Auckland City Hospital's Ortho-Geriatric Service: an audit of patients aged over 65 with fractured neck of femur

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ABSTRACT

AIMS: The aims of this audit were to collect the Minimum Data Set outlined by the Australia New Zealand Hip Fracture Registry (ANZHFR), assess patient characteristics, analyse process of care, and evaluate how this compares to NICE guidelines for hip fracture care, as well as to Auckland Hospital data from 2007.

METHOD: Retrospective case record audit of patients with fractured neck of femur aged 65 years and over admitted under Orthopaedics over a 4-month period in 2013.

RESULTS: Ninety-one patients were audited; mean age was 83 years, 68% were female. Both inpatient and 30-day mortality was 5%. 120-day mortality was 15%. Seventy-six percent of patients were admitted from ED within the national health target prescribed period of 6 hours. Only one patient was treated non-surgically. Eighty-six percent had surgery within 48 hours of admission. Eighty-two percent of patients had rehabilitation and treatment by Older People's Health. Of those living at home pre-fracture, 76% returned home on discharge. Thirty-seven percent of patients were able to walk unaided prior to hip fracture, but only 1% on discharge. Average overall length of stay was 22 days. Bisphosphonates were prescribed for 56% of patients.

CONCLUSIONS: Compared to 2007, Auckland City Hospital has demonstrated a significant improvement in the rate of provision of timely surgery for hip fracture patients. Most patients are receiving the guideline recommended fracture-specific surgical interventions. The assessment and treatment of osteoporosis needs further attention.

Hip fracture incidence is high, with significant associated mortality and morbidity. It was estimated that there were 3,803 hip fractures among New Zealanders in 2007, and the projected number of hip fractures for 2013 and 2020 were 4,535 and 5,350, respectively.[1] Mortality following hip fracture approaches 20–25% at 1 year.[2] Of those who survive for 12 months, only 50% are expected to reach their pre-fracture level of mobility and function.[3] The economic burden of hip fractures is equally significant. The total cost of treating one hip fracture case was estimated to be $23,859 in 2007.[1] Previous studies have reported that 8% of hip fractures result in first-time admission to a long-term residential facility, and this also contributes to the economic burden.[1]

UK hospitals have been auditing hip fracture care in relation to best practice guidelines since 2007 through the National Hip Fracture Database (NHFD). This system has led to observable improvements in outcomes for people with hip fractures. For example, the NHFD has demonstrated a decrease in 30-day mortality from 9.6% in 2008, to 8.9% in 2013.[4] Australia and New Zealand have decided to adopt a similar approach through the Australia New Zealand Hip Fracture Registry (ANZHFR) with the view of developing local standards of care and ensuring an ongoing centralised audit process to evaluate quality of hip fracture care. The Minimum Date Set (MDS) for ANZHFR first version was available in December 2012. The ANZHFR website was launched in 2014, and the New Zealand Hip Fracture Registry is currently being piloted in the Northern Region District Health Boards (DHBs).

A number of guidelines of best practice in hip fracture care have been developed. The timely delivery of definitive treatment to hip fracture patients is one key quality standard of interest. The National Institute for Health and Care Excellence (NICE) guidelines and standards of care state that people with hip fracture should have surgery on the day of, or the day after, admission.[5] The ANZ guideline makes a similar recommendation. The orthopaedic department at Auckland Hospital has made a continued effort to try and reduce waiting times for surgery over the years. There are also standards of care with regards to the type of hip fracture repair surgery that should be performed depending on the type of hip fracture.

There has also been a significant focus on reducing waiting times in Emergency Department (ED) at Auckland Hospital. This is related to one of the six national health targets since 1 July 2009, that 95% of patients will be admitted, discharged or transferred from an ED within 6 hours. One would expect that hip fracture patients in particular would be a priority group in terms of the emergency department assessment and care pathways. One of the aims of this audit was to see if and how the 'Shorter Stays in ED' policy had affected the ED waiting times for hip fracture patients in particular.

Treatment of underlying osteoporosis with vitamin D and bisphosphonate therapy has been shown to reduce future fracture risk.[6] Hence, we would expect both some admissions and most discharges to be on bone protection medications. However, studies to date show that prescription rates for bisphosphonates is lower than expected.[7,8]

A shared care approach between the orthopaedic surgeons and geriatricians for patients with hip fracture is being increasingly utilised in medical institutions. The aims of such an integrated approach is to optimise pre-operative medical assessment, perioperative patient care and ensure that there are comprehensive falls and bone health assessments. There is data supporting this shared care approach with positive outcomes with regards to traditional outcomes, such as in-patient and 1-year mortality, and length of stay.[9] However, presently there is a lack of data with regards to other practical outcomes, such as functional recovery and quality of life.

At Auckland City Hospital, Orthopaedic patients aged 65 and over receive medical input from a geriatrician or Older People's Health (OPH) registrar by way of twice-weekly ward rounds, and they also attend weekly Ortho-Geriatric Interdisciplinary Team Meetings. In 2006 a new initiative was introduced, where selected hip fracture patients are 'fast-tracked' to one particular OPH ward as soon as possible post-operatively. There are four acute-funded beds in one OPH ward, and when a bed is empty this allows another patient to be taken over. The decision to 'fast-track' is initiated by the charge nurse of the OPH ward receiving the patient, when a bed is available. Those not 'fast-tracked' can still be placed on the OPH waiting list for rehabilitation as appropriate.

One of the recommendations in the NICE guideline is that patients are operated with the aim of allowing them to fully weight-bear in the immediate post-operative period. The Interim Care Scheme will be mentioned in this audit. This is an initiative that allows those patients that are deemed to require a period of non-weight-bearing after an orthopaedic injury to be cared for at a private hospital (high-level residential care facility) until their orthopaedic surgeon allows them to weight-bear. They usually return to Auckland City Hospital for rehabilitation under Older Peoples Health, although some receive rehabilitation in the community.

One of the aims of this audit was to assess the baseline characteristics of hip fracture patients, including their demographics and baseline functional and cognitive levels. We were interested in looking at process and outcome measures, and compared this information with previous data from Auckland Hospital, an audit performed in 2007. This allowed us to evaluate how our local practice has progressed over the last 6 years. Another aim of this audit was to compare our local practice with the global standards of care and try and identify areas in need of improvement.

Methods

A retrospective case notes audit was undertaken of all patients aged 65 and over with hip fracture admitted under the Orthopaedic service at Auckland City Hospital over a 4-month period from 12 January to

Table 1: American Society of Anaesthesiology (ASA) scores of hip fracture patients.

ASA score	Number	Percentage
1	3	3%
2	14	16%
3	56	62%
4	17	19%
5	0	0
Total	90*	100%

*1 person did not have an operation

Table 2: Analysis of bisphosphonate use on admission.

	Previous fragility fracture or other indication for bisphosphonate		
On bisphosphonate	Yes	No	Total
Yes	17	0	17 (19%)
No	17	57	74
Total	34	57	91 (100%)

25 May, 2013. The audit was restricted to this time period to ensure it was achievable as an advanced trainee project. Patients were identified at the weekly Ortho-Geriatric Interdisciplinary meeting and by the Orthopaedic ward and 'fast-track OPH ward' charge nurses and house officers. A diagnosis-related group (DRG) code based search for hip fracture events was also performed to ensure there was complete coverage.

A data collection form was designed to collect the required patient information. This was in accordance with the Minimum Data Set (MDS) outlined in the ANZHFR data collection form. Clinical notes and electronic records were reviewed manually by the principal investigator. Data was entered into a secure Microsoft Excel spreadsheet. The data was analysed and compared to the data from the Auckland City Hospital hip fracture audit from 2007.

It was confirmed that this study did not require HDEC (Health and Disability Ethics Committee) review.

Results

Group demographics

Ninety-one patients aged 65 and over were admitted with a hip fracture during the 4-month audit period. The median age was 85 years (range 65–97), which was the same as for the 2007 audit. There were 62 women (68%) and 29 men (32%). The mean age for male patients was 82 and for females was 84 years.

Clinical characteristics

ASA scores

The American Society of Anaesthesiology physical status classification (ASA) score prior to injury was recorded. Fifty-six patients (62%) were classified as ASA 3, indicating severe systemic disturbance which is not incapacitating or acutely life-threatening (Table 1). Of all the patients, 81% had significant medical co-morbidities (ASA ≥3). The 2007 audit showed a similar distribution of ASA scores.

Pre-operative cognitive status

Data on pre-operative cognition was collected from the admission notes, as well as previous clinical documentation (eg, clinical letters, discharge summaries). At least 54% of patients had impaired cognition or dementia on admission. This information was not collected in the 2007 audit.

Bone protection on admission

Table 2 summarises bisphosphonate use on admission. Nineteen percent of patients were on a bisphosphonate on admission. Of those who had a previous fragility fracture or other indication for bisphosphonate use, 17 (50%) were not on a bisphosphonate on admission.

Fracture characteristics

Table 3 summarises the anatomical distribution of hip fractures versus the type of surgical intervention performed.

The NICE guidelines for hip fracture care has an evidence-based recommendation to perform replacement arthroplasty (hemi-arthroplasty or total hip replacement) in patients with a displaced intra-capsular fracture. All patients with a displaced intra-capsular fracture in our audit went on to have the recommended surgery.

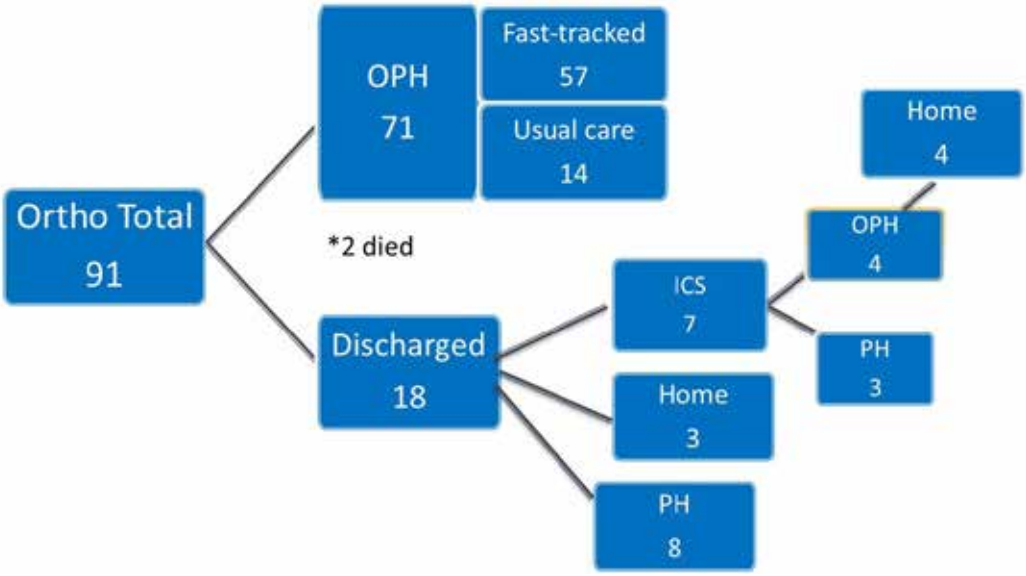
The NICE guideline recommends the use of extra-medullary implants, such as a sliding hip screw, in preference to an intra-medullary nail in patients with trochanteric

Table 3: Anatomical distribution of hip fractures and types of surgical intervention.

	Type of surgery						
Type of fracture	Cannulated screw	Dynamic hip screw	IM nails -long	Hemi-arthroplasty -cemented	Total hip joint replacement - cemented	Other	Total
Intracapsular -undisplaced	1	15		2		1	19
Intracapsular -displaced				37	5		42
Extra-capsular -intertrochanteric		15	8	1			24
Extracapsular -subtrochanteric			5				5
Total	1	30	13	40	5	1	90*

* One person did not have an operation.

Figure 1: Pathways of care.



fractures above and including the lesser trochanter. Fifteen of 24 (63%) patients with per/intertrochanteric fractures had the recommended surgery.

There is an evidence-based recommendation for the use of intramedullary (IM) nails to treat patients with a sub-trochanteric fracture. All 5 of the patients with this type of fracture underwent IM nail surgery.

Type of anaesthesia

General anaesthesia was used in 72% of patients, and spinal anaesthesia was used in 28% of patients.

Pathways of care

Figure 1 summarises the pathways of care for the patients in this audit.

Ninety-one patients were included in this audit. Seventy-one (78%) patients were transferred from the orthopaedic ward to the Older Peoples Health ward after surgery. Out of these 71 patients, 57 (80%) were 'fast-tracked', while the remaining 14 were placed on an OPH waiting list and went through the 'usual care' process. The average time taken to be placed on the wait list was 4 days, and patients spent an average of 3 days on the wait list. Eleven patients were discharged directly from Orthopaedics (3 to home and 8 to private hospital). Two patients died while under the care of Orthopaedics. Seven patients went from Orthopaedics to the interim care scheme, and four later returned to have rehabilitation under Older Peoples Health. Therefore, a total of 75 (82%) of the audited group had rehabilitation and treatment by Older Peoples Health. The 2007 audit showed that 84% of patients received rehabilitation under Older Peoples Health.

Table 4: Time spent in ED.

	2007 (n=113)	2013 (n=88)
% that spent <6 hours in ED	27%	76%
Average time in ED	10.3 hours	6.4 hours *
Median time in ED	8.1 hours	5.6 hours

*There was a significant difference in the average time in ED for 2007 versus 2013 (p<0.0001).

Table 5: Time from admission to surgery.

	Time from admission to surgery		
	<24 hours	<36 hours	<48 hours
Patients who received surgery (n)	49	70	77
% of total (90*)	54%	78%	86%
Patients who did not receive surgery within the time frame (n)	41	20	13
Reasons for surgery delay	**n (%)**	**n (%)**	**n (%)**
Medically unfit	20 (49%)	12 (60%)	8 (62%)
Awaiting orthopaedic diagnosis	5 (12%)	4 (20%)	4 (31%)
Awaiting theatre availability	16 (39%)	4 (20%)	1 (7%)

*One patient was managed non-surgically

Process of care measures

Time from fracture to admission

Apart from 7 patients, all presented to hospital within 48 hours of injury. Out of these 7 patients, 4 were living alone, 1 was living at home with others and 2 were from residential care. One patient sustained her injury as far back as 6 months prior. Of the 7 patients, 3 were stated to have normal cognition, 2 had dementia, 1 had cognitive impairment and 1 had unknown state of cognition.

Time in ED

The majority of patients (97%) were admitted via the ED, while the remaining 3% came through the Admission and Planning Unit (APU). One of the 6 national health targets introduced 1 July 2009, shorter stays in emergency departments, is defined as "95% of patients will be admitted, discharged or transferred from an emergency department within 6 hours". We compared the time spent in ED in our audited group for 2013 with the data from 2007 (Table 4).[10]

Orthopaedic consultant presence during surgery

According to the theatre records, the orthopaedic consultant was present in theatre for 17% of cases. This may be an under-representation of the actual level of consultant supervision due to the fact that the consultants may have attended partway through some of the cases, leading to the omission of their names from the theatre records at times.

Time to surgery

Table 5 summarises data regarding time from admission to surgery based on commonly used time criteria. It also summarises the main reasons for delay.

Reasons for delay to surgery at 24 hours were both medical and theatre availability. At 48 hours, medical reasons predominated and most of them were cardiac issues

The 2007 audit showed that 24% of patients received surgery within 24 hours of admission, and 59% of patients received surgery within 48 hours of admission.

Medical assessments

Thirty-eight patients (42%) had a medical review pre-operatively from one or more of the following services: anaesthetics; older people's health; cardiology; and/or general medicine. A medical review was considered to be an assessment by anyone other than the orthopaedic house officer or registrar. Fifteen patients (16%) were reviewed pre-operatively by a geriatrician/registrar. A total of 21 patients had a pre-operative anaesthetic review.

Table 6: Length of stay (average days).

Orthopaedic discharge destination	Number of patients	Average Length of stay (LOS) (days)			
		Orthopaedic ward	OPH ward	ICS	Total
Home direct-alone	1	5.6	-	-	5.6
Home direct-with others	2	3.5	-	-	3.5
Residential care -direct	8	12.3	-	-	12.3
OPH-fast-tracked	57	2.7	20.8	-	23.8
OPH-not fast-tracked	14	9.0	17.0	-	26.2
Average for all above groups					22.0
Interim care scheme	7	13.0	30.5 (n=4)	32.9	63.5

Ninety-eight percent were seen by a geriatric medicine consultant or registrar at some point during their admission. The average time taken to be seen by geriatric medicine from the time of admission was 2 days.

Length of stay (LOS)

The average length of stay is summarised in Table 6. Patients have been sub-grouped into those who were discharged directly from the orthopaedic ward, those who were fast-tracked to OPH, those who went to OPH through the wait-list and those who went to interim care.

Three patients were discharged home directly from the orthopaedic ward. These were all patients who had sustained un-displaced intra-capsular fractures and were treated with DHS. Patients who were from a private hospital returned when deemed medically stable.

In terms of the patients transferred to OPH, there was a small difference in LOS between the fast-tracked group and the others. The average total LOS, excluding the interim care patients, was 22.0 days, compared to 28.1 days in the 2007 audit. In terms of the patients who went onto the Interim Care Scheme, it took approximately 9 weeks before they were re-settled.

Outcome measures

Mortality

There were 5 inpatient deaths (5%), 2 in the Orthopaedic ward and 3 in the Older Peoples Health ward. 30-day mortality was 5%. 120-day mortality was 15%. The inpatient mortality for the 2007 audit was 5% as well.

Complications

Table 7 shows the main post-operative complications. Fifty percent of patients had more than one complication. The rate of diagnosis of delirium was similar to the audit in 2007, where 23% of patients were documented to have delirium.[10] In this audit, of the 38 patients who were noted to have normal cognition on admission, two developed post-operative delirium.

Living situation

Table 8 shows the living situation of hip fracture patients on admission and at discharge.

Prior to admission, 56% of patients were living at home, and 76% of this group were able to return home on discharge. Of the whole group, 10% went into residential care for the first time. Of the 25 patients originally living in rest homes, 72% were discharged to private hospital after their hip fracture. In comparison, the 2007 audit showed that 61% of

Table 7: Complications.

Complication	Percentage
Delirium	22%
Urinary tract infection	22%
Anaemia	21%
Perioperative hypotension	21%
Pneumonia/LRTI	16%
Electrolyte disturbance	13%
Constipation	10%
Arrhythmia	10%
Heart failure	9%
Worsening renal function	9%
Urine retention/incontinence	9%

Table 8: Living situation on admission and on discharge following hip fracture.

Living situation on admission (number patients)		Living situation on discharge (number patients)			
		Home	Rest Home	Private Hospital	Deceased
Home	51 (56%)	39 (76%)	2	7	3
RH	25	-	5 (20%)	18 (72%)	2
PH	15	-	-	15	-
Total	91	39	7	40	5 (5%)

Table 9: Walking aids on admission and on discharge.

Walking aid	Admission	Discharge
No aids	32 (37%)	1 (1%)
1 aid	11 (13%)	3 (3%)
2 aids/frame	38 (44%)	67 (78%)
Wheelchair	3 (3%)	1 (1%)
Bed-bound	-	14 (16%)
Not known	2 (2%)	
Total	86*	86*

*Excluded deceased patients

Table 10: DVT prophylaxis measures.

DVT prophylaxis	Number	Percentage
None	14	15%
Pre-op aspirin continued	28	31%
Aspirin (new)	11	12%
Enoxaparin	52	57%
Warfarin	2	2%
Foot pumps	21	23%

patients were living at home prior to admission, and 70% of this group were able to return home on discharge.

Mobility

Table 9 shows patients' requirements for walking aids before hip fracture and on discharge.

There is a significant reduction in independent mobility at discharge. The numbers requiring a frame on discharge almost doubles, and 16% are bed-bound on discharge. The 2007 audit showed that 44% of patients were able to mobilise unaided prior to admission, but only 1% were able to mobilise unaided on discharge.

Post-operative weight-bearing status

Patients are encouraged to weight-bear as soon as able after surgery. In this audit, 90% of patients were allowed to fully weight-bear, but 10% of patients were recommended restricted weight-bearing by the orthopaedic teams.

Prescriptions for prevention

DVT prophylaxis

Table 10 summarises the DVT prophylaxis measures taken. A variety of measures were used for DVT prophylaxis, and 35% of patients received more than one type of prophylaxis measure. However, according to the clinical records, 15% of patients did not receive any form of DVT prophylaxis.

Osteoporosis management

Table 11 shows that a bisphosphonate was started or continued in 56% of patients. The 2007 audit showed that 63% of patients were on a bisphosphonate on discharge. Our audit showed that intravenous bisphosphonates were more commonly prescribed than oral bisphosphonates. Intravenous bisphosphonate usage is likely to be higher than in 2007, though this specific data was not collected in the 2007 audit. There was no assessment/explanation given for the omission of bisphosphonates in 20% of patients. An explanation was given for 24% of patients, and the most common reasons for bisphosphonates being withheld were clinical context (52%), renal impairment (24%) and patient declination (19%).

Comparison of 'fast-tracked' with 'usual care' patients

Seventy-one patients were transferred from the orthopaedic ward to the Older

Table 11: Osteoporosis management.

Osteoporosis management plan	Number	Percentage
Bisphosphonate started/continued	48	56%
Oral bisphosphonate	11	13%
IV bisphosphonate	37	43%
Explanation for no bisphosphonate	21	24%
No assessment /explanation	17	20%
Total	86	100%

*Note: Excluded deceased patients

Table 12: Comparison of home versus residential care.

	Usual residence		
	Home (n=51)	Residential care (n=40)	Total (n=91)
Age (mean years)	82	85	83
Gender (% women)	75%	60%	68%
Walking aid on admission*			
No aids	58%	11%	37%
1 aid	10%	16%	13%
2 aids/frame	29%	63%	44%
Wheel-chair	0%	8%	3%
Not known	2%	3%	2%
ASA Score			
ASA score 1	6%	0%	3%
ASA score 2	25%	3%	16%
ASA score 3	57%	69%	62%
ASA score 4	12%	28%	19%
Pre-operative cognitive status			
Normal	69%	8%	42%
Impaired	20%	18%	19%
Dementia	8%	70%	35%
Not known	4%	4%	4%
Time spent in ED (average)	6 hrs 19 mins	6 hrs 46 mins	6 hrs 31 mins
% surgery <24 hours from admission	51%	58%	54%
Post-op weight-bearing status			
Full weight-bearing	86%	95%	90%
Restricted	14%	5%	10%
Total LOS (days)	23.0	19.2	21.3
Walking aid on discharge*			
No aids	2%	0%	1%
1 aid	6%	0%	3%
2 aids/frame	90%	63%	78%
Wheel-chair	0%	3%	1%
Bed-bound	2%	34%	16%
Mortality	3 (6%)	2 (5%)	5 (5%)

*Excluding deceased patients

Table 13: Comparative data—Auckland City Hospital.

Patients ≥65 years with hip fracture	2007 (n=115)	2013 (n=91)
Living at home pre-fracture %	61	56
Transfer to OPH %	84	82
Mean wait time for OPH (days)	1	2
Mean LOS Orthopaedics (days)	9	5
Mean LOS total (days)	28	22
Mean waiting time in ED	20hrs 40mins	6hrs 31 mins
% Surgery <24 hours from admission	24	54
% Surgery <48 hours from admission	59	86
Home returning home %	70	76

Peoples Health ward after surgery. Of these 71 patients, 57 (80%) were fast-tracked, as opposed to going through the usual wait list process. Given the small numbers of patients, a valid comparison between the two groups could not be made. The 2007 audit showed that of all the patients transferred from the orthopaedic ward to the Older Peoples Health ward, 43% were fast-tracked.

Comparison of patients admitted from home versus residential care

Table 12 shows the baseline characteristics, process of care measures and outcome measures for patients admitted from home versus residential care. This shows that the group from residential care tended to be more dependent for their mobility and were more likely to have some compromise of their physical, as well as cognitive, status. The percentage that received surgery within 24 hours for the two groups was similar and potentially shows that there was no bias in their treatment.

Comparative data for the 2007 and 2013 audits at Auckland City Hospital

Table 13 summarises the findings from the 2007 audit and the current 2013 audit.

Discussion

This audit of hip fracture care at Auckland City Hospital was conducted around the time of the launch of the ANZHFR, and this provides much of the backbone to the data collection, as well as the forthcoming discussion. The initiation of the ANZHFR marks an exciting, and hopefully constructive, time ahead in our ventures to improve hip fracture care for patients in this region. Having a centralised audit process is expected to illuminate areas in need of improvement, thus encouraging hospitals to strive for best practise care for this vulnerable group of patients.

The Auckland City Hospital 2007 audit provided a valuable set of data for comparison. We noted that in 2007, only 24% of patients were undergoing surgery within 24 hours of admission. Lack of operating resources was noted to be a significant contributor at the time. It was postulated that changes in operating theatre access as a result of completion of the new Auckland City Hospital in late 2003 lead to increased delays for older patients with hip fractures.[10] It is reassuring to see that the proportion receiving surgery within 24 hours of admission has recovered (54% in this audit).

There has been ongoing debate regarding what is actually the most reasonable time frame to aim for in hip fracture surgery. Observational studies have suggested that operative delay beyond 48 hours after admission may increase the odds of 30-day all-cause mortality by 41%, and of one-year all-cause mortality by 32%.[11] However, there is also evidence that mortality is increased with night-time emergency treatment.[12] It is understood that surgery may need to be delayed to treat and stabilise certain medical conditions in our older population. Hence a time frame of 48 hours appears within reason, and this is what the ANZ guideline has decided on as well.

The UK NHFD is a well-established hip fracture registry, and it has noted improvements in a variety of hip fracture care measures and patient outcomes over the

years. The NHFD 2013 report quoted 86% of patients received operative management within 48 hours. It was reassuring to see the percentage receiving surgery within 48 hours at Auckland City Hospital is comparable to this.

This study showed that a high proportion of patients (82%) are transferred to OPH for rehabilitation, and this is similar to 2007. The mean length of hospital stay at Auckland City Hospital appears to have reduced since 2007 (from 28 days to 22 days). The NHFD 2013 report notes a mean LOS of 20 days. It is difficult to comment on what an optimal LOS is, as it would involve a fine balance between the significant costs involved with hospital stays and the potential to achieve some functional recovery, and the avoidance of a move into residential care for those living at home prior to the fracture. In this audited population, 10% moved into residential care for the first time, which is similar to the rates reported in previous studies.[1] Overall, 30% of patients went to a higher level of care on discharge. Rest home residents in particular appeared to make a relatively poor recovery, with 72% being discharged to private hospital level of care. This may be explained by the increasing dependency levels of people in residential care in the Auckland region.[13]

It was noted that the rate of fast-tracking is higher than in 2007. In 2007, 43% of patients were fast-tracked, whereas the current data shows that 80% were fast-tracked. The small numbers of patients in this audit made it difficult to compare outcomes for the fast-tracked patients versus the non-fast-tracked patients.

In terms of the baseline features of our patient population, we note that the age and gender distribution was in keeping with other publications. Inpatient mortality was 5%, which was the same as in 2007. The 30-day mortality was 5% in this audit. The NHFD 2013 report noted a case mixed adjusted 30-day mortality of 8.2%.

Times spent in ED have significantly improved since 2007, and the introduction of the national health target of 'Shorter Stays in ED' in 2009 likely contributed to this change. There has been a nation-wide focus on this target. However, this audit shows that with regards to the hip fracture patients at least, we are still not meeting the national health target. This highlights the problem that hip fractures are not yet being treated as an 'emergency' in the ED. We know that the ED protocols/pathways for ST elevation myocardial infarctions (STEMI) and acute stroke have led to positive changes in the form of timely assessment and treatment of these serious health-care problems. We would postulate that developing a similar ED-based protocol/pathway for hip fracture patients at Auckland City Hospital could lead to better outcomes for this group of vulnerable patients as well.

There is a strong evidence base behind the institution of secondary prophylaxis measures for osteoporotic fractures, such as hip fractures. Bisphosphonates and vitamin D are currently the mainstays of bone protection therapy in New Zealand. Bisphosphonates are much more accessible now as PHARMAC currently allows funding for alendronate and zoledronic acid for any patient with a history of at least one fragility fracture and age of over 75. Dual energy x-ray densitometry (DEXA) scans are also much more accessible nowadays. In this audit, 56% of patients were prescribed a bisphosphonate on discharge after their hip fracture. The NHFD 2013 report noted a bisphosphonate prescription rate of 69%. One of the main concerns raised in this audit is that 20% of patients did not appear to have any assessment with regards to osteoporosis management. This may be partly explained by a lack of clinical documentation around this topic. For instance, osteoporosis management may have been addressed on a ward round but not been documented in the clinical notes by the junior staff. Therefore, we would recommend that the junior staff are educated in the importance of documentation of osteoporosis management in the clinical notes, as well as in the discharge summaries. It is also possible that these patients did not receive any assessment at all, which is concerning. Protocols have been shown to be effective in improving bone protection prescribing,[14] and another strategy could include a discharge check-list. These are potential interventions we would consider introducing at Auckland City Hospital to try and improve bone protection assessments.

In this audit, 10% of patients were prescribed restricted weight-bearing and arguably this is still too may. The aim should be that everyone can fully weight-bear in the immediate post-operative period. We also note that patients who go onto the Interim Care Scheme inevitably have a very prolonged recovery process, and it can take up to an average of 9 weeks before they know where they stand in terms of their mobility, functional status and living situation. The sharing of this data with the orthopaedic department will hopefully lead to some positive changes with regards to the surgical treatment and the post-operative weight-bearing status prescription.

There is a lack of evidence to help determine the optimal anaesthetic technique for hip fracture surgery. However, guidelines generally advocate for greater use of regional anaesthesia, as opposed to general anaesthesia.[15,16] Spinal anaesthesia was utilised in 28% of this cohort. The NHFD 2013 report noted that 47% of patients had spinal anaesthesia. Sharing our data with the orthopaedic and anaesthetic departments will hopefully lead to a review around this topic, and perhaps we will see more spinal anaesthesia being used in the future.

Auckland City Hospital orthopaedic department has a DVT prophylaxis policy. The NICE and ANZ guidelines do not include DVT prophylaxis recommendations, and they defer to other comprehensive guidelines. The Auckland City Hospital guideline summarises the guideline recommendations and defers to surgeon interpretation, and the decision to be made on a case-by-case basis. According to this audit, 15% of patients did not receive any form of DVT prophylaxis, and this is worth looking at closely alongside the orthopaedic department.

Conclusion

There have been some notable improvements in hip fracture care at Auckland City Hospital since 2007. ED waiting times are significantly better, though we are still not meeting the national health target. Also, the drop in the number receiving early surgery in 2007 appears to have recovered. The current rate of provision of early surgery at Auckland City Hospital compares well with hospitals in the UK. There has been a reduction in LOS at Auckland City Hospital since 2007. There is a growing demand for rehabilitation services, with 82% of hip fracture patients requiring a period of time on the rehabilitation ward.

There are certainly several areas in need of improvement. We would like to aim for having fewer patients with restricted post-operative weight-bearing status. DVT prophylaxis coverage, as well as osteoporosis management, need to be looked at as well.

There is obviously significant room for improvement in terms of hip fracture care at a national level. The ANZHFR will allow benchmarking within New Zealand, and with Australia and the UK. This will increase the attention and priority given to this vulnerable group of patients. The NHFD has shown improvements over the years, and we would hope for similar outcomes in Australia and New Zealand once the ANZHFR is established.

Competing interests:
Nil

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