New South Wales Health Promotion Demonstration Research Grants Scheme



PREVENTION OF FALLS IN RESIDENTIAL AGED CARE

NSW HEALTH

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Abbreviations and acronyms

AHS Area Health Service

FRAT Falls Risk Assessment Tool

FRS Falls Risk Assessment

GP General Practitioner

HAHS Hunter Area Health Service

HNEAHS Hunter New England Area Health Service

NOF Neck of Femur

PBS Pharmaceutical Benefits Scheme

RCT Randomised Controlled Trial

Executive summary

Issue addressed

Falls resulting in hip fractures are a major public health issue. Around one-third of such falls for those over 65 years occur among residents of residential aged care facilities, with around one-third resident in hostels and two-thirds resident in nursing homes at the time of the fall. A 10 per cent reduction in the rate of falls would result in substantial health service cost savings, notwithstanding the reduction in the burden of illness related to ageing for individuals and their families. The project was designed to test the hypothesis that a project officer working with residential aged care facilities to support best practice strategies for falls injury prevention could significantly reduce the number of hip fractures.

The intervention

Over a 17 month period, a range of best practice strategies were promoted in the intervention facilities. 'Link' persons were appointed in each facility to allow the project officer to introduce best practice strategies to the intervention facilities and to obtain data from all facilities.

Methods

All residential aged care facilities with at least 20 beds in the Hunter and Lower Mid-North Coast areas of NSW were invited to participate in the study. The study was undertaken as a cluster randomised controlled trial with whole facilities (clusters) randomly allocated to intervention or control conditions. During a base-line period of six months, information was collected on the resident profiles, falls and falls injuries, including hip fractures, and the existing falls injury prevention programs. Over the ensuing 18 month intervention period, data on falls and falls injuries in both intervention and control facilities were collected on a monthly basis. An audit of falls injury prevention strategies was carried out at the start and conclusion of the project to determine the extent of culture change.

Results

Of the 92 eligible facilities, 88 agreed to take part, including a total of 5,354 residents. Six facilities withdrew after commencement of the project. There was no difference in the number of falls or falls injuries, including hip fractures, between the intervention and control groups. There was also no difference in the number of hip fractures between the base-line six months and the last six months of the intervention.

Conclusions

The failure to produce a reduction in serious falls injuries in the intervention group may have been due to the contamination that occurred in the control group with regard to the use of best practice strategies. On the other hand, it may have been due to the relatively short period of the intervention as suggested in other studies, due to the ineffectiveness of the strategies used or due to the large number of residents with dementia.

So what?

It is clearly difficult to change the culture within residential aged care and particularly of the visiting medical officers. It would be valuable to repeat the project with a longer intervention period of three to five years. Some strategies such as calcium and vitamin D supplementation need change at a national level as there are significant obstacles to the widespread use of the current available preparations. It seems unlikely that any sustained reduction in hip fractures in residential aged care facilities can be obtained without outside support such as provided by an area project officer.

Introduction

Background

Falls injuries in general, and hip fractures in particular, are major public health issues with considerable cost to the health system. They also impact severely on the lives of older people. Prior to the commencement of this project, the former Hunter Area Health Service (HAHS) experienced about 450 hip fractures per year, of which about one-third were from aged care facilities. This latter group used around 6,000 hospital bed days at a total cost to the HAHS of about \$3,000,000. A number of strategies have been suggested to reduce the risk factors for falls and fractures, and could be employed to prevent these events in residential aged care settings. The evidence from overseas research on calcium and vitamin D supplementation and on hip protectors suggested that these strategies could potentially reduce hip fractures in aged care facilities by up to 50 per cent. This would represent a potential saving of 3,000 bed days or eight bed years and a budgetary saving of \$1,500,000.

Many aged care facilities have falls injury prevention programs but they are difficult to sustain given the myriad of other demands on the staff of aged care facilities. The history of falls injury prevention programs is that they often depend on one committed person and that the project struggles to survive if that person leaves or is moved to a different responsibility.

We proposed that falls injury prevention programs in aged care facilities could be more sustainable if they were supported by a centrally based facilitator able to provide resources, support and encouragement. The expectation was that the employment of a project nurse to support and encourage aged care facilities to implement a full range of best practice strategies of falls injury prevention would increase the sustainability of falls injury prevention programs in aged care facilities. The hypothesis was that the expenditure of \$80,000 per annum on the nurse and supporting resources would result in a saving to the Area Health Service (AHS) that would more than cover the cost of the project. A reduction of 10 per cent in hip fractures would result in a saving of 600 bed days or approximately \$300,000.

Early trials of falls prevention in aged care facilities used a limited number of strategies and produced variable results. One trial showed a reduction in falls by repeated fallers¹ and others failed to produce any reduction in falls or fractures ^{2,3} however they did show a reduction in hospital admissions. 1-3 The most significant results came from a French trial of vitamin D and calcium⁴ and the Danish hip protector trial,⁵ although these results have not been replicated in subsequent studies.

Two recent studies ^{6,7} have used a wider range of strategies with better results although the short period of intervention in one trial⁶ makes the results less convincing. A Swedish 11 week multi-strategy intervention involving 439 residents of nine residential care facilities was followed by a 34 week followup period. 6 The strategies included staff education, environmental modification, exercise programs, medication reviews, the provision of free hip protectors and post-fall staff conferences. Falls in the intervention group were reduced by 22 per cent and hip fractures by 87 per cent (both significant). A German 12 month trial among 981 residents of six nursing homes used staff training, resident education, environmental modification, exercise programs and hip protectors.⁷ Falls were significantly reduced by 45 per cent in the intervention group but there was no reduction in hip fractures.

In summary, there is still no clear evidence, that hip fractures in residential aged care facilities in Australia, can be consistently reduced by either single or multistrategy interventions.

Evidence-base for best practice approaches to falls prevention

A number of strategies are considered to be effective in the prevention of falls or falls injuries. A review of the evidence-base for these strategies is provided below.

Falls risk assessment on admission

Although there is no evidence that the use of a falls risk assessment (FRS) on admission to residential aged care reduces falls injuries, it is considered best practice to have such a program in place in residential aged care. The assessment determines the level of risk from which an appropriate prevention program can be planned and supported by staff education.

There are a number of risk assessment tools, none of which have received unanimous acceptance. The best known are the STRATIFY (St Thomas' risk assessment tool in falling elderly inpatients), 9 and the FRAT (Falls Risk Assessment (FRS) Tool – Peninsula Health), 10 both of which have been tested for sensitivity, specificity and inter-rater reliability. The latter has been considered the most suitable for residential aged care and has been used in falls prevention programs in both low and high care. Low level care homes generally provide accommodation and personal care, such as help with dressing and showering together with occasional nursing care. High level care homes care for people with greater degree of frailty, who often need continuous nursing care. 11 Although the FRAT was recommended as an assessment tool in this project, we did not insist that facilities change if they were already using a different but appropriate assessment tool.

Vitamin D and calcium supplementation

Vitamin D is a hormone produced by the skin that has effects upon bone, kidneys, gut, muscles and many other tissues. ^{12,13} Its best known functions are to increase calcium absorption from the intestine, to maintain the serum calcium level and to promote bone growth and strength by promoting mineralisation of osteoid. Vitamin D deficiency is, however, associated with many other physiological problems, including proximal muscle weakness and impaired balance.

Studies in the last two decades have highlighted the prevalence of vitamin D deficiency in Australia, particularly among older people in hospital, ¹⁴ especially those suffering hip fracture. ^{15,16} More recently, the high prevalence of vitamin D deficiency in residents of aged care facilities in Australia has been measured. In northern Sydney the prevalence of vitamin D deficiency among residents of aged care facilities was found to be 80 per cent. ¹⁷ In a more comprehensive study of 667 women in low care and 952 women in high care in NSW, Victoria and Western Australia, 45 per cent of high care residents were severely deficient (<25 nmol/L). ¹⁸

The potential for vitamin D in the prevention of hip fractures in aged care was first highlighted in France in the early nineties. A total of 3,270 ambulant women were randomly allocated to receive 1200 mg calcium and 800 IU of vitamin D or a double placebo for 18 months. In an intention to treat analysis, the intervention group suffered 26 per cent fewer hip fractures, while the women who completed the study suffered 43 per cent fewer hip fractures.

Further trials of vitamin D to reduce hip fractures have been less conclusive. A meta-analysis in 2005 found five RCTs for hip fracture and seven for nonvertebral fractures that met their criteria. 19 Low dose vitamin D (400 IU) was ineffective but high dose vitamin D (700-800 IU) reduced hip fractures by 26 per cent. All effective trials involved additional calcium supplementation, except for one by Trivedi ²⁰ which reduced non-vertebral fractures but not hip fractures. A trial of 800 IU vitamin D and 1,000mg calcium for the secondary prevention of fractures, following a low trauma fracture, failed to show an effect.²¹ It is known, however, that people who have already suffered a fracture are at much greater risk of a second fracture than an age-matched group with lower bone density who have never fractured.

Another meta-analysis by the same group of authors in 2004 also showed an effect of vitamin D on falls reduction of 22 per cent.²² Doses of the order of 800-1,000 IU seem to be more effective than lower doses.²³ The effectiveness of vitamin D in reducing falls has been supported by a large Australian trial in residential aged care which showed a reduction of 27 per cent in falls using a supplementation of 10,000 IU vitamin D weekly and 600mg calcium carbonate.²⁴

A summary review in 2005 concludes that vitamin D deficiency is a risk factor for osteoporosis, falls and fractures and that vitamin D supplementation in doses of 800IU in combination with calcium in doses of 1200 mg reduces the risk of falls and fractures in institutionalised patients. ¹²

The importance of calcium for the maintenance of bone health and the prevention of fractures has been difficult to clarify. There have been about 30 trials of the effect of calcium supplementation on bone density summarised by Nordin²⁵ and a Cochrane meta-analysis.²⁶ Overall, the studies show a small beneficial effect on bone density, considerably less than that achieved by bisphophonates, more marked in late postmenopausal women than in the perimenopausal phase.

There are fewer studies of the effect of calcium on fracture risk. A meta-analysis of such studies²⁶ suggested a relative risk of 0.77 for vertebral fractures and 0.86 for non-vertebral fractures but the meta-analysis may be biased by the selective reporting of studies which showed a positive effect. A large and more recent Australian study of 1,000 mg calcium over 5 years showed a reduced fracture risk of 34 per cent in women who completed the trial but no significant effect on an intention to treat analysis.²⁷

Professor Chris Nordin from Adelaide has studied calcium metabolism and its effect on bone health more intensively and longer than most. He has now estimated that postmenopausal women have obligatory calcium losses of about 420 mg per day. With an average absorption of 25 per cent of ingested calcium, Nordin estimates that an intake of 1400-1500 mg is required in postmenopausal women to ensure positive calcium balance. Depending on dietary intake, this may require a supplementary dose of 1200 mg, rather than the 600 mg generally used.²⁵

The recommendation of the South Australian working party, chaired by Professor Nordin, is that residents of aged care facilities should receive supplementation with both calcium 1,000 mg and vitamin D 800 IU unless the dietary calcium intake was estimated to be adequate. There are, however, two problems with this recommendation. One difficulty is the unpalatability of the tablets which are large and unflavoured. The second difficulty is the potential for an increased risk of ischaemic heart disease with calcium supplementation. This second concern arises from a recent New Zealand study. 28 It is difficult to determine the significance of this evidence as heart disease was not the primary end-point and the intervention and control groups differed with regard to the prevalence of cardiac risk factors.

Hip protectors

Hip protectors consist of plastic shields or foam pads fitted in underwear to sit adjacent to the greater trochanter. The theory is that the shields deflect the force of the impact of a fall away from the neck of the femur and act, to some degree, as a shock absorber.²⁹ The original cluster RCT of hip protectors in aged care facilities which brought hip protectors to the notice of health professionals was published in 1993.³⁰

The success of this trial has not been replicated in all subsequent trials, particularly those carried out in community settings 31,32,33 but randomisation has not always been rigorous and compliance frequently low.

A recent meta-analysis of hip protectors to prevent hip fractures identified 15 trials of which 11 had been conducted in residential care facilities.⁵ The 11 trials in aged care facilities, including six cluster RCTs, showed evidence of a statistically significant reduction of hip fractures of 33 per cent. There was no evidence of any increase in other fractures nor of other adverse events. Compliance in all trials was the main limiting factor. Hip fractures did occur while wearing hip protectors but they were comparatively rare.

In summary the effectiveness of hip protectors remains contentious but they have no major adverse effects. At the least, they may give the wearer confidence to remain ambulant and may remind carers of the risk of falling and injury. Problems with compliance in the community will restrict the uptake of hip protectors in this setting but institutional care is the ideal setting for optimal compliance.

Exercise programs

Poor balance, poor mobility and low muscle strength are confirmed risk factors for falling in communitydwelling older people. 34,35 Moreover, exercise programs to improve balance, gait and muscle strength have been shown to reduce falls in the same group of people. 36,37 Few studies of the effects of exercise on falls have been carried out in residential aged care settings. One large study in a retirement village in Sydney did show a reduction in falls with exercise but 78 per cent of the participants were living in self-care apartments and only 22 per cent in hostel accommodation.³⁸ One study of 190 nursing home residents involved an exercise program as well as continence management and showed a significant difference in falls although there was no reduction in the intervention group³⁹ while another similar sized study of exercise alone failed to show any benefit.40

Medication review

The link between medications and falling in older people has been shown in a number of epidemiological and cohort studies in the community ^{41,42} and in residential aged care settings. ^{43,44} The risk of falling with medication use can be due to the expected effects of the medication, for example, antihypertensives, or the adverse effects of the medication, for example, antidepressants, opiate analgesics. Older people are at increased risk of the adverse effects of medication due to the increased number of medications taken and altered pharmacokinetics and pharmacodynamics. Polypharmacy is common in residential aged care. ⁴⁵

What is not clear is whether the increased risk of falling with higher rates of medication use are due to the medications or due to the chronic diseases for which the medications are required. There is some evidence to suggest that the high prevalence of chronic disease and functional impairment in residents of aged care facilities may be the main risk factor for falls rather than the medications taken for these diseases. We are aware of only one RCT of medication review by a pharmacist in residential aged care which produced a significant reduction in falls over six months in the intervention group. 47

Despite the limited evidence for falls reduction from controlled trials of medication reviews in older people, including in aged care settings, the NHS recommendations in the UK are that all older people should have their medications reviewed annually and twice yearly if on four or more medications. ⁴⁸ Australian best practice guidelines for residential aged care mimic these UK guidelines and are meant to be facilitated by National Medication Management Reviews for which General Practitioners (GPs) are remunerated for initiating the review and acting on its recommendations.

Project funding and management

The project employed two staff members, a full-time project officer and a part-time statistician. The project officer was a Registered Nurse Educator with a long experience in residential aged care and existing links with many facilities in the Hunter. Project Staff were employed by the CARE Network (Community, Aged Care and Rehabilitation Services), subsequently the Greater Newcastle Cluster of Hunter New England Area Health Service (HNEAHS).

Aims and objectives

Aims

- To encourage the implementation of selected strategies in a random selection of aged care facilities in the Hunter New England region of NSW
- To significantly increase the use of evidence-based strategies across these facilities, prevent falls and reduce hip fractures
- To measure the impact on falls and fractures
- To reduce the number of injurious falls per month [measured by falls with fractured neck of femur (NOF)] among the residents in the intervention facilities by 30 per cent

Objectives

- To develop an appropriate, evidence-based multistrategy program to reduce hip fractures in aged care
- To test and document the feasibility of implementing the program
- To engage relevant stakeholders and project partners, including GPs
- To develop the resources required for ongoing maintenance of the interventions
- To measure the use of the strategies in different facilities
- To monitor rates of falls and particularly falls resulting in fractured NOF
- To develop a model of intervention to be implemented across other AHS in NSW and beyond

The intervention

Setting

The study was undertaken within the HNEAHS of NSW. The health service was created on 1 January 2005, following the merger between Hunter, New England and the Lower Mid-North Coast local government areas of Gloucester, Greater Taree City and Great Lakes. The HNEAHS spans 32 local government areas, covers a geographical area of over 130,000 square kilometres, and serves approximately 840,000 people (12% of the NSW population). This project included the Greater Newcastle, Lower Hunter and Lower Mid-North Coast clusters – extending from Morisset in the South to Taree in the North and West to Singleton/Muswellbrook and Murrundi. It was not feasible to randomise the facilities in New England because of the distances involved. The project was reviewed and approved by the HNEAHS Human Research Ethics Committee.

Involvement of Aged Care Facilities and residents

All residential aged care facilities with 20 or more beds in the former HAHS and the Lower Mid-North Coast Cluster of the HNEAHS were invited to participate in this study. Facilities were eligible to be included if they had 20 beds or more, as facilities with less than 20 beds were considered to be atypical. Ninety-eight facilities were contacted and informed of the study, of which 92 of these facilities had 20 beds or more and were invited to participate. Of the 92 eligible facilities, four refused to participate (initial consent rate 96%). A further six facilities withdrew from the study after randomisation. Data for these facilities are included in this report for the duration of participation.

In June 2005, the 88 facilities that originally provided verbal agreement to participate were visited by the project officer who obtained written consent and collected data for an Aged Care Facility Basic Information Form (Appendix A). At this time the facilities were asked to nominate a 'link' person who would be the contact for the project officer for the rest of the project.

The 'link' person was the facility manager in 54 of the facilities and another staff member in 31 of the facilities.

The Basic Facility Profile included data on the number of beds by type in each facility. All beds were assumed to be occupied. Bed numbers were updated at the commencement of the intervention (January to February 2006) and at the conclusion of the intervention (30 June 2007). The study ran for a two year period with the intervention period comprising approximately 17 months of that time.

Promotion and support of evidencebased multi-strategy program to reduce hip fractures in aged care facilities

The Project Officer employed several activities to promote and support the adoption of evidencebased approaches to reduce falls and fractures in the intervention facilities. These approaches included:

- The development of a set of resources to support the 'Big Green Box' ⁴⁹ which contained evidence based practice guidelines, an implementation guideline, a variety of fact sheets and a video
- Continuous Quality Improvement (CQI) Priority
 Action Planner that allows facilities to identify gaps in prevention programs
- Fall Alert Strategy for high risk fallers a system of colour coding to identify high risk fallers as well as a Falls Log which records all falls for any individual resident (Appendix B)
- Resources to support specific strategies
 - o FRS use of a validated tool (Appendix C)
 - o Mobility assessment
 - o Hip protectors
 - o Calcium and vitamin D supplementation

- o Continence management
- o Exercise programs
- o Footwear
- o Residential Medication Management Review
- o Post-fall management review
- An initial training session
- Network Meetings held once every 3 months
- A physical activity workshop to show facilities how to plan and run exercise programs
- Obtaining support from Divisions of General Practice

'Link' people from each intervention facility were invited to a training session in November 2005. At this session facility staff received a set of resources to assist them in the prevention of falls and fractures, and discussed the rollout of the strategies recommended in these resources. These resources included:

- Evidence base of strategies
- Brochures on hip protectors, vitamin D and calcium, safe footwear
- Posters promoting FRS, medication reviews, vitamin D and calcium, footwear, hip protectors
- Self-directed learning packages relating to vitamin D, FRS, dizziness, nutrition
- Tools and forms for FRS, Fall Alert Strategy (Appendix B), Fall Review Form (Appendix D), nutrition screen, Safe Footwear Checklist (Appendix E)
- Details of characteristics of different hip protectors
- Protocol for vitamin D
- Flow chart for FRS

The implementation of these resources was further encouraged during regular 3 monthly network meetings that were held from February 2006 to June 2007 (six meetings in total for the intervention period). Nominated 'link' people in all intervention facilities were sent an invitation to participate in the Network Meetings and contribute to the agenda. Meetings were facilitated by the Project Officer and were conducted at five different sites to allow for ease of access and giving several date choices.

The Network Meetings were a forum for the distribution of information, trouble shooting, brainstorming, and sharing of ideas. For each meeting, the agenda items included:

- Update on how the project was progressing
- Dissemination of new resources developed at the request of the participants, for example, brochures, posters, letters, education packages, forms and tools
- Brainstorming on problems or barriers identified and how to manage these
- Data collection issues
- Topics for the regular Newsletter produced by the **Project Officer**
- Dissemination of information requested by the participants

Across the various location options, each set of meetings in the schedule was attended by 'link' people from around 50 per cent of the facilities. Following each set of meetings, the Project Officer made a site visit to all facilities that did not attend a meeting and distributed the information from the meeting.

Encouragement and support of individual strategies

Vitamin D supplementation

To encourage medical officers to prescribe vitamin D, information on its significance for falls injury prevention was sent out via the Hunter Urban Division of General Practice Newsletter and an evening talk was arranged for GPs and pharmacists. The issue was also discussed at Medication Advisory Committee meetings. A brochure on vitamin D was produced to give to residents and families. To facilitate patient compliance with vitamin D and to ease prescribing, a monthly 50,000IU preparation was promoted. This preparation is obtainable through Compounding Pharmacists.

Hip protectors

Hip protector information brochures were produced for inclusion in resident admission packages. The brochure was given to families after a FRS had identified the resident as having a high risk of falls, or after a fall. Increasing staff awareness to promote a positive attitude towards the benefits of hip protectors was also attempted to encourage residents and families to consider hip protection.

Falls risk assessments

Those facilities that did not undertake a routine FRS on admission were asked to include an assessment in their admission database. Those facilities that were doing routine assessments were asked to review the form they used against the form recommended in the project folder (Appendix C) and check they were gathering similar information.

Physical activity

A workshop that focused on integrating physical activity into care was conducted by a physiotherapist. This workshop was based on the Otago Program and included some resistance exercises.

Footwear

Availability of safe, cost effective, reasonably stylish, washable footwear was a problem for most facilities. A few facilities were encouraged to establish a relationship with a local provider who would visit the facility if a group of residents were interested in making purchases. These providers also encouraged relatives to take a few styles and sizes of shoes to the facility, allow the resident to try them on, and then return those pairs that were not suitable. A brochure on safe footwear was produced for residents and families as well as a checklist for staff.

Post-fall management

A Post-fall Review form was provided as part of the resource kit. Only a few facilities tried to implement the form but found this difficult to sustain due to poor staff compliance. Two facilities introduced the fall review as part of a fall incident form and are still doing this at the end of the project. Other facilities had one incident form that was used for all incidents, not specific to falls, and they were reluctant to change this.

Facilities randomised to the control group did not receive any form of intervention.

Evaluation methods

Overall design

The study design was a cluster RCT involving the participation of a number of residential aged care facilities across the Hunter and Lower Mid-North Coast areas of NSW. Because the intervention was holistic and aimed at the environment and culture surrounding the residents, whole facilities (clusters), were randomly allocated to intervention or control conditions. This design allowed the comparison of outcomes for residents in facilities that were allocated to receive the intervention program and those receiving no intervention.

Randomisation

Consenting facilities were randomised by the project statistician into the intervention or control group, stratified on size and bed type (high or low care) as determined through the Aged Care Facility Basic Information Form (Appendix A). Facilities were characterised into three sets: those with low care beds only (42 facilities), those with high care beds only (24 facilities) and those with both low and high care beds (22 facilities). Where facilities had separate organisational units with no overlap of staff, each unit was treated as a separate facility for participation and randomisation. Forty-six facilities were randomly allocated to the intervention group and 42 facilities were randomly allocated to the control group.

Measures and outcomes

Measurement and comparison of outcomes was undertaken at two levels. The first level assessed whether the intervention resulted in an overall reduction of falls risk in the intervention facilities when compared to control facilities (facility level data). Time series data on the falls prevention activities and the monthly number of falls, falls with injury, any fracture, hip fracture and death were compared for intervention and control facilities. All permanent residents in the facility for each month were included in these analyses. The second level involved assessment of the effectiveness of the intervention for the residents who were in the participating facilities at

the start of the intervention period (individual level data). Details of the residents were obtained by conducting a census at the commencement of the intervention period.

Facility level data

Facility level data collection was designed to provide information for two purposes 1) to measure the use of the strategies in different facilities; 2) to monitor rates of falls and particularly falls resulting in fractured NOF. The data were gathered each month from July 2005 to Dec 2007 (seven months prior to the intervention and for the seventeen months of the intervention period). Each facility was asked to provide monthly aggregate data, using standard forms.

Monthly falls data collection

The Facility Monthly Falls Data Collection form (Appendix F) was used to collect information on the number of falls (not the number of residents falling as residents could fall more than once) and the number of falls reported in residents' charts resulting in adverse events such as fracture, hospitalisation or death within three months of fractured NOF. This form also collected information on the number of medication audits carried out by a pharmacist in the facility for that month, the total number of residents in the facility taking Vitamin D, the number of residents with hip protectors, the number of residents compliant with using their hip protectors, the number of respite admissions, the number of new permanent admissions, and the number of FRS completed on admission.

The link person for each facility coordinated the collection of the monthly data. Each month the staff member collecting the data audited the monthly 'incident records' which normally record details of falls and other significant incidents including date, time, injury, immediate treatment and any medical treatment and extracted this data to the 'Facility Monthly Falls Data Collection'. Where a facility failed to provide a monthly falls report the nominated staff member at the facility was emailed or faxed a second form followed by a phone call from the Project Officer.

Since not all Facility Monthly Falls Data Collection forms were expected to be returned each month, the rate of falls and related events occurring each month was determined by dividing the number of events by the total number of beds for each facility returning a form for that month. All beds were assumed to be occupied and the number of beds was assumed to be fixed as at the start of the project. However, an index of the turnover of individuals within this fixed size population was also obtained from monthly data on the number of new permanent and respite admissions.

Individual level data

Residents who were in the selected facilities at the start of the intervention period were monitored over the course of the intervention and follow-up period to determine the occurrence of a fall, the date of any hospital admission for a fractured NOF, and death. Survival analyses were then undertaken to compare time to first fall resulting in fractured NOF, and time to death.

Census

All participating facilities completed a census during January to February 2006 which recorded current resident's date of birth, sex, resident classification scale (RCS), their current FRS score on admission, whether they were ambulant, and whether they were residing in a dementia specific unit. A sample page from the census is provided in Appendix G. The individual RCS score determines the level of subsidy received for the resident from the Commonwealth. Ambulant is defined as anyone who can stand and walk with or without assistance. Resident's name, facility patient record number, and study ID were also recorded to allow linkage with hospital separations data and prospective follow-up. These administrative details were never electronically stored and were kept separate from all other data. The residents were followed over time to either death or time to first fall resulting in fractured neck of femur.

The 5,391 permanent residents identified during the census undertaken in January to February 2006 were followed for 545 days. During that period HNEAHS hospital emergency department data for the hospitals in the project area was monitored to identify transfers for fractured NOF and related events. Each month, the Project Officer audited the Emergency Department outcomes in the Patient Information Management System to identify ICD 10 codes associated with fractured NOF and other associated codes for people aged 65 years and over. Names and addresses for all

people identified as having fractured NOF were used to ascertain whether any were resident in participating facilities. The facilities were contacted to confirm the resident. When the fall audit was conducted (Appendix H), residents in the census were observed as having a fall. Each identified event was recorded on a study form with name, facility, date of birth, date of admission to facility, date of event, whether in cohort, and study ID. Data from the forms were later entered into the cohort data-base. Multilevel proportional hazards analysis was used to model the time to (first) fracture for each resident. Deaths were ascertained from monthly reports provided by facilities on deaths and other discharges. These reports included discharge status and destination (hospitalisation/ relocation).

Record audit of a fall resulting in a fractured neck of femur

Whenever a resident was identified as having fractured NOF, the facility was contacted and a fractured NOF review was undertaken (Appendix H). This review involved inspection of the resident's facility records to obtain details of the fall (date, time), falls assessment on admission to the facility and actions taken to address falls risk, the Resident Classification Scale rating at the time of the fall, activity prior to the fall, medications (including calcium and vitamin D supplements), exercise programs, mobility aids and use, general health, use of hip protectors, history of prior falls, and previous hospital admissions.

Statistical analysis

Census data

Categorical characteristics were compared using contingency table chi square test and age was compared using the non parametric Kruskal Wallace test.

Monthly falls data

Intervention activities such as vitamin D supplementation and number of hip protectors allocated were adjusted for the number of beds in each facility and a rate per month per 100 beds was constructed. Graphical analysis was used to demonstrate any trends. This included the production of 'spaghetti plots', where the trajectories of individual facilities were plotted over time and summary means plots showing overall trajectory over time for intervention and control groups separately. Where plots indicated a trend and where numbers of events were sufficient for statistical analysis, a longitudinal mixed

fixed and random effects model (growth model) was then fitted to test for the effect of study group allocation on any change in the rate of event per month over time whilst adjusting for bed type (low care only, high care only and mixed low and high care). A similar approach was taken with the outcomes such as total monthly falls for each facility. Graphical analyses were conducted using SAS. Longitudinal growth models were fitted using Mplus (V5.1 Muthen and Muthen, 1998 - 2008).

Survival analysis

A multilevel survival analysis was conducted with the outcome being time to first fall with 215 cohort residents noted as sustaining a fall resulting in fractured NOF. The analysis took into account the clustering of individuals within facilities. Covariates at the individual level were gender, age, whether the resident was ambulant or had dementia, RCS category classification and falls risk classification at the time of the census. At the facility level, grouping into intervention or control was considered in conjunction with bed type and facility size. Bed numbers were dynamic, and the numbers used were those collected at the start of the intervention. The analysis assumes that residents were influenced by the facility they were in at the time of the census, in other words, the analysis is an intention to treat analysis.

Results

There was great variation in facility size and the distribution of bed-type and RCS amongst facilities. Therefore it was not possible to produce perfectly balanced groups through randomisation. In general there was a tendency for intervention facilities to be larger than control facilities and to have a greater range of bed numbers and type. There was also a considerable change in the number and distribution of bed types over the course of the study.

Facility level data

Return of Facility Monthly Falls Data Collection

Facility Monthly Falls Data Collection forms were returned by 76 to 97 per cent of facilities for each month of the collection period (June 2005 to December

2007). There was no systematic bias in returns according to type of facility (data not shown), or the phase of the study (baseline, intervention or follow-up).

Falls prevention strategies

Hip Protectors

Hip protector allocation at the commencement of the study was about equal in the intervention and control facilities. Over time, there was a small but statistically significant increase in the provision of hip protectors to residents in the intervention group, however the difference between intervention and control facilities was not statistically significant (Figure 1). Adherence or compliance with wearing hip protectors increased similarly in both groups.

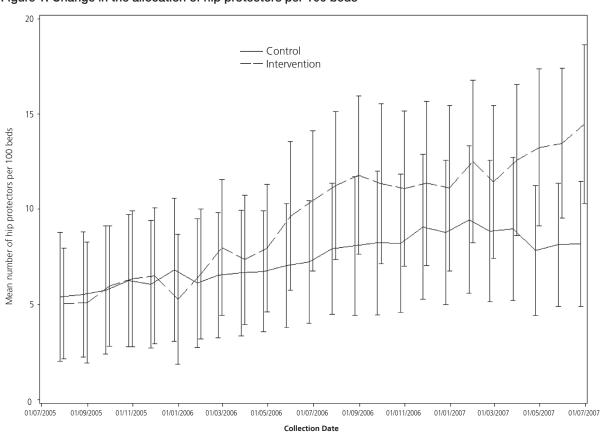


Figure 1: Change in the allocation of hip protectors per 100 beds

Vitamin D

Vitamin D supplementation in the intervention and control facilities is shown in Figures 2 and 3, respectively. There was a clear increasing trend in the provision of vitamin D supplementation in the intervention group. However, most of the gain was due to a few facilities participating strongly, with one facility increasing supplementation for nearly 90 per cent of residents (Figure 2). Many facilities did not increase supplementation at all.

Comparison of the use of Vitamin D supplementation in the intervention and control groups (Figure 4) shows that, whilst both groups had significant increases in use over time, the differences in use between the groups was not significant.

Figure 2: Vitamin D supplementation: Spaghetti plot for the intervention group

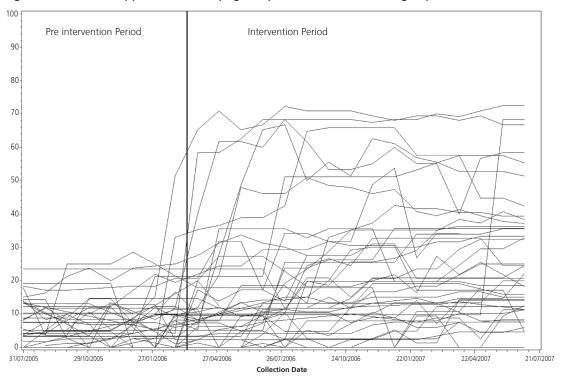
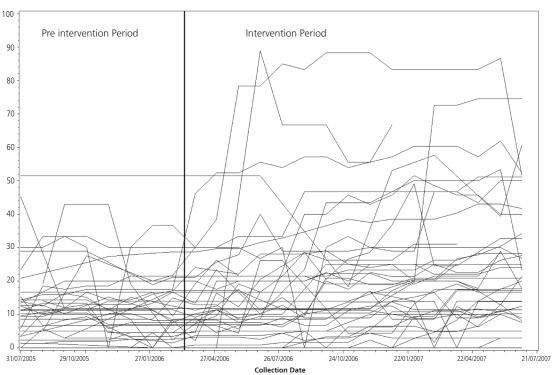


Figure 3: Vitamin D supplementation: Spaghetti plot for the control group



Control - Intervention 35 Mean number of Vitamin D supplements per month 100 beds 30 25 20 15 5 01/11/2005 01/01/2006 01/011/2006 01/01/2007 01/05/2007 01/07/2007 01/07/2005 01/09/2005 01/03/2006 01/05/2006 01/07/2006 01/09/2006 01/03/2007

Collection Date

Figure 4: Use of Vitamin D supplementation in intervention and control group facilities

Medication Reviews

The number of pharmacy reviews undertaken per 100 beds varied more by quarter than by intervention or control group (Table 1). There were no differences between control and intervention groups, irrespective as to whether these were considered quarterly (p=0.94) or biannually (p=0.70).

Table 1: Rate of quarterly reporting of pharmacy audits per 100 beds

Period	Control	Intervention
Jul – Sep 2005	21	21
Oct – Dec 2005	15	17
Jan – Mar 2006	18	17
Apr – Jun 2006	24	27
Jul – Sep 2006	16	18
Oct – Dec 2006	25	21
Jan – Mar 2007	25	20
Apr – Jun 2007	13	8

Falls risk assessments

At the commencement of the study the average number of assessments per 100 new admissions was 42. This differed significantly between the intervention and control groups with the intervention group reporting completing on average 22 more assessments per 100 new admissions than the controls (p=0.002). FRS increased in the control group during the base-line period but did not change in either group during the intervention.

Monthly falls events

The rate of falls per 100 beds in the intervention and control facilities is shown in Figures 5 and 6, respectively. The baseline crude incidence across all facilities was 171 falls, for every 1,000 bed-months of observation. There was a large variation in falls rates between facilities and from month to month but rates were not significantly different across pre and post-intervention periods. There was also no difference between the rates of falls for control and intervention facilities (Figure 7).

Figure 5: Falls per month per 100 beds: Spaghetti plot for the intervention group

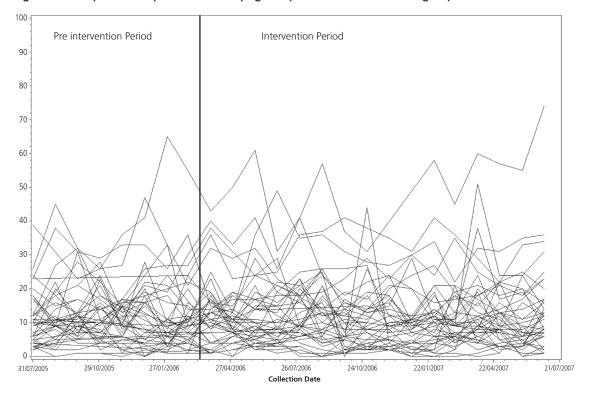


Figure 6: Falls per month per 100 beds: Spaghetti plot for the control group

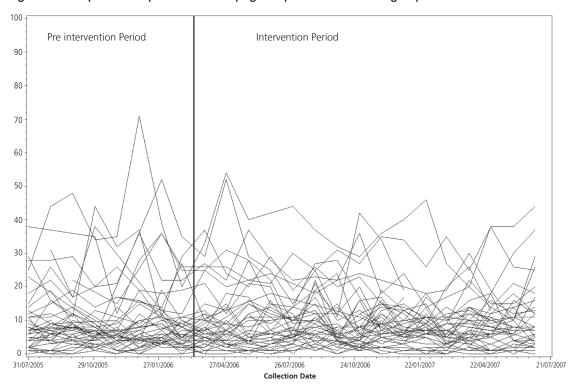
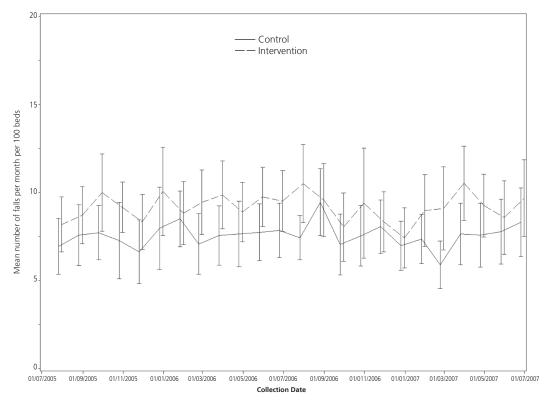


Figure 7: Mean number of falls per month per 100 beds in intervention and control facilities



Outcomes of the falls are shown in Table 2 where rates are expressed as per 1,000 falls. During the pre-intervention period, 4.7 per cent of falls required hospital admission, 1.4 per cent of falls resulted in a fractured NOF, and 1.5 per cent resulted in other fracture. For the entire cohort (intervention and control groups) there were 13.5 fractured NOF events per 1,000 falls. Of

these, 2 occurred within the first three months following admission (15%). The risk of death within three months of a fall resulting in a fractured NOF was 33 per cent, a higher mortality rate than would be otherwise expected. Similar rates for all events were reported during the post-intervention period, after accounting for the high variability of fall rates within facilities per month.

Table 2: Outcomes of falls in residential care

Outcomes	Intervention	on Facilities	Control Facilities		
	Pre-intervention Post-intervention		Pre-intervention	Post-intervention	
	(first six months)	(18 months)	(first six months)	(18 months)	
No. Bed-months	2501	2709	2236	2628	
Mean no. facilities reporting per month N (%)	38 (83)	41 (90)	35 (83)	40 (95)	
Mean no. falls per month	12	13	10	10	
Outcomes per 1,000 falls per month:					
Hospital Admissions	30	51	65	55	
Fractured NOF	11	17	16	18	
Other fracture	13	16	18	18	
Fractured NOF within 3 months of admission to facility	3	2	1	4	
Deaths within 3 months of Fractured NOF	5	4	4	9*	

^{*}One facility sustained a total of two falls on two consecutive months, each resulting in death.

Uptake of best practice strategies by facilities during project

The facilities' reported use of resources provided during the project are presented in Table 3. The most commonly adopted strategies were the monthly falls newsletter provided by the Project Officer, posters, and the footwear checklist. The least commonly adopted strategies were the assessment flowchart and the 'where about checklist'.

Table 3: Use of resources provided by the project officer specifically for the implementation of the intervention (N=43 facilities)

intervention (N=40 facilities)	
Resource	Frequency of use N (%)
Falls risk assessment tool	17 (44)
Fall alert flow chart	14 (36)
Falls log	15 (38)
Fall review form	17 (44)
Fall Alert Check form	9 (23)
Assessment flow chart	7 (18)
Footwear checklist	24 (62)
Hip protector suitability checklist	19 (49)
Posters in the orange section of the resource manual	27 (69)
CQI planner use	16 (41)
Monthly falls newsletter	35 (90)

Individual level data

At the time of the census, there were 5,391 permanent residents of 86 facilities, and the characteristics of these residents are shown in Table 4. Whilst intervention and control groups were similar with respect to gender, they differed on all other measured aspects. There was a significantly higher proportion of ambulant residents (p=0.02), a lower proportion of residents with dementia (p=0.02) and a higher proportion classified as high falls risk among the intervention facilities (p=0.02). Additionally, the intervention group had on average a slightly older population (p=0.002), and a greater proportion of residents with low RCS scores indicative of higher care requirements (p=0.001).

Table 4: Characteristics of residents in participating facilities as at the time of the census, January 2006 (N = 5,391)

Characteristics	Control	Intervention
Age: Median (range)	85 (27-107)	86 (32-107)
Female N (%)	1,862 (72)	2,049 (73)
Ambulant* N (%)	1,757 (68)	1,954 (71)
Dementia specific care N (%)	578 (22)	553 (20)

^{*} defined as anyone who can stand and walk with or without assistance

Falls resulting in admission for fractured neck of femur

Overall, 215 people in the cohort were identified as having fractured NOF during the observation period (106 from the control group and 109 from the intervention group). Rates of falls with fractured NOF were similar in the intervention and control groups (p=0.8) and over time. For time to (first) fracture for each resident there was no effect of study group [hazard ratio estimate =-0.10; 95% Confidence Interval (CI): -0.37, 0.18; p=0.5]. Resident factors related to increased risk of falls were being ambulant (hazard ratio estimate=0.61; 95%CI: 0.03, 1.19; p=0.04), having dementia (hazard ratio estimate=0.63; 95%CI: 0.27, 0.999; p=0.002), increasing age (hazard ratio estimate=0.04; 95%CI: 0.02, 0.05; p<0.001) and a high FRS where those with a low FRS had on average a negative hazard ratio of -0.56 (95%CI: -0.94, -0.16; p=0.006 when compared with those classified with an FRS of high; as did those with a medium FRS classification (hazard ratio estimate=-0.72; 95%CI: -1.08, -0.37; p<0.001). There was no effect evident for the between facility covariates of either high care bed category and low care dementia, however the low care generally had a slightly elevated risk of fall with fractured NOF.

This result was not influenced by deaths. During the period of observation there were 1,462 deaths and there was no overall difference between the groups on survival analysis (p=0.8).

Record audit of a fall resulting in a fractured neck of femur

The medication profile was similar to that expected in aged care facilities but 27 per cent of those with fractured NOF had a medication change in the two weeks prior to fracture. About a quarter of all fractures occurred in people taking vitamin D and a similar number taking calcium but the duration of use is not known. Thirty-one per cent of fractures occurred during an acute illness and another 14 per cent during an acute exacerbation of a chronic illness suggesting that a large number of fractures may occur during episodes of delirium. This may be reflected in the 37 per cent that suffered a decline in ADL levels in the two weeks prior to fracture. Only 30 per cent of people who fell and fractured participated often in a group exercise activity.

Only 42 per cent of people who fell and fractured had received a FRS on admission but 74 per cent had a falls risk score, of whom 89 per cent were scored either medium or high risk, by the time of the fracture. Considering actions taken following FRS, more people who fell and fractured in the intervention group received hip protectors, physiotherapy intervention, and an exercise program than in the control group but there were minimal differences for calcium, vitamin D, GP referral, and medication review.

Discussion

We completed a three year cluster RCT in residential aged care facilities in the Hunter and Lower Mid-North Coast to test the hypothesis that a full-time Project Officer could assist aged care facilities to carry out an evidence-based program of best practice strategies to reduce falls injuries and hip fractures. Prior to the commencement of the project, we estimated that a reduction in hip fractures in aged care facilities of 10 to 15 per cent would reduce costs to the AHS sufficiently to make the on-going employment of a Project Officer cost-effective.

We were not able, over a period of 17 months, to show a reduction in hip fractures in the intervention group compared to the control group. There are several possible reasons for this result, which are outlined below.

- 1. The best available strategies may not result in a reduction in hip fractures in this population. This seems unlikely given the results of calcium and vitamin D and hip protectors in overseas and Australian studies although the studies are not all consistent. On the other hand, few falls prevention programs in any setting, community, acute care or residential care, have produced a reduction in hip fracture rates.
- 2. The intervention period may have been too short to show an effect. A German study of multifaceted intervention on falls in residential aged care facilities would seem to support this possibility.⁵
- 3. Falls injury prevention programs may not be effective if they involve a significant proportion of people with dementia. Most people in Australian aged care facilities, especially in high care, have dementia and often of a significant degree. Subgroup analyses of an intervention trial in aged care facilities that showed an overall reduction in falls, failed to show a reduction in falls in residents with significant cognitive impairment. 6 Overseas trials of hip protectors and calcium and vitamin D that showed a reduction in falls injuries may not have involved large numbers of residents with dementia.

- 4. There was contamination between the intervention and control groups with regard to the introduction of the best practice strategies. This almost certainly happened as falls injury prevention was promoted widely by a number of agencies to aged care facilities during this period. In addition, the doctors responsible for the prescription of calcium and vitamin D, one of the key strategies, visited a number of facilities and would not have been aware of which facilities were in the control and intervention groups. Finally, requesting data on falls and fractures from the control group on a monthly basis may have focused attention on falls injury prevention.
- 5. The uptake of the best practice strategies may have been insufficient in the intervention facilities. There is tremendous pressure on aged care facilities which leaves staff with little time or energy to concentrate on programs such as falls injury prevention. During the project there were several releases of speciality documents requiring the attention of residential aged care providers. With the limited resources available these are competing for attention:
 - Best Practice Food and Nutrition Manual for Aged Care Facilities, Central Coast Health, 2004
 - Pain in Residential Aged Care Facilities Management Strategies. Australian Pain Society, 2005
 - Guidelines for a Palliative Approach in Residential Aged Care, National Health and Medical Research Council, 2006
 - The Guidelines for working with people with challenging behaviours in residential aged care facilities – using appropriate interventions and minimising restraint. NSW Department of Health, 2006
 - Pilot for the Aged Care Funding Instrument which was implemented in 2008.

This pressure is aggravated by regular changes in personnel, often involving key people in the facility such as the Director of Nursing or the falls injury 'link' nurse. During the project, there were 62 changes in the senior management positions (Director of Care, Director of Nursing, Deputy Director of Nursing and Facility Manager) within the participating facilities.

The support of GPs was essential for two of the key strategies, that is, the provision of calcium and vitamin D and medication reviews. This support is difficult to harness for some individual aged care facilities which can have large numbers of GPs (up to 40 for one facility), each responsible for a small number of residents. The acceptance of the evidence with regard to calcium and vitamin D was variable among GPs. Some supported this strategy enthusiastically but some received the information with skepticism. The uptake of calcium supplementation is further inhibited by the cost as these products are no longer available under the Pharmaceutical Benefits Scheme (PBS). In addition, the commonly used calcium supplements are large tablets and difficult for older people to swallow.

The project coincided with a period of considerable confusion with regard to the system of medications review in aged care facilities, which limited the effectiveness of this strategy and the involvement of GPs in any results.

The main barriers to hip protectors were cost, as residents living in high care facilities needed sewn-in shields and at least three to four pairs. Laundry process or chemicals used were often too harsh for the hip protector pants. Many residents did not like the 'look' of the garments, and claimed they were hot to wear and uncomfortable to wear in bed. Staff reported that residents with cognitive impairment would remove the protectors. Protectors were also perceived to add to the falls risk if the resident was independent with their own toileting as they were often difficult to remove in time. Despite the above obstacles, the use of hip protectors increased in both intervention and control groups.

Barriers to getting physical activity programs into place or reviewed included the level of expertise of the staff conducting group programs. Many group programs used purchased activity plans that did not focus on balance or strength. Staff also had difficulties individualising the activities within a group setting. Some rural or smaller facilities were unable to find a physiotherapist or to afford to employ a physiotherapist to assess the residents for individual programs.

Availability of safe, cost effective, reasonably stylish, washable footwear was a problem for most facilities. Slippers are the most commonly worn style of footwear. We recommended that slippers should not be used during the day but, if slippers were used, they should have a solid sole and full adjustable upper. Unfortunately, it was difficult to convince residents and families not to use unsafe slippers.

There are difficulties in the implementation of some of the strategies that will require attention from various authorities to overcome, as described next:

(a) Calcium supplementation

There is no easily available form of calcium that is palatable to older people. Caltrate is a large non-chewable tablet that older people find hard to swallow while Calsup is a chewable tablet with a rather unpleasant taste. Neither are on the PBS making cost an issue.

One confounding issue that emerged during the project was a research finding from New Zealand suggesting that calcium supplementation might increase the risk of cardiac ischaemia.²⁸ This created uncertainty in the minds of doctors, pharmacists and nurses which will be resolved only by further research with this issue as the primary endpoint.

(b) Vitamin D supplementation

The vitamin D available on the Pharmaceutical Benefits Scheme requires a daily dose adding to the cost and compliance issues for older people. Compounding pharmacists in the local area were able to market a 50,000 IU capsule to be taken monthly which greatly reduced the price and compliance issues. Unfortunately, it was uncertain as to whether non-compounding pharmacists could purchase this product causing confusion in the minds of prescribers. The promotion of a mixed calcium and vitamin D product by falls injury prevention experts in South Australia further added to confusion.

(c) Hip protectors

There are now at least five different brands of hip protectors on the Australian market. They differ in price, in the type of shields (hard or soft; removable or fixed) and the make of garment. The relative advantages and disadvantages of these products has not been established making choice confusing for aged care facilities. Many disintegrated in the industrial style washing machines used in some large aged care facilities. Acceptance of these garments is also difficult for older people unless the carer is insistent.

(d) Staffing of Aged Care Facilities

The staffing of aged care facilities seems now to be at a very low level, particularly with regard to trained nurses. The small number of trained staff available are stretched to cover even basic care with the enormous amount of documentation required and the increasing acuity of residents, with respect to dementia, difficult behaviours, physical disabilities and medical/nursing interventions. There is little time available for preventive care such as for falls injuries. The Australian Government may need to reconsider the staffing of facilities if falls injury prevention and other preventive programs (oral health, foot health, sarcopenia prevention) are to be serious aspects of residential aged care.

Recommendations

Local

In the Hunter New England Area, we have proceeded to form a Residential Care Falls Injury Prevention Network chaired by a Registered Nurse who works for HNEAHS in liaison with the residential aged care sector in a number of programs including advance care planning. This Network is overseeing the roll-out of a consistent program of falls injury prevention involving all of the best practice strategies used in the research project. These strategies have formed the basis of a Falls Injury Prevention Policy for Residential Aged Care for HNEAHS that is mandatory for State Government run facilities and advisory for facilities run by non-government organisations or the private sector. The Network meets by teleconference on a bi-monthly basis and provides advice and resources as required to facilities. The Network will attempt to monitor the number of hip fractures from aged care facilities but is currently hindered by information systems that are unable to recognise an aged care facility as an admission source.

NSW Health Department

Our results suggest that a full-time Falls Injury Prevention Liaison Nurse to work with aged care facilities in each AHS may not be cost-effective. A better option may be to employ a Liaison Nurse to work with aged care facilities in a number of areas that impact upon the AHS including:

- Falls injury prevention
- Advance care planning
- End of life care
- Transfers to hospital
- Acute care in aged care facilities
- Post-acute care in aged care facilities
- Discharge planning from hospitals to aged care facilities

Australian Department of Health and Ageing

- A palatable and inexpensive calcium preparation is urgently needed. One option would be a chewable, peppermint-tasting tablet, such as used to be marketed as Calcimax, but available on the PBS.
- A high dose vitamin D preparation that can be taken on a monthly, or even less frequent basis, should be freely available in Australia.
- If we are to seriously tackle the issue of hip fractures in aged care facilities, specially funded resources will be necessary. At least one day a week of an Enrolled Nurse would be required for a facility of 50-100 beds. Perhaps the Aged Care Funding Instrument should provide financial assistance for falls injury prevention for people assessed as high risk fallers.

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Appendices

Appendix A: Aged care facility basic information forms

Aged care facility basic information form

Aim

To collect basic information on all participating facilities to provide a facility profile that will assist in stratification of facilities into control and study groups and to monitor change in overall facility profile at the completion of the study.

How to use this form

This form will be completed by the project officer and the facility/lodge manager for each participating facility/lodge prior to the intervention stage and at the completion of the intervention stage.

Office Use:	Intervention Group /					up		
Date:	Contact	person:						
Name of organisation	າ:							
Facility name:								
Facility breakdown								
Total number of beds	3							
Comment			General			Dementi	a Specific	
Number low care beds	i							
Number high care bed	S							
Total no. ambulant res	idents							
Current category mix	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Cat 6	Cat 7	Cat 8
High care –								
general								
High care –								
dementia specific								
Low care -								
general								
Low care –								
dementia specific								
Comments								

Assessments: Please attach a copy of forms and/or policies if p	Comments	
Initial Falls Risk Assessment on Admission	Yes/No	
Ongoing Assessment of Risk of Falls	Yes/No	
Frequent Fallers Assessment Form	Yes/No	
Restraint Policy	Yes/No	
Falls Incident Form	Yes/No	

Medications	
Pharmacist used by facility?	
Does a Pharmacist do regular Medication Reviews?	
How soon after admission are these done?	
How many residents in your facility have been reviewed?	
What happens to this information/does it bring about change?	
Do you have a Medication Advisory Committee meeting? Yes / No	
How often and how many medical officers attend these meetings?	

Interventions: Please attach a copy of forms and/or policies if possible		Comments
Are hip protectors used?	Yes / No	Include types and compliance
On how many residents?		
How many residents are taking calcium?		
How many residents are taking vitamin D?	Low Care:	
	High Care:	
Is residents' eyesight reviewed by ophthalmologist / optometrist?	Yes / No	
Do the residents have access to a physiotherapist?	Yes / No	
Are regular reviews on numbers, appropriateness and safety of mobility aids attended?	Yes / No	
Are regular environmental safety audits conducted? Frequency?	Yes / No	
Do you have a policy on safe resident footwear?	Yes / No	
Does a foot care nurse or podiatrist review residents' feet regularly?	Yes / No	
Are regular exercise programs in place for residents?	Yes / No	

Individual exercise program developed by:				
Conducted by:				
Frequency:				
Walking program developed by:				
Conducted by:				
Frequency:				
Group exercise program developed by:				
Conducted by:				
Focuses on:				
Frequency:				
Is there an OHS committee?	Yes / No			
How are issues related to resident safety reviewed?				
Do you have a program or policy in place to promote and	Yes / No			
assess oral health and hygiene?				
Are continence assessments completed for each resident? When?	Yes / No			
viteti?				
Site map attached:	Yes / No			

Aged care facility basic information form - Control group

Date: _____ Contact person: _____

Aim

Office Use:

To collect basic information on all participating facilities to provide a facility profile that will assist in reporting on the project.

Intervention Group / Control Group

Please complete and Fax to Mandy Harden - 02 4924 6006

Name of organisatio	n:							
Facility name:								
Facility breakdown								
Total number of bed	s							
Comment			General			Dementi	a Specific	
Number low care bed	S							
Number high care bed								
Total no. ambulant re	sidents							
Current category mix	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Cat 6	Cat 7	Cat 8
High care –								
general								
High Care –								
dementia specific								
Low Care -								
general								
Low Care –								
dementia specific								
Comments								
Assessments: Pleas	e attach a cor	by of forms a	nd/or policies	if possible	Comments			
Initial Falls Risk Assess			-	Yes/No				
Ongoing Assessment	of Risk of Falls			Yes/No				
Frequent Fallers Asses	sment Form			Yes/No				
Restraint Policy				Yes/No				
Falls Incident Form				Yes/No				

Medications Pharmacist used by facility?__ Does a Pharmacist do regular Medication Reviews? ____ How soon after admission are these done? _ How many residents in your facility have been reviewed? ___ What happens to this information/does it bring about change? _ Do you have a Medication Advisory Committee meeting? Yes / No How often and how many medical officers attend these meetings? __ Interventions: Please attach a copy of forms and/or policies if possible Comments Are hip protectors used? Yes / No Include types and compliance On how many residents? How many residents are taking calcium? How many residents are taking vitamin D? Low Care:-High Care:-Is residents' eyesight reviewed by ophthalmologist / Yes / No optometrist? Do the residents have access to a physiotherapist? Yes / No Are regular reviews on numbers, appropriateness and safety Yes / No of mobility aids attended? Are regular environmental safety audits conducted? Yes / No Frequency? Do you have a policy on safe resident footwear? Yes / No Does a foot care nurse or podiatrist review residents' feet Yes / No regularly? Are regular exercise programs in place for residents? Yes / No Individual exercise program developed by: Conducted by: Frequency: Walking program developed by:

Conducted by: Frequency:

Group exercise program developed by:		
Conducted by:		
Focuses on:		
Frequency:		
Is there an OHS committee?	Yes / No	
How are issues related to resident safety reviewed?		
Do you have a program or policy in place to promote and assess oral health and hygiene?	Yes / No	
Are continence assessments completed for each resident? When?	Yes / No	
What falls injury prevention strategies have you introc months)?	Juced since the	e beginning of the project (over the last 12
What falls injury prevention strategies were already in project (over last 12 months)?	olace but have b	been reviewed since the beginning of the
What have been barriers in your facility to introducing	falls injury preve	ention strategies?

Thankyou for completing this questionnaire and please fax to Mandy Harden on 40246006

Aged Care Facility Basic Information Form - Intervention Group

Aim

Date:

Collect information on all facilities in the intervention group to monitor change in overall facility profile at end of intervention period. Please be honest with your comments, as this will assist us to assess the impact of the project.

Facility Name:

Return FAX: 49246006

Facility breakdown								
Total number of beds	S							
Comment			General		Designated Dementia Specific			
Number low care beds	5							
Number high care bed	ls							
Total no. ambulant res	sidents							
Current category mix	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Cat 6	Cat 7	Cat 8
High care –								
general								
High care – dementia specific								
Low care -								
general								
Low care –								
dementia specific								
Comments		•						

Assessments		Comments
Is a mobility assessment done on admission?	Yes / No	
What designation of staff is responsible for completing the mobility assessment?		
Is an initial Falls Risk Assessment completed on admission?	Yes / No	
Is your Falls Risk Assessment Tool used for assessing falls risk only ?	Yes / No	
What designation of staff is responsible for completing the Falls Risk Assessment Tool?		
Has the format of the Falls Risk Assessment Tool you use changed since the beginning of the intervention period?	Yes / No	
Does the Falls Risk Assessment you use have a score to identify residents who are low, medium and high risk of falls?	Yes / No	
Is ongoing Assessment of Risk of Falls completed?	Yes / No	
After admission when would you do a reassessment of the falls risk for a resident?		
* Could you please attach a copy of your current Falls Risk Assess	sment tool?	
Do you complete the same Falls Risk Assessment for your respite admissions?	Yes / No	
Do you use a Falls Log for all residents?	Yes / No	
Do you use a Falls Log for frequent fallers only?	Yes / No	

Do you use a Falls Incident Form specifically for falls only?	Yes / No			
Do you use a Fall Review/Report Form? (Different than the incident form. See attached form as an example)	Yes / No			
* Could you please attach a copy of your current Fall Review/Rep	ort Form?			
Medications				
Does a Pharmacist do regular Medication Reviews? Yes / No				
How soon after admission are these done?				
Do you have GPs initiating the Residential Medication Management	nt Review (F	(MMR)? 	Yes / No	
What happens to this information/does it bring about change?				
Is your facility represented at the Regional MAC (Medication Advis	sory Commi	ttee) orga	anised by the HUDGP?	Yes / No
Interventions: Please attach a copy of forms and/or policies possible	if	Comme	ents	
Are hip protectors used?	Yes / No			
Which hip protectors does your facility prefer?	1.Hip Sav	er	2. Sanicare- hard	3.Sanicare-soft
(please circle)	4. Hornsb	y Hips	5. Pelican Super Soft	
Is compliance with wearing the hip protectors a problem?	Yes / No			
What are the reasons your residents are non-compliant with wea	ring the hip	protecto	ors?	
Have you been able to access the Vitamin D 50,000IU supplementation?	Yes / No			
How many residents are taking vitamin D?	Low Care			
	High Care			
List the difficulties you have had with getting residents onto/takir	ng Vitamin) supplen	nentation.	
How many residents are taking calcium?				
List the difficulties you have had with getting residents onto/takir	ng calcium s	uppleme	ntation.	
Do you take a lying AND standing/sitting BP on admission?	Yes / No			
Do the residents have access to a physiotherapist on a regular basis?	Yes / No			

Yes / No

Are regular reviews on numbers, appropriateness and safety of mobility aids attended?

Are regular environmental safety audits conducted? Frequency?	Yes / No
Do you have a policy on safe resident footwear?	Yes / No
Does a foot care nurse or podiatrist review residents' feet regularly?	Yes / No
What are the problems you have with compliance with safe foot	wear?
Are regular exercise programs in place for residents?	Yes / No
Individual exercise program developed by:	
Conducted by:	
Walking program developed by:	
Conducted by:	
Group exercise program developed by:	
Conducted by:	
Focuses on:	
Frequency:	
How are issues related to resident safety reviewed?	
What falls injury prevention strategies have you introduced sind	ce the beginning of the project?
What falls injury prevention strategies have you reviewed since	the beginning of the project?
What falls injury prevention strategies have you found most diffic	rult to introduce and why?

What falls injury prevention strategies have you found to work w	ell in your facility and why?
What have been the barriers in your facility to introducing falls in	jury prevention strategies?
Resource Manual	
What tools in the Resource Manual have you used?	FRAT
(Please tick the tools in the list you have used)	Fall Alert Flow Chart
Thease tick the tools in the list you have usedy	Falls Log
	Where About Checklist
	Fall Review Form
	Assessment Flow Chart
	Footwear Checklist
	Hip protector Suitability Checklist
Did you use the Posters in the orange section of the Resource Manual?	
Did you use the CQI Planner that was given/sent out at the second Network Meeting?	
Did you find the 3 monthly newsletter Fall Matters useful?	Yes / No
Could you make suggestions to improve the newsletter?	
Can you suggest how to improve the Resource Manual?	
Have you used any of the Self Directed Learning Packages?	Yes / No
Which ones were most useful?	
What other resources could the project officer develop that may help you with Falls Injury Prevention in your facility?	

Thank you for your participation in this questionnaire and support of the project.

Falls Reduction in RACF Project

Fall Alert Strategy

o Bathroom if appropriate

o Inside wardrobe door

o Other

Using a Falls Risk Assessment Tool, all resident's identified as high risk or Automatic High Risk should be classified as Fall Alert. Fall Alert Strategy is the identification of residents who are at high risk of falling by:

- Placing a coloured sticker (eg blue, orange and green have been used) on appropriate locations eg:
 o Bed head
 o Care plan
 o Progress notes
 o Handover sheets
 o Communication sheet/book
 o Mobility aid
 o Dining room table
 o Resident's chair
- practical within the facility. ■ And implementing Alert Strategies such as: o Fall Alert Check Form for resident surveillance o Day o Night o Day and night o Other To monitor for: o Pain/comfort o Need to change location o Need to toilet o Need for food & drink o Behaviour suggesting an unmet need o Other___ o Movement Alarm/Alert System o Day o Night o Day and night o Other__ o Log of Falls

o To monitor individual residents falls to allow for individual analysis of data: date, time, location, description of incident, injuries, GP involvement,

what may help.

■ The Implementation of appropriate falls prevention strategies that meet the needs of the resident and are

Appendix C: Falls Risk Assessment Tool

How to use this form

Complete Parts 1 & 2 of this FRAT to establish 'Fall Risk'. Using Parts 1, 2 & 3 document in the progress notes and care plan the appropriate fall prevention strategies for this resident

Part 1 AUTOM	ATIC HIGH RISK STATUS IF one of the following	Name:	
is ticked		MRN:	
(tick HIC	GH risk below)		Attack Desident Lebel Here
	Dizziness	Address:	Attach Resident Label Here
	Postural hypotension present	DOB:	
	Recent change in functional status and/or		
	medications, which may affect safe mobility.	M.O.	
Part 2	ORE ASSESSMENT Recent Falls History: - including numb	er of falls ar	nd possible contributing circumstances

Risk Factor	Level	Risk Score
RECENT FALLS	none in last 12 months	2
(To score this, complete recent falls history above)	one or more between 3 - 12 months ago	4
(10 score this, complete recent fails history above)	one or more in last 3 months	6
	one or more in last 3 months whilst inpatient/resident	8
MEDICATIONS	not taking any of these	1
/Colletions Auti December Auti Declines /s Discontine	taking one	2
(Sedatives, Anti-Depressants, Anti-Parkinson's, Diuretics,	taking two	3
Anti-hypertensives, hypnotics)	taking more than two	4
PSYCHOLOGICAL	does not appear to have any of these	1
/A '	appears mildly affected by one or more	2
(Anxiety, Agitation, Depression, Withdrawn, Decreased	appears moderately affected by one or more	3
Cooperation, Decreased Insight or Decreased Judgement esp. re mobility)	appears severely affected by one or more	4
TOTAL		/20

COGNITIVE STATUS	PAS Cognitive	j	Standardised	Mini			
Align to cognitive assessment tool used for this resident	Impairment Scale		Mental Status				
	PAS=0-3		m-m score 24 or more		Intact	1	
	PAS=4-9	OR	m-m score 24 – 15	OR	mildly impaired	2	
	PAS=10-15	OIX	m-m score 15 – 9	OIL	mod impaired	3	
	PAS=16-21		m-m score 9 or less		severely impaired	4	
TOTAL							/20

FALL RISK STATUS	Low	5 - 11
(Document Fall Status in the Care Plan)	Medium	12 - 15
	High	16 - 20

IMPORTANT: IF HIGH RISK, COMMENCE A FALL ALERT PROTOCOL FLOW CHART

Part 3

RISK FACTOR CHECKLIST		Tick and explain
Vision	Reports/observed difficulty seeing objects/signs/ finding way around	
Mobility	Mobility status unknown or is unsafe/impulsive/ forgets walking aid	
Transfers	Transfer status unknown or is unsafe ie over-reaches, impulsive	
Behaviours	Observed or reported agitation, confusion, outbursts of anger, disorientation, difficulty following instructions or resistive with care, constant walking or pacing	
ADL's	Observed or reported risk-taking behavioursObserved unsafe use of equipment Unsafe/inappropriate footwear or clothing	
Environment	Difficulties with orientation to environment ie areas between bed/bathroom/dining room	
Nutrition	Underweight/low appetite	
Continence	Reported or known urgency/nocturia/accidents	
Other	Osteoporosis, history of fracture/s, signs/ presence of pain, restraint	

Document in the Resident Care Plan the Fall Risk identified a	nd appropriate falls prevention strategies for this resider
Signed:	Date:

Appendix D: Fall Review From

Aim	Name:
Identify contributing factors from fall incidence to review and improve individual resident's fall prevention strategies.	MRN:
-	Attach Resident Label Here
How to use this form	Address:
Complete this review immediately following a fall incident.	DOB:
Facility / Ward:	M.O.
Date: Time:	
Location of fall:	
What was the resident doing at the time of the fall? (include high noise level, staff attending other residents, cleaning, a	
Part 1 - Extrinsic Factors 1.1 At the time of the fall were any staff involved in other a meal / break other	activities? ie
1.2 Was there anything unusual about staffing on that day	
1.3 How would you rate the lighting at the time of the fall	
1.4 Could any of the following have contributed to the fall	? If yes tick box and explain how.
furniture lig	ghting
floor coverings cle	eaning
clutter ur	eaning rine on floor
clutter ur mobility aid ur	eaning
clutter ur mobility aid ur restraint (type) clo	eaning rine on floor rge to void othing / knee rugs / blankets
clutter ur mobility aid ur	eaning rine on floor rge to void othing / knee rugs / blankets

1.6 Check footwear: What was the resident wearing on their feet at time of fall?
Was Oedema present?Any other foot problems?
1.7 Mental Status: Usual mental status:
Mental status at time of fall:
1.8 Were hip protectors being worn at the time of the fall?
Part 2 - Intrinsic Factors 2.1 Has there been a recent sudden change in the resident's health status? Yes No Explain 2.2 Is eyesight a problem for this resident? Yes No
Explain:
2.3 Blood Pressure BP – lying or sitting (5 - 10 minutes) BP – standing
2.4 Were there any complaints of dizziness associated with the fall?
2.5 Urinalysis (if appropriate)
2.6 Check ears (wax, infection)
Part 3 - Medications 3.1 When was last medication review by pharmacist?
3.2 Is the resident taking any of the following?
Benzodiazepines Anti-psychotics
Anti- hypertensives Antiemetics Antidepressants
Anti-convulsants Diuretics Antiparkinson's
Sedatives: Last dose given:
*Analyse this review and document in the progress notes.
**Update the Care Plan to reflect the falls prevention strategies from this review for the resident.
Information collected by (name): Signature:

Appendix E: Safe Footwear Checklist

This checklist may be used in the resident's admission package or to assess safety of current footwear or purchase of new footwear.

The requirement for safe, well-fitting shoes varies depending on the individual and their level of activity. The features outlined may assist in the assessment of an appropriate shoe.

This is a general guide only. Some people require the specialist advice of a podiatrist for the prescription of appropriate footwear for their individual needs.

Name:	
MRN:	
Address:	
DOB:	Attach Resident Label Here
M.O.	

The shoe should	have the following features:	
	Safe Feature	Tick
Heel	Low & broad (<2.5cm)	
	Straight through sole	
	Firm heel collar to provide support	
Sole	Cushioned, flexible, non-slip	
Weight	Lightweight	
Toe box	Adequate width, depth & height for natural spread of toes	
	Have a one centimetre space between longest toe and end of shoe	
Fastenings	Laces, buckles elastic or velcro that hold securely	
Uppers	Accommodating material	
	Smooth seam-free interior	
Safety	Protect feet from injury	
Shape	Same shape as the feet, without causing pressure or friction on the foot	
Purpose	Appropriate for the activity being undertaken	
Orthoses	Comfortably accommodating orthoses	
	Podiatrist or physiotherapist advice	
Recommendations	/Plan:	

Appendix F: Facility Monthly Falls Data Collection

Month and year:	
Facility name:	

Aim

This form is to collect monthly data on falls and injuries related to falls for all the facilities participating in the project

How to use this form

This form will be sent to you electronically each month. Please transfer the information required from your internal data collection and CQI activities onto this form and return by forward email Mandy.Harden@hnehealth.nsw.gov.au, fax (02 4924 6006) or print the form and send completed form to Mandy Harden, Project Officer, Falls Prevention Project, CARE Network, Locked Bag 119, Wallsend, NSW, 2287.

				a study ID out of o		-	v foi	the month stated ab	ove
Resident ID		Resident ID		Resident ID		Resident ID		Resident ID	
Trans to hosp	1	Trans to hosp	1						
Trans from hosp	2	Trans from hosp	2						
Trans to other RACF	3	Trans to other RACF	3						
Trans from RACF	4	Trans from RACF	4						
Deceased	5	Deceased	5	Deceased	5	Deceased	5	Deceased	5
Date		Date		Date		Date		Date	
Resident ID		Resident ID		Resident ID		Resident ID		Resident ID	
Trans to hosp	1	Trans to hosp	1						
Trans from hosp	2	Trans from hosp	2						
Trans to other RACF	3	Trans to other RACF	3						
Trans from RACF	4	Trans from RACF	4						
Deceased	5	Deceased	5	Deceased	5	Deceased	5	Deceased	5
Date		Date		Date		Date		Date	

The **definition of a fall** for the purpose of this project - A fall is a sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor or the ground.

Number	
Number of falls	
Number of falls resulting in fractured neck of femur	
Number of falls resulting in a fractured neck of femur occurring in the first 3 months since admission to the residential aged care facility	
Number of falls resulting in other fracture(s)	
Number of hospital admissions related to falls injuries	
Deaths within 3 months of fractured neck of femur	
Number of medication audits carried out by a pharmacist	
Total number of residents in the facility taking Vitamin D	
Number of residents with hip protectors	
Number of residents compliant with using their hip protectors	
Number of respite admissions	
Number of new permanent admissions	
Number of falls risk assessments completed on admission	
Number of "Fall Review Forms" completed	
(Please note this is different to an incident form and is the review that is done separately or as well as the Incident form)	
Comments	

Appendix G: Residents Profiles Form (sample page)

Residents Profiles Form

How to use this form

The facility manager or link person will collect this information prior to the intervention stage of the study, assigning a Study ID number for each resident to ensure confidentiality. Photocopy the completed form and send/ fax the copy to the project officer on (02) 4924 6006.

Study of Falls in Nursing Homes

Facility ID: 10000	
Date data collected:	

Recorded number of beds for facility		Corrections
High care beds	40	
High care demenita beds	20	
Low care beds	60	
Low care dementia specific beds	10	
Total Number of beds	130	
Respite beds	4	
Number of Ids to allocate	126	
(=total beds- respite beds)		

	ID number	study ID		RCS	Ambulant	Dementia specific	Falls risk assessment
		number	M/F		Y/N	Y/N	Not assessed = 1
							Low = 2
							Medium = 3
							High = 4
		10-15-12					
		10-12-15					
		10-11-11					
		10-10-10					
		10-00-00					
Office use only							
Date received:							

Appendix H: Resident's Record Audit after a fall resulting in a fractured neck of femur

Aim

Records a retrospective profile of the resident who has sustained a fractured neck of femur from a fall for data analysis and future implementation of interventions/education.

How to use this form

This form will be completed for all residents from the study group who sustain a fractured neck of femur as a result of a fall.

Facility ID:	Resident ID:											
Date audit completed:	Resident DOB:											
Date of fall:												
Did the Resident live in a Dementia Specific Unit (circle): Yes / No												
Date of admission to facility:RCS at time of fall: 1	2	3	4	5	6	7	8					
What was the resident doing just prior to the fall?												
Weight: Diagnosis:												
[
1. Assessment					Ves	1						
1a. Was a Mobility Assessment attended on admission?					Yes	1						
					No	2						
					Unclear	3						
b. Was an Initial Falls Risk Assessment Tool completed on admission	n?				Yes	1						
					No	2						
					Unclear	3						
c. Have there been subsequent Falls Risk Assessments Tools comple	eted sin	ce admiss	ion to fac	ility?	Yes	1						
					No	2						
					Unclear	3						
					Number							
d. If yes, did the last change in assessment indicate an increase in '	falls ris	k"?			Yes	1						
					No	2						
					Unclear	3						
e. What level of 'Risk' of falls was the resident assessed at the time	of the	fall?			Not Assesse	d 1						
					No score on Risk Assessr							
					Low	3						
					Medium	4						
					High	5						
					Unclear	6						

f. What interventions were implemented as a result of the above assessments?							
Vit D	1	Review footwear	8				
Calcium	2	Not applicable	9				
Physio	3	Vision Assessed	10				
Falls Log	4	Mobility aid	11				
Hip protectors	5	Med review	12				
Referral to GP	6	Environment audit	13				
Review of feet	7	Exercises	14				
		Other	15				

General Health - Over the past two weeks did the resident:					
2a. Have an acute episode of a chronic illness?	Yes	1			
	No	2			
	Unclear	3			
b. What was the illness? eg asthma, CCF, etc					
c. When was this acute chronic illness first observed?	Date				
	Time				
d. Was this illness still current at the time of fall?	Yes	1			
	No	2			
	Unclear	3			
3a. Have an episode of an acute illness?	Yes	1			
	No	2			
	Unclear	3			
b. Name of acute illness eg UTI, URTI, cellulitis etc					
c. When was this acute illness first observed?	Date				
	Time				
d. Was this illness still current at the time of fall?	Yes	1			
	No	2			
	Unclear	3			
4a. Have a change in ADL functioning level?	Yes	1			
	No	2			
	Bathing	3			
	Dressing	4			
	Grooming	5			
	Toileting	6			
	Unclear	7			
	Not applicable	9			
b. Have a change in mobility?	Yes	1			
	No	2			
	Unclear	3			

5a. What was the resident's bowel habit prior to fall?	Normal for the resident	1
	constipated	2
	Smearing	3
	Loose	4
	Diarrhoea	5
	Unclear	6
b. Was there a notable decline in urinary continence?	Yes	1
	No	2
	Unclear	3
6. Was a decline in the resident's cognition noted?	Yes	1
	No	2
	Unclear	3
7a. Have postural hypotension?	Yes	1
	No	2
	Unclear	3
b. Is there a management plan for hypotension?	Yes	1
	No	2
	Unclear	3
	Not Applicable	8
8a. Date and time of last BP:-	Date	
	Time	
b. Last BP Diastolic		
c. Last BP Systolic		
9a. Has a Mobility aid?	Yes	1
	No	2
b. Uses mobility aid?	Always	1
	Often	2
	Sometimes	3
	Rarely	4
	Never/Refuses	5
	Not Applicable	8
c. Have hip protectors?	Yes	1
	No	2
d. Wears their hip protectors?	Always	1
	Often	2
	Sometimes	3
	Rarely	4
	Never/Refuses	5
	Not Applicable	8
e. Type of hip protectors:	Hard	1
	Soft - foam	2
	Soft - silicon	3
	Not Applicable	8

10a. Does the resident participate in a walking exercise program? Always 1 0ften 2 5 cometimes 3 8 carely 4 8 cefuses 5 Not Enrolled in Program 6 b. Does the resident participate in an individual exercise program? Always 1 Often 2 Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6 c. Does the resident participate in a group exercise program? Always 1 Often 2 Sometimes 3 Asrely 4 Always 1 Often 2 Sometimes 3 Asrely 4 Refuses 5 Not Enrolled in Program 6 d. Has the exercise program been reviewed since admission? Yes 1 No 2 Unclear 3 Not applicable 9 e. When was the exercise program last reviewed? Date Increased / expande			
Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6	10a. Does the resident participate in a walking exercise program?	Always	1
Rarely		Often	2
Refuses 5 Not Enrolled in Program 6 b. Does the resident participate in an individual exercise program? Always 1 Often 2 Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6 c. Does the resident participate in a group exercise program? Always 1 Often 2 Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6 C. Does the resident participate in a group exercise program? Always 1 Often 2 Sometimes 3 Rarely 4 Refuses 5 Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6 d. Has the exercise program been reviewed since admission? Yes 1 No 2 Unclear 3 Not applicable 9 e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program 2 Increased / expanded program 3 Focus change 4		Sometimes	3
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Often 2 Sometimes 3 Rarely 4 Refuses 5 Not Enrolled in Program 6 d. Has the exercise program been reviewed since admission? Yes 1 No 2 Unclear 3 Not applicable 9 e. When was the exercise program last reviewed? Date f. Results of the review of the exercise program: Maintained same program 1 Reduced program 2 Increased / expanded program 3 Focus change 4		Not Enrolled in Program	6
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d. Has the exercise program been reviewed since admission? Yes No 2 Unclear Not applicable 9 e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program Reduced program 1 Reduced program 2 Increased / expanded program 3 Focus change 4		Rarely	4
d. Has the exercise program been reviewed since admission? Yes No 2 Unclear 3 Not applicable 9 e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program Reduced program 2 Increased / expanded program 3 Focus change 4		Refuses	5
No 2 Unclear 3 Not applicable 9 e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program 1 Reduced program 2 Increased / expanded program 3 Focus change 4		Not Enrolled in Program	6
e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program Reduced program Increased / expanded program Focus change Junclear A Focus change Junclear A Focus change A Junclear Ju	d. Has the exercise program been reviewed since admission?	Yes	1
e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program 1 Reduced program 2 Increased / expanded program 3 Focus change 4		No	2
e. When was the exercise program last reviewed? f. Results of the review of the exercise program: Maintained same program Reduced program Increased / expanded program Focus change 4		Unclear	3
f. Results of the review of the exercise program: Maintained same program Reduced program Increased / expanded program Focus change 4		Not applicable	9
Reduced program 2 Increased / expanded program 3 Focus change 4	e. When was the exercise program last reviewed?	Date	
Increased / expanded program 3 Focus change 4	f. Results of the review of the exercise program:	Maintained same program	1
Focus change 4		Reduced program	2
		Increased / expanded program	3
Not applicable 9		Focus change	4
		Not applicable	9

11. Medications								
a. Was there a medication review by a ph	armaci	st in	last 6 months?)	Yes 1			
					No 2	No 2		
b. If yes what was the date of last medica	tion re	view	?		Date			
c. Were the recommendations from the n	nedicat	ion a	udit acted on?)	Yes 1			
					No 2			
					Not applicable 9			
Is the resident taking? Date last given given				Time last given	Generic name and brand/trade name	Dosage	Route	
d. Benzodiazepines	Yes	1						
	No	2						
e. Anti-psychotics	Yes	1						
	No	2						
f. Anti-hypertensive	Yes	1						
	No	2						
g. Antiemetics	Yes	1						
	No	2						

h. Anti-depressants	Yes	1						
	No	2						
i. Anti-convulsants	Yes	1						
	No 3	2						
j. Diuretics	Yes	1						
	No	2						
k. Anti-Parkinson's	Yes	1						
	No	2						
I. Sedatives	Yes	1						
	No	2						
m. In the past 2 weeks has there been a r	medicati	on (change?	hange? Yes 1				
				No 2				
n. If yes list: 1.Gener		1.Generic Na	me:	2.Generic Name:		:		
OLD Medication:		Dosage:			Dosage:			
		Route:			Route:			
NEW Medication:		1.Generic Name:			2.Generic Name:			
			Dosage:			Dosage:		
			Route:			Route:		
Date (Date Change	Date Change: Date Change:				
o. Is the resident taking calcium?				Yes	1			
		No 2		2				
p. Is the resident taking vitamin D?				Yes 1				
					No	2		

12. Prior falls	12. Prior falls (list details below)					
Date	Injuries	Comments				

13. Hospital	isations		
Has the resid	ent had any hospitalisati	Yes 1	
			No 2
Date	ICD10	Reason for Admissions	No. of hospital leave bed days

Further Comments (include what staff think contributed to the fall): _	