Published in final edited form as:

J Orthop Trauma. 2015 March ; 29(3): e109–e114. doi:10.1097/BOT.0000000000000221.

Factors Effecting Delay to Surgery and Length of Stay for Hip Fracture Patients

William M. Ricci, MD, Angel Brandt, MA, Christopher McAndrew, MD, and Michael J. Gardner, MD

Department of Orthopaedic Surgery, Washington University School of Medicine, St. Louis, MO

Abstract

Purpose—The purpose of this study was to determine factors, including day of week of hospital admission, associated with delay to surgery (DTS) and increased length of stay (LOS) in patients with hip fractures.

Design—Retrospective

Setting—Level I Trauma Center

Patients and Methods—Six hundred and thirty five consecutive patients admitted to a single hospital between January 1999 and July 2006 age 65 or older with a hip fracture (OTA 31) were identified retrospectively from an orthopaedic database. Demographic data, ASA score, hospital admission and discharge dates, the date of surgery, and details of any pre-operative cardiac testing were extracted from the hospital record. These data were used to identify the day of week for hospital admission and to calculate days for DTS and hospital LOS. Linear regression was used to identify independent variables associated with DTS and increased LOS.

Intervention—All patients underwent surgical treatment of a hip fracture (OTA 31)

Main Outcome Measures—Factors effecting DTS and LOS.

Results—Independent factors associated with DTS included the day of week for hospital admission, ASA score, and the need for pre-operative cardiac testing. Patients admitted Thursday through Saturday had longer DTS (mean 2.2 to 2.7 days) than did patients admitted other days (mean 1.7 – 1.8). Delay to surgery increased for increasing ASA: 1.4 days for ASA 2; 2.0 days for ASA 3; and 3.0 days for ASA 4. Those requiring pre-operative cardiac testing had an increased number of days to surgery (mean 3.2 days) than those without (1.7 days).

Independent factors associated with increasing hospital LOS included ASA, the need for pre-operative cardiac testing, male gender, and day of admission. Length of stay increased for increasing ASA: 6.3 days for ASA 2; 8.1 days for ASA 3; and 10.1 days for ASA 4. Those requiring pre-operative cardiac testing had an increased LOS (mean 9.4 days) than those without

Corresponding Author William M. Ricci, MD Professor Chief, Orthopaedic Trauma Service Director, Clinical Operations Washington University Orthopedics Campus Box 8233 660 South Euclid Avenue St. Louis, MO 63110 Phone (314) 747-2811 Fax (314) 747-2599 FAX ricciw@wudosis.wustl.edu.

Level of Evidence: Prognostic Level II. See Instructions for Authors for a complete description of levels of evidence.

Conflict of Interest Statement

A Brandt has no conflicts of interest to disclose.

(7.3 days). Male patients had a longer LOS (mean 9.8 days) than did females (mean 7.3 days). Patients admitted on Thursday or Friday (mean 8.5 – 9.1 days) had longer LOS than those admitted on other days (mean 7.3 – 7.9 days).

Conclusions—This is the first study to consider and identify day of admission and need for pre-operative cardiac tests as determinants of DTS and LOS for geriatric hip fracture patients. Relative scarcity of weekend hospital resources, when present, may be responsible for these delays. This study also confirms that patient medical condition as measured by ASA affects both DTS and LOS.

Keywords

delay to surgery; length of stay; Hip fracture; ASA; day of week

INTRODUCTION

Quality of care and the costs associated with the care of hip fracture patients are important medical and medical-economic issues. Morbidity and mortality of geriatric hip fracture patients, despite substantial improvements in medical technology, remain high. Delays from hospital admission to hip fracture surgery is one factor that has been implicated as being associated with increased risk of medical complications(1–5). Length of hospital stay (LOS) is an important factor that determines resource utilization and costs(6, 7). Identifying and modifying factors associated with delays to surgery (DTS) and LOS have the potential to impact medical expenditures and quality of care for hip fracture patients.

A DTS for hip fracture patients has been associated with increased risk of mortality(2). Accordingly, a stringent timeline for surgery (within 24 to 48 hours) has been advocated (8). The availability of resources including surgeon, operating room, medical consultant, and testing labs can influence the time from admission to surgery for patients with hip fractures(9–11). A lack of weekend resources has been postulated to be a causative factor for increased morbidity and mortality for several medical conditions including stroke and myocardial infarction(11–14) and has the potential to cause delay in the operative care of patients with hip fractures. For this reason, admission day of week was included in the analysis of factors that may contribute to delay from admission to surgery.

Length of hospital stay has been identified as an important driver of hospital cost and resource utilization in hip fracture patients. Reducing LOS is one method to reduce associated costs. Initiatives to reduce LOS must first identify factors that drive up LOS and then should focus on optimizing factors that are within control of health care providers. The most commonly cited factor associated with LOS is patient co-morbidity(15–18). This factor is beyond control of the health care team. The current study considered similar factors as other studies, but also considered admission day of week in the analysis of predictors of LOS.

The specific goals of this study were to evaluate factors affecting DTS and LOS in geriatric patients undergoing operative treatment of a hip fracture. To our knowledge, this is the first study to include day of week as a potential variable in the analysis of DTS and LOS for hip

fracture patients. We hypothesized that increasing medical comorbidities as measured by American Society of Anesthesiologists (ASA) physical classification score and hospital admission day would be associated with DTS and length of hospital stay.

Patients and Methods

Patients and Hospital Resources

Six hundred and thirty five consecutive patients age 65 or older treated operatively for a hip fracture (Orthopaedic Trauma Association Classification Type 31(19)) and discharged from a single tertiary care hospital between January 1999 and July 2006 were identified retrospectively from an orthopaedic billing database. Patients who expired before operative treatment or before hospital discharge were not included. The average patient age was 82 years (range 65 – 104 years) and there were 447 female and 188 male patients. Availability of operating room resources for hip fracture patients was different on weekends compared to weekdays. At least one guaranteed operating room for use at the discretion of an orthopaedic trauma surgeon was available daily (7:30 AM to approximately 4 PM) on weekdays. There were no dedicated weekend operating rooms for orthopaedic cases such as hip fractures. There were between two and four operating rooms typically available on weekends to accommodate all surgical services. Utilization was determined in a triage system administered by the anesthesiologist on call. Monday through Friday one orthopedic trauma surgeon was available each day to provide surgical care during the day, whereas at night and on weekends one on-call orthopaedist, not necessarily an orthopaedic traumatologist, was available. The cardiac testing laboratory, responsible for non-invasive cardiac scans, was open weekdays between 7AM and 5 PM. This laboratory was closed on weekends. If a hip fracture patient was identified to require a cardiac scan after 5 PM Friday, they would have to wait for this test until after 7 AM Monday. Due to the observed disparity in cardiac lab resources between weekday and weekend, the need for cardiac scan was included as an independent variable in analyses. These surgeon and hospital resources varied very little during the study period. The study was approved by the local institutional review board.

Extracted Data

Demographic data, ASA score, hospital admission and discharge dates, the date of surgery, and details of any pre-operative cardiac testing were extracted from the hospital record. These data were used to identify the day of week for hospital admission and to calculate days from admission to surgery (defined as date of surgery minus date of admission) and length of hospital stay (defined as date of discharge minus date of admission).

Statistical Analysis

For univariate analyses, *t*-tests and ANOVA tests were used for comparison of continuous variables and Pearson's chi-square tests or the Kruskal-Wallis test for categorical variables. Multivariate analysis utilized logistic regression to determine independent risk factors associated with DTS and LOS. Using days from admission to surgery and length of hospital stay as a dependent variables, patient age and gender, admission day of week, ASA score, and occurrence of a pre-operative cardiac test were used as independent variables for these

logistic regression analyses. Statistical significance was defined by $p < 0.05$. Statistical analysis was performed with IBM SPSS Statistics v. 21.

Results

Group Comparisons

The numbers of patients admitted each day of the week and their characteristics are presented in Table 1. Patient age ($p=0.852$), gender ($p=0.159$) and ASA ($p=0.138$) scores were similar regardless of day of admission. Five hundred and twenty one patients (82%) proceeded to surgery without and 114 (18%) with a pre-operative cardiac test. The cardiac tests included an echocardiogram ($n=42$), stress dobutamine or thallium imaging ($n=33$), exercise stress ($n=12$), cardiac catheterization ($n=4$), or some combination of these tests ($n=23$). Day of admission was found to be related to frequency of cardiac tests ($p=0.046$) with 9% of those admitted Wednesday and 27% of those admitted Monday getting cardiac tests (Table 1). Characteristics of patients with and without pre-operative cardiac tests are defined in Table 2. There was no difference in age ($p=0.752$) or gender ($p=0.396$) between those with and without a cardiac test and patients with a cardiac test had higher ASA scores ($p<0.001$).

Factors Affecting Days from Admission to Surgery

Univariate analyses revealed gender, ASA, cardiac testing and day of admission as being associated with increased DTS (Table 3). Logistic regression analysis revealed admission day of week ($p<0.001$), ASA score ($p<0.001$), and pre-operative cardiac testing ($p<0.001$) as independent variables effecting DTS. The average number of days from admission to surgery, stratified by admission day of week, are presented in Figure 1. Admission at the beginning of the week (Sunday through Wednesday) when hospital resources are maximal resulted in fewer delays (by approximately one day) than when admission was at the end of the week (Thursday through Saturday) when faced with reduced weekend resources. Greater than 50% of patients admitted Sunday through Wednesday had surgery within one day of admission compared to less than 30% for patients admitted Thursday through Saturday. The number of days to surgery increased with increasing ASA: 1.4 days for ASA 2; 2.0 days for ASA 3; and 3.0 days for ASA 4. Patients who underwent a pre-operative cardiac test had a longer time to surgery (average 3.2 days) compared to those without (average 1.7 days).

Factors Affecting Length of Hospital Stay

Length of hospital stay varied from 1 to 72 days. Eighty percent of patients had a LOS of 10 days or less. For the purposes of statistical evaluations, patients with a LOS greater than 10 days were grouped together. Univariate analyses revealed gender, ASA, cardiac testing and day of admission as being associated with increased LOS (Table 3). Logistic regression analysis revealed ASA score ($p<0.001$), cardiac testing ($p<0.001$), and gender ($p=0.001$), and admission day of week ($p=0.045$) as independent variables effecting LOS. The LOS increased with increasing ASA: 6.3 days for ASA 2; 8.1 days for ASA 3; and to 10.1 days for ASA 4. Patients who underwent a pre-operative cardiac test had a significantly longer LOS (average 9.4 days) compared to those without (average 7.7 days). Male patients had a longer LOS (average 9.8 days) compared to female patients (average 7.3 days). Length of

hospital stay was longer for those admitted on Thursday and Friday (mean 8.5 – 9.1 days) than for those admitted on other days of the week (mean 7.3 – 7.9 days), (Figure 2).

DISCUSSION

Hip fractures represent one of the most common orthopaedic diagnoses leading to hospital admission, morbidity, and mortality in the elderly population(20). Time from admission to surgery and hospital LOS have been identified as important medical-economic factors in this population. The current study identified patient-specific (ASA and gender) and other factors (admission day of week and pre-operative cardiac testing) that are associated with DTS and increased LOS for hip fracture patients.

Time to surgery is one of the most controversial issues in the hip fracture medical literature(21). Some studies provide evidence that DTS is associated with increased mortality. Operative delay beyond 48 hours after admission was found to increase the odds of 30-day all-cause mortality by 41% and odds of one-year all-cause mortality by 32%(1). In another study, delay of two days was found to be an important predictor of mortality within one year for elderly patients who have a fracture of the hip and who are cognitively intact, able to walk, and living at home before the fracture. It has been recommended that such patients should have their operation within two calendar days after admission to the hospital(2). Early surgery compared with late operative treatment of patients with a hip fracture was associated with an improved ability to return to independent living, a reduced risk for the development of pressure ulcers, and a shortened hospital stay(3). The current study is unique in that it is the first, to our knowledge, to consider day of hospital admission as an independent risk factor for DTS. Data from the current study indicates that day of admission is a significant independent risk factor that leads to DTS. This delay, which occurred when admission was at the end of the week, was also beyond the two day threshold commonly cited. These delays could not be accounted for by patient related factors since patients admitted on different days of the week had similar demographic characteristics and similar ASA scores. We hypothesize that reduced weekend hospital resources may contribute to this finding. It has been shown that hospital resource and staffing patterns are typically different on weekends and holidays than for weekdays(10, 11, 22). The lack of weekend resources has been postulated to be a causative factor for increased morbidity and mortality for several medical conditions including stroke and myocardial infarction(11–14). Specific to the geriatric hip fracture population, admission on a holiday was found to be an independent risk factor for 5- and 30- day postoperative mortality(22). Based on results of our study, day of hospital admission has the potential to cause delay in the operative care of patients with hip fractures.

Length of hospital stay is an important factor when considering the medical economics of hip fracture care. Hospital days represent a significant factor related to cost of care(15, 16). There appears to be consensus in the literature that medical co-morbidity is associated with LOS for hip fracture patients(15–18). Lefaivre et al, in a study of 607 patients age 65 or older with hip fracture, found that comorbidity was associated with increasing LOS(15). It should be noted that this study was performed in Vancouver, Canada and their average LOS was 23.48 days. This LOS is substantially longer than reported for hip fracture patients in

the United States(16, 18) and therefore these data may not be applicable to the US health care system. Kay et al identified ASA as the strongest predictor of post-operative LOS for the eight most common lower extremity isolated orthopaedic procedures based on CPT codes(16). Of these, they identified 273 patients with hip fractures (CPT 27236, 27245, and 27244). For these patients, average LOS was between 4.08 and 5.55 days for patients with ASA 2 (depending on CPT code), between 4.81 and 6.10 days for ASA 3, and between 7.00 and 9.75 for ASA 4. This is consistent with the results from the current study of 635 patients where LOS increased from 6.27 to 8.09 to 10.09 days for ASA's 2, 3, and 4, respectively. It should be noted that comparisons of the current study to that of Kay et al should consider that only patients age 65 and older were included in current study (average age 82 years) while no such criteria were used in the study of Kay et al. (average age based on CPT was 57 to 62 years).

There is less consensus regarding factors other than comorbidity that may be associated with LOS for hip fracture patients. Lafaivre et al identified DTS, age and fracture type as other significant factors associated with increased LOS(15), while Kay et al(16) identified only gender. The current study also identified male gender, but additionally identified the need for a pre-operative cardiac test as being associated with LOS. It should be noted that the precise indications and the utility of pre-operative cardiac testing remains unclear. The current study did not attempt to investigate such issues, but simply found an association between cardiac testing and LOS. Day of hospital admission was also identified as an independent risk factor for LOS with those admitted towards the end of the week, Thursday or Friday, having a longer length of stay.

There are several limitations of the current study that deserve consideration. There are a number of factors that have the potential to inject delay into this process of getting a patient from admission to surgery. Some of these, such as availability of resources, and particularly the relative availability of weekend resources, are likely to be variable between hospitals. The situation at the hospital involved in this study represents just one place along a continuum and therefore results of this study should be interpreted in this context. Additionally, the tertiary care hospital involved in this study had a moderate volume of hip fracture patients, averaging 86 patients per year during the study period. Other hospitals with smaller or larger volumes of such patients may be presented with different obstacles and resource allocations. Similarly, the threshold for obtaining pre-operative cardiac testing reflects individual physician judgment and may not be reflective of thresholds at other institutions. Individual comorbidities were not considered; rather ASA was used as a surrogate for medical comorbidity. The ASA score is widely used in clinical practice and in research studies. It has been used to predict perioperative risk, perioperative mortality and complication rates, and postoperative outcomes(23–25) in surgical patients in general and has been shown to be prognostic for mortality(26, 27) and LOS of hip fracture patients(16, 17). Neither fracture type nor procedure type were included as independent variables. We feel it is unlikely that these parameters contributed to delay. All patients in the cohort had OTA Type 31 fractures. These were all considered fractures of immobilization and the relative urgency for operative fixation was the same in all cases. Supporting this position, Brown et. al. recently reported that fracture type was not a significant predictor of LOS in hip fracture patients(17).

The current study identified both patient characteristics and hospital resources as factors that impact DTS and hospital LOS for patients with hip fractures. Patient medical condition as measured by ASA affected both DTS and LOS and male gender increased LOS. Health care providers have little control over these patient factors. Other factors that are potentially under the control of health care providers were also identified as effecting DTS. Patients undergoing pre-operative cardiac tests and those admitted at the end of the week had increased DTS and LOS. Improving weekend hospital resources has the potential to reduce operative delay and length of stay.

Acknowledgments

WM Ricci receives consulting income from Smith&Nephew, Biomet, and Stryker. He also receives royalties from Smith&Nephew, Wright Medical, Biomet (expected), and Stryker (expected). Research and Institutional support is provided by Smith&Nephew, Synthes, AO North America, and COTA. Book royalties are expected from Lippincott Williams & Wilkins.

MJ Gardner receives consulting fees from Synthes, Stryker, DGIMed Ortho, BoneSupport AB, and RTI biologics. He also receives institutional research support from Synthes and book royalties from Lippincott Williams & Wilkins.

Christopher McAndrew: Tuition support was received from an institutional grant, unrelated to the work: NIH NCATS UL1TR000448

REFERENCES

1. Shiga T, Wajima Z, Ohe Y. Is operative delay associated with increased mortality of hip fracture patients? Systematic review, meta-analysis, and meta-regression. *CanJAnaesth*. 2008; 55:146–154.
2. Zuckerman JD, Skovron ML, Koval KJ, et al. Postoperative complications and mortality associated with operative delay in older patients who have a fracture of the hip. *JBone Joint SurgAm*. 1995; 77:1551–1556.
3. Al Ani AN, Samuelsson B, Tidermark J, et al. Early operation on patients with a hip fracture improved the ability to return to independent living. A prospective study of 850 patients. *JBone Joint SurgAm*. 2008; 90:1436–1442.
4. Sircar P, Godkar D, Mahgerefteh S, et al. Morbidity and mortality among patients with hip fractures surgically repaired within and after 48 hours. *AmJTher*. 2007; 14:508–513.
5. Bredahl C, Nyholm B, Hindsholm KB, et al. Mortality after hip fracture: results of operation within 12 h of admission. *Injury*. 1992; 23:83–86. [PubMed: 1572720]
6. Pendleton AM, Cannada LK, Guerrero-Bejarano M. Factors affecting length of stay after isolated femoral shaft fractures. *J Trauma*. 2007; 62:697–700. [PubMed: 17414350]
7. el-Darzi E, Vasilakis C, Chausalet T, et al. A simulation modelling approach to evaluating length of stay, occupancy, emptiness and bed blocking in a hospital geriatric department. *Health care management science*. 1998; 1:143–149. [PubMed: 10916593]
8. Hamlet WP, Lieberman JR, Freedman EL, et al. Influence of health status and the timing of surgery on mortality in hip fracture patients. *AmJOrthop*. 1997; 26:621–627.
9. Bergeron E, Lavoie A, Moore L, et al. Is the delay to surgery for isolated hip fracture predictive of outcome in efficient systems? *JTrauma*. 2006; 60:753–757. [PubMed: 16612294]
10. Needleman J, Buerhaus P, Mattke S, et al. Nurse-staffing levels and the quality of care in hospitals. *NEnglJMed*. 2002; 346:1715–1722.
11. Peberdy MA, Ornato JP, Larkin GL, et al. Survival from in-hospital cardiac arrest during nights and weekends. *JAMA*. 2008; 299:785–792. [PubMed: 18285590]
12. Saposnik G, Baibergenova A, Bayer N, et al. Weekends: a dangerous time for having a stroke? *Stroke*. 2007; 38:1211–1215. [PubMed: 17347472]
13. Kostis WJ, Demissie K, Marcella SW, et al. Weekend versus weekday admission and mortality from myocardial infarction. *NEnglJMed*. 2007; 356:1099–1109.

14. Barba R, Losa JE, Velasco M, et al. Mortality among adult patients admitted to the hospital on weekends. *EurJInternMed.* 2006; 17:322–324.
15. Lefaivre KA, Macadam SA, Davidson DJ, et al. Length of stay, mortality, morbidity and delay to surgery in hip fractures. *J Bone Joint Surg Br.* 2009; 91:922–927. [PubMed: 19567858]
16. Kay HF, Sathiyakumar V, Yoneda ZT, et al. The Effects of ASA Physical Status on Length of Stay and Inpatient Cost in the Surgical Treatment of Isolated Orthopaedic Fractures. *J Orthop Trauma.* 2013
17. Brown CA, Olson S, Zura R. Predictors of length of hospital stay in elderly hip fracture patients. *Journal of surgical orthopaedic advances.* 2013; 22:160–163. [PubMed: 23628571]
18. Garcia AE, Bonnaig JV, Yoneda ZT, et al. Patient variables which may predict length of stay and hospital costs in elderly patients with hip fracture. *J Orthop Trauma.* 2012; 26:620–623. [PubMed: 22832431]
19. Marsh JL, Slongo TF, Agel J, et al. Fracture and Dislocation Classification Compendium - 2007: Orthopaedic Trauma Association Classification, Database and Outcomes Committee. *Journal of Orthopaedic Trauma.* 2007; 21
20. Youm T, Koval KJ, Zuckerman JD. The economic impact of geriatric hip fractures. *AmJOrthop.* 1999; 28:423–428.
21. Vidal EI, Moreira-Filho DC, Coeli CM, et al. Hip fracture in the elderly: does counting time from fracture to surgery or from hospital admission to surgery matter when studying in-hospital mortality? *OsteoporosInt.* 2009; 20:723–729.
22. Foss NB, Kehlet H. Short-term mortality in hip fracture patients admitted during weekends and holidays. *British journal of anaesthesia.* 2006; 96:450–454. [PubMed: 16443639]
23. Menke H, Klein A, John KD, et al. Predictive value of ASA classification for the assessment of the perioperative risk. *International surgery.* 1993; 78:266–270. [PubMed: 8276556]
24. Wolters U, Wolf T, Stutzer H, et al. ASA classification and perioperative variables as predictors of postoperative outcome. *British journal of anaesthesia.* 1996; 77:217–222. [PubMed: 8881629]
25. Prause G, Ratzenhofer-Comenda B, Pierer G, et al. Can ASA grade or Goldman's cardiac risk index predict peri-operative mortality? A study of 16,227 patients. *Anaesthesia.* 1997; 52:203–206. [PubMed: 9124658]
26. Norring-Agerskov D, Laulund AS, Lauritzen JB, et al. Metaanalysis of risk factors for mortality in patients with hip fracture. *Danish medical journal.* 2013; 60:A4675. [PubMed: 23905564]
27. Clement ND, Green K, Murray N, et al. Undisplaced intracapsular hip fractures in the elderly: predicting fixation failure and mortality. A prospective study of 162 patients. *J Orthop Sci.* 2013; 18:578–585. [PubMed: 23686084]

Figure 1.

The average number of days from admission to surgery plotted against admission day of the week ($p < 0.001$). Error bars indicate 95% confidence intervals.

Figure 2.

The average length of hospital stay plotted against admission day of the week ($p=0.045$). Error bars indicate 95% confidence intervals.

Table 1

Patient Characteristics Stratified by Day of Admission

Day of Admission	#	Age (p=0.852)			Gender (p=0.159)			ASA (p=0.138)				Cardiac Scan (p=0.046)							
		Ave	Min	Max	SD	M	F	2	3	4	No	Yes							
Monday	107	82.5	67.1	104.2	7.8	39	36%	68	64%	17	16%	64	60%	26	24%	78	73%	29	27%
Tuesday	98	82.0	64.8	99.9	7.9	28	29%	70	71%	23	23%	60	61%	15	15%	78	80%	20	20%
Wednesday	82	80.3	64.9	98.2	8.5	23	28%	59	72%	16	20%	55	67%	11	13%	75	91%	7	9%
Thursday	93	82.8	65.1	98.7	7.7	27	29%	66	71%	20	22%	63	68%	10	11%	80	86%	13	14%
Friday	80	82.1	64.6	97.7	7.8	28	35%	52	65%	12	15%	55	69%	13	16%	67	84%	13	16%
Saturday	83	81.9	65.4	100.2	8.1	26	31%	57	69%	18	22%	50	60%	15	18%	69	83%	14	17%
Sunday	92	83.1	67.1	104.2	7.9	17	18%	75	82%	22	24%	64	70%	6	7%	74	80%	18	20%
All	635	82.1	64.6	104.2	8.0	188	30%	447	70%	128	20%	411	65%	96	15%	521	82%	114	18%

Table 2

Characteristics Based on Pre-operative Cardiac Testing

Pre-Op Cardiac Test	#	Age (p=0.752)			Gender (p=0.396)			ASA (p<0.001)							
		Ave	Min	Max	SD	M	F	2	3	4					
No	521	82.2	64.6	104.2	8.0	158	30%	363	70%	117	22%	337	65%	67	13%
Yes	114	81.9	64.8	100.2	8.0	30	26%	84	74%	11	10%	74	65%	29	25%

Table 3

Univariate Analyses

	DTS	LOS
Age [*]	0.654	0.832
Gender [^]	0.025	0.001
ASA ⁺	<0.001	<0.001
Cardiac Testing [^]	<0.001	<0.001
Day of Admission [^]	<0.001	<0.001

^{*} ANOVA

[^] Pearson's chi-square

⁺ Kruskal-Wallis