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Impact of Nurse-Led Telephone Follow-up on Heart Failure Readmissions

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Abstract

Heart failure readmissions are a common and costly issue. Poor transitions of care as patients move from one setting to another are thought to be a major contributor to this growing problem. For those patients discharged to skilled nursing facilities (SNFs), poor transitions can be especially problematic. Telephone follow-up by nurses is a cost effective intervention commonly used to improve communication and coordination of care, thought little is known about interventions directed at patients discharged to SNFs. The purpose of this review is to evaluate the evidence regarding nurse led telephone follow-up in the transition of care process and provide a foundation for future study of these interventions in the SNF population. Synthesis of evidence from an integrative review, four systematic reviews, and three clinical practice guidelines suggests telephone follow-up may aid in the reduction of readmissions but further study is needed to determine the most effective structure of a telephonic program.

Background

Heart failure (HF) is the leading cause of hospitalization and readmissions for persons aged 65 and older (Stamp, Machado, & Allen, 2014). A significant proportion (20%) of Medicare beneficiaries are readmitted within 30 days of discharge, at an estimated annual cost of more than $17 billion (Bradley, et al., 2013; Hernandez, et al., 2010). Reduction of readmission rates has become a national priority. Under provisions of the Affordable Care Act (ACA), hospitals are currently facing reimbursement penalties for readmission rates deemed excessive by the Center for Medicare and Medicaid Services (CMS) (Naylor, et al., 2012). Over and above the financial aspect is the impact of readmission on the quality and continuity of care for HF patients (Stamp, Machado, & Allen).

Much effort has been dedicated toward determining the exact reasons for the high rate of HF readmissions. Commonly identified elements include poor communication, insufficient discharge planning, inadequate medication reconciliation across settings, patient non-compliance, and less than effective education strategies (Smith, 2013). Health care organizations are employing multiple strategies in an effort to address these issues and reduce rates of readmission. A broad area of interest is the improvement of transitions of care from the hospital to the next setting by enhanced communication with patients and families, improving self-care skills, and providing high-risk patients with additional support services (Johnson, Laderman, & Coleman, 2013).

Despite the focus on transitions of care, little has been done to examine the nursing processes involved in hospital to SNF discharges. Given that discharge to a SNF is one of the strongest predictors of 30-day readmission, this gap in the research is especially concerning

(King, et al., 2013). Frequently frail, elderly, and with multiple comorbidities, this population is particularly vulnerable to adverse events resulting from poor transitions between settings (Coleman, 2003).

Transition of care has been defined as a broad range of services designed to ensure continuity and coordination of care, prevent avoidable poor outcomes among high-risk populations, and promote the timely and safe transfer of patients from one setting to another or from one level of care to another in the same setting (Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011). Enhanced communication with patients, families, and caregivers, as well as among providers, is a key component of care transitions. Telephone follow-up calls have been cited as a cost-effective method of improving communication, particularly during the critical period immediately following hospital discharge (Johnson, Laderman, & Coleman, 2013). However, there has been little standardization on how, and by whom, the intervention should be conducted. The purpose of this review is to examine the impact telephone follow-up with SNF staff may have on 30-day readmission rates for HF patients discharged to SNFs.

Review of the Literature

A literature search was carried out using Medline and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. Multiple combinations of key words nursing intervention, telephone follow-up, heart failure, readmissions, and skilled nursing facility were used in the search. Sources were limited to English language, peer-reviewed articles, within the date range of 2004-2015. Reference lists were reviewed for additional items. This search resulted in 318 items. After discarding duplicates, titles and abstracts were evaluated. When an abstract was unavailable, article content was reviewed. Inclusion criteria included nurse led

interventions, readmission listed among studied outcomes, heart failure patients included in the sample, and telephone follow-up cited as an intervention. A total of 12 studies were finally included. Evidence was rated according to the American Association of Critical-Care Nurses (AACN) evidence-leveling system (Armola, et al.,2009). A synopsis of each study including author, year, study design, independent variables (IVs), dependent variables (DVs), sample/setting, results, instruments (if applicable), conclusions/recommendations, limitations, and level of evidence is shown in Table 1.

As studies were reviewed, it became clear that telephone interventions are carried out in a variety of ways. According to Johnson, Laderman, & Coleman (2013), telephone follow-up programs can be evaluated by three decision points including who makes the call; timing, frequency, and duration of telephone intervention; and which information is included in the call. The studies included in this review were analyzed using these decision points.

Who delivers the call?

In the development of a telephonic follow-up program, an obvious first step is to determine who should be initiating the call. Given their clinical expertise and role in discharge planning, nurses are a logical choice (Johnson, et al., 2013), and are the provider of interest for this review. Within the category of nursing, there was considerable variation in both educational level and area of expertise of nurses making the calls. Two studies reviewed a mixed skill model in which senior nursing students were paired with either home health nurses or case managers to perform the telephone intervention (Wheeler & Waterhouse, 2006; Wong, Chow, Chan, & Tam, 2014). A comparison between telephone follow-up alone and telephone follow-up bundled with home visits in the study by Wong, et al.(2014), revealed reduction in hospital readmissions in

both groups, though results seemed to favor the group receiving a combination of home visits and telephone calls. Thus, the authors questioned whether telephone follow-up alone was sufficient to make a significant difference in reducing readmissions (Wong, et al., 2014). In the study by Wheeler and Waterhouse (2006), fewer HF patients receiving the telephone intervention were readmitted compared with the control group, though the difference was not statistically significant.

In only one study was the nurse making the calls described as having specific training and experience in care of cardiac patients. The study by Yu, et al. (2015) also combined telephone follow-up with home visits, along with a pre-discharge visit performed by the same cardiac nurse. Fewer readmissions were noted at six weeks in the treatment group, but no significant difference between groups was seen at nine months when the study was completed.

Utilization of an advanced practice nurse (APN) was reported in two studies; in a supervisory role (Wong, et al., 2014) and as the sole provider of the intervention (Brandon, Schuessler, Ellison, & Lazenby, 2009). Significantly fewer readmissions were seen in the group receiving telephone follow-up from the APN (Brandon, et al., 2009). Case managers were the providers of telephone follow-up in several of the studies (Kind, et al., 2012; Jacobs, 2011; Slater, Phillips, & Woodard, 2008). All three studies in which case managers made the calls reported a reduction in readmission rates for groups receiving telephone interventions, however, no statistical significance was reported for the findings. The study by Jacobs (2011) was of particular interest, in that the telephone follow-up was made not to the patient, but to the nursing staff of SNFs.

Results from studies using case managers could have been impacted by variables other than the intervention itself. In the study by Kind and colleagues (2012) the case manager had pre-discharge contact with study patients; this contact could have influenced the overall positive results. In the study by Slater, et al. (2008), telephone follow-up was initially delivered by nurses in the hospital call center, then transferred to dedicated case managers. Impact of the change in personnel on results was not reported. One additional study, involving the use of health plan telephonic case managers employed by a large private carrier, demonstrated a statistically significant drop in 30-day readmissions in the intervention group (Melton, Foreman, Scott, McGinnis, & Cousins, 2012).

In the remaining four studies, the level of nursing staff utilized in the telephone intervention was less specifically described. Two of the studies (Harrison, Hara, Pope, Young, & Rula, 2011; Dunagan, et al., 2005) described utilization of "specially trained nurses", though in neither case were details given of the extent of the training. The intervention groups in both studies reported statistically significant reductions in readmission rates. Another international study combining home visits with telephone calls (Nogueira de Souza, et al., 2014) utilized "trained nurses", again with no details as to extent of training. Primary endpoints, including readmission, were reduced in the intervention group, but at borderline statistical significance. The final study reported on the use of health coaches to deliver the telephone intervention (Wennberg, Marr, Lang, O'Malley, & Bennett, 2010). The intervention group again was reported to have statistically significant reductions in readmission rates. It is important to note that in this study the health coach was not expressly a nurse, but rather a member of a multidisciplinary team that included registered nurses, licensed vocational nurses, pharmacists, dietitians, and respiratory therapists.

Timing, Frequency, and Duration of Follow-up

The importance of timely intervention emerged as a theme throughout the studies reviewed. However, exactly what was deemed timely varied across the reports. In four studies the time frame for initiation of the telephone follow-up was not clearly described (Brandon, et al., 2009; Slater, et al.,2008; Wennberg, et al., 2010; Wong, et al., 2014). An additional four studies (Dunagan, et al., 2005; Jacobs, 2011; Kind, et al., 2012; Melton, et al., 2012) described interventions initiated within a specific timeframe, ranging from 24-72 hours post-discharge. In the study by Wheeler and Waterhouse (2006), telephone follow-up was initiated after completion of a course of home health care, a period lasting one to four weeks. Similarly, in the study by Yu, et al. (2015), telephone calls were initiated after two weekly home visits. Nogueria de Souza, et al. (2014) described telephone calls made following each of four home visits, with the first visit made within 10 days of hospital discharge. Harrison, et al. (2011) reported initiation of follow-up within 14 days of hospital discharge. Calls were made as early as day one post-discharge.

Frequency of calls and duration of the intervention also varied considerably across studies. In the study by Wennberg and colleagues (2010), description of the intervention was quite broad, stating the enhanced support group received up to five outreach attempts, compared to three in the usual support group. Duration of the outreach was not reported, though outcomes were measured at the end of one year (Wennberg, et al., 2010). In three of the 12 studies reviewed, the telephone intervention consisted of a single call (Harrison, et al., 2011; Jacobs, 2011; Melton, et al., 2012).

Weekly calls were a recurring theme in several studies, with noted differences in duration of the intervention. Brandon, et al. (2009) reported a call frequency of weekly for two weeks, followed by every 2 weeks for the next 10 weeks. A system of weekly calls, for a period of up to four weeks, was described in two studies (Kind, et al., 2012; Wong, et al., 2014). Dunagan, et al. (2005) described calls made at least weekly for a period of two weeks. Calls in the study by Yu, et al. (2015) were made biweekly for three months, then bimonthly for six additional months. Nogueira de Souza and colleagues (2014) reported phone calls made following home visits at 30, 60, and 120 days post-discharge. Two studies reported slightly higher frequencies of calls (one-two per week) for up to 12 weeks (Slater, et al., 2008; Wheeler & Waterhouse, 2006). Adjusting the frequency of follow-up, based on the individual patient's needs, was reported in the studies by Dunagan, et al. (2005) and Kind, et al. (2012).

Actual time spent in completing the telephone calls was reported in only three studies. Brandon, et al. (2009) reported call duration of 5-30 minutes. Calls in the Veterans Administration (VA) study, described by Kind and colleagues (2012), averaged 36 minutes in length. Each of the four calls in the Brazilian study (Nogueira de Souza, et al., 2014) lasted approximately 10 minutes. Jacobs (2011) reported that case managers made an average of two calls per day with a total of 170 calls, made within a six- month period. Data of this type could have bearing on determining staffing requirements for a telephonic follow-up program.

Which Information Is Essential?

Commonalities were evident in descriptions of information included in telephone interventions of the 10 studies reviewed. Themes that emerged were some form of medication reconciliation, recognition of signs and symptoms indicative of worsening condition and how to

respond, and the importance of timely follow-up with a provider. These elements were described in broader terms in six studies (Harrison, et al., 2011; Melton, et al., 2012; Nogueira de Souza, et al., 2014; Wennberg, et al., 2010; Wong, et al., 2014; Yu, et al., 2015).

In each of the remaining studies, additional specific interventions were identified. These interventions included discussion of low sodium diet (Jacobs, 2011; Brandon, et al., 2009), daily weight monitoring (Jacobs, 2011; Slater, et al., 2008), assessment of patient support systems and socioeconomic concerns (Slater, et al., 2008; Wheeler & Waterhouse, 2006), and provision of support for management of other risk factors such as diabetes and smoking (Brandon, et al., 2009; Slater, et al., 2008). Two studies included elements of disease management. In the study by Dunagan, et al. (2005), if screening indicated evidence of HF exacerbation, the patient was advised to take additional diuretics or contact their primary care provider for further instructions. Similarly, in the study by Yu, et al. (2015) the cardiac nurse was available by phone to subjects for questions about disease management and worsening symptoms.

Discussion/Synthesis of the Evidence

All of the studies reviewed suggest nurse administered telephone follow-up may have some impact on reducing hospital readmissions for HF patients. These findings are consistent with those reported in other reviews of the literature (Delgado-Passler and McCaffrey, 2006; Hamner, 2005; Johnson, et all, 2013; Scott, 2010; Smith, 2013; Stamp, et al., 2014). Considerable variation was seen in the structure of the telephonic programs presented. Educational level of nursing staff delivering the calls ranged from student nurse to APN. In only one study (Wennberg, et al., 2010) was the intervention not expressly provided by nurses. Several authors commented on how the expertise of staff chosen to perform the intervention

contributed to the success of the program. For example, two studies described the skill of case managers in accessing and coordinating community resources (Kind, et al., 2012; Slater, et al., 2008).

The studies in which nursing students were utilized (Wheeler & Waterhouse, 2006; Wong, et al., 2014) suggested a mixed skill model could serve as a viable staffing alternative in the face of resource constraints. Several studies (Dunagan, et al., 2005; Harrison, et al., 2011; Wong, et al., 2014) alluded to the need for additional training of the interventionists, consistent with evidence from other reviews (Stamp, et al., 2014). The extent to which consistency of the caller may have added to the efficacy of the intervention was not specifically addressed in any of the studies. However, Jacobs (2011) noted the decision to limit interventionists to two nurse case coordinators. Limiting callers was thought to reduce variability of approach and provide a more accurate analysis of the process.

Although timing of telephone intervention varied from study to study, most commonly calls were initiated within 24-72 hours of discharge. Other literature reviews (Johnson, et al., 2013; Naylor, et al., 2011; Stamp, et al., 2014) report similar time frames. The consensus seemed to be the sooner the intervention, the better, particularly in the case of patients at highest risk for readmission. Duration of interventions ranged from one-time calls to nine months of follow-up. Though the evidence suggests the benefit of early intervention, further study will be needed to determine the optimal framework.

Common themes of medication reconciliation, recognition of signs and symptoms of worsening condition, and timely provider follow-up emerged in the review of information included in the telephone interventions. An element of disease management was included in two

studies (Dunagan, et al., 2005; Yu, et al., 2015) but most of the remaining studies focused on repetition and reinforcement of education begun in the hospital (Brandon, et al., 2009; Harrison, et al., 2011; Kind, et al., 2012; Melton, et al., 2012; Nogueira de Souza, et al., 2014; Slater, et al., 2008; Wennberg, et al., 2010; Wheeler & Waterhouse, 2006).

Quality of evidence was rated using the AACN grading system (Armola, et al., 2009). Two studies in the review were of prospective, randomized design (Dunagan, et al., 2005; Melton, et al., 2012). Along with randomized control trials conducted by Wong and associates (2014) and Nogueira de Souza, et al. (2014), these studies represented the highest level of evidence in this review with a grade of B. An additional four studies (Brandon, et al., 2009; Harrison, et al., 2011; Wennberg, et al., 2010; Yu, et al., 2015) were designated grade C. The remaining four studies (Jacobs, 2011; Kind, et al., 2012; Slater, et al., 2008; Wheeler & Waterhouse, 2006) included quality improvement initiatives and pilot projects and as such, were rated level D evidence. Clearly, gaps exist in the research and additional, more rigorous study is needed.

Limitations of the studies in this review include small sample size in several of them (Brandon, et al., 2009; Jacobs, 2011; Wheeler & Waterhouse, 2006). Lack of generalizability to other settings was a common limitation noted. Several authors noted it was not possible to conclude impact on readmissions was solely due to the telephone intervention. A single study (Jacobs, 2011) addressed interventions targeting readmissions from SNFs, reflecting the paucity of evidence regarding this vulnerable group of patients.

Current studies indicate nurse led telephone follow-up may have some impact on reducing readmissions of HF patients. What is not clear is which elements of such a program are

most likely to produce positive outcomes and how programs could optimally be structured. Telephone follow-up alone may not be sufficient to significantly impact hospital readmissions. Additional studies with large numbers of patients in randomized control trials are needed to fill the gaps in knowledge. In particular, research is needed in interventions for higher risk patients, such as those who are discharged to SNFs.

Systematic Reviews

Additional evidence was sought by a search of systematic reviews. Seven systematic reviews relating to the clinical question were located after a search using the Medline database and the Cochrane Database of Systematic Reviews. The search was carried out using multiple combinations of key words care transitions, heart failure, readmissions, and telephone follow-up. The range of publication dates for the selected reviews was 2004-2015. Reviews were chosen based on inclusion of variables and outcomes relating to the clinical question. These included populations of HF patients, telephone follow-up as an intervention, readmission as an outcome, and delivery of the intervention by nurses. A summary of the selected reviews including conclusions and recommendations is shown in Table 2.

Five of the reviews specifically examined HF patients (Feltner, et al., 2014; Inglis, et al., 2010; McAlister, Stewart, Ferrua, & McMurray, 2004; Takeda, et al., 2012; Vedel & Khanassov, 2015). The study by Naylor and colleagues (2011) focused on chronically ill adults, a group that would encompass HF patients. In the remaining review by Scott (2010), HF patients were identified as a population in which selected interventions were associated with positive outcomes. The majority of the reviews identified nurses as common interventionists (McAlister, et al., 2004; Naylor, et al., 2011; Takeda, et al., 2012). Notably in one review, the nurse was

most often an APN (Naylor, et al., 2011). Telephonic intervention was the sole focus of the review by Inglis and colleagues (2010). It is interesting to note that distinction was made between structured telephone support and telemonitoring, and outcomes were reported separately for each intervention. The remainder of the reviews included telephone follow-up as one of several interventions evaluated for impact on readmission rates (Feltner, et al., 2014; McAlister, et al., 2004; Naylor, et al., 2011; Scott, 2010; Takeda, et al., 2012; Vedel & Khanassov, 2015).

Telephone interventions were effective in reducing both HF related and all-cause readmissions in HF patients in two reviews (Inglis, et a., 2010; Takeda, et al., 2012). Naylor, et al. (2011) reported a reduction in all-cause readmissions through six to 12 months associated with interventions that included telephone post-discharge support. Telephone contact and advice to contact the primary care provider for signs of deterioration reduced HF hospitalizations but not all-cause hospitalizations in the review by McAlister, et al. (2004). Only HF related readmissions and mortality were reduced by telephone support in the review by Feltner, et al. (2014). As reported by Scott (2010), telephone support of patients with HF as a single component intervention was effective in reducing readmissions. In contrast, the review by Vedel & Khanassov (2015) concluded telephone follow-up was not efficacious in reducing readmission rates.

There were several common limitations identified across the selected reviews. One limitation common to all of the reviews was heterogeneity of interventions, making categorization problematic. The possibility of overlap between categories could have unknown impact on reported effects of interventions. In the reviews by both McAlister, et al. (2004), and Takeda, et al. (2012), the lack of direct or head-to-head comparisons between interventions was cited as a limitation. Another common limitation was the unknown impact of confounding

variables such as patient adherence, differences in intensity and duration of intervention, and changes in medical therapy, on reported effects. Takeda, et al. (2012) also included the lack of clear identification of core intervention elements as a limitation. A limitation directly related to the clinical question under review is the lack of inclusion of patients discharged to SNFs as intervention recipients in any of the selected reviews. A noted lack of published studies involving persons aged 85 and older was cited as a limitation by reviewers Vedel & Khanassov (2015). Certainly this age group is of interest, given the focus on patients discharged to SNFs.

Overall the quality of the selected systematic reviews was good. Six of the seven included only randomized control trials (Feltner, et al., 2014; Inglis, et al., 2010; McAlister, et al., 2004; Naylor, et al., 2011; Takeda, et al., 2012; Vedel & Khanassov, 2015). In each of these same reviews, more than 20 studies were included. The review by Scott (2010) included only seven studies, which included controlled studies and systematic reviews. Some non-randomized studies were excluded due to paucity of data and small sample sizes for some interventions (Scott, 2010). All of the systematic reviews discussed here were graded for quality using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, et al., 2009); scores are shown in Table 2.

To illustrate the use of PRISMA guidelines in evaluating the quality of review reports, the scoring for the review by Inglis, et al., (2010), is summarized in the following discussion. The abstract was clearly written and identified most of the components on the PRISMA checklist, including background, objectives, search methods, selection criteria, data collection and analysis, main results and authors' conclusions. Missing from the abstract were limitations and implications of key findings. In the introduction, the rationale for the review was explained in the context of current knowledge regarding the growing problem of HF and its management.

The question being addressed was again stated in the form of objectives, and participants, interventions, types of studies, and outcome measures were explained in detail.

Description of the methodology employed in this review was a major strength. All aspects of the search process were explained in great detail, as was the criteria for selection of studies and the process of data extraction. The authors of this review were diligent in assessing the risk of bias of individual studies and the impact bias may have had on cumulative evidence. A flow diagram was included in the results section, clearly outlining the study selection process. Study results were presented with effect estimates and confidence intervals and illustrated with forest plots. In the discussion section, the main findings were succinctly described and strength of evidence for each outcome was presented in table form. Limitations were identified, as were implications for practice and research. Sources of funding for the review and other support were provided. This systematic review was thought to contain all elements of the PRISMA checklist, and was therefore assigned a score of 100%.

Clinical Practice Guidelines

Additional sources of evidence were sought in the form of clinical practice guidelines (CPGs). A search was conducted utilizing the National Guideline Clearinghouse site. Multiple combinations of key words heart failure, transitions of care, geriatrics, skilled nursing facility, and hospital readmissions were used to locate relevant guidelines. Given the context of the clinical question under review, the terms heart failure, transitions of care, and geriatrics, were used to narrow the search. After review of stated objectives in several studies, a total of three CPGs were identified as relevant to this review. All of the included guidelines are of recent

publication, with a date range of 2010-2013. Each guideline was evaluated for quality using the Appraisal of Guidelines for Research and Evaluation (AGREE) II instrument (AGREE Next Steps Consortium, 2009).

The guideline by Lim, Foust, and Van Cleave (2012) reviewed the processes utilized in transitional care. A review of the guideline using the AGREE tool revealed less than optimal scores in several domains. Of particular note is outcome of scoring for the third domain, which concerns rigor of development. The score assigned for this domain was 48%. Rigor of development is probably the most crucial element in the process of CPG development and this low score significantly impacts the overall strength of the guideline. Scores for scope and purpose (94%), stakeholder involvement (61%), clarity of presentation (67%), and applicability (71%), were generally better and added to the strength of the guideline. Overall, the guideline was thought to be of moderate quality, and would be recommended with modifications.

The next guideline under review was developed by the American Medical Directors Association (2010), and concerned transitions of care in the long-term care continuum. In this review as well, a less than optimal score was earned in the rigor of development domain (58%). Specifically, the strengths and limitations of the body of evidence were not clearly described and no specific link between recommendations and evidence was apparent. A low score (46%) was also assigned for the applicability domain mainly due to lack of description of facilitators and barriers to application. The remaining scores were fairly good (greater than or equal to 50%), leading to designation of an overall moderate level of quality. The guideline would be recommended for use, with some modification.

The final guideline looked at heart failure in adults (Pinkerman, et al., 2013). Of the three guidelines reviewed, this one was deemed of the highest quality. In three out of six domains (scope and purpose, stakeholder involvement, and clarity of presentation), the guideline was assigned a score of 100%. Compared to the other guidelines, the rigor of development score was significantly higher (90%) for this guideline. Recommendations were quite detailed and contained many elements that could pertain to the clinical question under review. Overall, this particular guideline was thought to represent high quality and would be recommended for use.

The CPGs selected for this review addressed key elements of the clinical question. Two looked specifically at transitions of care (American Medical Directors Association, 2010; Lim, et al., 2012) and the third looked expressly at HF patients (Pinkerman, et al., 2013). All included hospital readmissions in major outcomes considered. The guidelines incorporated interventional themes consistent with those identified in other sources of evidence included in this report. These themes include efforts to reduce readmission rates through facilitating smooth transitions of care across settings, engagement of the patient and family in shared decision-making, coordination of care across settings, and timely, accurate communication between providers and between providers and patients.

Of the guidelines considered, quality was generally good with ratings ranging from moderate to high. In addition, the guidelines were evaluated as to quality of evidence provided using the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model (Dearholt and Dang, 2012). A summary of the guidelines including authors/year, objectives/aims, major recommendations pertaining to clinical question, and level and quality of evidence is shown in Table 3. Overall the guidelines represent good quality evidence and add to the rationale to suggest practice change in the transitional care process for HF patients discharged to SNFs.

Ranking and Level of Evidence

Sources of evidence utilized in this report were broadly categorized as primary research, systematic reviews, or CPGs. The strength of evidence in each category was evaluated using various scales or tools appropriate for the category. For the primary research, the AACN rating system was used, and only four of the 12 studies (Dunagan, et al., 2005; Melton, et al., 2012; Nogueira de Souza, et al., 2014; Wong, et al., 2014) were ranked at level B. Most of the remaining studies qualified as quality improvement initiatives (Jacobs, 2011; Kind, et al., 2012; Slater, et al., 2008; Wheeler & Waterhouse, 2006), and as such, represent lower level and quality of evidence. Results from the studies did suggest that telephone follow-up by nurses could have positive impact on HF readmissions, but findings were inconsistent. It was not clear from the primary research which elements of a telephonic program were most likely to produce positive outcomes. Only one of the studies in the primary research (Jacobs, 2011), specifically studied the population of interest, HF patients discharged to SNFs.

The evidence was generally of a higher level and quality in the systematic review category. Five of the seven (Feltner, et al., 2014; Inglis, et al., 2010; McAlister, et al., 2004; Takeda, et al., 2012; Vedel & Khanassov, 2015), received high scores on the PRISMA checklist. These reviews included substantial numbers of randomized control trials. Evidence from six of seven reviews again suggested the benefit of telephone follow-up in efforts to reduce HF readmissions. However, none of the selected reviews included those patients discharged to SNFs.

CPGs relevant to the clinical question were limited to three. Quality, again, was varied. One of the three (Pinkerton, et al., 2013) received high marks for quality on two rating scales, the

AGREE II tool and the JHNEBP quality guide. However, it should be noted that telephone follow-up was not specifically mentioned in the recommendations but would conceivably be included under the broader heading of transition of care. Transition of care was a common theme within the CPGs, consistent with evidence from primary research and systematic reviews. Elements of transitional care that carried throughout the evidence included medication reconciliation, engagement of the patient and family, comprehensive discharge planning and adequate transition communication.

When taken as a composite, the overall evidence is probably moderate in quality. Certainly, there is a critical need for future research consisting of large randomized control trials and should include direct comparisons of different types of interventions (McAlister, et al., 2004). Future research should also include more detailed reporting of core elements of interventions (Takeda, et al., 2012). Little is known about interventions targeting patients discharged to SNFs, creating an expansive arena for additional research.

Summary of Recommendations

While the amount and quality of evidence specifically relating to telephone follow-up for SNF patients is less than optimal, there is a wealth of evidence substantiating the benefits of transitional care (Naylor, et al., 2011). As previously described, the processes involved in care transitions were a common thread throughout the evidence. Specially trained nurses, including APNs, are frequently the interventionists for HF patients. Utilization of telephone follow-up is one cost-effective option to provide medication reconciliation, ensure timely follow-up with a provider, reinforce self-management skills, engage patients and their families, and complete

comprehensive discharge planning. It is vital to analyze current processes and adopt a program that is tailored to population needs and resources.

A proposed hospital policy change would focus on structured, post-discharge telephone support of HF patients, including those discharged to SNFs. Emphasis would be placed on patient self-management skills, such as recognition of signs and symptoms of worsening condition and how to respond (McAlister, et al., 2004; Naylor, et al., 2011; Scott, 2010). Proactive communication of acute care providers with primary care providers and others in the community setting would be instituted to mitigate problems with handoffs between care settings (Naylor, et al., 2011). Telephone support could be used to enhance shared decision-making between patient, families, and providers, ensuring care choices are consistent with patient values and preferences (Pinkerman, et al., 2013).

To incorporate this policy change and assess its impact on readmission rates for HF patients discharged to SNFs will be the basis of a DNP evidence-based practice capstone project. An initial step will be to analyze current handoff policies and identify breakdowns in communication and care processes. The structure of the telephone intervention can then be developed to address the weaknesses in policy. Baseline components of the program will include medication reconciliation and arrangement of timely follow-up. Fostering partnerships with community SNFs to address problems with transitions will serve to strengthen efforts to reduce readmissions. A program of this type may reduce readmissions, but the ultimate prize will be enhanced quality and coordination of care.

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Table 1: Studies Assessing Impact of Nurse Led Telephone Follow-up

Author, year	Purpose, aims	IVs, DVs	Study Design	Instruments	Sample, setting	Results	Conclusions, Recommendations	Limitations	Level of Evidence
Brandon, et al., 2009	Determine the effect of an APN-led telephone intervention on hospital readmissions	IV: Telephone enhanced disease management by APN DV: hospital readmission	Pretest-posttest experimental study	NA	20 participants living with HF > 6 mos, capable of self-care, with telephone access, randomly assigned to intervention or usual care	HF related readmissions significantly improved with biweekly telephone interactions with an APN	APNs serve as effective care coordinators decreasing readmission rates. APNs can improve quality of care while decreasing costs	Small sample size threatens internal and external validity	C
Dunagan, et al., 2005	Determine the impact of nurse-manage d telephone management program on need for hospital-based care	IV: Scheduled telephone calls by specially trained nurses DV: time to hospital encounter	Prospective, randomized control study	NA	151 patients hospitalized with HF at urban, teaching hospital, NYHA II-IV, English speaking. Randomized to usual care or usual care + intervention	Overall, compared to control group, intervention group had significantly longer times to hospital encounter and hospital readmission	Nurse administered disease management intervention that included judicious use of "rescue" diuretic therapy and patient education significantly delayed subsequent hospital encounters	Data on hospital encounters may be incomplete	B
Harrison, et al., 2012	Determine if telephone outreach is effective in reducing 30	IV: telephone call within 14 days of discharge DV: 30 day	Retrospective cohort study	NA	All 30,272 members from large commercial health plan enrolled in	Intervention group 23.1% less likely to be readmitted	Telephonic model produced significant reductions in readmissions.	Retrospective study. Not possible to conclude impact on	C

	day readmission rates	readmission rates			chronic disease management program who had hospital admission during 2008		Ability to reach a patient quickly is crucial to overall success of telephonic intervention	readmission solely due to intervention	
Jacobs, 2011	Decrease readmission rates by providing optimal continuity of care and streamlining care delivery for HF patients discharged to SNFs	IV: Follow-up phone calls within 48 hrs to RN/LPN staff at SNF DV: hospital readmission rates for HF patients in SNFs	Quality improvement initiative	NA	HF patients discharged from United Hospital (MN) to SNF over six month period compared to six month period prior to intervention	Readmission rate decreased from 30% to 11.2% over the six month intervention period	HF readmission rates were reduced resulting in cost savings and maintaining quality care in subacute setting. Partner with SNF with higher rates to identify causative factors	Relatively small number; may not be generalizable to other settings. Quality improvement initiative	D
Kind, et al., 2012	Improve care coordination and outcomes among veterans with high risk conditions discharged to community settings	IV: Nurse case manager (NCM) working with patients before and after discharge with all contact by phone once patient is home. DV: readmission rates	Quality improvement initiative. Pre-post design	NA	87 bed VA hospital in upper Midwest. Community dwelling veteran at high risk of poor post-hospital outcomes	Patients who received intervention experienced ½ fewer readmissions than those in baseline comparison group	Study suggests program is feasible to decrease readmission in sample population. Relatively low cost and resource base may make this a viable alternative in transitional care.	Additional studies needed to determine if effects persist in larger populations and those outside the VA system. Readmissions to non-VA hospitals not assessed. Pre-post design inherently limited.	D
Melton, et al., 2012	Determine if telephonic case	IV: Prioritized post-discharge telephone	Prospective, stratified, randomized study	Episodic Risk Group	Study patients from private health insurance	30-day readmission rate for	Prioritized outreach may be one method for	Unable to control for unobserved	B

	management patient prioritization protocol for recently discharged high- risk patients with select acute conditions reduced all-cause readmissions	outreach DV: 30- day and 60-day all-cause readmission rates		(ERG) score to assign risk of readmission. No reliability or validity mentioned	carrier who had length of stay (LOS) > three days; diagnosis of heart, GI, or lower respiratory disease randomized to control or intervention (n=1994 for each group)	intervention group was 5.7% compared to 7.3% for control group. 60-day readmission rate 7.5% for intervention group vs 9.6% for control group	reducing risk of readmission. Timing of receiving the intervention to high-risk patients is critical.	environmental factors. Inability to adjust for prior case management activity.	
Nogueira de Souza, et al., 2014	Evaluate effect of nurse-based intervention after HF admission compared to usual care (primarily medical follow-up)	IV: Nurse-led intervention of four home visits combined with four reinforcement telephone calls DV: Composite endpoint of first visit to ED, hospital readmission, or all-cause mortality in first six months of follow-up	Randomized control trial	NA	252 patients hospitalized for HF in two tertiary university hospitals in Brazil, randomized to usual care or usual care + intervention	27% reduction in primary composite endpoint	Predominantly nurse-led strategy of home visits and telephone calls proved beneficial in Brazil's public health system	Relatively small trial. Main finding borderline statistical significance	B
Slater, et al. 2008	Reduce readmissions of HF patient through use of nurse	IVs: structured telephone follow-up by NCM to patients with	Pilot; pre-post design	NA	Patients with chronic HF discharged from NC hospital. 612 patients were	HF patients completing the telephonic program had	HF telephonic program demonstrated excellent outcomes using	Pilot study. May not be generalizable to other settings. No	D

	administered telephonic education program	chronic HF discharged from hospital DV: Hospital readmission			enrolled and completed program (2002-2005)	significant reduction in readmissions in the 6 month period following intervention compared to 6 month period prior. ED visits were also reduced.	limited though expert resources. Case management expertise critical to success of program. Especially suite to patient population with wide geographic distribution	analysis of relationship of NCM salaries and financial benefits of program	
Wennberg, et al. 2010	Assess effect of telephone-based care management strategy on resource utilization of subjects with selected medical conditions	IV: Targeted telephone care-management program DV: Number of hospital admissions at one year	Stratified,randomized quality improvement trial	NA	174,120 insured members with selected medical conditons (including HF)randomized to usual vs enhanced support groups	10.1% reduction in annual hospital admissions for enhance support group	Targeted telephone care-management program was successful in reducing hospitalizations	May not be generalizable to other populations	C
Wheeler & Waterhouse, 2006	Assess the effectiveness of regular telephone interventions by nursing students on outcomes of HF patient in the home	IV: Regular telephone interventions by nursing students DV: Hospital readmission	Pilot study	NA	Convenience sample of 40 home health patients with diagnosis of HF assigned to intervention or comparison group. Community setting with home health agency and four year B	Fewer patients in intervention group were readmitted during the study period.	Although difference was not significant, trend suggests telephone intervention may have helped decrease readmission rate. Utilization of nursing students may be cost-effective	Small sample size, relatively short period of study, pilot study	D

					SN program		alternative		
Wong, et al. 2014	Determine effect of transitional care program for discharged medical patients and the differential effects of telephone calls only	IV: Home visits and telephone calls; calls only DV: Hospital readmission rates	Randomized control trial	NA	Patients discharged from regional hospital in Hong Kong with chronic disease (including HF). Randomized to control(n=210), home visits with calls (n=196), or calls only (n=204)	Home visit group had significantly lower readmission rate than control (10.7% vs 17.6%) but no significant difference was found in call only group	Telephone calls alone may not be sufficient to bring about significant reduction in readmissions. Mixed skill model may produce positive effects in transitional care	Results may not be generalizable. No data to inform which part of intervention brought about the effects	B
Yu, et al., 2015	Determine effect of nurse-led transitional care on readmission and mortality rates in Chinese HF patients	IV: Interventions including home visits, regular phone calls over 9 month period DV: Event-free survival, all-cause rehospitalization and death	Single center randomized control trial	NA	178 patients hospitalized with HF in university hospital in Hong Kong randomized to usual care or intervention	Fewer readmissions in treatment group at six weeks; no significant difference in endpoints at 9 months	Adaptation of nurse-led transitional care in context of Chinese culture and health care may be beneficial	Significant differences in gender and use of ACEI between groups. Higher drop-out rate in control group	C

Table 2. Systematic Review Description

Author(s)/Year	Objective/Aim	Conclusions	Recommendations	PRISMA score
Feltner, et al., 2014	Review RCTs of transitional care interventions to reduce mortality and readmissions for adults hospitalized for HF, in order to assess and compare effectiveness of those interventions	Structured telephone support reduced readmission and mortality specific to HF; home visits and multi-disciplinary HF clinics reduced rates for all-cause readmissions and mortality	Future research should assess effect of interventions on 30-day readmission rates and include direct comparisons between specific interventions	100%
Inglis, et al., 2010	Review RCTs of structured telephone support or telemonitoring compared to standard practice for HF patients in order to quantify the effects of interventions over and above usual care.	Both telemonitoring and structured telephone support were effective in reducing proportion of HF-related admissions. Structured telephone support was effective in reducing risk of all-cause admission in HF patients	Future research should focus on intensity of intervention so benefits of these interventions compared with other proven disease management strategies can be identified and the best multimodal strategy determined for each patient subgroup. Aim is to tailor HF programs to population needs and resources and patient preferences.	100%
McAlister, Stewart, Ferrua, & McMurray, 2004	Determine whether multidisciplinary strategies improve outcomes for HF patients	Strategies that employed telephone contact and advice to see provider in event of deterioration reduced HF admissions but not all-	Direct comparisons of different types and/or intensities of interventions should be the focus of future research. Most efficacious strategies appear to be patient education to improve self-care, follow-up	78%

		cause admissions.	monitoring by specially trained staff, and access to specialized HF clinics.	
Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011	Identify/synthesize available evidence regarding transitional care for adult, chronically ill populations	Three interventions associated with positive long-term effects in all-cause readmissions-comprehensive discharge planning, follow-up interventions with home visits, telehealth facilitated intervention (including telephone post-discharge support)	Priority should be placed on small subset of more effective interventions that contribute to decreased readmissions for all causes through 12 months. Investment should be made to promote endorsement and adoption of effective interventions as best practice. Adoption of these models should be incentivized under the ACA.	52%
Scott, 2010	To determine relative efficacy of peridischarge interventions categorized as single or multicomponent	Telephone support of HF patients was one of four single component strategies that were effective in reducing readmissions. Multicomponent interventions with pre- and post-discharge elements seem to be more effective than most single element interventions	Hospitals should critically review and when appropriate, reconfigure current processes toward interventions that are more likely to reduce readmissions.	44%
Takeda, et al., 2012	To update the previously published review which assessed	Case management type interventions by a HF specialist nurse	Future research might include head-to-head comparisons between interventions; effect	100%

	the effectiveness of disease management interventions for HF patients.	reduces both HF-related and all-cause readmissions. Though optimal components of these interventions are not known, telephone follow-up by the nurse specialist was a common component.	of interventions on patient/caregiver satisfaction; assessment of cost-effectiveness; more detailed reporting of core elements of interventions	
Vedel & Khanassov, 2015	Review of RCTs of transitional care interventions for patients with HF in order to assess impact on utilization of acute care services and determine the efficacy and optimal duration of interventions	Interventions of high intensity reduced risk of readmission regardless of duration. Those of moderate intensity were effective when implemented for six months or more; low-intensity interventions were not effective	Future research should examine both patient characteristics and specific components of interventions. Incorporation of findings into each health care context will aid determination of optimal duration and intensity of interventions	100%

Table 3. Summary of Clinical Practice Guidelines

Author(s)/Year	Objective/Aim	Major Recommendations pertaining to EBP question	Level of Evidence (JHNEBP)	Quality of Evidence (JHNEBP)
American Medical Directors Association, 2010	Improve quality of care delivered to patients in long-term care settings. To focus on transitions between settings within the long-term care continuum (LTCC), between LCCC and acute-care settings, and between an LTCC setting and the patient's community home.	• The sending facility/care entity communicates with the receiving entity. Patient information received by entity prior to patient arrival. • Key to successful transition is communication with the next site of care and transmission of both required information and any additional data considered essential to provision of quality care. • Transition is not complete until both sides have verified hand-off has occurred. • Receiving facility must review information sent with the patient to ensure clarity and completeness and follow up with sending facility as needed.	IV	B-
Lim, Foust, & Van Cleave, 2012	To provide a standard of practice protocol to • Assist nurses in assuming a proactive role in transitional care	• Summary of care provided by sending institution to next care providers • Patient goals and preferences • Updated problem list, baseline cognitive/functional status • Medication reconciliation	IV	B-

	• Assist nurses in identifying barriers and offering solutions in the care transition process. • Enhance care coordination during transitions across healthcare settings among all members of healthcare team, including family/ caregivers	• Preparation of patient and caregiver for what to expect at next level of care • Follow-up plan for outstanding tests and follow-up appointments • Explicit discussion with patient/caregiver regarding warning signs/symptoms of worsening condition and who to contact should this occur		