

## Research

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# Improving the Care of Fall Injured Elders in U.S. Emergency Departments

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## ABSTRACT

**Objective:** Geriatric fall-related injuries have become a fatal public health crisis in America which has affected the population at an ever growing rate. America's Emergency Departments (EDs) are the heart of the problem and the solution towards preventing geriatric falls. The purpose of the study reported here is to address the concerns associated with the quality of care that American EDs provide to their fall-injured geriatric patients.

**Methods:** To address these concerns (see supplementary data) a survey was conducted in April/May of 2015 among 800 ED physicians of American College of Emergency Physicians (ACEP). Approximately, 83% of the physicians (N=660) responded to the survey which was designed and analyzed by the authors. Data was appropriately analyzed using the chi-square test of goodness of fit.

**Result:** Most of the physicians participating the survey perceived that none of these diagnostic observations like balance, gait, vision, hearing, physical therapy needs, clinical depression, fear of falling, etc., are routinely provided to fall-injured elders in their ED. Sixty-three percent of the physicians perceive that these fall injured patients routinely leave the ED without a documented appointment with a medical provider for follow-up diagnosis or evaluation. Sixty-two percent of the physicians associated with the survey believe that fall injured patients return to the same ED almost 26-59% of the time. Sixty-six percent of the respondents would recommend that they and their colleagues take an 8-hour online course in geriatric fall prevention. Fifty-seven percent of our respondents were likely to refer high fall risk ED geriatric patients to a nearby Center of Excellence in Geriatric Fall Prevention and Treatment (CGFPT).

**Conclusion:** American ED physicians agreed on two initiatives: Firstly, 66% of the surveyed physicians agreed that they and their colleagues need to be more informed about geriatric fall prevention (*via* an online course). Secondly, 57% would recommend the creation of nearby CGFPT to which they can refer high fall-risk patients. Adoption of these two strategies would possibly help improve the healthcare of full injured geriatric ED patients in future.

**KEY WORDS:** Elderly falling; Fall prevention; Geriatric; Emergency department.

**ABBREVIATIONS:** EDs: Emergency Departments; ACEM: American College of Emergency Physicians; CDC: Centers for Disease Control and Prevention; EPRN: Emergency Physicians Research Network; ACEP: American College of Emergency Physicians; CGFPT: Center of Geriatric Fall Prevention and Treatment; STEADI: Stopping Elderly Accidents, Deaths & Injuries; MCO: Managed Care Organization.

## INTRODUCTION

Geriatric fall-related injuries have become a huge, ever-growing, costly and fatal public health crisis in America.<sup>1-3</sup> For the 46 million elders currently residing in the U.S.,<sup>4</sup> the following annual estimates were obtained: 15 million U.S. residents suffer the fall, out of which up to 10 million residents suffer from medically attended fall injuries<sup>5,6</sup>; among which 2.5 million visited an ED for fall injuries<sup>7</sup>; 900,000 have been admitted to the hospital for injuries; 730,000 falls of elders have resulted in their being admitted to the hospital *via* the ED<sup>8,9</sup>; 400,000 have been discharged following long-term nursing home care<sup>10</sup> and 25,000 have died on account of the harm caused by the fall.<sup>11</sup>

These numbers are increasing rapidly at an ever growing rate. From 2001 to 2013, the number of elders in the U.S. population have increased by 27%<sup>12,13</sup>; geriatric ED visits for all injuries was increased by 52%; hospitalization for geriatric fall injury *via* the ED rose up by 92%<sup>14</sup>; hospitalization for geriatric fall injuries was waxed by 116%<sup>15</sup>; deaths caused by geriatric fall was recorded up to 119%.<sup>16</sup>

America's EDs are the heart of the problem and the solution towards preventing geriatric falls. Out of the total patients admitted in the ED's, it was observed that about 80% of all the hospitalizations of seniors are due to geriatric fall injuries. EDs represent 20% of the annual fall costs as computed by Centers for Disease Control and Prevention (CDC)<sup>17,18</sup> (and showed 20% increase in the rate of hospitalizations from 2001 to 2013 [i.e., from 21% to 26%]).<sup>19</sup>

The fall injuries which require hospitalization are, of course, the more serious ones. In the past decade, 70% reported cases were that of fractures, internal injuries or traumatic brain injuries (TBIs).<sup>20</sup> Falls are 300% more likely to require hospitalization than any other type of injuries (motor vehicle accidents, poisoning, drowning, etc.).<sup>21</sup> Nursing home admissions after an ED visit and hospitalizations constitute an average of about 54% (*versus* 29% for "all causes").<sup>22</sup>

CDC estimated that the direct cost of falls leaped from \$19B in 2000 to \$34B in 2013.<sup>23</sup>

Other analysts attributed the direct costs of fall estimates in 2013 to have roughly increased from \$36B to \$42B,<sup>24</sup> but few of these estimates capture the cost of true long-term care of fall injuries. Sixty percent of the fall-caused nursing home admits have been retrogressed into long stay residents and their treatment takes approximately 2 years in the nursing home.<sup>25</sup> About 65% of these are on Medicaid, health care programs that assist low-income families.<sup>26</sup> The residency and treatment offered in the national nursing homes bill probably exceeds \$16B.<sup>27</sup>

The rapid increase in the population of the very old citizens (i.e., persons at or above the age of 85) is important to note here because the rate of all injuries doubles every decade and

becomes over 65% (such that the elders of the age group 75-84 years fall and get injured 200% times more frequently and those over 85 years are 400% more likely to fall and get injured than the 65-74 year old cohorts).<sup>28</sup> Costs are 175% higher for those aged between 75-84 years and 200% higher for those aged more than 85 years relative to the 65-74 year old cohort.<sup>29</sup>

In 2011, Agency for Healthcare Research and Quality (AHRQ) reported that 17% of all ED visits were due to injury; 21% of these ED visitors were aged more than 65 years; 71% of the elderly injured ED patients were admitted because of fall injuries.

Fractures accounted for 41% of the elderly ED visits; contusions were approximated as 33% of the elderly ED visits; open wounds accounted for about 21% visits. Women represented about 70% of the ED fall injured elders and approximately 75% of the geriatric fall-caused fracture victims. Men reported a significantly higher % of falls among TBI patients in the U.S. EDs.

## METHODOLOGY

A survey was conducted in April/May of 2015 among 800 ED physicians of the American College of Emergency Physicians (ACEP). This survey was field tested on a similarly selected sample of national ED physicians in May/June of 2014. This particular study yielded results which did not show any statistically significant difference from the latter, larger study ensuring that no co-mingling of the 2 data sets were permitted. A few, clearly noted, separately reported data points from the earlier study were included in Table 2.

The study was conducted among physicians selected from the Emergency Physicians Research Network (EPRN) who were the representatives of ACEP's 27,000 physician members (to a +/- 5% CI). Out of them, about 83% (660) physicians responded to the survey, a rate which is regarded very high for a related study. Besides the high response rate, we were also confident about the results of the survey because it was field tested/pre-tested in 2014 on 330 similarly selected doctors such that the results produced did not show a statistically significant difference from the observations of the larger study.

In the 2015 study, physicians were asked to estimate the percentage of cases in which balance and gait disorders and PT/remediable leg weaknesses were reported among the fall injured patients in the ED. In the field test, vision deficits, hearing loss, mild cognitive impairment, clinical depression, fear of falling were also recorded and, without co-mingling data from the two studies, Table 1 reported the balance and gait disorders through the fear of falling.

## Statistical Analysis

Data was appropriately analyzed using the chi-square test of goodness of fit. All the reported findings attained statistical sig-

**Table 1:** Balance and Gait Disorders through Fear of Falling.

Balance and Gait Disorders	290%	2.9
PT Remediable Leg Weakness	440%	4.4
Vision Deficits	250%	2.5
Hearing Loss	340%	3.4
Mild Cognitive Impairment	180%	1.8
Clinical Depression	220%	2.2
Fear of Falling	130%	1.3

nificance at the 0.01 level or better. Results found were recorded as follows (Tables 2-5).

## RESULTS

A survey was conducted in April/May of 2015 among 800 ED physicians. Out of them, about 83% (660) physicians responded to the survey, a rate which is regarded very high for a related study.”

### Perceived Relative Frequency of Follow-up Medical Appointments

We found a statistically significant difference in responses-c<sup>2</sup>

(1, N=660) 37.8,  $p=0.000$ . Results demonstrated that a majority (62%) of the ED physicians perceive that their ED care was unlikely to provide follow-up medical appointments to elders reporting fall injuries.

Perceived relative frequency of 2<sup>nd</sup> or repeat fall injuries for patients returning to the same Ed-c<sup>2</sup> (1, N=660) 323.4,  $p=0.000$ . Results demonstrated that a majority of the ED physicians do not routinely experience 2<sup>nd</sup> or repeated fall injuries [but that 62% perceived such outcomes as taking place sometimes/occasionally’ (i.e., in 26% to 59% of geriatric fall injury cases)].

For those physicians who are likely to refer high fall risk patients to a nearby center of excellence Ed-c<sup>2</sup> (1, N= 660)

**Table 2:** Representing Perceived Relative Frequency of Diagnostics or Evaluations Provided to Fall Injured Elder ED Patients (N=660).

Measure	Diagnostics or Evaluation	Always/Often (60% to 100%)	Sometimes/Occasionally (26% to 59%)	Rarely or Never (0% to 25%)
A	Balance testing and/or detection of gait disorders	23%	30%	47%
B	Assessment of the need for physical therapy	11%	32%	57%
C	Vision assessment*	1%	11%	88%
D	Hearing loss assessment*	1%	1%	98%
E	Mild cognitive impairment*	49%	33%	18%
F	Clinical depression*	15%	23%	62%
G	Fear of falling*	4%	12%	84%
H	2015 average of A+B	17%	31%	52%
I	2014 average of A+B	14%	16%	70%
J	2014 average of C through G	21%	29%	58%

\*2014 National ACEP Data

**Table 3:** Representing Perceived Relative Frequency of Follow-up Medical Appointments (N=660) and Likely to Refer High Fall Risk Patients to a nearby Center of Excellence (N=660).

Concerns associated with the quality of care	Routinely	Not Routinely	p-value
Perceived Relative Frequency of Follow-up Medical Appointments (N=660).	38%	62%	$p=0.000$
Likely to Refer High Fall Risk Patients to a nearby Center of Excellence (N=660).	57%	43%	$p=0.000$

**Table 4:** Representing Perceived Relative Frequency of 2<sup>nd</sup> or Repeated Fall Injuries Returning to the Same Ed (N=660).

Routinely	Sometimes/Occasionally/Other	p-value
15%	85%	p=0.000

**Table 5:** Representing Likely to Recommend 8-hour Online Geriatric Fall Prevention Course for Self and Colleagues (N=660).

Likely to Recommend	Unlikely to Recommended	p-value
66%	34%	p=0.000

12.8,  $p=0.000$ . Results demonstrate that the majority (57%) of ED physicians would be likely to refer high risk patients to near-by centers of excellence.

For those physicians who are likely to recommend an 8 hour online geriatric fall prevention course for self and colleagues Ed-c<sup>2</sup> (1, N=660) 68.1,  $p=0.000$ . Results demonstrated that ED's are likely to recommend an 8-hour online geriatric prevention course.

## DISCUSSION

The importance of the ED towards addressing the American public health crisis of geriatric falls is clear. Besides the high response rate, we were also confident about the results of the survey because it was field tested/pre-tested in 2014 on 330 similarly selected doctors such that the results produced did not show a statistically significant difference from the observations of the larger study. A vast majority of costly hospitalization for geriatric falls came through the ED, even though 70% of the fall-injured ED patient's visit ends by being discharged to the same housing where more than 60% of the falls took place. Most of the costly nursing home admissions for falls come from the hospital (just as, again, most hospitalizations came through the ED). So a majority of the geriatric hospitalizations and nursing home admissions for falls are seen for the first time in the ED.

In the absence of effective action in the ED, the crisis is likely to get worse. More than 60% of the US primary care doctors did not even report themselves for not having routinely asked their patients about falls; a majority of the managed care organization (MCO) physicians tend not to discuss falls routinely with their geriatric patients; (CDC found that a vast majority of doctors surveyed in the process of preparing their fall screening materials – Stopping Elderly Accidents Deaths and Injuries (STEADI) were unfamiliar with clinical best practice guidelines on falls). Physicians engaged in large practices tend not to participate in fall prevention educational programs; when doctors participate, the usual conference type formats do not have an effect on reducing falls or changing the behavior of the physician towards falls. More intense physicians education programs have

had very mixed outcomes.

This study suggests that more than 60% (and probably many more) fall injured elderly ED patients do not tend to be aware of the reason for their fall. Engle et al<sup>30</sup> found that 78% of the ED patients do not tend to understand what happened to them in the ED, why or what to do next: About 40% get their discharge instructions about half right while about 20% get it all wrong.

It is true that primary prevention of falls *via* multi-factorial programs have had some interesting results. Cohen et al<sup>31</sup> developed an elaborate and detailed program of telephonic and face-to-face conversations during home interventions, which seem to reduce the number of falls by 13% in at least one year of their multi-year efforts. That study also reports a reduction to about 33% in the long-term care claims (although it is not entirely that the reduction in claims is due to the reduction in falls.

Authors have reported reductions in geriatric fall-caused hospitalizations by more than 50% and reductions in fall-caused utilization of nursing homes by more than 60%. Indeed, nursing home utilizations was reduced by 79%, controlling prior healthcare utilization with respect to interventions, and not health status or prior trends, which impacted the reduction in falls. These larger reductions in fall injuries took place among 9500 Medicaid eligible seniors in three states over a total of 6 years. In the largest study (Florida; n=6624), more than 1.3 billion medicaid claims were examined and the study was independently audited in addition to the State/Federal reviews. The representation of this data was nominated for a Presidential Prize at the meeting of the American Geriatric Society in 2005 and featured at the 2013 National Urban Health Conference.

In the recent times, fall prevention tools, kits, guidelines and recommendation have been provided by CDC, the American Geriatric Society, The American Medical Directors Association, AHRQ, CMS, the US Preventative Health Services Task Force, the White House Conference on Aging, the American Academy of Orthopedic Surgeons and others.<sup>31</sup> All of this activity suggests that multi-factorial programs of fall prevention can and do work.

But nobody seriously thinks that primary fall prevention programs which target seniors in the general population (who have a 22% annual probability of having a medically attended fall in the next year) can compete with fall prevention programs that target people, like ED high fall-risk patients, who have an odds ratio of falling injuriously, which is 300% to 400% times higher (or more) than that of the general population.

## CONCLUSION

The study reported that American ED physicians are attempting to get serious about fall prevention. It is understood that they possibly agree on at least two major initiatives. First, 66% of the surveyed physicians agreed that they and their colleagues needed to know more about geriatric fall prevention (*via* an online course). Secondly, 57% would recommend creation of nearby centers of excellence in fall prevention that is would refer their high fall-risk patients to such centers.

These two initiatives would seem to be a useful start in improving the healthcare of fall injured geriatric ED patients.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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## SUPPLEMENTARY DATA

## The Survey Questionnaire

1. Please estimate how often the elderly patients with fall injuries received the following diagnosis or evaluation in your ED?
2. Please estimate how often the elderly fall patients received a documented referral for follow-up diagnostic evaluation in your ED?
3. Please estimate how often the elderly fall patients return to the ED having suffered a 2<sup>nd</sup> or repeated fall?
4. Please estimate how often you would like to refer the high risk elders in your ED to a nearby Center of Geriatric Fall Prevention and Treatment (CGFPT)?
5. Can your ED be certified as a Fall Prevention Facility by having a majority of your physicians, nurses and techs enroll in an 8-hour accredited online fall prevention course? How likely would you be to recommend seeking such certification?

**NOTE:** The diagnostics categories asked about in Question #1 refer to somatic conditions which show a strong association with (increased) geriatric fall frequencies. More specifically, in a meta-analysis of more than 100 studies, the following % increases in the odds ratio of geriatric falls were found.<sup>19</sup>