How Building Excellence in Sensor Technology Aims to Reduce Falls in Residential Aged Care.

Project Background

Falls in residential aged care are common in older people which, if not managed well, can lead to an increased risk of morbidity impacting on reduced quality of life, and premature death[1]. Previous studies identified the incidence of falls in Australian residential care was frequent, with nearly 60% of residents experiencing at least one fall and one in four residents requiring hospitalisation as a result of a fall[2]. Furthermore, the Royal Commission into Aged Care Quality and Safety and the Aged Care Quality and Safety Commission highlighted the need for effective systems and strategies to manage high impact clinical risks such as falls, including a better understanding of a person's risk of falling and greater efficacy in the implementation of falls monitoring and prevention strategies as an integral part of care planning and support[3,4].

Autonomous falls risk monitoring

The ability to autonomously monitor falls risks and activities associated with fall events, and to alert professionals, caregivers, and family members has the potential to facilitate timely support for residents. In this vein, a suite of sensors has successfully been trialed to provide in-home monitoring of activities of daily living for older people living in their own homes[5]. Similarly, sensors are being explored to passively detect falls events to better manage falls in residential aged care[6]. These systems, however, are traditionally reactive with alerts activated at the time of the fall or near the time of a predicted fall. Novel approaches to identify and manage fall risks earlier, are needed.

The Talius™ platform is a technology-based solution that collects data from a range of sensors in order to improve care and safety. This platform has the potential to monitor activities of residents that are associated with falls, learn activity patterns (e.g., frequency of bathroom visits, changes in sleep patterns and quality of sleep, distance to mobility aids, etc.) and facilitate the development of timely strategies to prevent falls.

Objectives

This study will explore the feasibility of using the Talius platform with a suite of ambient and wearable sensors to identify falls risks and promote fall prevention. We will also explore the enablers and barriers to adoption of this platform, in the context of falls prevention by residents and staff members.
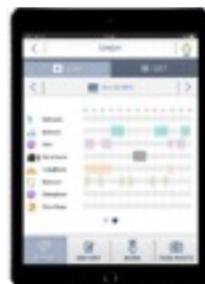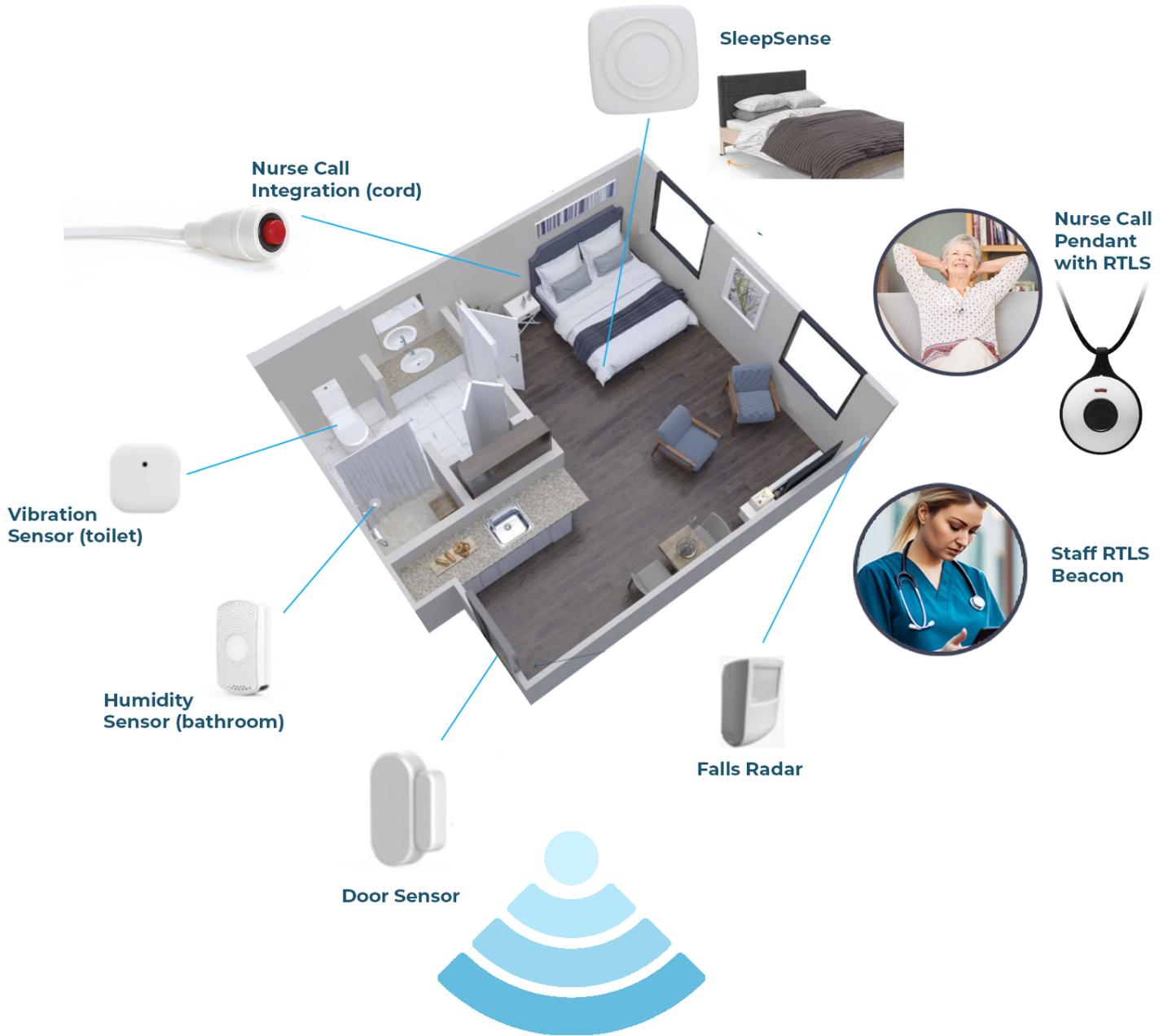
This is a collaborative project between Talius, CSIRO, Whiddon and Anchor Excellence and has received funding from the Aged Care Research and Industry Innovation Australia (ARIIA). This presentation will provide an overview of the study protocol and progress to date.

References:

1. J. E. Ibrahim et al., "Premature deaths of nursing home residents: An epidemiological analysis," Medical Journal of Australia, vol. 206, no. 10, pp. 442–447, Jun. 2017, doi: 10.5694/MJA16.00873.
2. N. Wabe et al., "Epidemiology of falls in 25 Australian residential aged care facilities: A retrospective longitudinal cohort study using routinely collected data," International Journal for Quality in Health Care, vol. 34, no. 3, Jul. 2022, doi: 10.1093/intqhc/mzac050.
3. Australian Government Aged Care Quality and Safety Commission, "Standard 3 Personal care and clinical care," 2019.
4. Australian Commission on Safety and Quality in Health Care., Preventing falls and harm from falls in older people : best practice guidelines for Australian residential aged care facilities. Australian Commission on Safety and Quality in Health Care, 2009.
5. Q. Zhang et al., "DACS: Smarter Safer Homes to Support Older People Living in Their Own Homes Through Enhanced Care Models," Sep. 2022. Accessed: May 15, 2023. [Online]. Available: https://publications.csiro.au/publications/publication/PIcsiro:EP2022-4933
6. N. Pannurat, S. Thiemjarus, and E. Nantajeewarawat, "Automatic fall monitoring: a review," Sensors (Basel), vol. 14, no. 7, pp. 12900–12936, Jul. 2014, doi: 10.3390/S140712900.

SleepSense

**Nurse Call
Integration (cord)**

**Nurse Call
Pendant
with RTLS**

**Vibration
Sensor (toilet)**

**Staff RTLS
Beacon**

**Humidity
Sensor (bathroom)**

Falls Radar

Door Sensor

**Real-time data is
visualised on dashboards
and sent to staff on the
floor using mobile
handsets.**