



Factors that affect fractured neck of femur outcome: Clinical commissioning groups influence length of stay and discharge destination



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ABSTRACT

Background: The average length of stay (LOS) following a hip fracture in hospitals around the UK has been approximately 20 days in recent years. This can vary between hospitals and there are numerous factors that can affect LOS. We had the impression that LOS varied by Clinical Commissioning Group (CCG) from which the patient originates. The aim of our study was to discover whether the concern was valid, and if so, what the reasons may be.

Methods: We analysed hip fracture data collected at our Trust between September 2008 and December 2014. LOS was compared for each of three CCGs in our Trust's catchment areas, and those patients admitted from outlying CCGs. Sub-analysis was performed by patient age, ASA grade, abbreviated mental test score, procedure type and discharge destination to determine which factors influence LOS.

Results: 1847 patients were identified. After excluding deaths, missing data and extreme outliers, 1603 patients were included in the analysis. The median LOS varied from 14.9 to 23.4 days across CCGs. The major reason for this variation was discharge destination. CCGs associated with longer LOS had a significantly higher rate of discharge to the patient's own home, rather than institutional care. This was independent of patient age, mental status, ASA grade and promptness of surgery.

Conclusion: We have shown that CCGs vary in their performance to aid discharge. This directly influences a Trust's performance on the National Hip Fracture Database. Compared with other hospitals, our results show a poor outcome in terms of length of stay, but much better performance regarding home discharge. We recommend that more emphasis in future be placed on discharge destination than LOS.

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Introduction

In England and Wales, the length of stay (LOS) after fractured neck of femur is recorded in the National Hip Fracture Database (NHFD) and as such is a hospital outcome measure. There may be competition between rapid discharge and the patient being discharged to their own home. Reasons for late discharge are multifactorial. It has been shown that patients who wait longer for their operation may deteriorate and spend longer as inpatients [1]. ASA grade, age and abbreviated mental test score (AMTS) may also be relevant [2]. Availability of home care and carers is important.

NICE guidelines advise that a multidisciplinary approach to rehabilitation should be utilised, involving physiotherapists and occupational therapists, as well as liaising with mental health, falls

prevention, bone health, primary care and social services [3]. The Best Practice Tariff (BPT) is paid if certain criteria are met, such as surgery within 36 h of admission [4]. Regarding discharge, there are several options available. An early supported discharge can be considered as part of a Hip Fracture Programme, which allows the patient to be discharged to the community even when they have not yet achieved their full rehabilitation potential. Some hospitals have access to intermediate care that allows rehabilitation in a community hospital or residential care unit, with home discharge as independence improves. Patients admitted from residential care may be discharged back to their care home quickly unless their care needs increase. These variations affect LOS and there have been numerous descriptions of possible reasons [5–7]. The prolonged lengths of stay obviously incur excess cost which is not always reimbursed.

We have wondered over the years whether the role and efficiency of particular Primary Care Trusts (PCTs) and now Clinical Commissioning Groups (CCGs) are important. These organisations

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distribute funding for health and social care within discrete regions of England. Each is in charge of its own budget based on regional priorities and needs. Local variations between CCGs may mean that discharge policies vary owing to the availability of services within a particular postcode.

Our hypothesis was that there is regional variation in LOS, influenced by the patient's CCG. We also wished to determine whether patients in some CCGs had differential rates of discharge home versus institutional care.

Methods

A hip fracture database has been in place in our hospital since September 2008. It was initially for a local audit and now submits data to the NHFD. It has a comprehensive set of data and records patients' discharge destinations with regards to our 3 main CCGs, and for those from outside our usual catchment area due to our proximity to an international airport. Data such as patient age, sex, post code (and therefore CCG), type of fracture, type of procedure, time between hospital admission and surgery, housing status, discharge destination, AMTS before and after surgery, and the length of stay in hospital was collected. All admitted patients were included. Exclusion criteria were in-hospital mortality and incomplete data. To determine how differences in discharge destination vary by CCG, secondary analysis was conducted only for patients admitted from their own homes, excluding all patients in institutional care.

Data analysis was performed using SPSS version 22. Tests of normality for our data were performed using the Shapiro-Wilk test. Comparisons of lengths of stay between CCGs were performed using the Kruskal-Wallis H test, with Dunn's post-hoc testing for pair wise comparisons. Correlations between non-parametric statistics were analysed using Spearman's rank correlation coefficient. Statistical significance was taken at $p < 0.05$. As the data was computed from the NHFD, for which we are registered, there were no ethical concerns.

Results

Our database contained 1847 patients between September 2008 and December 2014. We excluded patients who died in hospital ($n = 211$) and those with an incomplete data set ($n = 12$). This left 1624 patients. The median length of stay was 20.7 days. Our data for length of stay was not normally distributed ($p < 0.0001$) and to conduct meaningful statistical analysis, extreme outliers (whose lengths of stay exceeded 115.4 days) were excluded from the analysis. This left 1603 patients for the complete analysis.

There was no significant difference in patient age between the CCGs. Age and length of stay were not significantly correlated ($r = 0.0044$, $p = 0.079$). AMTS on admission [8] showed a weak negative correlation with LOS ($r = -0.147$, $p < 0.001$): as AMTS increased, LOS decreased. A weak positive correlation was found between ASA and LOS ($r = 0.271$, $p < 0.001$). As would be expected, as ASA increased, LOS increased.

The LOS prior to removal of outliers, broken down by CCG are illustrated in Fig. 1. LOS varied significantly by CCG ($p < 0.0005$), as displayed in Table 1. Table 2 illustrates the results of pair wise comparisons of lengths of stay between different CCGs. To account for the differing lengths of stay between CCGs, post-hoc analysis was performed for those patients admitted from their own homes ($n = 1254$), stratified by discharge destination (Table 2 and Fig. 2). Overall, 82% of these patients were discharged home. The discharge destinations varied significantly by CCG and are shown in Table 3. The highest rate of home discharge was seen for our worst performing CCG in terms of length of stay and this was

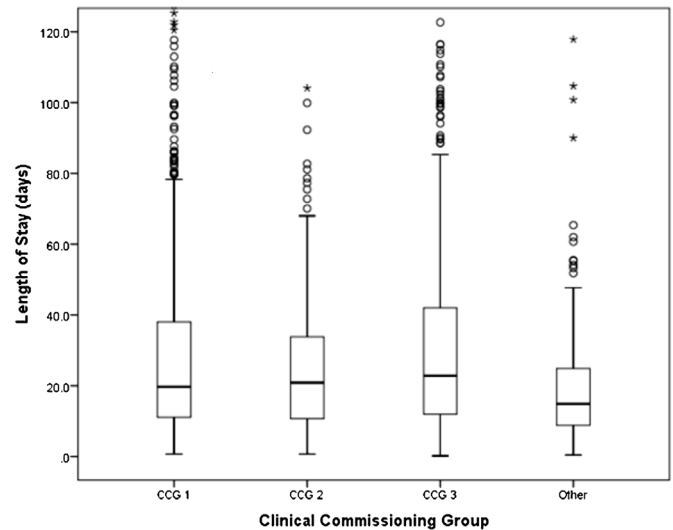


Fig. 1. Length of stay for each Clinical Commissioning Group. The chart has been cropped for stays greater than 120 days. Circles represent outliers; stars represent extreme outliers. Median LOS displayed for each group.

Table 1
Length of stay by CCG.

Clinical Commissioning Group	All patients		Patients admitted from home only	
	Number	Length of stay Median (IQR)	Number	Length of stay Median (IQR)
CCG 1	585	19.6 (12–37)	440	18.6 (12–36)
CCG 2	200	20.9 (11–33)	167	19.8 (11–33)
CCG 3	658	23.4 (13–41)	528	23.0 (13–42)
Others	160	14.9 (9–24)	119	14.1 (10–24)

Table 2
Comparison of length of stay between different CCGs. * denotes significant result.

Comparison	P value (adjusted for multiple comparisons)	
	All patients	Patients admitted from home only
CCG 1 vs CCG 2	1.0	1.0
CCG 1 vs CCG 3	0.039*	0.032*
CCG 1 vs Others	<0.0005*	0.001*
CCG 2 vs CCG 3	0.104	0.100
CCG 2 vs Others	<0.0005*	0.023*
CCG 3 vs Others	<0.0005*	<0.0005*

statistically significant ($p < 0.0005$). Shorter LOS was observed for patients from out-of-area, which can be explained by the significantly increased rate of discharge to another acute trust (odds ratio 16.3, $p < 0.0005$).

Operations performed varied by patient and fracture configuration and were associated with significantly different LOS ($p < 0.001$). As may be expected, patients undergoing total hip replacement had shorter LOS (Table 4), as these patients typically have fewer co-morbidities. Likewise, those having cannulated screw fixation had shorter lengths of stay. This is attributable to the fact that younger patients have this surgery and therefore have fewer issues with self-caring.

Overall mortality in our series was 11.4%. Most deaths were due to cardiorespiratory problems, some of which were hospital

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