

Outpatient Oncology Fall Risk: A Quality Improvement Project

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ABSTRACT

Introduction. Patients receiving cancer treatment are at high risk for falls. No current guidelines or standards of care exist for assessment and prevention of outpatient oncology falls. This quality improvement project's purpose was to 1) describe and evaluate outpatient oncology falls data to determine root cause(s), and develop, implement, and evaluate intervention strategies for future policy refinement, and 2) compare fall rates pre/post implementation of a system-wide Ambulatory Fall Risk Bundle.

Methods. Retrospective data were used to describe and categorize fall incidence for the University of Kansas Cancer Center over 12 months. Further analyses were conducted to describe fall rates per 10,000 kept appointments pre/post implementation of an Ambulatory Fall Risk Bundle protocol. Semi-structured interviews were conducted with medical assistants and nurse managers to evaluate the initiative's impact, staff satisfaction, and recommendations for refinement.

Results. The initial 12-month assessment yielded 58 patient falls retained for further analyses. Most patients were receiving chemotherapy (46, 79%). Common contributing symptoms included dizziness/faintness and weakness (25, 43%). Tripping/falling over a hazard (12, 24%) and falls during transfer (10, 5.8%) also were cited. Subsequent analyses of fall rates indicated no change. Recommendations resulting from the qualitative interviews included: orthostatic vital sign protocol implementation, redesign of the electronic medical record fall risk alert, stakeholder involvement in protocol development, staff training, and related patient education strategies, and the procurement of additional assistive devices/equipment.

Conclusions. System-related policy and culture change, investment in physical and human resource enhancements, and evidence-based protocols are needed to improve outpatient oncology fall rates.

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INTRODUCTION

Patient safety is paramount for providing high-quality healthcare in both the inpatient and outpatient settings, and fall rates are an important quality indicator for nurse-sensitive outcomes.¹⁻³ However, the primary focus for fall tracking and prevention occurs in the inpatient setting. Very little literature is available concerning risk factors and the prevention of falls in the outpatient setting. On a more specific level,

evidence indicates that individuals diagnosed with, and receiving treatment for cancer may be at higher risk for falls than the non-cancer population, particularly those aged 60 and above.⁴⁻⁷ Potential risk factors include neurotoxic chemotherapy and orthostatic hypotension.⁶⁻⁸ To date no guidelines to prevent or reduce falls in the outpatient oncology setting have been published, nor is there a standardized assessment tool to assess fall risk in this population. Oncology nurse educators at the University of Kansas National Cancer Institute-designated Comprehensive Cancer Center (KUCC) recognized outpatient oncology falls as a safety concern and partnered with nurse scientists within the School of Nursing to investigate the problem and propose policy change to the cancer center leadership.

An Oncology Nursing Falls Project Team (Project Team) was formed to develop and conduct a quality improvement project. In addition to the oncology nurse educators and nurse scientists, Project Team representation also included the KUCC Quality & Performance Improvement Manager and nursing faculty with qualitative interviewing and analyses expertise. The initial purpose of this quality improvement project was to describe and evaluate KUCC outpatient falls data to determine root cause(s) and to develop, implement, and evaluate intervention strategies for future policy refinement. However, prior to the completion of the planned data collection and analyses, the parent institution (University of Kansas Health System-UKHS) formed an Ambulatory Practice Council. The purpose of this Council was to develop and implement a system-wide Ambulatory Fall Risk Prevention Bundle (Fall Risk Bundle) to "go live" as of September 2020. As a result, the Project Team adapted the purpose of the quality improvement project to also compare KUCC fall rates pre/post Fall Risk Bundle implementation and to assess staff integration of, and satisfaction with, the new policies to further inform recommendations for system change.

METHODS

Setting and Existing Falls Assessment Procedure. University of Kansas Medical Center (KUMC) Human Subjects Committee quality improvement determination was confirmed prior to data collection. The quality improvement project was conducted at the KUCC, which encompasses eight community oncology outpatient clinics throughout the greater Kansas City metropolitan and surrounding areas.

Prior to initiation of the quality improvement project, UKHS institutional policy for outpatient clinics included a Fall Risk Assessment for patients over age 65 or for those with obvious balance/steadiness issues or use of assistive devices at the time of admission. This assessment involved asking patients three screening questions: 1) Have you fallen within the past six months? 2) Do you use an assistive device? and 3) Do you have any limitations in mobility? A "yes" answer to any of the three questions indicated the patient was "high risk" for falls. The high-risk determination triggered a Fall Risk banner in the electronic medical record (EMR) and outpatient clinic staff were instructed to place a yellow fall risk band on the patient's wrist.

Intervention. The UKHS Ambulatory Practice Council Fall Risk Bundle elements and processes are listed in Table 1. The new workflow included identifying all high fall risk patients during pre-visit planning or chart preparation. The chart was to be reviewed by the outpatient clinic registered nurse (RN) for any patients over the age of 65 with a history of falls within the last six months, as well as the potential for impaired balance or mobility. These patient charts would be flagged as a fall risk by ensuring the Fall Risk banner was displayed in the EMR and the Fall Risk Bundle would be implemented when the patient arrived at clinic. An additional element of the new workflow included a process within the EMR to enable Patient Service Representatives (PSR) working at the registration desk to be able to see a report of the fall risk patients. This Department Appointment Report (DAR) displays all patients and their appointment times for the day. A column was added to the DAR to indicate the patient's fall risk status. If the Fall Risk banner was activated in the patient's chart, then the patient would be flagged on the PSR DAR as high fall risk. This workflow was designed so that the PSR would place a yellow high fall risk wrist band on the patient simultaneously with the patient identification band at check in.

Table 1. Fall risk bundle processes.

Process	Role
Identify and Notify	
Patient identified as a high fall risk during pre-visit planning or chart preparation if possible.	RN
Review chart for all patients over age 65, history of fall within the last six months, potential for impaired balance or mobility, use of assistive device, fall history.	RN
Ensure patient is flagged as high fall risk in EMR.	RN
Notify licensed provider at time of patient check-in.	PSR
Ensure Bundle elements are ready when patient arrives in clinic.	PSR
Apply high fall risk yellow wrist band at time of check in.	PSR
Screen	
Screening completed during rooming process.	MA
Assess for additional interventions.	RN
Assess for potential environmental or ambulation concerns.	RN
Assess high fall risk per clinical judgement.	RN
Bundle Physical Elements	
Yellow high fall risk wrist band	PSR
High fall risk flagged in EMR	RN
Yellow triangular high fall risk door flag for room	MA
Keep patient in lowest & safest position	MA/RN
Yellow high fall risk table tent flag	MA
Provide patient education about preventing falls	RN
Consider additional interventions (e.g., arm's reach while ambulating, use of assistive device such as wheelchair or walker)	MA/RN

Note: MA; medical assistant, PSR; patient services representative, RN, registered nurse

Once the patient was roomed, the fall risk screening questions would be completed by the medical assistant (MA) or person rooming the patient. Fall Risk Bundle elements, in addition to the yellow wrist band, included placing a yellow triangular door flag outside the room and a table tent inside the room stating to "leave the patient in the lowest seated position." The RN would then further assess the patient to identify the need for additional interventions related to environmental or ambulation concerns. Clinical judgement can always trump the fall risk assessment if patient does not meet the criteria, but should be considered a high fall risk based on clinical presentation or underlying disease characteristics.

Prior to Fall Risk Bundle implementation, cancer center staff received education about the new protocol by the Oncology Nurse Educators. MAs and RNs also were required to complete a supplemental assignment in the UKHS-hosted online learning and procedural database detailing the new protocol and to score 80% or higher on the associated quiz.

Measures. UKHS policy requires employees to complete a report within the patient safety event reporting system documenting the occurrence of all falls (patient, visitor, employee) and detailing the event and any assessments and/or interventions that were employed.

Data Collection for Falls Incidence and Description Pre-Fall Risk Bundle. The Project Team utilized the UKHS's patient safety event reporting system to determine the number of falls that occurred in the eight KUCC outpatient clinics and related departments (such as lab, radiology, etc.) between November 2018 and November 2019. These data were extracted in May of 2020. Information stored within the UKHS patient safety reporting system was used to develop the data entry form for a semi-structured dataset of outpatient oncology falls variables.

The variables included in structured fields are outlined in Table 2. Unstructured data fields included free text areas to document diagnosis and other contributing factors not listed in the structured fields. Narrative descriptions of the events associated with the fall incidents included in the free text fields were categorized and tabulated. Questions arising during data entry were discussed by the entire team.

Data Collection to Compare Pre/Post Fall Risk Bundle Implementation Falls Rate. To identify the impact of the Bundle, the fall rate was tracked over time and entered into a process behavior chart (Figure 1). The patient safety event reporting system is used to report events that caused, or have the potential to cause, patient harm. Events are ranked on a harm score of increasing severity from 1 through 9, with scores 1-2 being unsafe conditions or near misses (i.e., not reaching the patient), scores 3-5 indicating an event that reached the patient but did not cause physical harm, and scores 6 and above resulting in physical harm to the patient. Our fall rate included any falls with a harm score ≥ 3 that occurred in an outpatient cancer center-associated department; falls that occurred in shared spaces (such as lobbies and parking areas) were excluded, as those areas could have been frequented by patients seeking non-oncological medical care from practices outside the KUCC, but which share the same facilities (e.g., primary care, urgent care, radiology). Our denominator included any kept appointment in a cancer center department, meaning any physical (or face-to-face) appointment; cancellations and no-show appointments were excluded,

as were any telehealth appointments (since those patients would not be physically present at the practice location). Our monthly rate of falls per 10,000 kept appointments was then plotted on an XmR process behavior chart (aka Shewhart's Control Chart).

Table 2. Data entry form structured field variables.

Fall details	Event date
	Outpatient oncology clinic location
	Fall harm score
	Factors involved in the fall
	Whether fall was witnessed and by whom
	Whether fall was assisted
Person demographics	Category of person who fell (e.g., patient, family, staff)
	Age
	Gender
	Current treatment (e.g., chemotherapy, radiation therapy, targeted therapy, immunotherapy)
Assessments at time of fall	Physiologic measures (e.g., vital signs, blood glucose)
Pre-fall assessments	Pre-fall visit risk assessment date and risk score
Post-fall assessments	Post-fall visit risk assessment date and risk score

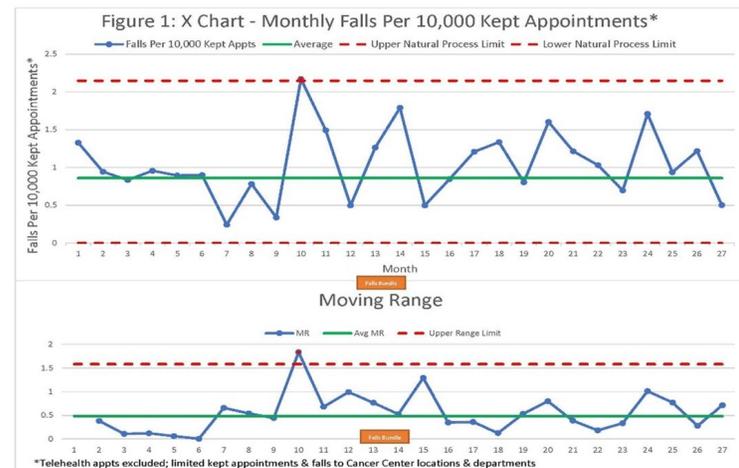


Figure 1. Depicts one X chart and one Moving Range (MR) chart. The upper X chart displays individual measurements of the monthly fall rates over time (per 10,000 kept appointments). The lower MR chart displays the month-to-month variability between corresponding measurements.

Data Collection to Assess Staff Satisfaction with the Fall Risk Bundle Initiative Impact, Related Training, and Recommendations for Refinement. All MAs and nurse managers working in the eight outpatient KUCC clinics were invited by email to participate in this quality improvement project. Participation served as consent, as projects with Human Subjects Committee determination as quality improvement do not require written signature. The sampling goal was to interview all nurse managers and two MAs from each outpatient clinic location, or until data saturation was achieved. Participation for MAs involved virtual attendance at group sessions to provide feedback on the Fall Risk Bundle implementation; nurse managers were interviewed individually. MAs and nurse managers were interviewed separately to

facilitate open communication and feedback. Two semi-structured interview guides were developed by the Project Team members with qualitative research expertise (MP). Further revision and approval by the full team was completed prior to use. Parallel questions in the interview guides for MAs and nurse managers were organized around eight categories of interest identified by the Project Team: 1) pre-Fall Risk Bundle falls assessment, 2) Fall Risk Bundle training content, 3) usefulness of Fall Risk Bundle training, 4) suggestions for changes to Fall Risk Bundle training, 5) differences post-Fall Risk Bundle implementation, 6) usefulness of Fall Risk Bundle components, 7) suggestions for changes to the Fall Risk Bundle, and 8) ideas for fall prevention. Interviews ranged from 30-60 minutes and were conducted on a secure Zoom platform after the introduction of the Fall Risk Bundle during the Fall of 2020. The interviews were conducted by one Project Team member (MP) between March and May of 2021. These interviews were recorded, transcribed verbatim (DE) and stored on the institutional password-protected secure computer drive. Member checking was not possible due to pandemic-related staff attrition.

Quantitative Data Analyses. Descriptive statistics (frequencies and percentages) were calculated to describe the falls incidence and associated assessments prior to Fall Risk Bundle implementation (November 2018-2019). Monthly fall rates per 10,000 kept appointments were calculated for the 13 months preceding and following Fall Risk Bundle implementation.

Qualitative Data Analyses. Two Project Team members independently analyzed the written transcripts from the semi-structured interviews (MP, DE). A qualitative thematic analysis with an inductive approach was used to analyze the data. The goal was to evaluate the Fall Risk Bundle initiative impact, staff satisfaction, and recommendations for refinement from the perspectives of the MAs and their nurse managers. The inductive approach was selected so emerging themes were closely linked to the data and not made to fit an existing coding schema.⁹ Data analyses were conducted by two Project Team members (MP, DE) who followed the steps outlined by Braun & Clarke.⁹ Specifically, data were coded systematically, examined for potential themes and confirmation of how the data reflected those initial themes, followed by the refinement of final themes for reporting.

RESULTS

One systems issue identified by the Project Team during data collection prior to the implementation of the Fall Risk Bundle protocol was the transient nature of the EMR Fall Risk banner. This banner disappeared from the EMR any time a subsequent fall risk assessment did not indicate the patient to be high risk (e.g., the patient did not answer yes to any of the fall risk questions, regardless of whether the patient had a previous fall at the cancer center). Anecdotally, patients were known to refuse the yellow wrist band so as not to be "labeled" as high risk for falls. Additionally, prior to the Fall Risk Bundle implementation, no specific clinic staff role was designated as the one responsible to apply the yellow fall risk wrist band.

Pre-Fall Risk Bundle Description of Falls. The total number of falls were collected for the KUCC eight locations between November 2018 and November 2019. Seventy falls were recorded. After subtracting incidents for staff, visitors, and non-oncology patients, a total of 58 fall incidents were retained for further analysis. Of these 58, 44 patients were determined to have been checked in for their appointment at the time of the fall, 13 had not yet checked in, and the status for 1 was unable to be determined. For the 44 patients who had checked in prior to the fall occurrence, a fall risk assessment was documented for 23 (52.3%), and of these, 7 were found to be low risk and 16 were rated as high risk (Table 3).

Table 3. Fall risk assessment documentation.

	Visit where fall occurred*	Visit preceding fall**	Visit following fall**
Fall risk assessment documented	23 (52.3%)	25 (43%)	32 (72.7%)
Low fall risk rating	7	19	15
High fall risk rating	16	6	17

*Denominator only included the 44 patients who had checked in for their clinic visit prior to the fall.

**Denominator includes the total 58 patients with documented fall incidents.

Data were collected to describe the fall risk assessment results for the outpatient oncology clinic visits preceding and following the fall incidents. Fall risk assessments were documented for clinic visits preceding the fall incident for 25 (43%) patients. Of these 25, 19 were assessed at low risk and 6 rated at high risk. During the clinic visit following the fall incident, fall risk assessments were conducted for 32 (72.7%) patients. At this subsequent visit 17 were rated at high risk and 15 were designated as low risk.

Ages ranged from 39 to 94 (mean age was 65). Most patients were receiving chemotherapy (46, 79%). Alkylating agents were noted to be the most common classification of drugs (16, 34.7%) followed by taxanes (8, 17.4%) and antimetabolites (8, 17.4%). Data were not available on the incidence/presence of neuropathy. Vital signs (including blood pressure and heart rate) post-fall were documented for 10 (17.2%) of the cases. Blood glucose level was documented for one case. The most frequently cited contributing factors to the fall incidents (Table 4) were symptoms described as dizziness, faintness, weakness, and “legs giving out” (25, 43%). Tripping/falling over a hazard was cited for 12 (24%) cases. Falls occurring during transfer (to chair, from exam table, or from car) were cited for 10 (5.8%) cases.

Table 4. Fall incident description.

Fall incident	Frequency
Trip over hazard (or fall over hazard)	12
Trip, no hazard	7
Symptoms (dizzy, faint, weakness, legs giving out)	25*
Transfer (trying to sit, trying to get out of car, trying to get off exam table)	10*
Slip on surface	1
Other	3
Not documented	1

*One case documented dizziness while trying to transfer off exam table.

Comparison of Pre/Post Fall Risk Bundle Implementation

Falls Rate. Displayed on the upper X chart of Figure 1 are the individual measurements of the monthly fall rates over time, while the lower moving range (MR) chart displays the month-to-month variability between corresponding measurements. Signals are identified as individual measurements either above or below the upper natural process limit or lower natural process limit, respectively, on the X chart (red, dashed lines), or above the upper range limit on the MR chart (also represented by the red, dashed line). Such a signal (in both the X and MR charts) was identified in month 10, with an increase in the fall rate likely attributable to the clinic expansion that occurred that month in the cancer center, following the COVID-19 lockdown in early 2020. Evidence of a sustained change that occurred to the underlying process would be a signal of exceptional variation⁹ and would be represented by eight or more successive measurements on either side of the average fall rate, or the green line on the X Chart. However, as demonstrated by Figure 1, no evidence of a sustained change in the fall rate was noted either before or after the implementation of the Fall Risk Bundle (identified on the chart in month 14). Rather, outside of the clinic expansion signal after the COVID lockdown, the fall rate remained constant around the monthly average of 0.85 falls per 10,000 kept appointments.

Result for the Semi-Structured Interviews. Semi-structured interviews were conducted with 10 of 12 nurse managers (83%) and 21 MAs (minimum target sample of 16). Two or more MA interviews were conducted at all but one site (one interview conducted) and data saturation were achieved. Data analysis revealed concordance between the MAs’ perceptions of and experiences with the Fall Risk Bundle and with those of the nurse managers. Goals for the semi-structured interviews were reflected in three main themes that emerged from the data and are outlined below.

Theme 1: Fall Risk Bundle Training - Standard Fare, Although a Good Refresher. In general, MAs and nurse managers remembered few specifics about the Bundle training, although both groups reported the training was a “good refresher.”

One MA stated, “I don’t think I remember doing it.” Another MA said that “if we were assigned [the training] via email, we did it.” MAs stated they received many training modules, and a few did remember taking it but not the specifics of the training. Regarding training content, an MA said: “It didn’t really add a lot of new stuff from what we previously had. It did help us recall stuff we already knew.” Responses to the training were mixed. Some MAs felt they knew the material already and it was repetitive, and others felt it was a good refresher. Some felt the training

was not clinic specific. Satisfaction with the training ranged from neutral to satisfied; one MA said: “I felt it was informative, but it wasn’t something that you could put in your memory bank. I just don’t think it was powerful enough to stick with you.” Other MAs felt it was too long and lacked a “wow factor.” Others were more satisfied with the training: “I’m sure I got good information.”

Nurse managers found it “hard to gauge [MAs’] engagement, comprehension, retention” of the training information. Nurse managers either did not view the training or did not remember doing so. Some nurse managers believed that the training was a good refresher and useful for new people. Both groups had suggestions for improving the training. MAs stated they wanted in-person, hands-on practice, not a video only; they mentioned the usefulness of a live demo with a mock patient, a group effort, and having someone come in and do the teaching, which would help participants take the content more seriously. One MA said: “In person training is the best so we can see what they want from us. It’s more powerful than a test. You can see it and do it.” Several nurse managers stated they felt staff learned best from hands-on training while acknowledging that virtual modules that can be completed asynchronously makes training more accessible. Suggestions for improvement included teaching MAs how to address patient education regarding falls prevention, particularly when using the bathroom. Another suggestion was to include a method to measure engagement, comprehension, and retention of material.

Theme 2: Fall Risk Bundle Receives Mixed Reviews. Several MAs felt there was no difference between the new Fall Risk Bundle and the previous procedure, stating “no difference, no change, nothing different.” Conflicting opinions were voiced regarding the helpfulness (or not) of the yellow triangles to be placed on the doors of the rooms for patients designated as high fall risk. One MA felt that “hanging something on door is difficult to remember to do in hectic day” while another MA reported a clinic-specific nuance in which all doors already were equipped with metal door flags (red, green, and yellow) so the use of additional yellow door flags was redundant. Additionally, some MAs reported the yellow table tents were a helpful visual reminder of fall risk while others reported these “were too small and got lost”.

Nurse managers agreed that there was no real change between the previous procedure and the new Fall Risk Bundle overall, except in signage. One nurse manager said: “The message is just a bit different, and it seems to be louder. Our staff is more alert and aware about it.” On the other hand, another nurse manager felt that: “Helping staff understand the why behind the what sometimes can be challenging especially when what’s being implemented doesn’t make a lot of sense” based on clinic-specific environments. Contrasting opinions about any differences with the Fall Risk Bundle ranged from believing that MAs were more alert and aware about falls, to MAs seeing no value in the Fall Risk Bundle. One manager noted that table tents got in the way of patient care.

Both groups agreed that components of the Fall Risk Bundle were inconsistently implemented across the various outpatient oncology clinics. For example, MAs and nurse managers reported consistent use of the yellow wrist bands as compared to very little uptake for the table tents.

As noted for the Fall Risk Bundle training, both groups shared several pertinent revision suggestions. Broad categories for reduction in fall risk spanned three areas: 1) physical resources, 2) human resources, and 3) process/cultural changes. Physical resource suggestions included: redesign of the EMR fall risk banner to remain in place for six months post-fall regardless of participants’ answers to the three fall risk assessment questions, and redesign of the EMR fall risk banner placement in the chart so it is immediately apparent without staff needing to scroll through the chart. Nurse managers also suggested exam tables could be lowered, placement of gait belts in every room, and redesigned bathrooms to provide room for assistive devices and staff while providing privacy. Suggested human resources included implementing a greeter near elevators, escorts to walk patients out of clinic, and developing a process for safely getting patients in and out of the front door. Patient education and culture change around keeping patients safe was noted as necessary to helping patients understand why safety measures were in place – designed for their safety and not meant to diminish their autonomy. Further specifics for suggested revisions are outlined in Table 5.

Theme 3: Fall Risk-Contributing Factors. The most cited location and reason for falls reported by both groups was the bathroom – both as patients traveled to the bathroom and while using it. The underlying issue was noted to be patients’ request for privacy in the bathroom and refusal of assistance. Footwear was the second-most cited reason for falls, particularly flip flops. Other places and reasons for falls from the MAs’ perspective included patients’ disease stage, standing for weight measurement, and lack of education on fall risks. Nurse managers noted sedation medication and refusal to use assistive devices as probable causes. Both MAs and nurse managers agreed that certain physiological factors were likely at play, such as patients being hypotensive, light-headed, or dizzy. Other physical factors identified by both groups included patients tripping over their own feet, tangling with IV poles, and stumbling over poorly placed or designed clinic furniture. Chairs in the clinic rooms were noted to have legs that curved outward, creating a tripping hazard.

DISCUSSION

Evidence-based standards to assess fall risk and prevent falls in outpatient oncology clinics are needed to enhance patient safety. The fall risk screening questions utilized in both the UKHS inpatient and outpatient settings are consistent with falls screening questions recommended by the American and British Geriatrics Societies Clinical Practice Guidelines for Prevention of Falls in Older Persons.¹¹ However, a recent systematic review of the literature indicates that no standard assessment tool has yet been developed for the outpatient oncology setting.¹² Results from this review demonstrate that a history of falls is the most commonly identified risk factor for older adults with cancer in both inpatient and outpatient settings. Asking about the occurrence of any recent falls is recommended at every clinic visit for this population.

Table 5. Medical assistant and nurse manager recommendations for Fall Risk Bundle revision.

	Medical assistants	Nurse managers
Physical resources	Sturdier/larger fall risk door flags.	Only place fall risk signs/symbols exterior to the room and omit use of table tents.
	Availability/knowledge of location of gait belts.	Supply gait belts in every room.
	Additional (and newer) wheelchairs.	Standardize signs/symbols so that all stakeholders know the meaning. Bathroom redesign to provide room for assistive devices and staff while providing patient privacy.
Human resources	Designated staff (such as transport persons) to assist patients to and from their rooms, and escort them to their vehicle.	Implementation of a greeter near elevators, escorts to walk patients out of clinic, and developing a process for safely getting patients in and out of the front door.
	Conduct daily staff huddles on scheduled patients to identify those known to be high fall risk.	Consistent application of the fall risk wristbands by the registration desk staff prior to patient rooming.
Process/culture change	Availability of additional/enduring training videos.	Development of a falls check list in clinic rooms detailing the steps to prevent falls (such as application of the yellow falls risk wrist band and ensuring patients are placed at the lowest seat/table height).
	Development of a falls check list in clinic rooms detailing the steps to prevent falls (such as application of the yellow falls risk wrist band and ensuring patients are placed at the lowest seat/table height).	Solicitation of stakeholder input from clinic staff, patients, and families prior to further Falls Risk Bundle implementation.
	Implementation of a patient resource guide with focused education about home hazards, footwear, use of handrails in the clinic.	Ensure the Falls Risk Bundle is specific to the cancer patient population and not a “general Ambulatory Fall Risk Bundle”.
		Redesign of the fall risk banner within the medical record to remain in place for six-months post-fall; redesign of fall risk banner placement to be immediately apparent without the need for scrolling.
		Patient education and culture change around keeping patients safe (e.g., helping patients understand rationale for existing safety measures).

Since the inception of this quality improvement project, the results of one study have been published describing implementation and study of a color-coded flag system in an outpatient oncology infusion center to reduce fall rates.¹³ Shah reports use of a modified fall risk assessment tool (FRAT) within the EMR to assess outpatients at each infusion visit.³ A “yes” response to any of the FRAT questions generates the application of a yellow fall risk wrist band and a yellow flag outside of the patient’s room, similar to two of the bundle elements implemented at KUCC. In contrast to the quality improvement project results reported here, fall rates dropped from 5% to 0% within six months.¹³

Scant work has been conducted to qualitatively collect the experiences of healthcare team members regarding falls risk protocols and associated training, particularly in ambulatory oncology clinics. In the hospital setting, staff nurses may have the most influence in falls prevention.¹³ Results from one recent hospital-based study indicated that intense falls prevention messaging from administration had a negative effect and led staff nurses to fear falls and to guard themselves against falls repercussions, such as job loss and public humiliation, resulting in nurses’ desire to avoid caring for falls risk patients.¹³ In our QI project, MAs had the most responsibility for falls prevention, and while present, the falls messaging did not serve to alarm the MAs or lead to job neglect. In contrast, MAs identified additional ways to help prevent falls in their clinic. One idea noted above from the MA interviews was

to better educate patients on why falls prevention in the clinic was important. This idea is supported by results from a recent scoping review indicating that incorporating patient education into falls prevention strategies can reduce falls and accompanying injuries.¹⁴ Patient education has been demonstrated to reduce falls in the hospital setting. A recent study was conducted to evaluate the impact of a fall prevention toolkit for patients and families in the hospital setting. Implementation of the toolkit was associated with a significant reduction in falls and concurrent injuries.¹⁵

This quality improvement project was restricted by several limitations. Utilization of the UKHS patient safety reporting system to describe KUCC fall rates and investigate pre/post bundle change was subject to the risk of under reporting inherent in adverse-event reporting systems dependent on self-report.^{14,15} However, this system is the only available mechanism for collecting falls data at our institution. Another study limitation relates to the delay to initiate the qualitative interviews (from the Fall of 2020 to the Spring of 2021) due to staffing challenges related to the COVID-19 pandemic. Project Team members were deployed to meet direct care needs within the institution during this timeframe. These factors prolonged our data collection period for conducting the qualitative interviews and reduced the pool of MAs who were present for the original pre-bundle implementation education. Unfortunately, bundle development and implementation was

not customized by disease specialty and variability between individual outpatient clinics settings. No process procedures were put in place to monitor implementation compliance or satisfaction, nor were disease specialty stakeholders involved in the bundle development. A project strength was the important information gleaned from the qualitative interviews; however, the project design did not include methods to obtain insights from outpatient oncology patients or family members.

Project Teams' Recommendation. Results from the review of the data extracted from the institutional health systems' patient safety event reporting system provided evidence that dizziness, faintness, and weakness were the most cited descriptors associated with the fall incidents. Likewise, falls occurring during transfers commonly were noted. Taken together, along with the known association between postural hypotension and fall risk in primary care,^{8,18} and the lack of an outpatient oncology clinic protocol for post infusion or procedure vital signs, the Project Team recommends development and implementation of an orthostatic vital sign protocol. The Project Team recommends that orthostatic vital signs be assessed prior to discharge for all high-risk patients, as well as following infusions and prone position procedures. Discharge should be delayed until blood pressure returns to baseline, or patients with documented postural hypotension whose family members are present should be escorted by wheelchair to their cars. Consideration also should be given regarding a policy for a discharge escort service for any patient deemed to be a high fall risk.

Review of the UKHS' patient safety event reporting system data also demonstrated lack of consistent or durable documentation of fall risk. The project team recommends a redesign of the EMR Falls Risk Banner so that this alert will be maintained for a six-month period following a fall or determination that a patient is a high fall risk. This recommendation was further supported by the results of the semi-structured qualitative interviews conducted with the MAs and nurse managers.

Development of a patient education strategy, such as an educational tool kit, with input from all stakeholders at our eight KUCC clinics is suggested. Longer-term solutions with budget ramifications are recommended for consideration by the cancer center leadership, such as safer chairs, adjustable exam tables, additional gait belts and wheelchairs, assistive devices, and bathroom redesign.

CONCLUSIONS

Results from this quality improvement project indicated that system-related policy and culture change, investment in physical and human resource enhancements, and evidence-based protocols are needed to improve outpatient oncology fall rates. Stakeholder involvement, multifactorial educational strategies, and unit-specific customization of ambulatory fall-risk protocols are desired by outpatient oncology clinic staff. The project findings were shared with cancer center leadership with priority assigned to the redesign of the EMR Falls Risk Banner functionality and implementation of the proposed orthostatic vital sign protocol for patients rated as high-risk on the fall risk assessment. Next steps include obtain input from all stakeholders, such as MAs, clinic RNs, nurse managers, patients/family members, and system administrators to redesign staff and patient education around mitigation of fall risks. The Project Team will continue to monitor and assess the incidence and type of falls as these recommendations are implemented.

Although this quality improvement project was conducted to identify and address outpatient oncology fall rates for one NCI-designated comprehensive cancer center, the lessons learned about the importance of stakeholder engagement in policy development are broadly applicable to other institutions.

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