



## Delay Belt Device: A Fall Prevention System

### Summary

Injuries related to falls are a major source of morbidity and mortality and come with a significant financial burden to the health care system. This technology, a delay belt device (DBD) with electronic control features, provides a straightforward and complete solution to this problem. The DBD is an integrated electronic safety device that can be easily deployed using a conventional hospital bed. This device would allow a high level of control over the patient while maintaining patient autonomy and safety.

#### Key Investigator

Michael Makley

#### Field

Healthcare device

#### Technology

Device  
 Software

#### Advantages

Two-way communication between patient and nursing staff

Remote release

Can be used in conventional hospital bed systems

Increased patient safety

Emergency release option should broaden its use to include nursing home settings

#### Status

Available for licensing

#### Patent Status

US Patent 9,480,307

#### UMB Docket Reference

MM-2012-077

#### External Reference

Bergen et al. *CDC Morbidity and Mortality Weekly Report*. September 23, 2016.

CDC National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS).

### Market

Patient falls are a major problem in healthcare facilities. Patients can be confused after surgery, medical illness, dementia, or brain injury. These conditions often result in poor balance. Patients often try to get out of bed without requesting assistance because they are unaware of increased physical deficits or because they become impatient waiting for the medical staff response.

According to the American Hospital Association's registry of hospitals in the United States, there is a total of 5,724 registered hospitals with a total of 924,333 staffed beds. The aggregate estimated cost of falls in hospitals resulting in injuries is over \$100 million annually. Given the aging US population, the number of falls and the costs to treat the associated injuries is expected to increase.

The Deficit Reduction Act of 2005 authorized the Center for Medicare and Medicaid (CMS) to reduce payments for fall-related injury (FRI), and other hospital-acquired conditions (HAC). The Affordable Care Act of 2010 imposed further penalties on hospitals with high HAC rates. In 2015 hospitals with HAC rates in the top quartile nationally will have their Medicare payments reduced by 1%.

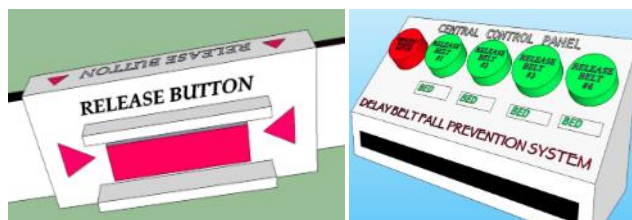
The Joint Commission [TJC], the primary hospital accreditation entity, directs that the least restrictive intervention be tried first to prevent falls in hospitalized patients at risk. The intent of this mandate is to maintain a patient's autonomy. More restrictive devices can only be employed after an adverse event like a fall or near fall. A patient must often have multiple adverse events before an adequate level of restraint is applied.

Elderly patients are a group that is at high risk for falls and nursing homes, and home care is potential markets. Nursing homes are not allowed to utilize any physical restraints as defined by TJC. The Joint Commission on Hospital Accreditation [TJC] defines a restraint as anything from which a patient cannot release at will.

The DBD device invented by Dr. Makley provides a unique solution to hospitals and nursing homes wishing to reduce patient falls and maintain patient autonomy.

### Technology

The DBD is a restraining system that balances the need for patient safety and autonomy. It also provides a mechanism for automatically releasing a patient in an emergency situation.



The patented device consists of an electronic locking belt that the patient can release by engaging a button. The patient's restraints will automatically release after a preset delay of 1-5 minutes. The device also consists of a remote, central panel that allows the hospital and nursing staff to receive notification that a patient is about to get up, provides for 2-way communication with the patient, and to release patients remotely. In the case of an emergency, the system would release all patient belts.