Quality of telephone nursing services for adults with cancer and related non-emergent visits to the emergency department

by Dawn Stacey, Lynne Jolicoeur, Katelyn Balchin, Kate Duke, Claire Ludwig, Meg Carley, Lindsay Jibb, Craig Kuziemsky, Suzanne Madore, Lisa Rambout, Jackie Romanick, Michael M. Vickers, Lorraine Martelli

ABSTRACT
A quality improvement project was conducted to determine the quality of telephone nursing for patients with cancer symptoms. Eligible patients were ones who telephoned the nurse about cancer symptom(s) within four weeks prior to an emergency department (ED) visit not requiring hospital admission. Experienced oncology nurses extracting data indicated appropriateness of ED visits and opportunities for improvement. The Symptom Management Analysis Tool was used to analyze nurse documentation. For 77 patients, 87% ED visits occurred within four days of calls about symptoms (e.g., pain, breathlessness, constipation, diarrhea, nausea/vomiting) and 91% could have been managed by more complete telephone assessment and/or an urgent clinic visit. Quality of nurse documentation revealed few patients were assessed adequately (38%), received any symptom-specific medication review (49%), or were guided in self-care strategies (17%). There was low-quality telephone symptom management by nurses and a need for alternative options for patients requiring urgent face-to-face assessments. Our findings highlight a gap in use of guidelines for informing telephone symptom management.

INTRODUCTION
Oncology nurses are typically the first line of access to guide patients receiving cancer treatments to safely manage symptoms at home and to appropriately triage more severe symptoms (Stacey, Green, Ballantyne, Skrutzkowski, et al., 2016). In fact, most oncology patients receive cancer treatments on an outpatient basis and manage their treatment side effects while at home. Such side effects and resulting symptoms pose an important safety issue, as they can quickly escalate, thereby leading to delays in treatment, and may possibly become life threatening (Cancer Quality Council of Ontario, 2016; Kondo et al., 2015; Livingston et al., 2011; Vandyk et al., 2012). The cancer symptom most associated with mortality is febrile neutropenia (Vandyk et al., 2012).

Effective symptom management improves patient outcomes with less physical distress, reduced emotional distress, and better quality of life (Hoffman, 2013; Johnston et al., 2009). However, symptoms from cancer treatment often result in unplanned emergency department (ED) visits that are unlikely to require hospitalization (Flannery et al., 2013; Livingston et al., 2011; Reid & Porter, 2011; Vandyk et al., 2012).

Only 58% of all ED visits for cancer symptoms resulted in hospital admissions in 16 studies (Vandyk et al., 2012). The most likely symptom requiring hospital admission in 94% of patients was febrile neutropenia. Common cancer-related symptoms in ED visits in multi-symptom studies, in order of frequency, were pain, respiratory concerns, fever/infection, anuria/dysuria, altered nutritional status, neurologic changes, fatigue, bleeding, and gastrointestinal symptoms. Given 42% of the ED visits (n = 15,503) did not require hospitalization, a significant number of immunocompromised patients were
put at risk of developing hospital-acquired communicable diseases. It is critical to explore the processes of ensuring oncology patients are appropriately using the ED.

Most Canadian ambulatory oncology programs provide patients with telephone-based nursing services (Macartney et al., 2012; Stacey et al., 2007). Patients are encouraged to call if they are experiencing symptoms. However, little is known about the influence of nursing telephone-based symptom management on ED visits (Flannery et al., 2013; Vandyk et al., 2012).

**OBJECTIVE**

To measure the quality of telephone-based nursing symptom management and impact on non-emergent ED visits. Specific objectives were: a) to determine the quality of telephone symptom support provided by nurses for patients with cancer receiving treatment(s); and b) to explore the non-emergent ED visits occurring after nursing telephone services.

**METHODS**

We conducted a quality improvement project using an integrated knowledge translation approach (Abdullah & Stacey, 2014; Bowen & Graham, 2013; Canadian Institutes of Health Research, 2012). This approach included knowledge users as co-applicants on the team (SM, LJo, LR, KB, KD, MV). Knowledge users are individuals who are likely to be able to use the quality improvement project results to make informed decisions about health practices, programs, and/or policies (Canadian Institutes of Health Research, 2016). As part of their role, they helped identify the project objectives, ensured feasibility of the methods, and helped interpret the findings. We engaged knowledge users early and during the study to have study findings that are relevant to and more likely used by the oncology program (Bowen & Graham, 2013; Gagnon, 2009). The hospital’s Research Ethics Board (REB) reviewed our quality improvement project and issued a letter confirming the REB waived its review and the project was REB exempt.

**Setting.** The project took place within a large multi-site Canadian ambulatory oncology program that serves a population of about 1.3 million. At the main site, embedded within an academic teaching hospital, there were an average of 1,100 patients receiving systemic therapy and 500 patients receiving radiation treatments per month. Patients initiate about 1,000 telephone calls per month and the majority of calls were about symptom management. There were 18 registered nurses who responded to these calls and the nurses had received orientation to providing telephone services. Concurrently, there were on average 250 ED visits per month by oncology patients.

**Eligible patients.** We included patients making a non-emergent ED visit between March 2015 and February 2016, defined as an ED visit not requiring hospital admission and for which the patient had initiated a call to the oncology nurse telephone services at the cancer centre within four weeks prior to the ED visit for the same symptom.

**Procedures:** Two registered nurses (one BScN, one MScN), with more than eight years of experience working in an outpatient oncology clinical setting were trained to extract chart data, determine appropriateness of the symptom management provided during the telephone call, and identify missed opportunities for avoiding ED visits. The nurses used data from the hospital’s electronic health record (MOSAIQ®) to complete the standardized data extraction form including a previously used form on nurse symptom management (Ludwig et al., 2017; Stacey, Green, Ballantyne, Tarasuk, et al., 2016). Data were captured in an Excel spreadsheet including: a) nursing documentation of symptom support provided (e.g., symptom assessment, severity level, medication review, self-management, use of guidelines); b) patient characteristics (e.g., age, sex, type of cancer, treatments); c) documentation of the ED visit; and d) outcomes (e.g., hospitalization, symptom resolution). The audit included related data from six weeks before and after the call, for the purposes of capturing important contextual information on each patient.

**Instruments.** The Symptom Management Analysis Tool (SMAT), developed for this study, is an eight-item tool for evaluating the quality of symptom management provided by healthcare professionals with patients experiencing cancer symptoms. SMAT items include: 1) focused on most problematic symptom; 2) completeness of the assessment (50% or more of gold standard assessment criteria); 3) appropriateness of triage based on assessment findings; 4) review of medications relevant to the symptom; 5) patient agreement to continue or initiate medications as discussed is obtained; 6) review of three or more self-care strategies relevant to the symptom; 7) patient agreement to continue or initiate self-care, as discussed, is obtained; and 8) summary of an agreed upon plan with next steps is conducted.

The SMAT was developed based on patient-centred approach to evidence-informed symptom management (Registered Nurses’ Association of Ontario, 2015). The gold standard criteria for assessment, medication review, and self-care strategies were based on the Pan-Canadian Oncology Symptom Triage and Remote Support (COSTaRS) set of 15 symptom practice guides. Each practice guide was established using a systematic review to identify symptom specific clinical practice guidelines and written in plain language for use by nurses in clinical practice (Stacey & Carley, 2017). SMAT items specific to providing patient and family-centred care are focusing on the most problematic symptom and obtaining patient agreement to continue or initiate symptom management strategies after discussing use of medications and self-care approaches (Registered Nurses’ Association of Ontario, 2015).

As part of the tool development, SMAT was initially used to evaluate telephone calls between a simulated patient experiencing cancer treatment-related nausea and a nurse providing homecare services. After this initial use, two items were removed, “overall patient centred” and “willing to recommend this service”, given these items were not independent of other items. Based on the judgement of the oncology nurses extracting data on the calls, it was decided a cut-off of 50% or more of the assessment items was adequate to determine the appropriateness of the triage of the call. It was also presented to
ambulatory oncology nurses who routinely provide telephone symptom management, educators, and managers to confirm face validity. These nurses verified that it was reasonable to focus on three self-care strategies.

Analysis. Analysis focused on the two objectives: quality of symptom support and ED visits. Two team members (DS, MC) independently evaluated nurses’ quality of symptom management by analyzing nursing documentation in the patients’ health record using the Symptom Management Analysis Tool (SMAT). Findings between coders were compared. Two experienced oncology nurses, who were trained for this project, determined the appropriateness of the symptom management and missed opportunities for avoiding ED visits. The missed opportunities for avoiding ED visits were analyzed descriptively.

RESULTS
In 225 ED visits not requiring hospitalization, 77 (34%) were for patients who had called the oncology nurse telephone services within four weeks of the ED visit. The reasons 148 ED visits were not eligible were: telephone call to the oncology nurse telephone services was unrelated to the ED visit (n = 70; 47%); no oncology treatments received within 60 days (n = 60; 41%); patient admitted to hospital from ED (n = 10; 7%); and other (n = 8; 5%, duplicate patient, disease progression, blood-work abnormality, patient called nurse from ED, non-CONSARS symptom).

For the 77 eligible ED visits, the typical patient was female, aged 62 years old, living in an urban area and receiving home services (Table 1). The most common types of cancer documented were gastrointestinal, breast, and lung. The majority of patients were receiving chemotherapy (68%) with 9% receiving it orally.

Within four weeks of the ED visit, nurses most commonly reported the telephone call was about pain (n = 37; 48%), breathlessness (14; 18%), constipation (12; 16%), diarrhea (11; 14%), and nausea/vomiting (8; 10%) (Table 2). In 79% of these calls, only one symptom was documented (n = 61). Of 77 calls, 17 documented Edmonton Symptom Assessment Score (ESAS) ratings >4 out of 10 within four weeks before the telephone call for pain (n = 9; mean ESAS score 4.6/10), breathlessness (n = 5; ESAS 4.6/10), appetite problems (n < 5; ESAS 5.5/10) and fatigue (n < 5; ESAS 5/10). The 77 calls occurred on any day of the workweek in the morning (46%) or afternoon (54%). The outcomes of these telephone calls were to stay home with symptom management advice provided by the nurse (47%), go to ED (43%), or clinician appointment booked for further assessment (10%). Only 1 of 77 patients had nurse documentation reporting the urgent care clinic in the ambulatory oncology program was full, the physician confirmed face-to-face assessment was required, and the patient was directed to go to ED.

The quality of symptom management in nursing telephone call documentation revealed a 57% median total SMAT score with a range of 0 to 100%. Fourteen calls (18%) scored 100% on SMAT, 4 (5%) scored 80 to 99%, 15 (19%) scored 60 to 79%, and 44 (57%) scored less than 60%. The majority of nurses focused on the most problematic symptom (n = 71; 92%) and summarized the next steps for an agreed upon plan (67; 87%) (Figure 1). Few nurses (n = 29; 38%) conducted an adequate assessment of the symptom and only 26 appropriately triaged the symptom (34%). Of 77 patient calls, 38 (49%) reviewed medications and 2 (2.6%) reviewed three or more self-care strategies. For less than 24% of cases, it was evident from the documentation that patients agreed to continue or initiate use of medications or self-care strategies discussed. Three nurses (4%) documented use of symptom specific guidelines during the telephone call.

Most ED visits occurred on the same day as the telephone call to the nurse (n = 40; 52%), and 13% occurred five or more days after the call (Table 3). The ED triage code indicated 19 were emergent (25%) defined as appropriate by ED staff and 57 were urgent (75%). When oncology nurses who provide telephone support completed the chart review, they assessed seven cases (9%) as being appropriate for ED visits and 70 cases (91%) as could have been managed in an urgent care visit within the ambulatory oncology program. Of these 70 visits, 37 (53%) occurred during ambulatory oncology program hours and 33 (47%) occurred outside usual hours.

### Table 1: Patient Characteristics

| Variable*          | Response categories                                      | Eligible encounters n = 77 |
|--------------------|----------------------------------------------------------|---------------------------|
| Age (years)        | Mean (range)                                             | 62 (24 to 89)             |
| Sex                |                                                          |                           |
| Female             | 46 (60.5)                                                |                           |
| Male               | 30 (39.5)                                                |                           |
| Residence location |                                                          |                           |
| Urban              | 38 (50.0)                                                |                           |
| Rural              | 16 (21.1)                                                |                           |
| Suburban           | 16 (21.1)                                                |                           |
| Remote (e.g., Nunavut) | 6 (7.9)                                |                           |
| Disease Site       |                                                          |                           |
| Gastrointestinal   | 30 (39.5)                                                |                           |
| Breast             | 21 (27.6)                                                |                           |
| Lung               | 8 (10.5)                                                 |                           |
| Skin               | 6 (7.9)                                                  |                           |
| Other (<5)/Unknown (e.g., primary unknown, genitourinary sarcoma, central nervous system, head and neck) | 11 (14.5) |                           |
| Current treatment (within 60 days of PSL call) |                              |                           |
| Chemotherapy       | 52 (67.5)                                                |                           |
| Radiation          | 10 (13.0)                                                |                           |
| Chemotherapy and Radiation | 15 (19.5)                      |                           |
| Type of chemotherapy |                                                          |                           |
| IV                 | 59 (88.1)                                                |                           |
| Oral               | 6 (9.0)                                                  |                           |
| Missing            | 2 (3.0)                                                  |                           |
| Receiving home care services |                              |                           |
| Yes                | 53 (68.8)                                                |                           |
| No                 | 17 (22.1)                                                |                           |
| Unsure/Missing     | 7 (9.1)                                                  |                           |

*Values are frequency (percent), unless otherwise specified; ED=Emergency Department.
### Table 2: Characteristics of Telephone Call within four weeks of ED visit

| Variable                        | Response categories                          | Eligible encounters n = 77 |
|---------------------------------|---------------------------------------------|-----------------------------|
| Day of the week                 |                                             |                             |
| Monday                          | 11 (14.3)                                   |                             |
| Tuesday                         | 20 (26.0)                                   |                             |
| Wednesday                       | 16 (20.8)                                   |                             |
| Thursday                        | 13 (16.9)                                   |                             |
| Friday                          | 17 (22.1)                                   |                             |
| Time of day                     |                                             |                             |
| Morning                         | 35 (45.5)                                   |                             |
| Afternoon                       | 42 (54.5)                                   |                             |
| Symptom(s) of focus†            |                                             |                             |
| Pain                            | 37 (48.1)                                   |                             |
| Breathlessness                  | 14 (18.2)                                   |                             |
| Constipation                    | 12 (15.6)                                   |                             |
| Diarrhea                        | 11 (14.3)                                   |                             |
| Nausea & Vomiting               | 8 (10.4)                                    |                             |
| Fatigue                         | 6 (7.8)                                     |                             |
| Appetite Loss                   | 5 (6.5)                                     |                             |
| Other <5 each (bleeding, depression, mouth sores) | 6 (7.8) |                             |
| Number of symptoms documented   |                                             |                             |
| One                             | 61 (79.2)                                   |                             |
| Two                             | 11 (14.3)                                   |                             |
| Three to four                   | 5 (6.5)                                     |                             |
| Symptom(s) consistent with telephone call |               |                             |
| Yes, within 4 weeks             | 17 (22.1)                                   |                             |
| No (24 inconsistent symptom(s), 6 ESAS reported after telephone call, 1 ESAS reported >4 weeks before telephone call) | 31 (40.3) |                             |
| Missing                         | 29 (37.7)                                   |                             |
| Consistent symptom(s) to telephone call reported on ESAS |                   |                             |
| Pain (mean score 4.6/10)        | 9 (52.9)                                    |                             |
| Breathlessness (mean score 4.6/10) | 5 (29.4)                  |                             |
| Appetite (mean score 5.5/10)    | <5                                          |                             |
| Fatigue (mean score 5/10)       | <5                                          |                             |
| ESAS score in telephone nursing |                                             |                             |
| Yes (reported pain mean score 8.4) | 8 (10.4)                          |                             |
| No                              | 69 (89.6)                                   |                             |
| Triage disposition              |                                             |                             |
| Stay home with advice           | 36 (46.8)                                   |                             |
| Appointment booked for further assessment | 8 (10.4) |                             |
| Go to ED                        | 33 (42.9)                                   |                             |

*Values are frequency (percent), unless otherwise specified; ED=Emergency Department.†Frequencies total more than 77 since some patients had multiple symptoms.

### Table 3: ED Visit Characteristics

| Variable                        | Eligible encounters n = 77 |
|---------------------------------|-----------------------------|
| Number of days between telephone call and ED visit |                             |
| Same day                        | 40 (51.9)                   |                             |
| One                             | 9 (11.7)                    |                             |
| Two                             | 8 (10.4)                    |                             |
| Three to Four                   | 10 (13.0)                   |                             |
| Five to twelve days             | 10 (13.0)                   |                             |
| Day of the week                 |                             |                             |
| Monday                          | 7 (9.1)                     |                             |
| Tuesday                         | 10 (13.0)                   |                             |
| Wednesday                       | 12 (15.6)                   |                             |
| Thursday                        | 15 (19.5)                   |                             |
| Friday                          | 18 (23.4)                   |                             |
| Saturday                        | 7 (9.1)                     |                             |
| Sunday                          | 8 (10.4)                    |                             |
| ED visit in or outside of business hours |                         |                             |
| Weekday in business hours (8am-5pm) | 43 (55.8)       |                             |
| Weekday outside business hours  | 18 (23.4)                   |                             |
| Weekend or Statutory Holiday    | 16 (20.8)                   |                             |
| ED Triage Code                  |                             |                             |
| Emergent                        | 19 (25.0)                   |                             |
| Urgent                          | 57 (75.0)                   |                             |
| Encounter appropriate for oncology urgent care clinic, if available |                   |                             |
| Yes (n = 37 in work weekday; n = 33 out of work weekday) | 70 (90.9)         |                             |
| No, ED visit appropriate        | 7 (9.1)                     |                             |
| Opportunities for improvement and examples |                       |                             |
| None                            | 28 (36.4)                   |                             |
| Yes, if yes:                    | 49 (63.6)                   |                             |
| Further assessment              | 20 (40.8)                   |                             |
| Follow-up call to patient next day | 10 (20.4)             |                             |
| Refer to symptom management team, psychosocial team, earlier oncologist apt | 8 (16.3) |                             |
| Send to urgent oncology care clinic | 9 (18.4)             |                             |
| Teach about symptom and self-care | 5 (10.2)                     |                             |
| Arrange for laboratory testing/x-rays | 3 (6.1)                 |                             |
| Access to symptom guideline     | 1 (2.0)                     |                             |
| Better documentation of symptoms at oncologist visits | 1 (2.0)                    |                             |
| Follow-up call after first treatment | 1 (2.0)                   |                             |
| Other (prescription change, MRI booking) | 2 (4.1)                |                             |

*Values are frequency (percent), unless otherwise specified; ED=Emergency Department.
Oncology nurses auditing the charts identified opportunities for improved symptom management in 49 of the 77 cases (64%) (Table 3). The most common opportunity for improvement was the need for further assessment (41%). Some patients (20%) could have benefited from a next day follow-up call to reassess the symptom. Other patients (16%) could have been referred to a more appropriate service such as the symptom management team, psychosocial oncology team, home care nursing services or their oncologist. Fewer patients (10%) were identified as potentially benefiting from additional teaching in managing side effects of treatment such as diarrhea, constipation, mouth care, and medication use.

**DISCUSSION**

In this quality improvement project, we explored the link between patient calls to the oncology nurse telephone services and subsequent ED visits. Thirty-one percent of patients did not call before going to ED, identifying an opportunity for better guidance for patients on steps for seeking medical attention for cancer treatment-related symptoms. One-third of the patients telephoned the nurse before going to the ED and 87% of ED visits occurred within four days of this call. Review of the documentation indicated that 91% of the ED visits could have been managed by urgent care clinics within the ambulatory oncology program and only one patient had documentation indicating this urgent care clinic was full. The most common reason for missed opportunities by oncology nurses on the telephone was inadequate assessment; only 38% of patients had documentation to indicate an adequate symptom assessment was conducted on the telephone. The quality of the symptom assessment also influences the approach to symptom management using medications and self-care strategies. Interestingly, only half of the nursing documentation for patient telephone calls had any evidence of symptom-specific medication review and only 17% documented conducting a review of one or more self-care strategies. Only two patients (3%) had documentation indicating the nurse discussed three or more self-care strategies. For the common symptoms reported in these telephone calls (e.g., pain, breathlessness, constipation, diarrhea, nausea/vomiting), clinical practice guidelines have 10 or more self-care strategies recommended (Stacey et al., 2017). Hence, there are missed opportunities for nurses to be guiding patients in the use of medications and self-care strategies for managing their symptoms.

Oncology nurses have an important role in accurately assessing and triaging patients to the appropriate level of care required for their symptom(s). When the nursing assessment for 77 patients was rated against gold standard criteria, only 29 were adequately assessed using 50% or more of the symptom-specific assessment criteria and three of the oncology nurses reported using guidelines. Based on these incomplete assessments, nurses triaged 43% of patients on the telephone to go to ED; whereas only 9% were rated as emergent by the experienced oncology nurses reviewing the chart audit data. Considering these findings from a learning health system approach, it is important to consider: a) expectations of nurses providing telephone symptom management from nursing leadership and physicians; b) adequate staffing for nurses to provide quality telephone services; c) actual symptom management provided in calls versus documented; and d) easy access to symptom management guidelines.

The quality analysis of nurses’ telephone documentation indicating the proportion of patients’ documentation scored was full, partial or no points on the Symptom Management Analysis Tool (SMAT) (n = 77).

![Figure 1: Quality analysis of nurses’ telephone documentation indicating the proportion of patients’ documentation scored was full, partial or no points on the Symptom Management Analysis Tool (SMAT) (n = 77)](image-url)
Our findings highlight that ER visits could be reduced if there are other healthcare services for patients with moderate to severe symptoms requiring urgent face-to-face assessments. Urgent care clinics are being used within some ambulatory oncology programs on weekdays for assessing patients, diagnostic testing (laboratory tests, radiography), and administering intravenous fluids and/or medications (Hong et al., 2019; Sedghi et al., 2019). Both studies showed reduced ED visits after the urgent care clinics were established. However, the volume of weekend ED visits remained unchanged given the absence of an urgent care clinic available on weekends (Hong et al., 2019). Urgent care clinics for oncology patients do not replace the nursing role on the telephone but rather provide healthcare services for those triaged with more severe symptoms. In fact, most cancer patients and family members are satisfied with telephone symptom support (Stacey, Green, Ballantyne, Skrutzkowksi, et al., 2016). Other options for patients calling with severe symptoms are to have reserved urgent visit capacity within ambulatory oncology clinics and/or link to palliative care services or homecare nursing services.

There are several strengths and limitations to be considered when interpreting the findings. This is the first known quality improvement project linking telephone calls about a symptom to a subsequent non-admission ED visit at a large tertiary ED. Another strength was the systematic tracking of documentation about a symptom across jurisdictions within a healthcare facility. The project data was limited to documentation in the patients’ health record with a specific focus on documentation by oncology nurse telephone services and ED visits. It is possible that the nurses or ED clinicians did not provide complete documentation. Furthermore, it was not possible to track patients that went to EDs of other hospitals within the region. To help with the interpretation of the data, we hired experienced oncology nurses working in clinical practice to extract data from the health record and provide their judgement on appropriate use of ED visits and opportunities for nurses to provide better symptom management. These nurses received training in the chart audit procedures and had the opportunity to discuss questions with an advanced practice nurse on the project team (LJo). Another limitation is that their judgement may have been biased in support of the oncology nurse who provided the documentation under analysis. Finally, we did not collect data on the level of experiences of nurses who were responding to the telephone calls and this should be considered for future quality improvement projects.

Our findings have implications for clinical nursing practice and education. The oncology nurses in this quality improvement project had not received any specific education in telephone-based oncology nursing services. Previous studies of telephone-based symptom management by oncology nurses revealed the need for specific training (Stacey, Green, Ballantyne, Tarasuk, et al., 2016; Stacey et al., 2018). Nurses who participated in a one-hour training workshop demonstrated improved confidence with providing evidence-informed telephone-based symptom management (Stacey et al., 2015). There is also opportunity for nurses to self-evaluate their performance and/or for them to receive performance feedback. Previous studies focused on audit and feedback of healthcare professionals as a knowledge translation intervention have demonstrated improved performance (Brehaut et al., 2016). Subsequent completeness of symptom assessments, as measured by SMAT, could be monitored over time.

CONCLUSIONS

Oncology nurses play an important role in responding to patient telephone calls about cancer treatment-related symptoms being experienced at home. When exploring calls to nurse telephone services that have a subsequent ED visit not resulting in hospitalization, we identified 91% of patients could have been managed by telephone and/or in-person urgent care clinic visits without going to the ED. However, nurses on the telephone frequently documented incomplete assessments and inadequate symptom management guidance to patients. There is a need for further investigation on the quality of symptom management in audio-recordings of telephone calls, the influence of evidence-based symptom-specific guidelines on the quality of nursing telephone services, and ways to ensure appropriate resources for telephone-based nursing services.

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