

## Examining Do-Not-Resuscitate Orders Among Newly Admitted Residents of Long-term Care Facilities

Peter Brink

Department of Health Sciences, Lakehead University, Thunder Bay, Ontario, Canada.

**ABSTRACT:** Do-not-resuscitate (DNR) orders are an important part of advance directives. To date, little is known about DNR orders in Ontario's long-term care (LTC) facilities. The Canadian Institute for Health Information (CIHI) stated that in between 2011 and 2012, there were more than 32,000 discharges from Ontario's LTC facilities, 44% of which resulted from death. This study examined DNR orders in LTC homes in Ontario. The sample includes all LTC residents receiving care between 2010 and 2012. Data provided by the CIHI were collected using the Canadian version of the Resident Assessment Instrument. The data included administrative assessments on health of 112,746 residents. The average age of LTC residents in this study was 84.5 years, and about 70% were female residents. Results showed that residents admitted from home were less likely to have a DNR order on file during assessment and three months later. Residents whose families were responsible for care were more likely to have DNR orders when admitted, but this effect was not found at three-month follow-up. Residents who were in end-stage diseases were more likely to have completed DNR orders upon admission to LTC facilities. The presence of a health condition (eg frailty, depression, heart condition, pulmonary or psychiatric condition) increased the likelihood of residents having DNR orders when admitted to LTC facilities. Residents whose conditions were deteriorating were more likely to have completed DNR orders before the three-month follow-up. In conclusion, this study represents an important step in identifying issues related to DNR orders in LTC facilities. The factors that influence whether residents have DNR orders on file upon admission depend on the presence of family members, whether the residents are designated as end-of-life cases (six months or less), older age, and health. Discussions about resuscitation are an important part of care plans.

**KEYWORDS:** long-term care, end-of-life, advanced directives, care planning

**CITATION:** Brink. Examining Do-Not-Resuscitate Orders Among Newly Admitted Residents of Long-term Care Facilities. *Palliative Care: Research and Treatment* 2014;8 1–6 doi:10.4137/PCRT.S13042.

**RECEIVED:** August 20, 2013. **RESUBMITTED:** November 21, 2013. **ACCEPTED FOR PUBLICATION:** November 25, 2013.

**ACADEMIC EDITOR:** Alan Nixon, Associate Editor

**TYPE:** Original Research

**FUNDING:** Funding for this project was provided by the Canadian Institute of Health Research.

**COMPETING INTERESTS:** Author discloses no potential conflicts of interest.

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**CORRESPONDENCE:** [peter.brink@lakeheadu.ca](mailto:peter.brink@lakeheadu.ca)

### Introduction

People are increasingly looking at long-term care (LTC) facilities as places to live out the rest of their lives. This trend is consistent with the strategy put forth by the Ontario government, the Aging at Home Strategy. It emphasizes the importance of advance directives among residents of LTC facilities. Do-not-resuscitate (DNR) orders are part of those advance directives and help residents to maintain their autonomy once their decision-making capacity has been lost or compromised. It is reasonable to examine the use and role of advance directives in LTC facilities because many LTC residents struggle with terminal illness or end-of-life issues.<sup>1</sup> DNR orders in

LTC have largely been ignored. The purpose of this study is to examine DNR orders in LTC using administrative census-level data.

The probability of residents in LTC facilities experiencing serious illness or complex chronic disease is high.<sup>2</sup> Between 2009 and 2010, Ontario had approximately 89,035 approved beds in LTC operating facilities. During this time, a total of 123,219 residents were under care, indicating that on average, 16.2% of all LTC residents die each year<sup>2</sup> and that deaths in LTC facilities accounted for 52% of all discharges ( $n = 38,346$ ).<sup>2</sup> The Canadian Institute for Health Information<sup>3</sup> stated that in between 2011 and 2012, there were more than



32,000 discharges from Ontario LTC facilities, 44% of which resulted from death.

To date, little is known about DNR orders in LTC facilities. Even information regarding the prevalence of DNR orders remains unknown. Studies from the United States have shown that physicians are reluctant to ask residents questions about their personal preferences or issues.<sup>4,5</sup> Although surveys have indicated an overall willingness among staff members to talk about advance care directives, they often remain reluctant to engage in meaningful conversation.<sup>6</sup> Research from the United States has suggested that the proportion of residents who have DNR orders on file range from 36%<sup>7</sup> to as high as 71%.<sup>8</sup>

The Canadian health care system is not comparable to that south of the border. For example, DNR policies do exist in Ontario's LTC facilities.<sup>9</sup> These policies state that residents should be consulted and their wishes followed, and that all information must be documented in health records. They also state that residents who are not mentally capable should have substitute or designated decision makers, which is in accordance with the Health Care Consent Act.<sup>10</sup> However, substitute decision makers cannot execute advance care directives on behalf of incapable residents; what they can provide is consent or refusal of consent to treatment.

This study examined the prevalence of DNR orders among residents who were admitted to LTC facilities in Ontario between April 1, 2010 and March 31, 2012. This study was the first of its kind in Ontario. Beginning in 2010, all LTC facilities were mandated to report information on health from all residents receiving care. From then on, census-level data have been collected and held by the CIHI.<sup>11</sup>

## Methods

**Data.** The census-level data comprised information on the health of residents from all LTC facilities in Ontario from April 1, 2010, to March 31, 2012. For the purposes of this study, cross-sectional analyses were based on the residents' initial assessments once admitted to LTC facilities. Information on health is collected upon admission to LTC facilities and on a quarterly basis thereafter. Residents whose status was comatose or were below the age of 65 were not included in the analyses. Analyses focused only on new admissions to LTC facilities. IRB approval was obtained for this study.

**Instrument.** The Resident Assessment Instrument Minimum Data Set (RAI MDS 2.0) is a comprehensive, standardized assessment instrument of more than 400 items. A full assessment of residents is required within 14 days of admission to LTC facilities, annually, and after any significant change in resident status. A shorter version is completed for each resident once during each fiscal quarter. The RAI MDS 2.0 measures the presence or absence (1 or 0, respectively) of DNR orders. RAI coordinators at Ontario's LTC facilities invite residents to express their personal wishes about advance directives once all the information necessary to

make the appropriate decisions has been communicated. Any expressed wishes must be documented.

Evidence in the literature has supported the reliability and validity of many of the items on the RAI MDS 2.0.<sup>12-17</sup> Domains include psychological, physical, social, and spiritual well-being.<sup>16,17</sup> The RAI MDS 2.0 assesses levels of cognition (cognitive performance scale (CPS)),<sup>15</sup> activities of daily living (activities of daily living-hierarchy scale),<sup>18</sup> depression (MDS-depression rating scale (DRS)),<sup>12</sup> and pain (pain scale).<sup>13</sup>

## Analyses

First, descriptive statistics is presented. Second, bivariate statistics examining the relationship between each independent variable and the dependent variable (DNR) is examined. The list of variables used in the analysis is presented in Table 1. Each set of statistics was examined with the appropriate chi-square or *t*-test statistics. The first set of analyses examined the factors associated with having DNR orders among new admissions. The second set of analyses examined the predictors of having DNR orders among newly admitted residents who did not previously have DNR orders in place. The multivariate analytic method employed two separate logistic regressions to model DNR orders among new LTC residents.

Logistic regression is a technique used to predict a discrete outcome, such as the presence or absence of DNR orders by one or more variables that are categorical, continuous, or a mix. The difference between logistic regression and other non-parametric techniques (ie multiple regression) is that many of the conventional assumptions are relaxed. For example, independent variables do not require equal variance within each group, to be normally distributed or linearly related. However, appropriate cell sizes are necessary to achieve meaningful confidence intervals. The second set of analyses examines predictors of DNR orders three months after admission among residents newly admitted to LTC facilities.

Models were developed using the reverse selection procedure. Control variables (ie prior residence, age, marital status, and sex) were entered into the model first. All variables that were significantly associated with the dependent variable were then entered into the logistic regression. One variable was removed at each step; the removed variable was identified as the least significant. This procedure was repeated until only significant variables and control variables were left in the model. The rationale for this process was to develop a succinct model of variables associated with the dependent variable.

New variables were calculated to examine new DNR orders in three months. These variables included changes in Activities of Daily Living (ADL) score, changes in cognition (CPS), and changes in frailty (chess scale). This calculation was done by deducting the variable at Time 1 from the variable at Time 2 (three months later) so that a negative number reflected a decline in condition and a positive number reflected an improvement in condition.

**Table 1.** Variables used in analyses.

Age
<b>Sex</b>
Male
Female
<b>Marital status</b>
Never married
Married
Widowed
Divorced/separated/unknown
<b>Estimated length of stay</b>
Within 30 days (yes or no)
<b>Prior residence</b>
Home
In-patient acute care
Other (residential care, complex care, other institutional)
Family responsible for care
Resident responsible for care
<b>Cardiovascular comorbidities</b>
Arteriosclerotic heart disease
Congestive heart failure
Hypertension
Stroke
Other cardiac problems
<b>Noncardiovascular comorbidities</b>
Allergies
Anemia
Arthritis
Diabetes
Hypothyroidism
Recent urinary tract infection
<b>Pulmonary comorbidities</b>
Asthma
Emphysema
Pneumonia
Respiratory infection
<b>Psychiatric diagnosis</b>
Anxiety disorder
Depression
Bipolar
<b>ADL (long scale)</b>
Cognition (CPS)
Frailty (chess scale)

**Table 2.** Descriptive statistics of sample.

VARIABLE	M	95% CI	
Age (all)	84.5	84.5–84.5	
New admissions	83.8	83.8–83.9	
Other	84.9	84.9–85.0	
Men	82.5	82.4–82.6	
Women	85.4	85.3–85.4	
VARIABLE	%	n	N
DNR order complete	70.5	79,531	112,731
<b>Sex</b>			
Female	69.8	78,678	112,746
Male	30.2	34,068	112,746
<b>Marital status</b>			
Never married	6.7	7,542	112,511
Married	26.5	29,847	112,511
Widowed	58.4	65,672	112,511
Other	8.4	9,450	112,511
<b>Entry service type</b>			
Acute inpatient care	34.0	38,291	112,746
Home and home care	33.0	38,378	112,746
Other (institutional)	32.0	36,077	112,746
<b>Assessment type</b>			
New assessment	39.4	44,408	112,746
Full assessment	20.6	23,199	112,746
Quarterly assessment	32.7	36,871	112,746
Other	7.3	8,268	112,746

resulted from quarterly assessments. Just over 65% ( $n = 78,678$ ) of newly admitted residents were women, with the majority either being widowed (55%,  $n = 65,672$ ) or married (31%,  $n = 29,847$ ). The average age at assessment for residents sampled (65+) was 83.8 years. Many of the residents were admitted from home or home care (35%) or from inpatient acute care (34%).

**Bivariate associations.** Demographic variables were examined in relation to the independent variables of interest to the presence of DNR orders. A proportionally similar number of female residents (59.3%) compared to male residents (57.1%) had DNR orders in place. An examination of marital status shows that 62% of widowed residents had DNR orders in place when admitted to LTC facilities,  $F(df = 3, n = 44,394) = 383.86, P < 0.001$ . Differences were also found when examining where residents were admitted from. As an example, residents admitted from inpatient acute care were the least likely to have DNR orders in place (54.4%), whereas residents admitted from other facilities (eg rehabilitation facility, continuing care, or residential care) were the most likely to have DNR orders in place (64.1%). Approximately 58% of residents admitted from home, including those who received home care, had DNR

## Results

The data included assessments of 112,746 residents (see Table 2), of those assessed, 39% ( $n = 44,408$ ) were new admissions to LTC facilities, 20% ( $n = 23,199$ ) of residents were full assessments, and 32% ( $n = 36,871$ ) of resident assessments

**Table 3.** Factors associated with having completed DNR orders when admitted to LTC facilities.

VARIABLE	UPON ADMISSION			THREE-MONTH FOLLOW-UP		
	OR 95% CI			OR 95% CI		
Admitted from						
Acute inpatient care	–			–		
Home/home care	0.805*	0.761	0.851	0.844*	0.757	0.940
Other care facility	1.119*	1.055	1.186	1.000	0.889	1.124
Age	1.044*	1.040	1.048	1.041*	1.034	1.048
Marital status						
Never married	–			–		
Married	1.030	0.924	1.148	1.080	0.877	1.330
Widowed	1.086	0.977	1.208	0.976	0.795	1.198
Other	0.820*	0.723	0.929	0.775*	0.607	0.990
Male	1.061*	1.007	1.119	0.954	0.862	1.056
Family responsible	1.645*	1.552	1.744	0.899	0.806	1.002
Resident responsible	1.015	0.958	1.076			
End-stage disease	2.995*	2.060	4.354			
ADL change				1.025*	1.015	1.035
CPS change				1.145*	1.084	1.210
Frailty (chess)	1.079*	1.053	1.106			
Cognition (CPS)	1.069*	1.052	1.087			
Depressive symptoms (DRS)	1.025*	1.014	1.036			
Heart condition	1.038*	1.013	1.064			
Other disease condition	1.093*	1.068	1.118			
Pulmonary condition	1.083*	1.029	1.140			
Psychiatric condition	1.090*	1.044	1.139			

\*Significant at the 0.05 level.

orders in place upon admission. Residents who had DNR orders in place upon admission were more likely to be older ( $M = 84.95$ ) than residents who did not have DNR orders in place ( $M = 82.21$ ).

**Multivariate analysis.** Control variables (prior residence, age, marital status, and sex) were entered into a logistic regression. Independent variables were entered using a stepwise method. An examination of the control variables showed that sex of the resident was not related to DNR orders being in place (see Table 3). Results showed that residents admitted from home were less likely to have completed DNR orders, whereas residents admitted from residential, continuing, or rehabilitative facilities were more likely to have DNR orders on file. Completion of DNR orders also was related to older age. DNR orders were associated with an estimated prognosis of six months or less and higher levels of frailty (chess scores), cognitive impairment (CPS), and depression (DRS). Diagnoses related to a greater likelihood of DNR orders included heart and circulatory diseases, noncardiovascular diseases, psychiatric diagnoses, and pulmonary diseases. Responsibility for the residents' well-being also was a contributing factor: having family members responsible for decision making

greatly increased the likelihood of having DNR orders in place.

**Predictors of new DNR orders.** The second set of analyses examined predictors of new DNR orders among newly admitted LTC residents. The analyses focused on LTC residents who did not have DNR orders upon admission. The dependent variable was the presence or absence of DNR orders three months after admission to LTC facilities, as well as at the three-month follow-up.

The independent variables were entered into the logistic regression. The place of residence showed that residents admitted from home were less likely to have new DNR orders on file at follow-up, as were older residents and residents who were married. Health conditions were not associated with new DNR orders among newly admitted residents. Change in condition in ADL status and cognitive performance, where higher numbers indicated a worsening of a condition, were predictors of DNR orders three months later. Residents who arrived in care without DNR orders on file and whose ADL and levels of cognition were deteriorating were more likely to complete DNR orders three months later.



## Discussion

The study examined DNR orders among residents newly admitted to LTC facilities in Ontario. LTC facilities are increasingly becoming places where people live out their lives. Aging in place remains an important part of health care in Canada, and transfers to acute care or hospital care are not always in the best interests of the residents of LTC facilities. The need for autonomy and self-determination is important to LTC facilities and residents alike.

This study showed that approximately 70% of all LTC facilities' residents have DNR orders on file, compared to less than 60% of all newly admitted residents. This study examined the predictors of new DNR orders three months after admission to LTC facilities.

Residents admitted to LTC facilities who designated a significant other(s) or immediate family member(s) to be responsible for his or her care were more likely to have DNR orders on file. Prior places of residence (eg home, acute inpatient care, or other institutional care) can play a significant role in whether DNR orders are in place at the time of admission and three months later. For example, in this study, at the time of admission, residents from home were less likely to have DNR orders on file, whereas residents who were admitted from other health care facilities were more likely to have them in place. Results showed that only 54% of residents admitted from home had completed DNR orders, compared to 58% of acute in-patient care admissions and 64% of other institutional admissions. At the three-month follow-up, only residents admitted from home were less likely to have completed DNR orders.

Age played a role in the completion of DNR orders. Similar to a study by Suri et al,<sup>19</sup> residents who were older were more likely to have completed DNR orders. Although difficult to explain fully, age likely was related to health and physical condition. Male residents were far less likely to have completed a DNR order. Residents who suffered high levels of functional impairment, cognitive impairment, or frailty were also more likely to have completed DNR orders when admitted to LTC facilities. This was true for residents newly admitted and those who were still in LTC facilities at the 3-month follow-up and whose condition was deteriorating. An examination of marital status showed that at the time of admission, residents who were separated or divorced were less likely to have DNR orders on file. This effect remained at the three-month follow-up.

## Limitations

DNR orders might not have been recorded in every instance. For example, resuscitation was not initiated if the residents' wishes against resuscitation were known to staff members or through any form of advance care plans or plans of treatment. Staff members were instructed to follow the residents' wishes, whether they are oral or other means of communication. Therefore, the MDS documentation might not have

represented the true number of DNR orders followed in LTC facilities.

## Conclusion

A large number of LTC residents have DNR orders on file, and there are a number of factors related to, or predictive of, completion of DNR orders among those who arrive at LTC facilities without them. Clearly, some work remains to increase the number of DNR orders on file, especially among residents who are older, are in a state of functional or cognitive decline, or have been admitted from home.

This study is important to the current literature because it is the first to examine DNR orders among LTC residents in Canada using administrative data. It is distinctive because it used a comprehensive instrument to examine multiple domains. An important next step will be to examine compliance rates with DNR orders in LTC facilities. The findings show that 70% of LTC residents in Ontario have recorded DNR orders and that future research needs to examine rates of compliance.

## Author Contributions

Conceived and designed the study: PB. Analyzed the data: PB. Wrote the first draft of the manuscript: PB. Made critical revisions: PB. The author reviewed and approved of the final manuscript.

## DISCLOSURES AND ETHICS

As a requirement of publication the author has provided signed confirmation of compliance with ethical and legal obligations including but not limited to compliance with ICMJE authorship and competing interests guidelines, that the article is neither under consideration for publication nor published elsewhere, of their compliance with legal and ethical guidelines concerning human and animal research participants (if applicable), and that permission has been obtained for reproduction of any copyrighted material. This article was subject to blind, independent, expert peer review. The reviewers reported no competing interests.

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