Hidden Burdens of Orthopedic Injury Care: The Lost Providers

Bruce H. Ziran, MD, Mary-Kate Barrette-Grischow, MA, MPH, and Thomas Hull, BA

**Background:** There are no previously known studies on the effects of orthopedic trauma on informal caregivers despite rich literature in other areas of caregiving. In this prospective study, we characterize personal and socioeconomic impact on orthopedic trauma caregivers.

**Methods:** Ninety-nine subjects were given the Caregiver Burden Scale and an original survey measuring emotional, employment, and socioeconomic burden. Demographic, patient injury, and treatment data were also collected.

**Results:** Seventy percent of caregivers were female family members of the patient. Fifty-four percent experienced substantial disruption to social life and emotional stress. Fifty-one percent spent more than 21 hrs/wk caregiving postinjury. Before/after injury time spent caring for the patient was statistically significant (p < 0.01). Many caregivers experienced employment stress; 8% quit their jobs. Before/after injury employment stress was statistically significant (p < 0.01). Caregivers also expressed considerable financial stress.

**Conclusions:** Socioeconomic impacts related to caregiving experiences extend beyond the clinical care of the patient with caregivers facing extensive stress, financial drain, and employment difficulties. Understanding the complex nature of caring for orthopedic patients may assist in connecting patients and caregivers to the appropriate services and further improve patient outcomes.

**Key Words:** Caregiver, Informal caregiver, Caregiver burden, Orthopedic trauma.


There is considerable literature describing orthopedic trauma outcome studies regarding functional disability, depression levels, and quality of life measures. However, these analyses do not measure the residual effects on family members that take the role of caregiver to the orthopedic patient. Understanding the impact of a potentially debilitating fracture and subsequent treatment on the patient’s caregiver and the consequences to his/her psychological and socioeconomic well-being can lead to better posttraumatic counseling by primary care physicians, multidisciplinary approaches to treatment and rehabilitation, and careful consideration of the needs of family members or primary caregiver or both. Occurring against the backdrop of possible preexisting medical conditions, the financial and emotional cost to the individuals and their families may be extremely high.

Orthopedic surgical techniques are advancing rapidly and outcomes may appear better from the procedural standpoint. However, the “end result” of orthopedic care does not typically measure parameters such as personal and economic loss or changes in relationship or living arrangements. There is a need to change the definition of success for orthopedic procedures. A recent study in the *Journal of Bone and Joint Surgery* found that long-term lower extremity (LE) injury outcomes were still significantly below age appropriate norms across injury types, severity, and surgical procedures. The study concluded that patient characteristics outside the medical realm, such as available social support, had to be examined more closely than is the traditional norm to understand and begin to attain better functional outcomes.

The foremost element of support for the orthopedic trauma patient is the caregiver. Caregivers of these patients are beset with difficulties since management and rehabilitation for orthopedic injuries is challenging and little research exists regarding how to support these patients and their families so that optimal clinical outcome is achieved. Also the shift in the healthcare industry from longer inpatient hospitalizations to the ambulatory care setting has resulted in the strain placed on a patient’s family and other loved ones. This two-fold punch creates an environment ripe for the overburdening of the caregivers. This potential overburdening may result in negative physical, mental, emotional, and social outcomes.

The purpose of this study is to examine the emotional and socioeconomic impact of caring for orthopedic patients over time.

**Patients and Methods**

A prospective cohort of participants were screened at the clinic of a single orthopedic trauma surgeon. Target subjects were caregivers of patients with orthopedic injuries who were hospitalized at a regional level I trauma center. Caregivers of patients with head or spinal cord injuries or both were excluded from the study, because we felt the magnitude of care for patients without cognitive function or motor control would be overwhelming compared with the chosen study group. Approval for the study was obtained from the hospital’s Institutional Review Board. A member of the research staff or the clinical nurse coordinator screened 137 caregivers of orthopedic trauma patients at the orthopedic clinic during a 12-month collection period. There were 99 subjects who

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The Caregiver Burden Scale (Montgomery et al.) was given to participants as well as an additional 40-question survey developed by the authors of this article at first clinical visit post-injury (usually 2–4 weeks after fracture) (Fig. 1). The Caregiver Burden Scale is used to determine the amount of subjective stress burden, subjective demand burden, and objective burden. Subjective stress burden is defined as the emotional effects of caregiving obligations (i.e., tension in the caregiver’s life), whereas subjective demand burden is the perception of the demands of caregiving responsibilities (i.e., caregiver feels manipulated by the dependent patient). Finally, objective burden is the perceived intrusion that caregiving tasks have on the tangible facets of the caregiver’s life (i.e., time for recreation).4

The additional survey measures levels of personal and socioeconomic burden, as well as some demographic information of interest and some clinical questions such as bone injured and date of injury. Caregivers were asked questions concerning the impact that care has on time (temporal burden), employment, and finances. Caregivers reported the amount of time spent caring for the patient before injury, after injury, and follow-up. Employment interference and financial strain were also evaluated in this manner.

Follow-up occurred at a minimum of 6 months and no longer than 9 months after completion of the first survey to assess changes over time and identify caregivers of patients with negative outcomes. Negative outcomes were defined as any situation in which there was an institutionalization, re-injury, breakdown in the caregiver/patient relationship, or death. The initial questionnaire was used to contrast caregivers of negative outcome patients with the other subjects to identify predisposing burden characteristics that may be potential predictors of unfavorable outcomes.

Statistical analysis was completed using SPSS (SPSS, Chicago, IL). Descriptive statistics including frequency distributions and percentages were calculated. Univariate and multivariate analysis of outcome variables with demographics, clinical variables, and moderators of outcome (social and economic variables) was done. Nonparametric inferential statistics were calculated using a Wilcoxon’s signed rank test for paired sample measures for changes over different time periods, and Mann-Whitney U tests for independent samples. Caregivers were stratified into groups by the patients’ region of injury: upper extremities (UE); LE; and both upper and lower extremities (U/LE). Caregivers and patients were also stratified into groups by age: young (15–39); mid-age (40–64); old (65+).

RESULTS

Patient and caregiver demographic information is summarized in Figures 2 and 3. Notably, there is an approximately 2:1 female to male ratio of caregivers and a near 3:1 ratio of LE to UE and U/LE. Also 58% of caregivers were employed while trying to balance the roles of providing care to the patient.

Survey Results

Six percent provided more than 21 hrs/wk of care to patients before fracture(s). However, after orthopedic trauma, 50.5% of caregivers were spending more than 21 hr/wk caring for the patient, and 27% spent between 6 hr/wk and 20 hrs/wk fulfilling caregiving roles. The mean amount of time spent caring for the patient increased significantly from 1.8 hr/wk to 5.0 hrs/wk in the time frame after the injury compared with before the injury ($p < 0.01$). Twenty-five percent of caregivers report a small amount of interference with employment after injury; 20% reported a great amount of interference with job responsibilities; and 8% of caregivers were forced to quit their jobs because of caregiving duties. There was a significant increase in the mean level of employment burden from 1.2 to 2.0 before injury to after injury ($p < 0.01$). After assuming care of the patient, 29% of subjects experienced a small amount of financial burden; 13% reported a moderate amount of financial stress; and 26% expressed significant financial trouble in which a lifestyle change (i.e., disruption in housing) was necessary to continue their role as caregiver. The mean amount of financial burden increased significantly from 1.31 to 2.55 in the time frame after the injury compared with before the injury ($p < 0.001$).

LE and combination U/LE injuries were associated with longer time spent caring for the patient, higher financial burden, and greater employment interference. Thirty-three percent of caregivers spent more than 21 hrs/wk caring for the patient after a UE injury compared with 53% after an LE and 54% after a U/LE. Eight percent reported a large amount of employment interference after a UE compared with 18% after an LE and 38% after a U/LE. Last, 27% of LE and 31% of U/LE caregivers reported significant financial burden in contrast to only 17% of those assisting patients with UE injuries.

The Caregiver Burden Scale showed 54% of caregivers experienced a substantial disruption of their social life; 54%...
Orthopaedic Trauma Services – Caregiver Questionnaire

PLEASE PRINT LEGIBLY

1. Your Name:________________________ Your Date of Birth:__________ Sex (M/F):__________

Your Address (Street):______________________________________________________________

City:________________________ State:________________________ Zip:________________________

Your Phone Number: (______)_______-_______________________________

2. Patient’s Name:____________________ Patient’s Date of Birth:__________ Sex (M/F):__________

3. Date Questionnaire Completed:_____/_____/_______

4. Please fill in below the type of injury, treatment, and dates:

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<thead>
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<th>INJURY</th>
<th>Date of Injury</th>
<th>TREATMENT</th>
<th>Date of Treatment</th>
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5. How long have you been taking care of the patient for the injuries listed above?

Less than 6 months  □  19 months to 24 months  □
6 months to 12 months  □  25 months to 30 months  □
13 months to 18 months □  Greater than 30 months  □

6. I am the patient’s__________ (please check the box that best fits)

Mother  □  Spouse  □
Father  □  Granddaughter  □
Daughter □  Grandson  □
Son  □  Friend  □
Other (please specify)  □

7. How many children does the patient have? __________

8. What is the highest level of education YOU have completed?

Some high school or less  □  College degree  □
High school diploma or GED □  Graduate or professional degree □
Some college or trade school □

Fig. 1. Orthopaedic Trauma Services Caregiver Questionnaire with Caregiver Burden Measure.
9. Which of the following best describes your employment status?

- Employed full-time
- Employed part-time
- Unemployed
- Retired due to age
- Retired due to disability

10. After hospital discharge the patient was sent to:

- His/Her own home
- My home
- Nursing Home
- Rehabilitation Center
- Assisted Living Center
- Other (Please specify):

11. Which of the following best represents the amount of time you spent caring for the patient BEFORE his/her injury?

- No care given before the injury
- Less than 2 hours/week
- 2-5 hours/week
- 6-10 hours/week
- 11-20 hours/week
- Greater than 21 hours/week

12. Which of the following best represents the amount of time you spend caring for the patient NOW?

- No care given after the injury
- Less than 2 hours/week
- 2-5 hours/week
- 6-10 hours/week
- 11-20 hours/week
- Greater than 21 hours/week

13. Which of the following best describes how the care of the patient interfered with your employment BEFORE the injury?

- No interference
- A small amount of interference
- A great amount of interference
- I had to quit my job due to the amount of care needed
- I was not employed six months before the injury

14. Which of the following best describes how the care of the patient interferes with your employment NOW?

- No interference
- A small amount of interference
- A great amount of interference
- I had to quit my job due to the amount of care needed
- I have not been employed during the time specified

15. How much of a financial impact was the care of the patient to you BEFORE the injury?

- None
- Small (disposable income only: gas, spending money, etc.)
- Moderate (leisure money, no vacation money, etc.)
- Significant (lifestyle change: clothing, food, housing, etc.)
- Crisis (home liquidation, asset loss, bankruptcy, etc.)
16. How much of a financial impact is the care of the patient to you NOW?

None ☐
Small (disposable income only: gas, spending money, etc.) ☐
Moderate (leisure money, no vacation money, etc.) ☐
Significant (lifestyle change: clothing, food, housing, etc.) ☐
Crisis (home liquidation, asset loss, bankruptcy, etc.) ☐

The following statements exhibit how caregivers sometimes feel. Please check the box that best fits your experience: never, rarely, sometimes, frequently, or nearly always. There are no right or wrong answers.

Skip any questions that do not apply.

17. I feel that I receive enough support from the hospital and hospital staff.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

18. I feel that I receive enough support from the doctor and staff with regard to the care of the patient.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

19. I feel that the patient’s insurance carrier is has been supportive.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

20. I feel my physical health has been getting worse since becoming the patient’s caretaker.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

21. I visit my family physician when I am not feeling well.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

22. I feel that the person I am caring for appreciates me.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

23. I feel that taking care of the patient brings fulfillment to my life.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

24. My family helps me care for the patient.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

25. I feel I have lost control of my life since becoming the caregiver to the patient.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

26. I feel that I have less money available since becoming the caregiver to the patient.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

27. I feel I do not do as much for the patient as I should.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐

28. I fear not being able to continue caring for the patient.
   Never ☐  Rarely ☐  Sometimes ☐  Quite Frequently ☐  Nearly Always ☐
of caregivers felt considerable emotional stress related to caregiving responsibilities; 13% found their responsibilities too demanding; and 10% felt significant levels of all three aforementioned categories of burden. Responses stratified by hemisphere of injury are as follows: 8% of UEs, 61% of LEs, and 61% of U/LEs experienced interference in their social

**Community-Based Social Support Survey**

Please check the box that best answers or describes your level of agreement with the following statements:

33. The hospital provided information about how to apply for home delivered meals/“meals on wheels” for the patient.
   - Yes □
   - No □

34. The patient or someone (any participating caregiver) applied for home delivered meals/“meals on wheels.”
   - Yes □
   - No □

35. The application process for home delivered meals/“meals on wheels” is simple.
   - Disagree □
   - Somewhat agree □
   - Agree □
   - Strongly agree □
   - Don’t know □

36. The hospital provided information about how to apply for home energy assistance (i.e. HEAP) for the patient.
   - Yes □
   - No □

37. The patient or someone (any participating caregiver) applied for home energy assistance (i.e. HEAP).
   - Yes □
   - No □

38. The application process for home energy assistance is simple.
   - Disagree □
   - Somewhat agree □
   - Agree □
   - Strongly agree □
   - Don’t know □

39. The hospital provided information about transportation assistance for the patient.
   - Yes □
   - No □

40. The patient or someone (any participating caregiver) applied for transportation assistance.
   - Yes □
   - No □

41. The application process for transportation assistance is simple.
   - Disagree □
   - Somewhat agree □
   - Agree □
   - Strongly agree □
   - Don’t know □

42. The hospital provided information about adult daycare.
   - Yes □
   - No □

43. The patient or someone (any participating caregiver) applied for adult daycare.
   - Yes □
   - No □
44. The application process for adult daycare is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

45. The hospital provided information about respite care (assistance for caregivers).
   Yes □ No □

46. The patient or someone (any participating caregiver) applied for respite care.
   Yes □ No □

47. The application process for respite care is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

48. The hospital provided information about prescription drug assistance.
   Yes □ No □

49. The patient or someone (any participating caregiver) applied for prescription drug assistance.
   Yes □ No □

50. The application process for prescription drug assistance is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

51. The hospital provided information about chore/housekeeping assistance.
   Yes □ No □

52. The patient or someone (any participating caregiver) applied for chore/housekeeping assistance.
   Yes □ No □

53. The application process for chore/housekeeping assistance is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

54. The hospital provided information about food assistance/food stamps.
   Yes □ No □

55. The patient or someone (any participating caregiver) applied for food assistance/food stamps.
   Yes □ No □

56. The application process for food assistance/food stamps is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

57. The hospital provided information about legal assistance. Yes □ No □

58. The patient or someone (any participating caregiver) applied for legal assistance.
   Yes □ No □

59. The application process for legal assistance is simple.
   Disagree □ Somewhat agree □ Agree □ Strongly agree □ Don’t know □

60. The hospital provided information about visiting nurse or personal care assistance.
   Yes □ No □

Fig. 1. (Continued).
life; 50% of UEs, 56% of LEs, and 69% of U/LEs felt a significant emotional strain related to caregiving responsibilities; and 0% of UEs, 12% of LEs, and 33% of U/LEs considered their duties too difficult. Finally, 8% of LEs and 25% of U/LEs felt significant levels of all aforementioned levels of burden.

Thank you for completing these questions!

Caregiver Burden Measure
Rhonda J.V. Montgomery, Edgar F. Borgatta, Marie L. Borgatta

I would like to know whether assisting or having other contact with the patient has affected the following aspects of your life.

Please tell me the amount of each of these aspects in your life has changed due to your caregiving activities. Do you have a lot less, a little less, the same, a little more, or a lot more . . .

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<td>. . . feelings that you are being taken advantage of by the patient?</td>
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<td>. . . time for friends and other relatives?</td>
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Responses stratified by age of the caregiver are as follows: 35% of young, 43% of mid-age, and 24% of older caregivers experienced interference in their social life; 65% of young, 57% of mid-age, and 38% of older caregivers felt significant emotional strain related to caregiving responsibilities; and 26% of young, 10% of mid-age, and 5% of old caregivers considered their duties too difficult. Responses stratified by age of patient are as follows: 48% of young, 25% of mid-age, and 47% of old patients had caregivers who experienced substantial interference in their social life; 59% of young, 55% if mid-age, and 48% of old patients had caregivers who felt significant emotional strain related to their caregiving responsibilities; and 15% of young, 15% of mid-age, and 4% of old patients had caregivers who considered their duties too difficult.

Caregiver responses stratified by employment are as follows: 58% who worked fulltime, 46% who worked part-time, 60% of those unemployed, and 44% of those retired indicated caregiving interfered with their social life; 12% who worked fulltime, 36% of those who worked part-time, 5% who were unemployed, and 11% of those retired experienced high-emotional strain because of their caregiving duties; 64% of
Fig. 4. Mean burden as a function of time.

Fig. 5. Caregiver burden as a function over time.
those who worked fulltime, 54% who worked part-time, 60% of those unemployed, and 44% who were retired deemed their caregiver responsibilities too difficult.

Response of the caregiver stratified by education are as follows: 49% who had no higher education and 58% of caregivers with at least some college or trade school experienced interference in their social life; 16% with no higher education and 12% with at least some higher education indicated their caregiving responsibilities were emotionally straining; 53% of caregivers with no higher education and 60% of those with at least some college or trade school reported their caregiving duties too difficult.

The caregiver response stratified by education level and employment are as follows: with no higher education: 58% who worked fulltime, 29% part-time, 63% who were unemployed, and 29% of those retired experienced interference in their social life; with at least some college or trade school: 58% of those who worked fulltime, 67% who worked part-time, 58% of those unemployed, and 55% retired deemed their caregiving responsibilities intruded on their social life; no college or trade school: 9% who worked fulltime, 60% of those who worked part-time, 13% who were unemployed, and 0% of those retired experienced high-emotional strain; with at least some higher education: 13% of the caregivers who worked fulltime, 17% of the part-time, none of those unemployed, 18% who were retired deemed their caregiver duties to be emotionally straining; the caregivers with no higher education: 55% who worked fulltime, 57% of the part-time, 63% who were unemployed, and 43% of those retired indicated their responsibilities too difficult; of those with at least some college or trade school: 68% who worked fulltime, 50% of those who worked part-time, 58% of those unemployed, and 46% who were retired reported their responsibilities to be too difficult.

**Follow-Up Results**

Thirty percent of caregivers continued to experience a substantial disruption of their social life; 44% of caregivers experienced sustained emotional stress related to their caregiving responsibilities; 7% found their responsibilities too demanding, and 100% of those with high levels of this burden reported high levels in all three categories. Overall, the mean burden in all three categories fell significantly below those of the initial survey ($p = 0.001, 0.025,$ and $0.025$ for objective, subjective stress, and subjective demand burdens, respectively).

The mean levels of temporal, financial, and employment burden decreased significantly from the initial postinjury levels (2.6 from 5.0, $p = 0.003$; 1.8 from 2.6, $p < 0.001$; and 1.3 from 2.0, $p < 0.001$, respectively). However, the follow-up burden metrics were elevated in comparison to preinjury levels (1.8 from 1.3, $p = 0.003$; 2.6 from 1.8, $p < 0.001$; 1.3 from 1.2, $p = 0.08$). Figure 4 shows the mean shifts in burden over time. A summary of the distribution of these burdens throughout all three time points (before injury, after injury, and follow-up) is displayed in Figures 5 and 6.

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**Fig. 6. The Montgomery Borgatta Caregiver Burden Scale.**
There were 12 caregivers of negative outcome patients (i.e., subsequent injury, institutionalization, severing of relationship, death). They reported far higher percentages of objective burden, social interference, and fear of not having the money to continue giving care to the patient than those other caregivers in the study. The mean scores for the objective demand burden were significantly higher in the population with negative outcomes \( (p = 0.05) \). A summary of the differences between caregivers with and without negative outcome patients is in Figures 7–9.

**DISCUSSION**

Primary informal caregivers are often employed adult children with families of their own. This position of caring for both their own children and their parents or the injured party, in addition to working outside the home, causes a higher degree of perceptual burden than in those not employed. The mid-aged caregiver reported the highest percent of disruption to social life in the current study, reflecting the difficulties of this sort of “dual-duty” they are experiencing. Financial drain is another strain for caregivers as time away from work and extra money spent for travel and/or assistance for the patient depletes funds.

This study indicates that younger caregivers are more likely to report that patient demands are too much or are over and above what the patient actually needs. The burden of caregiving may hold serious consequences for a caregiver’s physical and psychological health, which in turn impacts the quality of care the orthopedic patient receives. This is of grave concern as the functional recovery of a patient from an orthopedic trauma often seems unrelated to the severity of the injury. Some patients with fractures that are easily reduced and treated will fail to return to their previous levels of independence, whereas others with more severe injuries will recuperate completely.

Hospital readmission rates vary depending upon type of injury, quality of postacute care, demographic factors, and comorbidities of the patient. Intrator and Berg found that those who received professional in-home health treatment after extensive inpatient rehabilitation had reduced hospitalizations and non-Medicare nursing home admissions. In a recent study of hip fracture patients, nearly one-third were readmitted to the hospital in the 6 months after surgical intervention, 34% of all readmissions occurred within 1 month of initial discharge, and those rehospitalized had significantly higher mortality rates. Fracture patients can gain...
**Fig. 8.** Caregiver burden as a function of patient outcome.

**Fig. 9.** The Montgomery Borgatta Caregiver Burden Scale as a function of patient outcome.
functional stability and decrease risk of future hospitalization by spending time in rehabilitation facilities after injury. Although these facilities are often expensive, the likelihood for hospital readmission decreases and the costs over the long term are reduced.11

In our study, more women assume the role of caregiver than men (approximately 70% women and 30% men), and these findings are consistent with other studies.12,13 One-third of caregivers surveyed were the patients’ children, followed by the patients’ spouse as the second most common scenario for the family units in our investigation.

It is not surprising with the multitude of factors (i.e., time caring for the patient, going to work, and finances) affecting caregivers so that many of them are experiencing some effect of burden. Many are required to put in several hours a week caring for the patient while maintaining employment responsibilities and other familial duties. Most employed caregivers reported some level of interference with their professional lives. Some caregivers lost time at work and several were forced to give up their jobs to devote themselves to giving care to the patient. Less time at work equals less money that can be applied to paying the family’s financial obligations. Over one-fourth of subjects stated that they were having significant financial trouble and had to make necessary lifestyle changes after taking over care of the patient. These findings are noteworthy.

Several limitations to this study of burden in informal caregivers of recovering orthopedic trauma patients exist. First, the measure of baseline care responsibilities was based on recollection of the time before injury and is difficult to accurately analyze. Second, caregivers who refused to take part in the study were not compared with the population that accepted administration of the survey tool. In future research endeavors, a retrospective medical chart review of patients whose caregivers refused to be questioned should be performed to elucidate any differences between the groups with regard to age, sex, and injury. Further, the survey did not extract data regarding the functional capacity of those caregivers who were employed or whether they took Family and Medical Leave Act time to fulfill care responsibilities. Additionally, insurance status and detailed information about assistance from other friends or family members was not collected at the time of the survey. These variables may influence the level of stress experienced by the caregiver and should be addressed in future studies. Finally, the survey tool developed by the research team has not been validated, as it is the first to address caregivers of orthopedic trauma patients. Repeated use of the instrument is necessary so validity can be measured. A larger prospective, longitudinal study is warranted.

Despite the fact that the caregiver is the third member of an important triad, including the physician and patient, research looking at the caregiver as an integral part of the care plan has been lacking, particularly in the United States. More comprehensive investigation into the role of caregiving to the orthopedic trauma patient is warranted.

REFERENCES