Exploring the Nurse Practitioner Role in Managing Fractures in Long-Term Care

Sharon Kaasalainen, RN, PhD¹, Alexandra Papaioannou, MD, FRCPC, FACP¹, Jennifer Burgess, NP-PHC, MSc, GNC(C)², and Mary Lou Van der Horst, RN, BScN, MSc³

¹McMaster University, Hamilton, Ontario, Canada

²Nurse-Led Outreach Team, Shalom Village, Hamilton, Ontario, Canada

³Conestoga College, Hamilton, Canada

Abstract

The purpose of this study was to assess the current level of involvement of nurse practitioners (NPs) in activities related to preventing and managing fractures in long-term care (LTC). This study used a sequential explanatory mixed methods design that included two phases—a cross-sectional survey followed by qualitative interviews. A final sample of 12 NPs completed the online survey for a response rate of 67%. Eleven of the 12 NPs who completed the survey agreed to participate in a follow-up interview. NPs reported that they were quite engaged in managing fractures in LTC; specifically, they were most active in caring for residents post-fracture. NPs described their role as being holistic in nature in their assessment and treatments related to managing fractures. The findings from this mixed method study add to the growing body of knowledge related to how NPs manage fractures in LTC.

Keywords

fractures; long-term care; nurse practitioner

Introduction

Residents living in long-term care (LTC) experience considerable decline in their quality of life as a result of fractures and falls. Fractures can be a significant source of pain, anxiety, depression, prolonged disability, and reduced pulmonary function (Gold, 1996; Maggio et al., 2001; Papaioanno, Watts et al., 2002; Schlaich et al., 1998), and cause agitation in the frail elderly. Fracture rates in LTC are 4 to 8 times higher than a similarly aged group of community-dwelling older adults (Norton et al., 1999; Sawka, Ismaila, Cranney, et al., 2010; Sugarman et al., 2002; Zimmerman et al., 1999). The estimated prevalence of hip fracture in LTC is approximately 20%, and is even higher as residents approach age 90 or older (Kanis

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Corresponding Author: Sharon Kaasalainen, McMaster University, 3N25F, 1280 Main Street West, Hamilton, L8S 4K1, Ontario, Canada. kaasal@mcmaster.ca

Declaration of Conflicting Interests

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et al., 2004; Maggio et al., 2001). Hip fractures are one of the leading causes of hospitalization for LTC residents and occur at a higher rate than in the community (Ronald, McGregor, McGrail, Tate, & Broemling, 2008), and the consequent pain and delirium are distressing for both the residents and their families. Residents who suffer a fracture will require more specialized and more hours of care when they return to LTC. Hence, managing fractures in LTC warrants serious attention.

Along with post-fracture management, efforts are also needed to prevent fractures from occurring in the first place to minimize the negative consequences association with them (Wall, Lohfield, Giangregoro, Ioannidis, Kennedy, Moser & Morin, 2013). Fracture prevention in LTC is multifaceted and includes falls prevention activities, risk assessments, ensuring adequate intake of calcium and vitamin D, and balance and strengthening exercises (Demontiero, Herrmann, & Duque, 2011; Papaioannou et al., 2010). For residents at highest risk of fractures, hip protectors and osteoporosis medications are options that should be considered (Sawka, Ismaila, Cranney, et al., 2010). A prior fracture is a major risk factor for future fractures, independent of bone mineral density (BMD), and should be a trigger to assess and consider treatment (Chen et al., 2011; Kanis et al., 2008). Future work is needed to explore new models of care to optimize post-fracture care and prevent future fractures from occurring.

Osteoporosis, a common condition in LTC residents, is characterized by skeletal fragility and low bone mass resulting in increased risk of fractures at the spine, rib, wrist, pelvis, and hip (Seeman, 2002; Zimmerman et al., 1999). Although there is limited research on vertebral fractures in LTC, by age 80 years it is estimated that 50% of all individuals have a vertebral fracture (Papaioannou, Watts et al., 2002; Schlaich et al., 1998). Vertebral fractures are associated with considerable pain, reductions in quality of life, functional impairment, and mortality; whereas, wrist fractures are associated with functional decline and play a role in further development of disability (Edwards, Song, Dunlop, Fink, & Cauley, 2010; Lau et al., 2008). Moreover, Hopkins et al. (2013) stated that significant excess costs exist for residents with fractures of the hip, vertebral, and humerus, and that ignoring these fractures underestimate the true cost of osteoporosis.

Research has shown that treatment reduces the risk of fractures related to osteoporosis by 40% to 60% (Bessette et al., 2008). Given these rates, clinical practice guidelines were developed for the diagnosis and management of osteoporosis in Canada (Papaioannou et al., 2010) with the goal of reducing negative consequences of suffering from osteoporosis, such as a fracture. However, implementing these guidelines is challenging given the nature and limitations of the LTC sector, which include off-site location of physicians, heavy paperwork and regulatory requirements, staffing and resource limitations, communication barriers, and high rates of staff turnover (Kennedy et al., 2012). Hence, creative ways of implementing the guidelines are needed.

Nurse Practitioners (NPs) have recently been introduced in LTC in Canada and could be better utilized to their full scope of practice to improve the way osteoporosis and fractures are managed; they are positioned well to act as change champions to implement new practices in LTC (Bakerjan, 2008). However, the role of the NP is not well defined in terms

of how they manage fractures, both prevention and treatment, within the LTC setting (Martinez-Reig, Ahmad, & Duque, 2012). In order for NPs to be effective in clinical practice, clarity of roles within the team is essential (Cummings, Fraser, & Tarlier, 2003; deGuzman, Ciliska, & DiCenso, 2010).

Therefore, the *purpose of this study* was to assess the current level of involvement of NPs in activities related to preventing and managing fractures in LTC. Specifically, the following research questions were asked:

Research Question 1: How do NPs, who currently work with LTC homes, provide post-fracture management and prevent new fractures from occurring for residents?

Research Question 2: What indicators do NPs use to assess for fracture risk in LTC residents and how do they screen for osteoporosis?

Research Question 3: What are some of the barriers and facilitators to optimizing the NP role in preventing and managing fractures in LTC?

Method

This study used a sequential explanatory mixed methods design (Creswell, Clark, Gutmann, & Hanson, 2003) that included two phases—a cross-sectional survey followed by qualitative interviews—to gather information about the NP's current role in managing fractures in LTC homes across Ontario. The survey involved both qualitative and quantitative approaches to the collection and analysis of data. The follow-up interviews were grounded in qualitative descriptive methods (Patton, 2002; Sandelowski, 2000). The study was conducted in 2012 and was approved by a university research ethics board in southwestern Ontario.

Setting and Sample

The total of 18 NPs who worked exclusively in LTC facilities across Ontario, Canada, were asked to participate in the study. In Ontario, LTC care homes are defined as residential facilities that provide nursing and personal care on a 24-hr basis to individuals who require frequent assistance with activities of daily living (e.g., personal hygiene, toileting, eating) and supervision or monitoring for safety (Ontario Ministry of Health and Long-Term Care, 2014). The LTC homes that employed the NPs who participated in this study included both for-profit and not-for-profit homes, rural and urban, and small (35 beds) and larger homes (280 beds). In the majority of these homes, NPs worked under medical in partnership with the collaborating LTC physician. A final sample of 12 NPs completed the online survey for a response rate of 67% (see Table 1). Eleven of the 12 NPs who completed the survey agreed to participate in a follow-up interview.

Survey

The survey comprised of four sections. The first section focused on demographic information such as age, educational background, years of practice as both a registered nurse (RN) and licensed NP, and type of position held (i.e., full-time, part-time). The second section included questions about the practice patterns of NPs related to post-fracture management, fracture risk assessment, use of evidence-based guidelines (see Table 2 for list

of items), based on two previous surveys that were administered to NPs across Ontario (DiCenso, Paech, & IBM Corporation, 2005; Kaasalainen, DiCenso, Donald, & Staples, 2007). The third section included a case study with six questions at the end that explored how NPs would respond to related care decisions. The case study was developed by a team member (J.B.) based on a number of frequently encountered clinical scenarios in LTC. Finally, NPs were asked to identify the barriers and facilitators that they experienced while trying to prevent and manage fractures for LTC residents. A final question on the survey asked if they would be willing to be interviewed at a later date.

Procedure and recruitment—The survey was piloted to assess its feasibility and identify any barriers to its completion using two NPs with expertise in caring for older adults. The survey was modified based on their feedback and responses, with changes to wording of two questions to make them easier to understand. The survey took approximately 15 to 20 min to complete. All NPs who worked in LTC in Ontario, Canada were emailed a letter outlining the nature of the study and asked to complete it online. To increase the response rate, a second email was sent 2 weeks after the first mailing, followed by a telephone call 1 week after the second mailing (Dilman, 1978).

Data analysis—The quantitative data from the survey were summarized using descriptive statistics. Frequency distributions, means, and standard deviations were calculated. Content analysis was used to analyze the survey data obtained from the open-ended questions.

Interviews

The 11 NPs who indicated on their survey that they would be willing to participate in a follow-up interview were contacted by email to complete a consent form and determine a time for a telephone interview that was convenient to them. A trained research assistant conducted the interviews. During the interview, NPs were asked about their perceptions of the NP role in residents in managing fractures, including related challenges, and suggested strategies for improvement (see Table 3).

Data management and analysis—Data from the interviews were transcribed and analyzed using the software program N-Vivo 9.0 (QSR International, 2011). Important concepts that emerged from the data were labeled, categorized, and coded (Patton, 2002; Sandelowski, 2000). Initially, two individuals coded six transcripts independently. Discrepancies were discussed until consensus on a coding framework was reached. A number of methods were used to improve the credibility of the findings; for example, member checking or “recycling interpretation” was done with participants. After each interview, informants were asked to review a two-page summary of key findings and comment on the investigators’ interpretation of the interview data (Crabtree & Miller, 1999). Investigator triangulation was used to minimize any idiosyncratic biases. Two individuals independently analyzed data and met regularly throughout the analysis phase to discuss progress and findings.

Results

Characteristics of Sample

The average age of the NPs was 45.83 years ($SD = 16.20$); these NPs had been practicing as NPs for an average of 7.0 years ($SD = 3.59$) and as RNs for an average of 23.58 years ($SD = 11.06$). Half of the NPs had a bachelor's degree in nursing (50%) and half had a master's degree (50%) and all of them worked full-time (100%). Three NPs (25%) were part of an outreach team (e.g., worked off-site and provided outreach support to homes) and on average, they worked at 2.33 ($SD = 2.71$) LTC homes.

Survey

Practice patterns—NPs reported that they were quite engaged in managing fractures in LTC (see Table 2); specifically, they were most active in caring for residents post-fracture (mean = 7.83, $SD = 1.85$, range = 0–10). The indicators that they used most to assess for risk of fracture were previous history of falls (mean = 9.33, $SD = 1.37$, range = 0–10), residents' age (mean = 9.25, $SD = 1.29$, range = 0–10), and prior fragility fracture (mean = 9.0, $SD = 1.48$, range = 0–10).

NPs reported that they assessed for the risk of fracture on admission as well as during a post-fall assessment, stating that there is limited time to assess at any other times. When asked where they document about fracture risk, almost half of the NPs reported that they document it in resident progress notes (50%), while others reported documenting it in annual health reviews (17%), in residents' profile (8%), care plans (17%), or interdisciplinary assessment notes (8%). A third of the NPs (67%) stated that they use a standardized fracture risk tool or protocol in their LTC home. All of the NPs stated that they were familiar with the Canadian Osteoporosis Guidelines and 92% of them reported using them in practice.

Case study responses—NPs responded to a number of questions posed based on a case study example (appendix). When asked about the main areas of concern for Mrs. Smith, NPs reported inadequate pain management (75%); risk of possible falls (42%) and fractures (42%), including vertebral fractures; inappropriate medication use (50%), such as questionable use of Lasix and need for osteoporosis medications; possible delirium (42%); sleep deprivation (42%); and possible infection (17%). When asked about what could be causing her behaviors, almost all of the NPs reported pain (92%), followed by delirium (42%), over sedation (25%), or dementia (17%).

NPs thought that Mrs. Smith should be assessed in many ways, including a complete physical exam (83%) with rib-to-pelvis measurement (25%), X-ray of spine and pelvis (58%), bloodwork completed (58%), pain assessment (50%), physiotherapy assessment (50%), urine for culture and sensitivity (33%), delirium assessment (25%), falls assessment (25%), and sleep assessment (17%). After assessing Mrs. Smith, NPs reported she should be treated by prescribing routine and *pro re nata* (as needed [PRN]) pain treatments, such as acetaminophen, increased citalopram (83%); initiating osteoporosis medications, such as calcium, vitamin D, bisphosphonates (83%); decreasing sedation by weaning and discontinuing clonazepam and seroquel (67%); and discontinuing colace and order a routine

laxative (33%). Lastly, NPs reported the following key outcomes as being the most important: increased comfort/decreased pain (92%), decreased falls (58%), improved bone health (50%), improved mobility (25%), improved sleep (25%), decreased behaviors (17%), and improved quality of life (8%).

Barriers to managing fractures in LTC—Participants reported that limited access to diagnostic services (e.g., BMD testing, X-rays) was a key barrier to managing fractures in LTC. They also reported a lack of nursing staff to monitor residents for pain effectively; limited access to a resident's history; lack of education and training for nursing staff to recognize possible fractures, manage pain effectively, and reduce fall risk; attitudes of staff and family members that resident behaviors are due to dementia not pain; the perception that residents receive better care at the hospital; and the false impression that fractures are inevitable and older adults do not benefit from interventions (e.g., vitamin D and calcium supplementation and bisphosphonates). They also reported that resident adherence with taking medications, wearing hip protectors, and using the proper assistive devices for mobility limited adequate care around falls and fractures.

Facilitators to managing fractures in LTC—NPs stated that physiotherapy and exercise were key to improving the management of fractures in LTC. Other facilitators included fall prevention programs, the availability of adequate equipment for prevention of falls, better communication between hospitals and LTC homes, more education to LTC staff at all levels related to managing pain and improving bone health, more NPs in LTC, increased staffing levels, and more involvement with family members.

Qualitative Interviews

Overall, the NPs described how they engaged in managing fractures while residents were living in LTC from both a preventative and post-fall perspective, as well as on readmission after a hospital visit that resulted from a resident fall or fracture. The NPs described their role as being holistic in nature in their assessment and treatments related to managing fractures and stated that they were most involved in assessing and screening for falls, providing physical care (i.e., cast assessment), managing medications, ordering X-rays, involving physiotherapy and exercise, and admitting to the hospital if warranted. However, they identified a number of barriers to providing optimal care (i.e., diagnostic delays, unpredictable nature of falls, lack of staff, polypharmacy, managing multiple comorbidities, and poor continuity of care between LTC home and hospital) and suggested some strategies for improvement (i.e., more access to on-site specialists and diagnostic imaging, better communication, more effective pain management, more education for staff, more education for residents and families).

NP role in managing fractures

Using a holistic approach—The majority of NPs described their role in managing fractures as being holistic in nature that allowed them to look at “the whole story” of the resident (see Table 4). Within this holistic approach, NPs stated that they need to know the resident's history, for example, their normal activity level and behaviors, whether or not a resident has had a previous fragility fracture, or if bisphosphonates were prescribed. NPs

stated that they've managed a variety of fractures, including clavicle, wrist, femur, humerus, pelvis; however, the most common ones seen in LTC are hip and vertebral fractures.

Managing medications—NPs spoke a great deal about their involvement in managing medications to optimize drug therapy for residents. NPs stated that most residents were prescribed calcium and vitamin D medications. They found this challenging sometimes when dealing with frail older adults who have polypharmacy issues and multiple comorbidities.

Utilizing a multidisciplinary approach to prevent falls—NPs commented on the importance of using preventative measures, such as using hip protectors, involving physiotherapy to optimize exercise, and completing a fall screening risk for residents. They use a number of strategies to reduce falls, such as using alarms on beds and chairs, assessing metabolic issues to make sure the resident isn't dehydrated or confused, assessing the environment to make sure there are no obstacles, minimizing use of restraints, ensuring lighting and footwear are adequate, mobility aides are used if necessary, and that the bed position is not too high. The importance of good pain management was also mentioned as "residents are more likely to fall if they are in pain."

NPs spoke of the need to collaborate with other team members (i.e., physicians, occupational therapists, physiotherapists, personal support workers) to manage fractures as there is "*so much more than nursing is needed to manage fractures appropriately.*" In this manner, NPs optimized a multidisciplinary collaborative approach to care so that resident needs related to managing fractures were met by using team members who had the appropriate expertise and specialized skills. The importance of physical activity in both fracture and fall management was highly endorsed by NPs to "*keep them [residents] as active as possible so they have good muscles around those poor little bones.*"

Caring for residents after a fall—NPs described how they were involved with conducting assessments, most often after a fall had occurred and with "frequent fallers." NPs stated that they were consulted by other LTC staff on a "case-by-case" basis depending on what the cause of the fracture was and how long ago it was.

Other than the RNs, the NPs were usually the first person to assess a resident after a fall as they were more accessible than other off-site staff, for instance, the physician. If a fall has occurred, then NPs are involved in ordering X-rays to determine if there is a fracture and whether or not a resident needs to go to the hospital as a result. Sometimes, the RN would decide on his or her own if a resident needs to go to the hospital if the decision is clear but other times the RN would call the NP or the physician first before sending the resident to the hospital if the RN felt that further consult was needed. If unsure, the NP "*would have to immobilize, splint the area until the report came back to confirm whether there was a fracture or not, and whether we need to send them out to get casted.*"

NPs stated that they would be involved in assessing casts and if necessary, would remove them. A couple of NPs stated that they would have to remove casts if residents were admitted with them on or were readmitted from hospital with a cast and it was "*a little too*

tight and they just wanted somebody to come to the home to assess it or kind of open it up to perhaps relieve some of the pressure.”

Caring for residents on readmission from hospital—NP participants stated that residents who were admitted to the hospital after a fracture usually return to LTC about 5 days post-operative. NPs main concern at this time is related to controlling pain and finding out how to prevent further falls. NPs also commented on the importance of communicating with family members, maintaining good nutrition, monitoring for depression, attending to wound care, and encouraging physical activity for the resident if possible.

Managing osteoporosis and vertebral fractures—NPs highlighted the important link between managing osteoporosis and fractures at the same time. However, NPs stated that they “*don’t usually go looking for osteoporosis, but will treat everybody like they have osteoporosis and start them with the calcium and Vitamin D*” and if “*you manage them from an osteoporosis standpoint you decrease the number of fractures that your residents will have if they are falling.*” Moreover, if it was determined that a resident had a fragility fracture, then the NP would assess the number and type of medications that the resident was taking, in particular bisphosphonates and chronic steroid use, and the resident’s body mass index (BMI). The need for an individualized treatment plan was paramount.

Barriers to managing fractures in LTC—NPs identified a number of barriers that they’ve experienced when trying to manage fractures in LTC, including diagnostic delays, inappropriateness for some residents for bone density testing, poor layout of LTC home, lack of staff, lack of knowledge of family members, lack of individualized care, the unpredictable nature of falls, polypharmacy and side effects of medications, high volume of comorbidities of residents, poor communication among health care providers, and lack of resources and coverage for fall prevention strategies (see Table 5). NPs also identified barriers that were specific to a post-fall hospital transfer, stating that long waiting times for surgery, relocation delirium, changes in medication, increased use of restraints, and chance of infection and pressure ulcers create additional challenges to managing fractures optimally.

Discussion

The findings from this mixed methods study highlight the NP role in managing fractures in LTC. Specifically, the survey findings highlighted that NPs were mostly involved in caring for residents after a new fracture and that they primarily used the indicator—resident had a fall in the previous year—to assess for risk of future fractures. According to Martinez-Reig et al. (2012), health care professionals who care for LTC residents need a high awareness of the risk factors for subsequent fractures to intervene appropriately. As such, NPs are positioned well to build capacity within LTC homes by providing education to staff and assisting with clinical care related to assessing risk of fractures in residents and providing appropriate treatments.

New models of care in LTC that optimize the NP role in this manner are needed. Ideally, NPs should be employed to work in one or two homes at the most, offering more time on-site to provide direct clinical care to residents and maximizing their full scope of practice

(Kaasalainen et al., 2007). Working within a collaborative physician/NP partnership will also help NPs maximize their full scope of practice as well as contribute to more evidence-based and integrated care (Donald et al., 2009). For example, the results of this study highlight the importance of ongoing assessment, monitoring and ensuring the appropriate follow-up of casted fractures in the LTC setting, which are part of the NP scope of practice (College of Nurses of Ontario, 2011). Future research is needed to evaluate such a model of care, specifically related to fracture management in LTC.

NPs have emphasized the challenges in managing multiple comorbidities in the LTC population. In fact, older adults are more likely to be admitted to LTC post-hip fracture when they also have cognitive impairment, difficulties with functional abilities, advanced age, in-hospital delirium, comorbidity, depression, low social support, depression, and “new impairments at discharge” (Martinez-Reig et al., 2012). Due to these complexities and polypharmacy, NPs report difficulty at times in ensuring that LTC residents are treated appropriately for osteoporosis and for overall bone health. This is consistent with the evidence that rates of prescription for osteoporosis medications in LTC are lower compared with community settings (Papaioannou et al., 2008). By engaging the pharmacist role more in collaborative practice with NPs and physicians in LTC, perhaps issues related to polypharmacy and appropriate prescribing could be minimized.

Furthermore, this study stresses the importance of assessing for vertebral fractures in LTC and treating for pain, which is often overlooked (Bessette et al., 2008; Greenspan et al., 2012). NPs identified several reasons for this that include both health and human resources. Health resources include timely access to diagnostic services, while human resources include staffing levels, awareness and education, and attitudes and practices of health professionals and families. The NP in LTC is well positioned to address these gaps in alignment with the core competencies of NP practice in Canada that include multidisciplinary collaboration, communication, education, leadership, advocacy, research and evidence-informed practice (Bakerjan, 2008). Surprisingly, current restrictions on Ontario NPs for ordering pelvic and spinal X-rays and for ordering pain management that includes controlled substances (College of Nurses of Ontario, n.d.) did not emerge in qualitative findings, likely due to the collaborative relationships that these NPs maintain with LTC physicians. Still, to streamline care and increase timeliness of assessments and treatments, expansion of NP scope of practice in this area warrants further discussion.

Along with the commonly reported barrier of inadequate staffing levels in LTC, both quantitative and qualitative findings here also underline the need to address the lack of timely diagnostic services in LTC. Similar findings were established through a physician survey whereby physicians reported that BMD testing and X-rays were less important in LTC residents largely due to their inaccessibility (Sawka, Ismaila, Raina, et al., 2010; Suarez-Almazor, Homik, Messina, & Davis, 1997). These findings emphasize the need for clinical practice guidelines for managing fractures and osteoporosis to be customized to guide all LTC clinicians, including NPs, given the unique realities of the setting and population.

There are limitations to this study. First, data were collected in one province of Canada, so results may be different in other locations. Some of these differences may relate to the educational level of NPs in Canada (i.e., baccalaureate or master's); licensure and scope of practice of the NP in Ontario, Canada; some residents in Canada experience long wait times for surgery following fractures; and in Canada, residents generally return to LTC 5 days post-operatively. The fact that we conducted the follow-up interviews by telephone could be a potential limitation as participants may be less comfortable discussing issues over the phone than in person. Finally, this study addressed the perspective of NPs only. Future work is needed to explore perceptions of personal support workers, nurses, pharmacists, physicians, and other care providers in terms of what they identify as barriers and enablers to providing high-quality post-fracture care and preventative strategies used to minimize fractures.

Conclusion

The findings from this mixed method study add to the growing body of knowledge related to how health care providers manage fractures in LTC, particularly the NP role. The NPs surveyed and interviewed in this study highlight important practices that they engage in to both prevent and care for post-fractures for LTC residents. Some troubling barriers were identified, specifically lack of staff and timely access to diagnostic services in LTC, that need to be addressed to provide optimum and effective fracture care, consistent with current clinical practice guidelines.

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Biographies

Sharon Kaasalainen is an Associate Professor with the School of Nursing at McMaster University. She has conducted a number of studies related to optimizing the NP role in long term care homes.

Alexandria Papaioannou is a Professor of Medicine at McMaster University in the Division of Geriatric Medicine and a Geriatric Medicine Specialist at Hamilton Health Sciences - St Peter's Hospital. She is serving as the Co-Chair of the MOH LTC Osteoporosis

Strategy for Ontario, a public health initiative to prevent and reduce the impact of osteoporosis, fractures and falls.

Jennifer Burgess is a Nurse Practitioner who works in an outreach capacity in Long Term Care Homes across the Hamilton and surrounding area.

Mary Lou Van der Horst is an Assistant Clinical Professor, Conestoga College and a Senior's Health Nursing Consultant, Hamilton, ON, Canada.

Appendix

Case Study

You've been called in to see Mrs. Smith who is an 87-year-old female living in a long-term care home. She has a past history of glaucoma, depression and anxiety, Alzheimer's disease, and a past history of delirium. She has osteoporosis and osteoarthritis with previous left hip fracture and wrist fracture. Recently, she has started calling out especially worse after sitting up in chair and with transfers. She has exhibited increased lethargy with changes in her sleep pattern (sleeping more in the morning and wakes up around 3:00 p.m.). Since admission to LTC (about a month ago) she has had two falls and hospital staff reported other falls while she was in the hospital as well. Staff observed some behavioral indicators of pain with vague self-reports of pain from Mrs. Smith. She is kyphotic in appearance, had a recent loss of mobility (past 6 months), screams after 10 to 15 min up in W/C or when Clonazepam wears off. Family reports that she used to be on regular Tylenol in the retirement home but this was discontinued in hospital.

Medications include:	Recent pertinent diagnostics:
Lasix 20 mg PO daily Xalatan and Timolol gtts L-Thyroxine 0.075 mg PO daily Celexa 40 mg PO daily (recently decreased from 60 mg) Spiriva and short acting PRN Seroquel 50 mg PO BID at 0800 and 2000—new since hospitalization Clonazepam 0.5 mg PO at 0800 and 1200; 2 mg PO at 1600 and 2 mg PO once daily PRN Colace QHS Lactulose PRN Tylenol PRN (PO or PR)	CXR 2 days ago is negative for active process

Note. PO = *per os* (by way of mouth); PRN = *pro re nata* (as needed); BID = *bis in die* (twice a day); QHS = *quaque hora somni* (every night at bedtime); PR = *per rectum*; CXR = chest X-ray.

Questions

1. What are your main areas of concern for Mrs. Smith?
2. What do you think might be causing her behaviors?
3. How would you assess her?
4. How would you treat her?
5. What are the key outcomes that you think are the most important to achieve?

Table 1Demographical Information of NPs ($n = 12$).

	<i>M</i>	<i>SD</i>	<i>%</i>	<i>n</i>
Age	45.83	16.20		
Years as RN	23.58	11.06		
Years as NP	7.00	3.59		
Educational background				
BScN			41.67	5
Baccalaureate (other)			8.33	1
Master's			50.00	6
PhD			0.00	0
Full-time			100.00	12
Part of outreach team			25.00	3
Number of homes working at	2.33	2.71		

Note. NPs = nurse practitioners; RN = registered nurse.

Table 2NP Practice Patterns Related to Managing Fractures ($n = 12$).

Perform the following activities^a	<i>M</i>	<i>SD</i>
a. Assess residents for risk of falls	6.25	3.31
b. Assess the residents for risk of fractures	6.75	2.73
c. Help implement preventative strategies for fractures	7.00	2.76
d. Care for residents after they've had a fracture	7.83	1.85
e. Care for residents after they've had a <i>vertebral</i> fracture	6.83	2.89

Indicators used to assess fracture risk in LTC residents^a	<i>M</i>	<i>SD</i>
a. Current smoking	6.50	4.10
b. Resident age	9.25	1.29
c. Prior fragility fracture	9.00	1.48
d. Use of glucocorticoids	8.42	2.71
e. High alcohol intake	6.00	3.89
f. Rheumatoid arthritis	8.92	1.56
g. Previous history of falls	9.33	1.37
h. Gait and balance	8.92	1.73
i. Loss in weight and height	7.42	2.78
j. Measurement of rib to pelvis distance	2.83	2.59
k. Measurement of occiput-to-wall distance (for kyphosis)	3.08	2.91
l. Assess fall risk using Get-Up-and-Go test	5.50	3.83

Other	Yes	No
	<i>n</i> (%)	<i>n</i> (%)
Standardized fracture risk tools or protocols used in institution	8 (0.67)	4 (0.33)
Familiar with Canadian Osteoporosis Guidelines	12 (1.00)	0 (0.00)
Canadian Osteoporosis Guidelines used in practice	11 (0.92)	1 (0.08)

^aPossible scores ranged from 0 (*not at all*) to 10 (*all of the time*).

Table 3

Content Area and Questions for Telephone Interview.

Content area	Questions
Current practice	What do you currently do to care for residents who have had a previous fracture What do you currently do to care for residents who have a diagnosis of osteoporosis? What do you currently do to care for residents who are being readmitted to LTC after having been sent to hospital for a fracture? How do you care for a resident if they have had a vertebral fracture post-fall? → Pain treatment plan?
Fall prevention	What do you think is the most important activity to do (or is supported by the strongest evidence) to reduce falls in LTC?
Challenges	What are some challenges to managing fractures to LTC residents? → To prevent fractures? → To care for after they've had a fracture? → To care for after they've been readmitted to LTC after having been sent to hospital for a fracture?
Suggestions for improvement	What would help improve the care you provide to residents related to managing fractures in LTC? → To prevent fractures? → To care for after they've had a fracture? → To care for after they've been readmitted to LTC after having been sent to hospital for a fracture?

Note. LTC = long-term care.

Table 4

NP Role in Managing Fractures in LTC.

Using a Holistic Approach

"I think the NP approach is more of a nursing focus, we tend to try and look at the whole picture and not just at the disease and what are we going to do about it. We try to look at the whole picture for the person. And because in this role or field, I've developed a rapport with all these different care personnel that we have no trouble working together." (NP 4)

"It's the whole um, story again, but knowing that, we can't fix that fracture. And it's going to take quite a while if it heals at all, it's going to take a while and the healing will probably be a tenuous type of healing so we really have to focus on the pain and not having the pain management mess up their bowels or their nutritional intake, that's a really fine line to find." (NP 6)

Managing Medications

"I've worked hard at convincing staff that vitamin D is very important. What's so funny that I find with the staff that you know, there's always this issue of the number of meds that people in long-term care get and of course they want the doctor to help them and treat them. So they'd stop calcium or vitamin D, they'd stop that over stopping some of the psychotropics and I'm always saying no, let's change this, we don't need that, we can cut the psychotropics ... It's you know, not just meds, its multi-factorial, you have to address all of them." (NP 1)

"I would say that at certain times, just the volume of medication and the competing comorbidities make it very difficult in terms of what medications to keep and what medications are going to go. So if you have somebody who has problem eating or struggling a bit then I think that's something as well. And I also, I also think there is also a component that isn't recognized with the idea that it may be a symptom of a decline in general overall health. Sometimes you see that with our dementia population there are lots of balance things that kind of signal things are changing within in them, and so they do have an increased risk with fracture [right] not necessarily just because of poor bone qualities but also because of ah, the comorbidities that they face." (NP 8)

Utilizing a Multidisciplinary Approach to Prevent Falls

"Well it's multidisciplinary that shows the strongest evidence right, so I think physio it's really hard, but I think the big one physio, Tai-chi, lots of strengthening. I will give you more though, footwear, they have poor feet, you know, they are stumbling adequate footwear because of foot pain. A lot of people ignore this, underestimate, they are the things that we walk on and if you don't have the proper footwear you have deformities and you've got ulcers and our feet enlarge as we age and so want to use their other shoes, so that attributes to it as well. Making sure they are on Vitamin D so that you improve the muscle strength and they've shown that as well. Pain control if they are in pain you know, they are more likely to fall, you know, so wide use of opioids then you don't have the Tylenol. Increase lighting so they don't fall there are so many things, that's why it's multidisciplinary, there's so many factors, muscle control. Keeping the physio in LTC is very important." (NP 10)

Caring for Residents Immediately After a Fall

"We typically get called into that in regards to frequent fallers. So we will get called and somebody has had a laceration and needs sutures to the head and then we also discover that they have had frequent falls and have had a fracture in the past so we get involved with individuals like that." (NP 3)

Caring for Residents Upon Readmission After Hospital Stay

"... and just their whole quality of life, their ability to be socially active etc, all of that is very important, so how do you do manage pain and still allow them to have a life to live with." (NP 11)

"We really look at what happened to cause that fracture [okay] and so we try to think of interventions around what happened that we can put in place to prevent it from happening again. And we usually do that in a multidisciplinary way in our falls, we call it our falls meeting [oh okay] so we have input from everyone on the team, and that's a very important aspect." (NP 7)

Managing Osteoporosis and Vertebral Fractures

"And then once we have an indication that they might be osteopenic or osteoporotic, we look at their medications and what they are on. Are they on a bisphosphonate and should they be, because there are reasons to not be on those also. Are they on calcium, although now there is a lot of controversy about how effectively calcium is absorbed and maybe at the maximum 500 milligrams a day should be given? We look at their dietary intake and of course Vitamin D, right now our standard is about 1000 international units. I know that there is controversy out there too, with some saying 2000 should be a standard dose. Right now our doctor, our main doctor is, looks for the 1000 international dosage. sometimes there is that sort of interaction or could be an order of some kind, blood pressure is a big thing, we watch blood pressures. I am finding more and more I'm taking people off blood pressure pills because you know what, you get on when you are 55, 65, even 75, you may not need when you are in this situation here when you are not worried about driving anywhere or have those normal stresses in your life. So blood pressure is a big thing that we look at ..." (NP 2)

"Well that's a big area that is often overlooked hip fractures are the obvious ones, but vertebral fractures because they lose their balance. So one you've got problems eating, you've got problems with their respiratory so they are prone to pneumonia because of the acute posture. You've got them off balance because the center of gravity has moved over so there's a higher risk for more falls and you've got the pain. Vertebral fractures are a big area but there is so much that can be done to prevent further and to reduce the pain." (NP 9)

Note. NPs = nurse practitioners. LTC = long-term care.

Table 5

NP Reported Barriers to Managing Fractures in LTC.

Unpredictable Nature of Falls

"It's the unpredictable ones, like this one lady who had low fall risk, she normally walks with a walker and had no issues, and then she just turns herself one way and trips herself and falls on the ground. I mean we couldn't predict that." (NP 4)

Lack of Individualized Care

"I think within the LTC outreach team that I belong to we try to put out this blanket approach and it really has to be individualized and you need somebody with that thinking ability to tweak it in the homes." (NP2)

Lack of Staff

"I think the problem with that is we have that information but we have trouble implementing it and even the most basic recommendations for falls prevention, it doesn't matter if they know what they are we can't implement them if we don't have the staff." (NP5)

"In terms of prevention, the families have to pay for things like hip protectors and sometimes there are cash concerns there too. So sometimes preventative measurements aren't done, even if it has been recommended in a therapy assessment and nurse practitioner assessment." (NP 1)

Lack of Resources and Diagnostic Delays

"I've worked emerg[ency] 25 years and I could put on a cast on wrists but in LTC I can't because I can't get the X-ray. Um, you know, like I'm certainly not going to do anything about a fractured hip in LTC but there are things that we probable could do but we can't just get timely interventions done for the people. And you know, it's all heartbreaking to have to send them to hang around in an emergency department for hours on end." (NP 3)

"More than likely it's going to be next day or even two or three days later which can make the difference. Um, and then the other problem we have is, even if we do get access to the imaging um, contact with the surgeons to discuss plan of care. Because a lot of time the residents would be able to be convalesced in the home and then you know, be transferred over for surgery the same day. But what keeps happening is if we try to contact the surgeon they will just default automatically to say send them to the ER and then we'll work from there. So even if they've had an x-ray done that seems to be their default. So if we had great connections to our surgical staff I think that would be beneficial." (NP 8)

Lack of Education for Families

"Sometimes families just don't get it, they [staff] are trying not to go to restraints, at least minimal restraint, and families want them restrained and it's just an ongoing battle. They think being restrained is going to create no fractures but in essence it agitates the patient more and they take their belt off and they get up and go. And they can't get up and go because they have been sitting for too long and they don't have the muscles that they used to and they tend to fall more when we have made them sit too long. Yeah, so they kind of don't get that, so there's a lot of teaching and reassuring on the nursing staff part to the families to figure out preventing falls." (NP 8)

Note. NPs = nurse practitioners. LTC = long-term care.