Non-Agitating Device for Patients Living With dementia

A Hackathon Challenge
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The Challenge

- "The patients often get up and walk at risk of falling and serious injury. We do not believe in restraining patients that are at high risk for falls due to the negative effects associated with restraint, e.g. muscle wasting, loss of freedom and dignity, risk of constipation, weight loss and quality of life".

- "The challenge is that there is no current product that can be secured to a chair or patient that does not agitate the patient. Could the group develop a chair alarm that does not alarm the patient but rather the care giver? What could be developed so that we could respond before the patient falls when they stand up from their wheelchair? Could this be an automatic locking device for the wheelchair when weight is lifted that then alerts to a device the care giver is wearing?".
Dementia

- A broad term applied to a group of signs and symptoms seen in a variety of diseases affecting the brain.
- Impacts roughly 62,000 British Columbians and is expected to rise to 87,000 by 2024 (MoH, 2014).
- This marks dementia as one of the biggest health challenges for B.C., elsewhere in Canada and around the world.
Behavioural and Psychological Symptoms of Dementia (BPSD)

**Behavioural symptoms**
- physical aggression
- loud vocalisation
- restlessness
- agitation
- wandering

**Psychological symptoms**
- anxiety
- depressive mood
- hallucinations
- Delusions

(Cohen-Mansfield, 2013)
Falls

- Falls can have a devastating impact on seniors and the effects can last a lifetime (Sherrington & Tiedemann, 2015).
- By taking certain measures, we can eliminate falls or mitigate the damage that can result from a fall.
- It is the responsibility of every single care provider to keep falls and injury prevention a focus of their care.
Falls and Related Injuries

- Falls are the leading cause of injury-related deaths and hospitalizations for seniors in BC.
- Between December 2012 and December 2013, 93% of hip fractures across Island Health were due to falls. This percentage increased to 95% for people 65 years and older (As cited in IH, 2014).
- The majority of incidents and events reported in the Island Health Patient Safety Learning System are related to falls.
Causes of Falls

Result from factors that contribute to a loss of balance:

- biological
- behavioural
- social/economic
- environmental factors
Royal Jubilee Hospital

Vancouver Island Health Authority Falls Report by Facility and Unit

01/05/2018 - 31/07/2018
Royal Jubilee Hospital
217 falls reported, 50 (23%) resulted in harm
86% of fall reports have Final Approval status

Falls by month

Percentage of falls by degree of harm
2 South West

2 South West - Geriatric Tertiary Mental Health
Royal Jubilee Hospital:

44 falls reported, 11 (25%) resulted in harm
100% of fall reports have Final Approval status
01/05/2018 - 31/07/2018

Falls by month

Percentage of falls by degree of harm
2 South East

2 South East - Geriatric Mental Health
Royal Jubilee Hospital:

35 falls reported, 9 (26%) resulted in harm
100% of fall reports have Final Approval status
01/05/2018 - 31/07/2018
What is Available

**Restraints**

- Restraints used to prevent patients from independently standing or walking do not prevent falls or injuries.
- Physical restraints often cause or worsen agitation, combative ness, and confusion and thereby increase the risk for falls.
What is Available

Chair Alarms
What is Available

**Automatic Braking System for Wheelchair**

- A detection system is installed under the seat
- Automatically locks the wheels as soon as the patient stands up
The Evidence

- Implementation of chair alarms were not cost efficient or effective in preventing inpatient falls (Sahota et al., 2014).
- Unlocked wheel chair is identified as a factor contributing to falls and fall injuries (Tsai et al., 2014).

**Thus**

There is a need for a device that alerts the caregiver, does not irritate the patient, and auto-locks the breaks on the wheel chair due to the forgetfulness of the patient.
Revisiting the Challenge

- To design a chair alarm that alerts caregivers, not the patient, to at-risk patients when attempting to get out of bed or chair in a timely manner.
- The device should not irritate patients, increase their agitation or anxiety, and thus, increases their risk of falling.
- The device should alert caregivers in a timely fashion, so they can respond before the patient falls when he or she stands up from their wheelchair.
- The device should consist of an alarm system along with an automatic locking device for the wheelchair when weight is lifted and, at the same time, alerts the caregiver.
References


