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Predictors of Re-Hospitalization for Home Healthcare Patients

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By

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Dissertation Committee

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Abstract

The overall purpose of this study was to examine the predicative capability of

OASIS admission data for acute care re-hospitalization of home healthcare patients.

Secondary data analysis using logistic regression was conducted on retrospective data

from OASIS collected during the time period of July 1, 2006 to June 30, 2007. This study

was conducted in a Medicare certified Home Health organization that is part of the

largest public health system in California. The sample of 1802 patients with complete

episodes of care was derived from a data set of 5,523 patients. All patients were included

in the analysis and logistic regression model and the disease specific independent

variables included patients with a primary or secondary diagnosis of diabetes and an open

skin lesion or wound. The OASIS variables examined in the logistic regression model

that showed significance as predictors of acute care re-hospitalization included a

diagnosis of diabetes, overall prognosis, rehabilitation prognosis, existing dyspnea,

existing urine and bowel incontinence, impairment in currently dressing the upper body

and the ability to take own oral medications.

These findings apply to all patients in the OASIS database as the logistic

regression model included all patients. An interesting finding was that the presence of a

lesion or open wound was not significant as a predictor of acute care re-hospitalization.

Also of interest was the occurrence of re-hospitalization of 15% that is lower than

that reported in the literature as well as the occurrence of diabetes of 14% which is lower

than the population in the community. The study methodology related to the backwards

method of logistic regression modeling was useful in being able to examine a large number of variables and their relationship to a dichotomous dependent variable. Since this design and method has not been described in the literature prior to this study it has interesting implications for future research using OASIS.

DEDICATION

This dissertation is dedicated to my mother, father and husband:

My parents, Joseph and Charlotte Walecke who nutured the confidence in me to believe

and seek out all possibilities in life.

My husband, James T. Fischer, who is my best friend and has been my steadfast

supporter through this amazing endeavor.

Acknowledgment

I would like to express my sincere appreciation and gratitude to those individuals who contributed to the context that enabled me to be successful in this amazing endeavor.

To my dissertation committee:

Dr. Cynthia Connelly, my chair, who guided me and stood by me and who has had a profound influence on shaping me as an emerging nurse scientist. I feel blessed to have had such a fine education and I feel a duty to go forth and change the world.

Dr. Jane Georges who from the very beginning enlightened me as to the meaning of "mindscapes".

Dr. Linda Urden for her support and generosity in sharing her time and knowledge.

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To Lorie Shoemaker, Chief Nurse Executive at Palomar Pomerado Health, a

kindred spirit, who invited me to join her on a transformational journey and

ensured that I had every possible organizational support for my research.

To Elissa Hamilton, Director of Home Health at Palomar Pomerado Health, who

enthusiastically facilitated my access to OASIS.

To my extended family, friends and colleagues....you know who you are.

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Chapter 1

INTRODUCTION

In recent years quality of services has been an increasing focus in the United

States health care system. This emphasis has included efforts to quantify and analyze

outcomes of care (Keepnews, Capitman, & Rosati, 2004). For home healthcare the focus

on outcomes has resulted in new federal requirements that all home healthcare agencies

participating in Medicare or Medicaid collect and report patient data using a single core

set of measures in the Outcomes Assessment and Information Set (OASIS) (Keepnews et

al., 2004). In the home healthcare arena, the Outcomes and Assessment Information

System (OASIS) is used by home healthcare agencies as a data source for interpreting

quality of care and outcomes of patients they serve. The research team that developed

OASIS also developed methods of interpreting quality indicators from the data (Rantz &

Connolly, 2004).

Re-hospitalizations

More than 25% of home healthcare patients will be re-hospitalized; a number that

has risen steadily since 2000 when home healthcare agencies began collecting

standardized data (Department Of Health And Human Services Office Of The Inspector

General 2006). Although the optimal rate of re-hospitalization following home health in

not known, great variability in rates exists across agencies. For example during the period between March 2004 to February 2005, the average risk-adjusted rate for the 25 percent of agencies with the best rates was 17.4 percent, in contrast with 48.8 percent for the twenty-five percent of agencies with the worst rates. (These rates are for a one year period of time, taking into account all patients that were admitted or returned from an inpatient stay during that year and subsequently becoming hospitalized before being discharged from home care (Department Of Health And Human Services Office Of The Inspector General, 2006). The most challenging area most home healthcare agencies struggle with is also the one outcome measure that has never improved, the percentage of patients who were re-hospitalized. The national rate of 27.98% represents 1,034,034 home healthcare patients that were re-hospitalized. A reduction in the re-hospitalization rate of just 3% represents 110,129 fewer patients re-hospitalized and a Medicare savings of $2.7 billion dollars (Briggs Corporation, 2006).

Quality Improvement Organizations (QIO's) under contract with the Centers for Medicare and Medicaid Services (CMS) are working on a national home healthcare quality initiative to reduce avoidable re-hospitalizations for patients receiving home healthcare services. To support this work CMS has funded QIO's in every state, territory and the District of Colombia allowing them to work directly with home healthcare agencies in adopting more effective, person-centered processes (Center for Medicare and Medicaid Services, 2006).

QIO's help home healthcare organizations in designing efficient systems and implementing an organizational culture of quality. These strategies are designed to accelerate the rate of quality improvement and result in improved patient outcomes for Medicare beneficiaries who receive home healthcare services (Center for Medicare and Medicaid Services, 2006). The strategies to reduce acute care re-hospitalization that the QIO's are working with home healthcare agencies on include: 1) Hospitalization risk assessment, 2) Patient/caregiver emergency care plans, 3) Home telehealth for appropriate patients, including phone monitoring, telemonitoring and teletriage, 4) Medication management, 5) Influenza and Pneumococcal vaccination 6) Using frontloading visits for high risk populations, 7) Patient/caregiver self-care management skill, and 8) Focusing on disease management of CHF, COPD, diabetes, neoplasm, and chronic skin ulcers to prevent poor outcomes (Center for Medicare and Medicaid Services, 2006).

A growing body of evidence has shown that significant reductions in avoidable re-hospitalizations can be achieved by implementing delivery system strategies and interventions designed to rectify these problems (Center for Medicare and Medicaid Services, 2006). The strongest evidence exists for improvements in hospital discharge planning and in patient transitions from hospital to home (Center for Medicare and Medicaid Services, 2006).

Wounds

Previous research has indicated that admission OASIS assessment may provide a method of identifying older adults receiving home health care who are at risk for Stage I and Stage II pressure ulcer development (Bergquist,2003) and that further study related to socioeconomic status with this home health population is warranted (Schwarz & Elman, 2003).

Diabetes

Remington (2005) argues reducing hospital readmissions for diabetes complications could save the Medicare program $1.3 billion annually and Medicaid $386 million a year.

Conceptual Framework

The conceptual framework informing this study is the Quality Health Outcomes Model (QHOM), an adaptation of the Donabedian Structure, Process, Outcomes Model (Donabedian, 1973). The Structure, Process, Outcomes Model for quality of care and outcomes research has for decades provided the framework for policy studies (Mitchell, Ferketich, & Jennings, 1998). In 1998 the American Academy of Nursing Expert Panel on Quality Care (an expert panel of nurse leaders in outcomes research) adapted the Donabedian linear model into a dynamic model utilizing multiple feedback loops. The QHOM was created specifically to address the question of nursing's contribution to patient outcomes and globally to guide health outcomes research (Mitchell et al., 1998).

The QHOM allows the researcher to ask the Structure, Process, Outcomes core questions:

"Do we have the right things?" (Structure);

"Are we doing the right things?" (Process); and

"Are the right things happening?" (Outcomes)

(Mitchell, et al., 1998, p.43).

The QHOM expands on the original framework by being "broad enough to guide development of databases relevant to quality improvement initiatives and outcomes management initiatives, to suggest key variables in clinical intervention research, and to provide a framework for outcomes research and outcomes management that compares not only treatment options, but organizational or system level interventions." (Mitchell, et al.,1998, p. 44). The QHOM was designed to allow for contextual interactions and to reflect the dynamic relationship of interdisciplinary care in complex clinical settings.

All relationships in the model are bi-directional. There is no direct relationship between interventions and outcomes; rather in the QHOM, interventions influence, and are influenced by, the system and client domains; therefore, it is through the system and client that interventions influence outcomes (Mitchell, et al., 1998). System characteristics absorb the elements of structure and process in the Donabedian model relative to the level of analysis Mitchell et al. (1998). Included in the system are health care organization size, ownership, nursing resources, nurse skill-mix, nurse practice model and available technology. Client characteristics include client demographics, client

health, and disease risk factors. Interventions are defined as all of the direct and indirect interventions the client receives in the clinical process.

In summary, the QHOM was created to provide a theoretical framework for future exploration of research questions about nursing's contribution to patient outcomes (Mitchell, et al., 1998).

Significance of Study

The anticipated significance of this study is to provide evidence and direction for nurse leaders in decision making and designing healthcare delivery models for complex health populations. As healthcare costs increase and funding for follow-up by home healthcare nurses decrease, it is important to evaluate predictors of acute care re-hospitalizations of patients with complex health problems. Given the high priority that CMS has made in the reduction of acute care re-hospitalizations in the Medicare population the question arises: Does admission OASIS assessment data provide a method of identifying home healthcare patients with wounds and a co-morbidity of diabetes at risk for re-hospitalization. This home healthcare population has the highest volume and is the most problem prone and will be the sample I will be using for my study.

Purpose of Study

The overall purpose of this study is to examine the predicative capability of OASIS admission data for acute care re-hospitalization of home healthcare patients with wounds and a co-morbidity of diabetes.

Specific Aim

This goal will be achieved through the following aim:

1.   To examine the relationship of routine admission data with the

patient level outcome acute hospital readmission of patients with

wounds and a co-morbidity of diabetes receiving home healthcare

services.

Nursing Implications

Nursing leaders in healthcare service delivery organizations must have

information on the cost of new service delivery models, the means by which successful

models can be more rapidly deployed throughout the health care system, the features of

successful models, and variations in these models that better fit the contextual realities of

delivering services across sectors such as acute and community care.

The review of the literature regarding unplanned re-hospitalizations in complex

health populations revealed many implications for nursing. Yet, although specific nursing

strategies have been suggested to help prevent unplanned re-hospitalizations and include

a model of evidence-based practice, risk assessment, emergency plan of care, front

loading visits and follow up phone calls in home health care further research is needed to

understand which factors are associated with unplanned re-hospitalizations in complex

health populations. These findings can provide clinicians the tools to identify patients at

the greatest risk for re-hospitalization, implement effective interventions, and develop

models to promote the quality of life and functional abilities of their patients as well as

reduce rates of re-hospitalizations.

Chapter 2

REVIEW OF LITERATURE

Health care expenditures in the United States have increased from $714 billion in 1990 to $1,987.7 billion in 2005 (American College Of Healthcare Executives, 2007). Home Healthcare expenditures in the United States have increased from $12.6 billion in 1990 to $47.5 billion in 2005 (American College Of Healthcare Executives, 2007). Alarmingly, more than 25% of home healthcare patients will be re-hospitalized; a number that has risen steadily since 2000 when home healthcare agencies began collecting standardized data (Department Of Health And Human Services Office Of The Inspector General, 2006).

In response to federal requirements, the Outcomes and Assessment Information System (OASIS) was developed and is being used by home healthcare agencies as a data source for interpreting quality of care and outcomes of patients they serve (Keepnew et al., 2004). Although the OASIS can compare various home healthcare outcomes, scholarly inquiry is needed to examine predictors of these outcomes in complex health populations. In this chapter the phenomenon of acute re-hospitalization specifically for patients with wounds and a co-morbidity of diabetes within the context of receiving home healthcare services will be presented. First, the Quality Health Outcomes Model, serving

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as the guiding framework in the examination of predictors of acute re-hospitalization will be discussed. Next a review of the science on acute re-hospitalization for patients with wounds and a co-morbidity of diabetes receiving home visitation will be presented. Finally gaps in the literature with need for further research will be discussed.

Conceptual Framework: Quality Health Outcomes Model

The conceptual framework informing this study is the Quality Health Outcomes Model (QHOM), an adaptation of the Donabedian Structure, Process, Outcomes Model (Donabedian, 1973). The Structure, Process, Outcomes Model for quality of care and outcomes research has for decades provided the framework for policy studies (Mitchell, Ferketich, & Jennings, 1998). In 1998 the American Academy of Nursing Expert Panel on Quality Care (an expert panel of nurse leaders in outcomes research) adapted the Donabedian linear model into a dynamic model utilizing multiple feedback loops. The QHOM was created specifically to address the question of nursing's contribution to patient outcomes and globally to guide health outcomes research (Mitchell et al., 1998).

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The QHOM expands on the original framework by being "broad enough to guide development of databases relevant to quality improvement initiatives and outcomes management initiatives, to suggest key variables in clinical intervention research, and to provide a framework for outcomes research and outcomes management that compares not only treatment options, but organizational or system level interventions." (Mitchell, et al.,1998, p. 44). The QHOM was designed to allow for contextual interactions and to reflect the dynamic relationship of interdisciplinary care in complex clinical settings.

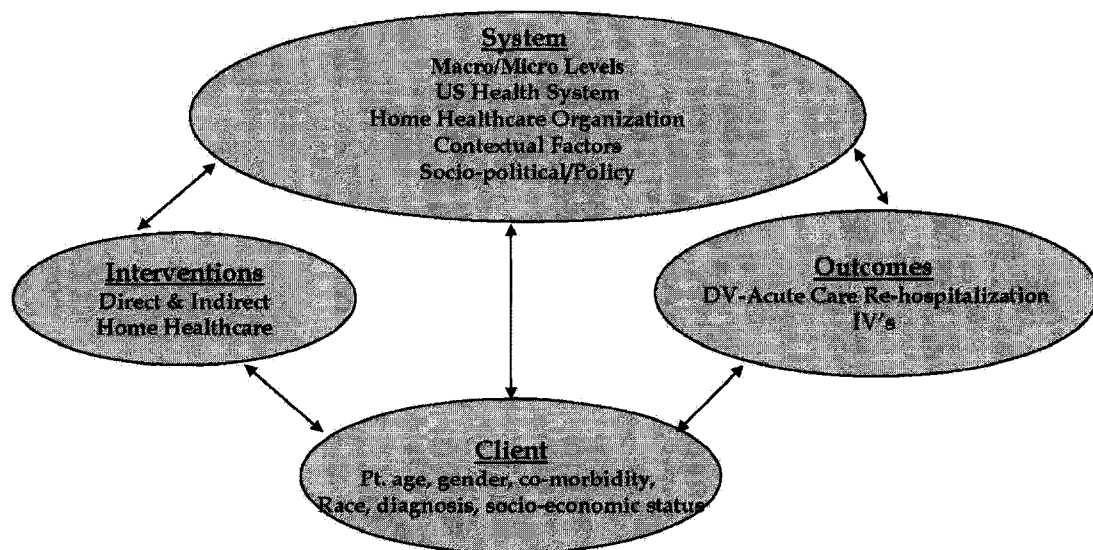# Quality Health Outcomes Model

Figure 1: Quality Health Outcomes Model

All relationships in the model are bi-directional. There is no direct relationship between interventions and outcomes; rather in the QHOM, interventions influence, and are influenced by, the system and client domains; therefore, it is through the system and

client that interventions influence outcomes (Mitchell, et al., 1998). System characteristics absorb the elements of structure and process in the Donabedian model relative to the level of analysis Mitchell et al. (1998). Included in the system are health care organization size, ownership, nursing resources, nurse skill-mix, nurse practice model and available technology. Client characteristics include client demographics, client health, and disease risk factors. Interventions are defined as all of the direct and indirect interventions the client receives in the clinical process.

Jones and Burney (2002) applied the QHOM in a prospective, interdisciplinary study of the outcomes of selected surgeries using both generic and condition specific data collection instruments conducted at an academic medical center over a 6 year time period and illustrated the usefulness of such an effort for patients, nurses and physicians, the institution and the respective disciplines in general. Using the QHOM the effect of treatment or intervention variables on outcome measures was assumed to be mediated by both structural and client characteristics.

Swan and Boruch (2004) described the evidence base in nursing, the quality and strength of nursings' evidence, the application of the QHOM and made recommendations for practice, research and policy to increase nursings' contribution to quality healthcare. They proposed that nurses everywhere must use innovative solutions to operationalize the "evidence" in evidence-based nursing and that the QHOM provides a useful way of advancing research and evidence about the quality of healthcare in America. That when used with the conceptual framework for the National Health Care Quality Report the

QHOM provides a map for identifying evidence gaps and research questions arising from the model and conceptual framework as well as evidence synthesis, integrating methodologic quality driven by theoretical understanding (Swan & Borwick, 2004).

Lake (2006) defines nursing outcome research as research to identify or quantify the effect of nursing practice on patient outcomes. Although most clinical nursing research could be considered outcomes research the term "outcomes research" has come to be associated with a focus on how the organization of nursing impacts efficacy of a individual nursing intervention. The organizational focus makes this type of outcomes research multilevel in nature and fit within the QHOM.

Doran et al. (2006) refer to QHOM in their study around nursing-sensitive outcomes data collection in acute care and long term care settings and the five outcome categories expected to be sensitive to nursing care inputs; 1) achievement of appropriate self care, 2) demonstration of health promoting behaviors, 3) health related quality of life, 4) perception of being well cared for, and 5) symptom management to criterion.

Huycke and associates (2000) discuss the rapid changes over the past 30 years in the way that health care in the United States has been delivered, financed and regulated and the four stakeholders that have emerged: 1)patients, 2)providers, 3)payors, and 4)public regulatory agencies that do not have a consensus on the definition of quality health care. The authors suggest that five ethical principles: 1)autonomy, 2)justice, 3) beneficence, 4) non-malfeasance, and 5)prudence are included in the QHOM framework

and outlines possible relationships between the ethical principles and the key stakeholders.

Gunther and Alligood (2002) conducted an integrative literature review and meta-analysis to establish a framework for defining quality of care based on nursings' unique body of knowledge through identification of nursing actions associated with high quality care with the rationale that nurses are legally liable and morally responsible for the quality of care they provide to patients. Using the QHOM as one of the frameworks, they found that despite a professed philosophy of holism and humanism, nursing relies heavily on the industrially derived structure-process-outcome model with the current emphasis on outcomes. The authors concluded that patient outcomes are the product of the services nurses deliver and are appropriate as defining criteria only when care is being evaluated from the patients perspective. Defining quality from the nursing professions frame of reference focuses on evaluating the services provided; that is nursing actions and behaviors linked to the use of nursing knowledge and that high quality nursing equates with competence in the cognitive, affective and psychomotor domains.

Given and Sherwood (2005) described patient outcomes that are amenable to nursing intervention (nursing-sensitive outcomes) and the role of the Oncology Nursing Society in ensuring patients ability to receive care that enables them to receive the best outcomes and a focus on improving those outcomes allows nursing to drive quality oncology care through clinical practice, education and policy. The authors used the

QHOM to understand the link between interventions and nursing-sensitive patient outcomes.

Ray (1999) explored the philosophical and methodological issues involved in "what counts as making a meaningful difference?" which is the fundamental question in health outcomes research and evidence-based practice. The author also identified key stakeholders and the competing agendas they bring to the debate and also introduced that power to define what counts as meaningful change in health status is typically rooted in disciplinary socialization, linguistic traditions and an orthodox concensus that circumscribes acceptable research foci and methods. The author encourages researchers to involve the target population in designing studies to help rebalance relative stakeholder power and to consider the consequences of their methodological decisions.

Swan , Lang, and McGinley (2004) discuss that despite evidence of nursings' contribution to the quality of care much of what nurses do remains essentially invisible and that it is vital to recognize a need for a paradigm shift in nursing that utilizes new informatics tools required for optimum use of evidence related to the delivery of quality nursing care and that this can be accomplished by embedding nursing language within informatics structures and is essential to make the work of nurses visible and to articulate evidence about the quality and value of nursing in the care of patients, groups and populations.

Wong, Stewart, and Gilliss (2000) modified the quality of care framework and blended the labels of both models with respect to structure, labeling it structure/inputs.

Types of characteristics were specified that can guide the evaluation of areas of interest in a primary care system. This adaptation of the framework systematically organizes standardized data elements that are critical to monitoring and subsequently improving quality of care, guiding research, influencing policy and developing nurse-sensitive outcomes.

OASIS Outcomes

OASIS is the most widely used patient outcome measure in home healthcare since it became mandatory for all agencies participating in the Medicare program to use. Numerous studies have been conducted using the OASIS (Center for Medicare and Medicaid Services, 2006). Rantz and Connolly (2004) put forth that large data sets in non-acute care hold much potential for measuring quality in those settings so that research can move beyond descriptive studies to interventions that can be tested and proven to improve quality of care and outcomes of those we serve.

Doran (2003) discusses the use of OASIS in measuring nursing-sensitive outcomes and the benefits that include being able to establish benchmarks for care and assess performance from year to year and provide data that nurse researchers can use to explore best practices and improve quality of care for home healthcare patients.

Adams et al. (2000) and Fortinsky and Madigan (1997) have examined specifically the relationship between the provision of home healthcare nursing and home healthcare outcomes. The major finding was that neither of these studies found a consistent relationship between home healthcare service utilization and outcomes. In both

of these studies, the provision of home healthcare was quantified using broad measures including number of visits, costs and length of stay, and did not measure home healthcare interventions provided.

An expansion of the use of OASIS in outcomes based quality improvement (OBQI) is currently underway (Centers for Medicare & Medicaid Services, 2006; Delmarva Foundation, 2002; Madigan, Tullai-McGuinness, & Fortinsky, 2002). Studies conducted by Shaughnessy and colleagues (2002a, 2002b) indicate that the OBQI process which involves analyzing outcomes using OASIS and targeting and implementing plans for improvement for the selected outcomes has resulted in improvements of selected outcomes (Shaughnessy, Crisler, et al., 2002a; Shaughnessy, Hittle, et al., 2002b). These studies have focused on re-hospitalization rate and compared targeted OASIS outcome scores with non-targeted outcome scores within the same agency.

Schlenker, Powell, and Goodrich (2005) assessed the initial changes in home healthcare patient outcomes under Medicare's Home Health Prospective Payment System (PPS) implemented by CMS in October 2000 by analyzing Pre-PPS and early PPS data obtained from CMS OASIS and Medicare claim files using regression analysis applied to national random samples to estimate pre-PPS/PPS outcome and visit per episode changes. Findings included outcome changes risk adjusted were mixed and generally modest. Favorable changes includes higher improvement rates under PPS for functioning and dyspnea, higher community discharge rates and lower hospitalization and emergent care rates. Most stabilization non-worsening outcome rates also increased, however,

improvement rates were lower under PPS for wounds, incontinence, and cognitive and emotional/behavioral outcomes. Total visits per episode (case mix, adjusted) declined 16.6 percent although therapy visits increased by 8.4 percent. Conclusions that the outcome and visit result suggest improved system efficiency under PPS (fewer visits, similar outcomes). Declines in several improvement rates merited ongoing monitoring as did subsequent (post home healthcare) hospitalization and emergent care use.

Nelson (2004) discusses the need for nurses to measure the effectiveness of their practice. The Prospective Payment System in 2000 forced home healthcare agencies to become more cost efficient while demonstrating improved patient care outcomes. Tools to measure outcomes include OASIS. As part of the federally mandated outcome based quality monitoring process, home healthcare agencies use the collected OASIS data to identify target areas of service or care that indicate a need for improvement and compare their data to other home healthcare agencies. This author describes how a home healthcare agency integrated OASIS data into its performance improvement program to measure patient outcomes using data about surgical wounds.

Berquist (2003) conducted a retrospective secondary analysis of OASIS data to determine whether admission data routinely collected on OASIS might be used to identify the older adult at risk for pressure ulcer development in home healthcare. The sample included 1711 non-hospice patients 60 years or older and free of pressure ulcers who were admitted to a large Midwestern home healthcare agency. Cox regression analysis showed that limitation in activity to bed, dependence in dressing, and needing

assistance with transferring predicted Stage 1 pressure ulcer development. Bowel/bladder incontinence, oxygen use, a current fracture, and dependence in dressing predicted Stage II and greater pressure ulcer development. Predictors of Stage I plus Stage II and greater pressure ulcers included those predictors from each of the individual models including limitation in activity to bed, dependence in dressing, a current fracture, oxygen use, needing assistance with transferring and urinary incontinence. These findings suggest that the admission OASIS assessment may provide a method for identifying elderly patients who are at risk for developing Stage I and Stage II pressure ulcers in home healthcare.

Kroposki and Alexander (2004) investigated the relationship of workplace variables and client outcomes. The researchers used a correlational, predictive, descriptive design to measure nursing technology, organizational structure, nurses role clarity, client outcomes and client satisfaction in 43 home health sites with 205 nurses and 325 clients completing surveys. Findings suggested that nurses understanding of their roles correlated to the organizational structure. Nurse managers in home healthcare settings can use the model constructed as a result of the research to adjust the dimensions of organizational structure to improve client outcomes. Further research using the QHOM conceptual framework may be of value.

Monsen and Kerr (2004) reported on the increased data reporting requirements, reimbursement changes and automation capabilities that provide new challenges for home healthcare and public health agencies. These factors have become the impetus for computerization of practitioner documentation. Standardized documentation systems

allow agencies to describe client needs, service delivery and related client outcomes and to generate powerful data when used consistently and reliably in practice settings. These authors suggested strategies for assuring data quality and simple, effective analysis and reporting.

Niewenhous (2007) reported on the status of Pay for Performance and OASIS data collection and the outcomes based quality improvement process that have been helping home healthcare agencies to prepare for payment based on the quality of care they provide.

Allen, Burt, Roychoudhury, and Chen (2004) described a pilot project conducted in 5 states that was part of the Centers for Medicare & Medicaid Services plan to implement Outcome Based Quality Improvement (OBQI) in home healthcare settings nationwide. Participating agencies in this project had statistically significant improvements when comparing their performance in 2001 versus their performance in 2000. They did not achieve significant improvement though in comparison to the national reference group and the authors recommend that agencies should implement the OBQI process in its entirety annually until the desired outcome is achieved.

Re-hospitalizations

The expense and intrusion of unplanned hospital readmissions have led clinicians and researchers to view them as a ready area for potential quality improvement. The literature is broadly grouped into a) economic considerations of re-hospitalization including high-cost use, b) quality of care issues stemming from early discharge, c)

substitution or complementary healthcare services as a strategy for reducing impatient days and d) discharge planning processes or interventions that might reduce re-hospitalization (Benbassatt & Taragin, 2000; Fonarow,1998; McKay, Rowe, & Bernt, 1997; Shipton,1996; Warburton,2002).However, gaps in the literature exist in describing what the important factors are in predicting who is at risk for re-hospitalization.

The varying definitions of re-hospitalization, different design methodologies, conflicting statistical evidence, and diverse samples present a challenge for reaching conclusions as to which factors consistently predict re-hospitalization (Franklin, Noetscher, Murphy, & Lagoe,1999; Pollack,2001; Shipton, 1996). Methodological challenges related to the study of hospital re-hospitalizations using secondary data include threats to internal and external validity in the measurement of re-hospitalizations. It is difficult to make comparisons because the definition of terms, methods of data collection, approach to data analysis and overall generalizability differ (Pollack,2001)

Benbassatt and Taragin (2000) looked at re-hospitalizations as a measure of quality of healthcare in a review of the literature and recommended future research focus on specific patient populations as scrutiny of the causes of these re-hospitalizations may lead to identification of unmet clinical, educational and psychosocial needs.

Re-hospitalization and Complex Health Populations

Previous researchers have examined the relationships between acute re-hospitalization and various complex populations receiving home health services. For example, Weissman et al. (1999) tested the relation of re-hospitalization to quality and

the utility of re-hospitalizations as hospital quality measures in a case controlled study of 1,758 Medicare patients in four states between 1991 and 1992 with pneumonia or congestive heart failure. Using a measure of related adverse re-hospitalizations defined as re-hospitalizations that indicated potentially sub-optimal care during initial hospitalization and were identified from administrative data using admission diagnosis and intervening time periods designated by physician panels. Using linear regression to estimate the association between implicit and explicit quality measures and re-hospitalization status and adjusting for severity. The findings were that rates of inferior quality of care did not differ significantly by re-hospitalization status and simulations identified no meaningful relationship between related adverse re-hospitalizations and hospital quality of care.

Schwarz and Elman (2003) evaluated whether severity of cardiac illness, cognitive functioning, and functional health of older adults with heart failure and psychosocial factors related to caregiving were predictive of re-hospitalizations for those with heart failure. Using a prospective, descriptive, predictive design their sample included 128 patient-caregiver dyads in two community hospitals in Ohio. Findings included that 44% of the patients were readmitted to the hospital within 3 months. The interaction of caregiver stress and depression were significant predictors of risk of re-hospitalization. Conclusions that nurses should consistently assess changes in patient's cardiac symptoms in addition to their ability to provide self-care and recommended

further study to determine whether interventions designed to increase spousal support would decrease hospital readmissions.

Shipton (1997) studied patients with congestive heart failure receiving home healthcare to pilot an educational tool in the hope it would reduce the number of re-hospitalizations in a given period. A chart review of 1991 medical records was conducted to determine whether a specific disease process accounted for most re-hospitalizations in a large metropolitan hospital in Missouri that had 14,518 hospital admissions to the medical service, 4,356 of which (30%) were re-hospitalizations. Congestive Heart Failure was identified as the disease process with the most re-hospitalizations. A comparative study was conducted to determine whether a systematic educational program for congestive heart failure patients in the home setting would reduce re-hospitalizations and length of stay (Shipton, 1997). The setting was a home healthcare agency in rural Missouri. Several limitations to the study included inability to determine the effectiveness of different nurses to implementing the intervention to the client related to differing educational levels and lack of continuity, a small sample size of 12 subjects and the risk of the patient being re-hospitalized out of the area. The study conclusions were that focus on the acutely ill patient and financial reimbursement to patients and hospitals is primarily for the clinical management of the patients in the hospital. Hospitals are pressured to decrease the cost of services yet elderly and chronically ill individuals use most of the health care resources. Recommendations for further research to examine the

long term costs effects of preventive education and care after discharge compared with the cost of multiple re-hospitalizations were made.

Naylor et al. (2004) examined the effectiveness of a transitional care intervention delivered by advanced practice nurses to elders hospitalized with heart failure. Using a randomized controlled trial with follow-up through 52 weeks post index hospital discharge in six Philadelphia academic and community hospitals they had 239 eligible participants aged 65 and older that were hospitalized with heart failure. The intervention was a 3 month advance practice nurse directed discharge planning and home follow-up protocol. Measurements included time to first re-hospitalization or death, number of re-hospitalizations, quality of life, functional status, costs and satisfaction with care. Conclusions that a comprehensive transitional care intervention for patients hospitalized with heart failure increased the time between hospital discharge and readmission or death, reduced the total number of re-hospitalizations and decreased healthcare costs thus demonstrating promise for improving clinical and economic outcomes.

Barker et al. (1994) examined predictors of hospitalization of community wide nursing home patients using nursing home utilization review and hospital discharge data retrospectively of a cohort of 2120 patients newly admitted to nursing homes and followed for 2 years. Patient characteristics were analyzed for predictors of re-hospitalization. Charges and outcomes were compared with hospitalization of community-dwelling elders. Findings included higher re-hospitalization rates for intermediate vs skilled levels of care and 40% of all re-hospitalizations occurred within 3

months of admission. Length of stay, charges and mortality rates were higher than for hospitalizations from the community. Conclusion that hospitalizations from nursing homes are not easily predicted but may in large part be prevented through health care reforms that integrate acute and long term care.

Arnold et al. (2003) examined rates and predictors of re-hospitalization among 180 adolescents followed up for up to 10.3 years after discharge from an inpatient psychiatric unit. In this prospective, naturalistic study demographic variables including diagnoses, pre-hospitalization suicide attempts, and previous hospitalizations were examined as predictors of re-hospitalization. Univariate analysis revealed significant differences between adolescents who were re-hospitalized and those that were not, in terms of age, presence of an affective disorder and presence of a co-morbid psychiatric disorder. In the multivariate predictor model, age and the presence of an affective disorder were the only significant predictors of re-hospitalization. Although the population studied is quite different, the predictive methodology is of value related to the proposed study.

Boockvar et al. (2003) examined the causes of re-hospitalization after hip fracture and the relationships between re-hospitalization and 6-month physical function and mortality in a prospective, multi-site, observational cohort study with 562 patients. Measurements included demographic characteristics, type of fracture and repair, co-morbid conditions, postoperative complications, do not resuscitate status, and active clinical problems at the time of discharge. Re-hospitalization and principal diagnoses

were ascertained from hospital admission/discharge databases. Findings indicated that re-hospitalizations after hip fracture are largely due to non surgical illness and are associated with increased morbidity and mortality.

Hughes, Johnson, and Nemeth (2000) report on re-hospitalizations as a key measurement tool in outcomes focused health care environment. Monitoring the volume of re-hospitalizations is a process in light of database resources available to care providers. Examining and reporting on the actual reasons for re-hospitalizations provides opportunities for improvement specific to the needs of a patient population. They describe the use of a re-hospitalization coding tool used at a healthcare organization that demonstrates both the ability to assess the causes for patients returning to the organization within thirty days of discharge and the opportunity to correct problems in specific service areas with regard to discharge planning.

Naylor and McCauley (1999) conducted a study using a secondary analysis of data collected on 202 patients hospitalized with common medical and surgical cardiac conditions who completed a 24 week post discharge follow up program as part of a large scale randomized clinical trial. Subjects were 65 and older, admitted from their homes with a cardiac diagnosis. The intervention consisted of comprehensive discharge planning and home follow up by an advanced practice nurse for 4 weeks after discharge. Control subjects received usual care. Findings indicated that medical patients in the intervention group had fewer multiple re-hospitalizations during the 24 weeks of follow up and a reduced total number of days of re-hospitalization. There were fewer re-hospitalizations

in the surgical group when measured from discharge to 6 weeks. There was no difference in functional status between intervention and control groups for either population. The findings of this study suggest that high risk elders with significant cardiac problems may benefit from a care program than emphasizes collaborative, coordinated discharge planning and home follow up that includes telephone and home visits.

Lagoe, Noetscher, and Murphy (2000) developed quantitative benchmarks for hospital outcomes as well as utilization that include both re-hospitalizations and lengths of stay. A number of hospitals in two distinctly different geographic health care environments were studied as to the differences in outcomes and utilization of the most common high cost diagnostic related groups (DRG). Unscheduled re-hospitalizations within 30 days of initial discharge were used as outcome indicators because they reflect both the quality of acute care and the need for case management in the post discharge period. Benchmark targets were established for patients with a diagnosis of congestive heart failure, acute myocardial infarction treated medically, or chronic obstructive pulmonary disease using scattergrams that showed each hospitals mean acute length of stay on the x axis and the re-hospitalization rates on they y axis. Benchmarks were identified as those points with the lowest values for both indicators as demonstrated by points that were closet to the intersection of the two axes.

Lagoe, Noetscher, and Murphy (2000) describe the development of information concerning the distribution of re-hospitalizations by diagnosis in seven different United States metropolitan areas. The data demonstrated that circulatory disorders were

associated with the largest number of communitywide re-hospitalizations in all of the communities. It also showed that circulatory, respiratory and digestive disorders accounted for a majority of re-hospitalizations in all of the areas. This information suggested that case management efforts to reduce re-hospitalizations can focus on a limited range of clinical diagnoses.

Chuang, Wu, Ma, Chen, and We (2005) assessed the effects of patient characteristics at discharge, the need for nursing care, discharge planning program, post hospital care arrangements, and caregiver characteristics of stroke patients discharges from neurological wards in of seven hospitals in the Taipei area. Surveys were conducted on 489 patients prior to discharge and at one month discharge. Of the 489 patients included in the study 24.3% were re-hospitalized. After controlling for other variables, factors associated with re-hospitalizations were the number of limitations in activities of daily living, first incidence of stroke, the need for wound nursing care, the adoption of a care plan, and the discharge locations. Contrary to expectation age, length of stay, counseling before discharge and caregiver burden were not associated with re-hospitalization. The findings of this study indicate that ADL limitation is an effective predictor of re-hospitalization, as well as the need for wound care. Increasing home nursing resources to meet the demand for wound nursing may also be effective in reducing re-hospitalizations.

Ottenbacher, Smith, Illig, Fielder, and Granger (2000) examined the relation between length of stay and re-hospitalization in a large sample of patients who received

inpatient medical rehabilitation from 1994-1998 from 167 hospitals in 40 states

subscribing to the Uniform Data System for Medical Rehabilitation, the largest national

registry of standardized information on medical rehabilitation in the United States, to

provide descriptive information regarding trends between length of stay and re-

hospitalization across different rehabilitation impairment groups. Length of stay for

inpatient medical rehabilitation decreased significantly and the percentage of patients re-

hospitalized increased for all rehabilitation impairment categories examined during the 5

year period. The relative rate for re-hospitalization was highest for patients in the

rehabilitation categories of amputation and neurologic disorders.

Benda (2001) studied a systematic random sample of 600 homeless Vietnam

veterans age 46-56 who abused substances, many of whom were co-morbid with

psychological afflictions. All of these veterans were in a Midwestern residential program

for homeless substance abusers at the time of interview. Cox's proportional hazards

model was used to estimate the relative rate of re-hospitalization or hazard function

across the follow up interval of two years by predictors. The ecological predictors include

but are not limited to demographic characteristics, history of drug and psychiatric

treatment, psychological afflictions, abuse before 18 years of age, inner strengths, social

support, religiosity and direct combat experience in Vietnam. The outcome analyzed was

the proportion of time in the community without re-hospitalization.

Re-hospitalizations and Home Healthcare

Anderson, Hanson, and Devilder (1999) conducted a literature review prior to the requirement that all home healthcare agencies participate in OASIS and found that the literature to that time was grounded in a medical or hospital perspective and failed to address re-hospitalizations during home healthcare. In an attempt to describe clients who have unplanned returns to an inpatient setting during the first 100 days of home healthcare service delivery, they conducted a retrospective chart review of 916 medical records for home healthcare patients from 11 Midwestern home healthcare agencies. Data were based on the Hospital Readmission Inventory Audit (Anderson et al., 1999); a measurement with previously established validity and reliability. One conclusion was that chronic illness appeared to be the best indicator for re-hospitalization. This finding may assist home healthcare clinicians in targeting high risk patients who could benefit from interventions aimed at minimizing unplanned returns to the hospital.

Anderson, Clarke, Helms, and Foreman (2005) conducted a longitudinal mixed design to replicate a study conducted 9 years previously (pre-PPS) in the same home healthcare agency to describe and compare clients who were re-hospitalized during an episode of home healthcare before and after the inception of the prospective payment system. Seventy six closed case medical records were retrospectively reviewed and compared to pre-PPS data. Findings were that currently readmitted clients were sicker than were those in the previous research report, they were readmitted sooner for a

different diagnosis and they had less continuity of services. Conclusions were that the home health industry has undergone dramatic change in payment for services and of particular concern is the adverse patient outcome of an unplanned re-hospitalization. Prior studies have characterized such patients in home healthcare but no comparative reports were found in the literature search since the inception of PPS. Findings from this study indicated that an increased emphasis on cost containment and higher risk clients appear to have changed patterns of care delivery.

Mor (2005) discussed the issue of publicly reporting information stimulates providers efforts to improve the quality of care. The availability of mandated, uniform clinical data in all nursing homes and home healthcare agencies has facilitated the public reporting of comparative quality data. Mor reviewed the technical and conceptual challenges of applying information about the quality of long term care providers and the evidence for the impact of information based quality improvement. Quality "tools" have been used despite questions about the validity of the measures and their use in selecting providers or offering them bonus payments. Although the industry now realizes the importance of quality, research still is needed on how consumers use this information to select providers and monitor their performance and whether these efforts actually improve the outcomes of care.

Marek, Popejoy, Petroski, and Rantz (2006) used a quasi- experimental design to evaluate the clinical outcomes of a nurse care coordination program for people receiving services from a state funded home and community based waiver program. Findings

included that at 12 months one group scored significantly better statistically in the clinical outcomes of pain, dyspnea, and ADL's. No significant differences between groups were found in eight clinical outcome measures at 6 months. Conclusions were that use of nurse care coordination for acute and chronic home care warrants further evaluation as a treatment approach for chronically ill older adults.

Home Care Nurse News (1998) describes a study among home healthcare patients with heart failure that examines services provided to this large number of patients in order to reduce the number of re-hospitalizations and determined that a low percentage of the sample of 102 patients admitted to a Medicare certified home healthcare agency with a heart failure diagnosis were re-hospitalized before their home healthcare treatment ended. Patients received an average of 11 skilled nursing visits over a 37 day period. Seventy-two percent of the patients met the outcome goals established in the plan of care; 12% were re-hospitalized during the time of service; and 14% still received services.

Martens and Dempsey-Mellor (1997) studied the relationship between home healthcare services and re-hospitalization of patients with congestive heart failure, using a retrospective, exploratory, descriptive design and a sample of 924 patients discharged from a hospital to home from two hospitals in Ohio. Findings included that patients receiving home healthcare services were re-hospitalized significantly less often within a period of 90 days after hospital discharge. This study was also done prior to the requirement of OASIS participations by home healthcare agencies.

American Health Consultants (2006) describes an organization whose re-hospitalization rate is 17% which is 11% below the national average and is anecdotally attributed to the practice of front loading visits and an integrated health system. Nurses meet with patient and family and start the plan of care in the home while the patient is still in the hospital.

American Health Consultants (2006) Briggs Corporation (2006) report QIO's help home healthcare organizations in designing efficient systems and implementing an organizational culture of quality. These strategies are designed to accelerate the rate of quality improvement and result in improved patient outcomes for Medicare beneficiaries who receive home healthcare services (Center for Medicare and Medicaid Services, 2006). The strategies to reduce acute care re-hospitalization that the QIO's are working with home healthcare agencies on include; 1) Hospitalization risk assessment, 2) Patient/caregiver emergency care plans, 3) Home telehealth for appropriate patients, including phone monitoring, telemonitoring and teletriage, 4) Medication management, 5) Influenza and Pneumococcal vaccination, 6) Using frontloading visits for high risk populations, 7) Patient/caregiver self-care management skill, and 8) Focusing on disease management of CHF, COPD, diabetes, neoplasm, and chronic skin ulcers to prevent poor outcomes.

Madigan, Schott, and Matthews (2001) viewed re-hospitalization as a multidimensional concern that is influenced by patient, caregiver, healthcare provider and health system factors including overall health system variables that are not often

considered in the literature such as the use of managed care or the timing of the referral to home healthcare. Re-hospitalization is most accurately considered from a health system perspective where costs savings from one sector may be expended in another sector. For example, cost savings obtained from "early" hospital discharge may be reflected in additional expenditures in home healthcare or in subsequent re-hospitalizations. The focus of their study was to describe the events leading to re-hospitalization, examine home healthcare admission to determine which patients would be re-hospitalized, and ascertain whether the re-hospitalizations were considered necessary and/or preventable. Data was collected using the Hospital Readmission Inventory, selected items from OASIS B1, the functional status items mandated for collection at the time of the pre-OASIS study and a set of questions generated by the research team. Data was collected by home healthcare nurses in three home healthcare agencies in a Midwestern urban area on a convenience sample of 117 heart failure patients. The finding of a re-hospitalization rate of 24% in this sample of home healthcare patients was similar to that found in other studies of elders in general (Madigan et al.) and with home healthcare patients with heart failure (Madigan et al.). Based on these findings the researchers raised the question of whether home healthcare agencies should use any re-hospitalization as an indicator of failure of the home healthcare system or whether a base rate of predictable hospitalization should be established within the population of patients who have heart failure as a diagnosis. The findings were consistent with other studies in spite of the different design and methodologies that the researchers suspected that the 20% to 25% rate may be the

baseline expectation. Thus, quality improvement indicators in outcome based quality improvement (OBQI) that set the threshold of re-hospitalization lower than this may be unrealistic and unnecessarily restrictive. The most critical period for the occurrence of a re-hospitalization is within the first 3 weeks. Re-hospitalization is not solely a home healthcare issue but crosses other sites of care such as hospital, sub-acute and home healthcare. With the structural changes in home healthcare quality activities that require home healthcare agencies to examine re-hospitalization rates there is increasing focus on the issue.

Proctor, Howell, Li, and Dore (2000) studied older adults with congestive heart failure and tested the hypothesis that adequate home healthcare operationalized as patient-perceived adequacy of formal and informal assistance is associated with lower re-hospitalization. The study followed 253 elderly (age 65 and older) Medicare patients discharged to their homes after hospitalization for congestive heart failure. Structured telephone interviews were conducted at 2, 6, 10 and 14 weeks post discharge. Study findings indicated the importance of home healthcare in reducing high risk of re-hospitalization among elderly patients.

Smith et al. (2005) conducted a pilot study to assess utilization of acute healthcare services among seniors receiving home healthcare in Canada to determine associated outcomes. This prospective cohort study followed 47 seniors admitted to home healthcare by two home healthcare agencies in Canada over a 12 month period. Demographic information and medical history were collected at baseline and patients were followed

until either termination of home healthcare services, death, or the end of the study. The

primary outcome was re-hospitalization. Secondary outcomes included emergency

department visits without admission calculated. Univariate analyses were performed to

test for potential risk factors. Survival curves for accumulative rates of re-hospitalization

and emergency department visits were created. Conclusions were that the incidence of re-

hospitalization and visits to the emergency department among seniors receiving home

healthcare services is high and presence of co-morbidity appears to be an important

predictor for re-hospitalization (Smith et al., 2005).

Rosati, Huang, Waliser, and Feldman (2003) study explored factors that place

patients at risk for re-hospitalizations after home healthcare admission. One year of

retrospective outcomes assessment information data from a large home healthcare agency

was used to identify 7,393 patients who had at least one episode of re-hospitalization.

Descriptive, bivariate and multivariate analysis were conducted to examine the

associations between the risk of repeated unplanned re-hospitalizations and home

healthcare recipients' socio-demographic characteristics, social and environmental

structures, clinical history and functional status. Adjusted odds ratios, 95% confidence

intervals and p values were computed. Results revealed that after the data had been

adjusted for age and gender, a number of demographic, clinical and functional factors

predicted re-hospitalizations. Descriptive findings related to socio-demographic

characteristics and social and environmental structures found a greater proportion of

home care recipients at high risk for unplanned re-hospitalizations were women of white

or Hispanic racial/ethnic backgrounds and either dually eligible for Medicare and Medicaid or receiving Medicaid benefits. Significant differences in social structures were observed. Compared with the low risk group a greater proportion of home healthcare recipients at high risk for repeated episodes of unplanned re-hospitalization lacked informal care and fewer received help with IADL's from their primary caregivers. Related to clinical history a significantly larger proportion of those in the high risk group were admitted into home healthcare with chronic conditions such as CHF, diabetes, HIV/AIDS, chronic skin ulcers and COPD. The high risk group was significantly more likely to have had more secondary diagnoses. In addition, a significantly greater proportion of the high risk group experienced difficulty breathing and more were referred to home healthcare from an inpatient setting, including hospitals and skilled nursing facilities. Related to functional status a significantly larger proportion of persons in the high risk group needed assistance with ADL and IADLs and with taking medications. Multivariate findings after being adjusted for age and gender that persons who were significantly more likely to be at risk of having three or more episodes were as follows: those who were dually eligible or Medicaid recipients; were referred from an inpatient setting, including hospitals and skilled nursing facilities; lived alone; had more than two secondary diagnoses; needed help taking medications; had a greater ADL dependency; had difficulty breathing; and were admitted with CHF, diabetes, HIV/AIDS, chronic skin ulcers, or COPD. The results showed that African Americans were less likely to have three or more episodes of unplanned re- hospitalization than whites. Recommendations

for future research included replicating these findings at other home healthcare agencies as well as examining a broader range of clinical predictors. Recommended consideration to conducting analyses of predictors within specific diagnoses.

Keepnews, Capitman, and Rosati (2004) examined the use of OASIS data to analyze patient level outcomes of home healthcare on 1,015 patients receiving home healthcare services from a large independent home health agency between August 1998 and December 1999. They constructed an index consisting of 16 OASIS measures, primarily activities of daily living (ADL) and instrumental activities of daily living (IADL). Scores were computed for functional status on admission and at discharge. Predictors of functional status at discharge were identified by regression analysis. They found that 78.1% of patients improved, 18.5% declined, and 2.8% showed no change. The model explained 57.2% of variance in functional status at discharge. Age, visual impairment, having Medicaid as a payor, urinary incontinence, cognitive impairment, and use of unplanned or emergency care were negatively associated with functional outcomes of care. Being treated for open wounds or lesions, cardiovascular and orthopedic conditions were positively associated with functional outcomes. The researchers concluded that OASIS data can be used to analyze patient-level functional outcomes of short-term home healthcare services and recommended further research to continue refining methods of analyzing patient outcomes and their predictors.

Diabetes Outcomes and Home Healthcare

Dalton (2005) identified three processes for high quality disease management for patients with diabetes and receiving home healthcare; 1) diabetes self-management; 2) clinical management; 3) participant self-management including behavior changes in physical activity, food choices, medication administration, monitoring blood glucose, problem solving for when blood glucose is high or low, management of medication during sick days, risk reduction activities and psychological adaptation. Existing home healthcare OASIS data as a source of outcomes is beneficial, although as it relates to the patient with diabetes and the best method of measurement of blood sugar control, Hemoglobin AIC, may not be available as they are not always required for discharge from home healthcare patients. OASIS measures include two diabetes self care behaviors; the patients ability to administer oral medication and to administer injectable medications. Dalton (2005) describes other outcomes that can focus on determining if home healthcare patients with diabetes demonstrate self care deficits. If patients have adequate ability to care for themselves they will not demonstrate deficits in self care. If patients do not have adequate ability to care for themselves they will demonstrate one or more self care deficits. OASIS data can be used to identify self care deficits for home healthcare patients with diabetes. Five items in the OASIS are relevant measures of self care deficits; 1) Emergent care (M0830), 2) Emergency care reason (M0840), 3) Inpatient facility admission (M0855), 4) Reason for hospital admission (M0890), 5) Patient

disposition at time of discharge (M0870). The patient's clinical record is the source of

two other important outcomes, American Diabetes Association (ADA) blood glucose

control and physician glucose control. The recorded blood glucose on the day of

discharge can be obtained to determine if the blood glucose meets ADA guidelines and

the physician glucose parameter guidelines. Other important patient self care behaviors

that are important outcomes for home healthcare patients with diabetes, such as glucose

monitoring and diet adherence are not measured by OASIS and may be captured by using

clinical data aside from OASIS data.

Patients with Wounds and a Co-morbidity of Diabetes

Fife (2007) reports on Pay for Performance and how it will work for patients with

diabetes and wound care. A review of the 10 diagnoses for which CMS expends the

largest amount of its budget, three of them are related to diabetes: chronic ulcerations,

infection, and PVD. It is estimated that $8.5 billion is spent for wound care products and

services. Two percent of all chronic ulcerations are caused by diabetes. The prevalence of

diabetes in the population is increasing at 14 percent per year and diabetic wounds

represent 80 percent of all chronic wound costs. Several national organizations have

established evidence-based guidelines. The National Quality Forum is an organization

that endorses national consensus standards for measuring and publicly reporting on

performance. The National Quality Forum endorsed standards will become the primary

standards used to measure the quality of health care in the United States. Currently, there

are only a few standards pertaining to diabetes.

Rosenblum (2007) reports on the increasing numbers of patients with pressure ulcers being admitted to home healthcare driving up re-hospitalization rates and skilled nursing visits and clinical outcomes suggest that the industry as a whole has not made substantial improvement in the management of pressure ulcers. The clinical and financial implications of the data support the need for focused attention, increased education and better management of pressure ulcers. In light of the payment and medical supply changes that take effect January 1, 2008 it is recommended that home healthcare agencies incorporate pressure ulcer best practices. Data was obtaining from OASIS records, 837 claims and visit files of over 1,500 home health agencies and demonstrate that increasing numbers of patients with pressure ulcers are being admitted to home healthcare and the trend will likely continue, 86% of these pressure ulcers are either not healing or partially granulated on admission to home health care, re-hospitalization rates among these patients are 39% and are emergent or urgent in nature, re-hospitalizations are twice as likely to occur among these patients due to infections, worsening status of the pressure ulcer and/or urinary incontinence, pressure ulcers require one third more skilled nursing and aide visits.

Pettit (2007) reports that according to the Healthcare Cost and Utilization Statistical Brief of April 2006 pressure ulcers are increasingly common in United States hospitalizations. In 2003, 455,000 hospital stays were documented during which the patient had a pressure ulcer. This was a 63% increase over the past 11 years while overall

hospitalization increased by only 11%. Concurrent diagnosis included diabetes (22.7%), paralysis (27.4%), senility (22.7%), and malnutrition 17.8%).

Harrington, Corea, Zagari, and Klitenic (2000) examined the healthcare costs related to patients with diabetes and lower extremity ulcers by estimating the prevalence of diabetes and diabetic lower extremity ulcers in the Medicare population, characterized the Medicare population specific costs for lower extremity ulcer episodes, and evaluated potential cost savings associated with better healing of lower extremity ulcers by analyzing Medicare claims data from 1995 to 1996 standard analytic files. Harrington et al. found that Medicare expenditures for lower extremity ulcer patients were on average 3 times higher than those for Medicare patients in general. Lower extremity ulcer related spending accounted for 24% of total spending for lower extremity ulcer patients. Most of the ulcer related costs accrued on the inpatient side, proportionately smaller amounts went to physicians and nursing home facilities. To determine the potential effect of better diabetic ulcer management a model was created that estimated the impact on costs with improved healing rates. Improving the 20 week healing rate from 31-40% would save Medicare $189 per episode. Harrington et al. concluded that lower extremity ulcers cost the Medicare system $1.5 billion in 1995. Any wound care intervention that could prevent even a small percentage of wounds from progressing to the stage at which inpatient care is required may have a favorable cost effect on the Medicare system.

Nash, Bellew, Cunningham, and McCulloch (2005) using a retrospective exploratory data analysis of 50 patients with diabetes and neuropathy and/or peripheral

vascular disease who succumbed to amputation and 30 patient with same risk factors who did not have amputation to explore the quality of medical care and patient compliance that were operationally defined using current guidelines for management of patients with diabetes. Findings included that medical care below standard of care for patients with diabetes and poor patient compliance are significant predisposing factors for amputation in patients with diabetes and suggest that more comprehensive medical care and patient involvement may attenuate the risk of amputation in patients with diabetes.

Home Healthcare and Wounds

Pieper (1999) studied home care patients with wounds to ascertain the number of home care patients with wounds, determine the types of wounds being treated in the community and identify wound care treatments used at home. This was a descriptive, multi-site collaborative project involving 13 home care agencies in Michigan that volunteered through a research consortium. Systematic sampling was used to select nursing in each agency to collect data. Two hundred eighty-one nurses recorded information about patients visited during the week of the study. Data was recorded about 2847 patients. Patients with wounds were commonly found in home healthcare. Wounds were present in 36.3% of the patients. Of the patients with wounds 58.3% had one wound and 41.7 % had multiple wounds. Wound types included surgical (62.4%), pressure ulcers (24.9%), and vascular leg ulcers (22.2%). There was a low utilization of specialty dressings and commercial irrigation solutions across all wound types; tap water and gauze were the most used wound care treatments. In addition, patients with wounds had

significantly longer home healthcare visits than patients without wounds, thus, nurses who follow patients with wounds may need additional time to provide the care.

Bell-Syer, Foxlee, and Cullum (2007) report on the Cochrane Wounds Group that was established in 1995 with the aim of conducting systematic reviews of randomized controlled trial evidence to establish the effectiveness of interventions for the prevention and treatment of wounds and their complications. The Wounds group has developed and maintains a database of clinical trials relevant to the scope of the group known as the Cochrane Wounds Group Specialized Trials Register. This register was developed and is maintained by systematically searching electronic databases such as MEDLINE, EMBASE, CINAHL and the Cochrane Central Register of Trials and by hand searching the wound care literature and conference proceedings. As of November 2006, 376 trials were included in the 43 Cochrane Wounds group reviews published. Looking at the register as a whole approximately 1852 citations refer to chronic wounds studies, yet only 198 or 11% of these have been incorporated into reviews. Gaps include subjects such as topical agents for treating diabetic foot ulcers, dressings to treat donor sites, repositioning and mobilization for treating pressure ulcers and surgical repair of lacerations.

Wound and Ostomy and Continence Nurses Society (2006) set forth home healthcare guidelines on skin and wound status items. As mandated by the Balanced Budget Act of 1997, home healthcare reimbursement shifted to a prospective payment system effective October 2000. Under this system, payment is based on the patient's clinical severity, functional status and therapy requirements. The following guidelines for

classification of wounds were developed by a consensus panel of content experts; 1)

MO445: Does the patient have a pressure ulcer? 2) MO450: Current number of pressure

ulcers at each stage, 3) MO460: Stage of most problematic (observable) pressure ulcer, 4)

MO464: Status of most problematic (observable) pressure ulcer, 5) MO468: Does the

patient have a stasis ulcer? 6) MO470: Current number of observable stasis ulcers, 7)

MO474: Does this patient have at least one stasis ulcer that cannot be observed? 8)

MO476: Status of the most problematic (observable) stasis ulcer, 9) MO482: Does the

patient have a surgical wound? 10) MO484: Current number of (observable) surgical

wounds, 11) MO486: Does the patient have at least one surgical wound that cannot be

observed due to the presence of a non-removable dressing? and 12) MO488: Status of

the most problematic (observable) surgical wound.

Bedell, Bradley, and Pupiales (2003) described how the Visiting Nurse Service of

New York developed an interdisciplinary wound resource team based on the need to

integrate new wound care research and products and prepare for the Prospective Payment

System. This organization is the largest nonprofit home healthcare agency in the United

States providing community based services to more than 24,000 patients daily of which

27% are referred for wound care. Most common wound categories include pressure

ulcers, surgical wounds, venous stasis ulcers and neuropathic ulcers and if not treated

promptly using evidence-based guidelines the financial and emotional costs of these

wounds are high. In the United States an estimated $2.5 billion is spent annually on

wound care and pressure reducing products. This cost does not include the associated medical, financial and quality of life issues experienced by patients and caregivers.

Graham, Harrison, Cerniuk, and Bauer (2007) describe a partnership between health services researchers from two Canadian university's, a community nursing agency and a home healthcare authority that led to major improvements in the quality of care for people with leg ulcers. The synthesis of both external and local evidence played a key role in the adoption of an evidence-based protocol and provided critical context to support a significant reorganization of an existing service delivery model. This demonstrated that with a collaborative partner approach, systematic and transparent research processes can be rapidly developed to support policy change.

Lorimer, Harrison, Graham, Friedberg, and Davies (2003) studied the congruency of community provided leg ulcer care with best practice to identify organizational and clinical factors associated with the provision of best practice by conducting a chart audit of 66 patient records in a home healthcare agency in Canada. Several gaps were identified in the care provided and a standardized approach to care was needed that included a comprehensive leg ulcer assessment to determine the ulcer etiology, determination of an Ankle Brachial Pressure Index score to screen for the presence of arterial disease and compression for all clients who meet the criteria for venous disease. A reorganization of services was recommended which included an increased role for community nurses in leg ulcer assessment and management.

Graham et al. (2005) describe efforts to address the issue of growing resources devoted to individuals requiring community care for leg ulcers a Canadian home healthcare authority established and evaluated a demonstration leg ulcer service using the Practice Guideline Evaluation and Adaptation Cycle. In an effort to provide current and evidence-based care existing leg ulcer clinical practice guidelines were identified and appraised for quality and suitability to the new service. Of 19 identified leg ulcer practice guidelines, 14 were not evaluated because they did not meet the criteria. Of the 5 remaining guidelines, 3 were fairly well developed and made similar recommendations. The level of evidence supporting specific recommendations ranged from randomized clinical trial evidence to expert opinion. By comparing the methodologic quality and content of the guidelines the task force reached consensus regarding recommendations appropriate for local application.

Pieper et al. (2007) examined patients wound knowledge and concerns prior to discharge from an acute care hospital in a comparative descriptive study of 76 patients with wounds using a questionnaire. Results suggested that patients greatest concerns about going home were: 1) how active to be at home 2) wound pain 3) looking for wound complications and 4) watching for wound infections.

Graham, Harrison, Nelson, Lorimer, and Fischer (2003) conducted a systematic review of prevalence studies of lower-limb ulceration in adults to determine the prevalence of leg ulcers reported in the literature. Twenty two reports of prevalence studies were identified. Eight population based prevalence studies used clinical validation

and reported prevalence rates of open ulcers ranging from 0.12% to 1.1% of the
population; the prevalence rate of open or healed ulcers was reported to be 1.8%. Seven
population based prevalence studies without clinical validation reported prevalence rates
of open ulcers ranging from 0.12% to 0.32% of the population. Differences in the
populations studied, study design, ulcer definition, ulcer etiology, inclusion of foot ulcers,
method of clinical assessment, and clinical validation of ulcer cases indicate that it is
inappropriate to pool the estimates of prevalence. In most studies that considered age and
sex, the prevalence of ulcers increased with age and was higher for women.

Friedberg, Harrison, and Graham (2002) conducted a descriptive study over a 4
week period in 1999 to gain a better understanding of the home healthcare expenditures
incurred in providing care to the population with leg ulcers in an urban area in Canada.
Home healthcare nurses visited all clients and completed an in depth assessment of their
social, medical and leg ulcer history. Legs were inspected, an ankle brachial pressure
index score was determined and ulcers were examined and measured. For each nursing
visit, supply usage, travel and treatment times and mileage were tracked. During the
study period 2270 visits were made costing $80.62 Canadian dollars; supply costs were
$21.06. The regional annual home healthcare expenditures were conservatively estimated
to be $1.3 million, The authors argue costs could potentially be reduced by cutting the
40% visit time attributed to travel, decreasing the visit frequency to clients with minimal
drainage and attention to best practice.

The National Association Of Wound Care (2007) recommend that the standards of care guidelines established by the American Diabetes Association be followed in assessing the diabetic foot in clinical practice and that all patients with diabetes should receive an annual foot examination to identify high risk foot conditions that may lead to amputation or foot ulcerations. High risk conditions include peripheral neuropathy with loss of protective sensation, altered biomechanics, evidence of increased pressure, bone deformity, peripheral vascular disease, a history of ulcers or amputation and severe toe deformities. People with 1 or more high risk conditions should be evaluated more frequently for the development of additional risk factors.

Kravitz, McGuire, and Sharma (2007) reviewed the literature related to the treatment of diabetic foot ulcers and findings included that treatment of diabetic foot ulcers requires a thorough understanding of the factors associated with the development of chronic wounds in the foot including assessment of the neurovascular integrity of the foot and ankle. The successful resolution of foot ulcers is highly dependent on the choice of wound dressings and the method used to offload the extremity. Nonviable tissues and wound debris must be removed or excised to stimulate the wound healing cascade and create an environment where good wound care will facilitate healing. Pathomechanical weightbearing forces, including shear, must be removed from the wound surface. Management of these patients is best accomplished with a transdisciplinary team approach.

Wound Healing Society (2006) culminated a three year effort by content experts to develop Wound Care Guidelines that include a review of the literature, definitions, diagnostic criteria, patient stratification, co-morbidity, wound bed preparation, specific wound treatment, whole patient treatment, continuing care and treatment efficacy/outcome measures.

Based upon this exhaustive literature review gaps were identified related to an integrated, systematic, evidence-based approach of health care delivery to complex health populations at both a macro and micro level in the United States.

Chapter 3

METHODOLOGY

The overall purpose of this study was to examine the predicative capability of OASIS admission data for acute care re-hospitalization of home healthcare patients with wounds and a co-morbidity of diabetes. The Quality Health Outcomes Model supports the reciprocal interaction among the four constructs of system characteristics, interventions, client characteristics and outcomes. In this study the four constructs are operationalized as a Medicare certified home healthcare agency that is part of an integrated public health system (system characteristic) home healthcare (interventions), patients with wounds and a co-morbidity of diabetes (client characteristics) and acute care re-hospitalization (outcome). This chapter provides a description of the research design, sample and sampling, instrumentation, data collection procedures and data analytic techniques. The protection of human subjects is also discussed.

Specific Aim

To examine the relationship of routine OASIS admission data with the patient level outcome acute hospital readmission of patients with wounds and a co-morbidity of diabetes receiving home healthcare services.

Design

A descriptive correlation design using secondary analysis of retrospective data collected from the OASIS, July 1, 2006 through June 30, 2007 was used for this study. A descriptive correlational study is defined as a study conducted in a naturalistic setting without any attempt to modify, control, or introduce something new to the environment (Kerlinger & Lee, 2000). Descriptive designs are employed when the researcher wishes to obtain information in an area in which little previous investigation has occurred (Kerlinger & Lee, 2000). Although the OASIS has been used to determine outcomes of home healthcare services it has not been examined for utilization as a predictor of acute care re-hospitalization. An exhaustive review of the literature found no one has examined OASIS for it utility in predicting acute care re-hospitalization for home healthcare patients. Agencies are required to improve their outcomes in total rather than looking at specific disease processes or other individual criteria that might represent barriers to improvement in overall outcomes (Center for Medicare and Medicaid Services, 2006). Using data from a large home healthcare agency that is part of a healthcare system this study examined predictors of re-hospitalization in home healthcare patients with wounds and a co-morbidity of diabetes for whom OASIS admission and discharge data were available. The dependent variable of interest was acute care re-hospitalization.

Setting and Subjects

The sample included patients with complete episodes of care who were admitted to a large Southern California health system home healthcare agency that serves both

urban and rural areas between July 1, 2006 and June 30, 2007 and which OASIS data was available. Patients were selected based on the International Statistical Classification of Diseases and Related Health Problems (ICD) codes that classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury or disease. Every health condition can be assigned to a unique category and given a code, up to six characters long. Such categories can include a set of similar diseases (Centers for Medicare and Medicaid, 2006).

The International Classification of Diseases is published by the World Health Organization (Center for Medicare and Medicaid Services, 2006). The ICD is used world-wide for morbidity and mortality statistics, reimbursement systems and automated decision support in medicine. This system is designed to promote international comparability in the collection, processing, classification, and presentation of these statistics. The ICD is a core classification of the WHO Family of International Classifications (WHO-FIC).

The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) is based on the World Health Organization's Ninth Revision, International Classification of Diseases (ICD-9) Center for Medicare and Medicaid Services (2006). ICD-9-CM is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States.

The National Center for Health Statistics (NCHS) and the Centers for Medicare and Medicaid Services are the U.S. governmental agencies responsible for overseeing all changes and modifications to the ICD-9-CM.

ICD-9-CM 250 for diabetes was selected as an independent variable. Exclusion criteria was incomplete episodes of care defined as incomplete OASIS data available.

Power, Effect and Sample Size

Every subject who met the inclusion criteria between July 1, 2006 and June 30 , 2007 was included in the study. There is no consensus on the approach to compute the power and sample size with logistic regression. Some authors use the likelihood ratio test; some use the test on proportions; some suggest various approximations to handle the multivariate case. Some advocate the use of the Wald test since the Z-score is routinely used for statistical significance testing of regression coefficients (Demidenko, 2007). Since this is a descriptive study with the aim of examining the predictive utility of OASIS and not focused on hypothesis testing, the Final Logistic Regression Model, which includes statistical significance defined by $p < 0.05$, where p is from the Wald test for Confidence Interval for the Odds Ratio and overall statistical significance is tested by the likelihood ratio test $p < 0.1$, will be used to demonstrate logistic regression model fit.

Measurement and Data Collection Procedures

Data on potential predictors for acute care re-hospitalization were obtained from admission OASIS assessment and include such items as overall prognosis, rehabilitation

prognosis, dyspnea, urinary incontinence, bowel incontinence, current oral medications and ability to dress upper body.

Decisions about the use of home healthcare outcomes measures for such considerations as public reporting and pay for performance are based on OASIS validity and reliability studies that were conducted by the University of Colorado prior to the roll out (Center for Medicare and Medicaid Services, 2006). As such, these studies were limited to a small number of home healthcare agencies, many of whom participated in the development of the OASIS data set and the item definitions and guidance. Since the national roll out of OASIS in 1999, CMS has issued new guidance on how to interpret and respond to many of the OASIS questions (Center for Medicare and Medicaid Services, 2006). However, very little research has been conducted on the reliability and validity of OASIS since that time (National Association for Home Care & Hospice, 2007).

The most recent research was a study by the Visiting Nurse Service of New York's Center for Home Care Policy and Research completed in 2001. This study found that in the real-world application of OASIS many of the data items scored low in reliability tests. Of particular concern is their findings of low reliability for the instrumental activities of daily living (IADL), functional status in the 14 days prior to the episode, and prognosis.

Recommendations outlined in the 2007 Regulatory Blueprint for Action by the National Association for Home Care & Hospice included conducting new research on the

validity and reliability of OASIS application in the real world as well as refraining from using outcome measures derived from OASIS data for pay for performance until further studies have been completed and necessary changes made to the data set (National Association for Home Care & Hospice, 2007). These recommendations were based on the rationale that the research on the validity and reliability of OASIS conducted during its development cannot be relied on outside of the study environment (National Association for Home Care & Hospice, 2007).

Dependent Variable

Unscheduled re-hospitalization from home healthcare defined as the completion of Transfer to an Inpatient Facility and was measured using OASIS item M0855.

Independent Variables OASIS Items

Diabetes Diagnosis is defined as either primary or secondary and the ICD 9 CM 250 and was measured using OASIS items M0230/240.

Patient Gender is defined as either Male or Female and was measured using item M0069

Ethnicity on the OASIS is classified as American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Pacific Islander, Caucasian and Unknown and is measured with item M0140.

Overall Prognosis: BEST description of patient's overall prognosis for recovery from this episode of illness and is scored, 0 = Poor: little or no recovery is expected

and/or further decline is imminent, 1 = Good/Fair: partial to full recovery is expected, and UK = Unknown. It is measured by OASIS item M0260.

Rehabilitative Prognosis is defined as the best description of patient's prognosis for functional status and is scored, 0 = Guarded: minimal improvement in functional status is expected; decline is possible, 1 = Good: marked improvement in functional status is expected, and UK = Unknown. This is measured by OASIS Item M0270.

Life Expectancy is defined as the projected amount of time patient has to live (Physician documentation is not required) and is scored, 0 = Life expectancy is greater than 6 months, or 1 = Life expectancy is 6 months or fewer. It is measured with item M0280.

High Risk Factors characterizing this patient: (Mark all that apply) and is scored, 1 = Heavy smoking, 2 = Obesity, 3 = Alcohol dependency, 4 = Drug dependency, 5 = None of the above, or UK = Unknown and is measured by item M0290.

Living circumstances is defined as who patient lives with: (Mark all that apply)and is scored, 1 = lives alone, 2 = with spouse or significant other, 3 = with other family member, 4 = with a friend, 5 = with paid help (other than home care agency staff), or 6 = With other than above and is measured with item M0340.

Primary Caregiver taking lead responsibility for providing or managing the patient's care, providing the most frequent assistance, etc. (other than home care agency staff), is scored, 0 = No one person [If No one person, go to M0390], 1 = spouse or significant other, 2 = daughter or son, 3 = other family member, 4 = friend or neighbor or

community or church member, 5 = paid help, or UK = Unknown [If Unknown, go to M0390], and is measured by item M0360.

Vision with corrective lenses if the patient usually wears them is scored, 0 = Normal vision: sees adequately in most situations; can see medication labels, newsprint, 1 = Partially impaired: cannot see medication labels or newsprint, but can see obstacles in path, and the surrounding layout; can count fingers at arm's length, 2 = Severely impaired: cannot locate objects without hearing or touching them or patient non-responsive, and is measured by item M0390.

Hearing and Ability to Understand Spoken Language in patient's own language (with hearing aids if the patient usually uses them)is scored, 0 = No observable impairment. Able to hear and understand complex or detailed instructions and extended or abstract conversation, 1 = with minimal difficulty, able to hear and understand most multi-step instructions and ordinary conversation. May need occasional repetition, extra time, or louder voice, 2 = Has moderate difficulty hearing and understanding simple, one-step instructions and brief conversation; needs frequent prompting or assistance, 3 = Has severe difficulty hearing and understanding simple greetings and short comments. Requires multiple repetitions, restatements, demonstrations, additional time, 4 = Unable to hear and understand familiar words or common expressions consistently, or patient non-responsive, and is measured by item M0400.

Speech and Oral (Verbal) Expression of Language (in patient's own language)is scored, 0 = Expresses complex ideas, feelings, and needs clearly, completely, and easily

in all situations with no observable impairment, 1 = Minimal difficulty in expressing

ideas and needs (may take extra time; makes occasional errors in word choice, grammar

or speech intelligibility; needs minimal prompting or assistance), 2 = Expresses simple

ideas or needs with moderate difficulty (needs prompting or assistance, errors in word

choice, organization or speech intelligibility). Speaks in phrases or short sentences, 3 =

has severe difficulty expressing basic ideas or needs and requires maximal assistance or

guessing by listener. Speech limited to single words or short phrases, 4 = Unable to

express basic needs even with maximal prompting or assistance but is not comatose or

unresponsive (e.g., speech is nonsensical or unintelligible), 5 = Patient nonresponsive or

unable to speak, and is measured by item M0410.

Frequency of Pain interfering with patient's activity or movement is scored, 0 =

patient has no pain or pain does not interfere with activity or movement, 1 = less often

than daily, 2 = daily, but not constantly, 3 = all of the time, and is measured by item

M0420.

Intractable Pain: Is the patient experiencing pain that is not easily relieved, occurs

at least daily, and affects the patient's sleep, appetite, physical or emotional energy,

concentration, personal relationships, emotions, or ability or desire to perform physical

activity is scored, 0 = No, 1 = Yes, and is measured by item M0430.

Does this patient have a Skin Lesion or an Open Wound? This excludes

"OSTOMIES," is scored, 0 = No [If No, go to M0490], 1 = Yes, and is measured by

item M0440.

When is the patient dyspneic or noticeably Short of Breath, is scored, 0 = never, patient is not short of breath, 1 = when walking more than 20 feet, climbing stairs, 2 = with moderate exertion (e.g., while dressing, using commode or bedpan, walking distances less than 20 feet), 3 = with minimal exertion (e.g., while eating, talking, or performing other ADLs) or with agitation, 4 = At rest (during day or night), and is measured by item M0490.

Has this patient been treated for a Urinary Tract Infection in the past 14 days, is scored, 0 = No, 1 = Yes, NA = Patient on prophylactic treatment, and UK = Unknown, and is measured by item M0510.

Urinary Incontinence or Urinary Catheter Presence, is scored, 0 = No incontinence or catheter (includes anuria or ostomy for urinary drainage) [If No, go to M0540], 1 = patient is incontinent, 2 = patient requires a urinary catheter (i.e., external, indwelling, intermittent, suprapubic)[Go to M0540], and is measured by item M0520.

Bowel Incontinence Frequency is scored, 0 = very rarely or never has bowel incontinence, 1 = less than once weekly, 2 = one to three times weekly, 3 = four to six times weekly, 4 = on a daily basis, 5 = more often than once daily, NA = patient has ostomy for bowel elimination, UK = unknown, and is measured by item M0540.

Current Ostomy for Bowel Elimination: Does this patient have an ostomy for bowel elimination that (within the last 14 days): a) was related to an inpatient facility stay, or b) necessitated a change in medical or treatment regimen is scored, 0 = patient does not have an ostomy for bowel elimination, 1 = patient's ostomy was not related to an

inpatient stay and did not necessitate change in medical or treatment regimen, 2 = The

ostomy was related to an inpatient stay or did necessitate change in medical or treatment

regimen, and is measured by item M0550.

Cognitive Functioning: (Patient's current level of alertness, orientation,

comprehension, concentration, and immediate memory for simple commands.) is scored,

0 = alert/oriented, able to focus and shift attention, comprehends and recalls task

directions independently, 1 = requires prompting (cuing, repetition, reminders) only

under stressful or unfamiliar conditions, 2 = requires assistance and some direction in

specific situations (e.g., on all tasks involving shifting of attention), or consistently

requires low stimulus environment due to distractibility, 3 = requires considerable

assistance in routine situations. Is not alert and oriented or is unable to shift attention and

recall directions more than half the time, 4 = Totally dependent due to disturbances such

as constant disorientation, coma, persistent vegetative state, or delirium, and is measured

by item M0560.

When Confused (Reported or Observed) is scored, 0 = never, 1 = in new or

complex situations only, 2 = on awakening or at night only, 3 = during the day and

evening, but not constantly, 4 = constantly, NA = patient nonresponsive, and is measured

by item M0570.

When Anxious (Reported or Observed) is scored, 0 = none of the time, 1 = less

often than daily, 2 = daily, but not constantly, 3 = all of the time, NA = patient

nonresponsive, and is measured by item M0580.

Behaviors Demonstrated (at Least Once Observed): (Mark all that apply is scored,

1 = memory deficit: failure to recognize familiar persons/places, inability to recall events

of past 24 hours, significant memory loss so that supervision is required, 2 = impaired

decision-making: failure to perform usual ADLs or lADLs, inability to appropriately stop

activities, jeopardizes safety through actions, 3 = verbal disruption: yelling, threatening,

excessive profanity, sexual references, etc, 4 = physical aggression: aggressive or

combative to self and others (e.g., hits self, throws objects, punches, dangerous

maneuvers with wheelchair or other objects), 5 = disruptive, infantile, or socially

inappropriate behavior (excludes verbal actions), 6 = delusional, hallucinatory, or

paranoid behavior, 7 = none of the above behaviors demonstrated, and is measured by

item M0610.

Frequency of Behavior Problems (Reported or Observed) (e.g., wandering

episodes, self abuse, verbal disruption, physical aggression, etc.) is scored, 0 = never, 1 =

less than once a month, 2 = once a month, 3 = several times each month, 4 = several

times a week, 5 = at least daily, and is measured by item M0620.

Receiving Psychiatric Nursing Services is scored, 0 = No, 1 = Yes, and is

measured by item M0630.

Current Grooming(M0640) Grooming: Ability to tend to personal hygiene needs

(i.e., washing face and hands, hair care, shaving or make up, teeth or denture care,

fingernail care) and is scored, 0 = able to groom self unaided, with or without the use of

assistive devices or adapted methods, 1 = grooming utensils must be placed within reach

before able to complete grooming activities, 2 = someone must assist the patient to groom self, 3 = patient depends entirely upon someone else for grooming needs, UK = unknown, and is measured by item M0640.

Current Ability to Dress Upper Body Ability to Dress Upper Body (with or without dressing aids) including undergarments, pullovers, front-opening shirts and blouses, managing zippers, buttons, and snaps and is scored, 0 = able to get clothes out of closets and drawers, put them on and remove them from the upper body without assistance, 1 = able to dress upper body without assistance if clothing is laid out or handed to the patient, 2 = someone must help the patient put on upper body clothing, 3 = patient depends entirely upon another person to dress the upper body, UK = unknown, and is measured by item M0650.

Current Ability to Dress Lower Body Ability to Dress Lower Body (with or without dressing aids) including undergarments, slacks, socks or nylons, shoes and is scored, 0 = able to obtain, put on, and remove clothing and shoes without assistance, 1 = able to dress lower body without assistance if clothing and shoes are laid out or handed to the patient, 2 = someone must help the patient put on undergarments, slacks, socks or nylons, and shoes, 3 = patient depends entirely upon another person to dress lower body, UK = unknown, and is measured by item M0660.

Current Bathing: Ability to wash entire body. Excludes grooming (washing face and hands only) is scored, 0 = able to bathe self in shower or tub independently, 1 = with the use of devices, is able to bathe self in shower or tub independently, 2 = able to bathe

in shower or tub with the assistance of another person: (a) for intermittent supervision or encouragement or reminders, OR (b) to get in and out of the shower or tub, OR (c) for washing difficult to reach areas, 3 = participates in bathing self in shower or tub, but requires presence of another person throughout the bath for assistance or supervision, 4 = unable to use the shower or tub and is bathed in bed or bedside chair, 5 = unable to effectively participate in bathing and is totally bathed by another person, UK = unknown, and is measured by item M0670.

Current Toileting: Ability to get to and from the toilet or bedside commode is scored, 0 = able to get to and from the toilet independently with or without a device, 1 = when reminded, assisted, or supervised by another person, able to get to and from the toilet, 2 = unable to get to and from the toilet but is able to use a bedside commode (with or without assistance), 3 = unable to get to and from the toilet or bedside commode but is able to use a bedpan/urinal independently, 4 = is totally dependent in toileting, UK = unknown, and is measured by item M0680.

Current Transferring: Ability to move from bed to chair, on and off toilet or commode, into and out of tub or shower, and ability to turn and position self in bed if patient is bedfast is scored, 0 = able to independently transfer, 1 = transfers with minimal human assistance or with use of an assistive device, 2 = unable to transfer self but is able to bear weight and pivot during the transfer process, 3 = unable to transfer self and is unable to bear weight or pivot when transferred by another person, 4 = bedfast, unable to

transfer but is able to turn and position self in bed, 5 = bedfast, unable to transfer and is unable to turn and position self, UK = unknown, and is measured by item M0690.

Current Ambulation/Locomotion: Ability to SAFELY walk, once in a standing position, or use a wheelchair, once in a seated position, on a variety of surfaces is scored, 0 = able to independently walk on even and uneven surfaces and climb stairs with or without railings (i.e., needs no human assistance or assistive device), 1 = requires use of a device (e.g., cane, walker) to walk alone or requires human supervision or assistance to negotiate stairs or steps or uneven surfaces, 2 = able to walk only with the supervision or assistance of another person at all times, 3 = chairfast, unable to ambulate but is able to wheel self independently, 4 = chairfast, unable to ambulate and is unable to wheel self, 5 = bedfast, unable to ambulate or be up in a chair, UK = unknown, and is measured by item M0700.

Feeding or Eating: Ability to feed self meals and snacks. Note: This refers only to the process of eating, chewing, and swallowing, not preparing the food to be eaten, 0 = able to independently feed self and is scored, 1 = able to feed self independently but requires: (a) meal set-up; OR (b) intermittent assistance or supervision from another person; OR (c) a liquid, pureed or ground meat diet, 2 = unable to feed self and must be assisted or supervised throughout the meal/snack, 3 = able to take in nutrients orally and receives supplemental nutrients through a nasogastric tube or gastrostomy, 4 = unable to take in nutrients orally and is fed nutrients through a nasogastric tube or gastrostomy, 5 =

unable to take in nutrients orally or by tube feeding, UK = unknown, and is measured by item M0710.

Current Preparation of Light Meals (e.g., cereal, sandwich) or reheat delivered meals and is scored, 0 = (a) able to independently plan and prepare all light meals for self or reheat delivered meals; OR (b) is physically, cognitively, and mentally able to prepare light meals on a regular basis but has not routinely performed light meal preparation in the past (i.e., prior to this home care admission), 1 = unable to prepare light meals on a regular basis due to physical, cognitive, or mental limitations, 2 = unable to prepare any light meals or reheat any delivered meals, UK = unknown, and is measured by item M0720.

Current Transportation: Physical and mental ability to safely use a car, taxi, or public transportation (bus, train, subway) and is scored, 0 = able to independently drive a regular or adapted car; OR uses a regular or handicap-accessible public bus, 1 = able to ride in a car only when driven by another person; OR able to use a bus or handicap van only when assisted or accompanied by another person, 2 = unable to ride in a car, taxi, bus, or van, and requires transportation by ambulance, UK = unknown, and is measured by item M0730.

Current Laundry: Ability to do own laundry — to carry laundry to and from washing machine, to use washer and dryer, to wash small items by hand and is scored, 0 = (a) able to independently take care of all laundry tasks; OR (b) physically, cognitively, and mentally able to do laundry and access facilities, but has not routinely performed

laundry tasks in the past (i.e., prior to this home care admission), 1 = able to do only light

laundry, such as minor hand wash or light washer loads. Due to physical, cognitive, or

mental limitations, needs assistance with heavy laundry such as carrying large loads of

laundry, 2 = unable to do any laundry due to physical limitation or needs continual

supervision and assistance due to cognitive or mental imitation, UK = unknown, and is

measured by item M0740.

Current Housekeeping: Ability to safely and effectively perform light

housekeeping and heavier cleaning tasks is scored, 0 = (a) able to independently perform

all housekeeping tasks; OR (b) physically, cognitively, and mentally able to perform all

housekeeping tasks but has not routinely participated in housekeeping tasks in the past

(i.e., prior to this home care admission), 1 = able to perform only light housekeeping

(e.g., dusting, wiping kitchen counters) tasks independently, 2 = able to perform

housekeeping tasks with intermittent assistance or supervision from another person, 3 =

unable to consistently perform any housekeeping tasks unless assisted by another person

throughout the process, 4 = unable to effectively participate in any housekeeping tasks,

UK = unknown, and is measured by item M0750.

Current Shopping: Ability to plan for, select, and purchase items in a store and to

carry them home or arrange delivery is scored, 0 = (a) able to plan for shopping needs

and independently perform shopping tasks, including carrying packages; OR (b)

physically, cognitively, and mentally able to take care of shopping, but has not done

shopping in the past (i.e., prior to this home care admission), 1 = able to go shopping, but

needs some assistance: (a) by self is able to do only light shopping and carry small packages, but needs someone to do occasional major shopping; OR (b) unable to go shopping alone, but can go with someone to assist, 2 = unable to go shopping, but is able to identify items needed, place orders, and arrange home delivery, 3 = needs someone to do all shopping and errands, UK = unknown, and is measured by item M0760.

Current Ability to Use Telephone: Ability to answer the phone, dial numbers, and effectively use the telephone to communicate is scored, 0 = able to dial numbers and answer calls appropriately and as desired, 1 = able to use a specially adapted telephone (i.e., large numbers on the dial, teletype phone for the deaf) and call essential numbers, 2 = able to answer the telephone and carry on a normal conversation but has difficulty with placing calls, 3 = able to answer the telephone only some of the time or is able to carry on only a limited conversation, 4 = unable to answer the telephone at all but can listen if assisted with equipment, 5 = totally unable to use the telephone, NA = patient does not have a telephone, UK = unknown, and is measured by item M0770.

Current Management of Oral Medications: Patient's ability to prepare and take all prescribed oral medications reliably and safely, including administration of the correct dosage at the appropriate times/intervals. Excludes injectable and IV medications. (NOTE: This refers to ability, not compliance or willingness.) and is scored, 0 = able to independently take the correct oral medication(s) and proper dosage(s) at the correct times, 1 = able to take medication(s) at the correct times if: (a) individual dosages are prepared in advance by another person; OR (b)   given daily reminders; OR (c)

someone develops a drug diary or chart, 2 = unable to take medication unless administered by someone else, 3 = no oral medications prescribed, UK = unknown, and is measured by item M0780.

Data Analysis

A logistic regression model building process was conducted utilizing backwards method. Predictors were identified using logistic regression analysis in the R statistical software (The R Project , 2008). A wide array of statistical techniques have emerged for analyzing data with categorical dependent variables, including discriminant analysis, log-linear regression, probit analysis, and logistic regression (Mertler & Vannatta, 2005). The choice of the model depends on the characteristics of explanatory variables. When the response variable is categorical data and the explanatory variables are categorical and/or continuous data either the logistic regression model or discriminant analysis is used (Munro, 2005). Both of these statistical procedures can be used to predict group membership, discriminant analysis requires assumptions about the data that are more restrictive than logistic regression (Kerlinger & Lee, 2000). Discriminant analysis requires that predictors have multivariate normality for each category of the grouping variables and that each category have the same variance and covariances for the predictors. It is recommended that discriminant analysis not be used with categorical predictors.

Logistic regression is a multivariate statistical technique used to predict a dichotomous dependent variable from a set of independent variables. Logistic regression

estimates the probability of a certain event occurring and identifies the variables that are useful in making this prediction (Mertler & Vannatta, 2005). Because the dependent measure is dichotomous, ranging from zero to one, its slope, relative to the independent measures, is non-linear (Munro, 2005). Logistic regression analysis adjusts for the binary nature of the dependent variable and its non-linear relationship with the independent values (Kerlinger & Lee, 2000). Logistic regression does not assume a linearity of relationship between the independent variables and the dependent variable, it does not necessitate normally distributed variable, nor does it assume homoscedasticity, and overall has fewer strict assumptions (Mertler & Vannatta, 2005).

Multiple logistic regression analysis uses transformed data through natural logarithms in order to reduce nonlinearity. It uses maximum likelihood estimation methods to estimate parameters. The tolerance statistic is often used to examine potential issues related to Collinearity among independent variables. For instance, a tolerance statistic that is less than 0.20 or less suggests a potential Collinearity problem (Munro, 2005). The logistic regression coefficients have the same interpretation as the coefficients in regular multiple regressions, except that the units of the dependent variable represent the logged odds (Kerlinger & Lee, 2000). The logistic regression coefficients show the change in the predicted logged odds of experiencing an event or having a characteristic for a one-unit change in the independent variables. Both likelihood ratio statistic and Wald statistic have been used to evaluate the statistical significance of the contribution of

independent variables to the explanation of the dependent variable (Mertler & Vannatta, 2005).

Logistic regression analysis also produces odds ratios associated with each predictor value. The odds of an event is defined as the probability of the outcome event (e.g., being hospitalized) occurring divided by the probability of the event not occurring (e.g., not being hospitalized). The odds ratio for a predictor is defined as the relative amount by which the odds of the outcome increase (odds ratio greater than 1) or decrease (odds ratio less than 1) when the value of the predictor variable is increased by one unit.

For the purposes of this analysis, logistic regression was used to identify the best fitting model. Logistic Regression was employed to measure the relationships between the dependent variable acute care re-hospitalization and the independent variables. The likelihood statistic is often used in logistic regression analysis to test how well the overall model fits the data. A well-fitting model is significant at the .05 level (Mertler & Vannatta, 2005).

Several steps were used to build a logistic regression model. The selection process began with an analysis of each variable.

The second step of variable selection and model building is to select variables for the multivariate analysis. How variables are entered into the logistic regression model can affect outcome. The third step, after the multivariable model is fit to the data, is to verify the importance of each variable within the model. This process includes both an examination of the Wald statistic for each variable and a comparison of individual

estimated coefficients with the coefficient from the model containing only that variable (Mertler & Vannatta, 2005). The Wald statistic is like the t test in linear regression because it tells us whether the b coefficient for that predictor is significantly different from zero (Mertler & Vannatta, 2005). Based on the large sample size involved in this study, the Wald statistic is an important measure for the inclusion and exclusion of variables. An important aspect of the model building process is the researcher critically reviewing all variables included in a model based on statistical methods, experience, and clinical knowledge.

Demographic variables such as gender and ethnicity were used to create a profile of the sample using descriptive measures.

Human Subjects Procedure

In order to ensure the protection of each subject's freedom from intrinsic risk or injury and to ascertain rights to privacy and dignity, a variety of human subject protective mechanisms were utilized in this study. Approval for the proposed study was obtained from the University of San Diego Investigational Review Board, and the Palomar Pomerado Health Investigational Review Committee. Since this retrospective study was conducted on de-identified data, no participant informed consent was required. Written information related to this study was kept in a locked office, and any electronic files were password-protected. There was no perceived potential physical, psychological, or social risks to the subjects in this study. The findings will be used to enhance current knowledge relating to home healthcare patients.

Chapter 4

RESULTS

The overall purpose of this study was to examine the predicative capability of

OASIS admission data for acute care re-hospitalization of home healthcare patients with

wounds and a co-morbidity of diabetes. Secondary data analysis using logistic regression

was conducted on retrospective data from OASIS collected during the time period of July

1, 2006 to June 30, 2007. In this chapter the study findings are presented. A description

of the sample population is provided first. The logistic regression model building process

is then described and the final logistic regression model for predictors of re-

hospitalization is presented.

Characteristics of the Sample

Data was obtained from 1802 individuals who were home healthcare patients

from July 1, 2006 through June 30, 2007. The sample was evenly distributed based on

gender with 51% of the sample female. (Ethnicity composition is: 1551 (86.1%)

Caucasians, 159 (8.8%) Hispanics and 92 (5.1%) others. Ninety four percent had a

prognosis rated as good; 14% of the patients had a diagnosis of diabetes. There were 278

(15%) patients who had unscheduled re-hospitalizations from home care.

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Table 1: Summary of Demographic and Study Variable Characteristics

Summary of Demographic and Study Variable Characteristics in complete episode data set n=1802	Percent
M0855 Acute Care Re-hospitalization- unscheduled	15%
ICD 9 CM 250 Diabetes Diagnosis	14%
M0069 Patient Gender Male	49%
M0069 Patient Gender Female	51%
M0140 Ethnicity Caucasian	86%
M0140 Ethnicity Hispanic	8%
M0140 Ethnicity Other	6%
M0260 Overall Prognosis Good	94%
M0270 Rehabilitation Prognosis Good	84%
M0280 Life Expectancy greater than 6 months	96%
M0290 High Risk Factors present	98.5%
M0360 Primary Caregiver is family member	72%
M0390 Vision impaired	16%
0400 Hearing impaired	26%
M0410 Speech impaired	17%
M0420_Pain Frequency	61%
M0430 Intractable Pain present	14%

M0440 Lesion or Open Wound	49%
M0490 Dyspnea	39%
M0510 Urinary Tract Infection	9%
M0520 Urinary Incontinence	21%
M0540 Bowel Incontinence	10%
M0550 Ostomy present	2%
M0560 Cognitive Function impaired	20%
M0570 When Confused	27%
M0580 When Anxious	24%
M0620 Frequency of Behavior Problems	3%
M0630 Receiving Psychiatric Nursing Services	1%
M0640 Current Grooming	47%
M0650 Current Ability to Dress Upper Body impaired	55%
M0660 Current Ability to Dress Lower Body impaired	65%
M0670 Current Bathing impaired	85%
M0680 Current Toileting impaired	33%
M0690 Current Transferring impaired	75%
M0700 Current Ambulation/Locomotion impaired	19%
M0710 Current Feeding or Eating impaired	33%
M0720 Current Preparation of Light Meals impaired	75%

M0730 Current Transportation impaired	97%
M0740 Current Laundry impaired	97%
M0750 Current Housekeeping impaired	98%
M0760 Current Shopping impaired	98%
M0770 Current Phone Use impaired	19%
M0780 Current Oral Medications Management impaired	49%

To examine which predictor variables (see Table 2) increased the odds for acute

re-hospitalization backward logistic regression was conducted. Figure 2 depicts the

model building process.

Table 2: Independent Variables

Independent Variable	Independent Variable
Diabetes Diagnosis-ICD 9 CM 250	M0140 Ethnicity
M0069 Patient Gender	M0270 Rehabilitation Prognosis
M0260 Overall Prognosis	M0290 High Risk Factors
M0280 Life Expectancy	M0360 Primary Caregiver
M0340 Patient Lives with?	M0400 Hearing
M0390 Vision	M0420_Pain Frequency
M0410 Speech	M0440 Lesion or Open Wound

M0430 Intractable Pain	M0510 Urinary Tract Infection
M0490 Dyspnea	M0540 Bowel Incontinence
M0520 Urinary Incontinence	M0560 Cognitive Function
M0550 Ostomy	M0580 When Anxious
M0570 When Confused	M0620 Frequency of Behavior Problems
M0610 Behaviors Demonstrated	M0640 Current Grooming
M0630 Receiving Psychiatric Nursing Services	M0660 Current Ability to Dress Lower Body
M0650 Current Ability to Dress Upper Body	M0680 Current Toileting
M0670 Current Bathing	M0700 Current Ambulation/Locomotion
M0690 Current Transferring	M0720 Current Preparation of Light Meals
M0710 Current Feeding or Eating	M0740 Current Laundry
M0730 Current Transportation	M0760 Current Shopping
M0750 Current Housekeeping	M0780 Current Oral Medications
M0770 Current Phone Use	
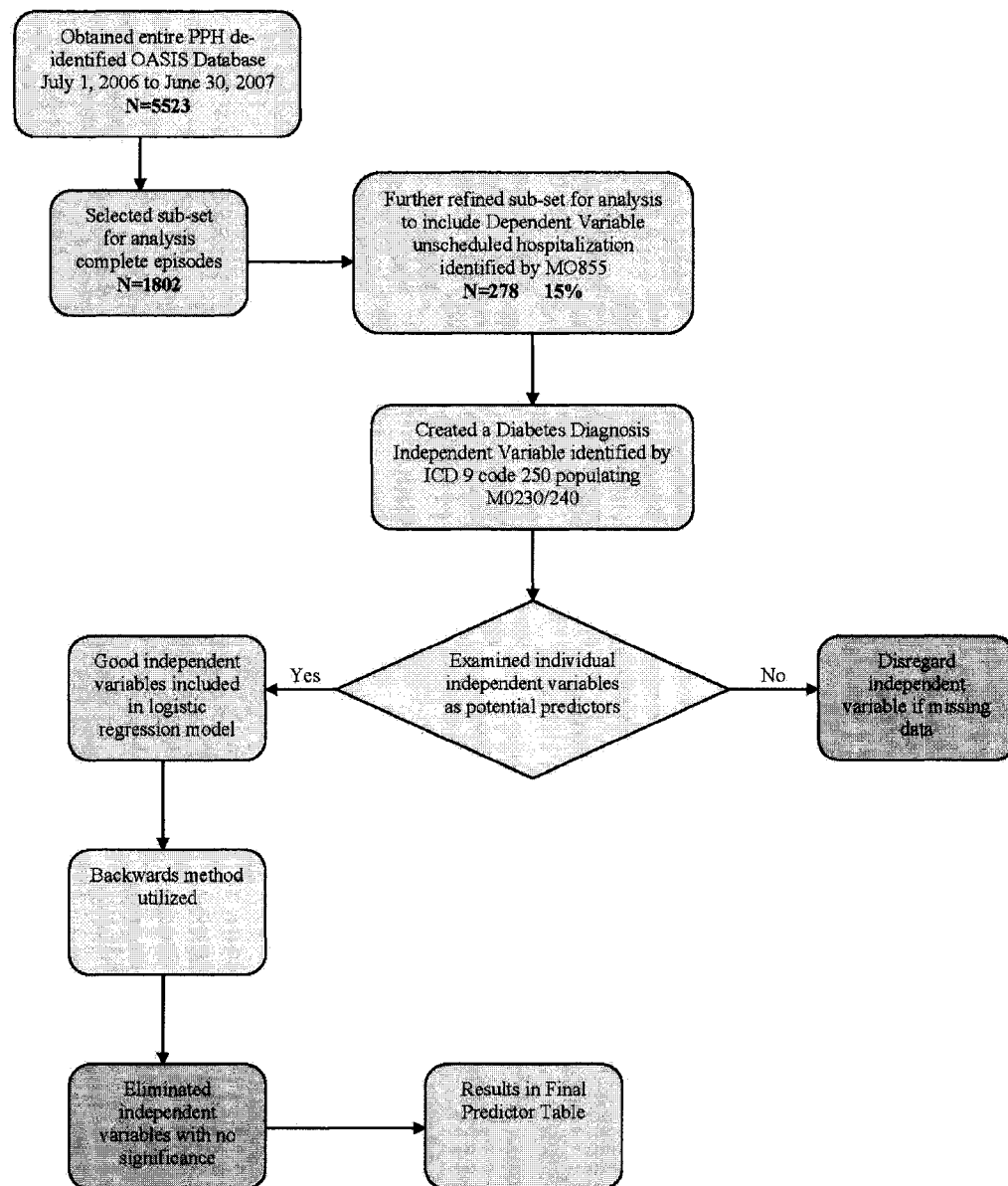
Figure 2: Logistic Regression Model Building Process

Findings

The Aim was to examine the relationship of routine OASIS admission data with the patient level outcome acute hospital readmission of patients with wounds and a co-morbidity of diabetes receiving home healthcare services.

The Final Predictor Logistic Regression model is shown in Table 3. The diabetics had an elevated risk (OR=1.67, 95%CI 1.14-2.46) of re-hospitalization. Those with better rehab prognosis had lower risk of re-hospitalization (OR=0.61, 95%CI 0.41-0.92).

The last column of Table 3 shows the p-value from the likelihood ratio test. This is for testing the overall effect of a predictor, especially a categorical variable with multiple levels. The Overall Prognosis, even though there was not statistically significant differences across its levels, is significant for improving the model fitting by using the likelihood ratio test to test nested models. For short of breath, all dyspneic problems increased the risk of re-hospitalization but only two conditions (walking more than 20 feet or climbing stairs and moderate exertion) reached statistical significance. (For walking more than 20 feet or climbing stairs, OR=1.48, 95%CI 1.04-2.10; for moderate exertion, OR=1.86, 95%CI 1.28-2.70.) Urine incontinence was also associated with re-hospitalization (p=0.003) with using a urinary catheter doubled the risk (OR=2.0, 95%CI 1.16-3.45) but being incontinent had a reduced risk (OR=0.55, 95%CI 0.35-0.87) as compared to no incontinence or catheter. Bowel incontinence is another statistically significant risk factor with a p-value of 0.00001 across all levels. Having bowel incontinence more than once per week (once to three times weekly, four to five times

weekly or at least once a day) were all associated with increased risk of re-hospitalization. Current ability to dress upper body was a significant predictor (p=0.01). More specifically, someone must help the patient to put on upper body clothing is significantly associated with re-hospitalization (OR=1.57, 95%CI 1.07-2.29). For oral medication use, if a patient could not take medication unless administered by someone else, the odds of this patient to be re-hospitalized is (OR=1.56 95%CI 1.03-2.36) of that of a patient who could independently take the medication at the right dose and at the right time.

Table 3: The Final Logistic Regression Model for Predicting Re-hospitalization

Variable Name	Regression Coefficient	Odds Ratio	95% CI for Odds Ratio	p-value c
Diabetes Status True False	 0.52	 1.67	 (1.14,2.46)b	 0.01
Overall Prognosis 0 1 UK	 ------a -0.02 0.96	 0.98 2.60	 (0.47,2.05) (0.97,7.78)	 0.00018
Rehab Prognosis 0	 ------a			

1	-0.49	0.61	(0.41,0.92)b	
UK	-0.43	0.65	(0.25,1.63)	0.0002
When Dyspneic				
0	------a			0.01
1	0.39	1.48	(1.04, 2.10)b	
2	0.62	1.86	(1.28,2.70)b	
3	0.24	1.27	(0.71,2.27)	
4	0.55	1.73	(0.52,5.77)	
Urine Incontinence				
0	------a			0.003
1	-0.58	0.55	(0.35,0.87)b	
2	0.69	2.00	(1.16,3.45)b	
Bowel Incontinence				
0	------a			0.00001
1	0.19	1.21	(0.45,3.24)	
2	1.22	3.38	(1.61,7.12)b	
3	1.95	7.08	(2.53,19.87)b	
4	0.83	2.29	(0.96,5.47)	
5	1.87	6.48	(1.04,40.32)b	
UK	0.07	1.07	(0.09,12.99)	
Current Dress Upper				

0	------a			0.01
1	0.27	1.31	(0.91,1.88)	
2	0.45	1.57	(1.07,2.29)b	
3	0.14	1.15	(0.59,2.26)	
Current Oral Meds				
0	------ a			0.09
1	0.25	1.28	(0.92,1.81)	
2	0.44	1.56	(1.03,2.36)b	

a. the reference level of the categorical predictor

b. statistically significant defined by $p < 0.05$ where p is from the Wald test

c. overall statistical significance tested by the likelihood ratio test $p < 0.1$

Summary

In the chapter the results of the data analysis for this study was presented in three sections. The first section described the characteristics of the population sample and was followed by the logistic regression model building process. The Aim of the study to examine the predictive capability of OASIS related to acute care re-hospitalization was accomplished and demonstrated by the findings set forth in the final logistic regression predictor table.

Chapter 5

DISCUSSION OF FINDINGS

The purpose of this research study was to examine the predicative capability of

OASIS admission data for acute care re-hospitalization of home healthcare patients with

wounds and a co-morbidity of diabetes. In this chapter the research design and method,

data analysis and the overall results will be summarized in the context of the literature

and the Quality Health Outcomes Model which provided the conceptual framework for

this study. Those variables that are predictive for re-hospitalization will be discussed and

the non-significant variables will be briefly addressed. In addition, implications for

nursing practice, education and research will be presented.

This study was conducted in a Medicare certified Home Health organization that

is part of the largest public health system in California. The sample of 1802 patients with

complete episodes of care was derived from a data set of 5,523 patients in the PPH

OASIS database receiving home health care between July 1, 2006 and June 30, 2007. All

patients were included in the analysis and logistic regression model and the disease

specific independent variables included patients with a primary or secondary diagnosis of

diabetes and an open skin lesion or wound. The majority of the patients were Caucasian

and female.

Specific Aim

To examine the relationship of routine OASIS admission data with the patient level outcome acute hospital readmission of patients with wounds and a co-morbidity of diabetes receiving home healthcare services.

The Quality Health Outcomes Model was useful as a framework for conceptualizing the relationship between the home healthcare organization, healthcare provided in the home, the outcome of acute care re-hospitalization and the patient. All relationships in the model are bi-directional. There is no direct relationship between the home healthcare (interventions) and outcome of acute care re-hospitalization; rather in the QHOM home healthcare influences, and is influence by, the home healthcare organization and patient domains; therefore, it is through the home healthcare organization and patient that home healthcare influences outcomes.

The OASIS variables examined in the logistic regression model that showed significance as predictors of acute care re-hospitalization included a diagnosis of diabetes, overall prognosis, rehabilitation prognosis, existing dyspnea, existing urine and bowel incontinence, impairment in currently dressing the upper body and the ability to take own oral medications.

These findings apply to all patients in the OASIS database as the logistic regression model included all patients. An interesting finding was that the presence of a lesion or open wound was not significant as a predictor of acute care re-hospitalization.

Also of interest was the occurrence of re-hospitalization of 15% that is lower than that reported in the literature as well as the occurrence of diabetes of 14% which is lower than the population in the community. This has interesting implications related to the home healthcare provided by the home healthcare organization studied.

The study design related to the use of a de-identified existing database was useful in that the data was made available. Challenges associated with the use of this database included missing data, coding of variables as well as that the de-identification included removing the patients date of birth thus eliminating the age variable. Future work will include requesting an age calculation to replace the date of birth.

The study methodology related to the backwards method of logistic regression modeling was useful in being able to examine a large number of variables and their relationship to a dichotomous dependent variable. The flexibility of logistic regression as applied to this design was useful. Since this design and method has not been described in the literature prior to this study it has interesting implications for future research using OASIS.

An important outcome of this work will be the rapid translation of the results of this study into practical application and practice within the healthcare organization studied as well as the home healthcare community at large. Future work will include examining the variables with predictive significance that may be modifiable in order to gain more information on which to base designs of interventions and or care delivery models.

Implications for Nursing

Practice

This study adds to a growing body of research using the OASIS data set. The use of OASIS, a consistent and standardized data set across a large number of home health organizations offers opportunities for both new and replicable research. Home Health nursing leaders can use the findings from this study to design focused interventions and delivery models to mediate or modify the effect of the predictive variables. Aspects of the nursing process can be examined to determine a modifying effect on the predictor variables such as overall prognosis and rehabilitation prognosis which is assessed by the nurse. Home health nurses use the nursing process, the essential methodology by which patient goals are identified and achieved. The nursing process is comprised of assessment, diagnosis, outcomes identification, planning, implementation and evaluation (American Nurses Association, 2008).

Home Health reflects more than a change in location or acute care delivered in the home. Home health requires a change in the definitions of care to reflect a broad array of coordinated services, benefits and caregivers available to patients experiencing complex problems (American Nurses Association, 2008). Home health nurses practice independently and require highly developed skills in assessment and care coordination. They practice in collaboration with other healthcare professionals, they most often are the only professionals in the home providing care to the patient. They must possess in assessment, clinical decision-making, and clinical practice. These skills form the

foundation for planning, nursing care interventions, communication with other healthcare

providers, and referral to other healthcare settings when appropriate and as described in

the Home Health Nursing Scope and Standards of Practice. (American Nurses

Association 2008)

Home health nursing differs from other nursing specialties in the degree of

responsibility nurses assume in managing the financial cost of care. Home health nurses

work directly with public and private payers and with consumer-directed payment

programs. Home health nurses must have advanced knowledge of reimbursement systems

to help patients obtain the care they need while containing the cost of care (American

Nurses Association, 2008). Advanced practice registered nurses working in home health

settings possess advanced specialized clinical knowledge and skills to provide health care

to patients, families and groups in their places of residence. The increasingly older and

chronically ill home health patient population requires a high level of clinical expertise as

treatment and medication regimens have grown in complexity. These patient

characteristics combined with the pressure to improve clinical outcomes require more

advanced practice nurses in home health (American Nurses Association, 2008).

Education

Nursing education is facing new and increasing challenges in preparing future

nurses to care for the increasing complex populations the will be cared for in the home.

Nursing curriculum should reflect the projected scope of nursing care. Faculty will

educate new nurses to promote the profession's abilities to positively affect client

outcomes in regard to restoration of health and prevention of illness. The benefit of utilizing educated, skilled professional nurses promotes cost-effective outcomes which will need to be documented due to the future of prospective payment (American Nurses Association, 2008). Nurses need to emphasize the contribution they make to the health and well-being of patients and by doing so they increase the value that society places on nursing. Nurses must challenge the prior models of nursing practice and compel the development of innovative and integrated curricula (American Nurses Association, 2008).

Research

Research priorities identified include outcomes, health policy, the use of advanced practice nurses, and models of care and best practices. Evidence-based practice and guidelines are important to home health nurses. While the number of studies specific to home health and capable of serving as a foundation for evidence-based practice is still small, increasing interest encourages expansion of the research base, increased opportunities for home health nurse researchers, more interdisciplinary collaboration, improved funding, and better patient outcomes (American Nurses Association, 2008). Programs of clinical and administrative research offer the greatest opportunities for continuation and expansion and include transitional care, outcomes, technology and the work environment (American Nurses Association, 2008).

Conclusion

This study demonstrated the utility of OASIS data as a predictor of acute care re-hospitalization. Home health nurses, their organizations and the healthcare industry face a challenging future.. Medicare remains the largest single payer of home care with 69% of home healthcare patients being over 65 years old (Center for Medicare and Medicaid Services, 2006). Chronic illnesses are increasingly common among older adults and account for the majority of home healthcare diagnoses. Chronic illnesses are also costly, accounting for more than 70% of the cost of health care in the United States each year. Chronically ill patients frequently require multiple medications, ongoing treatment and monitoring. The impact on quality of life and functional ability is significant. Many patients with chronic illnesses that require lifestyle modification as part of their care plan do not adhere to such recommendations to manage their illnesses. With an increasing emphasis on healthcare outcomes, home healthcare nurses are challenged to work more effectively with the chronically ill (American Nurses Association, 2008).

Home health clinical practice continues to include care of acutely ill patients, allowing for early discharge of hospitalized patients to receive more complex treatments. (American Nurses Association, 2008).

For home health nurses, one goal has always been to help patients remain healthy and avoid acute care hospitalization. This outcome now is the focus of national concern as hospitalization contributes to the ever increasing risk and cost of health care. As

discussed previously a number of strategies have been identified as important to reducing

hospitalizations among home healthcare patients (Center for Medicare and Medicaid

Services, 2006).. The ability to measure and compare outcomes using OASIS data has

had a major impact on home health nursing (American Nurses Association, 2008). As

home healthcare evolves into a pay-for-performance model of reimbursement, home

healthcare nurses will become better educated about and accountable to achieving

positive patient outcomes. Home health nurses must use effective strategies to provide

home health care with attention to age, and developmental stages, cultural issues, and

evidence-based practices (American Nurses Association, 2008), Center for Medicare and

Medicaid Services, 2006) .

Home health services will become an even more critical element of the healthcare

system by controlling the overall cost of healthcare, keeping patients out of expensive

acute care hospitals, and reducing the need for patients to reside in long-term care

facilities (American Nurses Association, 2008), Center for Medicare and Medicaid

Services, 2006) .

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Appendices

Appendix A

Palomar Pomerado Health

Investigational Review Committee Approval

MEDICAL STAFF SERVICES

November 9, 2007

Brenda Fischer, PhD(c), RN, MBA, CPHQ
Magnet Council, Palomar Pomerado Health
15255 Innovation Drive
San Diego, CA 92128

RE: Predictors of Re-hospitalization for Home Healthcare Patients with Wounds and a
        Comorbidity of Diabetes

Dear Ms. Fischer:

The Palomar Pomerado Investigational Review Committee (PPH IRC), in its meeting of November 8,
2007, reviewed and approved the protocol for the above-mentioned study. The study was approved to be
conducted at Palomar Pomerado Health Homecare Program.

Prior to initiation of the study, approval must also be obtained from the Executive Committee and
Administration of the Hospital(s) involved. Studies approved by the Investigational Review Committee
may not proceed until after Executive Committee and administrative approval is obtained. Please contact
Linda Urden, R.N. at (858) 613-4072 or Catherine Konyn, R.N. at (760) 739-3682 for information on the
administrative review process. Study specific laboratory and imaging studies that will be performed as part
of the study are required to be ordered on the appropriate form.

The Palomar Pomerado Investigational Review Committee is in compliance with Federal Rules and
Regulations and operates in accordance with Good Clinical Practices. Approval of this protocol and
informed consent is effective for one (1) year from the initial approval and may not proceed past
November 8, 2008 without reapproval by the Palomar Pomerado Investigational Review Committee.

Sincerely,

Richard G. Just, M.D.
Chairman, Investigational Review Committee

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A California Health Care District

Appendix C

OASIS

Outcome and Assessment Information Set (OASIS-B1)

Items to be Used at Specific Time Points

Start of Care -- Home Health Patient Tracking Sheet, M0080-M0825

    Start of care—further visits planned

Resumption of Care -- M0080-M0825

    Resumption of care (after inpatient stay)

Follow-Up -- M0080-M0100, M0175, M0230-M0250, M0390, M0420,

    Recertification (follow-up) assessment   M0440, M0450, M0460, M0476, M0488, M0490, M0530-
    Other follow-up assessment   M0550, M0610, M0650-M0700, M0825

Transfer to an Inpatient Facility -------------------------- M0080-M0100, M0830-M0855, M0890-M0906

    Transferred to an inpatient facility—patient not discharged from an agency
    Transferred to an inpatient facility—patient discharged from agency

Discharge from Agency — Not to an Inpatient Facility

    Death at home-- M0080-M0100, M0906
    Discharge from agency-------------------------------------- M0080-M0100, M0200-M0220, M0250, M0280-M0380,
    M0410-M0820, M0830-M0880, M0903-M0906

Note: For Items M0640-M0800, please note special instructions at the beginning of the section.

CLINICAL RECORD ITEMS

(M0080) Discipline of Person Completing Assessment:

        ☐ 1-RN   ☐ 2-PT   ☐ 3-SLP/ST   ☐ 4-OT

(M0090) Date Assessment Completed: __ __ / __ __ / __ __ __ __
                                month day   year

(M0100) This Assessment is Currently Being Completed for the Following Reason:

Start/Resumption of Care
☐ 1 – Start of care—further visits planned
☐ 3 – Resumption of care (after inpatient stay)

Follow-Up
☐ 4 – Recertification (follow-up) reassessment **[Go to M0175]**
☐ 5 – Other follow-up **[Go to M0175]**

Transfer to an Inpatient Facility
☐ 6 – Transferred to an inpatient facility—patient not discharged from agency **[Go to M0830]**
☐ 7 – Transferred to an inpatient facility—patient discharged from agency **[Go to M0830]**

Discharge from Agency — Not to an Inpatient Facility
☐ 8 – Death at home **[Go to M0906]**
☐ 9 – Discharge from agency **[Go to M0200]**

DEMOGRAPHICS AND PATIENT HISTORY

(M0175) From which of the following **Inpatient Facilities** was the patient discharged <u>during the past 14 days</u>? **(Mark all that apply.)**

- ☐ 1 - Hospital
- ☐ 2 - Rehabilitation facility
- ☐ 3 - Skilled nursing facility
- ☐ 4 - Other nursing home
- ☐ 5 - Other (specify) _____
- ☐ NA - Patient was not discharged from an inpatient facility **[If NA at SOC/ROC, go to *M0200;* If NA at Follow-Up, go to *M0230*]**

(M0180) **Inpatient Discharge Date** (most recent):

___ ___ / ___ ___ / ___ ___ ___ ___
month day   year

☐ UK - Unknown

(M0190) **Inpatient Diagnoses** and ICD-9-CM code categories (three digits required; five digits optional) <u>for only those conditions treated during an inpatient facility stay within the last 14 days</u> (no surgical or V-codes):

Inpatient Facility Diagnosis	ICD-9-CM
a. _____	(___ ___ ___ . ___ ___)
b. _____	(___ ___ ___ . ___ ___)

Effective 10/1/2003

List each Inpatient Diagnosis and ICD-9-CM code at the level of highest specificity for only those conditions treated during an inpatient stay within the last 14 days (no surgical, E-codes, or V-codes):

Inpatient Facility Diagnosis	ICD-9-CM
a. _____	(___ ___ ___ . ___ ___)
b. _____	(___ ___ ___ . ___ ___)

(M0200) **Medical or Treatment Regimen Change Within Past 14 Days:** Has this patient experienced a change in medical or treatment regimen (e.g., medication, treatment, or service change due to new or additional diagnosis, etc.) within the last 14 days?

- ☐ 0 - No **[If No, go to *M0220*]**
- ☐ 1 - Yes

(M0210) List the patient's **Medical Diagnoses** and ICD-9-CM code categories (three digits required; five digits optional) <u>for those conditions requiring changed medical or treatment regimen</u> (no surgical or V-codes):

Changed Medical Regimen Diagnosis	ICD-9-CM
a. _____	(___ ___ ___ . ___ ___)
b. _____	(___ ___ ___ . ___ ___)
c. _____	(___ ___ ___ . ___ ___)
d. _____	(___ ___ ___ . ___ ___)

Effective 10/1/2003

List the patient's Medical Diagnoses and ICD-9-CM codes at the level of highest specificity for those conditions requiring changed medical or treatment regimen (no surgical, E-codes, or V-codes):

Changed Medical Regimen Diagnosis	ICD-9-CM
a. _____	(___ ___ ___ . ___ ___)
b. _____	(___ ___ ___ . ___ ___)
c. _____	(___ ___ ___ . ___ ___)
d. _____	(___ ___ ___ . ___ ___)

(M0220) **Conditions Prior to Medical or Treatment Regimen Change or Inpatient Stay Within Past 14 Days:** If this patient experienced an inpatient facility discharge or change in medical or treatment regimen within the past 14 days, indicate any conditions which existed <u>prior to</u> the inpatient stay or change in medical or treatment regimen. **(Mark all that apply.)**

- ☐ 1 - Urinary incontinence
- ☐ 2 - Indwelling/suprapubic catheter
- ☐ 3 - Intractable pain
- ☐ 4 - Impaired decision-making
- ☐ 5 - Disruptive or socially inappropriate behavior
- ☐ 6 - Memory loss to the extent that supervision required
- ☐ 7 - None of the above
- ☐ NA - No inpatient facility discharge <u>and</u> no change in medical or treatment regimen in past 14 days
- ☐ UK - Unknown

(M0230/M0240) **Diagnoses and Severity Index:** List each medical diagnosis or problem for which the patient is receiving home care and ICD-9-CM code category (three digits required; five digits optional – no surgical or V-codes) and rate them using the following severity index. (Choose one value that represents the most severe rating appropriate for each diagnosis.) ICD-9-CM sequencing requirements must be followed if multiple coding is indicated for any diagnoses.

> **Effective 10/1/2003**
>
> List each diagnosis and ICD-9-CM code at the level of highest specificity (no surgical codes) for which the patient is receiving home care. Rate each condition using the following severity index. (Choose one value that represents the most severe rating appropriate for each diagnosis.) E-codes (for M0240 only) or V-codes (for M0230 or M0240) may be used. ICD-9-CM sequencing requirements must be followed if multiple coding is indicated for any diagnoses. If a V-code is reported in place of a case mix diagnosis, then M0245 Payment Diagnosis should be completed. Case mix diagnosis is a primary or first secondary diagnosis that determines the Medicare PPS case mix group.

<u>Severity Rating</u>
0 - Asymptomatic, no treatment needed at this time
1 - Symptoms well controlled with current therapy
2 - Symptoms controlled with difficulty, affecting daily functioning; patient needs ongoing monitoring
3 - Symptoms poorly controlled, patient needs frequent adjustment in treatment and dose monitoring
4 - Symptoms poorly controlled, history of rehospitalizations

(M0230) Primary Diagnosis	ICD-9-CM	Severity Rating
a. _____	(__ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4

(M0240) Other Diagnoses	ICD-9-CM	Severity Rating
b. _____	(▓ __ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4
c. _____	(▓ __ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4
d. _____	(▓ __ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4
e. _____	(▓ __ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4
f. _____	(▓ __ __ __ . __ __)	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4

Effective 10/1/2003

(M0245) Payment Diagnosis (optional): If a V-code was reported in M0230 in place of a case mix diagnosis, list the primary diagnosis and ICD-9-CM code, determined in accordance with OASIS requirements in effect before October 1, 2003--no V-codes, E-codes, or surgical codes allowed. ICD-9-CM sequencing requirements must be followed. Complete both lines (a) and (b) if the case mix diagnosis is a manifestation code or in other situations where multiple coding is indicated for the primary diagnosis; otherwise, complete line (a) only.

<u>(M0245) Primary Diagnosis</u>   <u>ICD-9-CM</u>

a. _____   (__ __ __ . __ __)

<u>(M0245) First Secondary Diagnosis</u>   <u>ICD-9-CM</u>

b. _____   (__ __ __ . __ __)

(M0250) Therapies the patient receives <u>at home</u>: **(Mark all that apply.)**

☐ 1 - Intravenous or infusion therapy (excludes TPN)
☐ 2 - Parenteral nutrition (TPN or lipids)
☐ 3 - Enteral nutrition (nasogastric, gastrostomy, jejunostomy, or any other artificial entry into the alimentary canal)
☐ 4 - None of the above

(M0260) Overall Prognosis: BEST description of patient's overall prognosis for <u>recovery from this episode of illness</u>.

☐ 0 - Poor: little or no recovery is expected and/or further decline is imminent
☐ 1 - Good/Fair: partial to full recovery is expected
☐ UK - Unknown

(M0270) Rehabilitative Prognosis: BEST description of patient's prognosis for <u>functional status</u>.

☐ 0 - Guarded: minimal improvement in functional status is expected; decline is possible
☐ 1 - Good: marked improvement in functional status is expected
☐ UK - Unknown

(M0280) Life Expectancy: (Physician documentation is not required.)

☐ 0 - Life expectancy is greater than 6 months
☐ 1 - Life expectancy is 6 months or fewer

(M0290) High Risk Factors characterizing this patient: **(Mark all that apply.)**

☐ 1 - Heavy smoking
☐ 2 - Obesity
☐ 3 - Alcohol dependency
☐ 4 - Drug dependency
☐ 5 - None of the above
☐ UK - Unknown

LIVING ARRANGEMENTS

(M0300) Current Residence:

☐ 1 - Patient's owned or rented residence (house, apartment, or mobile home owned or rented by patient/couple/significant other)
☐ 2 - Family member's residence
☐ 3 - Boarding home or rented room
☐ 4 - Board and care or assisted living facility
☐ 5 - Other (specify) _____

(M0340) Patient Lives With: (Mark all that apply.)

- ☐ 1 - Lives alone
- ☐ 2 - With spouse or significant other
- ☐ 3 - With other family member
- ☐ 4 - With a friend
- ☐ 5 - With paid help (other than home care agency staff)
- ☐ 6 - With other than above

SUPPORTIVE ASSISTANCE

(M0350) Assisting Person(s) Other than Home Care Agency Staff: (Mark all that apply.)

- ☐ 1 - Relatives, friends, or neighbors living outside the home
- ☐ 2 - Person residing in the home (EXCLUDING paid help)
- ☐ 3 - Paid help
- ☐ 4 - None of the above [If None of the above, go to *M0390*]
- ☐ UK - Unknown [If Unknown, go to *M0390*]

(M0360) Primary Caregiver taking lead responsibility for providing or managing the patient's care, providing the most frequent assistance, etc. (other than home care agency staff):

- ☐ 0 - No one person [If No one person, go to *M0390*]
- ☐ 1 - Spouse or significant other
- ☐ 2 - Daughter or son
- ☐ 3 - Other family member
- ☐ 4 - Friend or neighbor or community or church member
- ☐ 5 - Paid help
- ☐ UK - Unknown [If Unknown, go to *M0390*]

(M0370) How Often does the patient receive assistance from the primary caregiver?

- ☐ 1 - Several times during day and night
- ☐ 2 - Several times during day
- ☐ 3 - Once daily
- ☐ 4 - Three or more times per week
- ☐ 5 - One to two times per week
- ☐ 6 - Less often than weekly
- ☐ UK - Unknown

(M0380) Type of Primary Caregiver Assistance: (Mark all that apply.)

- ☐ 1 - ADL assistance (e.g., bathing, dressing, toileting, bowel/bladder, eating/feeding)
- ☐ 2 - IADL assistance (e.g., meds, meals, housekeeping, laundry, telephone, shopping, finances)
- ☐ 3 - Environmental support (housing, home maintenance)
- ☐ 4 - Psychosocial support (socialization, companionship, recreation)
- ☐ 5 - Advocates or facilitates patient's participation in appropriate medical care
- ☐ 6 - Financial agent, power of attorney, or conservator of finance
- ☐ 7 - Health care agent, conservator of person, or medical power of attorney
- ☐ UK - Unknown

SENSORY STATUS

(M0390) Vision with corrective lenses if the patient usually wears them:

- ☐ 0 - Normal vision: sees adequately in most situations; can see medication labels, newsprint.
- ☐ 1 - Partially impaired: cannot see medication labels or newsprint, but can see obstacles in path, and the surrounding layout; can count fingers at arm's length.
- ☐ 2 - Severely impaired: cannot locate objects without hearing or touching them or patient nonresponsive.

(M0400) **Hearing and Ability to Understand Spoken Language** in patient's own language (with hearing aids if the patient usually uses them):

- ☐ 0 - No observable impairment. Able to hear and understand complex or detailed instructions and extended or abstract conversation.
- ☐ 1 - With minimal difficulty, able to hear and understand most multi-step instructions and ordinary conversation. May need occasional repetition, extra time, or louder voice.
- ☐ 2 - Has moderate difficulty hearing and understanding simple, one-step instructions and brief conversation; needs frequent prompting or assistance.
- ☐ 3 - Has severe difficulty hearing and understanding simple greetings and short comments. Requires multiple repetitions, restatements, demonstrations, additional time.
- ☐ 4 - Unable to hear and understand familiar words or common expressions consistently, or patient nonresponsive.

(M0410) **Speech and Oral (Verbal) Expression of Language** (in patient's own language):

- ☐ 0 - Expresses complex ideas, feelings, and needs clearly, completely, and easily in all situations with no observable impairment.
- ☐ 1 - Minimal difficulty in expressing ideas and needs (may take extra time; makes occasional errors in word choice, grammar or speech intelligibility; needs minimal prompting or assistance).
- ☐ 2 - Expresses simple ideas or needs with moderate difficulty (needs prompting or assistance, errors in word choice, organization or speech intelligibility). Speaks in phrases or short sentences.
- ☐ 3 - Has severe difficulty expressing basic ideas or needs and requires maximal assistance or guessing by listener. Speech limited to single words or short phrases.
- ☐ 4 - Unable to express basic needs even with maximal prompting or assistance but is not comatose or unresponsive (e.g., speech is nonsensical or unintelligible).
- ☐ 5 - Patient nonresponsive or unable to speak.

(M0420) **Frequency of Pain** interfering with patient's activity or movement:

- ☐ 0 - Patient has no pain or pain does not interfere with activity or movement
- ☐ 1 - Less often than daily
- ☐ 2 - Daily, but not constantly
- ☐ 3 - All of the time

(M0430) **Intractable Pain:** Is the patient experiencing pain that is not easily relieved, occurs at least daily, and affects the patient's sleep, appetite, physical or emotional energy, concentration, personal relationships, emotions, or ability or desire to perform physical activity?

- ☐ 0 - No
- ☐ 1 - Yes

INTEGUMENTARY STATUS

(M0440) Does this patient have a **Skin Lesion** or an **Open Wound**? This excludes "OSTOMIES."

- ☐ 0 - No [If No, go to *M0490*]
- ☐ 1 - Yes

(M0445) Does this patient have a **Pressure Ulcer**?

- ☐ 0 - No [If No, go to *M0468*]
- ☐ 1 - Yes

(M0450) **Current Number of Pressure Ulcers at Each Stage:** (Circle one response for each stage.)

	Pressure Ulcer Stages	Number of Pressure Ulcers				
a)	Stage 1: Nonblanchable erythema of intact skin; the heralding of skin ulceration. In darker-pigmented skin, warmth, edema, hardness, or discolored skin may be indicators.	0	1	2	3	4 or more
b)	Stage 2: Partial thickness skin loss involving epidermis and/or dermis. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.	0	1	2	3	4 or more
c)	Stage 3: Full-thickness skin loss involving damage or necrosis of subcutaneous tissue which may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.	0	1	2	3	4 or more
d)	Stage 4: Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (e.g., tendon, joint capsule, etc.)	0	1	2	3	4 or more
e)	In addition to the above, is there at least one pressure ulcer that cannot be observed due to the presence of eschar or a nonremovable dressing, including casts? ☐ 0 - No ☐ 1 - Yes					

(M0460) [At follow-up, skip this item if patient has no pressure ulcers] **Stage of Most Problematic (Observable) Pressure Ulcer:**

☐ 1 - Stage 1
☐ 2 - Stage 2
☐ 3 - Stage 3
☐ 4 - Stage 4
☐ NA - No observable pressure ulcer

(M0464) **Status of Most Problematic (Observable) Pressure Ulcer:**

☐ 1 - Fully granulating
☐ 2 - Early/partial granulation
☐ 3 - Not healing
☐ NA - No observable pressure ulcer

(M0468) Does this patient have a **Stasis Ulcer?**

☐ 0 - No **[If No, go to *M0482*]**
☐ 1 - Yes

(M0470) **Current Number of Observable Stasis Ulcer(s):**

☐ 0 - Zero
☐ 1 - One
☐ 2 - Two
☐ 3 - Three
☐ 4 - Four or more

(M0474) Does this patient have at least one **Stasis Ulcer that Cannot be Observed** due to the presence of a nonremovable dressing?

☐ 0 - No
☐ 1 - Yes

(M0476) [At follow-up, skip this item if patient has no stasis ulcers] **Status of Most Problematic (Observable) Stasis Ulcer:**

☐ 1 - Fully granulating
☐ 2 - Early/partial granulation
☐ 3 - Not healing
☐ NA - No observable stasis ulcer

(M0482) Does this patient have a **Surgical Wound?**

- ☐ 0 - No **[If No, go to *M0490*]**
- ☐ 1 - Yes

    (M0484) **Current Number of (Observable) Surgical Wounds:** (If a wound is partially closed but has <u>more</u> than one opening, consider each opening as a separate wound.)

- ☐ 0 - Zero
- ☐ 1 - One
- ☐ 2 - Two
- ☐ 3 - Three
- ☐ 4 - Four or more

    (M0486) Does this patient have at least one **Surgical Wound that Cannot be Observed** due to the presence of a nonremovable dressing?

- ☐ 0 - No
- ☐ 1 - Yes

    (M0488) [At follow-up, skip this item if patient has no surgical wounds] **Status of Most Problematic (Observable) Surgical Wound:**

- ☐ 1 - Fully granulating
- ☐ 2 - Early/partial granulation
- ☐ 3 - Not healing
- ☐ NA - No observable surgical wound

RESPIRATORY STATUS

(M0490) When is the patient dyspneic or noticeably **Short of Breath?**

- ☐ 0 - Never, patient is not short of breath
- ☐ 1 - When walking more than 20 feet, climbing stairs
- ☐ 2 - With moderate exertion (e.g., while dressing, using commode or bedpan, walking distances less than 20 feet)
- ☐ 3 - With minimal exertion (e.g., while eating, talking, or performing other ADLs) or with agitation
- ☐ 4 - At rest (during day or night)

(M0500) **Respiratory Treatments** utilized at home: **(Mark all that apply.)**

- ☐ 1 - Oxygen (intermittent or continuous)
- ☐ 2 - Ventilator (continually or at night)
- ☐ 3 - Continuous positive airway pressure
- ☐ 4 - None of the above

ELIMINATION STATUS

(M0510) Has this patient been treated for a **Urinary Tract Infection** in the past 14 days?

- ☐ 0 - No
- ☐ 1 - Yes
- ☐ NA - Patient on prophylactic treatment
- ☐ UK - Unknown

(M0520) **Urinary Incontinence or Urinary Catheter Presence:**

- ☐ 0 - No incontinence or catheter (includes anuria or ostomy for urinary drainage) **[If No, go to *M0540*]**
- ☐ 1 - Patient is incontinent
- ☐ 2 - Patient requires a urinary catheter (i.e., external, indwelling, intermittent, suprapubic) **[Go to *M0540*]**

(M0530) [At follow-up, skip this item if patient has no urinary incontinence or does have a urinary catheter] **When does Urinary Incontinence** occur?

- ☐ 0 - Timed-voiding defers incontinence
- ☐ 1 - During the night only
- ☐ 2 - During the day and night

(M0540) Bowel Incontinence Frequency:

- ☐ 0 - Very rarely or never has bowel incontinence
- ☐ 1 - Less than once weekly
- ☐ 2 - One to three times weekly
- ☐ 3 - Four to six times weekly
- ☐ 4 - On a daily basis
- ☐ 5 - More often than once daily
- ☐ NA - Patient has ostomy for bowel elimination
- ☐ UK - Unknown

(M0550) Ostomy for Bowel Elimination: Does this patient have an ostomy for bowel elimination that (within the last 14 days): a) was related to an inpatient facility stay, <u>or</u> b) necessitated a change in medical or treatment regimen?

- ☐ 0 - Patient does <u>not</u> have an ostomy for bowel elimination.
- ☐ 1 - Patient's ostomy was <u>not</u> related to an inpatient stay and did <u>not</u> necessitate change in medical or treatment regimen.
- ☐ 2 - The ostomy <u>was</u> related to an inpatient stay or <u>did</u> necessitate change in medical or treatment regimen.

NEURO/EMOTIONAL/BEHAVIORAL STATUS

(M0560) Cognitive Functioning: (Patient's current level of alertness, orientation, comprehension, concentration, and immediate memory for simple commands.)

- ☐ 0 - Alert/oriented, able to focus and shift attention, comprehends and recalls task directions independently.
- ☐ 1 - Requires prompting (cuing, repetition, reminders) only under stressful or unfamiliar conditions.
- ☐ 2 - Requires assistance and some direction in specific situations (e.g., on all tasks involving shifting of attention), or consistently requires low stimulus environment due to distractibility.
- ☐ 3 - Requires considerable assistance in routine situations. Is not alert and oriented or is unable to shift attention and recall directions more than half the time.
- ☐ 4 - Totally dependent due to disturbances such as constant disorientation, coma, persistent vegetative state, or delirium.

(M0570) When Confused (Reported or Observed):

- ☐ 0 - Never
- ☐ 1 - In new or complex situations only
- ☐ 2 - On awakening or at night only
- ☐ 3 - During the day and evening, but not constantly
- ☐ 4 - Constantly
- ☐ NA - Patient nonresponsive

(M0580) When Anxious (Reported or Observed):

- ☐ 0 - None of the time
- ☐ 1 - Less often than daily
- ☐ 2 - Daily, but not constantly
- ☐ 3 - All of the time
- ☐ NA - Patient nonresponsive

(M0590) Depressive Feelings Reported or Observed in Patient: (Mark all that apply.)

- ☐ 1 - Depressed mood (e.g., feeling sad, tearful)
- ☐ 2 - Sense of failure or self reproach
- ☐ 3 - Hopelessness
- ☐ 4 - Recurrent thoughts of death
- ☐ 5 - Thoughts of suicide
- ☐ 6 - None of the above feelings observed or reported

(M0610) Behaviors Demonstrated <u>at Least Once a Week</u> (Reported or Observed): (Mark all that apply.)

- ☐ 1 - Memory deficit: failure to recognize familiar persons/places, inability to recall events of past 24 hours, significant memory loss so that supervision is required
- ☐ 2 - Impaired decision-making: failure to perform usual ADLs or IADLs, inability to appropriately stop activities, jeopardizes safety through actions
- ☐ 3 - Verbal disruption: yelling, threatening, excessive profanity, sexual references, etc.
- ☐ 4 - Physical aggression: aggressive or combative to self and others (e.g., hits self, throws objects, punches, dangerous maneuvers with wheelchair or other objects)
- ☐ 5 - Disruptive, infantile, or socially inappropriate behavior (**excludes** verbal actions)
- ☐ 6 - Delusional, hallucinatory, or paranoid behavior
- ☐ 7 - None of the above behaviors demonstrated

(M0620) Frequency of Behavior Problems (Reported or Observed) (e.g., wandering episodes, self abuse, verbal disruption, physical aggression, etc.):

- ☐ 0 - Never
- ☐ 1 - Less than once a month
- ☐ 2 - Once a month
- ☐ 3 - Several times each month
- ☐ 4 - Several times a week
- ☐ 5 - At least daily

(M0630) Is this patient receiving **Psychiatric Nursing Services** at home provided by a qualified psychiatric nurse?

- ☐ 0 - No
- ☐ 1 - Yes

ADL/IADLs

> For M0640-M0800, complete the "Current" column for all patients. For these same items, complete the "Prior" column only at start of care and at resumption of care; mark the level that corresponds to the patient's condition 14 days prior to start of care date (M0030) or resumption of care date (M0032). In all cases, record what the patient is *able to do*.

(M0640) Grooming: Ability to tend to personal hygiene needs (i.e., washing face and hands, hair care, shaving or make up, teeth or denture care, fingernail care).

Prior   Current
- ☐   ☐   0 - Able to groom self unaided, with or without the use of assistive devices or adapted methods.
- ☐   ☐   1 - Grooming utensils must be placed within reach before able to complete grooming activities.
- ☐   ☐   2 - Someone must assist the patient to groom self.
- ☐   ☐   3 - Patient depends entirely upon someone else for grooming needs.
- ☐   UK - Unknown

(M0650) Ability to Dress Upper Body (with or without dressing aids) including undergarments, pullovers, front-opening shirts and blouses, managing zippers, buttons, and snaps:

Prior   Current
☐ ☐ 0 - Able to get clothes out of closets and drawers, put them on and remove them from the upper body without assistance.
☐ ☐ 1 - Able to dress upper body without assistance if clothing is laid out or handed to the patient.
☐ ☐ 2 - Someone must help the patient put on upper body clothing.
☐ ☐ 3 - Patient depends entirely upon another person to dress the upper body.
☐   UK - Unknown

(M0660) Ability to Dress Lower Body (with or without dressing aids) including undergarments, slacks, socks or nylons, shoes:

Prior   Current
☐ ☐ 0 - Able to obtain, put on, and remove clothing and shoes without assistance.
☐ ☐ 1 - Able to dress lower body without assistance if clothing and shoes are laid out or handed to the patient.
☐ ☐ 2 - Someone must help the patient put on undergarments, slacks, socks or nylons, and shoes.
☐ ☐ 3 - Patient depends entirely upon another person to dress lower body.
☐   UK - Unknown

(M0670) Bathing: Ability to wash entire body. **Excludes grooming (washing face and hands only).**

Prior   Current
☐ ☐ 0 - Able to bathe self in shower or tub independently.
☐ ☐ 1 - With the use of devices, is able to bathe self in shower or tub independently.
☐ ☐ 2 - Able to bathe in shower or tub with the assistance of another person:
       (a) for intermittent supervision or encouragement or reminders, OR
       (b) to get in and out of the shower or tub, OR
       (c) for washing difficult to reach areas.
☐ ☐ 3 - Participates in bathing self in shower or tub, but requires presence of another person throughout the bath for assistance or supervision.
☐ ☐ 4 - Unable to use the shower or tub and is bathed in bed or bedside chair.
☐ ☐ 5 - Unable to effectively participate in bathing and is totally bathed by another person.
☐   UK - Unknown

(M0680) Toileting: Ability to get to and from the toilet or bedside commode.

Prior   Current
☐ ☐ 0 - Able to get to and from the toilet independently with or without a device.
☐ ☐ 1 - When reminded, assisted, or supervised by another person, able to get to and from the toilet.
☐ ☐ 2 - Unable to get to and from the toilet but is able to use a bedside commode (with or without assistance).
☐ ☐ 3 - Unable to get to and from the toilet or bedside commode but is able to use a bedpan/urinal independently.
☐ ☐ 4 - Is totally dependent in toileting.
☐   UK - Unknown

(M0690) Transferring: Ability to move from bed to chair, on and off toilet or commode, into and out of tub or shower, and ability to turn and position self in bed if patient is bedfast.

Prior Current
☐ ☐ 0 - Able to independently transfer.
☐ ☐ 1 - Transfers with minimal human assistance or with use of an assistive device.
☐ ☐ 2 - Unable to transfer self but is able to bear weight and pivot during the transfer process.
☐ ☐ 3 - Unable to transfer self and is unable to bear weight or pivot when transferred by another person.
☐ ☐ 4 - Bedfast, unable to transfer but is able to turn and position self in bed.
☐ ☐ 5 - Bedfast, unable to transfer and is unable to turn and position self.
☐   UK - Unknown

(M0700) Ambulation/Locomotion: Ability to <u>SAFELY</u> walk, once in a standing position, or use a wheelchair, once in a seated position, on a variety of surfaces.

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently walk on even and uneven surfaces and climb stairs with or without railings (i.e., needs no human assistance or assistive device).

☐ ☐ 1 - Requires use of a device (e.g., cane, walker) to walk alone <u>or</u> requires human supervision or assistance to negotiate stairs or steps or uneven surfaces.

☐ ☐ 2 - Able to walk only with the supervision or assistance of another person at all times.

☐ ☐ 3 - Chairfast, <u>unable</u> to ambulate but is able to wheel self independently.

☐ ☐ 4 - Chairfast, unable to ambulate and is <u>unable</u> to wheel self.

☐ ☐ 5 - Bedfast, unable to ambulate or be up in a chair.

☐   UK - Unknown

(M0710) Feeding or Eating: Ability to feed self meals and snacks. **Note: This refers only to the process of <u>eating</u>, <u>chewing</u>, and <u>swallowing</u>, <u>not preparing</u> the food to be eaten.**

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently feed self.

☐ ☐ 1 - Able to feed self independently but requires:
    (a) meal set-up; <u>OR</u>
    (b) intermittent assistance or supervision from another person; <u>OR</u>
    (c) a liquid, pureed or ground meat diet.

☐ ☐ 2 - <u>Unable</u> to feed self and must be assisted or supervised throughout the meal/snack.

☐ ☐ 3 - Able to take in nutrients orally <u>and</u> receives supplemental nutrients through a nasogastric tube or gastrostomy.

☐ ☐ 4 - <u>Unable</u> to take in nutrients orally and is fed nutrients through a nasogastric tube or gastrostomy.

☐ ☐ 5 - Unable to take in nutrients orally or by tube feeding.

☐   UK - Unknown

(M0720) Planning and Preparing Light Meals (e.g., cereal, sandwich) or reheat delivered meals:

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - (a) Able to independently plan and prepare all light meals for self or reheat delivered meals; <u>OR</u>
    (b) Is physically, cognitively, and mentally able to prepare light meals on a regular basis but has not routinely performed light meal preparation in the past (i.e., prior to this home care admission).

☐ ☐ 1 - <u>Unable</u> to prepare light meals on a regular basis due to physical, cognitive, or mental limitations.

☐ ☐ 2 - Unable to prepare any light meals or reheat any delivered meals.

☐   UK - Unknown

(M0730) Transportation: Physical and mental ability to <u>safely</u> use a car, taxi, or public transportation (bus, train, subway).

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently drive a regular or adapted car; <u>OR</u> uses a regular or handicap-accessible public bus.

☐ ☐ 1 - Able to ride in a car only when driven by another person; <u>OR</u> able to use a bus or handicap van only when assisted or accompanied by another person.

☐ ☐ 2 - <u>Unable</u> to ride in a car, taxi, bus, or van, and requires transportation by ambulance.

☐   UK - Unknown

(M0740) Laundry: Ability to do own laundry -- to carry laundry to and from washing machine, to use washer and dryer, to wash small items by hand.

Prior Current

☐ ☐ 0 - (a) Able to independently take care of all laundry tasks; OR
(b) Physically, cognitively, and mentally able to do laundry and access facilities, but has not routinely performed laundry tasks in the past (i.e., prior to this home care admission).

☐ ☐ 1 - Able to do only light laundry, such as minor hand wash or light washer loads. Due to physical, cognitive, or mental limitations, needs assistance with heavy laundry such as carrying large loads of laundry.

☐ ☐ 2 - Unable to do any laundry due to physical limitation or needs continual supervision and assistance due to cognitive or mental limitation.

☐   UK - Unknown

(M0750) Housekeeping: Ability to safely and effectively perform light housekeeping and heavier cleaning tasks.

Prior Current

☐ ☐ 0 - (a) Able to independently perform all housekeeping tasks; OR
(b) Physically, cognitively, and mentally able to perform all housekeeping tasks but has not routinely participated in housekeeping tasks in the past (i.e., prior to this home care admission).

☐ ☐ 1 - Able to perform only light housekeeping (e.g., dusting, wiping kitchen counters) tasks independently.

☐ ☐ 2 - Able to perform housekeeping tasks with intermittent assistance or supervision from another person.

☐ ☐ 3 - Unable to consistently perform any housekeeping tasks unless assisted by another person throughout the process.

☐ ☐ 4 - Unable to effectively participate in any housekeeping tasks.

☐   UK - Unknown

(M0760) Shopping: Ability to plan for, select, and purchase items in a store and to carry them home or arrange delivery.

Prior Current

☐ ☐ 0 - (a) Able to plan for shopping needs and independently perform shopping tasks, including carrying packages; OR
(b) Physically, cognitively, and mentally able to take care of shopping, but has not done shopping in the past (i.e., prior to this home care admission).

☐ ☐ 1 - Able to go shopping, but needs some assistance:
(a) By self is able to do only light shopping and carry small packages, but needs someone to do occasional major shopping; OR
(b) Unable to go shopping alone, but can go with someone to assist.

☐ ☐ 2 - Unable to go shopping, but is able to identify items needed, place orders, and arrange home delivery.

☐ ☐ 3 - Needs someone to do all shopping and errands.

☐   UK - Unknown

(M0770) Ability to Use Telephone: Ability to answer the phone, dial numbers, and effectively use the telephone to communicate.

Prior Current

☐ ☐ 0 - Able to dial numbers and answer calls appropriately and as desired.

☐ ☐ 1 - Able to use a specially adapted telephone (i.e., large numbers on the dial, teletype phone for the deaf) and call essential numbers.

☐ ☐ 2 - Able to answer the telephone and carry on a normal conversation but has difficulty with placing calls.

☐ ☐ 3 - Able to answer the telephone only some of the time or is able to carry on only a limited conversation.

☐ ☐ 4 - Unable to answer the telephone at all but can listen if assisted with equipment.

☐ ☐ 5 - Totally unable to use the telephone.

☐ ☐ NA - Patient does not have a telephone.

☐   UK - Unknown

MEDICATIONS

(M0780) **Management of Oral Medications:** <u>Patient's ability</u> to prepare and take <u>all</u> prescribed oral medications reliably and safely, including administration of the correct dosage at the appropriate times/intervals. **<u>Excludes</u> injectable and IV medications. (NOTE: This refers to ability, not compliance or willingness.)**

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently take the correct oral medication(s) and proper dosage(s) at the correct times.

☐ ☐ 1 - Able to take medication(s) at the correct times if:
    (a) individual dosages are prepared in advance by another person; <u>OR</u>
    (b) given daily reminders; <u>OR</u>
    (c) someone develops a drug diary or chart.

☐ ☐ 2 - <u>Unable</u> to take medication unless administered by someone else.

☐ ☐ NA - No oral medications prescribed.

☐   UK - Unknown

(M0790) **Management of Inhalant/Mist Medications:** <u>Patient's ability</u> to prepare and take <u>all</u> prescribed inhalant/mist medications (nebulizers, metered dose devices) reliably and safely, including administration of the correct dosage at the appropriate times/intervals. **<u>Excludes</u> all other forms of medication (oral tablets, injectable and IV medications).**

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently take the correct medication and proper dosage at the correct times.

☐ ☐ 1 - Able to take medication at the correct times if:
    (a) individual dosages are prepared in advance by another person, <u>OR</u>
    (b) given daily reminders.

☐ ☐ 2 - <u>Unable</u> to take medication unless administered by someone else.

☐ ☐ NA - No inhalant/mist medications prescribed.

☐   UK - Unknown

(M0800) **Management of Injectable Medications:** <u>Patient's ability</u> to prepare and take <u>all</u> prescribed injectable medications reliably and safely, including administration of correct dosage at the appropriate times/intervals. **<u>Excludes</u> IV medications.**

<u>Prior</u> <u>Current</u>

☐ ☐ 0 - Able to independently take the correct medication and proper dosage at the correct times.

☐ ☐ 1 - Able to take injectable medication at correct times if:
    (a) individual syringes are prepared in advance by another person, <u>OR</u>
    (b) given daily reminders.

☐ ☐ 2 - <u>Unable</u> to take injectable medications unless administered by someone else.

☐ ☐ NA - No injectable medications prescribed.

☐   UK - Unknown

EQUIPMENT MANAGEMENT

(M0810) **Patient Management of Equipment (includes <u>ONLY</u> oxygen, IV/infusion therapy, enteral/parenteral nutrition equipment or supplies):** <u>Patient's ability</u> to set up, monitor and change equipment reliably and safely, add appropriate fluids or medication, clean/store/dispose of equipment or supplies using proper technique. **(NOTE: This refers to ability, not compliance or willingness.)**

☐ 0 - Patient manages all tasks related to equipment completely independently.

☐ 1 - If someone else sets up equipment (i.e., fills portable oxygen tank, provides patient with prepared solutions), patient is able to manage all other aspects of equipment.

☐ 2 - Patient requires considerable assistance from another person to manage equipment, but independently completes portions of the task.

☐ 3 - Patient is only able to monitor equipment (e.g., liter flow, fluid in bag) and must call someone else to manage the equipment.

☐ 4 - Patient is completely dependent on someone else to manage all equipment.

☐ NA - No equipment of this type used in care **[If NA, go to *M0825*]**

(M0820) **Caregiver Management of Equipment (includes ONLY oxygen, IV/infusion equipment, enteral/parenteral nutrition, ventilator therapy equipment or supplies):** Caregiver's ability to set up, monitor, and change equipment reliably and safely, add appropriate fluids or medication, clean/store/dispose of equipment or supplies using proper technique. **(NOTE: This refers to ability, not compliance or willingness.)**

- ☐ 0 - Caregiver manages all tasks related to equipment completely independently.
- ☐ 1 - If someone else sets up equipment, caregiver is able to manage all other aspects.
- ☐ 2 - Caregiver requires considerable assistance from another person to manage equipment, but independently completes significant portions of task.
- ☐ 3 - Caregiver is only able to complete small portions of task (e.g., administer nebulizer treatment, clean/store/dispose of equipment or supplies).
- ☐ 4 - Caregiver is completely dependent on someone else to manage all equipment.
- ☐ NA - No caregiver
- ☐ UK - Unknown

THERAPY NEED

(M0825) **Therapy Need:** Does the care plan of the Medicare payment period for which this assessment will define a case mix group indicate a need for therapy (physical, occupational, or speech therapy) that meets the threshold for a Medicare high-therapy case mix group?

- ☐ 0 - No
- ☐ 1 - Yes
- ☐ NA - Not applicable

EMERGENT CARE

(M0830) **Emergent Care:** Since the last time OASIS data were collected, has the patient utilized any of the following services for emergent care (other than home care agency services)? **(Mark all that apply.)**

- ☐ 0 - No emergent care services **[If no emergent care, go to *M0855*]**
- ☐ 1 - Hospital emergency room (includes 23-hour holding)
- ☐ 2 - Doctor's office emergency visit/house call
- ☐ 3 - Outpatient department/clinic emergency (includes urgicenter sites)
- ☐ UK - Unknown **[If UK, go to *M0855*]**

(M0840) **Emergent Care Reason:** For what reason(s) did the patient/family seek emergent care? **(Mark all that apply.)**

- ☐ 1 - Improper medication administration, medication side effects, toxicity, anaphylaxis
- ☐ 2 - Nausea, dehydration, malnutrition, constipation, impaction
- ☐ 3 - Injury caused by fall or accident at home
- ☐ 4 - Respiratory problems (e.g., shortness of breath, respiratory infection, tracheobronchial obstruction)
- ☐ 5 - Wound infection, deteriorating wound status, new lesion/ulcer
- ☐ 6 - Cardiac problems (e.g., fluid overload, exacerbation of CHF, chest pain)
- ☐ 7 - Hypo/Hyperglycemia, diabetes out of control
- ☐ 8 - GI bleeding, obstruction
- ☐ 9 - Other than above reasons
- ☐ UK - Reason unknown

DATA ITEMS COLLECTED AT INPATIENT FACILITY ADMISSION OR AGENCY DISCHARGE ONLY

(M0855) To which **Inpatient Facility** has the patient been admitted?

- ☐ 1 - Hospital **[Go to M0890]**
- ☐ 2 - Rehabilitation facility **[Go to M0903]**
- ☐ 3 - Nursing home **[Go to M0900]**
- ☐ 4 - Hospice **[Go to M0903]**
- ☐ NA - No inpatient facility admission

(M0870) **Discharge Disposition:** Where is the patient after discharge from your agency? **(Choose only one answer.)**

- ☐ 1 - Patient remained in the community (not in hospital, nursing home, or rehab facility)
- ☐ 2 - Patient transferred to a noninstitutional hospice **[Go to M0903]**
- ☐ 3 - Unknown because patient moved to a geographic location not served by this agency **[Go to M0903]**
- ☐ UK - Other unknown **[Go to M0903]**

(M0880) After discharge, does the patient receive health, personal, or support **Services or Assistance?** **(Mark all that apply.)**

- ☐ 1 - No assistance or services received
- ☐ 2 - Yes, assistance or services provided by family or friends
- ☐ 3 - Yes, assistance or services provided by other community resources (e.g., meals-on-wheels, home health services, homemaker assistance, transportation assistance, assisted living, board and care)

> **Go to M0903**

(M0890) If the patient was admitted to an acute care **Hospital**, for what **Reason** was he/she admitted?

- ☐ 1 - Hospitalization for emergent (unscheduled) care
- ☐ 2 - Hospitalization for urgent (scheduled within 24 hours of admission) care
- ☐ 3 - Hospitalization for elective (scheduled more than 24 hours before admission) care
- ☐ UK - Unknown

(M0895) **Reason for Hospitalization: (Mark all that apply.)**

- ☐ 1 - Improper medication administration, medication side effects, toxicity, anaphylaxis
- ☐ 2 - Injury caused by fall or accident at home
- ☐ 3 - Respiratory problems (SOB, infection, obstruction)
- ☐ 4 - Wound or tube site infection, deteriorating wound status, new lesion/ulcer
- ☐ 5 - Hypo/Hyperglycemia, diabetes out of control
- ☐ 6 - GI bleeding, obstruction
- ☐ 7 - Exacerbation of CHF, fluid overload, heart failure
- ☐ 8 - Myocardial infarction, stroke
- ☐ 9 - Chemotherapy
- ☐ 10 - Scheduled surgical procedure
- ☐ 11 - Urinary tract infection
- ☐ 12 - IV catheter-related infection
- ☐ 13 - Deep vein thrombosis, pulmonary embolus
- ☐ 14 - Uncontrolled pain
- ☐ 15 - Psychotic episode
- ☐ 16 - Other than above reasons

> **Go to M0903**

(M0900) For what **Reason(s)** was the patient **Admitted** to a **Nursing Home?** **(Mark all that apply.)**

☐   1   -   Therapy services
☐   2   -   Respite care
☐   3   -   Hospice care
☐   4   -   Permanent placement
☐   5   -   Unsafe for care at home
☐   6   -   Other
☐ UK   -   Unknown

(M0903)   **Date of Last (Most Recent) Home Visit:**

__ __ / __ __ / __ __ __ __
month   day   year

(M0906)   **Discharge/Transfer/Death Date:**   Enter the date of the discharge, transfer, or death (at home) of the patient.

__ __ / __ __ / __ __ __ __
month   day   year