Evaluation of Orthopedic Trauma Surgery
Follow-up and Impact of a Routine Callback Program

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abstract

A high rate of patients lost to follow-up is a common problem in orthopedic trauma surgery. This adversely affects the ability to produce accurate clinical outcomes research. The purpose of this project was to (1) evaluate the rate of loss to follow-up at an academic level I trauma center; (2) identify the patient-reported reasons for loss to follow-up; and (3) evaluate the efficacy of a routine patient callback program. All patients who underwent surgery in the orthopedic trauma division of the University of Virginia Medical Center from April 1, 2014, to September 30, 2014, and did not complete their postoperative clinic follow-up were analyzed. The characteristics of these patients were evaluated, and the primary reason for not completing the recommended follow-up was identified. All patients were then offered additional orthopedic follow-up at the time of contact. Of the 480 patients who met the inclusion criteria, 41 (8.5%) failed to complete the recommended postoperative follow-up course. The most common reason for being lost to follow-up was feeling well and not having the need to be seen (46.3%). Only 6 (14.6%) of the 41 patients requested follow-up care at the time of contact. The lost to follow-up rate in this study, 8.5%, was considerably lower than that previously reported, but patient characteristics were consistent with those of prior studies on this subject. The low lost to follow-up rate may reflect a difference in geographic location or patient population. The patient callback program had a low yield of patients requesting additional follow-up after being contacted. [Orthopedics. 2017; 40(2):e312-e316.]

Postoperative clinic follow-up is essential to the delivery of comprehensive care within the surgical disciplines. In the setting of orthopedic trauma, postoperative clinic visits allow orthopedic surgeons to identify complications in a timely manner in order to adjust postoperative treatment protocols and resources as needed to ensure optimal outcomes. Despite the importance of clinic follow-up as a source of continued access to necessary services after discharge, non-compliance with follow-up appointments remains a common problem in orthopedic trauma practices.1-6 In addition to poor compliance with follow-up having clinical implications, several studies have also identified its ramifications for the ability to produce accurate research on clinical outcomes.7-11 As such, an understanding of both the risk factors for and the reasons behind this noncompliance may facilitate the development of methods aimed to address this problem.

Several studies have investigated how clinical variables and patient demographics are associated with follow-up in a variety of patient populations and clinical settings. The emergency medicine literature is particularly abundant in assessing risk factors for noncompliance with follow-up such as age, sex, insurance status, education level, and distance from clinic.1-9,12-16 However, follow-up after discharge from
Table

Summary of Literature Evaluating Noncompliance With Postoperative Clinic Follow-up After Orthopedic Trauma Surgery

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of Patients</th>
<th>Setting</th>
<th>Population</th>
<th>Compliance Rate</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murnaghan and Buckley</td>
<td>236</td>
<td>Level I academic medical center, Calgary, Canada</td>
<td>Displaced intra-articular calcaneal fractures</td>
<td>198 (84%) of 236 with any follow-up visit</td>
<td>LTF (n=38) were younger (36 vs 40 y), Aborigi- nal descent, more likely to be “unskilled clerical sales, service, or labor” workers, and more likely to have a preoperative Bohler’s angle of 0° to 15°. FU (n=198) were more likely to be “skilled or semiskilled clerical, sales, service, or trades/crafts” workers and more likely to have a preoperative Bohler’s angle of &lt;0°.</td>
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<tr>
<td>Tejwani et al</td>
<td>293</td>
<td>3 metropolitan academic medical centers, New York, New York</td>
<td>Distal radius fractures</td>
<td>239 (82%) of 293 with any follow-up visit</td>
<td>LTF (n=54) associated with nonoperative treatment and not having surpassed secondary education levels. FU (n=239) associated with operative treatment, postsecondary education, income &gt;$55,000, and higher Physical and Mental Health scores on 36-Item Short Form Survey.</td>
</tr>
<tr>
<td>ten Berg and Ring</td>
<td>335</td>
<td>Level I academic medical center, Boston, Massachusetts</td>
<td>Metacarpal fractures</td>
<td>231 (69%) of 335 with any follow-up visit within 1 month</td>
<td>LTF (n=104) independent risk factors included unmarried status; public, free, or no insurance; unemployed, disabled, or unknown work status; and 5th metacarpal fracture.</td>
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<tr>
<td>Whiting et al</td>
<td>2165</td>
<td>Level I academic medical center, Nashville, Tennessee</td>
<td>Isolated operative orthopedic trauma injuries</td>
<td>1449 (67%) of 2165 with first follow-up visit</td>
<td>LTF (n=717) associated with tobacco use, &gt;100 miles from clinic, government or no insurance, American Society of Anesthesiologists score &gt;2, and fracture of the hip or pelvis.</td>
</tr>
<tr>
<td>Zelle et al</td>
<td>307</td>
<td>Level I academic medical center, San Antonio, Texas</td>
<td>Operative orthopedic trauma injuries</td>
<td>92 (30%) of 307 with all 4 follow-up visits; 225 (73%) of 307 with first follow-up visit</td>
<td>LTF at 6-month visit predicted by male sex, government or no insurance, and tobacco use. Illicit drug abuse was a predictor of noncompliance with any follow-up appointment.</td>
</tr>
</tbody>
</table>

Abbreviations: FU, follow-up compliant; LTF, lost to follow-up.

the emergency department likely involves different factors and levels of acuity that may not be valid for the orthopedic trauma population. Although the general surgery trauma literature has identified demographic risk factors for mortality and functional outcomes, and access to postdischarge services, the reported risk factors for noncompliance with clinic follow-up after discharge remain less consistent. In a recent large study of 1818 general trauma patients at an urban level I trauma center in Fort Worth, Texas, Overton et al reported a clinic follow-up compliance rate of 80%, with the only predictors of compliance being increasing Injury Severity Score, increasing hospital length of stay, and participation in local access to care programs. Although the cumulative literature is not entirely consistent or thorough, these studies begin to elucidate the various clinical and demographic factors associated with noncompliance with postoperative follow-up after orthopedic trauma surgery. The Table provides a summary of the literature on the subject. Importantly, however, none of these studies investigated and reported why patients choose to not attend follow-up appointments, thereby leaving clinicians and researchers to speculate about the underlying reasons. Although the identification of risk factors is important for recognizing those patients at higher risk for noncompliance with follow-up, an understanding of patients’ reasons for failure to follow up is imperative in addressing this issue. Thus, the purpose of the current improvement project was to both characterize clinical and demographic factors and
identify patient-reported reasons for failure to follow up in clinic after orthopedic trauma surgery.

**Materials and Methods**

After submission to the institutional review board at the University of Virginia Health System, it was determined that this study did not require further review. A systematic chart review retrospectively identified all patients who underwent surgery in the orthopedic trauma division of the University of Virginia Medical Center from April 1, 2014, through September 30, 2014. The medical record of each patient was reviewed and data were collected. The patient’s medical record number, date of surgery, surgical procedure, and surgeon were recorded. Further review of the medical record was performed to identify those patients who were scheduled to be seen for routine postoperative follow-up but did not attend the appointment. These patients were the population of interest for this project.

This group of patients was contacted individually using the information in the medical record. Each patient was asked the same group of questions to identify reasons for not attending follow-up. Scheduling of a follow-up appointment was offered during the conversation. Patients who had elected to seek postoperative orthopedic follow-up care from another facility or orthopedist and patients who were deceased were excluded from the final results. Patients may have undergone multiple procedures throughout the time frame of the study but results were recorded per patient.

Patients were asked to identify a primary reason for not receiving follow-up care at the University of Virginia from among the following choices: did not feel the need to be seen and doing well, unaware of follow-up or forgot appointment, unsatisfactory care, or travel and transportation were prohibitive. Patients were asked if any orthopedic follow-up care had occurred at an outside facility. All patients were offered orthopedic follow-up care at the time of contact. The preferred method of contact for appointment reminders was recorded.

The patients who were unreachable via the contact information available in the medical record were sent a letter via the US Postal Service to the address noted in the medical record. Patients were given a 4-week period to respond to the letter by phone, email, or mail before they were considered to be unreachable and lost to follow-up.

The group of patients who did not receive all of the postoperative follow-up care as directed was further reviewed to identify type of surgery, age, race, sex, tobacco use, insurance status, surgical procedure performed, and number of postoperative visits attended. Patients were identified as noncompliant with follow-up if not attending all of the recommended postoperative visits.

Descriptive statistics were used to analyze basic demographic information and to identify common factors among those who did not receive directed follow-up care.

**Results**

A total of 480 patients underwent at least 1 surgical procedure performed by an orthopedic trauma surgeon in the University of Virginia Health System main operating room during the period of April 1, 2014, through September 30, 2014. All of the patients were older than 18 years. At the time of discharge from the hospital, all of the patients but 2 were given a scheduled follow-up visit in the orthopedic surgery outpatient trauma clinic. The 2 who were not provided with a follow-up appointment at the time of discharge were transferred to another inpatient facility on a weekend day.

Forty-one (8.5%) of the 480 patients did not receive or complete the surgeon-recommended postoperative follow-up plan and were deemed lost to follow-up. Of this group, 21 (51.2%) were male and 20 (48.8%) were female. The age range of the patients was 23 to 85 years. Thirteen members of the failure to follow-up group (32%) were not reachable by the previously mentioned attempts to contact. Nineteen patients (46.3%) reported not seeking further follow-up care because of feeling well and not having a need to be seen. Five patients (12%) reported that the distance from their home to the facility was the reason for failure to follow up. Four patients (9.7%) were unaware of the appointment or forgot to schedule a return visit.

Twenty-one (51.2%) of the patients who were lost to follow-up either had no insurance or had Medicaid. Nine (22.0%) patients had Medicare only, and the remaining 11 (26.8%) patients had commercial insurance.

Six (14.6%) of the 41 failure to follow-up patients did, at the time of contact, request that follow-up care be scheduled and it subsequently was scheduled. All of these patients who requested follow-up appointments had attended at least 1 postoperative or follow-up appointment prior to being lost to follow-up. Of the patients who attended zero postoperative or follow-up appointments, none who were contacted requested additional follow-up care.

Forty patients (97.6%) reported the preferred method of appointment reminders to be telephone contact, while 1 patient (2.4%) preferred mail.

In the group of 19 patients who did not follow up owing to feeling well, the average age was 44 years and 63.2% were male and 36.8% were female. Eighteen patients (94.7%) in the group attended at least 1 postoperative visit. None of the patients in this group requested additional follow-up at the time of contact.

In the group of 5 patients who reported travel distance as the reason for not attending the follow-up visit, the average age was 60 years. Females accounted for 80.0% of this group. Sixty percent of this group attended at least 1 postoperative
appointment, while the remaining 40.0% did not return for any follow-up care. One patient in the group (20.0%) did request follow-up care at the time of contact.

The group of 4 patients who were unaware of the appointment or forgot to schedule a return appointment were 75.0% female and had an average age of 49 years. All of these patients had attended at least 1 postoperative appointment, with an average of 2.25 visits per patient. At the time of contact, all 4 members of this group (100%) wanted to schedule follow-up care.

**Discussion**

There is a relative paucity of data evaluating risk factors for noncompliance with clinic follow-up in the orthopedic trauma literature, which is summarized in the Table. Some studies have focused on narrow patient populations such as specific fracture types, making extrapolation to a general orthopedic trauma population difficult. Only a few studies have examined clinic follow-up compliance in a general orthopedic trauma population. In a study of 2165 operative orthopedic trauma patients at a level I trauma center in Nashville, Tennessee, Whiting et al. reported a 66.9% compliance rate with the first postoperative clinic visit. Failure to follow up was significantly associated with tobacco use, distance greater than 100 miles from the clinic, government or no insurance, American Society of Anesthesiologists score greater than 2, and fracture of the hip or pelvis. Age, sex, and race were not significant predictors. In a second study of 307 operative orthopedic trauma patients at a level I trauma center in San Antonio, Texas, Zelle et al. reported a 73.3% compliance rate with the first postoperative clinic visit and a 30% compliance rate with all 4 postoperative clinic appointments at 2 weeks, 6 weeks, 12 weeks, and 6 months. Male sex, tobacco use, and government or no insurance were statistically significant predictors of noncompliance with the 6-month follow-up appointment. Illicit drug abuse was a predictor of noncompliance with any follow-up appointment.

Although the prior literature has attempted to delineate the patient demographics and characteristics that are common among those who are lost to follow-up, there are various findings. The purpose of this study was to evaluate not only the patient demographics, but also the specific reasons given by patients for failing to complete their follow-up. This had not been previously reported in the orthopedic trauma literature. In general, the patient characteristics in this study agree with some of the prior literature in that there was no gender predominance in the lost to follow-up group and the majority of the patients had no or government insurance.

The lost to follow-up rate in the current sample was considerably lower than that reported by Whiting et al. This may reflect a difference in patient population or geographic differences. Level I trauma centers are likely to have considerable variability in their catchment areas, which may influence loss to follow-up.

This study found that the most common reason provided for failing to complete postoperative follow-up was that the patient was feeling well and did not need to be seen. Although this is often hypothesized to be the general motivation, it had not been previously demonstrated. This illustrates that the lack of follow-up often results from a voluntary decision by the patient not to seek further medical care, rather than from a failure of logistics or scheduling to provide the patient with appropriate access.

The callback program made a difference for only a small percentage of patients, as only 6 (14.6%) of the 41 patients who initially failed to follow up elected to schedule a clinic appointment. This low yield from the callback, as well as the results for the patient-reported reasons for failing to follow up, suggests that there is an underlying reason for the patients being lost to follow-up. It illustrates that the patients are making a choice regarding their health status, and have made a decision to not attend their follow-up appointment or seek further care.

However, the callback program did make a difference for 1 group of patients. All 4 (100%) of the patients who were lost to follow-up because of not knowing or forgetting they had an appointment ended up scheduling a clinic visit after the callback encounter. This was a relatively uncommon reason for being lost to follow-up, but in the current study, this group desired additional clinic follow-up. Perhaps a better appointment reminder system would be able to capture these patients and ensure they were aware of their appointments. The current practice in the clinic is to make the next follow-up appointment when checking out from the current clinic visit. Perhaps implementing reminder postcards could ensure that patients are aware of their upcoming appointments.

Although this program had a relatively low yield of scheduled appointments at the authors’ institution, the results may differ at an institution with higher rates of loss to follow-up. The population in this study was a mix of elective and non-elective orthopedic surgeries. The results might differ if these were purely nonelective or emergent orthopedic surgeries.

Discovering patients’ reported reasons for not completing their postoperative clinic follow-up is valuable for addressing this clinical outcomes issue. As large-scale databases become more available and outcomes reporting is further scrutinized, follow-up data may help prevent unnecessary and potentially costly complications. These telephone encounters can provide valuable patient-level characteristics for optimizing patient care and eliminating barriers among those patients who are at risk of being lost to follow-up. Furthermore, there is evidence in the literature that patients who are lost to follow-up have worse outcomes, including
significant symptoms and worse radiologic recovery, than those patients who do attend their follow-up appointments.9

**CONCLUSION**

Loss to follow-up at the authors’ institution (8.5%) was lower than expected compared with prior reports. In this population, the authors found a routine callback program to have a modest effect on improving patient contact and postoperative care. Active patient education prior to discharge regarding the need to keep follow-up appointments may be helpful in monitoring and mitigating complications. Further investigation regarding procedures to improve follow-up is warranted.

**REFERENCES**


