

Utilizing the ASA Score as a Predictor of 90-Day Perioperative Readmission in Patients With Isolated Orthopaedic Trauma Injuries

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Background/Purpose: As the American health-care system moves toward new payment structures that will no longer reimburse hospitals for perioperative readmission, it is critical that the orthopaedic trauma surgeon develop tools to predict the risk of postoperative readmission. While many studies have investigated readmission in the geriatric hip fracture population, very few studies have explored factors influencing postoperative hospital readmission in the orthopaedic trauma population. The American Society of Anesthesiologists (ASA) physical status classification is used worldwide by anesthesia providers as an assessment of the preoperative physical status of patients. This study seeks to explore factors influencing the readmission of patients with orthopaedic trauma injuries and the potential utilization of the ASA score in predicting a patient's risk of readmission.

Methods: All orthopaedic trauma patients who presented to a large Level I trauma center for operative treatment of their fracture from January 1, 2005 to December 31, 2010 were identified using CPT code searches and the institution's orthopaedic database. A total of 7338 unique patients were identified. The charts of these patients were reviewed to identify isolated cases in which there was only a single fracture requiring operative fixation with no other organ injury. 2354 patients fit this strict criterion. Of these patients, 1819 had complete readmission information and were included for analysis. The ASA scores of these patients who had isolated orthopaedic injuries were obtained from the institution's perioperative warehouse. The electronic medical records of these patients were then reviewed for basic demographic information such as age, gender, race, and medical comorbidities (coronary artery disease, diabetes, etc); the date of the first readmission related to the primary orthopaedic trauma fracture; and the reason for readmission. Patients were grouped into the following readmission categories: postoperative infection, postoperative surgical revision, and nonoperative medical condition. A logistic regression controlling for age, gender, race, 21 individual medical comorbidities, and type of fracture was conducted to identify the predictive ability of ASA on the likelihood of readmission for patients with isolated orthopaedic trauma injuries.

Results: Of the 1819 patients with strictly isolated fractures, 216 had acetabular fractures, 1252 had isolated lower extremity fractures, and 351 had isolated upper extremity fractures. After controlling for age, gender, race, medical comorbidities, and type of fracture for these patients, ASA had a significant association with 90-day readmissions ($P = 0.036$). Compared to patients with an ASA score of 1, patients with an ASA score of 2 were 1.21 times as likely to have a readmission; patients with an ASA score of 3 were 1.46 times as likely to have a readmission; and patients with an ASA score of 4 were 1.77 times as likely to have a readmission.

Conclusion: The ASA score is highly correlated with postoperative readmission rates for patients presenting with isolated orthopaedic trauma fractures. As such, the ASA score could potentially provide a powerful tool to help hospitals target “at risk” individuals in order to reduce the number of 90-day readmissions.

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Do Surgeons Know the Cost of Orthopaedic Trauma Implants? A Multicenter Study of 503 Surgeons

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Background/Purpose: Implant costs represent a substantial portion of health-care expenditures, and orthopaedic surgeons are positioned to play a key role in controlling these costs. A knowledge of implant costs is essential in this process; however, it is unknown if orthopaedic surgeons are knowledgeable in this domain. The purpose of this study was to assess orthopaedic surgeons' knowledge of common orthopaedic trauma implant costs. Our hypothesis was that orthopaedic surgeons would demonstrate a low level of implant cost knowledge.

Methods: This IRB-approved study was designed as an online survey administered to attending orthopaedic surgeons and residents at 7 academic medical centers associated with trauma centers. The survey consisted of 10 common orthopaedic trauma implant constructs that were each identified with a radiograph as well as an itemized component list. At each institution, the most commonly used vendors were chosen to maximize surgeon familiarity with the implant constructs. The actual cost of each construct (defined as the contracted amount paid to the vendor by the institution) was determined at each institution and then compared with the respondents' estimates. Estimates that were as discrepant as $\pm 20\%$ of the actual cost were considered correct.

Results: The response rate for the survey was 96% (503 of 522). Overall knowledge of implant costs among attending orthopaedic surgeons was low (mean 20% correct, 95% confidence interval [CI] 18%-22%). Attending orthopaedic trauma surgeons demonstrated greater implant cost knowledge than nontrauma surgeons in the univariate analysis ($P = 0.007$), but this relationship was no longer significant after controlling for frequency of implant usage and other factors ($P = 0.23$). In the multivariate analysis, the factors significantly associated with attending cost knowledge were number of years in practice ($P = 0.03$), frequency of implant usage ($P = 0.009$), and the price of the implant construct itself ($P < 0.001$). Knowledge of implant costs was also low among residents (mean 16% correct, 95% CI 15%-18%, $P = 0.004$ compared to the attending surgeons). In the multivariate analysis, factors significantly associated with resident cost knowledge were frequency of implant usage ($P = 0.01$) and the cost of the implant construct itself ($P < 0.001$). Self-assessment of implant cost knowledge was low among attending surgeons as well as residents, with 27% rating it as poor, 31% as below average, 35% as average, 6% as above average and 0.4% as excellent. However, over

80% of respondents indicated that cost should be “moderately,” “very,” or “extremely” important in the selection of orthopaedic trauma implants.

Conclusion: In this multicenter survey of 503 orthopaedic surgeons that captured 96% of potential respondents, most believed that cost should play an important role in the selection of orthopaedic implants. However, actual knowledge of implant costs was found to be low among attending surgeons as well as residents. If surgeons are expected to select lower cost implants when medically appropriate, additional education may be required to allow for this possibility.

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Does Fracture Care Make Money for the Hospital?**An Analysis of Hospital Revenue and Cost for Treatment of Common Fractures**

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Purpose: With increasing health-care costs and decreasing revenue, understanding the profitability of orthopaedic trauma care is becoming progressively more important. The relative profitability of caring for patients with various fractures is unknown, however. The purpose of this study was to determine the relative profitability to the hospital for a selection of specific common fractures.

Methods: Data were collected from hospital medical and financial records at a single large academic urban trauma center with a state-regulated hospital reimbursement system. This state's unique legislatively mandated system ensures that the burden of uncompensated care to the hospital is addressed and that cost-shifting from the uninsured to the insured patients is normalized across all payers. Hospital medical and financial records of 1020 patients admitted from 2008 to 2012 with a principal diagnosis of an acute traumatic fracture requiring surgical treatment were reviewed. Patients whose principal diagnosis fit into 1 of 5 common anatomic categories based on their ICD-9-CM codes were included. 275 acetabular fractures, 65 pelvis fractures, 277 hip fractures, 255 femoral shaft fractures, and 148 tibia shaft fractures were identified. Patients that sustained one of these fractures but had a different principal diagnosis were excluded. The net revenue, total cost of inpatient care (direct variable expense plus direct fixed expense), and direct margin (net revenue minus total cost, ie, profit) for each patient's acute inpatient hospital course were collected. Margins were compared using a one-way analysis of variance.

Results: The overall mean direct margin (profitability) of the cohort was \$19,526 per patient. The overall mean revenue was \$44,326 per patient and the overall mean cost of inpatient care was \$24,812 per patient (\$16,526 mean direct variable expense and \$8,286 mean direct fixed expense). Factors most influencing cost included length of stay (\$6403, 26%) and operating room use (\$6354, 26%). In addition, the supply variable expense (eg, orthopaedic implants) averaged \$4169 (17% of total cost). Of 1020 patients, only 44 (4%) had a negative direct margin (indicating a net loss to the hospital). The most profitable diagnosis was pelvis fracture ($P < 0.05$). Table 1 demonstrates cost and margin analysis for each fracture.

Table 1 Cost and Margin Analysis (in US\$)

	Net Revenue	Cost of Inpatient Care ^a	Direct Margin (Profit)	Supply Variable Expense (%) ^b
Pelvis	58,982	37,215	21,767	5,224 (14)
Acetabulum	48,197	28,737	19,460	4,051 (14)
Hip	39,619	20,103	19,579	3,743 (19)
Femur	41,360	21,862	19,498	4,619 (21)
Tibia	33,470	16,145	17,325	3,915 (24)

^aDirect variable + direct fixed expenses. ^beg, orthopaedic implants, percent of total cost.

Conclusions: This rate-regulated system allows analysis of hospital profitability in the context of a normalized revenue stream that should approximate the overall fiscal realities of other states. Our data show that providing orthopaedic trauma care can be economically feasible and even profitable to a hospital. Understanding the relative costs and margins will help providers and hospitals target cost containment projects.

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Sleep Disturbance Following Fracture Is Related to Emotional Well-Being Rather Than Functional Result

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Background/Purpose: Sleep disturbance is an extremely common complaint following orthopaedic trauma. However, the incidence, severity, and duration of sleep difficulty following common orthopaedic trauma surgeries are unknown. The aim of our study was to investigate the incidence and longitudinal improvement of sleep disturbance following four common orthopaedic traumatic conditions.

Methods: We reviewed prospectively collected functional outcomes data for 1095 orthopaedic trauma patients following four common orthopaedic trauma conditions. The functional status of patients with proximal humerus fractures (n = 111), distal radius fractures (n = 440), tibial plateau fractures (n = 109), and ankle fractures (n = 435) were followed with standard functional outcome measures. Surveys were conducted at 3, 6, and 12 months postoperatively. Patient-reported sleep disturbance, acquired from validated functional outcome surveys, was compared to overall functional outcomes scores and demographic information. Subgroup analysis was conducted for age, gender, body mass index, mechanism of injury (high versus low energy), and presence of additional fractures.

Results:

Percentage of Postoperative Sleep Disturbance at Standard Follow-up Intervals				
	Initial/Baseline	3 months	6 months	12 months
Proximal humerus fracture	Not recorded	41%	24%	18%
Distal radius fracture	7%	25%	16%	8%
Tibial plateau fracture	3%	32%	22%	18%
Ankle fracture	8%	19%	11%	11%

At 12-month follow-up the Short Form-36 Mental Health category for patients with distal radius fractures ($P = 0.001$) and the Short Musculoskeletal Function Assessment (SMFA) Emotional category for patients with tibial plateau fractures ($P = 0.024$) and ankle fractures ($P \leq 0.001$) were independent predictors of poor sleep while the respective functional status categories were not.

Conclusion: At 12-month follow-up, poor sleep was independently associated with poor emotional status, but not associated with poor functional status. The mental health status of patients with sleep difficulty in the latter stages of fracture healing should be carefully assessed in order to provide the highest level of care. The results of this study should allow orthopaedic trauma surgeons to counsel patients regarding expectations of difficulty sleeping following acute fractures.

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Anxiety and Depression in the Etiology of Chronic Pain: Results from a Two-Year Cohort Study of Trauma Patients

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Background/Purpose: Millions of Americans experience chronic pain. While chronic pain can often be linked to prior trauma, the risk factors for persistence following acute pain have just recently begun to receive attention. Numerous studies have shown that both acute and chronic pain increase risk for depression and anxiety, and a causal relationship has been hypothesized. The purpose of this study is to describe a structural model to explain the temporal relationships between pain, anxiety, and depression.

Methods: Patients (N = 545) from a longitudinal study of severe lower extremity trauma were followed at baseline, 3, 6, 12, and 24 months postinjury using a visual analog pain scale and the depression and anxiety scales of the Brief Symptom Inventory. Structural equation modeling (SEM) techniques were used to study temporal relationships between these three sets of longitudinal variables, presented as standardized regression weights (SRW). Multiple imputation techniques were used to account for missing data.

Results: A single structural model that included pain intensity, anxiety, and depression at all four time points yielded model fit measures indicating an excellent fit. Pain had weak effects on depression during the first year postinjury (3-6 months SRW = 0.07, $P = 0.05$; 6-12 months SRW = 0.06, $P = 0.10$), but did not predict depression beyond a year. Similarly, pain had weak effects on anxiety during the first year postinjury (3-6 months SRW = 0.05, $P = 0.21$; 6-12 months SRW = 0.08, $P = 0.03$). Depression did not predict pain over any of the time periods. In contrast, anxiety predicted pain over all three time periods, and the standardized regression weights for these relationships nearly doubled over this time span (3-6 months SRW = 0.11, $P = 0.012$; 6-12 months SRW = 0.14, $P = 0.0065$; 12-24 months SRW = 0.18, $P < 0.0001$). These effects were independent of the effects of each parameter measured at the previous time point (eg, pain at 3 months predicting pain at 6 months).

Conclusion: The results support the hypothesis that in the early phase following trauma, pain elicits anxiety and depression. These effects are smaller, however, than the effect of anxiety on pain over this time period. In the late (or chronic) phase, the effect of anxiety on pain nearly doubles, and is the only causal effect observed. These results provide further evidence that negative mood, specifically anxiety, has an etiological role in the persistence of acute pain.

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Δ Impact of Early Postoperative Pain on Outcomes One Year Following Traumatic Orthopaedic Injury

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Purpose: The purpose of this study was to determine whether the level of pain at hospital discharge predicts physical and mental health, depression, and posttraumatic stress disorder (PTSD) at 1 year following traumatic orthopaedic injury. The hypothesis was that increased pain at discharge would predict decreased physical and mental health and increased depressive and PTSD symptoms after controlling for patient and injury characteristics.

Methods: This study prospectively enrolled 225 patients, 19 to 86 years of age, admitted to a Level I trauma center for surgical treatment of a traumatic lower extremity (87%) or upper extremity (13%) orthopaedic injury. Participants were enrolled postoperatively on the orthopaedic unit and answered questions on demographics. A discharge assessment measured pain intensity (Brief Pain Inventory [BPI]). A follow-up assessment 1 year after hospitalization measured physical and mental health (Short Form-12) and depressive and PTSD symptoms (Patient Health Questionnaire-9 [PHQ-9] and PTSD Checklist-Civilian Version [PCL-C], respectively). Clinical characteristics were abstracted from the medical record. At 1 year, 132 patients (59%) completed follow-up. Multiple imputation techniques were employed for patients lost to follow-up. However, 12 patients with both missing discharge and follow-up data were excluded from the final analysis. Separate multivariable linear regression analyses (N = 213) were performed to determine whether pain at hospital discharge predicted the outcomes of physical and mental health and depressive and PTSD symptoms, after controlling for age, gender, race, marital status, education level, employment status, and ISS. The level of significance was set at $\alpha = 0.05$.

Results: Average pain intensity scores at hospital discharge on the BPI were 6.3 (standard deviation [SD], 2.4). 28% of patients reported mild pain (BPI <5), 28% moderate pain (5 ≤ BPI <7), and 44% severe pain (BPI ≥7). Separate multivariable regression analyses showed that increased pain at discharge predicted decreased mental health ($\beta = -0.91$; $P = 0.02$), increased depressive symptoms ($\beta = 0.58$; $p = 0.03$), and increased PTSD symptoms ($\beta = 1.6$; $P = 0.01$) at 1-year follow-up. In addition, having greater than a high school education predicted increased mental health ($\beta = 5.6$; $P = 0.01$) and decreased depressive ($\beta = -2.7$; $P = 0.01$) and PTSD symptoms ($\beta = -7.2$; $P = 0.01$). Pain at hospital discharge was not found to be a statistically significant predictor of physical health at 1-year follow-up.

Conclusion: Results imply that efforts to improve pain assessment and management among hospitalized orthopaedic trauma patients are needed to improve long-term mental health outcomes. Early screening for unmanaged pain is encouraged in order to identify patients at high risk for poor outcomes and who could benefit from more aggressive pain management.

Δ OTA Grant

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Nature's Wrath: The Effect of Daily Weather Patterns on Postoperative Pain Following Orthopaedic Trauma

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Background/Purpose: The effect of weather on patients' pain and mobility is a frequent complaint in all aspects of musculoskeletal care. While there has been limited investigation into the effects of weather on arthritis and various medical pathologies, to our knowledge there are no data regarding weather's effect on orthopaedic trauma patients' complaints of pain following acute and chronic fracture. The aim of our study was to investigate the influence of daily weather conditions on patient-reported pain and functional status.

Methods: We examined 2369 separate outpatient visits of patients recovering from operative management of an acute tibial plateau fracture (n = 332), an acute distal radius fracture (n = 1179), or chronic fracture nonunion (n = 858). At each outpatient visit, patients were asked to report their pain on a scale of 0 to 10. Functional status was recorded using the DASH (Disabilities of the Arm, Shoulder and Hand) or SMFA (Short Musculoskeletal Function Assessment). For each individual patient visit date, we then recorded the mean temperature, difference between the mean temperature and expected temperature based on a 17-year average, dew point, mean humidity, amount of rain, amount of snow, barometric pressure, and wind speed. All weather data were specific to the zip code of the outpatient medical office where patients were seen, and obtained from a publicly available almanac. Statistical analysis was run to search for correlations between weather data and patient-reported pain scores and functional status.

Results: There was a highly significant association between low barometric pressure (calculated as below one standard atmosphere or 29.92 in) and increased pain for patients at 1-year follow-up only ($P = 0.006$), and a trend toward association between low barometric pressure and increased pain for all patient visits ($P = 0.072$). At 1-year follow-up, temperatures above 35°F ($P = 0.018$) and humidity above 70% ($P = 0.001$) were also significantly associated with increased pain. No other weather data had significant correlation with patient-reported pain scores. No significant association was noted between weather data and patient-reported functional status (as calculated by the DASH or SMFA functional indexes).

Conclusion: While pain in the immediate postoperative period is most likely dominated by incisional and soft-tissue injuries, as time progresses weather clearly impacts patient pain levels. Variation in patient-reported pain scores due to weather conditions should be anticipated. Patients may be counseled that their symptoms may worsen in association with weather conditions.

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**Health Literacy in an Orthopaedic Trauma Population:
Improving Patient Comprehension Reduces Readmission Rates**

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Background/Purpose: Research has demonstrated that surgical patients often have problems comprehending and/or identifying their discharge instructions, medications, and the specifics of their diagnoses. Patients with lower educational backgrounds have worse comprehension than those with higher educational backgrounds. It is reasonable to assume that lack of comprehension among orthopaedic trauma patients may have a deleterious effect on postoperative complication rates leading to unnecessary hospital readmissions. This study sought to determine if an educational tool administered at discharge designed to improve patient comprehension reduced the rate of unplanned readmissions secondary to postoperative complications.

Methods: Over an 8-month period, orthopaedic trauma patients at a Level I trauma center were administered a questionnaire during their first postoperative clinic visit prior to being seen by a physician. The questionnaire included questions regarding the bone fractured, the type of implanted fixation, weight-bearing status, expected recovery time, and deep venous thrombosis (DVT) prophylaxis. All patients received verbal and written instructions outlining this information at hospital discharge. During the second half of the study, patients received an intervention consisting of an informational sheet with both text and pictorial representations at discharge that reinforced the aforementioned information. Patients with minimum 3-month follow-up were included to evaluate for hospital readmission secondary to surgical site infection, hardware failure, or DVT. Statistical analysis between the two patient populations—pre- and post-intervention—was conducted using Student *t* tests and χ^2 tests comparing demographic variables, performance on comprehension questionnaire, and hospital readmission rates.

Results: 299 eligible questionnaires were collected. 146 patients were given the standard discharge instructions (control group), while 153 patients were also administered the additional information sheet (intervention group). Previous work demonstrated that the intervention group had higher comprehension as indicated by their mean score on the questionnaire comprehension section ($P = 0.009$). Of the original 299 patients, 206 had minimum 3-month follow-up or suffered a postoperative complication (control group = 100, intervention group = 106). There was a 19% readmission rate secondary to postoperative complications in the pre-intervention group ($N = 19/100$), and a 9.4% readmission rate secondary to postoperative complications in the post-intervention group ($N = 10/106$). The readmission rate secondary to postoperative complication was statistically significantly lower in the post-intervention group (19.0% vs 9.4%, $P = 0.048$)

Conclusion: The use of an information sheet with text and pictorial representations to explain discharge instructions has been shown to improve patient comprehension. Furthermore, hospital readmission rates secondary to postoperative complication rates were decreased among patients who received the additional intervention.

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Stress Hyperglycemia Is Associated With Surgical Site Infection: A Prospective Observational Study of Nondiabetic, Noncritically Ill Orthopaedic Trauma Patients

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Purpose: Multiple studies have demonstrated the detrimental effects of hyperglycemia in trauma patients; however, there is a paucity of data concerning hyperglycemia and nondiabetic orthopaedic patients. We conducted the present study to evaluate the relationship of hyperglycemia and surgical site infections in a cohort of nondiabetic, noncritically ill orthopaedic trauma patients.

Methods: This was a prospective observational pilot study over a 9-month period (February 2011–October 2011). Inclusion criteria were patients age >17 years admitted with orthopaedic injuries requiring surgical intervention. Patients with a history of diabetes mellitus, current corticosteroid use, multisystem injuries, or who were admitted to the ICU were excluded. Demographics, medical comorbidities (as classified by the American Society of Anesthesiologist physical status), body mass index (BMI), presence of an open fracture, and number of operations were recorded. Fingertick blood glucose values were ordered twice daily for each patient. Hyperglycemia was documented for a fasting glucose value >125 mg/dL or a random value >200 mg/dL on more than one occasion, and was considered prior to the development of an infection. Hemoglobin A1C (Hgb A1C) was obtained from hyperglycemic patients, and occult diabetes was considered for an Hgb A1C >5.9. Occult diabetes mellitus was excluded from final study analysis. Surgical site infection was considered by a return trip to the operating room and confirmed by positive intraoperative cultures at the operative site.

Results: 171 patients were enrolled. Forty patients (23.4%) were hyperglycemic; 7 of these 40 (17.5%) had Hgb A1C >5.9. The final study population consisted of 164 patients, 33 (20.1%) with hyperglycemia. There were 12 (7.3%) surgical site infections. There was no significant association with age, gender, race, medical comorbidities, obesity (BMI >29), tobacco use, or the number of surgical procedures and the primary outcome. Patients with hyperglycemia were more likely to develop a surgical site infection (7 of 33 [21.2%] vs 5 of 131 [3.8%]; $P = 0.001$). Open fractures (6 Type I, 22 Type II, 22 Type III) were also associated with surgical site infections (7 of 50 [14%] vs 5 of 114 [4.4%]; $P = 0.03$). However, there was no association with open fractures and hyperglycemia (10 of 50 [20.0%] vs 23 of 114 [20.2%]; $P = 0.98$).

Conclusion: Hyperglycemia was present in 20% of nondiabetic orthopaedic trauma patients and demonstrated a significant association with surgical site infection in this prospective observational cohort. While many factors may contribute to surgical site infections, there is presently a lack of data on hyperglycemia in nondiabetic, noncritically ill patients. Future randomized studies are necessary to further determine the impact of glucose control on outcome in orthopaedic trauma.

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Effectiveness of Vitamin D Therapy in Orthopaedic Trauma Patients

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Purpose: 77% of our orthopaedic trauma patients have been shown to have either vitamin D deficiency or insufficiency. The purpose of this study was to determine the effectiveness of our vitamin D treatment protocol in orthopaedic trauma patients. Our hypothesis was that vitamin D therapy normalized serum vitamin D levels.

Methods: A retrospective review was done of all orthopaedic trauma patients at a university Level I trauma center from January 1, 2009 to September 30, 2010. Patients were selected if they had an initial and repeat vitamin D-25 serum levels. The standard regimen for all patients was over-the-counter vitamin D 1000 IU and 1500 mg of calcium daily. For patients with vitamin D deficiency or insufficiency, they also received 50,000 IU of ergocalciferol weekly until their vitamin D level normalized or their fracture healed. No compliance monitoring was performed except for questioning at each clinic visit.

Results: 201 patients had initial and repeat Vitamin D-25 levels. 84% of patients with a normal initial vitamin D-25 level remained normal and 16% became insufficient or deficient. 48% of the patients initially in the insufficient group improved to normal and 8% became deficient. Of the patients with vitamin D deficiency, 26% remained deficient and 74% became insufficient (see table).

Vitamin D-25 Level	Average Initial Vitamin D-25 Level (ng/mL)	Average Repeat Vitamin D-25 Level (ng/mL)	Average Increase in Vitamin D-25 Level (ng/mL)
Normal (≥ 32 ng/mL)	39.13	41.03	1.90
Insufficiency (<32 ng/mL) (insufficient group only)	25.19	33.98	8.79
Deficiency (<20 ng/mL)	13.74	28.67	14.93

Conclusion: Although Vitamin D therapy did improve the majority of the patients' vitamin D-25 level, it was not as successful as was hoped. Patients with initial deficiency had the largest improvement but still did not normalize. This study indicates that continued vigilance is required to adequately treat a low vitamin D-25 level. Future studies will prospectively evaluate treatment regimens and the effect of low vitamin D on complications of orthopaedic trauma.

Are Routine 2-Week Postoperative Radiographs Useful?**Brian Mosier**¹; Gregory T. Altman, MD¹, Lisa Taitzman, MD²;¹Department of Orthopaedic Surgery, Allegheny General Hospital, Pittsburgh, Pennsylvania, USA;²Department of Orthopaedic Surgery, Harborview Medical Center, Seattle, Washington, USA

Purpose: The purpose of this study is to evaluate the utility of early postoperative radiographs in the management of patients with surgically stabilized lower extremity fractures.

Methods: In a retrospective manner we collected 320 patients treated surgically for fractures involving the femur, tibia, and/or fibula by a single orthopaedic traumatologist. Routine practice at our facility is to follow up with surgery patients at approximately 2 weeks, 6 to 8 weeks, and 3 months postoperatively. If patients underwent staged management, then the 2-week follow point considered was after the final surgery. Medical records and radiographs were reviewed for all patients.

Results: Over a 5-year period, 320 patients with 344 fractures involving the femur, tibia, and/or fibula underwent surgical repair of their fracture. There were 162 men and 158 women. The average age was 42 years (range, 18-95 years). The average follow-up period for all 344 fractures was 110 days. Of the 344 fractures, 309 were radiographed at 2 weeks. There were 28 patients (35 fractures) who did not have 2-week radiographs secondary to being an inpatient or did not follow up at the 2-week interval. Of these 28 patients, none required any additional surgical interventions. Of the 309 fractures that had radiographs at 2 weeks, 246 fractures in 233 patients were followed for 3 months or greater duration. Four fractures required subsequent intervention at less than 3 months. All four interventions consisted of surgical irrigation and débridement of wound infections with removal of the exposed hardware. In our study no fracture required revision fixation as a result of the 2-week postoperative radiographs. In addition, no patient had a change in mobilization, weight bearing, or range of motion activities as the result of the 2-week radiographs.

Conclusion: The routine use of radiographic examination at the 2-week postoperative visit has limited utility.

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