoring system was successfully tested in a clinical environment (7,982 hours of data collection). 138 patients were divided into control and intervention groups. The q2h turning protocol compliance was 64% in the control group and 98% after implementing the monitoring system (p<0.01). The system also improved nursing efficiency by automatically documenting patient self-turns. 87% of nurses (41/47) felt that the system was helpful. Continuous position monitoring technology allows nurses to meet patient turning goals in an easier and more efficient manner. This technology allows providers to easily customize turning protocols for patients and helps ensure compliance with these individualized protocols. Furthermore, the system may be particularly useful in the perioperative setting, where pressure relief maneuvers are employed before and after surgery to help offset the pressure insult that occurs intraoperatively.

Results

The monitoring system was successfully tested in a clinical environment (7,982 hours of data collection). 138 patients were divided into control and intervention groups. The q2h turning protocol compliance was 64% in the control group and 98% after implementing the monitoring system (p<0.01). The system also improved nursing efficiency by automatically documenting patient self-turns. 87% of nurses (41/47) felt that the system was helpful.

Conclusions

Continuous position monitoring technology allows nurses to meet patient turning goals in an easier and more efficient manner. This technology allows providers to easily customize turning protocols for patients and helps ensure compliance with these individualized protocols. Furthermore, the system may be particularly useful in the perioperative setting, where pressure relief maneuvers are employed before and after surgery to help offset the pressure insult that occurs intraoperatively.

References

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