

## **Point Prevalence of Frailty and Cognitive Impairment Exceeds the Capacity of a Single Ward - Specialist Geriatric Wards to lead Best Practice**

D. O' Donnell, A. O' Mahony, M. Doyle, M. O' Gorman, A. O' Donoghue,  
A. O' Halloran, R. Mulcahy, G. Pope, J. Cooke

University Hospital Waterford.

### **Abstract**

#### **Background**

Our Hospital will soon open a Specialist Geriatric Ward with a focus on the provision of evidence-based care to cognitively impaired and frail older adults. Careful selection of patients who would most benefit from this care will be vital. As part of a multi component quality improvement project, we aimed to calculate the prevalence of frailty and cognitive impairment in our inpatient cohort to determine expected demand on this service and inform admission criteria.

#### **Methods**

All adult inpatients except those in the Emergency Department or on Obstetric, Paediatric, Critical Care and Psychiatric wards were screened for frailty using the Rockwood Clinical Frailty Scale (CFS) and for cognitive impairment by calculating 4AT score.

#### **Results**

233 patients were included. The point prevalence of frailty was 39.48 % (n=92) and of cognitive impairment was 24.46% (n=57). 18 % of patients were both frail and cognitively impaired (n=42).

#### **Conclusion**

Large numbers of patients would likely benefit from but may be unable to access a Specialist Geriatric Ward. Specialist Geriatric Wards therefore need to serve as exemplars of best practice so that evidence-based care can be disseminated within an institution.

## Background

Recent environmental and staffing audits of our Model 4 Hospital's 16 bed nominal "Geriatric ward" have indicated that it is sub-optimally suited to the provision of care for older adults. In its current guise, this ward does not have the infrastructural capability nor trained staffing levels to optimally meet the needs of complex older patients. This is not a problem unique to our hospital, with the recent National Dementia Audit revealing that dementia care relating to assessment, training, access to specialist services and discharge planning is sub-optimal, thereby increasing the risk of adverse patient outcomes and cost of acute care<sup>1</sup>.

The National Clinical Programme for Older People (2012) and the National Dementia strategy (2015) both outline the importance of optimising environmental conditions for older adults<sup>2,3</sup>. Such "Specialist Geriatric Wards" have been shown to be associated with greater patient and carer satisfaction, reduced readmission rates, more comprehensive assessment processes, documentation of resuscitation decisions, and increased rates of discharge to the patient's own home<sup>4</sup>. In the coming months, our institution plans to open a new purpose built "Specialist Geriatrics Ward" which will focus on the provision of evidence-based care to frail and cognitively impaired older adults.

Frailty has been defined as "a medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance, and reduced physiologic function that increases an individual's vulnerability for developing increased dependency and / or death"<sup>5</sup>. Frailty is independently predictive of falls, worsening health status, hospitalisation, institutionalisation, and mortality<sup>6</sup>. The prevalence of frailty in hospitalised elderly patients varies significantly in the literature with reported rates of almost 50%<sup>7,8</sup>. As frail patients have complex care needs and longer lengths of stay, they account for a significant proportion of hospital resources<sup>9</sup>. While frailty is associated with age, it is not an inevitable consequence of it and multiple interventions including exercise, nutritional assessments and medication reviews have been shown to reduce the risk of developing frailty<sup>10</sup>. Early identification of frailty and prompt intervention is therefore crucial in improving patient outcomes and reducing length of hospital stay.

Cognitive impairment in a hospital setting encompasses both acute delirium and established dementia. Both are commonly encountered across all healthcare settings, and associated with adverse outcomes including prolonged hospitalisation, deconditioning and increased mortality<sup>11</sup>. The heterogeneity of presentation of delirium and of potential precipitants commonly leads to diagnostic difficulties and therapeutic mismanagement. This frequently leads to the inappropriate use of antipsychotic medications with an associated increased risk of mortality, stroke, falls, sedation, and cognitive decline<sup>12</sup>. Similarly, extended stays and adverse events mean that hospital admissions are costly for people with dementia and are associated with poorer patient experiences and outcomes<sup>13</sup>.

Our aim was to establish the prevalence of frailty and cognitive impairment (encompassing both dementia and acute delirium) in our current inpatient cohort to determine the expected demand for specialist geriatric ward placement and inform admission criteria for the Specialist Geriatric Ward. This census was performed as part of a multicomponent quality improvement initiative.

## Methods

This study was carried out in a model 4 hospital with 431 inpatient and 85 day procedure beds, serving a catchment area of 500,000. As the study was performed as part of a multicomponent quality improvement initiative to guide service provision in our hospital, ethical approval was not required. All adult (aged sixteen or older) inpatients were deemed eligible for inclusion except for those in the Emergency Department or on Obstetric, Paediatric, Critical Care and Psychiatric wards. Patients were excluded from the study if they were actively dying, refused to participate, were absent from their bedside or were deemed to be critically unwell by the attending practitioner. In total eleven wards were reviewed by a team of six experienced geriatrics practitioners (four specialist registrars in geriatric medicine and two advanced nurse practitioners), who carried out patient assessments and chart reviews on all included patients over a one-week period in April 2019.

In addition to assessments for frailty and cognitive impairment, the following baseline characteristics were recorded: patient age, gender, and specialty of the ward where each patient resided. Patient identifying information was not retained. All eligible patients were screened for frailty using the Rockwood Clinical Frailty Scale (CFS). This well validated scale uses clinical descriptors and pictographs to provide clinicians with an easily applicable tool to stratify older adults according to level of vulnerability<sup>14</sup>. The attending practitioner assigned a score of one to eight to each patient (based on their pre-admission status), with a score of  $\geq 5$  indicating frailty.

The 4AT is a delirium detection tool that has been extensively validated in multiple studies<sup>15</sup>. Its intuitive design lends itself to rapid assessment in a clinical setting. To measure the point prevalence of cognitive impairment in our institution we calculated the 4 AT score on all adult inpatients. This involved a brief bedside assessment of alertness, attention, abbreviated mental test scores and fluctuating clinical course. A score of zero to four was assigned for each criterion with a cumulative score  $\geq 4$  suggesting the presence of cognitive impairment.

## Results

Baseline Characteristics	
Median Age (IQR) years	74 (16-99)
Male (%)	54.5 % ( n=127)
Medical Ward (%)	57.08 % (n=133)
Aged > 65 (%)	72.1 % ( n= 168)
Aged >80 ( %)	36.48% ( n=85)

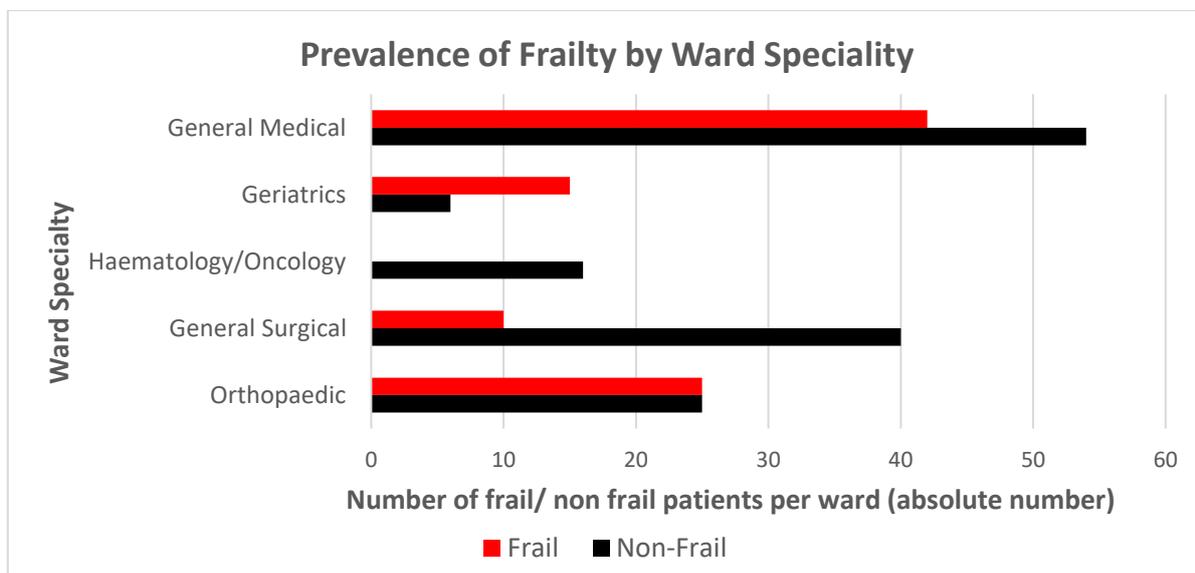
**Table 1. Baseline Characteristics.**

### Baseline Characteristics

253 patients were eligible for review. Twenty were excluded (11 deemed medically unsuitable for review by the attending geriatric practitioner, 4 refused assessment, 2 were not at their bedside at time of review, language barriers precluded formal cognitive assessment for 2 of the patients and one was discharged prior to review). In total 233 patients were included. The median age was 74 years (16-99). 54.5 % were male (n= 127). 133 patients resided on a medical ward (57.08 %) while 100 (42.92%) resided on surgical wards. 168 were aged 65 or older (72.1%) while 85 patients were over 80 (36.48%)

### Frailty

Point prevalence of hospital-wide pre-morbid frailty (CFS Score  $\geq 5$ ) was 39.48% (n = 92). Almost half (48.11%) of all female inpatients were frail (51/106) compared to 32.28 % of their male counterparts (41/127). The prevalence of frailty increased with age, with 51.78% (87/168) of patients over 65 and 71.76% (61/85) of patients over 80 classified as frail. The prevalence of frailty across all Medical wards was 42.85% (57/133) and in Surgical wards was 35% (35/100). Frailty was prevalent on almost all wards, but was highest on the geriatric ward (15/21).

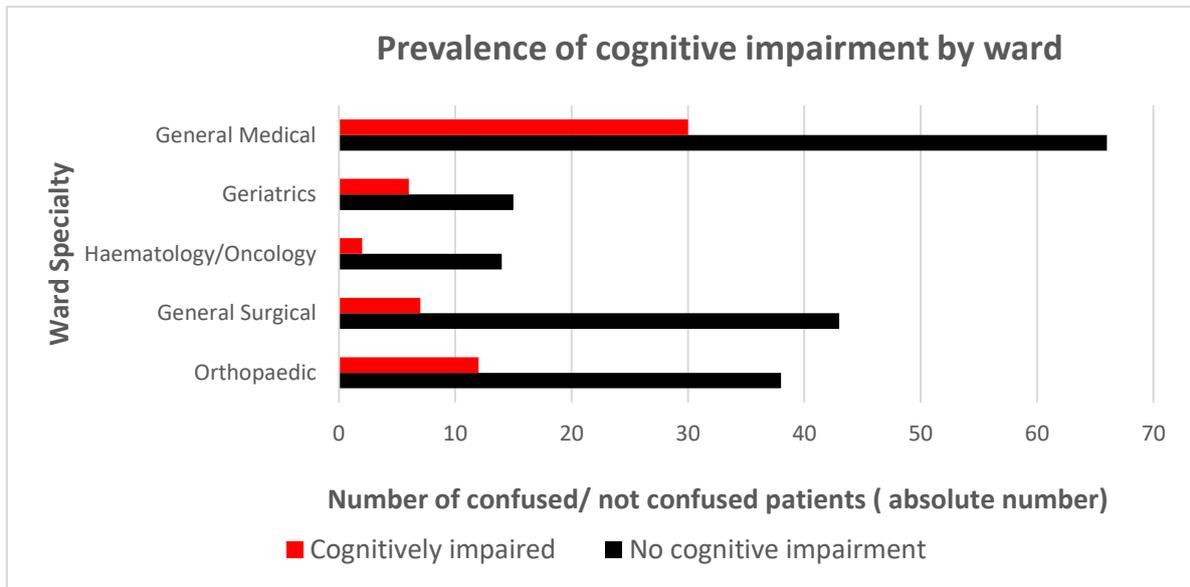


**Figure 1. Prevalence of frailty by ward speciality.**

### Cognitive Impairment

Point prevalence of hospital wide cognitive impairment (4AT score  $\geq 4$ ) was 24.46% (n = 57). Cognitive impairment was more prevalent among females 31.13% (33/106) versus males 18.89% (24/127). The prevalence of cognitive impairment also increased with age, with 32.74% (55/168) of patients over 65 cognitively impaired. 32/85 (37.65%) patients over 80 were cognitively impaired.

The prevalence of cognitive impairment was also higher on medical wards 28.57% (38 / 133) than on surgical wards 19 % (19/100). Cognitive impairment was more prevalent on general medical wards than on the geriatrics ward. 18% of patients (42/233) were both cognitively impaired and frail.



**Figure 2. Prevalence of cognitive impairment by ward speciality.**

	Frailty Prevalence	Prevalence of Cognitive Impairment
<b>Hospital wide</b>	39.48% ( n= 92)	24.46% (n=57)
<b>Female inpatient population</b>	48.11% ( n= 51)	31.13% ( n=33)
<b>Male inpatient population</b>	32.28% ( n=41)	18.9% ( n=24)
<b>All patients aged &gt; 65</b>	51.78% ( n= 87)	32.74% ( n= 55)
<b>All patients aged &gt; 80</b>	71.76% ( n= 61)	37.65% ( n= 32)
<b>Medical Wards</b>	42.86% (n=57)	28.57% ( n= 38)
<b>Surgical Wards</b>	35% ( n=35)	19% ( n=19)

**Table 2. Prevalence of frailty and cognitive impairment(subgroups).**

## Discussion

To our knowledge, this is the first published study to report the point prevalence of frailty in an acute Irish Hospital. Our Model 4 institution accepts acute medical and surgical admissions from both an urban and rural population, increasing the likelihood that our results will be reproducible in other hospitals. The high prevalence of frailty in our institution (39.1%) is in keeping with international data, with Richards et al describing an even higher prevalence of 48.8 % in a tertiary hospital in New Zealand<sup>8</sup>. While a central tenet of our Specialist Geriatric Ward will be the early recognition and timely provision of care bundles for frail patients, the prevalence outlined here greatly exceeds the expected capacity of our ward. The higher prevalence of frailty observed in females in our study is in keeping with the well-recognised male-female health survival paradox, a phenomenon whereby women survive longer into their frailty syndrome than their male counterparts<sup>16</sup>.

The high prevalence of frailty across a variety of specialty wards demonstrates that frailty is not a challenge unique to geriatric medicine, but a growing challenge for all specialties. While burgeoning sub-specialties such as ortho-geriatrics and geriatric- oncology have shown the benefit of specialist gerontology intervention in specific patient cohorts, the prevalence outlined here highlights the need for all specialties to be trained to recognise and manage frailty<sup>17</sup>. This phenomenon was highlighted by Tinetti, who discussed the need to disseminate gerontology principles to all non-gerontology health professionals, as ultimately this cohort will provide most of the routine care for older adults<sup>18</sup>. By upskilling non-gerontologists, a more age attuned workforce will become comfortable in the basic principles of caring for older patients, allowing Geriatricians to look after the most complex older patients. This will have the added benefit of enabling Geriatricians to act as knowledge leaders, provide clinical guidance, pursue research, and agree standards of care in this field<sup>18</sup>.

The overall prevalence of cognitive impairment in our institution (23.8%) was higher than that seen in previous studies, with a recent UK study reporting a prevalence of delirium of 14.7 %<sup>19</sup>. This can be explained by the fact that our study included both delirious and patients with dementia, not just those with acute delirium. The higher prevalence of cognitive impairment on general medical wards than the geriatrics ward highlights the need for all medical staff to be adequately trained in the recognition and management of cognitive impairment. The lower than expected prevalence of cognitive impairment seen in the geriatrics ward may reflect the increased awareness of delirium and its potential precipitants among medical and nursing staff on that ward. The risk of delirium can be reduced by regular orientation, a supportive environment, frequent medication review, and prompt treatment of acute medical issues, all of which would be provided on the proposed Specialist Geriatrics Ward. Previous studies have shown that patients with positive 4AT scores had longer lengths of stay and a higher 12-week mortality rate (16.1% and 9.2%, respectively)<sup>15</sup>. The complexity of care required for these patients is also reflected financially, with estimated 12-week costs of an inpatient stay for patients with delirium more than double the costs of an inpatient stay for patients without delirium<sup>15</sup>. These data highlight the need for dedicated specialist care, but once again the

prevalence of cognitive impairment in our study suggests that demand will far exceed the capacity of any single ward.

While the 4AT score has been well validated in diagnosing delirium / cognitive impairment it does not distinguish between the two. The lack of distinction between chronic cognitive impairment and acute confusion is a limitation of this study but in a clinical context, patients with either delirium or dementia require specialised care, best provided by those experienced in dealing with such complex patients. While this study does not differentiate between dementia and delirium, it highlights the high prevalence of cognitive impairment in acute hospitals and the number of patients likely to benefit from care bundles provided in Specialist Geriatrics Wards. The fact that patients excluded from the study included those who were critically unwell/ actively dying suggests that the prevalence of frailty and cognitive impairment may have been underestimated.

The number of people aged 65 and over in Ireland is projected to double between 2011 and 2031<sup>20</sup>. The higher prevalence of cognitive impairment and frailty seen in this sub-group has important implications for the future provision of healthcare in Ireland. While there is a growing body of evidence that suggests geriatric patients have superior outcomes when admitted to Specialist Geriatric Wards, it is not feasible for this number of frail and cognitively impaired patients to be cohorted in a single specialist area. While our study highlights a lesser number of patients who are both frail and cognitively impaired, the aetiology of their illnesses, complexity of their care needs, and potential reversibility of their presentation may differ greatly. It is therefore important that each hospital determine admission criteria to identify those at greatest need. We recommend a targeted approach involving comprehensive geriatric assessments of those identified as frail+/- cognitively impaired to identify potential interventions and agree treatment goals for admission to the ward. Clearly, given the prevalence outlined here, many patients likely to benefit from this care will be unable to access a Specialist Geriatric Ward. Specialist Geriatric Wards therefore must also serve as exemplars of best practice so that evidence-based care for this vulnerable cohort can be disseminated within an institution.

**Declaration of Conflicts of Interest:**

The authors have no conflicts of interest to declare

**Corresponding Author:**

Desmond O' Donnell

University Hospital Waterford.

E-Mail: 109322531@umail.ucc.ie

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