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An Interprofessional Approach to Reducing the Risk of Falls Through Enhanced Collaborative Practice

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Abstract

Falls are the leading cause of accidental deaths in older adults and are a growing public health concern. The American Geriatrics Society/British Geriatrics Society (AGS/BGS) published guidelines for falls screening and risk reduction, yet few primary care providers report following any guidelines for falls prevention. This manuscript describes a project that engaged an interprofessional (IP) teaching team to support IP clinical teams to reduce fall risk in older adults via implementation of the AGS/BGS guidelines. Twenty-five IP clinical teams with representatives from medicine, nursing, pharmacy, and social work were recruited from ambulatory, long-term care, hospital, and home health settings for a structured intervention: a 4-hour training workshop plus “coaching” for implementation for one year. The workshop focused on evidence-based strategies to decrease the risk of falls, including screening for falls; assessing gait, balance, orthostatics and other medical conditions; exercise including tai chi; vitamin D supplementation; medication review and reduction; and environmental assessment. Quantitative and qualitative data were collected via chart review, coaching plans and field notes, and post-intervention structured interviews of participants. Site visits and coaching field notes confirmed uptake of the strategies. Chart reviews showed a significant improvement in adoption of all falls prevention strategies except vitamin D supplementation. Long-term care facilities were more likely to address environmental concerns and add tai chi classes while ambulatory settings were more likely to initiate falls screening. The intervention demonstrated that interprofessional practice change to target falls prevention can be incorporated into primary care and long-term care settings.

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Keywords

Falls prevention; Interprofessional education; Implementation science

INTRODUCTION

The pace of change in health care is accelerating in response to demands for better patient outcomes, improved quality of care, and cost containment (the triple aim). (1) New models of primary care practice, such as the Patient Centered Medical Home (PCMH), are reshaping practice settings. (2, 3) Health professionals find themselves in new roles on teams with a myriad of practice guidelines to follow and ever more sophisticated, if unwieldy, electronic health records (EHRs) to navigate. Care of older adults, already inherently complex and nuanced, can sometimes become fragmented in the midst of this rapid change, lacking a person-centered, team-based approach. (4)

Preventing falls in older adults has proven most effective with a comprehensive, team-based strategy. (5, 6) Falls are the leading cause of accidental death in people over 65 in the United States (US) and cost \$34 billion in 2013. (7) Hospitals and quality assurance organizations have made falls prevention a priority, and public health groups have focused increasing attention on this topic. The American Geriatrics Society (AGS) and British Geriatrics Society (BGS) released guidelines in 2011 for evidence-based falls prevention practices, (8) but these guidelines have not been widely adopted by clinical teams. (9, 10)

Few comprehensive falls prevention interventions have been implemented in US practice settings. In the largest program to date, participants were trained to assess falls risk factors relevant to their own profession: physical therapists focused on walking difficulty, balance impairment, and postural hypotension; primary care providers focused on optimizing medications, foot problems, and vision problems; and occupational therapists evaluated home fall hazards. Neither team-level training nor team-based interventions were used. Results showed an adjusted rate ratio of 0.91 (CI 0.86-0.94) for serious falls-related injuries in the intervention versus control regions of the state. (11)

Landis and Galvin implemented a project that included a patient registry, electronic templates, standardized protocols, a falls clinic, and patient resources in four primary care practices. After the intervention, 69% of patients were screened for risk of falls and 23% had a referral for assistive devices or referral for appropriate exercise programs. Falls rates were low and were not impacted by the intervention (2.4% pre-intervention and 2.9% post intervention, $p=0.32$). (12) Ganz and colleagues implemented a falls prevention project including provider education, standard falls risk screening questions, decision support for those at risk for falls, patient education, and referrals to community resources (e.g., exercise programs). Intervention patients received 60% of recommended care during the intervention period, compared with 38% for controls ($p < 0.001$). There were no significant differences between the intervention and control groups in episodes of falls-related care in the 12- or 24-month periods after project implementation (incidence rate ratio 1.27 [CI 0.93-1.73] and 1.18 [CI 0.93-1.49], respectively). (13)

Implementation science is the translation of effective practices into real world settings, attending to local context and culture, barriers and facilitators to implementation, and sustainability. (14, 15) It is action-oriented, utilizing participant feedback to enhance the study design. Flexibility is a key feature, favoring adaptation to local context and feedback over fidelity to a particular intervention. Implementation science aligns evidence with rapidly changing clinical practice and values both the study of the process as well as whether patient outcomes are improved in the “real world.” (16)

The Oregon Geriatric Education Center (OGEC), funded by the Health Resources and Services Administration, is a collaborative effort among Portland State University's Institute on Aging and Master's of Social Work program, Oregon Health & Science University's (OHSU) Schools of Nursing and Medicine, and Oregon State University's College of Pharmacy and Extended Studies program. An interprofessional teaching team with members from medicine, nursing, social work, pharmacy, and gerontology followed a framework of implementation science to develop a falls prevention intervention. Specifically, the program incorporated falls prevention guidelines, motivational interviewing and other behavioral techniques to aid clinicians in working with patients, and utilized an interprofessional approach that allowed clinical teams to adapt the falls prevention strategies to best fit their clinical environment (17). The objective of the intervention was to inform and enhance adherence to the AGS/BGS falls prevention guidelines among interprofessional teams in practice, especially in rural areas. This manuscript reports changes in team behaviors following the intervention, and highlights lessons learned during the practice change process.

METHODS

Participants

Interprofessional clinical teams were recruited via word of mouth and in collaboration with the Oregon Rural Practice Based Research Network, a statewide network of primary care clinicians, community partners and academicians. The goal was to recruit clinical teams from both urban and rural settings. Ideally, team composition was designed to include disciplines represented in the teaching team (medicine, nursing, pharmacy, social work), but sites could self-identify the team composition they thought would be most successful and often, additional health professions were included. Team composition is detailed in Table 1. Practices initially expressed interest in the project by responding to a recruitment form. Teaching team members made follow-up phone calls and spoke personally with representatives from interested practices. Our goal was to recruit teams that cared for community-dwelling older adults, but several long-term care facilities expressed interest in participating in the project, and we included these facilities, despite less evidence for effectiveness of falls prevention strategies in long-term care.

Institutional Review Board Approval

The OHSU Institutional Review Board approved all project activities. All clinical team participants completed informed consent forms.

Intervention

The four-hour falls prevention training workshop was developed using the AGS/BGS falls prevention guidelines. (8) The training was revised to also incorporate elements of the CDC Stopping Elderly Accidents, Deaths, & Injuries (STEADI) Tool Kit (18) when it was released mid-way through the project. The STEADI Tool Kit provides clinicians with tools to assess and reduce fall risk among older adults. Falls prevention strategies included in the training intervention were: (a) screening, asking the single question “Have you fallen in the last year?” and then performing a Timed Up and Go (TUG); (19) (b) conducting further assessment to identify issues such as orthostatic hypotension or poor vision; (c) recommending vitamin D supplementation; (d) making referrals for physical therapy gait and balance training, and community exercise programs, including tai chi; (e) reviewing and reducing unnecessary or high risk medications; and (f) suggesting environmental modifications following home safety assessment and making eyewear and footwear recommendations. (17) The workshops included an interactive large group session followed by individual clinical team coaching sessions. The large group session was an interprofessional team-taught presentation of falls prevention strategies and included brief tai chi and motivational interviewing videos to reinforce key concepts and provide an opportunity for teams to practice strategies. Teaching team members then met to coach individual clinical teams in the use of the strategies and to identify two or three falls prevention strategies that they agreed to incorporate into their practice settings during the next year (commitment to practice change). Teaching team coaches helped clinical teams brainstorm ways to implement their chosen strategies and wrote a plan to follow up with each clinical team on a monthly to quarterly basis (based on team preference) for the next 12 months.

Coaching follow up and community tai chi trainings

Following each training workshop, the state Public Health Division sponsored a master tai chi trainer to train 12 or more tai chi instructors in that local area, either from long-term care facilities or the community. These instructors could then teach classes for patients referred for tai chi. Teaching team coaches did a phone or email check-in with their clinical teams every 1-3 months for 12 months following the intervention to brainstorm solutions and offer strategies for challenges to implementation that arose and provide any additional resources requested by the clinical team.

Data Collection

For each participating clinical team, 50 patient charts from the practice site were randomly selected for review from the three months prior to the training workshop (pre-intervention), and 50 patient charts were randomly selected for review 9-12 months after the training workshop (post-intervention). We chose the 9-12 month window to best identify sustained practice change. If a practice site was small and saw fewer than 50 patients during a three-month interval either pre- or post-intervention, all patient charts were reviewed within that three-month interval. In addition, field notes from coaching follow-up sessions were reviewed, and structured interviews with clinical team participants were conducted 9-12 months after the intervention.

Outcome measures

Quantitative measures included compliance with each of the falls prevention strategies and rate of falls, emergency department (ED) visits for falls, and hospitalizations for falls. Results are reported for the entire group as well as by type of practice setting (ambulatory, long-term care). Qualitative observations recorded by teaching team coaches during the small group sessions and in the post-intervention period provided descriptions of facilitators and barriers to practice change. Field notes from coaching follow-up and structured interviews with clinical team participants 9-12 months after the intervention augmented the analysis.

Data analysis

To assess change in falls prevention strategies (e.g., proportion of patients assessed for falls risk) and patient outcomes (e.g., number of falls), we compared pre-intervention to post-intervention percentages of patients who had each strategy documented in their charts, using Chi-square tests for categorical variables and independent *t*-tests (since different patient charts were reviewed during each data collection interval) for continuous variables. Qualitative comments from coaches and structured interviews were grouped into themes. All quantitative analyses were performed using STATA 13 statistical software (StataCorp LP, College Station, TX).

RESULTS

Participants

The teaching team delivered five intervention workshops to 95 health care professionals from 25 interprofessional clinical teams across seven counties in the state. Twelve teams were from long-term care facilities, 11 were from ambulatory settings, and one team each was from a hospital and a home health agency. Intervention participants included health professionals from each of the four targeted professions (medicine, nursing, social work, pharmacy), but also physical therapists, occupational therapists, activity directors, certified nursing assistants, and practice administrators (Table 1). The final workshop was given to 9 clinic sites from a regional Accountable Care Organization (ACO). This ACO requested that we utilize a “train the trainer” approach and just train the quality improvement champion from each clinic (usually a nurse or medical assistant) who would then train the rest of the team.

A total of 1,032 charts were reviewed in the pre-intervention period, and 988 charts were reviewed in the post-intervention period. Patients whose charts were reviewed had an average age of 84, 35% were male, and 89% were ambulatory. Of the 25 clinical teams, 22 implemented at least some falls prevention strategies in their practice settings (Table 1). Three teams that attended the training workshop did not implement any falls prevention strategies; they cited barriers that included high rates of staff and administrator turnover, lack of readiness for change, and/or insufficient time for implementation of the work plan. None of these three teams consented to post-intervention data collection. Of the 22 teams who implemented some falls prevention strategies, 8 teams (36%) were found to be “limited-implementers” (defined as 10 or fewer falls screens out of the 50 charts reviewed in

the post-intervention data collection period). Results are reported for all 22 teams, with a subgroup analysis for the 14 “full-implementer” teams.

Implementation of falls prevention strategies

Overall, teams showed modest improvement in implementation of documented falls prevention strategies in the areas of falls risk assessment, orthostatic blood pressure checks, medication review and reduction, referral for tai chi, and environmental changes. The only strategy that did not show significant improvement after intervention was vitamin D supplementation. Analyses of the data for only the “full-implementer” teams showed more robust evidence of practice change (Table 2). The ambulatory teams showed greater uptake of falls risk screening, and long-term care teams (who already had mandated falls risk screening) had greater uptake of falls prevention strategies such as environmental modifications (Table 3).

Patient outcomes

The rate of falls (12.9% vs 12.2%, $p=0.615$), ED visits for falls (3.5% vs. 3.1%, $p=0.660$), and hospitalizations for falls-related injuries (1.2% vs. 1.3%, $p=0.756$) did not change significantly during the three month post-intervention data collection period compared to the three month pre-intervention data collection period.

Coaching “field notes” and participant interviews

Common themes emerged from the qualitative data:

1. Fourteen of the 22 teams that implemented falls prevention strategies were still doing them after one year. The fourteen “full implementer” sites had more robust coaching relationships with teaching team members than the “limited implementer” sites (average of one additional coaching interaction). After one year, many of the long-term care facilities were offering tai chi classes several times weekly because of their popularity and perceived effectiveness among residents and staff. Interestingly, almost none of the tai chi participation was documented during provider visits in patients’ medical charts at the facilities so these data were not captured in the chart reviews.
2. Team history and dynamics mattered. Teams with high staff turnover were less likely to implement the strategies. Teams with high levels of cohesion could rapidly implement and sustain their selected strategies, allowing members to take on new roles to successfully implement the project (e.g., activities coordinators doing home safety evaluations). Teams with high levels of administrative support and/or participation in the intervention were more likely to show evidence of implementation.
3. Teams in rural areas tended to have more cohesion and sustainability across teams. For example, clinic, long-term care facility, and home health teams in rural areas all knew each other, and individuals were often members of multiple teams, so could collaborate to reinforce falls

prevention activities when patients transitioned across settings of care. As further “evidence” of long-term sustainability, some teams received tai chi “refresher” training courses three years after their initial project involvement (and two years beyond their data collection period).

4. Practice settings guided which selected falls strategies were implemented. Long-term care settings, where falls screening is already mandated, made changes that logically “fit” with their settings, such as environmental modifications and tai chi instruction. Ambulatory settings that had no previous structure for falls screening had higher uptake of falls screening itself (Table 3). Long-term care teams demonstrated a higher level of teamwork; teams from ambulatory settings relied more heavily on providers than on other team members to implement change.
5. Practice change takes time. Early “coaching” feedback (3-6 months post-intervention) showed that many teams had not started project implementation or were only beginning to address local barriers to implementation. Even though post-intervention data collection did not occur until 9 -12 months after the training, many sites were still early in their adoption of falls prevention strategies.
6. Most practice settings had EHRs during project implementation, but few utilized EHR tools, such as health maintenance reminders, to facilitate falls screening or to document other falls prevention strategies.
7. Clinical teams thought the strategies were feasible and relevant and expressly planned to make additional changes after the formal intervention period ended. One training workshop included an Accountable Care Organization [ACO] whose leadership decided, after our training workshop, to implement the falls prevention protocol ACO-wide but did not start its formal implementation until 12 months after the workshop. Some of these teams were considered “limited implementers” in the chart review.

DISCUSSION

Our study is the first to explicitly train and coach clinical teams interprofessionally, to include long-term care settings in the trainings, to include all of the AGS/BGS falls prevention strategies, and to adopt an implementation science approach where teams adapted best practices to fit their own needs. Additionally, we had a unique relationship with the state Public Health Division that allowed for training of over 60 community tai chi instructors, some in rural areas of the state. Our findings showed that clinical teams can substantially increase their falls prevention activities within the context of care for older adults in both ambulatory and long-term care settings. Teams chose strategies most relevant to their practice settings (e.g., clinic sites who were not previously screening for falls implemented screening programs, and long-term care facilities made environmental changes and added tai chi classes). The only fall prevention strategy that did not show positive change after the intervention was vitamin D supplementation, possibly because pre-intervention vitamin D

supplementation rates were high enough to reflect that those who were vitamin D deficient were already on supplementation.

The findings from the study have several implications. First, this interprofessional training intervention was effective in increasing the use of falls prevention strategies in a larger variety of clinical practice sites, including long-term care, than has been previously demonstrated. Our findings also emphasize the value of “coaching,” or checking back in with teams of professionals concerning the implementation of their chosen strategies. Sometimes implementation took longer than expected and without coaching, might not have occurred at all.

Our study had several limitations. Clinical teams volunteered to participate so the sample may not have been representative of the full range of clinical practices. Because each practice was encouraged to adopt the strategies most feasible for use in their setting based on the premise of implementation science, fidelity to the entire protocol was not consistent across practices. (20, 21) Not all clinical teams implemented a falls prevention plan, and we may not have identified all of the reasons why these teams had no or limited implementation. Although most teams showed statistically significant improvements in multiple practice change areas, none of the strategies reached 100% compliance. The intensity of the intervention may seem modest, but in reality, falls prevention was only one of many quality priorities during the year teams participated in this project. Each team took a half-day away from their jobs (e.g., clinics closed for that half-day, and lost a half day of revenue), and team members took additional time to implement the intervention and then follow up with the teaching team for a full year. In the context of primary and long-term care, this is a large commitment, and several teams mentioned that no prior project had gotten so much of their time. Many of the strategies, such as tai chi classes and environmental modification, were clearly being conducted at various training sites but were not documented by providers during routine office or long-term care visits in the patients’ medical records; hence, they were not uniformly “captured” as part of the quantitative data collection. We think this was due more to the “traditional” Subjective, Objective, Assessment and Plan (SOAP) format of provider notes than a lack of emphasis on the value of tai chi, as many teams reported they were implementing tai chi. Physical therapy was not one of our represented health professions because we had no available School of Physical Therapy to partner with, which could have negatively impacted our project. Our very strong emphasis on tai chi, the most effective exercise to reduce risk for falling, was a novel part of the project that likely mitigated this limitation. Lastly, we included long-term care teams in this project, despite the lack of evidence that community-based falls prevention strategies are also effective in long-term care. As a practice change project, we wanted to include teams who were enthusiastic about the project, even though their practice settings did not have as strong evidence for the intervention components. Clearly, many of the long-term care teams thought this project was highly valuable and they were able to make systematic changes, such as adding tai chi.

In summary, this interprofessional falls prevention intervention changed clinical team behavior in areas related to falls prevention (e.g., assessment of falls risk, assessment of orthostatic vital signs). The interprofessional training and strategies implemented are

consistent with newer primary care approaches (e.g., the PCMH) (2, 3) that offer the potential to better address the complex health care needs of older adults through care coordination and multicomponent interventions delivered by health care professionals across disciplines. Partnerships between academic health centers and community practice settings, particularly rural ones, need to expand so everyone can learn together and reinforce the skills required of interprofessional collaborative practice. Rather than the primary care provider being the sole contributor to the medical record, the whole team should play a role in documentation of patient care so that important information—such as referral to and engagement in exercise—is captured. Standardized protocols should be broadly implemented so that vital strategies for preventive care, such as falls screening, become the norm in practices that care for older adults. Given the increasingly widespread use of EHR, practice sites should consider utilizing EHR tools to remind practitioners of these strategies and to facilitate the recording of their implementation. Research needs to study the impact of EHR tools for falls prevention and other practice change work so that practices know which tools will be most effective. These and other strategies will help to ensure that older adults receive optimal care in primary care ambulatory practices and long-term care facilities alike, in both urban and rural communities. (22)

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Table 1
Clinical Team Characteristic and Falls Prevention Strategies Chosen for Implementation

Facility type *	Team Size **	Disciplines of Team Members ***	Falls Prevention Strategies Chosen to Implement						
			Falls Risk Screen	Med Review/Reduction	Ortho BP	Refer Tai Chi	Vit D Supp	Environmental assessment/change	
CLI	1	MA	X		X			X	X
MEM	3	RN, AD, NP	X			X		X	X
HOS	4	RN, PT, AD	X	X		X		X	X
HOH	2	RN, OT	X			X			
SNF	4	NP, PH, SW, AD	X	X		X			X
CLI	2	MA	X	X	X			X	X
SNF	4	RN, PH, AD, NP	X		X	X		X	
CLI	3	RN, AD, MA	X	X	X	X			
CLI	1	RN	X		X				
CLI	2	RN, AD	X	X					
CLI	9	MD, NP, RN, PT, PH, MA, NA	X	X			X		X
MEM	4	RN, PT, AD, NP	X		X	X	X	X	X
CLI	1	AD	X	X	X			X	X
CLI	7	NP, RN, AD, MA, NA	X	X				X	X
CLI	8	MD, RN, SW, AD, AR, PS	X		X		X		X
MEM	10	MD, AR, MA, AD, NA, PH	X	X			X		X
SNF	11	MD, RN, SW, PH, AD, MA, NA	X		X			X	X
CLI	1	RN	X						
CLI	1	MA	X		X				
CLI	1	MA	X	X	X	X	X	X	
SNF	3	RN, AD, NP, PH	X		X		X	X	X
SNF	5	RN, PH, SW, AD, NP	X		X		X	X	X

* Facility Type: CLI=Clinic; MEM=Memory Care; HOS=Hospital; HOH=Home Health; SNF=Skilled Nursing Facility

** Team size and composition were defined by the practice sites. Additional practitioners were recruited and involved onsite but not identified by the site as members of the primary team.

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Disciplines of Team Members: MA=Medical Assistant; RN=Registered Nurse; AD=Administrator; PT=Physical Therapy; OT=Occupational Therapy; NP=Nurse Practitioner; PH=Pharmacist;
SW=Social Worker, MD=Physician; AR=Activities/Recreation Director; PS=Pastoral Services; NA=Nursing Assistant

Table 2

Falls Prevention Strategies and Falls-Related Outcome Measures: Full Data Set and “Implementer” Data Set Analysis*

Falls Prevention Strategy or Outcome Measure	Pre (%)	Post (%)	% Change	P Value
Complete Data Set (22 sites; 1,032 pre-charts; 988 post-charts)				
Falls Risk Assessment	42.5	51.7	↑ 9.2	< .001
Orthostatics	2.5	16.6	↑ 14.1	< .001
Medication Review	86.0	93.5	↑ 7.5	< .001
Vitamin D Supplementation	50.9	52.1	↑ 1.2	= .573
Tai Chi	0.3	1.6	↑ 1.3	= .002
Environmental Modification	3.7	21.0	↑ 17.3	< .001
Full-Implementer Data Set (14 sites; 739 pre-charts; 678 post-charts)				
Falls Risk Assessment	55.9	71.5	↑ 15.6	< .001
Orthostatics	2.8	16.8	↑ 14	< .001
Medication Review	83.1	91.3	↑ 8.2	< .001
Vitamin D Supplementation	51.7	51.5	↓ 0.2	= .935
Tai Chi	0.3	1.9	↑ 1.6	= .002
Environmental Modification	4.2	27.4	↑ 23.2	< .001

* Highlighted row indicates significant change (P < .01)

Table 3

Falls Prevention Strategies and Patient Outcomes: Comparison of Results from Ambulatory Sites (“CLINIC”) and Long-Term Care Sites (“LTC”)*

CLINIC (6 sites; 358 pre-charts; 326 post-charts)					vs	LTC (4 sites; 202 pre-charts; 175 post-charts)			
Falls Prevention Strategy	Pre (%)	Post (%)	% Change	P Value		Pre (%)	Post (%)	% Change	P Value
Falls Risk Assessment	12.3	44.5	↑ 32.2	< .001		98.0	97.7	↓ 0.3	= .837
Orthostatics	3.1	6.8	↑ 3.7	= .025		3.5	30.9	↑ 27.4	< .001
Medication Review	96.7	93.6	↓ 3.1	= .060		51.5	84.0	↑ 32.5	< .001
Vitamin D Supplementation	59.2	61.0	↑ 1.8	= .626		51.0	49.7	↓ 1.3	= .805
Tai Chi	0.6	1.2	↑ 0.6	= .349		0	4.6	↑ 4.6	= .002
Environmental Modification	2.5	4.6	↑ 2.1	= .138		3.0	34.3	↑ 31.3	< .001

* Highlighted row indicates significant change (P < .05)