Worker's Compensation: How Do Orthopedic Surgeons Fare?

Eric C. Makhni, MD, MBA, Richard Li, and Charles S. Day, MD, MBA

Abstract

Introduction: Negotiable reimbursement for patients with workers' compensation (WC) has not been investigated previously. Our study investigated characteristics of the revenues (to individual surgeons) associated with these WC patients.

Methodology: All WC patient encounters in our orthopedics department from March 1, 2007 through June 30, 2008 were included. The revenue yield (final payment as percentage of original charge billed) and the total time to payment (time to process bill plus time for payment) were compared according to visit type, subspecialty, insurance payor, and number of Current Procedural Terminology (CPT) codes per encounter.

Results: Clinic visits (n = 816) comprised 65% of total patient encounters, and procedural encounters comprised 35% (n = 436). The overall revenue yield for WC was 49%, compared with 31% for Medicare. Yields for spine procedures (37%) were significantly lower than for other subspecialties, which ranged from 54% to 64% ($P = .002$). Time to payment was higher for procedures than clinic visits (101 vs 62 days, $P<.0001$), primarily due to increased time to post charges. Finally, increased time to payment was associated with increasing number of CPT codes per encounter.

Conclusion: Negotiated revenues from WC are greater than from Medicare but vary according to subspecialty and payor (with spine having the lowest yield). Time to payment displays considerable variation as well, especially in time to post charges.

Worker's compensation (WC) is a unique form of medical reimbursement. In Massachusetts, fees covered by this type of insurance are typically negotiated before payment for procedure and clinic patient encounters. WC is especially relevant for orthopedic surgeons, as it represents 12% of these practitioners' annual revenues.[1] Prior WC studies have focused on the increased costs associated with caring for WC patients compared with non-WC patients[2-4] and on WC patients' poorer medical outcomes compared with non-WC patients.[5,6] Little is known, however, about per-patient revenues associated with WC.

In Massachusetts, and in several other states, WC differs significantly from other insurance mediums because the reimbursement rate is not fixed by a predetermined contract between payer and provider. Instead, a fee agreement can be negotiated for each individual patient encounter, whether it be a procedure or an outpatient visit. Given the negotiable nature of WC, medical provider reimbursement from WC varies significantly. A common belief among medical providers is that payments from WC are higher than those of other standard payers, such as Medicare.

In the study reported here, we quantified revenue on a per-patient-encounter basis—specific to individual surgeons—from WC patients who made orthopedic clinic visits and underwent procedures. We also examined how long it took for these surgeons to receive payment for their services. To assess revenue, we made our primary outcome "yield," defined as the proportion paid of total charges (that is, if a procedure was billed at $100, and the final payment after negotiation was $65, the corresponding yield was 65%). To assess time to payment, we determined number of days between date of service (DOS) and date of payment (DOP). Finally, we combined these 2 outcomes and compared them with simulated Medicare outcomes to determine final "effective yield." Our goal in this study was to compare these outcomes across orthopedic subspecialties, visit types, and insurance types. We hypothesized that yields and time to payment would be higher for WC than for Medicare and would not vary significantly across subcategories.

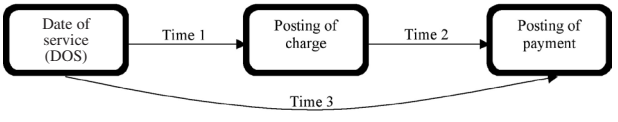

Figure 1. Time points associated with worker's compensation and Medicare payment used in this study.

Dr. Makhni is Resident in Orthopedic Surgery, Columbia Presbyterian Hospital, New York, New York.
Mr. Li is Undergraduate Student, Harvard College, Boston, Massachusetts.
Dr. Day is Associate Professor of Orthopedic Surgery, Harvard Medical School, Boston, Massachusetts, and Chief, Hand and Upper Extremity Surgery, Department of Orthopedic Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts.

Address correspondence to: Charles S. Day, MD, MBA, Department of Orthopedic Surgery, Beth Israel Deaconess Medical Center, 330 Brookline Ave, Boston, MA 02215 (tel, 617-667-2464; fax, 617-667-2155; e-mail, cday1@bidmc.harvard.edu).

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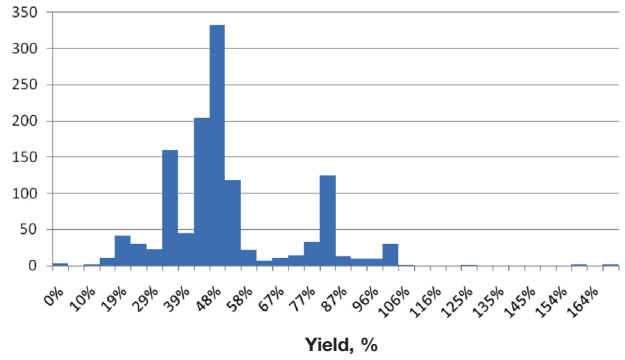

Figure 2. Distribution of worker's compensation revenue yields showed 3 distinct peaks.

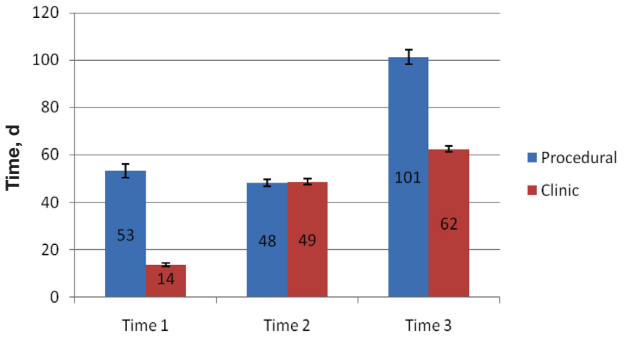

Figure 4. Time to payment for workers compensation procedure and clinic patient encounters.

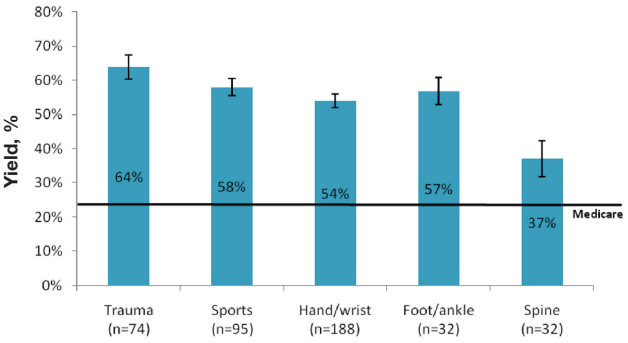

Figure 3. Mean yield of workers compensation procedure encounters by subspecialty. Mean Medicare yield across all subspecialties was 24%.

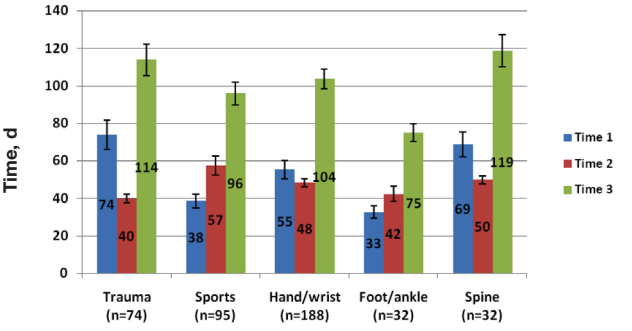

Figure 5. Total time to workers compensation payment by subspecialty.

Materials and Methods

Patients

Included in this study were all WC patient encounters between March 1, 2007 and June 30, 2008 in the Department of Orthopaedic Surgery at our institution, an academic medical center in Massachusetts. Prior institutional review board approval was obtained to analyze financial information related to patient care. All financial information related to patients in our department was managed by a third-party billing service. We requested the financial records of all WC patients. Only those patient encounters in which both charge and payment were posted during the study period were included. Demographic data for each patient (including age, sex, surgeon name, and insurance carrier) were noted, as was relevant financial information (related to payments and charges).

Determining Revenue Yield

For each WC patient encounter, charge and payment received were noted. The corresponding yield was equal to payment divided by charge, expressed as a percentage. Yields were calculated for each Current Procedural Terminology (CPT) billing code, as opposed to each patient. For example, for a patient who underwent a surgery in which 3 CPT codes were billed, a revenue yield was determined for each code separately. Yields were then segregated by visit type (clinic visit vs procedure, number of CPT codes per visit), subspecialty (surgeon specialties included trauma, sports, hand/wrist, foot/ankle, and spine), and insurance carrier. Only subspecialties in which 10 or more (WC-related) procedures were performed during the study period were included.

Determining Time to Payment

To assess time to payment for each patient encounter, we measured 3 time periods (Figure 1). Time 1 was number of days between DOS (date of clinic visit or surgery) and date of charge (DOC; date charge was posted by third-party billing service and sent to payers). Time 2 was number of days between DOC and DOP. Time 3 was total time to payment (number of days between DOS and DOP, or sum of the first 2 periods, such that time 1 + time 2 = time 3). As with revenue yield, these time points were compared regarding visit type, subspecialty, and insurance carrier.

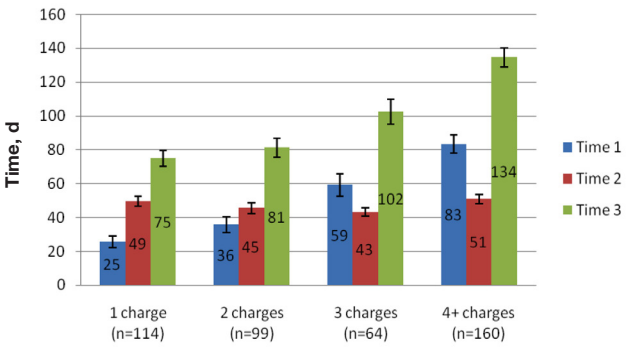

Figure 6. Total time to workers compensation payment by number of charges (Current Procedural Terminology code) per procedure encounter.

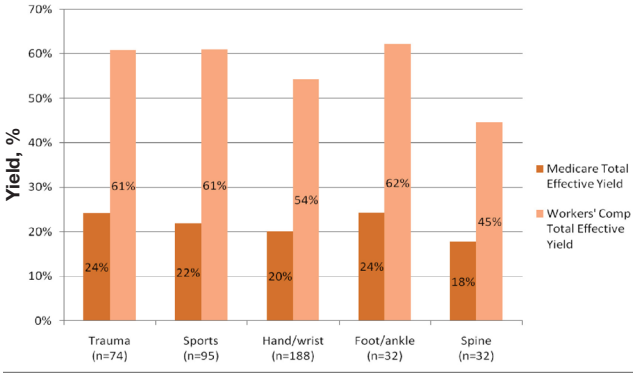

Figure 7. Total effective workers compensation and total effective Medicare yields by subspecialty.

At our institution, charge posting (time 1) is a multistep process. After a patient encounter, an orthopedic surgeon inputs CPT codes into the electronic medical records system and uploads the patient note (dictated clinical or operative note) for the encounter. Once the codes and the note are in the system, the billing director cross-checks them to ensure that the encounter was properly coded and sends the list of codes to a third-party coding company. The coding company verifies the accuracy of the codes with respect to the patient note and passes the list to a third-party billing company, which "posts" the charges.

When the surgeon's billing director notes a discrepancy on initial receipt of CPT codes, she refers them back to the surgeon or corrects them herself. When the coding company notes a discrepancy, it returns the codes to the surgeon's billing director, and she or the surgeon makes the correction.

Negotiations

Our institution performs elective and emergency surgeries for WC patients, and the fees for each type are negotiated. In elective cases, fees typically are negotiated before surgery. In emergency cases, negotiations occur afterward, and therefore time 1 is not affected. However, any delay in reaching an agreement and collecting payments lengthens time 2.

All administrative personnel involved in negotiations—including surgical schedulers and administrative assistants—follow a centralized protocol and are individually trained by the billing director.

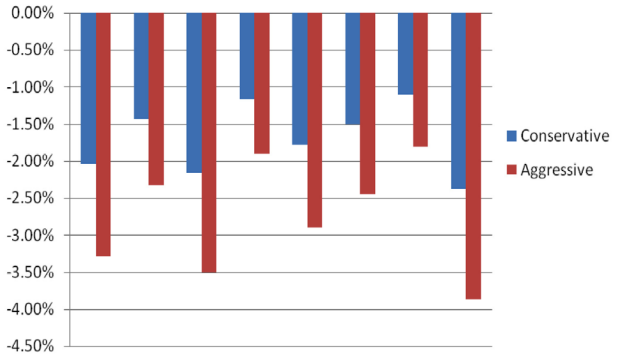

Figure 8. Conservative and aggressive estimates for value loss to individual surgeon, considering time required to receive worker's compensation payment.

Comparing With Medicare

CPT codes were used to determine the comparable Medicare reimbursement for our patient set. We constructed a "simulated" patient set, incorporating the same selection of CPT codes and dates for patient encounters in our WC study population. At our institution, patient services are billed the same charge amount regardless of insurance type. This allowed us to construct a comparable "Medicare yield" for our patients using the standard Medicare reimbursement rate. If a procedure is billed at $100, and revenue (after negotiation) from WC is $65, while Medicare reimbursement is $35, the yields for each will be 65% and 35%, respectively. Year-matched CPT Medicare reimbursements were determined according to 2007 and 2008 Medicare physician fee schedules provided by the Centers for Medicare & Medicaid Services. For multi-CPT encounters for a single DOS (1 surgery with 3 CPT codes), we modified the Medicare reimbursements according to the revenue contract our institution has with Medicare. Our institution receives 100% Medicare reimbursement of the first charge, 50% of the second charge, and 25% of each subsequent charge. Therefore, by reconstructing our patient set and replacing WC reimbursement with Medicare reimbursement—according to CPT-matched payments and the protocol for multi-CPT encounters—we constructed analogous Medicare revenue yields.

Comparing Effective Yields of Worker's Compensation and Medicare

To determine the effective yields of revenue payments, both revenue and time to payment were factored in. Revenues were "discounted" according to the time-value-

of-money principle,[7] which states that $1 today is worth more than $1 in the future (Appendix). To discount these revenues, we chose an interest rate of 6%, which represents a modest return on investment (certificate of deposit, online savings). The revenues were discounted between DOS and DOP (time 3). Total effective WC yield was calculated by discounting each payment according to the 6% interest rate over time to payment, summing the discounted payments, and dividing by total charges. For Medicare, time to payment of 6 weeks was assumed, in accordance with institutional regulations. WC effective yield was divided by the corresponding Medicare effective yield to determine the "WC multiplier," the ratio of total WC yield to total Medicare yield.

In addition, we calculated "value loss" to each surgeon, taking into account time to payment for the surgeon's WC patients. As already described, an interest rate of 6% was used to discount this revenue (conservative scenario). A 10% rate (aggressive scenario), representing a moderate target return on investment for an equity investor (stock market), was also used. This determined the effective value loss as a result of time to payment for WC patients. Effective revenue was calculated as discounted revenue as a percentage of total revenue, and value loss was calculated as 100% minus this effective revenue. For instance, if it took a surgeon 1 year to obtain the $100 payment for a surgical procedure, the surgeon's effective revenue yields would be $94 (conservative) and $90 (aggressive). Corresponding value losses would be –6% (conservative) and –10% (aggressive). Conservatively, this surgeon would effectively lose 6% of the revenue because of the time delay.

Statistical Methods

As mentioned, data for the 2 primary outcome variables, revenue yield and time to payment, were stratified by visit type (clinic visit vs surgical procedure, number of CPT codes per visit), orthopedic subspecialty, and insurance carrier. To assess differences in mean yield and time to payment between clinic and procedure visits, we performed a *t* test. One-way analyses of variance (ANOVAs) were conducted to analyze differences in mean yield and time to payment among the various orthopedic subspecialties and insurance carriers. All statistical analysis was done with StataSE 10 software (Stata, College Station, Texas).

Results

Assessing Yield

We examined 1252 WC patient encounters—816 (65%) for nonprocedure (clinic) visits and 436 (35%) for procedure visits. Procedure visits comprised 87% of total revenues during the study period, compared with a 13% contribution by clinic visits. Overall mean (SD) yield for all patient encounters was 49% (20%). Graphically displayed, the yield followed a unique distribution pattern with 3 distinct peaks, centering at yields of approximately 33%, 48%, and 80% (Figure 2). The yield for clinic visits was 45%, and the yield for procedure encounters was 56% ($P<.001$). The analogous mean Medicare reimbursement yield for all encounters was 31%, significantly ($P<.001$) less than that of WC reimbursement (49%). For procedure encounters, the Medicare yield was 24%, which is also significantly ($P<.001$) lower than the corresponding WC yield.

WC claims were then stratified into 5 subspecialty categories: trauma, sports, hand/wrist, foot/ankle, and spine. Hand/wrist procedures comprised 45% of all the WC procedure encounters, followed by sports (22%), trauma (17%), foot/ankle (8%), and spine (8%). Among these WC procedure encounters, trauma had the highest mean yield (64%), followed by sports (58%), foot/ankle (57%), and hand/wrist (54%). Spine had the lowest yield (37%, $P = .002$; Figure 3). All 6 potential pairing combinations (pairwise contrasts) of trauma, hand/wrist, sports, and foot/ankle showed no significant ($P>.05$) differences, indicating that the differences in WC yield among subspecialties arose almost entirely from the low yield of spine procedures. Mean Medicare yield across all subspecialties was 24%.

Yields by individual insurance carrier were assessed as well. Six carriers had at least 50 encounters each, or 599 encounters (48%) out of the total of 1252. These carriers' yields ranged from 43% to 54% ($P = .04$).

The final analysis regarding yield dealt with the effects of the number of charges per actual patient encounter (multiple CPT codes associated with a single DOS). Only procedure visits were included in this analysis, as these encounters had the potential for multiple charges. Of the 436 procedure encounters, 114 (26%) were associated with 1 CPT code, 99 (23%) with 2 codes, 64 (15%) with 3 codes, and 160 (37%) with 4 or more codes. The yield for procedures with 1 charge was 57%; 2 charges, 55%; 3 charges, 69%; and 4 or more charges, 50%. The difference between these charges was statistically significant, with reimbursement for patients billed 3 charges in 1 encounter being the highest.

Assessing Time to Payment

As mentioned, times 1, 2, and 3 were measured (Figure 1). Mean total time to payment was 76 days (time 3), with mean time 1 of approximately 27 days and mean time 2 of approximately 48 days. Total time to payment (time 3) was significantly ($P<.0001$) longer for procedure encounters (101 days) than for clinic visits (62 days) when considered separately (Figure 4). With the individual components broken down, time to post a charge (time 1) appeared longer in procedure encounters, whereas time from charge posting to payment (time 2) was roughly the same. Therefore, it took longer to receive payment for procedure encounters primarily because time to post charges was longer. The difference was approximately 40 days.

We then examined time to payment by subspecialty (Figure 5). For procedure encounters, total time to payment (time 3) ranged from 75 to 119 days—a statistically significant ($P = .03$) variation. The shortest time was for foot/ankle (75 days), the longest for trauma (114 days) and spine (119 days), and in the middle were sports (96 days) and hand/wrist (104 days). Again, large differences were found in time to post charge (time 1), which ranged from 33 days for foot/ankle to 74 days for trauma ($P<.0001$).

Time to payment was also determined with respect to number of different charges (CPT codes) per patient encounter. Total time to payment (time 3) was longer when more charges were being processed, with time 1 accounting for most of the increase (there was only a small difference in time 2). Therefore, each additional CPT code per DOS was associated with more time to post charges ($P<.0001$; Figure 6).

As with yields, insurance carriers were assessed with respect to time to payment. Again, carriers with 50 encounters (procedure, nonprocedure) or more were included. Total time to payment (time 3) ranged from 55 days to 99 days ($P<.001$).

Determining Effective Yield

All yield results were calculated with respect to revenues and charges without incorporating the time value of money, which involves the time to payment as well as a chosen "discount rate" (interest rate). When a 6% interest rate was applied, the foot/ankle subspecialty had the highest total effective WC yield (62%) and spine had the lowest (45%) (Figure 7). The overall effective yield of procedure payments was 57% for WC, compared with 21% for Medicare. From these values, we calculated an overall procedure WC multiplier (ratio of WC effective yield to Medicare effective yield) of 2.64 times Medicare and an overall total multiplier value of 2.30 times Medicare (when including both clinic encounters [which had a multiplier value of 1.25] and procedure encounters). For the subspecialties, sports (2.79) had the highest multiplier, followed by hand/wrist (2.70), trauma (2.56), and foot/ankle (2.52). Spine had the lowest WC multiplier (2.24).

Finally, loss of reimbursement value—arising from longer total time to payment—was calculated for each surgeon. As mentioned, 2 different scenarios were used when simulating the cost of capital ("interest rates"): conservative (6%) and aggressive (10%). Our practice included 9 surgeons who performed 10 or more cases. Total time to payment (time 3) ranged from 60 to 150 days, corresponding to a percent revenue loss ranging from 1.1% to 2.4% in the conservative scenario and from 1.8% to 3.9% in the aggressive scenario (Figure 8). Proportion of value loss was not associated with case volume. Total loss to the department was 1.66% (conservative 6% interest rate) and 2.70% (aggressive 10% interest rate).

Discussion

In Massachusetts, WC is a unique source of revenue for physicians and hospitals, as it is the only form of insurance in which the reimbursement rate is not predetermined by contract and is instead negotiated on a per-case basis. Our study focused on 2 aspects of this reimbursement system: percent "yield" and time to payment. We found that the yields from WC cases were significantly higher than those from Medicare cases and that these yields followed a distribution pattern with 3 distinct peaks, indicating that negotiations generally have 1 of 3 outcomes: (1) insurance pays at the Medicare reimbursement rate of 33%; (2) insurance pays at the postnegotiation, provider target-rate (assuming the full charge is not reimbursed), which in our department is set at approximately 80% of the charge; and (3) insurance pays a "compromise" rate of 49%. Further, we found significantly lower yields for spine/back cases than for the other subspecialty cases. In addition, we found that time to collect payment was significantly longer for procedure cases than for outpatient visits and that having additional CPT codes per patient encounter increased time to payment. Time to payment appeared to be affected most by time required to post charges. We also estimated that, after discounting payments for value loss due to longer time to payment, revenue yield from WC patients was 2.30 times higher than Medicare revenue yield across all encounters and 2.64 times higher when considering procedure encounters only. Last, we found that, factoring in time value of money in WC cases, longer time to payment meant individual surgeons in our practice took revenue losses of up to 4%.

To our knowledge, no other studies have focused on the variable reimbursement aspect of WC insurance. WC studies have instead focused more on the costs associated with care of these patients. Brinker and colleagues[2] found that practice expense per episode of care averaged $189.59 for all patients but was much higher for WC patients ($298.85). This increased cost of care was due in part to costs related to collection and billing efforts as well as dispute resolution. These findings support earlier data, reported by Bednar and colleagues,[3] that WC patients had significantly higher medical costs for a variety of reasons, including increased number of therapy and postoperative visits and "nonapparent" costs associated with payment collection efforts. A previous study in our department found that management of WC patients for hand/wrist pathology was associated with higher rates of surgery, longer wait times for surgery, increased likelihood of undergoing surgery after the first visit, and increased likelihood of undergoing electromyography when compared with non-WC patients.[8] These results are consistent with other studies demonstrating increased costs associated with WC patients.[2,3]

Our calculation of the ratio of WC effective yields to Medicare effective yields (WC multiplier) is particularly significant in the context of findings from Brinker and colleagues,[2] who found a considerable difference in prac-

tice expenses per episode of care between WC patients ($298.85) and Medicare patients ($148.01), a factor of 2.02 times. This difference was even more pronounced in episodes that involved operative treatment, with care of WC patients costing $455.90 compared with $222.70 for Medicare patients. The literature includes no other consideration of the revenues associated with the cost difference seen in this study. We showed that WC revenue yield exceeded Medicare revenue yield, after discounting payments for value loss due to longer time to payment, by a factor of 2.30 overall and 2.64 for procedure visits at our institution. This suggests that higher reimbursement for WC patients may offset their higher expenses relative to Medicare patients.

Several other important points can be taken from this study. We found that revenue yield was lower for spine patient encounters than for other subspecialty encounters. We have 2 possible explanations for this finding. First, people negotiating on behalf of the spine surgeons in our practice—including the surgeons themselves—may be overall less aggressive when pursuing WC reimbursement. However, all personnel involved in negotiations received identical training from the billing director and were given centralized protocols. The second possible explanation is that the multi-CPT profile of many spine cases may leave them vulnerable to "cascaded billing" practices of insurance payers, which, like Medicare, pay less for additional CPT codes. Understanding the exact cause of lower spine revenue yields will help orthopedic care managers to identify and minimize inefficiency.

Another important finding from this study is that time to payment was significantly longer for procedure encounters than for outpatient visits and, more important, increased significantly when multiple procedures (as measured by CPT codes) were involved in a single patient encounter. In Massachusetts, "clean claim" payments are mandated to be made within 45 days. Nevertheless, for procedures in this study, mean time to payment was 101 days. In both cases, time 1 was the main contributor to longer time to payment (time required to post charges). Assuming immediate, error-free reporting of CPT codes and patient note for a procedure, total time to post charges should take only 2 or 3 business days. In this study, that time was far exceeded, which points to a significant inefficiency in posting, with surgeon, billing personnel, and third-party coding company spending several days going back and forth to determine the correct, negotiated set of CPT codes. This situation is supported by the finding that time 1 was longer when there were more CPT codes per encounter (and therefore a correspondingly higher likelihood of making errors in CPT reporting). Delayed fee agreement negotiations also may play a role in longer time to payment, but this period (time 2) showed relatively little variation in subgroup analysis.

In our calculation of time value of money, we found that longer time to payment can negatively offset revenues for WC patients. As Figure 8 shows, longer time to payment results in a potential revenue loss of up to 4% for surgeons in our practice and 3% for the department as a whole. Nonapparent factors (including increased efforts of billing personnel and surgeons to collect payments) likely add to the revenue lost because of delay.

This study has limitations. Patients were from a single department at a single institution in a single state, so reimbursement results and time to payment may differ from those of patients in other US regions. In addition, the reimbursement efforts of the physicians and administrative staff may not be reflective of other practices that provide care for WC patients. However, both patient type and surgeon subspecialty encompassed a wide variety of orthopedic pathology, thus limiting selection bias. Further, this study examined reimbursement only in isolation, whereas a new study examining both the costs and revenue from a single WC patient set could quantitatively determine if increased WC revenue is "worth" the additional costs noted in the literature.

For orthopedic surgeons in Massachusetts, WC reimbursement is unique because of its negotiations-based structure. Although yields are higher from WC than from typical payers, such as Medicare, more study is needed to determine if WC remains an attractive reimbursement option given its long time to payment, increased collection efforts, and higher practice expenses. Centralizing the reimbursement process (negotiating, checking CPT codes, monitoring claim status) may help increase revenue yields and decrease time to payment, offsetting the higher costs associated with care of WC patients. This outcome may be particularly true for spine procedures, which, compared with other subspecialty procedures, have a lower revenue yield.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

References

1. Watkins-Castillo S. *Orthopaedic Practice in the US 2005–2006: Final Report.* Rosemont, IL: American Academy of Orthopaedic Surgery, Department of Research and Scientific Affairs; June 2006.
2. Brinker MR, O'Connor DP, Woods GW, Pierce P, Peck B. The effect of payer type on orthopaedic practice expenses. *J Bone Joint Surg Am.* 2002;84(10):1816-1822.
3. Bednar JM, Baesher-Griffith P, Osterman AL. *Clin Orthop.* 1998;(351):74-77.
4. Baker LC, Kreuger AB. Medical costs in workers' compensation insurance. *J Health Econ.* 1995;14(5):531-549.
5. Harris I, Mulford J, Solomon M, Gelder JM, Young J. Association between compensation status and outcome after surgery: a meta-analysis. *JAMA.* 2005;293(13):1644-1652.
6. Hou WH, Tsauo JY, Lin CH, Liang HW, Du CL. Worker's compensation and return to work following orthopaedic injury to extremities. *J Rehab Med.* 2008;40(6):440-445.
7. Berk J, DeMarzo P. *Corporate Finance.* Boston, MA: Pearson Education; 2007.
8. Day CS, Alexander M, Lal S, Horton H, Ahn CS, Pauyo T, Rozental TD. Effects of workers' compensation on the diagnosis and surgical treatment of patients with hand and wrist disorder. *J Bone Joint Surg Am.* 2010; 92(13):2294-2299.

Appendix. Calculating Time Value of Money

The principle of time value of money can be used to value monetary transactions that occur in the future, according to today's value. For example, $100 received 1 year from now is worth less than $100 received today because money received now can be invested over the same period. This represents an opportunity cost of receiving money in the future. The precise cost can be calculated according to the time valuation of money. For example, what is the value, in today's dollars, of $100 received 1 year from now, assuming a 5% interest rate? In other words, what is the "present value" (PV) of $100 received 1 year from now, according to a 5% interest rate? Using the formula PV = x/(1 + r)^t—where x is dollar amount, r is interest rate, and t is time in years—the present value is 100/(1 + 5%)^1, or $100/1.05 = $95.24. To obtain the value over a period shorter than 1 year, we prorate the interest rate according to the number of days elapsed. For example, to calculate the present value of $100 received 20 days from now, given a 5% annual interest rate, we calculate the effective interest rate over a 20-day period—which requires determining the proportion of the annual interest rate (of 5%) applied to the 20-day period. That proportion is 20/365, or 0.055. Therefore, to discount $100 by 5% over a 20-day period, we calculate 100/((1 + 5%)^(20/365)), or $99.73.

In this study, we calculated the present values of all the revenues from WC patients on the basis of time to payment. In other words, fees were decreasing in "worth" as increasingly more time elapsed before payments were made. Dividing these present values by the original charges allowed us to calculate the effective yields of the payments. We also applied the concept of time value of money to individual surgeon salary. In both the conservative and aggressive scenarios, we discounted the surgeon's revenues from WC patients by the mean amount of time it took to receive payment. The difference between total payments and present values was then divided by total revenues, equating to "values lost" by each surgeon.

This paper will be judged for the Resident Writer's Award.