
Can We Improve Medical Care for Nursing-home Patients?

The provision of adequate and appropriate care to nursing-home patients is becoming increasingly challenging. This article reviews some of the challenges, as well as possible solutions such as nurse-practitioner and alternative physician models of care delivery

By Janet Gordon, MD, FRCPC

Nursing-home medicine today faces daunting challenges. Patients have complex, active medical illnesses, including dementia with behavioral problems. Nursing-home staffing, both in terms of numbers and level of training, has not increased in keeping with the increased care needs of these patients. It is becoming increasingly difficult to find physicians willing to work in nursing homes, and those who are willing often have inadequate time to provide the level of care needed to fully address all the medical issues. Patients are prescribed numerous medications, often with adverse effects. Hospitalization is common, sometimes detrimental, but often the only available response to acute illness. In response to these challenges, new systems have been developed to attempt to meet care-

gaps and deliver more timely and appropriate care.

Appropriate Provision of Care

For the majority of patients in nursing homes with advanced chronic disease and a short life-expectancy, a palliative approach to medical care is appropriate. Patients with severe dementia have a poor prognosis, even with aggressive treatment. One study reported a 50% six-month mortality rate for patients with severe dementia hospitalized with pneumonia.¹ Another showed no evidence that investigating and treating patients with fever and severe dementia actually decreased mortality.² However, there are many barriers to the adoption of a palliative-care approach in nursing homes. The patient's prognosis is often not recognized by the family, physician or staff. One American study reported that, among patients with advanced dementia who died within one year of

admission to a nursing home, only 1.1% were perceived by their physician to have a life-expectancy of less than six months, although 71% actually died within six months. Compared to a group of patients with cancer who died within one year of admission, these patients with dementia were over twice as likely to be investigated with laboratory tests and receive tube feedings, 88% less likely to have a do-not-resuscitate (DNR) order, and 67% less likely to have a do-not-hospitalize order.³

Hospitalization can be detrimental to nursing-home residents for many reasons. For those with dementia and/or delirium, being transferred to an unfamiliar environment can be disorienting and frightening. The emergency-room staff assesses a patient for whom they have little baseline knowledge and, thus, often has a difficult time determining if there has been a change in mental status or in the physical findings. The hospital

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nursing staff has little knowledge of the specific care routines for feeding, toileting, sleep and behavior management that have been most effective for the patient. Furthermore, iatrogenic illness is common. One study found an aver-

age of 3.1 medications were changed on admission to hospital and 1.4 on transfer back to the nursing home. Twenty percent of transfers led to an adverse drug event due to a medication change.⁴ The number of hospitalizations varies greatly between local nursing homes and between countries. A study in New Brunswick reported that over one year, there were 60 emergency-room visits and 25 admissions per 100 nursing-home beds. Of note, between the nine nursing-homes studied, annual emergency-room visits ranged between six and 114 per year, per 100 beds.⁵ A study comparing American and Dutch nursing homes' rates of transfer to hospital for pneumonia showed rates of 28.5% and 0.9%, respectively, for patients with mild-to-moderate dementia and 22.1% and 0.3%, for patients with severe dementia.⁶

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If hospitalization is to be reduced, two objectives must be

achieved: advance directives must be established and resources must be provided to enable delivery of appropriate care on-site. An Ontario study randomized matched nursing homes to either the implementation of a detailed advance directive called "Let Me Decide," or to usual care. There was a broad education program involving patients, families, and nursing-home and hospital staff. Although nursing homes had been selected with the criteria of having advance directives for less than 25% of residents, by the end of the study, 57% of patients in control homes and 70% of patients in intervention homes had established an advance directive. However, in the control homes, 70% of the advance directives simply stated DNR. In the intervention homes, 89% of the advance directives were the detailed "Let Me Decide" advance directive. There were 0.48 mean hospitalizations among the control patients vs. 0.27 among the patients in the intervention homes. Cost saving was estimated to be \$1,749 per patient and there was no difference in patients' and families' satisfaction

or in mortality. Of note, the hospitalization rate in the intervention homes among patients with and without an advance directive was not different, suggesting that the decrease in hospitalization may have been due to the education process itself, rather than to the completion of an advance directive for the individual patient.⁷

Nurse Practitioners

In the United States, where Health Maintenance Organizations (HMOs) can be responsible for all of the costs for a group of nursing-home patients (including nursing-home care, emergency-room visits and hospitalization), the financial incentives are present to develop cost-effective systems of on-site care provision. One of the goals of the nurse practitioner positions has been to reduce hospitalizations.

In the "Evercare" program, nurse-practitioners provide care for an average of 90 patients in two homes, where they deliver direct patient care, communicate with staff and families and provide staff education.⁸ The program also provides an extra payment to the nursing home for every day a resident is acutely ill (intensive-service day). With closer follow-up of patients to prevent or detect illnesses earlier, and by having extra resources to care for acutely ill patients on-site, it was hoped that hospitalizations could be reduced.

The research did show that compared to non-randomized control groups (one within the same nursing home and one comprised of patients from different nursing homes), the number of emergency-room visits was reduced in the “Evercare” patients (6.3 and 7.3 vs. 3.3, respectively, per 100 patients per month), as was the number of hospital admissions (4.6 and 4.7 vs. 2.4). The average number of intensive-service days was 2.4 per “Evercare” patient. When hospital and intensive service days were added together, the total admissions were similar (4.6 and 4.7 vs. 4.8). Thus it appears that the nurse-practitioners in this study did not prevent acute illness, but rather enabled the patient to remain in the nursing home to be treated. Cost savings were estimated at over \$90,000 per nurse practitioner.⁹ Of note, there was no difference in the numbers of patients with advance directives, although it is possible that this issue was discussed informally.^{8,10} It is difficult to measure quality of care, but a survey showed no difference in the families’ opinions that patients were hospitalized if needed.⁸

A similar study of geriatric nurse-practitioners, each of whom cared for 100 to 130 patients, showed a decrease in emergency-room transfers, a decrease in length of hospital stay, and a cost savings that offset the nurse’s

salary.¹¹ Another model provided a one-year training program for RNs working in nursing homes. It was not a Master’s level program and some nurses did not have a Bachelor’s degree. The results of this study were more modest, and showed a decrease in hospital admissions for patients recently admitted to nursing-homes, but not for long-stay patients.¹² Another study, involving one adult and two family nurse practi-

tioners who worked with 25 MDs and rotated between nursing-homes quarterly, showed no difference in emergency-room transfers, hospitalizations or length of stay.¹³ The lack of continuity of care was hypothesized to be one explanation for the negative results of this study.

The potential benefits of nurse-practitioners extend beyond reductions in hospitalization. Patients are seen in a more timely fashion. Families are more satisfied that the patients are seen often enough, that medical problems are explained to them and that one person is in charge.⁸ However, measurements of function did not show a difference in these studies.^{12,14} Quality of life, the most

important outcome, is difficult to measure.

Physician Models

There are fewer studies of alternative physician models of care, even though present models are inadequate. In many nursing homes, there are several attending physicians providing care for patients. These physicians may attend in a number of different nursing-homes. They often have

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limited time scheduled for regular rounds, and leaving a busy office practice to respond to an acutely ill nursing-home patient is difficult. One American study reported that less than 30% of patients with an infection were examined by a physician prior to transfer to hospital, and there was an average delay of five hours for a phone response from the physician.¹⁵

One study examined a closed staffing system, where only a limited number of physicians provided care in the home, and reported more available cross-coverage for emergency care, faster response to emergencies and more participation in team meetings.¹⁶ There are American academic nursing-home models that have been

reported to improve care. One team included a rotating medical student, a medical resident and a student nurse-practitioner supervised by a geriatrician who rounded weekly. Compared retrospectively to usual care, there were more discharges and fewer medications prescribed.¹⁷ In a Veterans' facility, a geriatrician and longitudinal internal medicine housestaff replaced two full-time non-academic physicians. A geriatric nurse practitioner cared for 30 patients. This resulted in decreased hospital transfers, increased function, increased patient satisfaction, and a trend for fewer deaths. There were also decreased nursing sick days, perhaps as a result of increased job satisfaction. The cost of decreased hospital bed days approximated the nurse practitioner's salary.¹⁸ In the successful "Evercare" model of nurse practitioners, doctors were paid for urgent visits and there was also funding to enable physicians to attend family meetings and case conferences.⁹ In the nurse-practitioner models described earlier, the number of physician visits did not decrease. In other words, nurse practitioners complement, but do not replace, the care provided by physicians.^{9,10} One study examined three different nurse practitioner/MD models of care. It reported that the one successful at decreasing patient transfers to hospital was one in

which four nurse practitioners worked in teams with four physicians who worked in nursing homes, hospice and home care full-time.¹⁰

In the Netherlands, nursing-home medicine is a recognized specialty, requiring two years of training. The specialty was developed with the belief that patients would benefit from the presence of a full-time physician with time and expertise to review medical problems on an ongoing as well as emergency basis, to review medications, and to meet with families and other team members. There are now approximately 1,000 such physicians in Holland, each caring for an average of 100 nursing-home patients. They provide care for long-stay patients, palliative-care patients, and patients on rehabilitation units and in a day hospital. Unfortunately, there are no published clinical trials to evaluate the benefits of this model of care.¹⁹

Polypharmacy

The nursing home has been called "one of the most complex and challenging pharmacotherapeutic settings in all of medicine."²⁰ In Nova Scotia, nursing-home patients comprise 5% of the population covered by the provincial Pharmacare drug plan. Their average drug costs are almost twice that of community-dwelling seniors, and they are prescribed

almost three times as many medications. Of course, nursing-home patients do have multiple medical problems that could justify a large number of medications. Even if preventing death from congestive heart failure is not a goal, using medications to reduce dyspnea may be. There is evidence that pain, depression and osteoporosis are under-treated.²⁰ On the other hand, with weight loss and advancing dementia, the use of antihypertensives can often be decreased. The same is true for oral hypoglycemics, particularly as there is no evidence to support tight glycemic control in this population, and hypoglycemia is a real risk. For most medications, the risk:benefit ratio has never been evaluated in nursing-home patients, but is most certainly elevated. One study reported 67.4% of nursing-home patients experienced an average of two adverse drug reactions per year.²¹ It has been estimated that for every dollar spent on medications in nursing homes, \$1.33 is spent on adverse drug reactions.²²

Inappropriate prescribing is common. Using a consensus panel's definition of inappropriate medications, a prevalence of 40% was found in an American study.²³ In a Canadian study, the consensus of a family doctor, geriatrician and pharmacist was that 18% of patients were taking inappropriate medications.²⁴ There was an

encouraging Canadian study reporting that, although there was an increase in the number of medications after admission to a nursing home, the appropriateness of medications increased. Nevertheless, 20% of patients remained on inappropriate medications.²⁵ Patients prescribed potentially inappropriate medications have an increased risk of hospitalization and death.²⁶ It has been estimated that about half of adverse drug events are preventable.²¹ Common errors include dosing too high and not adjusting for impaired renal function.

There is no evidence yet that the presence of nurse practitioners decreases inappropriate medication use, but neither has there been a well-designed study from which to draw definite conclusions.^{12,14} There is evidence that one academic nursing home model reduced polypharmacy.¹⁷ A German study that compared office vs. nursing-home-based physicians' prescribing, reported fewer prescriptions and lower cost for the latter group, but no evidence for more appropriate prescribing.²⁷ Certification of extra training in geriatric medicine showed a trend for more appropriate prescribing in one study, but numbers were small.²⁸ Drug reviews by pharmacists are mandated in American nursing homes, but not Canadian ones. Although there is a potential conflict of interest with pharmacists who are

employees of the dispensing pharmacy, there is some evidence of benefit for such reviews. In one study, drug use decreased by half when the services of a consultant clinical pharmacist were instituted.²⁹ In an academic Veterans' facility, pharmacists' recommendations reduced drug costs.³⁰

Conclusion

Patients in nursing homes are among the frailest, most complex patients in medicine. The common Canadian model of care provided by a fee-for-service office-based family physician, with no extra training in geriatric medicine, is suboptimal and is not sustainable. This group of patients

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needs management by a team and communication between team members, but most physicians spend little time on-site working with the team, and are usually not even reimbursed for team meetings. Decisions about goals of care and advance directives are critical, but there is little opportunity for family and physicians to meet. Regular medication reviews are essential, but there is little time and no financial reimbursement for physicians. Although assessment in an emergency room

and treatment in hospital is sometimes necessary, this increasingly ill group of patients is sent there too often simply because there is no other means of accessing urgent medical care. These problems make recruitment of new physicians to nursing-home medicine difficult, which increases the magnitude of the problem.

The studies reviewed in this paper have limitations. Most are not randomized and few have been studied in the Canadian system. However, some preliminary solutions can be proposed. The nurse-practitioner model seems particularly appealing. These professionals have the skills to educate staff, meet with families and

work with the physician to manage ongoing chronic and acute medical and behavioral problems. Although there is little extra money in the healthcare system to provide funding for these positions, there is evidence that the money saved from decreased hospitalizations can compensate for the nurse practitioners' salaries. There are several barriers to be overcome before such a model could be widely implemented. It is essential that the nurses hired for these positions have the necessary skills to

be able to independently diagnose common medical illnesses, such as pneumonia and CHF, in a group in whom dementia, atypical illness presentation, multiple medical comorbidities and chronic chest findings make diagnosis challenging. They must have the confidence and skills to convince the attending physician, staff nurses and family that a patient, who would traditionally be managed in hospital, can be managed on-site. Physicians need a system that would enable them to be paid for the time they spend in discussions with the nurse practitioner, and not just for actual patient encounters. In contrast to the published studies, many

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Canadian nursing homes do not have access to mobile x-ray machines. It is also not clear where acutely ill patients should receive care (*i.e.* in their usual room or in

another specific area of the nursing home). Extra nursing resources would be needed. The biggest barrier would be how to transfer savings from the acute-care system to the nursing home system. Currently in the Canadian system, the nursing home financially benefits from a patient transfer to acute-care, as it does not absorb the acute-care costs, but rather continues to be paid for the bed for a period of time.

Although there are fewer studies of alternative physician models, there is some evidence to support the benefit of an increased physician presence. Most successful nurse-practitioner models were a collabo-

orative nurse-physician team. This will only be possible with an alternative to the fee-for-service model. A full-time physician presence would make it feasible for manage-

ment of chronic illnesses to be optimized, for communication with other staff and families to be improved, and for acutely ill patients to be seen urgently and regularly. Although specific studies have not been done, additional training in geriatric medicine seems critical to provide care for this frail, complex patient population.

Addressing the complex issue of polypharmacy may best be done by a pharmacist working together with the nurse practitioner and physician. Many contracting pharmacies do provide the services of a pharmacist, but having the physician and nurse practitioner on-site would increase communication and should increase the appropriateness of, and compliance with, the pharmacist's suggestions.

As the population ages, the needs of patients in long-term care will only increase, as will the inadequacies of our present system. These frail, complex patients require a highly skilled, integrated, accessible and flexible system of care, and we must begin to develop this system now.

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