3-2006

A Feasibility Study of Methodological Issues and Short-Term Outcomes in Seriously Injured Older Adults

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Abstract

Background: For any given traumatic injury, older adults experience a longer hospitalization, more complications, and higher mortality than do younger patients.

Objectives: To prospectively identify problems in designing follow-up studies in seriously injured older adults without head injury and to examine outcomes after serious trauma in older adults who were sent to a level I trauma center.

Methods: A short-term descriptive follow-up design was used in which each patient served as his or her baseline. Eligible patients had injuries that required admission to an intensive care unit, a hospital length of stay longer than 72 hours, or surgery. Patients with isolated hip fractures, central nervous system injuries, and burn injuries were excluded. Data were collected by using standardized instruments during the acute hospital stay and 3 months after discharge from the hospital.

Results: During a representative 2-month period, 21% of a potential 77 subjects died in the hospital, 44% had cognitive impairment that precluded participation, and 17% declined to participate. Twenty older adults (mean age 73.5 years) who were injured in motor vehicle crashes (45%), falls (35%), or pedestrian accidents (15%) or who had gunshot wounds (5%) were enrolled. Ten percent died after discharge. Levels of physical disability at 3 months after discharge were higher than those before the injury (score on Sickness Impact Profile physical subscale 24.5 vs 10.9, P = .02), and psychological distress (Impact of Event Scale score 20.9) remained elevated.

Conclusion: Mortality, disability, and posttraumatic psychological distress after discharge are problems in seriously injured older adults.

Disciplines

Medicine and Health Sciences | Nursing

A Feasibility Study of Methodological Issues and Short-Term Outcomes in Seriously Injured Older Adults

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• Background *For any given traumatic injury, older adults experience a longer hospitalization, more complications, and higher mortality than do younger patients.*
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• Conclusion *Mortality, disability, and posttraumatic psychological distress after discharge are problems in seriously injured older adults. (American Journal of Critical Care. 2006;15:158-165)*

Injury is an important public health concern; it is one of the leading health indicators of Healthy People 2010[1] because it contributes to preventable death and disability. Generally considered a problem limited to adolescents and young adults, traumatic injury is occurring with increased frequency among older adults. In 2004, more than 2.9 million older adults were treated for nonfatal traumatic injuries in hospital emergency departments; 18% of these patients were hospitalized.[2] Because of the unprecedented increase in the population of older adults in the United States and the apparent risk for injury, a better understanding is needed of the effects of serious injury on this group.

Similar to their younger counterparts, many older adults commonly engage in a similar spectrum of activities, such as driving, and thus are exposed to comparable risks for serious and/or multisystem traumatic injury. Although older adults make up 12% of

the US population, they account for 23% of total hospitalizations for traumatic injury.[3] Women 65 years and older are the group most likely to be hospitalized after an injury.[4] The top 3 causes of injury and injury-related death in older adults are falls, motor vehicle–related injuries, and suicide.[5] Many strategies have been aimed at primary prevention (eg, making pedestrian crosswalks safer by extending the walk signals to allow adequate time to cross or adding pedestrian islands to reduce injuries to pedestrians caused by motor vehicles), but little attention has been focused on secondary and tertiary prevention (eg, the type and length of rehabilitation provided, early recognition of depression and delirium after injury). Critical care clinicians can have a marked impact in preventing complications through early recognition of the sequelae of injury and the initiation of appropriate interventions.

Although the greatest impacts of injury are the loss of life and human distress, the financial costs are extensive, because older adults account for almost one third of all trauma-related expenses despite being a significantly smaller proportion of the population.[6] Included in the costs associated with traumatic injury are those associated with direct medical care and rehabilitation as well as with lost income and productivity. Older adults are admitted to the intensive care unit (ICU) less often than their younger counterparts are for a variety of factors, including higher initial mortality and undertriage to trauma centers.[7,8] However, once they are admitted, the ICU length of stay of patients 65 years or older is significantly longer than that of younger trauma patients,[7] a factor that significantly increases the cost of care. Additionally, older trauma patients require more medical and subspecialty consultations than their younger injured counterparts do while hospitalized,[9] indicating that for older adults, recovery is often a complicated process.

Physiologically, older adults require greater support than do younger patients after injury if resuscitation and treatment are to be successful and recovery fully realized. For any given injury, compared with younger patients, older adults experience a longer hospitalization,[9] more complications,[9] and higher mortality rates.[10-12] Discharge placement to home decreases as age increases.[9,13-15] As the percentage of older adults increases from the current 12% of the population to the projected 21% by the year 2050,[16] the personal, societal, and financial costs of caring for seriously injured older adults will become increasingly important. Thus, consideration and studies of severely injured older adults as a discrete group, a separate part of the population of adult trauma patients, are important. Further, viewing outcomes solely in the traditional, yet narrow, terms of mortality, complications, and discharge placement is not appropriate.

The difficulties associated with the traditional approach in older adults were elegantly delineated in the systematic review by McCusker et al,[17] who noted that use of admission to a nursing home as a proxy for functional outcome is not always clear cut. They stated that the decision to admit a patient to a nursing home involved both cultural and social issues in addition to the patient's functional status and should be interpreted with caution. In a recent study on health-related quality of life 2.8 years after traumatic injury, Inaba et al[18] found that compared with a normative uninjured cohort, elderly patients had significant residual disability, as indicated by scores on the 36-Item Short Form, and a significant decrease in independent functioning. A limitation of the study was that the authors had no preinjury baseline data available for comparison in the injured group. To date, no investigators have examined prospectively short-term outcome and functioning in elderly trauma patients.

Therefore, we undertook this feasibility study to prospectively identify problems in designing follow-up studies in seriously injured older adults and to examine outcomes after serious trauma in older adults who were sent to a level I trauma center. The primary outcome examined prospectively was short-term disability. Disability was broadly conceptualized as a limitation in the ability of individuals to fulfill socially defined roles expected of adults within a sociocultural society.[19] Our investigation was guided by the disability theory of Nagi,[19] which posits that factors including biological (age), environmental (social support), and psychological (depressive symptoms and posttraumatic psychological distress) characteristics contribute to disability after injury. This framework has been used as a guideline in several studies on recovery from injury in trauma patients.[6,20] The specific aims of our study were to describe factors that preclude enrollment of seriously injured older adults in studies on the outcomes of injury and to describe disability after injury in seriously injured older adults.

During this feasibility study, while studying severely injured older adults, we encountered a number of challenges associated with in-hospital characteristics of patients who were not enrolled. In this article, we report these findings and preliminary data on outcomes.

Methods

A short-term, descriptive follow-up design in which each patient served as his or her baseline was used. Seriously injured, English-speaking adults more

than 65 years old who scored 23 or higher on the Mini-Mental State Examination (MMSE)[21] and who could be contacted via telephone or in person after discharge from the hospital were candidates for enrollment in the study. Serious injuries were defined as those that required admission to an ICU, a hospital length of stay longer than 72 hours, or surgery. Patients with isolated hip fractures caused by a fall from a standing position, burn injuries, or central nervous systems injuries were excluded from the study. An isolated hip fracture from a standing position does not meet the criteria for severe injury in the state of Pennsylvania. Burns are a unique form of injury, and because of their metabolic nature, in research on injuries are generally studied as an exclusive entity. Injuries involving the central nervous system precluded participation because of the cognitive requirements of the follow-up interviews.

Instruments

The MMSE, a frequently used indicator of general cognitive function, was used to screen patients for entry into the study. A minimum score of 23 was used as the criterion, indicating the minimum level of cognitive ability required for participation.

The Sickness Impact Profile (SIP)[22] is a 136-item self-report performance-based assessment used to ascertain function before injury and disability after injury. The instrument consists of 2 dimensions, physical and psychosocial, and 12 subscales: sleep/rest, emotional behavior, body care and movement, eating, home management, mobility, social interaction, ambulation, alertness behavior, communication, recreation, and work. It has an internal consistency of .94.[20] Construct and concurrent validity have been established.[23] The SIP is scored to provide a total ranging from 0 to 100; 100 indicates the maximum level of disability. Additionally, each dimension and subscale is scored on a scale ranging from 0 to 100.

The severity of injury was determined by using the Injury Severity Score (ISS).[24] The ISS is the sum of the squares of the most severe injury in each of the 3 most severely injured body regions. The 6 body regions on which the ISS is based are head/neck, face, chest, abdomen/pelvic contents, extremities/pelvic girdle, and external. The ISS ranges from 1 (least severe) to 75 (most severe).[25] An ISS greater than 9 has been suggested as a criterion to indicate a "serious" level of injury or a level of injury in elderly adults that may require admission to an ICU.[4,11]

Concurrent medical problems were assessed by using the Charlson Index of Comorbidity.[26] This weighted index provides a prospective method of categorizing and evaluating the effect of comorbid conditions on mortality. With this instrument, comorbid conditions are assigned to 1 of 4 weights derived from a relative risk model. The weighted comorbidity score is a significant predictor of 1-year survival ($P < .001$).

The 19-item Medical Outcome Study Social Support Survey[27] was used to measure the size of each patient's social network and the perceived availability of social support. This survey has 4 distinct dimensions (emotional/informational, tangible, affectionate, and positive social interaction) that were established by multitrait scaling and confirmatory factor analysis.[27] Scale scores range from 0 (no perceived support) to 100 (high levels of perceived availability) and can be presented as an overall support index of support. Each item is short and simple and has a 5-item Likert-scale response format.

The 15-item Impact of Event Scale (IES)[28] was used to assess the level of subjective posttraumatic psychological distress. Two components of posttraumatic stress disorder are intrusive memories of the event and avoiding reminders of the event.[29] The IES is not diagnostic for posttraumatic stress disorder; rather it provides a severity measure of intrusive memories and event-related avoidance. Total scores range from 0 to 75. Validity has been well established,[28] and an internal consistency of .88 has been reported.[20]

Depressive symptoms were ascertained by using the 20-item Center for Epidemiologic Studies Depression Scale (CES-D),[30] which has validity in adults throughout their life span. Frequency of symptoms (general physical well-being, psychomotor retardation, depressed affect, and interpersonal functioning) experienced during the week before contact are rated. Somatic items are not overweighted in contributing to the total score, dispelling concern about confounding effects with disability measures.[31] The total score ranges from 0 to 60; higher scores indicate more depressive symptoms. Validity and reliability are well established,[30] as is internal consistency (.86).[31] The inclusion of a somatic subscale score on the CES-D, not included on other depression rating scales, allows an examination of the impact of physical symptoms and depression over time.[32]

Procedure

The study protocol was approved by the relevant human subjects board. Patients who met entry criteria were enrolled during their inpatient stays. A trauma surgeon and coinvestigator (D.K.) was available to provide expert opinion about enrollment questions and to determine medical readiness to participate. Research assistants made rounds on trauma service patients regularly to enroll subjects and collect data. The research

assistants were both experienced trauma advanced practice nurses.

During the initial months, few patients met entry criteria; therefore, on the basis of reports of the Major Trauma Outcome Study,[33] which indicated higher mortality rates for a given injury severity at 55 years of age or greater, criteria were expanded to enroll patients more than 55 years old. This approach increased the pool of potential subjects only slightly. In the event that candidates who were directly admitted to a subspecialty service such as orthopedics were being missed, an identification system involving case managers of the subspecialty services was added.

Eligible patients were provided a description of the study, given an opportunity to ask questions and have the questions answered, and asked to participate. After informed consent was obtained, each patient completed a screening MMSE. Patients who met MMSE criteria (score ≥ 23) were asked to participate in 2 interviews: the first in the hospital and a second one 3 months after discharge. Demographic, injury-related data, and scores on the SIP (to provide information on function before the injury), Social Support Survey, IES, CES-D, and Charlson Index of Comorbidity were collected at the initial interview.

As recommended by Given et al,[34] communication was maintained by mailing a thank-you to patients who participated in the study in the hospital. The letter mentioned the upcoming 3-month interview and requested that patients telephone the research team with any change in contact information. Patients were then telephoned to arrange the date and time for the interview. The 3-month interviews were performed in person or via telephone; at that time, the SIP (primary outcome measure), IES, and CES-D were completed.

Data Analysis

Descriptive statistics (means, medians, SDs) were first calculated for all study variables. Correlations between mean values of continuous variables were determined by using the Pearson correlation coefficient for the baseline and 3-month follow-up data. Paired Student *t* tests were used to assess for differences between baseline and 3-month measures. Significance was set at $P < .05$.

Results

The feasibility component of the study provided the most unexpected, yet informative, findings. Because 15% of the 1500 seriously injured patients admitted to the trauma center at the Hospital of the University of Pennsylvania annually are older adults, we were confident that we could acquire an adequate sample. Yet we experienced persistent enrollment difficulties, despite systematic steps to increase the yield. Therefore, we systematically investigated the reasons for the low enrollment.

We had anticipated loss of some patients because of preexisting cognitive impairments, but not to the extent we experienced. For example, during a 64-day period, 87 patients met initial screening criteria, but only 10 were successfully enrolled. Medical records were used to determine reasons for nonenrollment in the remaining 77 patients (Table 1). Of the 77 potential subjects, 16 (21%) died during the acute hospitalization. The principal reason for nonenrollment of otherwise qualified patients was cognitive impairment. Taken together, preexisting dementia, acute delirium or confusion, and failure to achieve an MMSE score of 23 or higher accounted for the loss of 34 (44%) of these potential subjects.

Additionally, 36% of our potential subjects had signs or symptoms of concurrent medical illnesses thought to contribute to the injury event (Table 2). Of note, these signs and symptoms were primarily neurological and perhaps contributed to the high proportion of patients excluded from the study.

The sample of patients who consented to participate during the entire 18-month enrollment period consisted of 20 older adults with a mean age of 73.5 years (SD 10.6; Table 3). Of these, 55% were women, and 70% were white. Most of the patients were married (55%); the others were widowed (30%), divorced (10%), or had never married (5%). A total of 60% of the sample lived with others; the majority of these (77%) lived with a spouse. A total of 20% served as the main caregiver for another family member.

The leading cause of injury was motor vehicle crash (45%). Other causes were falls (35%), pedestrian hit by a car (15%), and gunshot wound (5%). Most patients (40%) were discharged from the trauma center directly to their own or someone else's home and had a family member or friend available for support. A total of 35% were discharged to rehabilitation facilities, and 15% were discharged to skilled nursing facilities. Only 10% were discharged to home alone. One half of the sample anticipated problems in returning to previous activities. Among the participants, 30% anticipated legal involvement as a result of the injury.

Only 9 patients (45%) completed the 3-month follow-up interview. Lack of participation was due to refusal (20%), death (10%), change in mental status (10%), and loss to follow-up (15%). Of the 4 patients who refused participation in the follow-up interview, 2 did so because they did not remember giving consent or participating in the in-hospital interview.

The patients in the sample had low levels of comorbid disease (mean Charlson Index of Comorbidity 1.3)

Table 1 Factors precluding enrollment in the study of 77 potential subjects screened during a 2-month period

Factor	No. of subjects (%)
Persistently obtunded/delirious/confused	23 (30)
Died during hospitalization	16 (21)
Declined enrollment	13 (17)
Dementia	8 (10)
Receiving mechanical ventilation or "too sick" at time of discharge from the hospital	7 (9)
Psychiatric diagnosis that precluded enrollment	5 (6)
Aphasia from preexisting neurological disorder	2 (3)
Score on Mini-Mental State Examination <23 on screening by a research assistant	3 (4)

Table 2 Signs and symptoms associated with the injury event of 77 potential subjects during a 2-month period

Signs and symptoms	No. of subjects (%)
None	46 (60)
Syncopal episode or indications of positional hypotension	12 (16)
Dementia	8 (10)
Neurological symptoms later diagnosed as cerebrovascular accident	6 (8)
Acute alcohol intoxication	3 (4)
Acute visual disturbances	2 (3)

*Because of rounding, percentages do not total 100.

and high levels of social support (mean score on the Social Support Survey 82.4; Table 3). Total SIP scores were elevated at 3 months but not significantly greater than baseline. Compared with level of physical disability, as measured by the physical subscale of the SIP, before the injury (mean physical subscale score 10.9), the level 3 months after discharge (mean physical subscale score 24.5) was significantly higher (P = .02). The level of depressive symptoms tended to be lower at 3 months; in contrast, levels of posttraumatic psychological distress remained elevated, and the in-hospital and after discharge levels were strongly correlated (r=0.74, P=.04). Because of the small sample size, additional analysis was precluded.

Discussion

Because small sample sizes can be due to sample restrictions used to minimize the confounding variables typical of a heterogeneous older adult population,[35] we developed broad entry criteria. Our sampling criteria were designed to attain a representative sample of seriously injured patients. The capacity to obtain a representative sample has been identified as one of the most complicated problems in studies of older adults.[36] This problem was indisputably a factor in our study. Variable patterns of entry and exit from hospitals are major impediments to acquiring a sample of patients for a study,[37] as are more patient-specific obstacles, such as impaired vision, hearing, and energy.[38] In our study, the enrollment problems were patient centered and were primarily caused by impaired cognition. This finding is significant because patients with traumatic brain injuries were not included in the population screened for enrollment.

The effect of medical signs and symptoms that occur immediately before or during the time of injury on the risk of injury and recovery from injury would benefit from additional study. McGwin et al[38] found that risk for recurrent injury is increased in older adults. In that retrospective follow-up study,[38] adults 70 years and older who had experienced trauma were 3.25 times more likely than a noninjured cohort to be hospitalized for trauma during the follow-up period. Future studies should address the long-term implications for older patients and the impact of recurrent injury and comorbid conditions.

In our review of previous research on seriously injured older adults, we found no evidence suggesting the large proportion of seriously injured older adults with acute delirium. The regularity with which we discovered patients with acute confusional states was disturbing and is not well documented in the trauma literature. Of greatest concern was the failure of the healthcare team to recognize this delirium. Similarly, Inouye et al[39] noted that nurses recognized delirium in only 31% of patients identified by researchers as having delirium. In many instances, our research assistants were the first persons to recognize that a patient was delirious. A similar situation also occurred in several studies[40-42] involving elderly patients who came to an emergency department; impaired mental status, including delirium, was recognized only 17% to 33% of the time.

The use of a standardized screening tool such as the Confusion Assessment Method[43] or the modified version for patients in the ICU[44] can markedly increase the likelihood of appropriately detecting delirium. Both tools are reliable and valid methods for serially assessing patients more than 65 years old for delirium[45] and should be more widely used in institutions to detect and treat delirium early. Early detection of delirium is needed because of the clear link (association) between delirium and adverse outcomes, including longer lengths of stay, prolonged neurocognitive deficits after discharge from the hospital, and increased mortality rates.[45] Early recognition and treatment of delirium can moderate its severity and effects.[46] Inasmuch as the Society of Critical Care Medicine guidelines recommend routine assessment and monitoring for delirium,[47]

Table 3 Sample and key study variables

Variable	Mean	SD
Age, y	73.5	10.6
Education, y	12.4	3.1
Injury Severity Score	12.7	8.1
Score on Mini-Mental Status Examination	28.4	1.9
Charlson Index	1.3	1.3
Disability, score on Sickness Impact Profile		
Before the injury (n = 20)		
Total	11.0	9.2
Physical subscale	10.9*	10.2
Psychosocial subscale	10.1	10.1
3 months after discharge (n = 10)		
Total	21.7	12.2
Physical subscale	24.5*	14.9
Psychosocial subscale	16.0	14.8
Social support before injury, score on Social Support Survey	82.4	21.3
Posttraumatic psychological distress, score on Impact of Event Scale		
In hospital (n = 20)		
Total	20.5†	16.0
Intrusion	12.2	10.2
Avoidance	8.2	7.8
3 months after discharge (n = 9)		
Total	20.9†	14.0
Intrusion	10.7	9.2
Avoidance	10.2	7.0
Depressive symptoms, score on Center for Epidemiologic Studies Depression Scale		
In hospital (n = 20)	18.7	12.7
3 months after discharge (n = 9)	11.6	9.5

* $t_8 = -2.96$, $P = .02$.
† $r = 0.74$, $P = .04$.

critical care clinicians can clearly play a role in this area by becoming more knowledgeable about delirium, advocating for use of the proper assessment tools, and recognizing delirium appropriately.

Attrition was a problem in this feasibility study, reinforcing previous findings[36] that attrition rates are higher in studies of older adults than in studies of younger cohorts. A total of 10% of our subjects died after discharge from the hospital. Further, although we had enrolled only those patients with decision-making capacity, we discovered that cognitive impairment influenced our ability to retain subjects. One subject at follow-up had substantial cognitive decline that precluded participation. Two additional subjects refused the follow-up interview because they did not remember providing consent or taking part in the in-hospital interview. This refusal happened even though the subjects had MMSE scores of 23 or greater, were given a detailed consent process including a copy of the consent form, and were sent a postcard of thanks for their involvement in the study.

In this preliminary study, we sought to explore factors that contribute to disability after serious injury in older adults and to uncover barriers to enrollment, data collection, and use of various instruments. The injuries sustained by our patients were multisystem and life threatening. The mean ISS of 12.7 indicates moderate-to-severe injuries affecting more than a single body system. Although we excluded falls from a standing position that resulted in solitary hip fracture, other types of falls were the second leading cause, after motor vehicle crash, of injury. The falls our patients experienced were substantively different from falls from a standing position; for example, one patient fell from a ladder while cleaning the external parts of a chimney. Such circumstances indicate that seriously injured older adults are a mobile and independent group at risk for severe injuries.

Our findings revealed suboptimal short-term outcomes. Of the 20 patients enrolled in the study, 10% died unexpectedly after discharge. For 1 patient, death was due to a comorbid condition that may have been aggravated by the injury. These findings indicate that in-hospital statistics alone do not fully indicate the mortality rate in older adults after serious injury. Physical disability was significantly higher at 3 months after discharge than it was before the injury. This finding is consistent with the results of previous studies[20,48,49] in younger adults. Our study does not provide information as to whether this disability remains stable, improves, or potentially leads to a decline in function over time, and as a result, this focus is an important one for future studies.

Levels of depressive symptoms after discharge were lower than in-hospital levels; however, the levels of psychological distress were not. Levels of posttraumatic psychological distress were elevated during hospitalization and remained essentially unchanged 3 months after discharge. Posttraumatic psychological distress is often unrecognized in clinical settings[50]; thus, our findings suggest that patients should be systematically assessed for psychological distress both during their hospital stay and after discharge.

Although our small sample size precluded an examination of the effects of elevated levels of distress, previous research[20] indicated that psychological distress contributes significantly to ongoing disability. The psychological responses to traumatic injury in older adults and the effects of the responses on recovery after injury are important areas for future inquiry. The unexpectedness of traumatic injury most likely plays a role. Unlike

the situation before elective surgery or other procedures, no preparation is done for an injury; thus, the risk for depression and posttraumatic stress after an injury is increased.[50,51] Clinicians should assess patients routinely for signs of these disorders and should provide additional support because these disorders can markedly affect reserve and functional outcomes.[50,52]

These short-term findings raise several concerns. A total of 40% of the sample lived alone before the injury and did not have assistance readily available at home after discharge from the hospital. Furthermore, an additional 20% were caregivers before the injury for another adult living in the household. This finding suggests that disability after injury, even over the short-term, is potentially a problem for patients and their family systems.

Limitations and Future Directions

In future studies, investigators should anticipate the degree of cognitive impairment we found in this cohort of seriously injured older adults and incorporate it into the study design. Because of the high index of social support of the patients in our study, we suggest that future studies incorporate broader entry criteria, consent processes that include family members when possible, and use of proxy respondents. Each of these steps would ensure a broader and more accurate description of the recovery of seriously injured older adults.

Because of the small sample size, multivariate analysis could not be used to examine the influence of key study variables on disability after injury, and our conclusions should be considered preliminary. Nevertheless, our findings are important and indicate potential directions for future work. Our sample included only those older adults who had sufficient cognitive capacity to provide informed consent and to participate in the interviews. This sample, then, was most likely a healthier cohort than the broader population of seriously injured older adults. Although the Charlson Index of Comorbidity is a valid tool for evaluating the effects of comorbid conditions on mortality, the scores may not adequately reflect the effects of these conditions on function. In older adults hospitalized for medical reasons, delirium is an independent predictor of persistent poor cognitive and functional status in the year after the hospitalization.[53] For this reason, the disability of the patients in our study most likely represents a problem of much greater magnitude.

Summary

Serious traumatic injury is a substantial health concern in the increasing population of older adults. Because older adults are a vulnerable group who have less physiological reserve than younger persons do, investigating the outcomes of traumatic injuries and identifying risk factors for suboptimal recovery in the older group is important. Our findings indicate that mortality, physical disability, and psychological distress after discharge are high in seriously injured older adults. Our experiences in conducting the study illustrated some of the difficulties experienced in obtaining data on seriously injured older adults and in following up the patients in a sample over time. Coincidentally, the challenges posed by this study also revealed a substantial cohort of seriously injured older adults with acute confusional states that generally went unrecognized by healthcare providers. Critical care clinicians can aid secondary prevention efforts and improve outcomes in traumatically injured older adults by using standardized assessment tools to detect delirium and acute confusional states. Through early recognition and initiation of appropriate interventions, the severity of delirium can be diminished or prevented.

ACKNOWLEDGMENTS

This study was done at the Hospital of the University of Pennsylvania. It was funded by the University Research Foundation, University of Pennsylvania. We thank Michele Balas, PhD, CRNP, for her assistance in data collection.

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