

Time to surgery for fractured neck of femur in the Waikato District Health Board. Comparison between rural and metropolitan hospitals 2017-2019.

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Introduction

Neck of Femur (NOF) fractures are common in the elderly.¹ It is known that delays in the time taken to perform surgery are linked to higher mortality rates, therefore surgery should ideally be performed between 12 and 48 hours of admission.² The Australian and New Zealand (NZ) guidelines recommend patients should receive surgery within 48 hours of presenting to hospital.³

Patients who present to rural hospitals in the Waikato (NZ) District Health Board (DHB) (Thames, Te Kuiti, Taumarunui and Tokoroa Hospitals) with a NOF fracture require transfer for surgery to either Waikato Hospital (a tertiary hospital), or for Tokoroa hospital to Rotorua Hospital (a secondary hospital in Lakes DHB). This transfer takes a maximum of two and a half hours by road. This audit compares the length of time to receive surgery, the proportion that

receive surgery within 48 hours and the corresponding mortality rates at 30 and 120 days for patients who present to rural hospitals and to Waikato hospital.

Participants, Methods and Results

The digital clinical records of all patients who presented to Waikato DHB's rural hospitals (Taumaranui, Te Kuiti, Thames and Tokoroa) (n=235) and 235 randomly selected patients who presented to Waikato hospital (n=1900) with NOF fracture (ICD-10 codes S72.0-S72.2) between January 2017 and December 2019 were examined. Patients were excluded if they did not have surgery, had a diagnosis other than NOF fracture or were transferred out of the region. Demographic information and time from presentation to the emergency department to transfer, surgery and discharge were recorded. 30-day and 120-day mortality were also calculated.

The mean, frequency, percentage and 95% confidence intervals (95% CI) were calculated where appropriate. Continuous and categorical data were compared with the Mann-Whitney and Chi-squared tests respectively. Formal ethical approval was not required as this is an audit related activity.

A total of 172 and 204 patients were included from rural hospitals and Waikato hospital respectively. Descriptive data and the mean time to surgery, transfer and discharge as well as 30- and 120-day mortality are shown in Table 1.

Patients who presented to rural hospitals waited on average 1.24 days (29.76 hours, 95% CI: 0.44 -2.06 days, $p < 0.001$) longer for surgery and 13.2% (95% CI: 3.2%-23%, $p = 0.009$) fewer patients received an operation within 48 hours than those presenting to Waikato hospital.

There was a non-significant increase in the percentage of patients who had deceased at 30-days (3.4%, 95% CI: -2.7%-9.5%, $p = 0.30$) and 120-days (3.85%, 95% CI: -12% - 4.4%, $p = 0.4$) in those who presented to rural hospitals compared with Waikato Hospital. For patients presenting to Waikato hospital the mean time to discharge was 3.4 days (95% CI: -9.46 - 2.61, $p = 0.78$) shorter than those presenting to rural hospitals.

Comment

This audit shows that for patients presenting with NOF fracture to rural hospitals in the Waikato region (2017-2019), there was a significant delay in receiving surgery and a subsequent reduction in the proportion who receive an operation within 48 hours compared to patients that presented to Waikato Hospital. This difference is much greater than the time taken to transfer the patient. There is also a non-significant trend towards increased mortality in patients who present to rural hospitals.

Although there are no comparable NZ data, these findings are consistent with Australian data.^{4,5} Further research is required to examine the underlying cause of this inequity but also to determine if this delay is unique to the Waikato region, or whether this is a national trend. We recommend that an agreed pathway be developed between the rural hospitals and the orthopaedic centres to attempt to reduce this inequity.

References

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Table 1: Patient demographics and the time to surgery, transfer and discharge for rural hospitals in Waikato District Health Board and Waikato Hospital between 2017 and 2019.

	Rural Hospitals † (n=174)	Waikato Hospital (n=204)
Age (mean, 95% CI ‡)	80.7 years (79.2-82.1 years)	79.7 years (77.9 -81.6 years)
Gender (n, %)		
<i>Male</i>	67 (38.5%)	60 (29.4%)
<i>Female</i>	107 (61.5%)	144 (70.6%)
Ethnicity (n, %)		
<i>New Zealand European</i>	133 (76.4%)	153 (75.0%)
<i>Maori</i>	8 (4.6%)	8 (3.9%)
<i>Other European</i>	26 (14.9%)	28 (17.1%)

<i>Other</i>	7 (4.1%)	15 (4%)
Mean time to Surgery (mean, (95% CI))	2.99 days (2.21–3.77 days)	1.75 days (1.53-1.96 days)
Surgery within 48 hours (n (%), 95% CI))	104 (59.8%, 52.3-66.8%)	149 (73%, 66.6-78.9%)
Mean time to transfer (mean, (95% CI))	5.4 hours (4.73-6.09 hours)	N/A
Mean time to discharge (mean, (95% CI))	25.2 days(19.5-31.0 days)	21.6 days (19.6-23.6 days)
30-day mortality (n (%), 95% CI))	17 (9.85%, 6.2-15.1%)	13 (6.4%, 3.8-10.6%)
120-day mortality (n (%), 95% CI))	34 (19.5%, 14.3-26.1%)	32 (15.7%, 11.3-21.3%)

† Thames, Tokoroa, Te Kuiti and Taumaranui Hospitals

‡ Confidence Interval