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Research Article

Integrated Care Framework (ICF): Sustainability, Robust and Enhanced Model

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Abstract

Purpose: To provide a structured and proactive integrated model of care that will create sustainable, robust and enhanced clinical interfaces between the acute services and Residential Care Facilities (RCFs). The Integrated Care Framework (ICF) is designed to enhance quality of care for RCF residents and reduce the requirement for transfer to a hospital's Emergency Department (ED). **Design and Methods:** Mixed methods are utilised to inform the development of the Framework. An evidence review relating to integrated care informed development and quantitative findings from a selection of RCFs, numbering 1,652 beds that are based on consideration of 5 criteria markers: **(1)** quality **(2)** number of RCF attendances to ED; **(3)** number of hospital admissions **(4)** type of hospital presentations, and **(5)** number of new RCF admissions from hospital. **Findings:** The Framework supported the resident to be managed within their care setting through development of enhanced quality care metrics and staff training, reduced the requirement for transfer to a hospital's Emergency Department and enabled successful transition from the hospital to the RCF. Compliance of 90% Target was reached in the majority of metrics measured by all four Hospital Hubs (January–August 2023). **Originality:** This is a robust operational control model for the maintenance and enhancement of resident safety and wellbeing. This is achieved through effective governance, accountability, communication, collaboration, assessment and management of RCF issues or specific resident needs.

Keywords: Integrated care framework; Residential care facilities; Quality care metrics.

Background

From November 2021 to July 2023, RCSI Hospital Group and 16 Residential Care Facilities (RCFs) established a Care and Support Framework, designed to support requirements to RCFs across key areas of endeavour, within the geographical catchment area pertaining to the RCSI Hospital Group. This resulted in 4 Residential Care Facility Hubs, namely Beaumont RCF Hub (4 RCFs / 568 beds), Cavan RCF Hub (4 RCFs / 245 beds), Connolly RCF Hub (4 RCFs / 445 beds) and Drogheda RCF Hub (4 RCFs / 394 beds). Anonymity is provided to participants by numbering of hospitals and RCFs.

It is recognised that residents in RCFs and nursing homes, over 75 years, are three times more likely to be admitted to hospital than people who live in their own homes and are of a similar age. It is expected that a Care and Support Framework will support residents to remain in their nursing home and minimise admissions to hospital or EDs [1-4]. Admission to EDs can be stressful and

even harmful [2]. An Irish study found that multiple hospital admissions do not improve older nursing home resident's survival [5]. Overall one third of the long-term facility residents admitted acutely to hospital die during their stay [1,6], and outcomes are worse for residents who survive transfer to ED or hospital than for residents treated at home [6]. Reducing resident admission to hospital should be the aim of long-term residences [7,8].

Design and Methods

Mixed methods were utilised to inform the ICF: An evidence review relating to integrated care and quantitative findings from a selection of RCFs, numbering 1,652 beds, and based on consideration of 5 criteria markers: (1) quality (2) number of RCF attendances to ED; (3) number of hospital admissions (4) type of hospital presentations, and (5) number of new RCF admissions from hospital.

Study aim and Purpose

This study provides an integrated model of care that will create sustainable robust and enhanced clinical interfaces between the acute services and RCFs and to develop a structured and proactive Care and Support Framework, that is designed to enhance quality of care for RCF residents. The overall aim of the framework is to support the resident to be managed within their care setting, and reduce the requirement for transfer to a hospital's ED as well as supporting successful transition of the resident from the acute setting to the RCF.

As part of the ICF, performance is measured and tracked using a comprehensive suite of metrics (total of 28). For the purpose of this paper, 12 metrics are showcased from this selection including fundamental nursing care and training compliance with key requirements and standards. The RCFs and RCSI Hospital Group (now named North-East Hospitals Region, Ireland) are providing this data for the purpose of quality assurance and improvement as part of the ICF A comprehensive overview of quality care metrics is included, as well as training compliance with key requirements and standards. The relevant hospital works in close collaboration with each of the selected RCFs and offers enhanced support across 4 key dimensions: Clinical Leadership; Quality Assurance and Control in regard to patient safety and Training and Upskilling of staff and staff provision**.**

Development of Integrated Care Framework

Clinical Leadership will increase access to onsite specialist advice, assessment and support, as well as intervention input. Clinical resources vary across the ICF. Prior to implementing the framework, some resources and outreach services were available in some hospital hubs. The ICF aims to standardise and provide clinical leadership from the hospital, led by the outreach ICF Director of Nursing and at a minimum provides input from Geriatrician, Advanced Nurse Practitioner, Nurse Specialists including Infection Prevention and Control, Tissue Viability, Falls Coordinator and deteriorating and sepsis lead.

Quality Assurance Metrics allows for measurement of care provided and are an indication of quality of fundamental nursing care. Quality care metrics enables quality improvement and accountability of care and are the key component of the ICF. The Quality Care Metrics were developed in collaboration with RCFs and incorporated national and international evidence based standards expected for delivering quality care. KPI set is identified as areas of good practice (90-100%), areas requiring some improvement (80-89%) and areas requiring immediate attention and action plans (0-79%) [9].

A number of existing RCFs are selected from geographical areas surrounding each hospital site within the RCSI HG. Selection includes both public and private RCFs. The rationale for selection is identified and the methodology for performance measurement in terms of numerator/denominator, frequency of data collection, and data sources are defined. KPI Target key performance indicator values to be achieved are stated and actual key performance indicators for each RCF is identified and presented. Willingness and consent for RCFs to engage in this change was sought and agreed as being critical for successful advancement.

Assessment Framework and related specific RCF metrics:

(1) Skin integrity

(2) Pressure ulcer assessment and management

(3) Nutrition and hydration

(4) Falls and risks assessment

(5) Continence assessment, promotion and management

(6) Infection prevention and control

Additional metrics collated include:

- Number of RCF attendances to ED
- Number of hospital admissions
- Type and themes of hospital presentation
- Number of hospital transfers to RCFs.

Findings and Discussion

Many benefits to integrated care are evident [10-12]. The British Geriatric Society (BGS) [3] in their enquiry on the quest for quality of healthcare support for older people in care homes call

for leadership, partnership and improvement in care delivery. The ICF Model provides and enhances effective governance, accountability, communication, collaboration and assessment in the management of RCF issues or specific patient needs. The ICF also recommends that certain hospital services, for example Diagnostics should be undertaken through scheduled structured referral rather than emergency transfers [13]. The ICF provides for a structured *"early warning trigger."*

A quality improvement project to introduce an early warning tool to managing deterioration in older adults in care homes is also recommended by Little *et al.* [14]. Multidisciplinary Team assessment and the creation of necessary resident pathway, dependency need requirements and a standard proactive provision across each of the control constructs, rather than reactive response to the many *"challenges"* exhibited within the RCFs during the pandemic are recommended [10,15,16].

Quality Care Metrics

Physical Assessment: Skin Integrity Assessment in RCFs on Admission / Transfer

Older skin is vulnerable to infection or wounding resulting from trauma, such as a knock or bump, or from sustained unrelieved pressure over bony prominences, shear and friction [17]. Acute illness, high temperatures consequent to fevers and moisture from diaphoresis and incontinence can add to the vulnerability of aging skin. Therefore it is vitally important for staff to know the condition of resident's skin and to monitor for skin changes. Quality improvement initiatives for pressure ulcer care in the nursing home setting are recommended and implemented. Following assessment, treatment goals are agreed with the resident and a time frame for their achievement set [18]. Pressure ulcers can cause pain and lead to serious infections [17] leading to possible hospital admissions. National summary guidelines for nursing and midwifery quality care metrics [20] include the essential criteria for measurement of data for recording of skin care integrity care plans.

Metrics undertaken included (1) a skin integrity assessment was completed using a validated tool, immediately before or on the resident's admission to the Residential Care Facility and (2) a care plan was documented, no later than 48 hours of admission or transfer (RCSI HG Hubs 2022) [21] The Target was 90% compliance of all new admissions and transfers. Performance demonstrated that all four Hospital Hubs and the RCSI Hub as a whole achieved the target set between January 2023 and August 2023. Prior to the full implementation of the ICF, baseline compliance for this metric was 67% (January 2022).

Completion of Skin Care Plan for all residents

Metrics based on total bed capacity, a minimum sample of 25% of residence/service user records randomly selected per month from each unit with a minimum of 5 data collections per month for each of these locations [20]. See % completion of skin care assessment care plan 2023 relating to RCSI RCF Hubs in Figure 1.

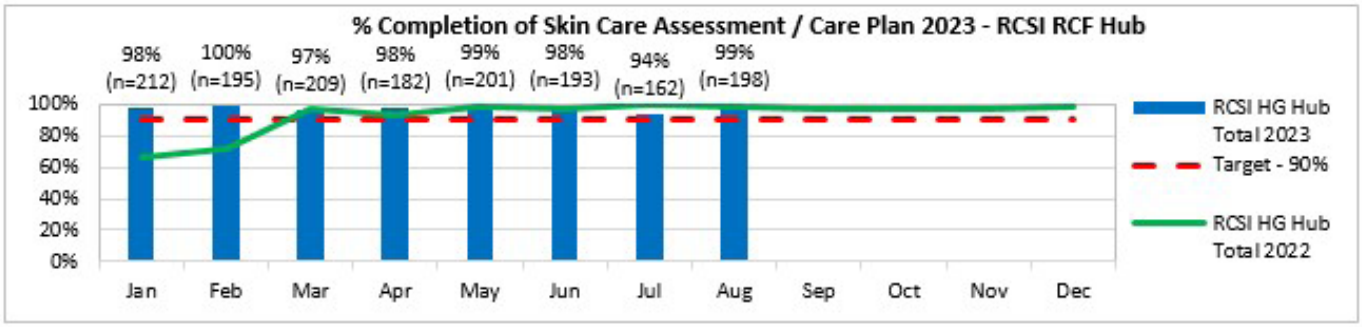

Figure 1: % Compliance with completion of Skin Care Assessment / Care Plan 2023 – RCSI RCF Hub.

Pressure Ulcer and Management: Development of newly acquired Grade 1-4 pressure ulcer (decubitus ulcer) within RCF

Pressure ulcers are injuries to skin and underlying tissue resulting from prolonged pressure on the skin and prevention is a marker of good care. The Metrics are based on the Number of Stage 1 & Stage 2 and Stage 3 & 4 pressure ulcers per month (newly acquired in RCF) per 10,000 RCF bed days. Local data from Residential Care Facility. findings demonstrate a 73% reduction in the number of grade 3 and 4 pressure ulcers in 2023 *vs* YTD 2022 (n = 15) in RCF Hospital Hub No 1. A 21% reduction was demonstrated in the number of grade 3 and 4 pressure ulcers in RCSI HG Hub total YTD 2023 (n = 19) *vs* YTD 2022 (n = 24). A 32% reduction in the number of Grade 1 and 2 pressure ulcers in RCF Hospital Hub No 1 YTD 2023 versus YTD 2022 (n = 62). A 30% reduction in the number of grade 1 and 2 pressure ulcers in RCSI HG Hub total YTD 2023 (n=111) *vs* YTD 2022 (n = 159) was demonstrated. See rate of Grade 3-4 Pressure Ulcers per 10,000 bed days used in [Figures 2 and 3].

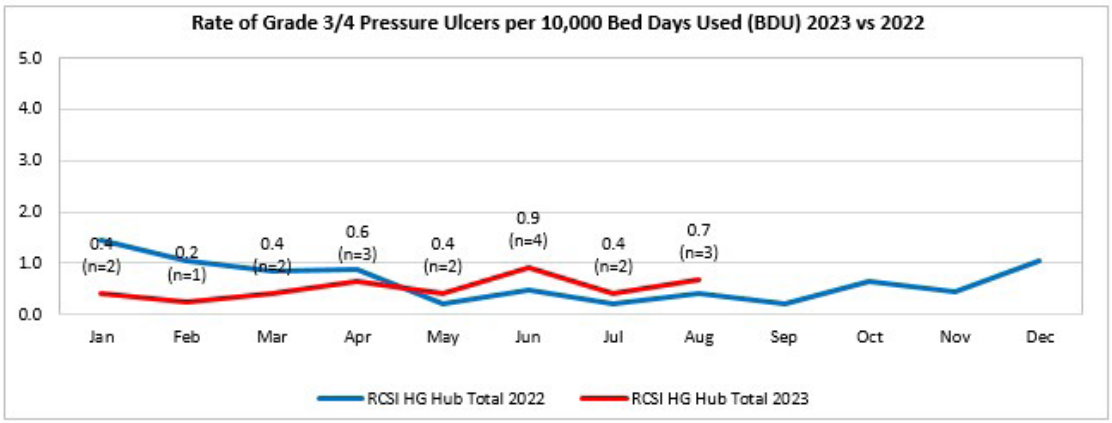

Figure 2: Pressure Ulcer and Management: Development of newly acquired Grade 3-4 pressure ulcer (decubitus ulcer) within RCF.

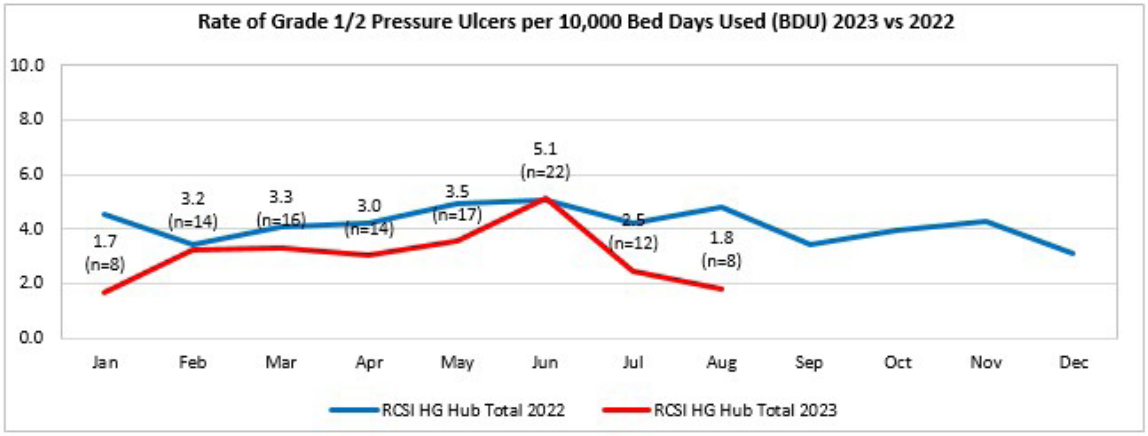

Figure 3: Pressure Ulcer and Management: Development of newly acquired Grade 1-2 pressure ulcer (decubitus ulcer) within RCF.

Nutrition and Hydration Assessment

Adequate food and hydration is fundamental to a person's health and wellbeing in the provision of safe quality care. Nutrition and hydration in the residential care setting is an important element in the provision of safe quality care [22,23]. Therefore, nutrition and hydration screening followed by an appropriate plan of care are seen as essential factors in recognising, managing and promoting improved nutritional and hydration status for residents. The Metric measures if (a) a nutrition and hydration assessment was completed using a validated tool, immediately before or on the resident's admission to the Residential Care Facility and (b) a care plan was documented no later than 48 hours of admission or transfer. RCSI Hospital Group Hubs as a collective achieved 90% target however, noncompliance was noted in July 2023. Prior to full implementation of ICF, compliance for this metric was 66% in January 2022 [21]. See RCSI HG Hub Total for Nutrition and Hydration assessments on admission to RCF in Figure 4.

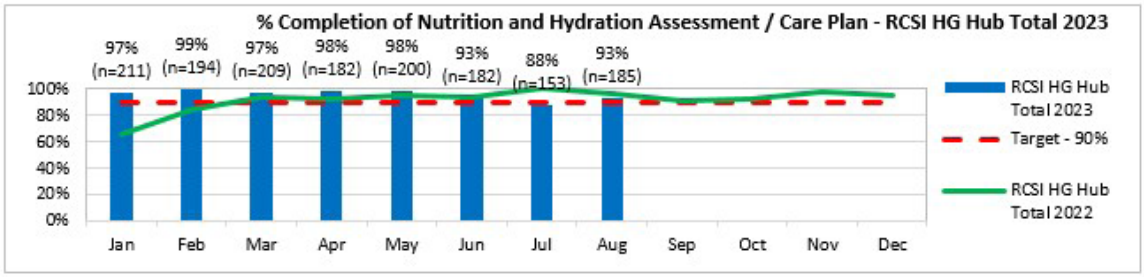

Figure 4: % Compliance with completion of Nutrition and Hydration Assessment / Care Plan – RCSI RCF Hub Total 2023

Falls Risk assessment on admission / transfer

Falls particularly in the elderly can lead to significant health decline, admission to hospital and mortality. As well as physical injuries suffered, the psychological and social consequences of falling can have a huge impact [24]. Consequently, prevention and injury management is a key priority in healthcare. All Residents are being assessed for falls risk screening and advance care planning interventions are in place in the RCF [8]. Other researchers recommend utilising quality improvements methods to enhance resident safety in long-term care [24,25].

The Metric measured if (a) a falls risk assessment was completed using a validated tool, immediately before or on the resident's admission to the RCF and (b) if a care plan was documented, no later than 48 hours of admission or transfer [21]. All Hospital Hubs achieved 90% compliance.

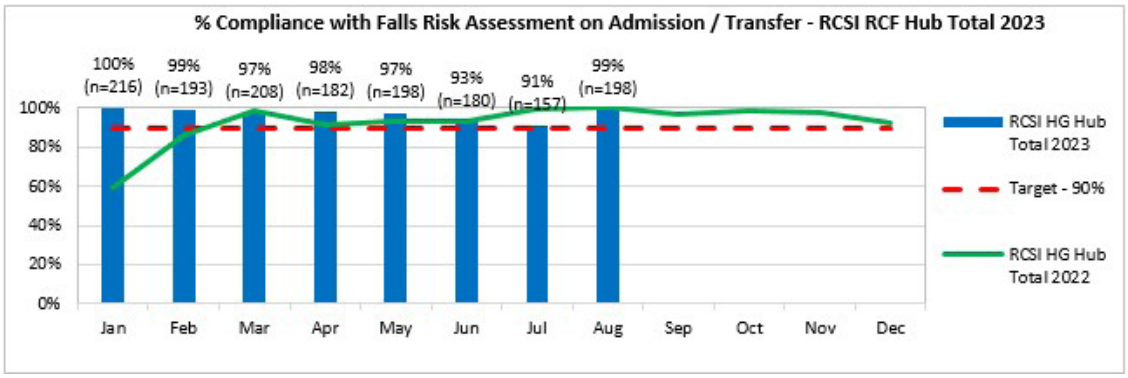

Figure 5: % Compliance with completion of Falls Risk assessment on admission / transfer RCSI HG Hub Total 2023

Figure 5 demonstrates the compliance with falls risk assessment on admission to the RCF, or when the resident returns to the RCF following a hospital transfer. Prior to full implementation of ICF, baseline compliance for this metric was 59% (January 2022).

Rate of Serious Falls per 10,000 Bed Days Used (BDU)

Reportable falls include any that result in serious injury to a resident that requires immediate medical and/ or hospital treatment. Metric measures the number of falls reported to HIQA within the reporting month [21].

Figure 6 demonstrates the rate of Serious Falls within the RCF. Based on the volume of RCF bed days used (BDU), the rate of measurement is per 10,000 BDU (DoH 2023**).** The rate of Serious Falls within the RCSI HG Hub Total demonstrates a 39% increase YTD 2023 (n =149) *vs* YTD 2022 (n = 107). Initiatives implemented by the ICF included onsite education training for nursing and HCAs and support to set up falls committee's (where not in place) to enhance governance and oversight. See Figure 6 for the rate of Serious Falls per 10,000 bed days used in RCSI HG Hubs Total in 2023. Review of all SRE falls is part of monthly discussions at Hub forums which allows for tracking, trending and shared learning.

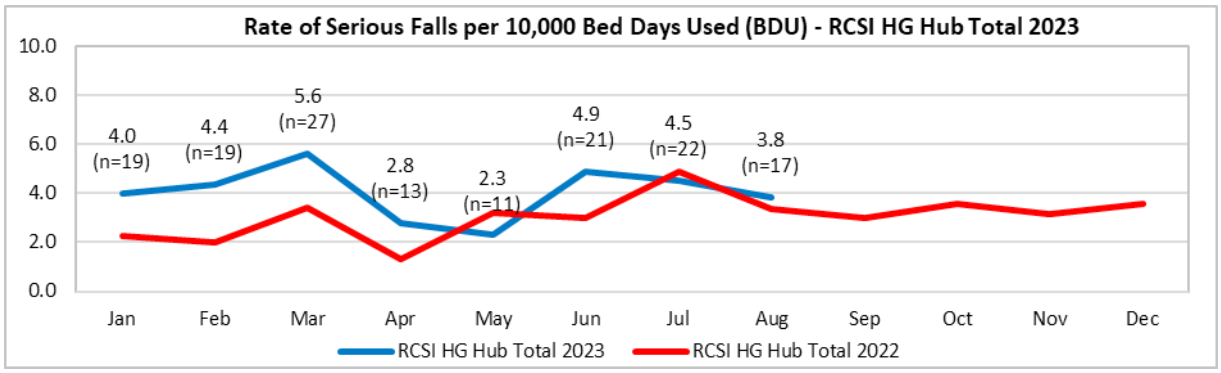

Figure 6: Rate of Serious Falls per 10,000 Bed Days Used (BDU) RCSI HG Hub Total 2023.

Continence Assessment

Continence assessment, promotion and management can significantly reduce the risks associated with incontinence, prevent hospital admission and protect the dignity of the resident. The metric measures if (a) a continence assessment was completed using a validated tool, immediately before or on the resident's admission to the Residential Care Facility and (b) a care plan was documented no later than 48 hours of admission or transfer (RCSI HG Hubs 2022, [21] Department of Health 2013). RCSI Total Hubs were compliant with the target of 90%. Prior to full implementation of ICF, baseline data for this metric was 54% (January 2022).

See Figure 7 for % completion of Continence Assessment /Care Plan in RCSI HG Hub Total in 2023.

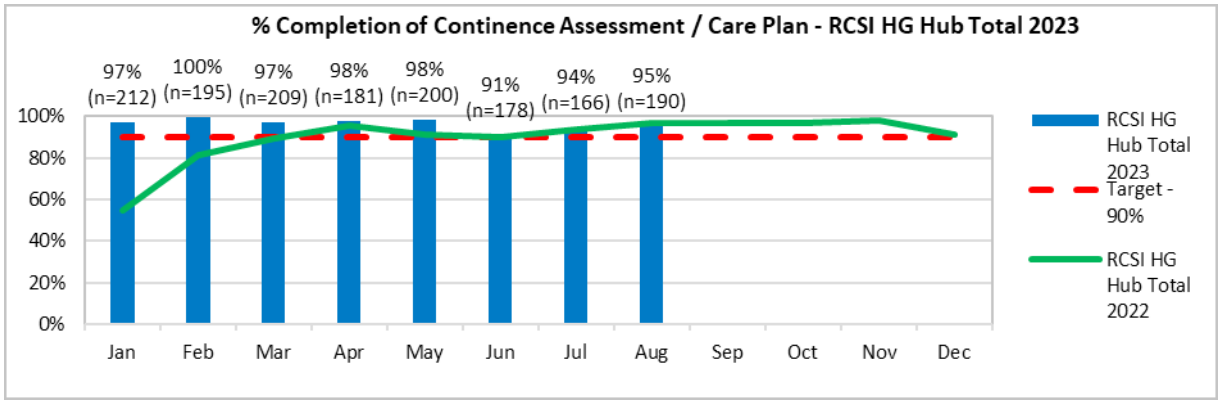

Figure 7: % completion of Continence Assessment /Care Plan in RCSI HG Hub Total in 2023.

New Patient Discharges from Hospital to Residential Care Facility

Metric measures the volume of residents discharged from hospital to a residential care facility as a new resident. Local data sets are extrapolated for analysis and publication. Sláintecare has identified a requirement to shift the balance of care from hospitals to primary and community care so as to deliver timely access to health and social care (Department of Health 2021). Through the support provided by the ICF to participating RCF's, RCSI HG are progressing measures to enable timely discharges of residents to a RCF. This reduces lengthy inpatient stays in hospital, and helps reduce delayed transfers of care (DTOC). The ICF has nurtured a collaborative working relationship between participating RCFs and the Hospitals, resulting in a more seamless transfer of residents and an increased offering of bed capacity. In 2023 discharges to RCFs from RCSI HG was 618 versus 195 in 2022, thus resulting in an increase in hospital bed capacity of 423 Figure 8.

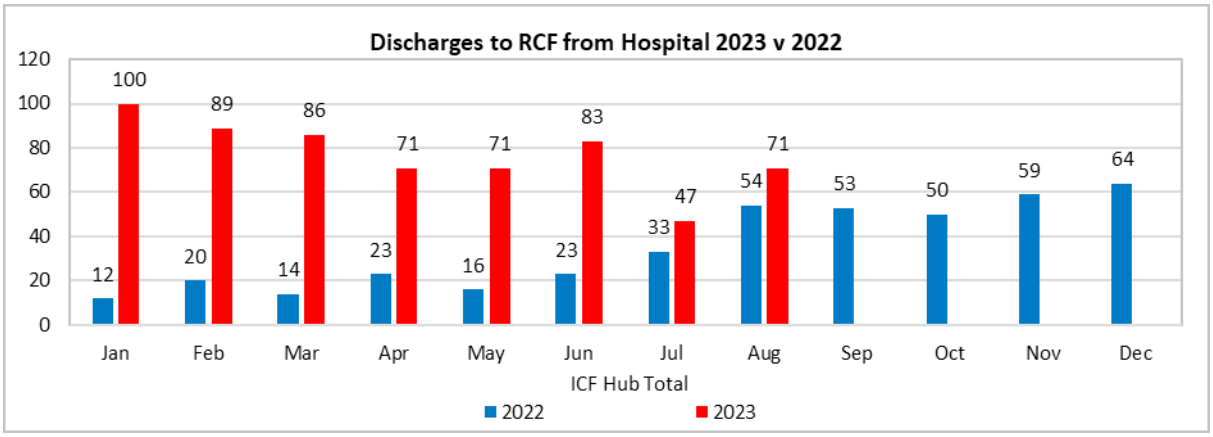

Figure 8: Discharges to RCF from Hospital 2023 v 2022.

RCF Presentations to ED 2023 v 2022

The Outreach Teams provide enhanced clinical support within the RCF, avoiding unnecessary transfer to a hospital ED. The metric measures the number of resident presentations to ED. Results demonstrate 16% (n=87) more presentations in 2023 compared to 2022 across the RCSI HG Hub Figure 9.

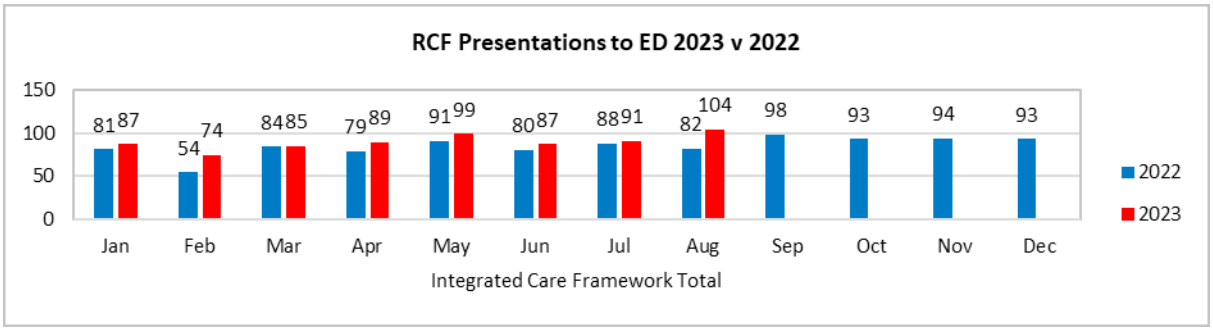

Figure 9: Presentations to Emergency Department from RCF RCSI HG Hub Total.

RCF Admissions to Hospital 2023 v 2022

The metric measures the number of hospital admissions from RCFs between the first and last day of the month. Results demonstrate a 6% (n = 27) increase YTD 2023 *vs* YTD 2022 in hospital admissions from RCFs. The Framework has doubled the number of residents discharged from hospital to an RCF in 2023 (n = 195) *vs* 2022 (n = 618), demonstrating the framework successfully managing residents in their home Figure 10.

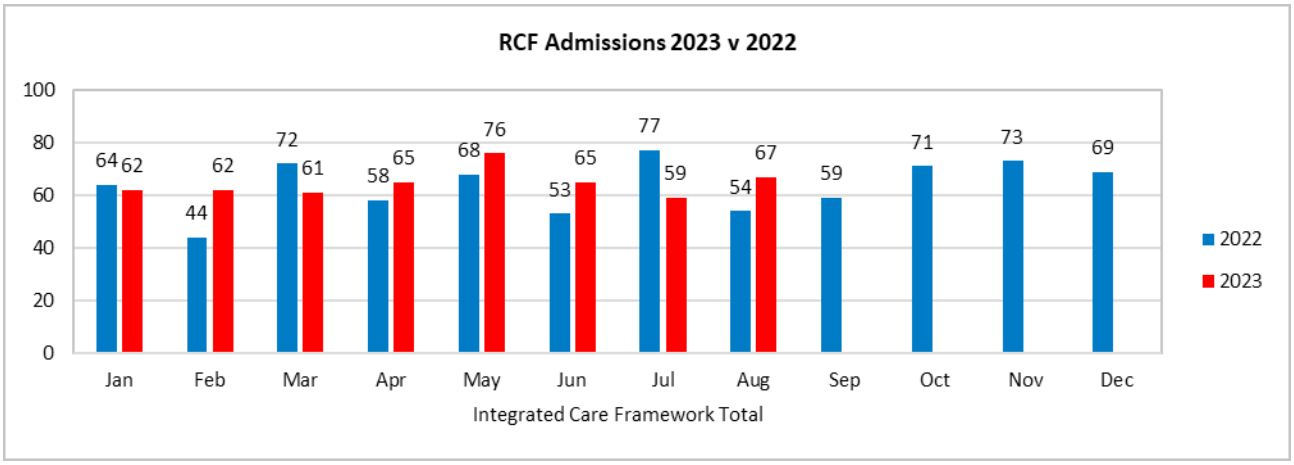

Figure 10: RCF Admissions to Hospital 2023 v 2022.

Diagnosis of residents on admission to hospital

Data was extracted from HIPE (Hospital In-Patient Enquiry) and categorised using, International Statistical Classification of Diseases and Related Health Problems (ICD-10) [26]. Outreach teams are utilised. The Outreach Teams reduce inappropriate emergency admissions from RCFs to Hospital EDs; ensure residents discharged from Hospital to RCF receive appropriate safe care and ensure care is delivered in the home [27]. The main diagnosis of residents on admissions from hospital was Diseases of the respiratory system which accounts for 29.5% of total admissions to hospital from RCFs and this was a similar finding for each RCF Hub: Diseases of the respiratory system include: unspecified acute lower respiratory infection, pneumonia, pneumonitis due to food and vomit and COPD. See Table 1 for YTD 2023.

Clinical Conditions	RCF Hub 1	RCF Hub 2	RCF Hub 3	RCF Hub 4	Grand Total
Diseases of the respiratory system	52	25	34	28	139
Injury*, poisoning and certain other consequences of external causes	24	7	20	23	74
Diseases of the genitourinary system	26	14	7	19	66
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	12	12	9	12	45
Diseases of the circulatory system	8	7	8	10	33
Diseases of the digestive system	12	2	7	5	26
Certain Infectious and parasitic diseases	14	5	2	4	25
Endocrine, nutritional and metabolic diseases	6	3	1	7	17
Diseases of the skin and subcutaneous tissue	5	4	5		14
Mental and behavioural disorders	2	1	3	4	10
Diseases of the blood and blood-forming organs and certain disorders involving the immune system	2	1		5	8
Diseases of the nervous system	1	1	2	4	8
Neoplasms	1	1	1		3

Diseases of the musculoskeletal system and connective tissue		1		1	2
Diseases of the eye and adnexa	1				1
Grand Total	**166**	**84**	**99**	**122**	**471**

Table 1: Diagnosis on Admission to Hospital - YTD 2023**;** *Note: 95% of injuries sustained are fall related.

Infection Prevention and Control (IPC) Metrics

As part of IPC measures ongoing monitoring of vaccination (flu and Covid) uptake for staff and residents are monitored as well as IPC outbreaks. RCSI HG Hub Total Hand Hygiene Audit Metrics measure the proportion of healthcare workers who comply with hand hygiene protocols. IPC CNS provide targeted education and training as well as audit support. Improving hand hygiene compliance has been described by WHO [28] as a key measure to reduce healthcare associated infection. Overall RCSI HG Hub achieved 94% compliance in August 2023. Since March of 2023 the Target set of ≥ 90% was achieved. Prior to full implementation of ICF, baseline data for this metric was 81% (January 2022) Figure 11.

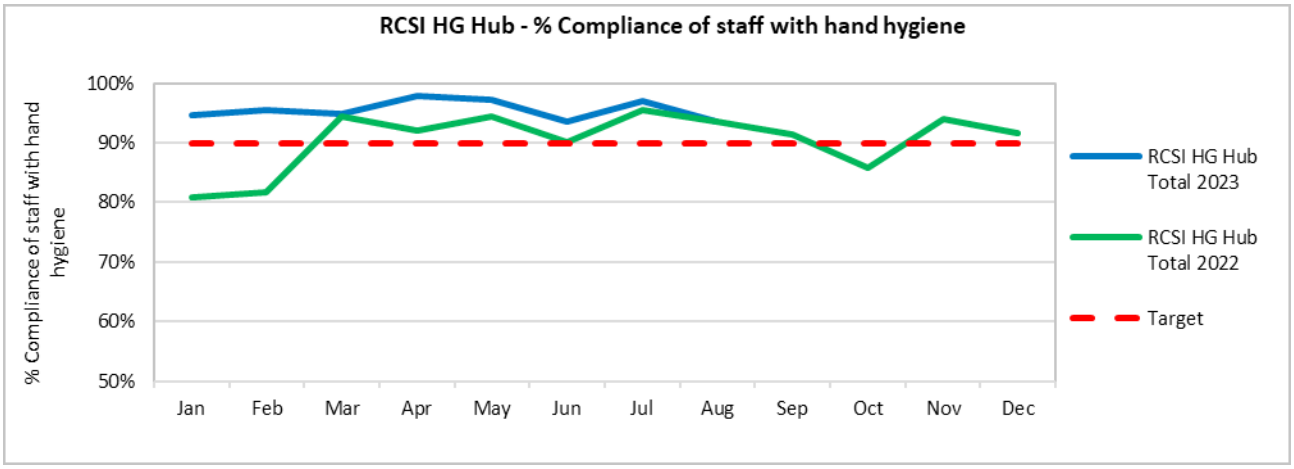

Figure 11: % Compliance of staff with Hand Hygiene RCSI HG Hub Total.

Infection prevention and control training

Hand Hygiene Training and Standard Precautions Training forms part of the minimum practices that apply to all resident care, regardless of suspected or confirmed infection status of the resident, in any setting where health care is delivered. These practices are designed to both protect healthcare workers and prevent healthcare workers from spreading infections among residents. Hand hygiene training was measured by Monthly Headcount. Overwhelming majority achieved >90% compliance (two occasions fell below compliance). See Table 2 for hand hygiene training completed in the four RCF Hubs (January-August 2023).

	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**
RCF Hub 1	96%	96%	96%	96%	98%	98%	85%	98%
RCF Hub 2	100%	100%	100%	100%	100%	100%	100%	100%
RCF Hub 3	98%	99%	100%	98%	100%	100%	100%	100%
RCF Hub 4	92%	93%	98%	99%	98%	97%	71%	97%

Table 2: Hand Hygiene Training Compliance 2023.

RCF Implications for practice

This is a robust operational control model for the maintenance and enhancement of resident safety and wellbeing in RCFs that is achieved through effective governance, accountability, communication, collaboration and assessment. Enhanced outreach teams provide care at the home setting and through the utilisation of appropriate performance metrics, monitors compliance of quality care metrics, supported with training to achieve same. HIQA [16] acknowledges enhanced professional clinical and care governance arrangements support quality of care being provided in RCFs. However to be noted, the ICF and service provision does not replace the role of the provider as outlined by HIQA; role of HIQA; RCF GP and Public Health or Community Support Teams, but aims to enhance [29-32].

Conclusion

The Integrated Care Framework supports the resident to be managed within the home care setting by providing an enhanced outreach model of care delivery. Quality Care Metrics data provides an overarching framework for managing quality care delivery and allows for continuous quality improvement. By Providing expert hospital staff allows for non-compliance and areas of focus to be supported through bespoke education and training programmes. The framework has demonstrated that when collaborative relationships are developed, resident transfers are managed seamlessly and continuity of care provision enhanced, as well as supporting successful transition of the resident from the acute setting to the RCF. The framework identified why residents present to ED. This has enhanced the development of patient care pathway thus avoiding transfer to ED, streamlining urgent transfers to ED and providing for the provision of certain hospital services, through a scheduled structured referral pathway, rather than emergency transfer. The Framework has doubled the number of residents discharged from hospital to an RCF in 2023 vs 2022, reducing the delayed transfer of care for residents, and unnecessary bed occupancy in hospital. The Framework also notes an increase in the number of residents being admitted to hospital from a RCF, however this increase is minimal at just 6% compared to the discharges.

Key Recommendations

- All RCFs should have access to an Integrated Care Framework to support resident care pathways
- Quality Care Metrics should be implemented in RCF's so that continuous improvements can be monitored and benchmarked
- Transitions from Hospital to RCF should be seamless and supported by outreach services to reduce re-admissions
- Staff training and development should be made available to RCF staff to support and maintain care delivery at the closest point of contact
- Ongoing focus relating to falls risk and management is required for continuous quality improvement.

Implications for practice

This is a robust operational control model for the maintenance and enhancement of resident safety and wellbeing in RCF's that is achieved through effective governance, accountability, communication, consultation and assessment. The ICF minimises urgent transfers to acute hospital units through the development and ultilisation of appropriate performance metrics.

Limitations to Study

The ICF was developed during challenging Covid -19 transmission. Metrics were found to be consistent and robust over time. Data analysis is continuing, using the ICF, to establish if current conditions may produce different results, during non-Covid times. Further research is recommended to establish if resident transfers to ED are reduced by use of the framework.

Ethics

Ethical guidelines were adhered to during all aspects of the framework development. Willingness and consent for RCF's to engage to this change was agreed by participants. Anonymity is ensured as results do not indicate individual responses but are combined.

Conflict of Interest

None reported

Funding

None required

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