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Stop The Falls! A framework for injury prevention outreach for older adults presented by the American Association for the Surgery of Trauma Geriatric Trauma and Injury Prevention Committees

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ABSTRACT

With the increasing age of the population in the USA, fall prevention events to target older patients are imperative. The American Association for the Surgery of Trauma hosted a fall prevention event at the host city of the 2023 Annual Meeting. We review the planning and implementation of this “Stop the Falls” event, in hopes that other institutions may benefit and sustainably effectuate fall prevention events for an increasingly geriatric population.

INTRODUCTION

The population of the USA is aging, with individuals aged 65 and older comprising 17% of the total population in 2020, and increasing five times more rapidly than the remainder of the population.¹ Approximately 25% of older adults report falling each year, with the risk of subsequent falls increasing after the initial event.^{2,3} Trauma surgeons are key in addressing these traumatic injuries from falls, which occur within an already frail population burdened by numerous comorbidities. Additionally, falls confer billions of dollars in annual healthcare expenditures³ and greatly affect the quality of life for both the patient and their caregivers.

The American College of Surgeons (ACS) Committee on Trauma released updated Trauma Quality Improvement Program Geriatric Trauma Management Guidelines in November 2023, noting the increased proportion of older adults, worsened outcomes with increased age, and specifically identifying falls as the most common cause of injury in this demographic.⁴ They note that “low velocity falls can result in disproportionately severe injury and even death”.

As of 2016, patients 65 and older constituted approximately 30% of all trauma patients, but incurred significantly higher mortality and morbidity than their younger counterparts.⁵ To address this increasing burden of injury, trauma centers should consider implementing standardized fall prevention education for their older adult population, and involve emergency medical service

(EMS) personnel to begin the prevention process in the field.⁶ The aim of this review is to propose a framework for fall prevention outreach and identify opportunities for improvement moving forward.

ESTABLISHING FALL EDUCATION AS INJURY PREVENTION AMONG TRAUMA CENTERS

Given the socioeconomic burdens imposed on the healthcare system, individuals, and families due to fall-related injuries, fall prevention is critical. Older adults have been identified as a vulnerable population, with worsened outcomes for similar injuries as compared with younger patients. The Centers for Disease Control and Prevention (CDC) and the ACS have identified geriatric trauma as an area of focus. Given the high degree of falls in this population, trauma centers nationwide have initiated fall prevention efforts, with two notably successful and sustainable programs implemented at the University of Arizona in Tucson, and the Ventura County Medical Center’s (VCMC’s) affiliation with the Ventura County Elderly Fall Prevention Coalition.^{6–10} The large percentage of older patients in both counties results in a sizeable volume of geriatric trauma admissions.^{7–11} These counties developed fall prevention programs to reduce injury and recidivism in their older adult population. The programs included education on fall prevention, interactive activities, and information on relevant local services. Education for this annual event is provided by a multidisciplinary team of specialists, followed by lunch and a Tai chi workshop for those interested and able. Event organizers work closely with local stakeholders and community members. Over time, the institutions have developed partnerships with multiple local vendors, including EMS, the Area Agency on Aging, home care service organizations, wellness groups, hospice care services, and the regional health department. Currently, the events host approximately 250 to 400 participants, in addition to multiple vendors. It is held concurrently with national “Fall Prevention Week”, as conducted by the Administration for Community Living.¹² In leading this effort, not only do trauma

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Table 1 Sample itinerary

Time	Speaker	Activity
09:45 am	Breakfast/coffee	
10:00 am	Trauma surgeon	Welcome
10:05 am	Local injury prevention coordinator	Local context
10:10 am	Trauma surgeon	Introduction/overview
10:15 am	Trauma surgeon	Personal perspective
10:25 am	Trauma surgeon	Epidemiology of falls
10:35 am	Social worker	Local resources
10:45 am	Trauma surgeon	Question and answer
11:05 am	Fire department captain/emergency medical services chief	Review of local emergency medical services responses, question and answer
11:25 am	Physical therapist	Gait and balance training
11:35 am	Martial arts studio	Tai chi exercise
11:45 am	Doctor of optometry	Optometric care
11:55 am	Break	
12:10 pm	Geriatrician	Review of primary care and polypharmacy
12:25 pm	Trauma surgeon	Fall prevention bingo
12:45 pm	Geriatric committee chair	Closing remarks
12:50 pm	Lunch/social hour	

surgeons provide education to community members, but they also collaborate with a variety of community organizations that contribute to the overall health and well-being of this patient population.

FRAMEWORK FOR IMPLEMENTATION

Key tenets of injury prevention include the identification of a vulnerable population, followed by behavioral modification, education, and hazard reduction. These must be consistent and sustained efforts to effect change.

Identification of population

For any injury prevention event, it is imperative to identify a specific target population. Fall prevention may target patients using an age cut-off, given that age is an independent predictor of mortality.¹³ Frailty indices may also be better indicators of poor outcomes in older patients. Several frailty indices exist, including the Trauma Specific Frailty Index, a validated method for the identification of frailty among elderly trauma patients.¹⁴ Other scores include the Rockwood Clinical Frailty Scale, the International Association of Nutrition and Aging Frailty Scale and others.^{15 16} Patients may also be identified through community-based organizations or nursing facilities. Screening can be accomplished on trauma center admission, or ideally during primary care physician (PCP) evaluation prior to the initial injury. Liaison with local PCP groups can strengthen the identification of vulnerable patients who require targeted intervention.

Behavioral modification

Behavioral modification is a hallmark of injury prevention. For a geriatric population, this includes evidence-based therapies aimed at improving strength and balance. Several behavioral or exercise regimens have been studied and published. Home-based exercise led by a physical therapist was studied in a randomized trial, demonstrating longitudinal benefits and decreased rates of subsequent falls as compared with a non-intervention group.¹⁷ Several meta-analyses confirm the idea that consistent exercise

routines improve outcomes in this population.^{18–20} Additionally, Tai chi exercises have been proven to improve outcomes. Tai chi is another evidence-based injury prevention strategy for geriatric patients, and is supported by the CDC as well as the National Council on Aging, among others.^{21 22} Sustainable therapies require commitment from providers and participants.

Cognitive therapy

Cognitive/psychological therapies can also be incorporated into fall prevention events. Cognitive impairment is a known risk factor for falls. Several studies have identified executive function and cognition as target for fall prevention, although specific guidance is lacking.²³ Therapies can include training to optimize memory, executive functioning, orientation and attention.²⁴ This should be conducted in conjunction with hazard reduction.

Hazard reduction

Hazard reduction requires educational sessions and environmental assessment by experienced personnel. Again, this can be conducted by specialists and organized by a trauma center, or performed by community-based organizations. Goals and objectives for each event should be clearly defined, assessing the target population, staff capabilities, and desired outcomes. Established recommendations have been published by the CDC and others.^{25 26} Specific interventions include reduction of clutter, optimal lighting, non-skid mats in bathrooms, rails on stairs, and other interventions.²⁷ Education on polypharmacy and medication optimization should also be provided.

Funding and sustainability

Funding may be cited as a barrier to entry for the implementation of injury prevention programs. However, partnerships with locoregional organizations may alleviate this burden, whereas establishing networks between trauma centers and the local community, as well as providing valuable resources for patients. Ensuring adequate stakeholder buy-in for longitudinal and sustainable fall prevention is imperative. Collaboration with local organizations affords a mutually-beneficial relationship in which organizations are featured and trauma centers are linked with the community. Often, vendors pay to feature their organization at an event organized by the local trauma center. Furthermore, these relationships allow for appropriate transition of care after identifying in-hospital patients who are at high risk. Appropriate marketing for both the trauma center and community partners ensures the longitudinal success of this event.

AAST ANNUAL MEETING PREPARATION

In an attempt to address fall prevention on a national level, collaborators from the Injury Prevention and Geriatric Trauma Committees of The American Association for the Surgery of Trauma (AAST) conceived a fall prevention event to be held concurrent to the 2023 AAST Annual Meeting, titled “Stop the Falls”. The aim was to create a framework for a fall prevention course for older adult patients that could be easily reproduced and deployed at trauma centers nationally. Notably, this was created to mirror the “Stop the Bleed” program, which has been incredibly successful in educating both healthcare providers and lay people in conducting hemorrhage control in public spaces. After concept formation by leaders of the Geriatric Trauma and Injury Prevention committees, the idea was presented to the AAST Board of Managers. The board supported and allocated funding for this event.

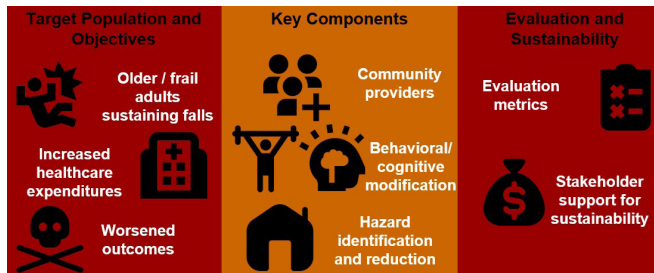


Figure 1 Key tenets of fall prevention.

A task force was created consisting of members of both the AAST Injury Prevention and Geriatric Committees dedicated to implementing an event targeting older adults local to the 2023 Annual Meeting. This event would include physical and cognitive therapy as well as education about hazard reduction. The task force met on a regular basis in advance of the 2023 Annual Meeting. Given the venue's catchment within the University of California at Irvine (UCI) Level 1 trauma center system, UCI injury prevention staff participated as key stakeholders in the design of this event. Planning was based on the Tucson model, as well as fall prevention events from additional member centers such as VCMC. This subcommittee met regularly to organize this event, reporting back intermittently to the full AAST Geriatric Trauma and Injury Prevention committees.

Site selection began approximately 10 months prior to the date of execution. Several local venues were evaluated in the area adjacent to the Annual Meeting site, including multiple assisted living facilities and a community center. After review, subcommittee members voted in favor of the Anaheim Senior Citizen Center, a local government-funded facility, given its inclusive mission, accessibility, and close relationship with city programs. The Anaheim Senior Citizen Center was located approximately 10 min from the Annual Meeting venue, did not require funding for venue utilization, had an established group of patrons, and could provide transportation for participants available through established local and federal funding sources.

After site selection, a tentative itinerary was created. The final itinerary included education regarding polypharmacy, decluttering, strength exercises, visual acuity evaluation and available local resources. It was decided that education for this event would be provided by trauma surgeons, a geriatrician, a local social worker, an optometrist, a pharmacist, the city fire department chief, and an injury prevention coordinator from UCI. The full itinerary is documented in [table 1](#). Tai chi and physical therapy instruction were also included, provided by AAST fellow

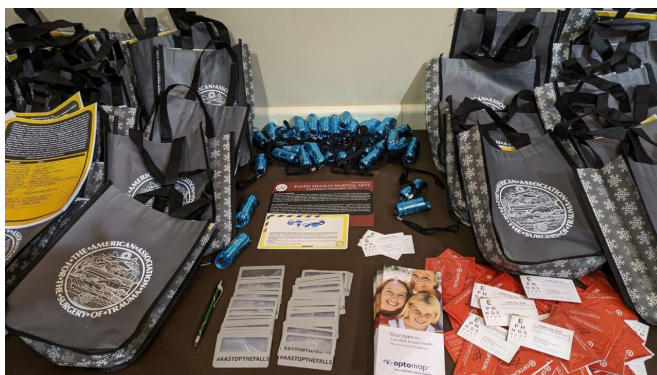


Figure 2 Handbook and giveaways.



Figure 3 Members of the AAST Geriatric and Injury Prevention Committees hosting the event.

contacts. Finally, participants could engage in a question-and-answer session and fall-prevention bingo as further cognitive stimulation to the session. Breakfast and lunch were provided to the participants. Organizers were mindful of the necessity to maintain short didactic sessions, and focus on interactive activities.

All of the individuals delineated in table 2 were contacted by planning committee members, and confirmed. Committee members organized the flow of events, fall-prevention bingo, age-appropriate giveaways, and marketing materials. Flyers were drafted with a summary of the event, and agenda associated agenda (online supplemental file 1).

After speaker confirmation, a handbook of local resources was created in collaboration with the injury prevention team at UCI. This handbook included local transportation services for older adults, housing assistance, free or low-cost clinics, available in-home support services, community food assistance, and additional local programs including the regional "Program for All-Inclusive Care" (PACE program), and information about the UCI Geriatric Emergency Nurse Initiative Experts program. This valuable document was printed in large font to be distributed to participants.

PREPARATION AND MARKETING

The organizing subcommittee created the handbook of resources to be distributed, including the document delineated above. The organizing subcommittee further identified appropriate giveaways to assist older adults, which included a small flashlight, a cutting board with grip technology, a whistle and several additional items, which were secured during this planning phase. Bags with the AAST logo, including these giveaways and the aforementioned handbook were also secured. Event-specific shirts for AAST organizers were created and obtained. Shirts contained the AAST logo and "Stop the Falls" for each participating AAST member. They were created in yellow to coincide with the national fall prevention aesthetic, as recommended by the American Hospital Association. Subcommittee members coordinated with the local physical therapy and Tai chi groups to create age-appropriate exercises to be incorporated into the event. Older adult-specific bingo was created by one member. This included straightforward questions about fall prevention and available resources. These were created on laminated sheets

and large, easily-held dry-erase markers secured for participation (online supplemental file 2).

Marketing was conducted by both AAST and the Anaheim Senior Citizens Center. Flyers and brochures were created and distributed to older adult members of this venue, and to the local community at-large. These materials included a short review of the event, the itinerary and speakers, as well as an electronic code to a webpage with pertinent information, and included the itinerary and logos from both AAST and UCI.

IMPLEMENTATION

In implementing our fall prevention event, we partnered with a local senior community center, and determined a tentative agenda that would include medication review, gait, balance, mobility, visual acuity, muscle strength, environmental assessment. Furthermore, times and activity levels were chosen to facilitate participation. Key tenets of fall prevention are delineated pictographically in [figure 1](#).

For our event, the day commenced with AAST members arriving at the venue to set up approximately 2 hours prior to the event start time to set up, including the arrangement of purchased food and drinks. Chairs equipped with grip technology were arranged with sufficient space between them, allowing for moderators to assist participants, and for participants to maneuver easily to their seats. Bags with the aforementioned handbook and giveaways were assembled. The setup is demonstrated in [figure 2](#). Speakers engaged audience members throughout the day with educational content via PowerPoint, interactive physical therapy, Tai chi, question-and-answer, and bingo sessions dispersed throughout the didactics. Participants were able to enter and exit as they pleased. Committee members assisted any individuals requiring physical assistance. Physical therapy and Tai chi exercises were conducted at each individual's seat, either although seated, or standing.

In total, over 60 older individuals participated in this event during the course of the day. Anecdotally, the participants reported a positive experience, and appreciated learning about community resources of which they had been unaware. They specifically enjoyed the interactive modules, including the question-and-answer session with the fire department chief, Captain David Berry. The inclusion of Captain Berry allowed participants to be informed of, and discuss local community interventions, including a fire alarm distribution and replacement program sponsored by the City of Anaheim. Clients requested information about 911 services and transport to local hospitals. To this, Chief Berry advised some of the triage practices used by the EMS teams, and the insurance implications of doing so. In fact, participants and organizers were surprised to know that a local cost was incurred with calling 911, billable to insurance.

AAST committee members also noted that they felt a sense of camaraderie and team-building during the event, having an opportunity to meet in person, and network in a collegial environment.

FINANCIAL IMPLICATIONS

Funding for this event was provided by the AAST. Funds were used to purchase morning refreshments, lunch, bags with resources and takeaways for the participants. Printed resources and age-specific supplies were obtained. Shirts for participating volunteers were also obtained. These were created without mention of a specific date or location, making them amenable for re-use by committee members in subsequent years. Volunteers assisted with the personal transportation of committee

members, and participants also sought their own transportation, reducing costs.

Although our event did not include funding from proprietary sources, additional opportunities for financial sustainability are available. As modeled by the University of Arizona at Tucson and VCMC's affiliation with the Ventura County Elderly Fall Prevention Coalition, the inclusion of local vendors may provide additional funding streams and creating a network of resources for older adults. These vendors gain publicity and advertisement to their target population, whereas trauma centers benefit from providing education and resources to constituents by hosting the event. Close collaboration between trauma centers and local organizations or vendors is warranted to create a fiscally sustainable event.

NUANCES OF IMPLEMENTATION

Organizers of events for older adults should bear in mind the nuances of the aging population. Timing of events should be conducted midmorning. If conducted too early, participants may not be able or willing to travel, and a later evening event also dissuades participants of this demographic. Didactic education must be kept short (between 5 and 10 min), and interspersed with interactive sessions. These interactions may come in the form of question-and-answer sessions, bingo, alternate educational games, or physical activity. Physical activity should proceed with caution, however. Depending on the mobility of the participants, chair-based exercise is recommended, and it is prudent to enlist trained assistants for each participant if conducting physical therapy or Tai chi activities to ensure the safety and stability of each person. Presentations should include large font for easy visibility, the use of microphones for the hearing-impaired, and be given in an area with minimal ambient noise. Similarly, handouts should feature large font, and giveaways should cater to patients with arthritis and difficulty with fine motor skills. Maintaining sensitivity to locally spoken languages, pamphlets or resources may require translation, and an interpreter may increase the participation of local constituents. Finally, participation of the local fire department garnered significant interest and interaction among attendees and would be prudent for those organizing similar events.

FUTURE DIRECTIONS AND METRICS

After action debrief of the event was conducted through committee review, and was met with positive feedback. However, evaluation metrics were not obtained. Despite the success of the inaugural AAST Fall Prevention event, there are several limitations to be addressed. No patient-reported metrics were obtained prior to or after this event. Nor did we obtain metrics of the committee's involvement or feedback on the day (ie, building camaraderie, ease of planning). Future iterations of the course should include participant surveys to evaluate retention of material and to optimize future educational sessions to meet the needs of this demographic. Recommended process evaluation material will be considered in the future.¹⁴ Additional time may be spent to elucidate advanced directives, and to encourage participants to approach their healthcare clinicians for further discussion in this regard. The engagement of additional community partners would create a robust partnership between AAST members and local groups. The goal of the Injury Prevention and Geriatric Trauma Committees is to continue close collaboration with local trauma centers during each Annual Meeting to promote local trauma centers as resources for injury prevention. Finally, broader outreach will be critical to ensure the curriculum

infiltrates a large population of older adults, and as the program grows, to enable sites to simulate this educational event without the presence of a national meeting. As this program expands, centers will be enabled to conduct education independently.

CONCLUSION

It is essential that trauma surgeons participate in injury prevention education for older adults, as done for other vulnerable populations. Sustainable programs require cooperation between trauma centers and community-based organizations, and may establish long-lasting relationships to benefit local constituents. This inaugural AAST event should be used as an example for member trauma centers to create replicate events, and should continue in future iterations with the collaboration of local venues as an homage to the site at each AAST Annual Meeting.

Multidisciplinary team members from AAST Geriatric Trauma, Injury Prevention, and UCI Medical Center in [figure 3](#).

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