


Key Service Improvements After the Introduction of an Integrated Orthogeriatric Service

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Abstract

Introduction: Models of orthogeriatric care have been shown to improve functional outcomes for patients after hip fractures and can improve compliance with best practice guidelines for hip fracture care. **Methods:** We evaluated improvements to key performance indicators in hip fracture care after implementation of a formal orthogeriatric service. Compliance with Irish Hip Fracture standards of care was reviewed, and additional outcomes such as length of stay, access to rehabilitation, and discharge destination were evaluated. **Results:** Improvements were observed in all of the hip fracture standards of care. Mean length of stay decreased from 19 to 15.5 days (mean difference 3.5 days; $P < .05$). A higher proportion of patients were admitted to rehabilitation (16.7% vs 7.9%, $P < .05$), and this happened in a timelier fashion (17.8 vs 24.8 days, $P < .05$). We found that less patients required convalescence post-hip fracture. **Discussion:** A standardized approach to integrated post-hip fracture care with orthogeriatrics has improved standards of care for patients. **Conclusion:** Introduction of orthogeriatric services has resulted in meaningful improvements in clinical outcomes for older people with hip fractures.

Keywords

orthogeriatric care, integrated care, rehabilitation, trauma surgery, systems of care, fragility fractures, hip fractures

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Background

Hip fractures are a major contributor to morbidity and mortality in older people and can have a devastating impact on their quality of life. The mortality rate of hip fracture for older people is high with up to 30% at 12 months.¹ A quarter of patients who were living independently before a fall leading to a hip fracture require admission to a nursing home after a hip fracture.²

Older patients after hip fracture benefit from comprehensive geriatric assessment and input from orthogeriatrics as well as the wider multidisciplinary team (MDT). Specialist orthogeriatric care has been shown to reduce the risk of perioperative complications, functional deterioration, and mortality rates.³ Early models of orthogeriatric care have existed since the mid-20th century, however, it is only in recent times that widespread integration of such models has occurred.⁴ This model of care has had a very positive effect on outcomes for older patients with hip fracture including a reduction in in-hospital complications,⁵ length of stay (LOS),⁶ functional disability, and in-hospital mortality.⁷

The Irish Hip fracture database (IHFD) was launched in 2012 as a statutory audit tool to help improve hip fracture care in Ireland and has been used to benchmark quality indicators. Early orthogeriatric involvement in patients' care is an expected standard of care⁴ and is part of the Irish Hip Fracture standards of care (IHFS). When all IHFS have been achieved for a patient with hip fracture, the hospital is reimbursed through a best practice tariff.⁸ International comparisons of the Irish Hip Fracture pathway with the United Kingdom and Germany has demonstrated that that Irish system has longer

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average LOSs and low rates of orthogeriatric input.⁹ We sought to evaluate the outcomes in our center after the implementation of a dedicated Orthogeriatric service.

We wanted to evaluate the levels of compliance to IHFS standards in a tertiary referral hospital which treats approximately 300 hip fractures annually and compare outcomes for patients before and after the introduction of a dedicated orthogeriatric service. We hypothesized that improved continuity of care by regular orthogeriatric review would result in an improvement in a number of markers of care. We examined key performance indicators (KPIs) such as rehabilitation admission rate, rehabilitation LOS, and proportion of patients discharged directly home. These KPIs are surrogates of good quality care and to our knowledge have not been examined in detail in previous studies. We looked at the number of inpatient consults sent for each time period and compared the number of general medical consults sought by the orthopedic team for a similar time period before the service, with the hypothesis that more integrated care would result in less general medical consults to other medical specialities.

The New Orthogeriatric Service

The new orthogeriatric service consisted of several changes to the logistical and clinical elements of the hip fracture pathway. Prior to establishment of the new orthogeriatric service, patients with hip fractures were admitted to the trauma ward under the sole care of the primary orthopedic surgeon. There was no formal orthogeriatric review service, and patients were referred to geriatric medicine on an ad hoc basis, at the discretion of the orthopedic team, often when complications were encountered.

The new service is led by a consultant orthogeriatric physician, who is supported by a full-time registrar in geriatrics. All new patients with a hip fracture receive a comprehensive geriatric assessment on admission. There is a constant geriatric medicine presence on the ward and the registrar plays a key role in liaising with the orthopedic team in addition to biweekly consultant ward rounds and MDT meetings. This presence allows early detection of postoperative complications and streamlines the process for patients to access off-site rehabilitation, nursing home placement, and timely discharges with appropriate supports.

Methods

A prospectively maintained database was reviewed. Patients presenting with a hip fracture between 2 specific time periods were included and compared. These periods were August 2018 to February 2019 (after introduction of the orthogeriatric service), and August 2017 to February 2018 (before introduction of the Orthogeriatric service). The same time frame was included over both years to account for seasonal variances; 285 patients with hip fracture were identified during a 12-month period. All patients had their data inputted

Table 1. Irish Hip Fracture Standards.

IHFS1	Percentage of patients admitted to an orthopedic ward within 4 hours of first presentation or directly to the theatre from the ED within 4 hours
IHFS2	Percentage of patients receiving surgery within 48 hours of first presentation (and within normal working hours)
IHFS3	Percentage of patients developing a pressure ulcer following admission
IHFS4	Percentage of patients reviewed by a geriatrician at any point during admission
IHFS5	Percentage of patients receiving a bone health assessment
IHFS6	Percentage of patients receiving a specialist falls assessment

Abbreviations: ED, emergency department; IHFS, Irish Hip Fracture standards of care.

into the national hip fracture database and IHFS were recorded (Table 1).

All data were prospectively entered to the IHFD by a dedicated orthopedic trauma nurse. All patients also had their data authenticated by the geriatric team, with case ascertainment having demonstrated to improve the reliability fidelity of the data collection in previous studies examining IHFD patients.¹⁰ Variables of interest collected included patient demographics, fracture type, orthopedic LOS, discharge destination, rehabilitation assessment, rehabilitation admissions, rehabilitation LOS, and new nursing home admissions. We compared the proportion discharged directly home instead of to convalescence.

Statistical analysis was conducted using SPSS. The chi-square test of homogeneity of 2 proportions was used to determine whether there was a statistical difference. A *P* value of <.05 was taken to be significant. The age-groups and gender were compared using the above method to determine whether there was a statistical difference between the groups.

Results

Similar numbers of patients with hip fracture were seen in each time period (*n* = 146 vs *n* = 139) with similar age profiles (81.8 vs 79.6 years). Mean LOS on the orthopedic ward decreased from 19 to 15.5 days (mean difference 3.5 days; *P* < .05).

Adherence to IHFS

Improvements were seen in all of the 6 IHFS. Higher proportions of patients reviewed after the orthogeriatric service commenced achieved standard 4, 5, and 6 (Table 2). The most significant improvements were an increase from 31.2% to 96.5% in the proportion of patients seen by a geriatrician, and an increase from 7.4% to 98.5% in those who had a formal falls assessment.

Less patients required medical team consults after the service began (32.2% vs 46.8%, *P* = .016). The resultant total number of consults sent over the 6-month period fell from 120 consults to 59 consults.

Table 2. Comparison of Irish Hip Fracture Standards.^a

	Pre-Orthogeriatrics %	Post-Orthogeriatrics %	χ^2	P Value
IHFS 1	2.9	7	0.7051	.401
IHFS 2	50.4	59.4	2.45	.117
IHFS 3	1.5	0.8	0.38	.533
IHSF 4	31.2	96.5	134.1	<.0001
IHSF 5	90.4	97.7	8.159	.0042
IHSF 6	7.4	98.5	239.7	<.0001

Abbreviation: IHFS, Irish Hip Fracture standards of care.

^aSee Table 1 for explanation of IHFS.

Rehabilitation Admissions

We examined the proportion of patients who were admitted for rehabilitation to a dedicated rehabilitation site. A higher proportion of patients were admitted to rehabilitation after implementation of the service (16.7% vs 7.9%, $P = .033$), and this happened in a timelier fashion (17.8 vs 24.8 days). For those patients who had rehabilitation, their LOS on the unit was also shorter (34.1 vs 46.8 days). We combined total LOS on the orthopedic ward and the rehabilitation LOS and found that after the service was implemented, patients who went to rehabilitation had an average shorter total LOS of 19.7 days. This was a statistically significant difference ($P = .029$).

Discharge Destination

We examined discharge destination after hip fracture admission. Discharge destination was established for all patients discharged directly from the orthopedic ward and also from the rehabilitation ward. For this analysis, we excluded patients who died during their acute hospitalization or those already living in a nursing home (NH). We found that less patients went to convalescence ($n=16$ in total); and although not statistically significant, there was a trend toward an increased proportion of patients discharged directly home (from 32.7% to 43.6%, $P = .09$). There were also less new nursing home admissions (6.8% vs 8.4%), although this was not statistically significant ($P = .65$).

Discussion

The introduction of an orthogeriatric service has substantially improved the quality of care for older people with hip fracture as well as compliance with IHFS in this tertiary referral hospital. This initiative strongly provides evidence that this combined MDT approach achieves this goal. The LOS was examined as a primary outcome, with secondary end points including discharge directly home and new NH admissions. Our reduction in LOS is on par with international results after implementation of dedicated orthogeriatric programs.¹¹ The improvements demonstrated on discharge destination and numbers getting to rehabilitation as well as shorter rehabilitation stays show the value of the orthogeriatric model of care most

importantly from a patient perspective but also from an organizational perspective. The deficits in service had been highlighted in the 2016 IHFD report and we can see in this study how benchmarking from national data sets identified the need to improve local outcomes and this led to improvements in local practice.

A number of reports have emerged from the NHS with respect to “getting it right the first time” and this core philosophy is embodied in the improved provision of care to this vulnerable cohort.¹² In our study, we have seen how introduction of dedicated Orthogeriatric services has improved care for older people with hip fractures and has resulted in positive improvements to KPIs, resulting in meaningful improvements in clinical outcomes for patients in a cost-effective manner. Improvements in quality indicators such as mortality and LOS have obvious clinical, financial, and service benefits. These have been recommended as objective pillars in evaluating hip fracture care.¹³ We noted that there was a reduction in the number of medical consults requested by orthopedic teams and feel that this reflects the improved quality and continuity of care for these patients.

Our Orthogeriatric model was based on the model of an Orthopedic ward with integrated geriatric care. This is a model that has been shown to have the lowest inhospital mortality and lowest LOS in comparison to other models of care.¹⁴ An unexpected benefit of this was an increased proportion of patients admitted to dedicated rehabilitation. The patients participating in rehabilitation were the most medically complex cohort with ongoing rehabilitation and medical needs and we noted that the LOS in rehabilitation decreased, which is consistent with other research in patients with hip fracture.¹⁵ All patients who went to rehabilitation ultimately were discharged to home, and these results highlight the crucial role of orthogeriatrics in providing rehabilitation and guiding discharge planning.¹⁶

Supporting a return to independent living is an important part of the orthogeriatric care pathway. The successful execution of a discharge directly home avoids the costly alternative of institutional care and is more importantly favored by older people themselves.¹⁷ We found a trend toward less nursing home admissions which has also been previously seen with the orthogeriatric model of care when predictors of institutionalization post-hip fracture have been examined.¹⁸ We found that less patients had a post-acute respite stay, which is another significant end point for patients. Respite stays are used frequently in patients with hip fracture often due to bed pressures or deficits in community care, despite the fact that they have not been shown to reduce acute hospital use and are not cost efficient for the patient or the hospital.¹⁹ Respite stay for orthopedic patients in particular has not been shown to reduce hospital LOS.²⁰

Strengths of the study include the fact that our control group is drawn from the same population, the same time period, the same hospital, and the same cohort of surgeons as the intervention group, and this homogeneity is likely to reduce bias and confounding. The same rehabilitation resources were available to both cohorts, the only difference being the coordinated

approach in care by a senior orthogeriatric physician. With any significant systems change, attitudes and behaviors are important, and these can occur over time. We extracted data shortly after the implementation of the service, and it is possible that the patients with hip fracture admitted from the start date of the intervention would have initially experienced a differential effect as the system was restructured. We may not have captured hidden improvements in attitudes and behaviors that would occur as the new system became firmly established.

A limitation to this study includes the fact that 2 different cohorts are being compared; however there was a dedicated orthopedic trauma nurse who was involved in the data collection in both groups, minimizing misclassification bias. Longer term follow-up will be needed to confirm these results, although international comparisons have shown sustained benefits after similar integrated programs of care.²¹

Conclusion

Introduction of orthogeriatric services has resulted in meaningful improvements in clinical outcomes for older people with hip fractures. The improvement of the service involved collaboration, streamlining existing services, and fostering a culture of change with patient care as the primary goal. This is something which has been proven to yield results in an Irish health care setting. Our experience would back up evidence for ensuring this service is in all hospitals who look after patients with hip fracture and the need for close follow-up to evaluate outcomes.


Declaration of Conflicting Interests

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