

# Predictors of Time to Surgery and Postoperative Mobilization following Hip Fracture

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## INTRODUCTION:

Faster time to operative fixation and mobilization decreases morbidity and mortality for hip fracture patients. The purpose of our study was to determine if patient race, language, or if being cared for on a surgical floor led to delays in surgical fixation or postoperative mobilization. Our hypothesis was that patients who speak a language other than English and admitted to nonsurgical floors will have longer times to surgery and mobilization than English speaking and patients admitted to surgical floors.

## METHODS:

This was a retrospective review of patients who underwent hip fracture surgery between January 2011 and January 2021. Patient demographics, injury characteristics, and floor of admission were collected and analyzed. Time of diagnosis was defined as the time of the initial presenting radiograph, and time of mobilization was defined as the time the patient stood at edge of bed with physical therapy. Floor of admission is determined based on admitting service (medicine, orthopaedics, trauma surgery) as well as bed availability. The study institution has a large Asian patient population and a robust Chinese interpreter service given its location in the city's Chinatown neighborhood. Regression modeling was used to control for variables that were significantly different between patient cohorts.

## RESULTS:

A total of 781 patients (average age of 78 years) were included in our analysis. Seventy three percent of patients spoke English, 23% a Chinese dialect, and 4% another language. Sixty-nine percent of patients identified as white, 3.5% as African American, and 26.2% as Asian. Fifty-five percent of patients were admitted to nonsurgical floors whereas 45% of patients were admitted to surgical floors. Time to surgery from injury and diagnosis was significantly longer on nonsurgical floors compared to surgical floors (33 vs. 51 hours and 22 vs. 28 hours,  $p = 0.0096$  and  $0.003$  respectively). Time from surgery to mobilization out of bed was also significantly shorter for patients on surgical floors compared to nonsurgical floors (53 vs. 63 hours,  $p = 0.01$ ). There was no difference in time to evaluation by physical therapy ( $p = 0.8$ ). Patients admitted to a nonsurgical floor had a significantly higher Charlson comorbidity index (5.76 and 4.62 respectively,  $p < 0.0001$ ) compared to those admitted to a surgical floor. When controlling for differences in Charlson comorbidity index between surgical floors, time to surgery from diagnosis remained significant ( $p=0.02$ ) while time to PT evaluation and surgery were not significantly different ( $p = 0.8$  and  $0.072$  respectively). Time to surgery was not significantly different based on language or race ( $p= 0.85$  and  $p= 0.18$ ). Time from surgery to PT evaluation and mobilization were also non-significant across primary language spoken and patient race ( $p$  range from  $0.39-0.84$ ).

## DISCUSSION AND CONCLUSION:

Patients admitted to nonsurgical floors had a significantly longer time to surgery as well as longer time to mobilize compared to patients who were admitted to surgical floors. Time to physical therapy evaluation following surgery was the same suggesting alternative factors such as medical comorbidities, staff training, and resource availability likely contribute to the significant difference in time to mobilize after surgery. There were no differences in time to surgery, PT evaluation, or mobilization based on patient race or language suggesting a robust interpreting service can aid in improving patient outcomes.

	Surgical Floor		P value
	Yes (n= 349)	No (n = 432)	
Time from Diagnosis to Surgery	22.38 ± 19.31	28.24 ± 30.97	<b>0.003</b>
Time from Surgery to Physical Therapy Evaluation	28.74 ± 26.47	28.26 ± 19.72	0.78
Time from Surgery to Mobilize	53.36 ± 46.84	62.87 ± 44.50	<b>0.01</b>

	Patient # or Avg ± Std. Dev	% of patients or (range)
<b>Total</b>	781	
<b>Sex</b>		
Male	282	36.11%
Female	499	63.89%
<b>Age</b>	77.9 ± 11.8	(50-102)
<b>Fracture classification</b>		
Femoral Neck	345	44.2%
Intertrochanteric	371	47.5%
Subtrochanteric	65	8.3%
<b>Mechanism of Injury</b>		
Low	730	93.5%
High	48	6.1%
Atraumatic	3	0.4%
<b>Transfer Status</b>		
ED to ED	178	22.8%
Floor to Floor	93	11.9%
N/A (presented at primary hospital)	510	65.3%
<b>Average Charlson Comorbidity</b>	5.25 ± 2.36	(1-15)
<b>Deceased in hospital</b>	18	2.3%