



Fall 2017

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## Commentary

### Role of Nurses in Managing Chronic Disease

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The Veterans Health Administration (VHA) serves a large population requiring care for chronic diseases such as diabetes mellitus, heart failure, hypertension, and chronic obstructive pulmonary disease. Moreover, many high risk Veterans with chronic disease have multiple comorbidities and psychosocial issues. These Veterans require care delivery designed to improve their quality of life and reduce overall costs of care. Additionally, the increased use of non-VA care necessitates robust care coordination efforts for Veterans with chronic disease. The role of the registered nurse (RN) has evolved to meet the increasingly complex care requirements of this Veteran population. Through their interventions, RNs contribute to improved outcomes and appropriate use of Veteran services. Nursing practice changes in outpatient and community settings have focused attention towards the value of RNs in improving outcomes and reducing the use of costly inpatient care.

RNs in VHA perform various roles across multiple settings to provide the necessary collaboration and coordination of services essential for patient-centered care delivery and optimal outcomes. RNs function as coordinators of care, providing significant value by reducing fragmentation and enhancing care transitions for the most complex patients. Since Veterans with chronic diseases often see specialty providers and may require different levels of care throughout their illness, RNs provide the support needed for Veterans and their families to navigate what can become a complex system of care. RNs conduct post-hospitalization phone calls to fa-

ilitate appropriate follow-up after acute care hospitalization. They also provide significant patient and family education, a critical component of successful chronic disease management. Utilizing their holistic approach, RNs further patient-centeredness to enhance care and satisfaction for the Veteran.

The VHA outpatient RN care manager role requires panel management of high-risk patients, chronic disease management, and facilitation of care transitions. The RN care manager coordinates care between services such as primary care, specialty care, behavioral health, and social work services. This coordination is particularly important for high-risk individuals to ensure smooth transitions and clear communication. RNs work as part of a team that may include physicians, nurse practitioners, pharmacists, and other healthcare professionals that support care delivery. They add capacity to the provider clinic by working at the full scope of their license and education, often using protocols to handle many things that would otherwise require provider time for this population of Veterans. RNs also provide direct patient care through independent nurse visits to conduct screenings and assessments, review lab tests, plan care and referrals, arrange home and community-based services, and teach Veterans and their caregivers. Non-face-to-face encounters may include secure messaging or telephone advice. For the individual with chronic illness, providing care when needed, while utilizing the most appropriate level of care improves quality and reduces costs of care.



### Director's Letter

There are currently more than 93,000 nursing personnel working in the Veterans Health Administration, the largest single job category among the nearly 365,000 VA employees. While nurses are central to any healthcare system, they are especially important in a national integrated system like VHA, which serves many smaller communities where physician supply is limited. Advanced practice nurses such as nurse practitioners have become a mainstay of VA primary care and, thanks to newly expanded practice authority, can practice

independently in VA facilities in all 50 states. Registered nurses play critical roles in PACT teams as care coordinators providing proactive, team-based care. Most interventions studied by HSR&D, from smoking cessation to preventing healthcare associated infections or falls, to improving functioning of PACTs have nurses at their center. I got fresh insight into the qualities and adaptability of VA nurses at a recent meeting of five teams from across VA who are implementing demonstration projects of PACT Intensive Management, a program of intensive outreach to VA's highest-risk and most challenging patients. Nurses (RNs and NPs) were the critical core of multi-disciplinary teams; they performed home visits, coordinated social and psychiatric support, co-attended specialty care appointments, called family members, and most importantly, became the face of a VA that could be counted on to go the extra mile for our most in-need Veterans.

VA also has a distinguished history of nurse investigators, especially in HSR&D, and helped by the Nursing Research Initiative, a mentored award program more than 20 years old. The articles in this issue highlight the work of some of our best nurse-scientists studying issues central to nursing practice in VA: the roles of nurses in chronic care management, their interaction with telehealth, and their central role in improving patient safety.

Due to their distinct training, and more extensive contact with patients, nurses are in many ways better equipped than physicians to help lead and examine several of the important changes happening in Veteran care: 1) the movement to proactive, team-based care; 2) the evolution from a physician-centric system focused on treating illness to a patient-centered delivery system focused on "whole health;" and 3) the integration of technology into ongoing care. Understanding the full impact of these changes requires going beyond simple measures of medical interventions and outcomes, but requires understanding of how patients communicate with their healthcare team; how best to support patient behavior change; and how to foster stronger engagement with and trust in the healthcare system. It is gratifying to see the contribution of VA nurses and nurse-researchers as VA undergoes this important evolution.

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*Director, HSR&D*

Successful management of chronic conditions requires Veteran participation in their care and self-management skills. RNs assist Veterans to drive their care through setting patient-driven goals, ones that address real-life issues that matter to them. To promote self-management, the RN provides education on topics such as smoking cessation, medications, nutrition, exercise, and symptom management. Additionally, RNs provide coaching and support to facilitate decision-making and adoption of healthy

behaviors. The RN uses specific interviewing techniques such as motivational interviewing to address uncertainties and assist the Veteran. The overall objective is to improve Veteran self-management to prevent exacerbation of their illness and reduce hospital readmissions and emergency department visits.

Advancing technology offers Veterans with chronic diseases alternative modalities for managing their disease. RNs play an

important role in these new care modalities. One example is home telemonitoring, where nurses provide monitoring of disease symptoms, assessment of adherence to medication regimens, and monitoring of parameters such as body weight, blood pressure, and heart rate to detect early signs of illness exacerbation. Early identification and rapid response, often to subtle changes in a patient's condition, improves outcomes and may prevent higher cost services such as hospitalization. As alternative care modalities evolve in telehealth, continued research about the impact of services on patient satisfaction, access to care, hospital admissions, and emergency department visits is essential to guide nursing practice.

Nurse practitioners also play a critical role in managing Veterans with chronic disease. They enable VHA to provide accessible, cohesive, and coordinated care for Veterans with chronic disease. They serve as primary providers to help meet access requirements. While evidence demonstrates nurse practitioners deliver high quality, safe, and effective care with a holistic focus, more research is needed to determine system cost effectiveness and analysis of avoidable hospital admissions and Veteran satisfaction.<sup>1</sup>

The Office of Nursing Services (ONS) continues to advance nursing practice to improve Veterans' care. An important aspect of improving care for Veterans with chronic disease includes building upon the RN role in management of Veterans requiring complex care. This effort will require development of each nurse's current knowledge about chronic disease management and increasing the use of evidence-based protocols and clinical practice guidelines.

Managing Veterans with chronic disease is highly complex and requires the use of evidence-based approaches. We have the responsibility to conduct research and determine best practice as we transform care delivery for Veterans. If we are to redesign future care delivery and implement innovative models of care, then evaluation of care delivery models and the role of the nurse is required to ensure quality and cost-effectiveness.

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## Response to Commentary

# Practicing to the Full Scope of Licensure Can Improve Access to Care

Sheila Cox Sullivan, PhD, RN, VHA-CM, VHA Office of Nursing Services, Washington, DC

The use of non-physician providers to increase access to health care is not unique to Veterans. A shortage of physicians specializing in primary care, poised to reach crisis proportions by 2025, has led to medical facilities calling upon nurse practitioners (NPs) and physician assistants (PAs) to fill the gap.<sup>1</sup> Varying degrees of limitations imposed by boards of nursing and medicine nationwide create additional challenges to meeting the demand of aging, chronically ill citizens. Coupled with the shortage of primary care physicians, these regulatory inconsistencies are one of the reasons VHA moved to exert federal supremacy in providing full practice authority (FPA) to registered nurses (RNs), including NPs, clinical nurse specialists (CNSs), and certified nurse midwives (CNMs). PAs are seeking the same authority. VHA took this step with the goal of improving access to care for Veterans as well as meeting the Institute of Medicine's call to allow practice to the full scope of licensure.

Substantial literature demonstrates that there is not a significant difference in the quality of care provided between these practitioners. However, there is a paucity of literature to support whether this revised model of care will achieve the same levels of satisfaction or efficiency for Veterans or providers. One study conducted in 2010 found that Veterans preferred being seen by NPs; however, the authors attribute this result to the tendency of NPs to focus on health promotion, and to their attention to Veteran concerns.<sup>2</sup> The authors appropriately note these characteristics are easily taught to other professions. However, there are no subsequent reports of how the implementation of

Patient Aligned Care Teams (PACT) may have changed this perception nor has there been sufficient time to determine whether FPA has had an impact on providers, Veterans, or budgetary issues, much less Veterans' access to health care.

Additional research is needed to fully understand the role of NPs in providing care to chronically ill Veterans. Hundreds of NPs manage primary and specialty care clinics throughout VHA, but a review of the Cochrane database finds no conclusive evidence on the efficiency or effectiveness of this delivery mechanism. Conversely, care coordination is seen as encompassing prevention, education, and management of chronic disease. Care coordination efforts by RNs is well documented in the literature, even more so since the Affordable Care Act established this model of care as a sound method for managing complex patients. In addition, the Centers for Medicare and Medicaid Services (CMS) determined in 2015 that "non in-person care" will be reimbursed when provided to individuals with two or more chronic illnesses when these conditions place the patient at an increased risk for exacerbation, hospitalization, or death. This guidance has expanded the use of telehealth and other forms of virtual care exponentially.

Hass and Swan suggest that RNs have functioned as care coordinators for years, but only received recognition following a study of RNs' roles in ambulatory care.<sup>3</sup> One consequence of the informal nature of nursing's role is a lack of standardization in implementation, which further inhibits the ability of researchers to evaluate the impact of nurses on care coordination. Measures of quality for ambulatory nurs-

ing care continue to be elusive, although the Healthcare Effectiveness Data and Information Set (HEDIS) provides some measures for the interprofessional team.

One aspect of the expansion of the RN role in ambulatory care that deserves further exploration is the management of stable chronic disease by protocols. Such protocols can enable an RN to obtain laboratory results and provide routine management to patients with hypertension or diabetes, for example. If the patient is stable and laboratory results are normal or unchanged from previous visits, the RN can enter these results into the record while providing any needed education for the patient. However, any changes in patient status would require an elevation of the level of care. There is no evidence suggesting that this practice would or would not work, and additional research is needed to evaluate its impact on quality of care, as well as patient and provider satisfaction with this model. The advantage of this model may lie in allowing unstable patients additional time with a physician, NP, or PA while ensuring adequate monitoring for those with stable chronic disease.

Allowing nurses to practice to the full extent of their licensure and education will require research to determine the best models for delivery of this care while maintaining patient safety and quality. However, allowing this scope of practice is critical to ensuring access to health care for Veterans and civilians alike.

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## Research Highlight

# VA Nursing: Effectiveness and Entry

Anne Sales, PhD, RN, Claire Robinson, MPH, and Sonia Duffy, PhD, RN, FAAN, all with HSR&D's Center for Clinical Management Research and QUERI/ONS Partnered Evaluation Initiative, Ann Arbor, Michigan; and Sheila Cox Sullivan, PhD, RN, VHA-CM, and Mary Pat Couig, PhD, MPH, RN, FAAN, both with VHA's Office of Nursing Services

The VA Office of Nursing Services (ONS), along with the Quality Enhancement Research Initiative (QUERI), established a Partnered Evaluation Initiative (PEI) with a team of researchers from the Ann Arbor Center for Clinical Management Research in 2014. The purpose of the PEI is to improve Veteran care by informing the QUERI program and ONS about: 1) the ability of strategic initiatives to maintain, modify, and expand nursing programs; and 2) the implementation of strategic initiatives, including variations in implementation across sites. The ONS/Ann Arbor PEI conducted evaluations of the: 1) Staffing Methodology (SM) directive; 2) RN Transition-To-Practice (RNTTP) program; and 3) Full Practice Authority (FPA) regulation.

### Staffing Methodology

Using nurse staffing data from 123 VHA facilities between fiscal year 2009 and 2015, we assessed: 1) the effect of the Staffing Methodology (SM) directive on changes in nurse staffing (defined as nursing hours per patient day [NHPPD]); and 2) the association between changes in nurse staffing and central-line associated bloodstream infection (CLABSI) and catheter-associated urinary tract infection (CAUTI) rates. We modeled the monthly change in infection rates associated with staffing levels in the post-implementation period, compared to the pre-implementation period, using an interrupted time series/segmented regression analysis and adjusting for serial correlations. We found a modest, but significant increase in NHPPD trends post-SM directive implementation, relative

to pre-implementation. Additionally, in the post-implementation period, an increase of one NHPPD was significantly associated with a decrease of .26 and .09 in the number of infections per 1,000 device days on average, relative to the effect of staffing on the pre-implementation infection rates for CAUTI and CLABSI respectively. In conjunction with other co-occurring hospital infection prevention initiatives, our findings suggest that changes in nurse staffing processes, as required by the staffing directive, are associated with reduced hospital-associated infections.

### RN Transition-To-Practice Program

To assess implementation of the RN Transition-To-Practice (RNTTP) program, we conducted semi-structured telephone interviews with Chief Nurse Executives, RNTTP Coordinators, and their teams at 19 medical centers between June 2015 and February 2016. Factors commonly mentioned as affecting implementation fell into four primary domains: materials and support from ONS, facility-level dynamics and resources, program-specific requirements, and program outcomes. Interviewees generally felt that curriculum resources, evaluation tools, and other program materials provided by ONS were helpful, but electronically stored in places and on platforms that were difficult to access and navigate. While interviewees described RNTTP as a powerful recruiting tool, coordinators were challenged by aligning the schedules of trainees with mentors and preceptors, and protecting trainee time for educational components. Our findings confirm that implementing RNTTP requires significant time and

coordination by program staff and nursing leadership. ONS leadership is aware of this, and are providing national guidance and support to ensure new graduates are able to transition effectively from entry-level to competent professionals. RNs are the largest single component of the VHA workforce, and their recruitment and retention are essential to ensuring access to patient care.

### Full Practice Authority: Understanding the Role of Certified Registered Nurse Anesthetists

To understand and describe the models of anesthesia care in VHA, we analyzed retrospective surgical data from 125 VHA facilities for an 18-month period (October 1, 2013-March 31, 2015). We identified three models of anesthesia care based on the documented principal anesthetist and supervising anesthetist (if present): Model 1: physician anesthesiologist supervising a certified registered nurse anesthetist (CRNA); Model 2: physician anesthesiologist practicing independently or supervising an anesthesiology resident; and Model 3: CRNA without a supervising anesthesiologist. We determined case volume and anesthesia care models by assessing the surgical case complexity, patient health status, and facility complexity. Over half (57 percent) of all surgical cases indicated a model of physician anesthesiologist collaborating with or supervising CRNA (Model 1), whereas 32 percent of cases were categorized as having a physician-driven model (Model 2), and 12 percent of cases indicated a CRNA without physician collaboration/supervision model (Model 3). Model 2 represented a higher proportion of highly complex cases (39 percent) compared to Model 3 (6 percent). Over half of surgical cases in the largest, most complex facilities used a collaborative/supervisory approach to anesthesia care (Model 1), while we found that the CRNA without collaboration/supervision model (Model 3) occurred almost exclusively among surgical cases in smaller facilities with lower complexity. These facilities are also in states in which the nursing practice act permits independent CRNA practice.

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## Research Highlight

# Using Bundles to Enhance Care and Improve Patient Outcomes

Sarah L. Krein, PhD, RN, HSR&D Center for Clinical Management Research, VA Ann Arbor Healthcare System, Ann Arbor, Michigan

Care or practice “bundles,” defined as a set of evidence-based practices that when implemented together result in better outcomes, have become a mainstay for improving health care quality and safety since the concept was first introduced by the Institute for Healthcare Improvement (IHI) in 2001.<sup>1</sup> Bundles for improving the care of patients being mechanically ventilated and with central lines soon led to a focus on sepsis, prevention of catheter-associated urinary tract infection (CAUTI), falls, and pressure ulcers, as well as a host of other outcomes. Indeed, some of these bundles have been a key component in successful care improvement initiatives both inside and outside the Department of Veterans Affairs (VA) healthcare system.

A recent example involving the implementation of care bundles in VA hospitals includes a virtual breakthrough series collaborative, led by the VA National Center for Patient Safety, which focused on reducing CAUTI and hospital-acquired pressure ulcers.<sup>2</sup> The CAUTI breakthrough initiative used a bundle that was based on prior work by a VA research team<sup>3</sup> and had been implemented at one VA medical center as well as regionally. This single site and regional work also informed a large-scale program that led to a significant decrease in CAUTI rates in a cohort of more than 600 hospitals across the United States. Results for sites participating in the VA CAUTI prevention breakthrough collaborative were also positive, with a decrease in the mean CAUTI rate from 2.37 in the pre-work phase to 1.06 per 1,000 catheter days during the implementation phase. In contrast, there was no change in the CAUTI rate for non-participating sites during the same timeframe.

The pressure ulcer program focused on implementing a previously established VA skin bundle. As with the CAUTI prevention program, researchers found a notable decrease (1.80 to .99) in hospital-acquired pressure ulcers among those sites participating in the VA pressure ulcer collaborative.

### Bundle Implementation: The Critical Role of Nurses

With these efforts, however, the bundle was only part of the program and what may not be immediately obvious is the critical role played by nurses in bundle implementation and the improvement process. In addition to nurses often leading the improvement teams, many of the bundle practices focused on nursing activities (e.g., patient repositioning for pressure ulcer prevention) or required nursing engagement (e.g., routine review and assessment of ongoing urinary catheter need to promote timely removal and prevent CAUTI). That is not to say that collaboration amongst clinical care providers is not necessary. Rather, bundles, by design, highlight the unique and important roles of all members of the care team and, particularly in the inpatient setting, bundles can emphasize the contribution of nursing and the importance of teamwork for optimizing patient care and outcomes.

While some clinical care providers may now suffer from what might be characterized as “bundle fatigue,” the principles behind the bundle, as originally conceptualized, remain a useful strategy for enhancing nursing practice, reinforcing the importance of nurses as part of the healthcare team, and promoting safer and more effective patient care. These principles include: 1) developing and using

a bundle to ensure that a core set of care practices, as determined by evidence and clinician agreement, are being reliably delivered; and 2) fostering communication and improving teamwork by involving care team members and individuals from multiple disciplines in bundle development.<sup>1</sup> Bundles can, therefore, prove beneficial in making sure everyone is working together and providing care from the same evidence base.

**With these efforts, however, the bundle was only part of the program and what may not be immediately obvious is the critical role played by nurses in bundle implementation and the improvement process.**

In sum, nurses not only can and should consider care bundles as an important strategy for enhancing and ensuring effective care delivery, but also nurses can and should play a role in identifying, testing, and developing the components of these practice bundles. While not all care activities or outcomes may fit with a bundled approach, for those that do, nurses can be instrumental in using this strategy for improving care and patient outcomes throughout VA.

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## Research Highlight

# Effects of Nurse-Managed Protocols in the Outpatient Management of Adults with Chronic Conditions

John W. Williams Jr, MD, MHS, Durham VA Evidence Synthesis Program, and Cristina Hendrix, DNS, GNP-BC, FAAN, Geriatrics Research, Education, and Clinical Center, Durham VAHCS, Durham, North Carolina

One of Secretary Shulkin's top five priorities is "improving timeliness of services." Meeting this priority will require strategies that emphasize efficiency in healthcare delivery such as the VA Patient Aligned Care Teams (PACTs). Launched in 2011, PACT uses alternative formats for care delivery such as shared medical appointments and telemedicine. PACT also embraces the value of team-based care. In this spirit, new strategies for expanding the roles and responsibilities of interdisciplinary PACT team members, including nurses, are being developed and tested. One such strategy is "nurse-managed protocols," whereby nurses take on an expanded role in the management of selected chronic medical conditions by following a protocol set by current clinical guidelines or standards of practice.

The VA Evidence-based Synthesis Program (ESP) provides timely and accurate syntheses of targeted healthcare topics of importance to clinicians, managers, and policymakers. In the past decade, the four VA ESP centers have supported VA policy and clinicians with more than 125 evidence reports. The Durham ESP completed a synthesis of studies evaluating nurse-managed protocols for the outpatient management of adults with type 2 diabetes, hypertension, hyperlipidemia, and congestive heart failure (CHF).<sup>1,2</sup> Investigators examined peer-reviewed publications from January 1980 through December 2012 that evaluated interventions using nurse-managed protocols compared with usual care targeting adults with the aforementioned conditions. The evidence review included 29 unique studies, of which 26 were randomized controlled trials.

### Key Evidence Review Findings

One of the key questions examined by the evidence review is whether nurse-managed protocols (compared with usual

care) improve indicators of clinical quality and resource utilization of Veterans with chronic medical conditions. Overall, the evidence review found that for patients with *elevated cardiovascular risk*, interventions using nurse-managed protocols had a small to moderate positive effect on improving HbA1c, blood pressure, and hyperlipidemia, but effects varied substantially across studies. Nurse-managed protocols compared with usual care also were associated with more patients reaching target goals in total cholesterol and blood pressure.

For patients with *CHF*, nurse-managed protocols were associated with lower all-cause mortality, more patients being prescribed an angiotensin-converting enzyme inhibitor or angiotensin receptor blocking (ACE/ARB) agent, and decreased CHF-related hospitalizations compared with usual care. Effects on other outcomes such as nursing staff satisfaction and treatment adherence were reported infrequently. All studies used an RN who had autonomy to titrate medications, and in most studies, initiated medications per protocol.

The evidence review also examined how well participating nurses adhered to the protocol. The review found that while indirect evidence (e.g., improved outcomes) suggests nurses adhere to protocols, direct evidence (e.g., through fidelity checks) is insufficient to establish how well nurses adhere to protocols when engaged in delivering nurse-managed care.

Finally, the evidence review sought to determine whether there are adverse effects associated with the use of nurse-managed protocols. Only one fair-quality study on diabetes in a health maintenance organization reported on adverse events. Severe low

blood glucose events were identical (1.5 percent) at baseline and increased similarly, 2.9 percent in the control group compared with 3.1 percent in the intervention group.

### Implications of Findings

With the implementation of PACTs, VA has begun to reconfigure team-based care models to expand the responsibilities of team members, such as nurses, to practice to the full extent of their education and training. Results from this systematic review and meta-analysis suggest that nurse-managed protocols have positive effects on the outpatient management of adults with stable, common chronic conditions such as type 2 diabetes, hypertension, hyperlipidemia, and CHF. However, descriptions of how nurses are trained to assume this expanded role are not well reported. Additionally, subgroup analyses showed some differences between in-person and telephone-based protocols. For example, interventions delivered primarily by telephone showed significantly greater effects for total and LDL cholesterol in patients with elevated cardiovascular risk, and greater mortality reductions in patients with CHF.

Evidence exists to support the effectiveness of nurse-delivered interventions in the management of Veterans with diabetes.<sup>3</sup> Efforts are also underway to develop and test nurse-managed protocols in cardiology at the Durham VAHCS. Nurses constitute the largest healthcare workforce group employed at VA, thus they are in an ideal position to collaborate with other team members to increase access of effective care for Veterans with chronic diseases.

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To view VA Evidence-based Synthesis Program reports or to nominate a review, go to [www.hsrd.research.va.gov/publications/esp/](http://www.hsrd.research.va.gov/publications/esp/).

## Research Highlight

# Home Telehealth RN Insulin Management Improves Health Outcomes

Nancy N. Brown, MSN, ARNP, ANP-BC, Barbara E. Carrara MSN, RN, and Freta L. Leddige, MSN, RN, all with Home Telehealth, Mann-Grandstaff VAMC, Spokane, Washington and Sharon A. Watts, DNP, FNP-BC, CDE, Louis Stokes VAMC, Cleveland, Ohio

The need for access to high quality chronic disease management is at an all-time high and stretching limited provider resources. Models that focus on use of the entire clinical team are needed to enhance access while improving coordination of care. In 2003, the Veterans Health Administration (VHA) introduced a national Home Telehealth (HT) system as a comprehensive, cost-effective, and well-received method for providing care coordination to a burgeoning chronic disease Veteran population.<sup>1</sup> For patients with diabetes, care coordination optimizes chronic disease management through daily end user messaging, education, and communication between Veterans and healthcare nurses.

### Efficient Glycemic Improvement

In 2011, at the Mann-Grandstaff VAMC, an influx of HT referrals for diabetic management prompted development of a systematic approach to improve care by implementing insulin adjustment standing orders that utilized the Veterans Affairs/Department of Defense (VA/DoD) Diabetes Clinical Practice Guidelines. Using the standing medication order, HT RN case managers provided safe and expedient resolution of blood glucose fluctuations on a real-time basis.

A Performance Improvement Project undertaken by the Mann-Grandstaff VAMC HT staff evaluated the effect of RN real-time insulin adjustment over a six month period using a quasi-experimental design comparing historical controls from a 2009 cohort (n=28) with the quality improvement intervention patients (n=24). They established the outcome variable as time to achieving A1C target. The project found a statistically significant improvement in time to reach target for the intervention cohort, as compared to

the historical cohort. The RN standing orders group accomplished this more efficiently, with a decrease in the average time to reach individual glycemic goal from 258 days to 89 days, a 66 percent improvement.

### Efficacy and Safety of RN Insulin Adjustment Protocol

With this success, the Mann-Grandstaff VAMC expanded RN standing orders in 2013 to create a more flexible, comprehensive Insulin Adjustment Protocol for HT RN Case Managers. RNs who were approved to use the protocol received 12 hours of didactic diabetic education, as well as mentoring and real-time decision support. Once Insulin Adjustment Protocol orders were written, HT RNs began utilizing it as part of their chronic disease management. Initially, they consulted regularly with the nurse practitioner advisor to transfer didactic learning into clinical application by jointly analyzing blood glucose patterns, developing in-depth understanding of the mechanisms of different insulins, the basal/bolus ratio concept, and determining how much, and what type, of insulin adjustment to make.

Concurrently, the Veterans Administration (VA) Office of Nursing Service (ONS) undertook a review of RN Case Manager research literature while designing a new model of chronic care delivery remarkably similar to the Mann-Grandstaff RN medication protocol. Several of the VHA medical diabetes experts expressed concern regarding RNs adjusting insulin with potential risk of adverse hypoglycemic events. To ensure Insulin Adjustment Protocol safety, ONS provided funding to harvest and analyze the RN insulin titration program.

The hypoglycemia evaluation included all patients with diabetes on insulin (n=155) enrolled in the program on August 1, 2014, with primary outcome variables being the occurrence of hypoglycemia and A1C reduction. Hypoglycemia was based on values from glucose self-monitoring (stratified by 50-70 and <50 mg/dL) plus ER visits. Researchers compiled data on patient age, length of time since diagnosis of diabetes, comorbidities, medications, number of low blood sugar readings, and the reason for the low blood sugar from vendor data and chart reviews. The mean age for patients enrolled in the RN protocol group was 66 and the mean duration of diabetes was 11 years. A high prevalence of baseline basal insulin use suggests that the RN protocol was implemented in a complex diabetes population.

Results from a paired t-test using Minitab 16 Statistical Software program indicated a significant difference in the reduction in A1C from entry into the program to finish with the RN managed insulin titration protocol. The mean baseline A1C was 9.6 percent and the final mean A1C was 7.7 percent. Mild hypoglycemia was present during the RN titration of insulin management. Serious hypoglycemia was very uncommon (n=2). The evaluation found no acute care admissions or ER visits for hypoglycemia. The evaluation further identified missed meals and increased activity as common causes for hypoglycemia with no such instances related to an RN insulin adjustment.<sup>2</sup> These findings demonstrate safety and efficacy in a model of care focusing on use of RN clinical team members working to the top of their license and improving quality of care in chronic disease management of an older population of patients with long standing diabetes.

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translating research into quality health care for veterans

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Our findings, which are descriptive only, indicate that anesthesia care is delivered primarily by physician anesthesiologists collaborating with or supervising CRNAs. Utilization of CRNAs in VHA may be influenced by case- and facility-level factors and by availability of physician anesthesiologists at facilities. CRNA practice without collaboration/supervision may be one approach to

ensuring access to surgical services in VHA, particularly at smaller, rural facilities.

The partnership between ONS and our evaluation center is an excellent example of strong collaboration between an important program office responsible for policy and practice in the field, and health services research and development.

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## FORUM

Karen Bossi and Margaret Trinity, Co-Editors

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