WINNING THE RACE AGAINST DIABETES

WITH SHARED MEDICAL APPOINTMENTS

AT THE U.S. DEPARTMENT OF VETERANS AFFAIRS

by

Jason Michael Gleason

A scholarly project submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Nursing Practice

in

Family and Individual Health

MONTANA STATE UNIVERSITY
Bozeman, Montana

April 2022

©COPYRIGHT

by

Jason Michael Gleason

2022

All Rights Reserved

DEDICATION

Brady, Carson, and Isaac, my three amazing sons and coyotes. I am so proud of the amazing men that you have grown up to be. The legacy of your mom and I live on in you. My life is blessed because of you.

Christopher—my rock, my inspiration, my hiking buddy, my heart, my everything. Your unwavering support and patience during my DNP program have meant the world to me. The pages of this manuscript are complete, and the greatest pages of our story lie ahead.

Heather Gleason, my sweetheart in heaven and mother to our three amazing sons. This project and everything I am and have become would not be possible without your love and support—the essence of who you were lives on in our boys and I. We love and miss you.

Stella Gleason my mom in heaven, Jim Gleason, my father full of wit, stories, and fun and Pat Gleason, my stepmom - I am who I am today because of you. Your influence, encouragement, values, love, support, and wisdom make up the essence of my humanity.

Shawn Gleason, Chris Gleason, Tracy Cunningham, Dawn Ferriter and Nicky Vavruska my siblings and partners in fun. Thanks for all of your love and support over the years. None of this would've been possible without you.

All of the patients I serve at the U.S. Department of Veterans Affairs - our national heroes. There has been no greater professional honor, charge, challenge, or blessing in my entire life than caring for and serving you.

ACKNOWLEDGEMENTS

Margaret Hammersla PhD, ANP-A and Sam Benavides-Vaello, PhD, RN for being such inspirational and supportive faculty leads for this project.

Special Thanks to: Mary Lynn Ayers, MD, FACP, Grace Baguley, CDCES, RD, Chris L. Borst, DNP, PMHNP, APRN, Rhetta Brandt, LPN, Annie Brown, MSN, BSN, Marci Olson Butcher, RD/CDCES, Janet Cameron, AMSA, Debera Charlton, MSN, RN, Maria Colandrea, DNP, NP-C, CORLN, FAANP, Antonette Darlington, PharmD, RPH, BCPS, Margaret Fitzgerald, DNP, FNP-BC, NP-C, FAANP, CSP, FAAN, DCC, FNAP; Susan Geubtner, BSN, MBA, PCCN, RN, Judy Hayman, PhD, Tracy Hellem, PhD, RN; Donna Hill-Howes, RN, MS, Penny Jensen, DNP, FNP-C, FAAN, FAANP, Kathryn Johnson, BSN, RN, Michelle Johnson, SMSA, Susan Luparell, PhD, RN, CNE, ANEF, James Paul C Maganito, DO, FACOOG, Kristy Mahlum, BSN, RN, Kathleen Mountan, COA, OSA, AMSA, Kerrie Mountan, COA, HT, Michael Nagel, BSN, RN, CCRN, Vanessa Pomarico, EdD, FNP-BC, FAANP, Jenny Prejean, LCSW, Susan Raph, DNP, RN, NEA-BC, Kristal Richards, MN, RN, CNL, Karyn Rinaldi-Cousart; Heather Sauro, MS, RD, CDCES, BC-ADM, Molly Secor-Turner, PhD, MS, RN Michael Spinelli, MD, FACP, Vicki Thennis, MSN, MHA, RN, Raymond Tierney, MSN, BC, RN, Mary Toren, BSN, RN, Erik Vilen, MD, Marcie Watson, LPN, Elizabeth Webster, LPN, Denise Weiler, BSN, RN, Sharon Weinstein, CSP and Helen Williams, MSN, RN.

These leaders, mentors, and colleagues provided exceptional guidance, steadfast determination, unwavering support, enthusiasm, time, and dedication all serving as a catalyst to bring this scholarly project from the pages of this manuscript to life in practice. They helped improve the health and wellness of the greatest patients on the planet—our national heroes.

TABLE OF CONTENTS

1. BACKGROUND AND SIGNIFICANCE 1

The Problem 1
Important Diabetes Biometrics 3

2. SYNTHESIS OF THE LITERATURE 7

Introduction 7
Origins of an Emerging Solution: Shared Medical Appointments (SMAs) 7
Important Metrics to Measure the Efficacy of SMAs for Diabetes 8
Benefits of Implementing Shared Medical Appointments (SMAs) for Diabetes 10
Improvement in Glycated Hemoglobin (A1C) 11
Improvement in Low Density Lipoproteins (LDL) 11
Improvement in Systolic Blood Pressure (SBP) 12
Improvement in Body Mass Index (BMI) 13
Improvement in Patient Satisfaction 14
Limitations of Implementing Shared Medical Appointments (SMAs) for Diabetes 15
Small Sample Size 16
Heterogeneity of What Comprises An SMA 17
Lack of Generalizability 18

3. PROJECT METHODS AND IMPLEMENTATION 20

Introduction 20
Theoretical Framework 20
Project Setting 24
Participants 24
Participant Consent 25
Information Protection 26
Institutional Review Boards and Executive Leadership Approval 27
Project Phases and Key Tasks 28
Building Momentum and Conducting Data Collection with Race Days 29
Weekly Diabetes Education Sessions and Shared Medical Appointments (SMAs) 30
Project Team 32
Potential Barriers 32

4. RESULTS OF THE QUALITY IMPROVEMENT PROJECT 35

TABLE OF CONTENTS CONTINUED

Population Characteristics 35
Montana VA Leaders and Staff 35
Patients with Diabetes 36
Data Analysis 36
Launch Day Activities 37
Patient Resources 37
Launch Day Evaluation 37
Patient Attendance 38
Results 39
Hemoglobin A1C 39
Systolic Blood Pressure (SBP) 40
Low Density Lipoproteins (LDLs) 41
Body Mass Index (BMI) 42
Patient Health Questionnaire-9 (PHQ-9) 43
Diabetes Treatment Satisfaction Questionnaire (DTSQ) 44
Discussion 45
Aligning Results with Project Purpose and Aims 45
Correlating Results with Existing Literature and Evidence-Based Practice 46
Findings Differed from Those Expected 46
Dissemination of Project Findings 47
Project Challenges and Lessons Learned 48
Limitations 50
Recommendations and Implications for Future Practice 51
Conclusion—Overarching Implications of Project Findings 52

5. REFLECTION ON DNP ESSENTIALS AND MY EDUCATIONAL JOURNEY 53

Introduction 53
Essential One: Scientific Underpinnings of Practice 54
Essential Two: Organizational and Systems Leadership 57
Essential Three: Clinical Scholarship and Analytical Methods for Evidence-Based Practice 59
Essential Four: Technology for the Improvement and Transformation of Healthcare 60
Essential Five: Care Policy for Advocacy in Health Care 63

REFERENCES CITED 67

TABLE OF CONTENTS CONTINUED

APPENDICES 74

APPENDIX A: Informed Consent to Participate in SMA and HIPPA Notification.....75
APPENDIX B: Quality Improvement Project vs. Research.....77
APPENDIX C: Logic Model 79
APPENDIX D: Timeline, Race Days, and Education Sessions 81
APPENDIX E: Win the Race Participant Punch Card 83
APPENDIX F: Diabetes Treatment Satisfaction Questionnaire (DTSQ).....85
APPENDIX G: Data Collection and Analysis Plan.....87
APPENDIX H: Veterans Integrated Service Networks.....89
APPENDIX I: Launch Day Evaluation 91

LIST OF TABLES

Table Page

1. Characteristics of the diabetes shared medical appointment project staff 36

2. Launch Day Patient Evaluation 38

3. Patient Participant Weekly Attendance 39

4. Project Results 45

ABSTRACT

Diabetes is a profound source of suffering for millions of people, as well as the seventh leading cause of death in the United States, resulting in 83,564 annual deaths (Mayer-Davis et al. 2017) Diabetes is more prevalent among US veterans at 25% compared to the general US population at 20% (Liu et al., 2017). The Veterans Health Administration (VHA) (2020) also reports that in addition to diabetes affecting 25% of the entire population of US veterans it is also the leading cause of blindness, end-stage renal disease, and amputation for VA patients. In 2001, the VHA added Type 2 diabetes to the list of health conditions caused by agent orange when it was used during the Vietnam War. Today, 270,000 Vietnam veterans are receiving disability payments for agent orange–related Type 2 diabetes (VHA, 2019).

Shared medical appointments (SMAs) are a unique model of care delivery that provides an interactive setting to complete patient visits, improve access, enhance efficiency, promote peer support, build comradery, and most of all improve health outcomes. The purpose of this project was to utilize existing literature based on robust research regarding SMAs to assemble an interdisciplinary team, develop, launch, and land a 12-week diabetes SMA quality improvement project at the Montana VA—Great Falls Community Based Outpatient Clinic. This project aimed to utilize SMAs to improve six diabetes-related metrics, including hemoglobin A1 C, systolic blood pressure, low-density lipoproteins, body mass index, depression as measured by the patient health questionnaire 9 (PHQ-9) and patient satisfaction as measured by the diabetes treatment satisfaction questionnaire (DTSQ). The project resulted in clinical and statistically significant improvement in five of these metrics, making the project a best practice model of sustainable, innovative care delivery within the Veterans Administration.

CHAPTER ONE

BACKGROUND AND SIGNIFICANCE

The Problem

In addition to afflicting 34 million Americans and being the seventh leading cause of death in the United States, report that patients with diabetes made 16 million visits to an emergency department in 2016. Additionally, of those visits, 438,000 patients were admitted to the hospital with ischemic heart disease, 313,000 with acute stroke, 130,000 with lower limb infections—which necessitated an amputation—209,000 with hyperglycemic crisis and 57,000 with a hypoglycemic crisis. Owing to this, the total direct and indirect costs of treating diabetes in the United States in 2017 amounted to $327 billion (Petersen, 2018).

The American Diabetes Association (ADA) (2018) reports that 14.3 million seniors (26.8% of the US senior population) over the age of 65 years old have diabetes and 1.5 million Americans are newly diagnosed with diabetes each year. Furthermore, the ADA, also reports that 88 million Americans aged 18 years old and older have pre-diabetes.

The Montana Department of Health and Human Services Diabetes Program (2019) reports that 64,000 adults in Montana are afflicted with diabetes. A devastating affliction that resulted in 958 deaths, 1,675 inpatient admissions, and 1,837 emergency medical transports all at a financial cost of $42,597,780 for Montanans in 2019. The ADA (2020) also reports that 8.1% of those living in Montana have diabetes, that 282,000 Montanans have pre-diabetes and that every year another 4,000 Montanans are diagnosed with diabetes. In 2017, the total direct

medical expenses for treating those diagnosed with diabetes in Montana was estimated to cost $634 million.

The VHA has over 800 community-based outpatient clinics (CBOCs) across the United States. Each CBOC has primary care providers, including APRNs, who lead a patient-aligned care team (PACT). The VA implemented the CBOC model of care to make healthcare more accessible for veterans rather than having them drive hundreds of miles to one centralized VA hospital for their primary care needs (VHS, 2020).

Montana has 14 CBOCs to serve our veterans across the fourth largest state in the country (Montana VA Health Care System, 2020). The CBOC in Great Falls has five PACTs, four of which are led by APRNs and one of them by a physician. The five teams currently provide care for 3,983 patients with 666 (16.72%) of those patients having diabetes. Of those patients with diabetes, 122 (18.31%) have a hemoglobin A1C greater than 8%, indicating poor glycemic control (Montana VA Electronic Quality Measures, 2021). Patients with diabetes being treated by the five PACTs also demonstrated a mean of 25% for poor blood pressure control with blood pressure >140/90 mm/Hg, 34.8% for poor low-density lipoproteins (LDL) management with an LDL >100 mg/dL, and 40% for poor weight control with a body mass index (BMI) >30 (Montana VA Electronic Quality Measures, September 2021).

The Great Falls CBOC has conducted health classes for diabetes in the past but with limited participation (2–8 patients, most of whom had taken the classes previously), no ADA standardized, approved curriculum and without SMAs which involve having an APRN or physician present to perform individual assessments during the program sessions.

Important Diabetes Biometrics

Glycated hemoglobin (A1C), systolic blood pressure (SBP), LDL, BMI, depression as screened using the patient health questionnaire 9 (PHQ-9) and patient satisfaction as measured by the DTSQ are important biometrics and measurements to consider when devising a transformative diabetes treatment program. Despite evidence showing the benefits of simultaneous control of A1C, SBP, and LDL in reducing the risk of diabetes complications and death attainment of all three goals simultaneously has been low at 10–30% (Hu et al., 2016).

A1C first discovered in 1955 is a widely used tool for diagnosing, screening, and managing patients with diabetes. It serves as a key risk indicator for diabetes-associated microvascular and macrovascular complications and mortality (Sandler & McDonnell, 2016). A1C has several advantages compared with fasting plasma glucose and the oral glucose tolerance test including greater convenience (fasting not required); greater preanalytical stability,fewer day-to-day perturbations during stress, and change in diet or illness (ADA, 2021). A1C is an important indicator of long-term glycemic control with the ability to reflect the cumulative glycemic history of the preceding three months.

Elevated A1C has been regarded as an independent risk factor for coronary heart disease and stroke in subjects with or without diabetes (Sherwani et al., 2016). The ADA has recommended A1C with a cut-point of ≥6.5% for diagnosing diabetes, and A1C is the test of choice for monitoring and chronic management of diabetes as it provides a reliable measure of chronic glycemia and correlates well with long-term diabetes complications (Lippi et al., 2010). An A1C goal of between 7% and 8% is reasonable and beneficial for most patients with Type 2 diabetes (Tello, 2020). In regard to evaluating long-term glycemic control, an A1C of < 7.0% is a

recommended target for most patients. This goal post changes to < 8.0% in patients who are elderly, especially those 80 years old and older (Silvio et al., 2015) due to the risk of hypoglycemia related to tight blood sugar control strategies, which could lead to falls, injuries, and other complications in the elderly. Stratton et al. (2000) say that "each 1% reduction in A1C is associated with a risk reduction of 14% in myocardial infarction and 37% in microvascular complications."

Hypertension is common among patients with diabetes, and it is a strong risk factor for atherosclerotic cardiovascular disease (ASCVD), heart failure, and microvascular complications. ASCVD is the leading cause of morbidity and mortality for individuals with diabetes, and it is the leading cause of direct and indirect costs associated with treating diabetes (de Boer et al., 2017). Improved SBP control has contributed to a reduction in ASCVD morbidity and mortality in patients with diabetes since 1990 (Gregg et al., 2014), and there are large benefits seen when multiple risk factors such as A1c SBP, LDL, BMI, and DTSQ are assessed and addressed simultaneously (Oellgaard et al., 2016). Hypertension is defined as a sustained blood pressure ≥ 140/90 mmHg as levels above this threshold are strongly associated with ASCVD, death, disability, and microvascular complications (Fox et al., 2015). An SBP <140 is the target goal for patients with diabetes with a blood pressure goal of <130/80 for those patients with diabetes and other high-risk cardiovascular disease risk factors as long as treatment can be achieved without undue burden for complications (de Boer et al., 2017).

Dyslipidemia is an important risk factor to consider when treating a patient with diabetes. Type 2 diabetes is hyperglycemia caused by insulin resistance, excessive hepatic glucose production, and insufficient insulin secretion by the pancreas. These factors contribute to fatty

acid influx into the liver causing the accumulation of lipid metabolites. This in turn causes non-alcoholic fatty liver disease, which contributes to overall ASCVD risk in patients with Type 2 diabetes (Erion, 2016). A lipids profile generally includes total cholesterol, triglycerides, high-density lipoproteins, and LDLs. LDLs carry approximately 60–70% of serum cholesterol. LDL transports cholesterol from the liver to peripheral tissues. During transportation, it can cause buildup on the arterial walls leading to atherosclerotic plaques, which can then lead to vessel narrowing, myocardial infarction, stroke, retinopathy, nephropathy, vascular dementia, and other microvascular diseases (Elshourbagy et al., 2014). The American Heart Association recommends a target level of <100 mg/dL for LDLs (Lee et al., 2021).

BMI is another important biometric to consider when assessing the overall risk for diabetes and its associated comorbidities. BMI is a person's weight in kilograms divided by the square of height in meters. An elevated BMI can indicate high body fatness. A BMI between 18.5 to <25 is normal, 25 to <30 is considered overweight, 30–40 is considered obese, and >40 is severe obesity (Centers for Disease Control [CDC], 2021a). Obesity management can delay the progression from pre-diabetes to Type 2 diabetes and is highly beneficial in the treatment of Type 2 diabetes. In patients with Type 2 diabetes, modest and sustained weight loss in those who are also overweight or have obesity has shown to improve glycemic control and reduce the need for medications (ADA, 2021).

The incidence of depression is also 24% higher in patients with diabetes (Holt et al., 2014), and emotional distress and depression prevent patients from acting on their competence to perform diabetes self-management behaviors (Schinkus et al., 2018). These factors make screening for depression using the PHQ-9 in patients with diabetes very important.

Patient satisfaction related to diabetes care is another important metric to measure. Outcomes of diabetes interventions should not be evaluated by biometrics such as A1C, SBP, LDL, and BMI alone. It is important to consider and evaluate the psychological aspects of patient care including patient satisfaction. The DTSQ was developed in the 1980s to assess patients' satisfaction with their diabetes treatment. It is composed of eight questions, each of which is scored on a Likert scale. Scores are totaled with higher scores indicating higher degrees of satisfaction with diabetes treatment (Bradley & Gamsu, 1994).

Nam et al. (2011) completed a large systematic review looking at patient- and clinician-related barriers that lead to diabetes being untreated. They found that patient-related barriers to treatment included attitude, beliefs, and knowledge related to diabetes self-management, cultural and language capabilities, lack of financial resources, comorbidities, and lack of social support. Clinician-related barriers to providing effective diabetes treatment included attitude, beliefs, and knowledge about diabetes, lack of effective communication skills and lack of a well-integrated health system.

The prevalence and complications related to the scourge of diabetes coupled with barriers to care demonstrate a clear need for innovative, dynamic modalities of care delivery including SMAs.

CHAPTER TWO

SYNTHESIS OF THE LITERATURE

Introduction

Four themes were identified during an in-depth review of the literature. These themes included the origin of SMAs and their dynamic connection to healthcare delivery at the VA, important metrics to consider in evaluating the efficacy of shared medical appointment implementation, benefits of implementing SMAs, and limitations of SMAs.

Origins of an Emerging Solution: Shared Medical Appointments (SMAs)

Evidence of the SMA model of care delivery was first published in 1907 when SMAs were used to evaluate and treat patients with tuberculosis (Pratt, 1907). The use of SMAs became more prevalent in the 1990s when they were initiated in Colorado and have been used for the evaluation and treatment of numerous chronic health conditions including heart disease, chronic obstructive pulmonary disease (COPD), dementia, mood and anxiety disorders, and diabetes (Taveira et al., 2010).

A shared medical appointment involves multiple patients seen at once for chronic disease management or follow-up care. SMAs offer an interactive setting in which patients have improved access to health care providers, participate more in their own medical care, and take advantage of counseling and peer support (Frates et al., 2017). Thompson-Lastad (2018) recognized that SMAs aim to improve patient health through a combination of medical care, education, and peer support while also interrupting the reproduction of health care inequalities.

SMAs are designed to improve health outcomes, increase access to care, and give patients opportunities to support each other making peer interaction an essential part of the group visit model of care (Geller & Shoemaker, 2015). SMAs for diabetes have had a positive impact on physiologic (A1C, SBP, LDL, BMI) outcomes and patient satisfaction (Housden & Wong 2016). Short- and mid-term improvement of physiologic outcomes are important in reducing long-term complications associated with diabetes including stroke, myocardial infarction, retinopathy, neuropathy, nephropathy, and skin wounds that could lead to amputations.

Important Metrics to Measure the Efficacy of SMAs for Diabetes

A1C, SBP, LDL, and BMI are key metrics to measure in the treatment of patients with diabetes. These biometrics are important to improve and control to reduce the risk of diabetes-related microvascular disease that could eventually lead to stroke, myocardial infarction, vascular dementia, retinopathy, nephropathy, neuropathy, skin wounds, amputations, and death.

A robust body of evidence from previous studies and quality improvement projects has established A1C, LDL, SBP, and BMI as key metrics to determine the efficacy of SMAs for patients with diabetes. The importance of these metrics and their relation to diabetes was discussed thoroughly in Chapter One. Seven major research and quality improvement projects were synthesized to evaluate which metrics should be measured to evaluate SMA outcomes for patients with diabetes. Projects were diverse and included two randomized control trials, two quality improvement projects, one systematic review, one quasi-experimental study, and one randomized pragmatic study.

Four of these diabetes SMA projects including two quality improvement projects were conducted in VA settings, involving veterans with diabetes making their findings especially

relevant to this diabetes SMA quality improvement project, which focuses on veterans. Additionally, the three remaining projects were conducted in community health centers or urban primary care centers making their findings also relevant to the project given similar patient demographics.

Key metrics including A1C, SBP, LDL, and BMI should be measured at baseline during the first week of shared medical appointment implementation and at least at the end of the project to evaluate for statistically significant improvement in outcomes. A1C is measured every three months as it is a measurement of the glucose bound to hemoglobin on the red blood cell. The average red blood cell lifespan is 90 days. The A1C test is measured every three months and corresponds to average blood glucose levels during the three months prior to the test. Therefore, to evaluate the efficacy of the SMA program for diabetes, it is most efficacious to measure the A1C at baseline during week one and at the conclusion of the program at week 12. LDL should also be measured at baseline and conclusion of the project as capturing LDL and A1C in the same lab drawn is most cost-efficient vs. measuring LDL more frequently throughout the project. SBP should be measured during weeks one and 12 of the project. The provider will also measure it once a month during the project. BMI will be measured during weeks one and 12 of the program. Three projects (Hartzler et al., 2018; Heisler et al., 2020; Vaughan et al., 2017) measured key metrics at baseline and six months. One project (Omogbai & Milner, 2018) measured key metrics at baseline, three and six months, and one project (Berry et al., 2016) measured key SMA diabetes metrics at baseline and every three months for 15 months. Berry et al. (2016) carried out their randomized control trial for 15 months to evaluate longer-term impact of SMAs.

Patient satisfaction is another important metric to measure when considering the launch of SMAs. The DTSQ (see Appendix F) is reviewed in detail in Chapter One and has proven validity and reliability (Bradley & Gamsu, 1994). Omogbai et al. (2018) utilized the DTSQ during their SMAs for the diabetes quality improvement project at the VA. It was measured at baseline at six months. The DTSQ will be utilized for the Great Falls VA diabetes SMA program and measured at baseline and three months to evaluate patient satisfaction.

The incidence of depression is also 24% higher in patients with diabetes (Holt et al., 2014), and emotional distress and depression prevent patients from acting on their competence to perform diabetes self-management behaviors (Schinkus et al., 2018). Further, patients with diabetes exhibit a higher rate of suicidal ideation (16.2%) compared to the general population at 9.2% (Elamoshy et al. 2018). The PHQ-9 is a widely used screening instrument for depression. The PHQ-9 is used often in primary care at the VA to screen patients including those with diabetes for depression. PHQ-9 scores greater than 10 have a sensitivity of 88% and specificity of 88% for identifying major depressive disorder. Internal consistency of the PHQ-9 has also been shown to be high (American Psychological Association, 2020). Given all these factors related to diabetes and depression and the profound connection between the two, all patients participating in the project will be screened for depression at baseline during day one (January 5, 2022) and again during project conclusion during week 12 (March 23, 2022).

Benefits of Implementing Shared Medical Appointments (SMAs) for Diabetes

A robust body of evidence suggests that SMAs for patients with diabetes can improve key biometrics (A1C, LDL, SBP, and BMI) in addition to improving patient satisfaction as measured by the DTSQ.

Improvements in key biometrics (A1C, LDL, SBP, and BMI) were consistent across studies and quality improvement projects synthesized in the literature. Therefore, similar target reduction goals were set for the SMAs for the diabetes quality improvement project at the Great Falls VA.

Improvement in Glycated Hemoglobin (A1C)

Patients attending SMAs for diabetes have seen a reduction in A1C (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Heisler et al., 2020; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017) with a mean A1C reduction of 0.94% and a reduction range of 0.3% to 1.5% spanning across all projects. This literature was synthesized to set a realistic A1C reduction goal of 1% for the Great Falls SMAs for the diabetes quality improvement project. Also of importance is that one study (Yang et al., 2019) showed no improvement in A1C among the SMA group, which they attributed to the small sample size (n=44) and short duration of the study (six months) in addition to a mean number of patients in the control and intervention groups achieving an A1c <7%, which limited the detection of between-group differences.

Improvement in Low Density Lipoproteins (LDL)

SMAs for diabetes (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017) have also resulted in reductions in LDLs with a mean LDL reduction of 11.9 mg/dl and a reduction range of 3 mg/dl to 15 mg/dl spanning across the six projects. This literature was synthesized to set a realistic LDL reduction goal of 10 mm/dl for the Great Falls SMAs for the diabetes quality improvement project. One project, a randomized pragmatic trial at the VA by Heisler et al. (2020), only focused on A1c and SBP as

measured biometrics. The authors did not elaborate on why they only focused on several of the important biometrics associated with diabetes.

Improvement in Systolic Blood Pressure (SBP)

Empirical evidence (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017) consistently demonstrates that SMAs for diabetes also resulted in improvement in SBP with a mean reduction of 8 mmHg and reduction range of 3 mmHg to 16 mmHg across the six projects. This literature was synthesized to set a realistic SBP reduction goal of 5 mm/dl for the Great Falls SMAs for the diabetes quality improvement project.

One study (Heisler et al., 2020) was a randomized pragmatic trial implemented in five VA health systems showed no significant improvement in SBP among those in the SMA group. These findings contrasted with the other studies and projects which showed an improvement. Specific comparison between Heisler et al. (2020) and Edelman et al. (2015) shows that Heisler et al. (2020) may not have shown a reduction in SBP because baseline blood pressure in their SMA group was consistently good with a mean SBP baseline <140 mmHg. Heisler et al. (2020) conclude that SBP reduction was not seen in their study because given the mean SBP baseline <140 mmHg SMA facilitators focused most of their efforts toward improving glycemic control rather than on improving SBP. Heisler et al. (2020) also noted that their SMA program focused on patient-directed, interactive, behavioral goal setting vs. the didactic focus of the others, which could have resulted in improved glycemic control over SBP improvement.

The diabetes SMA project at the Great Falls VA will have a blended facilitator and patient-directed, interactive, and didactic focus, which will hopefully result in improved outcomes.

Patients participating in the diabetes SMA project at the Great Falls VA will receive a blood pressure monitor and education to measure their blood pressure readings at home. They will be encouraged to bring their readings to SMA sessions for discussion. SBP will be measured at baseline and at the conclusion of the 12-week program to evaluate the project impact on SBP.

Improvement in Body Mass Index (BMI)

Patients' participation in SMAs for diabetes also demonstrated improvement in BMI (Omogbai et al., 2018; Vaughan et al., 2017) with a mean reduction in BMI of 0.85 points and a reduction range of 0.8 to 0.9 points across two projects. A reduction of 0.85 points in BMI was determined to be significant in the noted projects, and it would be a practical goal to set for the SMA diabetes program at the Great Falls VA clinic. Misra et al. (2019) say, "BMI calculation is based on an individual's height and weight (kg/m^2)". For an adult who measured 5 foot 10 inches in height, one BMI point would be equal to 3.1684 kg or 7 lb. Applying that calculation to the mean BMI reduction of 0.85 in the two projects noted above would equate to 5.95 pounds of weight loss in a patient with a height of 5 foot 10 inches. The CDC (2021) recommends that losing 5–10% of one's total weight can improve blood sugars and diabetes control. Ten pounds of weight loss in an individual who weighs 200 pounds would equal 5% of their total body weight. Therefore, losing at least 5.95 pounds in a patient with a height of 5 foot 10 inches who participates in the diabetes SMA program would put them well on their way to meeting their weight loss goal of improving glycemic control.

Improvement in Patient Satisfaction

Patients participating in SMAs for their diabetes also report improved satisfaction (Omogbai et al., 2018) with treatment using the SMA modality as evidenced by a 13.1 point increase ($p<.001$) in DTSQ scores. Omogbai et al. (2018) conducted a SMA for diabetes quality improvement project at the VA that included 30 male veterans. The DTSQ was measured at baseline and again at six months to evaluate patient satisfaction. Data collected at six months was not normally distributed, prompting the author to complete a paired t-test and nonparametric Wilcoxon signed-rank test. It was noted that participant scores improved from the baseline at 22.3 points (SD 2.59) to 35.4 points (SD 0.77) at six months. The results were statistically significant ($p<0.001$). Internal consistency of the DTSQ was established at baseline (Cronbach's alpha of 0.691), though all participants answered "very satisfied" on the Likert scale at six months for questions 1 and 4 which resulted in a follow-up Cronbach's alpha of 0.262 for items 5 and 8. In addition to data collected from the DTSQ, Omogbai et al. (2018) also noted that at the SMA conclusion participants reported anecdotally that they were grateful to have had the opportunity to connect with, relate to and support other veterans with similar health issues as their own, including diabetes.

Omogbai et al. (2018) note that they could find no other studies that utilized the DTSQ to evaluate patient satisfaction with SMA implementation for diabetes. They also cautioned readers to consider that while significant improvement in patient satisfaction was noted in their quality improvement project, internal consistency reliability was low for the six-month DTSQ measurement. I also found limited evidence in the literature of diabetes SMA programs

measuring patient satisfaction as a key metric. All of this makes cautious use of the DTSQ to measure patient satisfaction a unique opportunity for the project.

Patients engaged in SMAs for diabetes are more likely to abide by diabetes guideline recommendations (ADA, 2021) for ongoing surveillance and monitoring including retinal examinations, foot examinations, and microalbumin testing (Vaughan et al., 2017). Such evaluations detect retinopathy (which could lead to blindness), neuropathy (which could lead to foot ulcers and amputations), and nephropathy (which could lead to renal failure). Vaughan et al. (2017) illustrated evidence of this compliance with patients in the SMA group compared with those in the usual care group. Patients in the diabetes SMA group were more likely ($p<0.001$) to get retinal examinations with a completion rate of 90.5% vs. the 13.3% in the usual care group. Furthermore, diabetes SMA group participants had a higher ($p<0.001$) completion rate for foot exams at 57.1% vs. 0.0% in the usual care group. Finally, those in the diabetes SMA group were also more likely ($p<0.001$) to get urine microalbumin screening completed at a rate of 81% vs. 28.6% for the usual care group. Standards of diabetes care metrics (foot exams, retinal exams, and urine microalbumin measurements) will be measured on January 5, 2022 in all diabetes SMA participants at the Great Falls VA clinic striving for a completion rate of 90% or greater.

Limitations of Implementing Shared Medical Appointments (SMAs) for Diabetes

SMAs for diabetes have profound benefits as evidenced and synthesized in the literature. However, it is also important to consider program limitations as doing so allows project leaders to create strategies to help mitigate limitations and barriers. The most significant limitation themes noted across the literature for SMAs include small sample size, heterogeneity of what comprises an SMA, and lack of generalizability.

Small Sample Size

The average size of studies involving continuous outcomes is 30 per group (Billingham et al., 2013). Julious (2005) suggests that 12 participants are adequate for pilot studies or quality improvement projects like the diabetes SMA project at the Great Falls VA clinic.

Multiple studies and quality improvement projects (Berry et al., 2016; Hartzler et al., Heisler et al., 2020; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017; Yang et al., 2019) identify the small sample size as a project limitation. The mean size for all seven of these projects was 41 participants with a size range from 30 to 50 participants. All the studies met the 30-participant adequacy threshold identified by Billingham et al. (2013). However, the authors identified the need for studies and quality improvement projects with larger, more diverse samples to improve generalizability.

One key factor that may contribute to the small sample size is the attrition rate, especially when considering that SMA participants are asked to attend multiple sessions over three- and six-month programs or longer. For example, Hartzler et al. (2020), a 12-month SMA program initially had 59 participants registered for their SMA program but ended up with 38 completing the project. They did not elaborate on the cause for participants dropping out.

Four studies (Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017; Yang et al., 2019) had a project duration of six months. For those studies, participants met once a month for 2–3 hours for their diabetes SMA session. One study (Berry et al., 2016) lasted for 15 months with participants meeting once every three months. They had a retention rate of 88% with 35 patients remaining at the conclusion of their program. While Berry et al. (2016) had one of the longest durations for an SMA, their authors noted that their favorable retention rate of 88% was

likely related to participants only having to meet once every three months during the 15-month program. The diabetes SMA program at the Great Falls VA clinic will run for 12 weeks with 10 weekly sessions bookended by two data collection days during week one and week 12. The sessions will run for one hour over lunchtime, and participants will be encouraged to bring their lunch while snacks will also be provided.

Heterogeneity of What Comprises An SMA

While SMAs are defined as groups of patients meeting over time for comprehensive care related to a chronic condition such as diabetes, what comprises the content and framework for SMAs are quite diverse. SMAs have a variety of diverse curricula, frameworks, and theoretical foundations. Some SMAs for diabetes are heavy on didactic content taught by a facilitator and are informational with little interaction and participation by attendees. Other SMAs for diabetes are based on patient-driven, lead, and facilitated frameworks with little direction or expertise being provided by trained health care professionals. These frameworks lend themselves to being disorganized, disconnected, and ripe with miscommunication and misinformation from patients who are eager to share their expertise with others. Edelman et al. (2014) completed a systematic review of 17 unique studies comparing SMAs for diabetes with usual care modalities. Edelman's work focused on an evidence synthesis commissioned by the VA. Edelman's review found significant gaps related to the heterogeneity of what elements comprise an SMA, recognizing that such elements are often difficult to tease out in the literature and making the identification of what interventions (format, curriculum, participant recruitment, and retainment strategies, etc.) used during an SMA made it successful. Being able to identify what makes an SMA successful is key to dissemination and generalizability so that other organizations can apply and benefit from

SMA interventions. The diabetes SMA quality improvement project at the Great Falls VA will attempt to implement the SMA by incorporating the best of health care provider facilitated and patient-driven frameworks into one blended model, which will result in successful, sustainable outcomes. Another key aim of the project will attempt to create a standard SMA format (see Chapter Three); if successful, it can be easily replicated at other VA clinics within Montana VA and eventually VISN 19 and the national VA system as described further in Chapter Three.

Lack of Generalizability

Generalizability can be affected by quality improvement project special populations, participant demographics including age, and language utilization among others. Veterans exhibit a high degree of comradery and connection related to their shared military service experiences. The comradery that veterans share during a VA-sponsored SMA program may have a positive impact on outcomes (improved A1C, SBP, LDL, BMI, and DTSQ) as veterans support one another and hold each other accountable to be compliant with interventions to improve their diabetes control. Furthermore, veterans who have participated in peer or social support interventions through the VA demonstrate improved glycemic indexes (Piette et al., 2013).

While comradery can be utilized as a strength within the SMA framework, it can be a hindrance regarding SMA generalizability to populations outside the VA as comradery is not easily replicated but is organic and often rooted in years of shared experiences such as those found among veterans. Three studies and quality improvement projects (Heisler et al., 2020; Kirsh et al., 2007; Omogbai et al., 2018) were completed at the VA. Two studies and quality improvement projects (Berry et al., 2016; Vaughan et al., 2017) were completed at community

health centers; one (Hartzler et al., 2018) was completed at an urban primary care center, while another study (Yang et al., 2019) was completed in an urban community health center in China.

Participants in all the studies had a mean age of 60.4 years. The CDC (2019) identifies those at greatest risk of developing Type 2 diabetes as 45 years of age or older. Though relevant, a mean age of 60.4 does impact generalizability for diabetes SMA utilization for younger populations.

All the diabetes SMA studies and quality improvement projects used the English language exclusively except for the study conducted in China—the results of which were translated into English. This is important to consider since Bedard (2018) reports that 13.5% (44 million Americans) are foreign-born and that 22% of the US population does not speak English at home. All veterans are required to be knowledgeable about how to speak and write using the English language, so the risk of a language barrier for SMA implementation at the VA is low. However, language can be a significant barrier to generalizability in replicating the diabetes SMA program in other non-VA populations.

The literature is robust and clear in highlighting the profound history and origins of SMAs rooted in evidence-based practice. Despite identified limitations, SMAs have had a profound and positive impact on improving physiologic metrics and increasing patient satisfaction. An innovative and engaging SMA model of care will be designed, implemented, and evaluated to meet the needs of veterans with diabetes at a Great Falls CBOC launching in January 2022.

CHAPTER THREE

PROJECT METHODS AND IMPLEMENTATION

Introduction

This chapter describes the approach and methods that were utilized to carry out the intended quality improvement DNP project. The primary aim of this quality improvement project was to utilize current, evidence-based tools and literature to develop, launch, and sustain an interdisciplinary shared medical appointment modality of care delivery to improve diabetes outcomes and patient satisfaction at the Montana VA Great Falls CBOC. The theoretical framework that guides this project and the instruments used for gathering are also explained in greater detail throughout this chapter.

Theoretical Framework

Knowledge of the science of change theory is critical to altering organizational systems. Being conversant with various change theories can provide a framework for implementing, managing, and evaluating change within the context of human behavior (Wagner, 2019).

Havelock's (1973) phases of change theory served as a theoretical framework for this project. Havelock (1973) says that "there are two ways to look at stages of innovation. One way is to see it from the point of view of the people who are being changed, and the other is to see it from the point of view of someone who is trying to change someone else's behavior" (p. 5). The focus of the applied change theory for this quality improvement DNP project is on the process of

improving the services of those conducting change and changing patient behavior through education and peer support to improve diabetes outcomes.

Willcox et al. (2018) say that Havelock developed the theory to address two social forces that were gaining momentum in society in 1973, "the explosion of scientific knowledge, and the increasing expectation by policy makers, governments, business and society that scientific knowledge should be useful to society." There are six phases of Havelock's model which include building a relationship, diagnosing the problem; acquiring resources for change, selecting a pathway for the solution, establishing and accepting change, and maintenance and separation (Willcox et al., 2018).

There is tremendous value to incorporating each of these phases into the development of a group/shared visit model of care for patients with diabetes. During the *building a relationship* phase, the need for SMAs was established within the organization and a team for the project was assembled. This phase was completed by conducting an extensive literature review identifying the benefits and limitations of SMAs to help improve diabetes outcomes. Once the review was completed, a relationship with key stakeholders within the organization was established through meeting with Montana VA executive leadership (associate director of nursing services, associate chief nurse, associate chief of medical staff, clinical manager) and local front-line stakeholders (certified diabetes care and education specialist, education specialist, clinical pharmacist, primary care mental health integration specialist, licensed clinical social worker, registered nurses, licensed practical nurses, medical support assistants, tele-retinal surveillance and lab technicians) to present the literature, review the problem, cast a vision and review project framework and goals to establish buy-in, ignite momentum, and assemble the project team.

During the *diagnosing the problem* phase of the project, information gained during the literature review was utilized to establish a broad, global view of the problem of poor diabetes outcomes (abnormal A1C, SBP, LDL, BMI, and DTSQ) in patients managed under the "usual" independent visit model of care delivery and the benefits of launching innovative modalities of care including shared medical appointments. Local Montana VA data (incidence of diabetes, A1C > 8%, blood pressure >140/90, LDL >100 mg/dL, BMI > 30) were utilized to diagnose the problem and establish a need for change supporting the launch of SMAs for patients with diabetes.

During the *acquiring resources for change* phase, a team of front-line stakeholders supported by executive leadership brainstormed and secured resources for the project, including space, time, equipment, scheduling tools, a curriculum, and funding for snacks and incidentals. Clinic space, such as a conference room to hold 12 SMAs and space for seven different patient care stations during week one and week 12 of the project, was acquired. Time for team members to devote to planning and launching the project was approved by the VA executive leadership. Lab, foot exam, blood pressure monitoring, height and weight measurement, PHQ-9, DTSQ, and tele-retinal surveillance resources and equipment were also acquired.

The project leader secured permission in writing from Health Psychology Research, Ltd. 188 High Street, Egham, Surrey, United Kingdom, to utilize the DTSQ for the diabetes SMA project.

The DTSQ is a hard copy that the patient will fill out during week one and week 12 of the project. The hard copy DTSQ will ask for the patient's name. Aggregate data from all tools will be collected and reported. No protected health information from the DTSQ will be reported. The

DTSQ will be scanned into the patient's electronic health record, and the hard copy will be securely shredded after scanning following VA protocol for doing so.

Schedule development to organize SMAs within the existing electronic health system scheduling software was developed by consulting with the information technology department within the VA. A curriculum approved by the ADA including workbooks and an instructor's manual was utilized. Funding to purchase t-shirts for the team, snacks, and incentive prizes for shared medical appointment participants were provided by myself as the project leader. The Montana VA Whole Health Program may cover some of the costs of these items in the future when submitted as part of an annual budget.

Under the *selecting a pathway* phase, the project team equipped with evidence-based literature providing best practice resources planned and implemented SMAs for patients with diabetes receiving care at the Montana VA community-based outpatient clinic (CBOC) in Great Falls, Montana.

Comparing outcome data (A1C, SBP, LDL, BMI, PHQ-9 score, and DTSQ score) between the beginning and end of the 12-week quality improvement project was analyzed during the *accepting change* phase of the project. Project outcome data were broadly disseminated across the Montana VA, National VA system, and the public across the United States through local, regional, and national virtual presentations to assist others in using the model as a best practice for their patients with diabetes was also completed during the accepting change phase of the project.

Finally, during the *maintenance and separatio*n phase of the project, evidence-based literature, project momentum, and outcomes were utilized as catalysts to promote sustainable,

long-term change. Sustainability is evidenced by holding at least two 12-week shared medical appointment programs per year at the Great Falls CBOCs and others who incorporate the model into the delivery of patient care. Separation occurred with the project leader mentoring and turning the program over to the Montana VA Great Falls CBOC certified diabetes care and education specialist (CDCES) to take the lead in future diabetes SMAs.

Project Setting

The setting for this project was at a Veterans Administration CBOC located within the Montana VA health system in Great Falls, Montana, as described in Chapter One. All aspects of the project were completed at the Great Falls CBOC.

Participants

The Montana VA, Great Falls CBOC has conducted diabetes group education programs for years up until they were put on hold when the COVID-19 pandemic reached the United States in 2020. Participation in previous groups was open to any veteran with a diagnosis of diabetes regardless of the level of glycemic control they demonstrated. As a result, many classes would consist of the same 2–8 patients who kept coming back to the program. Some of them had excellent control of their diabetes, while those that needed the program the most were not actively recruited for the program. Health care providers, including APRNs, would facilitate the group education during the sessions, but there was no shared medical appointment component where patients were seen individually during a portion of the group session. The focus of this quality improvement project was to synthesize current evidence-based literature related to SMAs and apply it to improve diabetes care at the Great Falls VA. An essential component of this

quality improvement project was to target patients at greatest risk for diabetes complications to actively participate in the SMAs program for diabetes.

Therefore, rather than have open invitations to any veteran with diabetes, the following criteria were set. Patients were 18 years old or older. They had a diagnosis of diabetes with an A1C >8% (indicating poor control), and they needed to reside in Great Falls, Montana in order to attend the shared medical appointment sessions on a regular, consistent basis. Using electronic quality measure (EQM) data at the VA, the project leader was able to drill down data related to participant criteria noting that the Montana VA Great Falls CBOC provides care for 3,983 patients who are all over the age of 18 years old. 666 of those patients had a diagnosis of diabetes, and 122 of those patients with diabetes had an A1C >8%. Of those 122 patients, 80 had uncontrolled diabetes and lived in Great Falls, Montana. Those 80 patients were contacted by the project leader by telephone to inquire about their interest in participating in a 12-week diabetes shared medical appointment program, which was launched on January 5, 2022. A goal of at least 15 participants was set for the project, which is above the minimum threshold of 12 participants recommended for pilot quality improvement projects.

Participant Consent

It is recommended that patients participating in group health activities and SMAs provide written consent to participate, acknowledging their understanding that they may be sharing their health information with others during group discussions and provider interactions. Patients are encouraged to actively participate and share as that is the purpose of group visits, group education, and SMAs. Patients from the Montana VA, Great Falls CBOC who participated in the SMAs for diabetes project did so voluntarily under their own free will, and they were allowed to

stop participating in the program at any time. No participants dropped out of the 12-week program. Each participant signed informed consent (see Appendix A) to participate in the project including volunteering to have labs (A1C, lipids, chem-14 Panel, UA, urine microalbumin); blood pressure and BMI measurements in addition to completing a PHQ-9 and DTSQ during week one and week 12 of the project. Results from biometric measurements and PHQ-9 were reviewed with the participants. Participants also signed a HIPPA notification for participation in the SMAs for diabetes project and a consent to allow photos and videos of them to be disseminated in presentations and publications related to the project. Informed consents did contain personally identifiable information (name and date of birth) of who signed the forms. Consent forms were scanned into the patient's CPRS electronic health records with the hard copy being shredded after scanning.

Information Protection

The Great Falls CBOC uses the VA computerized patient record system (CPRS) as its electronic health record (EHR). An important component of the EHR is the EQM software package which allows for report generation of quality measures including those for diabetes (A1C >8%, blood pressure >140/90, LDL >100mg/dL, and BMI >30). CPRS data including EQM information is secure, encrypted, password and common access card (CAC) protected, and only accessible by those who are credentialed with a need to know the information.

All patient-related information for this quality improvement project, including EQM data, remained in the secure and protected CPRS EHR. Project participants were identified by name. Participants initialed an attendance roster each week and attended one of the 12 shared medical appointment sessions. Rosters were secured in a locked filing cabinet inside a secure and locked

office inside the secure VA building. No protected health information from the project left the Montana VA Great Falls CBOC. Statistical analysis was completed using Intellectus Statistics accessed through the secure VA network. Intellectus Statistics is also a password-protected and encrypted secure software program. Participants were de-identified, and only aggregate data was used for reporting and dissemination.

Institutional Review Boards and Executive Leadership Approval

The project's IRB proposal application was reviewed and signed off by the project faculty advisor and chair and then submitted to the Montana State University (MSU) Institutional Review Board (IRB) on December 10, 2021. The project proposal application was approved by MSU IRB on December 20, 2021 and assigned IRB Exempt Protocol Number: JG122021-EX.

Exempt status was achieved given the quality improvement project did not involve any vulnerable populations, including minors, pregnant women, or prisoners, and the project carries essentially no risk to participants. Veterans are not a vulnerable population simply for being veterans. Veterans who were pregnant were not allowed to participate in the quality improvement project.

This project was a quality improvement project and not a research project as it took evidence-based information in the literature derived from decades of completed, robust research, synthesized and applied that information to improve diabetes care and outcomes. Furthermore, participants in the project were not randomized into different intervention groups in order to enhance confidence in differences that might be obscured by nonrandom selection. The project also did not seek to test issues beyond current science and experience, such as new treatments. The project was not funded outside the organization with a commercial interest in the use of the

results, and the project leader and team had an ongoing commitment to improving the local care situation. All of these were characteristics of a quality improvement project and not a research project. See Appendix) for more information and the completed tool used to address the question of quality improvement vs. research.

The Montana VA does not conduct research at this time, and they do not have an IRB. This project and permission to identify the site of the project (Montana VA – Great Falls Community Based Outpatient Clinic) in the manuscript was approved in writing by Montana VA: executive leadership (associate director for patient care services), legal, quality management, and education.

Project Phases and Key Tasks

The project consisted of two phases. Phase one was devoted to project planning and approval, while phase two focused on project launch, evaluation, dissemination, and sustainment. Key tasks that were completed during phase one included conducting a literature review organized with an evidence matrix table, developing a logic model (Appendix C), creating a project proposal PowerPoint presentation for key stakeholders, acquiring written Montana VA executive leadership approval, identifying project participant criteria, establishing buy-in from key stakeholders, building momentum; assembling an interdisciplinary team, selecting an ADA-approved diabetes education curriculum, obtaining permission to use the DTSQ; securing project resources, completing and submitting MSU IRB exempt status application, and conducting regular biweekly consultations with lead faculty and completing a successful project proposal defense.

Key tasks that were completed during phase two of the project included project launch, evaluation, reporting, dissemination, and sustainment activities. Phase two launched on January 5, 2022. Project evaluation was derived from data related to short- and mid-term outcomes related to phase two. Short-term outcome data measurement took place on day one (January 5, 2022) of the 12-week diabetes SMA program. Short-term outcome data measurements completed on day one included how many participants completed baseline: labs (A1C, lipids panel), tele-retinal surveillance, foot exams, blood pressure measurement, height, weight, and BMI measurements, PHQ-9 to screen for depression, and the DTSQ to measure patient satisfaction with current diabetes treatment. A target completion rate of 90% was set for participants registered for the diabetes shared medical appointment program to complete these short-term outcome measurements.

Mid-term outcome data measurement focused on measuring blood pressure, weight, and BMI at four-week intervals throughout the 12-week program. Those measurements were taken at baseline (January 5, 2022), week 4 (January 26, 2022), week eight (February 23, 2022), and week 12 (March 23, 2022). Other mid-term data measurements collected at the conclusion of the project during week 12 (March 23, 2022) to compare and identify changes from baseline measurements during week one included labs (A1C and lipids), blood pressure measurement, weight, and BMI measurements, PHQ-9, and the DTSQ.

Analysis was conducted to determine statistical significance by comparing these key measurements taken at the beginning of the project on January 5, 2022 and the conclusion of the project on March 23, 2022. It was projected that participants in the diabetes SMA program would experience improvements in A1C, SBP, LDL, BMI, PHQ-9, and DTSQ scores.

Building Momentum and Conducting Data Collection with Race Days

To ignite momentum and promote participation in the project, a race car theme was incorporated with the banner, “winning the race against diabetes.” January 5, 2022 was designated as race day number one, with the last day of the 12-week project, March 23, 2022, being designated as race day number two. During race days, 15 program participants rotated through eight stations (see Appendix C) in groups of 3–4 including check-in; pharmacy; dietitian/CDCES; mental health and social work, foot exams, teleretinal surveillance, provider, and finally checkout. Labs (A1C, CBC, Chem-14; Lipids, UA, Urine Microalbumin) were ordered and completed on all participants one week prior to race days one and two ensuring that lab results were available to review at the provider station during race days. Keeping with the race car theme, staff working at each station were designated as a “pit crew” empowering patients to “win the race.” Key activities and pit crew assigned to each of the eight stations are described in Appendix C.

Staff at each station had their own laptop already assigned to them by the VA to document in CPRS. All data (labs, tele-retinal surveillance exams, foot exams, depression and anxiety screening, medication reconciliation, vital signs including blood pressure, BMI, vaccinations, etc.) collected during race days were documented in the secure, encrypted, password, and CAC card protected CPRS EHR. Race day one and two was scheduled from 8:00 a.m. to 12:00 p.m. on January 5, 2022 and March 23, 2022, with the schedules of the station pit crew cleared for that time to allow their full participation as approved by Montana VA executive leadership. Race day number two also featured a celebration potluck from 12:00 p.m. to 1:00 p.m. to conclude the project and give out race trophies and other awards for participants.

Weekly Diabetes Education Sessions and Shared Medical Appointments (SMAs)

After race day number one was completed on January 5, 2022, participants returned to the Montana VA, Great Falls CBOC education conference room once a week to attend one-hour diabetes education and shared medical appointment sessions. Pre-assigned Great Falls CBOC team members facilitated those sessions. The project leader, an APRN, attended all sessions. Attendance was measured at each session with an 80% target set for attendance each week. Participants received a laminated "win the race punch card" (see Appendix E,) and a hole punch was used to punch the card each week they attended. During week 12, the program participants with the most punches received an incentive prize.

An ADA-approved curriculum titled, "Type 2 Diabetes Basics 5th Edition" published by the Park Nicollet International Diabetes Center has already been purchased by the VA and was utilized as the curriculum for the program. The curriculum was comprehensive and included workbooks for participants and an instructor's manual directing facilitators on how to conduct the education sessions.

The curriculum was broken down and presented over 10 one-hour, weekly sessions. Each one-hour weekly session featured five minutes of introductions, 30 minutes of patient education and open discussion guided by the selected curriculum, 20 minutes for hands-on demonstrations (such as whole health yoga, acupressure treatments, cooking demonstrations, foot care demonstrations, etc.), and five minutes to close the sessions. The project leader purchased healthy snacks and beverages for each session. In the future, a request will be made that the Montana VA Whole Health program include funding for such items in the annual budget. A celebration potluck was held at the conclusion of the program during week 12 (March 23, 2022).

Once a month (January 26, 2022, February 23, 2022, and March 23, 2022) an APRN provider conducted participant evaluations. The APRN provider met with individual patients at a station adjacent to the conference room. The provider coded the visit applying CPT codes (99212 through 99214) used for individual visits and ICD-10 codes for diabetes as allowed for use with SMAs by the Centers for Medicare and Medicaid. Shared medical appointment visits were documented in the CPRS EHR.

Project Team

The team for this project included key Montana VA executive leadership and local front-line stakeholders at the Montana VA Great Falls CBOC who were involved in implementing the project as described in detail throughout this proposal. Facilitators involved in conducting weekly education sessions for participants received a special one-hour training on how to be an effective facilitator by the Montana VA education training specialist.

Potential Barriers

Potential barriers to the project included lack of staff buy-in, lack of patient interest and participation, cost of providing weekly snacks and incentives for participants, facilitator time devoted to the project conflicting with the time required for their primary job duties, and fluid COVID-19 pandemic dynamics resulting in the complete prohibition of all in-person education activities.

A lack of staff buy-in was identified as a potential barrier at the start of the project. To address this, the project lead involved staff in project planning and development; recruited staff from a broad interdisciplinary swath that included APRNs, RNs, LPNs, the clinic pharmacist,

mental health professionals, and medical support assistants recognizing and spotlighting their unique and diverse skill sets; and held regular planning meetings which included fun activities including door prizes for attendance and spot-lighted the race car theme of "winning the race against diabetes" to fuel team momentum. Through these efforts, a committed, effective, and dynamic interdisciplinary team was assembled who were eager to participate in phase two of the project launched on January 5, 2022.

Lack of patient interest and participation in the project were mitigated by the project lead: contacting each potential participant (VA patients, >18 years old, A1C >8% living in Great Falls) by telephone to personally invite them to participate in the project; the project lead calling each participant weekly to check in with them and remind them to attend the weekly session; assigning a race care theme to the project to enhance familiarity and acceptance; offering healthy snacks and beverages at each of the weekly education sessions; reviewing the health benefits of controlling diabetes blood pressure and lipids; and offering positive feedback and incentive awards to recognize goal achievement and progression through the program. Through these efforts, 15 participants registered for and completed the program.

It was also important to identify funding for this project. Funding through the VA can be cumbersome as funds are usually budgeted annually with multiple layers of approval needed for adjustments. The VA has agreed to cover the costs of staff, space, labs, sphygmomanometers, monofilaments for foot exams, curriculum workbooks, and the facilitator manual. A request was made with the Montana VA Whole Health program to provide funds for the purchase of bulk quantities of healthy beverages and snacks at a discount wholesaler. Funding was not secured through the VA for healthy snacks due to the request needing to be placed in time for annual

budgeting, so the project leader donated funds for snacks and beverages. In future programs, considering sustainability, these items will be included in the annual budget request process at the VA.

All staff participating as facilitators of the project have primary employment duties with the VA, the most important of which is providing patient care. At the beginning of phase one, the project leader secured approval from Montana VA executive leadership to allow staff to submit leave requests for administrative time during the two, four-hour race days for data collection on January 5, 2022 and March 23, 2022, and during the weeks that they are facilitating an education session from 12:00 noon to 1:30 p.m. (30 minutes added to cover the facilitators' lunch break). During their assigned administrative leave, other VA staff members covered their primary employment duties as they would during other types of leave.

Thankfully, COVID-19 prevalence did not increase to the point of causing restrictions on in-person meetings. However, if restrictions were instituted, the diabetes shared medical appointment program was prepared to launch as a virtual event using existing, secure, and encrypted VA video connect technology.

As a federal facility, all participants who attended shared medical appointment sessions in person were required to wear masks. Masks and hand sanitizer were also made readily available during each session. Completion of the COVID-19 vaccination series and influenza vaccination were also strongly encouraged and available during launch day, January 5, 2022.

CHAPTER FOUR

RESULTS OF THE QUALITY IMPROVEMENT PROJECT

Population Characteristics

This project included two groups, Montana VA leadership and interdisciplinary staff, who developed, launched, and facilitated the project and the patients who participated in the project.

Montana VA Leaders and Staff

There are multiple layers of leadership within the Montana VA. Approval, support, and input from Montana VA executive leadership, local Montana VA – Great Falls Clinic leadership, Montana VA support staff, and a team of interdisciplinary front-line facilitators were required for successful project planning, launch, and completion. Buy-in, support, and input were successfully acquired from all members of Montana VA executive leadership, local leadership, and support staff in addition to front-line interdisciplinary facilitators as outlined in Table 1.

Table 1. Characteristics of the diabetes shared medical appointment project staff

Table 1 Characteristics of the diabetes shared medical appointment project staff (n = 24)

Montana VA Executive Leadership	(n = 5)	**Interdiciplinary Front-line Facilitators**	(n = 13)
Executive Directors		APRN (Project Leader)	(n = 1)
Chief of Staff		Registered Nurses	(n = 5)
Associate Director of Nursing Services		Licensed Practical Nurses	(n = 1)
Associate Chief Nurse		Medical Support Assistants	(n = 3)
Associate Chief of Primary Care		Clinical Pharmacist	(n = 1)
Local VA Great Falls CBOC Leadership	(n = 2)	Certified Diabetes Care and Education Specialist	(n = 1)
Clinic Manager		Licensed Clinical Social Worker/Mental Health Provider	(n = 1)
Assistant Clinic Manager			
Montana VA Support Personnel	(n = 4)		
Chief Legal Counsel			
Director or Quality Management			
Director of Health Education			
Information Services Specialist			

Patients with Diabetes

Sixteen patients who met the inclusion criteria registered to participate as the primary focus of the project. One patient needed to drop out of the program prior to launch day due to a family member's illness. A total of 15 patients started and completed the SMA process and are included in the data analysis.

The mean age of project participants was 63.27 years old, with the youngest being 39 years old and the oldest participant being 77 years old. All (n=15) participants identified as male and met inclusion criteria including being a veteran over the age of 18 years old, having an A1C >8%, and residing within the city limits of Great Falls, Montana.

Data Analysis

Descriptive statistics were utilized to analyze and report on the population. The Shapiro-Wilk test was utilized to check normal distribution, Levene's test was used to check

homogeneity, paired t-tests were used to determine statistical significance, and given the small sample size (n = 15), a Wilcoxon signed-rank test was utilized to also determine and confirm statistical significance comparing metrics from baseline and conclusion of the project. The p-value was set at $p \leq 0.05$. Intellectus statistics were utilized to complete calculations.

Launch Day Activities

The project launched on January 5, 2022. During launch day, all participants (n = 15) were divided into small groups of 3–4 patients each. Patients rotated through nine different stations where they received a provider visit, a clinical pharmacist visit, CDCES visit, mental health visit, lab review, BP and BMI measurements, foot examination, PHQ-9 screening, and a DTSQ survey. Five patients who were due for tele-retinal surveillance and four patients who were due vaccinations received them. All these services were provided in three hours, one hour earlier than projected.

Patient Resources

All patients (n = 15) participating in the program received a welcome packet and important tools to help with diabetes self-care management, including an automatic blood pressure cuff, pedometer to help them measure daily steps, digital scale, foot cream, and a foot inspection mirror.

Launch Day Evaluation

A day-one program evaluation was created (see Appendix I) since a similar program evaluation could not be found in the literature. Each participant (n = 15) was given an evaluation to provide feedback on launch day activities. The survey included a five-point Likert scale with 1

= strongly disagree to 5 = strongly agree. Responses were overall positive with results indicating a mean response of 4.28 (agree) for all five survey items. Launch day patient evaluation and responses are shown in Table 2.

Table 2. Launch Day Patient Evaluation

Table 2 Launch Day Patient Evaluation

Question/Statement	**1-5 Point Likert Scale Results** **1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree**
Communication inviting me to the event was helpful	M = 4.33 (*SD* = 1.05, SE_M = 0.27, Min = 2.00, Max = 5.00, Skewness = -1.48, Kurtosis = 0.90
I enjoyed receiving healthcare in small groups	M = 4.40 (*SD* = 1.06, SE_M = 0.27, Min = 2.00, Max = 5.00, Skewness = -1.61, Kurtosis = 1.17
Attending this event will help me improve my diabetes control	M = 4.27 (*SD* = 1.10, SE_M = 0.28, Min = 2.00, Max = 5.00, Skewness = -1.21, Kurtosis = 0.03
The handouts and orange folder I was given were helpful	M = 4.20 (*SD* = 1.08, SE_M = 0.28, Min = 2.00, Max = 5.00, Skewness = -1.11, Kurtosis = -0.09
I would like to attend similar group activities in the future	M = 4.20 (*SD* = 1.01, SE_M = 0.26, Min = 2.00, Max = 5.00, Skewness = -0.83, Kurtosis = -0.62

Patient Attendance

After the three-hour launch day on January 5, 2022, patients actively participated in ten one-hour education/shared medical appointment sessions before the conclusion of the program during a graduation and celebration session on March 23, 2022. The overall mean patient attendance rate for the 12 weekly sessions was 93.8% with a range of 86.60% (n - 13) to 100% (n - 15) (Max = 100.00). The weekly attendance rate during the entire 12-week program never fell below 86.6% (n -13), as shown in Table 3.

Table 3. Patient Participant Weekly Attendance

Table 3 Patient Participant Weekly Attendance 93.86% (*SD* = 5.31, SE_M = 1.53, Min = 86.60, Max = 100.00, Skewness = -0.14, Kurtosis = -1.26)

Week	Attendance Rate	Week	Attendance Rate	Week	Attendance Rate
Week one	100% (n = 15)	**Week five**	93.3% (n = 14)	**Week nine**	93.3% (n = 14)
Week two	100% (n = 15)	**Week six**	86.6% (n = 13)	**Week ten**	93.3% (n = 14)
Week three	93.3% (n = 14)	**Week seven**	86.6% (n = 13)	**Week eleven**	93.3% (n = 14)
Week four	100% (n = 15)	**Week eight**	86.6% (n = 13)	**Week twelve**	100% (n = 15)

Results

Project results focused on six primary measurements (A1C, SBP, LDL, BMI, PHQ-9 scores, and DTSQ scores) from the 15 participants. Measurements were taken at baseline on January 5, 2022 and again at program conclusion during week 12 on March 23, 2022. A paired t-test was conducted to determine statistical significance by comparing results from weeks one and 12. Recognizing the small sample size (n = 15) could impact normality, a Wilcoxon signed-rank test was also completed to confirm statistical significance. Project results are shown in Table 4.

Hemoglobin A1C

A1C levels were measured in 100% (n = 15) of patients. The mean week one A1C was 9.66% with a range of 7.40 to 13.60%. The mean week 12 A1 C was 8.29% with a range of 6.80% to 9.90%. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.67$, $p < .001$ indicating that the assumption of normality was violated, likely due to the small sample size of (n = 15). Levene's test was utilized $F(1, 28) = 1.12$, $p = 0.300$ to evaluate homogeneity, and that assumption was met. Statistical significance of the A1C results was noted using a paired t-test $t(14) = 3.51$, $p = 0.003$; however, given the violation of the normality

assumption due to the small sample size, a Wilcoxon signed-rank test was completed which confirmed statistical significance $V = 120.00$, $z = -3.41$, $p < 0.001$ of improvements in A1C.

Improvements in A1C were clinically significant as well with a mean drop in A1C of 1.37 points among the 15 participants. Adding to the clinical significance, all 15 participants had a reduction in A1C ranging from a maximum reduction of 6.3 points to a minimum reduction of 0.3 points. None of the 15 participants had an A1C increase over the 12-week program. A goal set for the project was based on similar findings in the literature (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Heisler et al., 2020; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan, et al., 2017) was an A1C reduction of at least one point. A1C outcomes (mean reduction of 1.37 points) exceeded the project target. The fact that all 15 participants reduced their A1C during the 12-week program is clinically significant as reducing A1C by even 0.2% could lower diabetes related mortality by 10% (Sherwani et al., 2016). Improving glycemic control as evidenced by a reduction in A1C may be more important than treating dysplipidemia for the prevention of both microvascular and macrovascular complication associated with type 2 diabetes (Vaag et al., 2006). Finally, patient who experience an A1C reduction of 1 point reduce their risk of cardiovascular death by 45% (Eeg-Olofsson, 2012). Participants in this quality improvement project experienced a mean reduction of 1.37 points in their A1C triggering the potential for a clinically significant reduction in the risk for developing diabetes related microvascular disease, complications and cardiovascular death. The range of reduction was from 0.3 points to 6.3 points. Even those with modest reduction in A1C were well on their way to reducing their overall risk factors for diabetes related target organ cardiovascular disease.

Systolic Blood Pressure (SBP)

SBP levels were measured in 100% (n = 15) of patients using an automated blood pressure cuff. The mean week one SBP was 143.73 mmHg with a range of 118 to 185 mmHg. The mean week 12 SBP was 124.80 mmHg with a range of 104 to 146 mmHg. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.90$, $p = .111$ indicating that the assumption of normality was met. Levene's test was utilized $F(1, 28) = 5.44$, $p = 0.027$ to evaluate homogeneity and that assumption violated. Statistical significance of the SBP results was noted using a paired t-test $t(14) = 4.88$, $p < 0.001$; however, given the violation of the homogeneity assumption due to the small sample size, a Wilcoxon signed-rank test was completed which confirmed statistical significance $V = 114.00$, $z = -3.07$, $p = 0.002$ of improvements in SBP.

Improvements in SBP were clinically significant as well with a mean drop in SBP of 18.93 mmHg among the participants. All but three participants had a decrease in systolic blood pressure, while three had an increase in SBP during the 12-week program. Adding to clinical significance, at baseline 53.3% (n – 8) of participants met the AHA goal for SBP < 140 mm/Hg. During week 12 of the program, 86.6% (n – 13) of program participants met the AHA goal for SBP < 140 mm/Hg. The goal set for the project was based on similar findings in the literature (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017) was an SBP reduction of 5 mmHg. SBP outcomes (mean reduction of 18.93 mmHg) exceeded the project target. Considering all of these factors and outcomes related to systolic blood pressure is important as a 5 mm Hg reduction in blood pressure reduces the risk of a major cardiovascular events including myocardial infarction or stroke by

approximately 10% (Blood Pressure Lowering Treatment Trialists' Collaboration, 2021) Therefore 13 out of 15 shared medical appointment participants reduced their risk of having a major cardiovascular event making the outcomes of this shared medical appointment quality improvement project clinically significant.

Low Density Lipoproteins (LDLs)

LDL levels were measured as part of a lipids panel on 100% (n – 15) of patients. The mean week one LDL was 84.93 mg/dL with a range of 20 to 142 mg/dL. The mean week 12 LDL was 77.53 mg/dL with a range of 30 to 142 mg/dL. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.89$, $p = 0.077$ indicating that the assumption of normality was met. Levene's test was utilized $F(1, 28) = 0.01$, $p = 0.911$ to evaluate homogeneity, and that assumption was also met. A paired t-test for changes in LDL was not significant $t(14) = 1.34$, $p = 0.202$. A Wilcoxon signed-rank test also showed that the differences in LDL between week one and week 12 were not significant $V = 54.50$, $z = -1.22$, $p = 0.223$.

Seven participants had a decrease in LDL proteins, three had no changes in LDL level, while five had a slight increase in LDL during the 12-week program. Other aspects of the lipids profile also demonstrated marked clinical significance including one patient with life-long persistent triglyceridemic who experienced a 444 mg/dL reduction in triglycerides. Furthermore, 73.3% (n – 11) of participants experienced an increase in high-density lipoproteins over the 12-week program ranging from a maximum increase of 13 points to a minimum increase of 1 point), 13.3% (n – 2) of participants had no change in HDL, and only 13.3% (n – 2) of participants experienced a decrease in HDL ranging from a maximum of 4 points and a minimum of 2 points reduction. A goal set for the project is based on similar findings in the literature (Berry et al.,

2016; Edelman et al., 2015; Hartzler et al., 2018; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan et al., 2017) was an LDL reduction of 10 mg/dL with the results falling just short of that at 7.4 mg/dL likely due to the reasons previously mentioned.

Clinical and statistical significance of LDL reduction were mixed for this project. However, the seven participants who experienced a reduction in LDL reduced their risk of cardiovascular events. In fact, LDL reduction significantly reduces the risk of major vascular events including cardiovascular death, MI, acute coronary syndrome and stroke by 26% per 1 mmol/L reduction in LDL (Gencer et al., 2020).

Body Mass Index (BMI)

BMI was measured in 100% (n = 15) of patients. The mean week one BMI was 32.04 with a range of 24.91 to 43.93. The mean week 12 BMI was 31.33 with a range of 24.03 to 42.89. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.98$, $p = 0.953$ indicating that the assumption of normality was met. Levene's test was utilized $F(1, 28) = 0.01$, $p = 0.929$ to evaluate homogeneity and that assumption was also met. Statistical significance of the BMI results was noted using a paired t-test $t(14) = 4.88$, $p < .001$. Given the project's small sample size, a Wilcoxon signed-rank test was completed which also confirmed statistical significance $V = 119.00$, $z = -3.35$, $p < 0.001$ of improvements in BMI.

Improvements in BMI ($M < 0.71$) were clinically significant as 93.3% (n – 14) of program participants lost weight and had a decrease in body mass index during the 12-week program. Weight loss over the 12-week program ranged from a maximum of 9.9 pounds to a minimum of 1 pound. A goal set for the project based on similar findings (Omogbai et al., 2018; Vaughan et al., 2017) in the literature revealed a BMI reduction of 1 point. The results of this project came

close to meeting that target with a mean reduction of 0.71. Fourteen participants in this shared medical appointment project experienced a reduction in their BMI. This is clinically profound because in patients with type 2 diabetes each 1 kg of weight loss is associated with 3-4 months of prolonged survival and weight loss of 4.5 kg or more led to clinically important long-term reductions in blood pressure and a 65% relative risk reduction in hypertension (Schwartz et al., 2010). Further, reduction in BMI with even modest weight reduction of 2-5% can also result in improved glycemic control which in turn reduces the risk of diabetes associated cardiovascular target organ damage. While the mean BMI of all participants at week 12 was still above goal (< 25) 14 project participants were headed in the right direction and experienced a reduction in weight as reflected in the reduced BMI which in turn reduced their cardiovascular risk factors related to diabetes.

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 was measured to screen for depression in 100% (n = 15) of patients. The mean week one PHQ-9 was 9.13 with a range of 0 to 22. The mean week 12 PHQ-9 was 5.93 with a range of 0 to 11. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.89$, $p = 0.059$ indicating that the assumption of normality was met. Levene's test was utilized $F(1, 28) = 1.88$, $p = 0.182$ to evaluate homogeneity, and that assumption was also met. Statistical significance of the PHQ-9 results was noted using a paired t-test $t(14) = 2.28$, $p = 0.039$. Given the project's small sample size, a Wilcoxon signed-rank test was completed which also confirmed statistical significance $V = 73.50$, $z = -1.96$, $p = 0.050$ of improvements in depression screening score as measured by the PHQ-9.

PHQ-9 measurements between week one and week 12 of the project also confirmed

clinical significance for the project as there was an overall mean reduction in PHQ-9 scores of 3.2 points indicating an improvement in depression symptoms. Furthermore, 11 participants reported an improvement in their depression symptoms, two reported no change in depression symptoms, and two reported worsening depression symptoms.

A goal set for the project was a mean reduction in PHQ-9 scores by 2 points per participant. The PHQ-9 outcomes (mean reduction of 3.2 points) exceeded the project target.

Adding to clinical significance, question 9 on the PHQ-9 screening tool for depression is related to suicidal ideation and asks if participants have had any "thoughts that you would be better off dead, or of hurting yourself." Two of the 15 participants (13.3%) who completed the week one PHQ-9 screening tool at baseline had a positive finding for question 9. They had an immediate evaluation by mental health services. During week 12 of PHQ-9 screening, zero out of 15 participants reported any active suicidal thoughts or thoughts of hurting themselves.

Diabetes Treatment Satisfaction Questionnaire (DTSQ)

The DTSQ was utilized to measure patient satisfaction in 100% (n = 15) of patients. The mean week one DTSQ score was 26.40 with a range of 12 to 36. The mean week 12 DTSQ was 35.47 with a range of 29 to 41. The p-value for all tests was set at 0.05. A Shapiro-Wilk test was completed $W = 0.90$, $p = 0.102$ indicating that the assumption of normality was met. Levene's test was utilized $F(1, 28) = 10.15$, $p = 0.004$ to evaluate homogeneity, and that assumption was violated. Statistical significance of the DTSQ results was noted using a paired t-test $t(14) = -5.68$, $p < 0.001$. Given the project's violation of the assumption of homogeneity likely due to the small sample size, a Wilcoxon signed-rank test was completed, which confirmed statistical significance $V = 1.50$, $z = -3.33$, $p < 0.001$ of improvements in DTSQ.

Improvements in DTSQ were also clinically significant with a mean increase in patient satisfaction as measured by DTSQ of 9.07 points, with all 15 participants reporting an increase in patient satisfaction. A goal set for the project based on similar findings in the literature (Omogbai et al., 2018) was a DTSQ increase of 5 points. Results of this project exceeded the target with an increase of 9.07 points over baseline.

Table 4. Project Results

Table 4 Project Results – Six Key Measurements – Comparing Week One with Week Twelve Outcomes

Characteristic	Week One	Week Twelve	Significance
A1C	*M* = 9.66 *SD* = 1.69, SE_M = 0.44, Min = 7.40, Max = 13.60, Skewness = 0.94, Kurtosis = 0.23	*M* = 8.29 *SD* = 1.05, SE_M = 0.27, Min = 6.80, Max = 9.90, Skewness = -0.08, Kurtosis = -1.34	↓ by 1.37 points Statistically (p=.003) and clinically significant
Systolic blood pressure	*M* = 143.73 mm Hg *SD* = 20.26, SE_M = 5.23, Min = 118.00, Max = 185.00, Skewness = 0.44, Kurtosis = -0.96	*M* = 124.80 *SD* = 11.73, SE_M = 3.03, Min = 104.00, Max = 146.00, Skewness = 0.21, Kurtosis = -0.79	↓ by 18.93 mm/Hg Statistically (p=.003) and clinically significant
Low-density lipoproteins	*M* = 84.93 *SD* = 31.41, SE_M = 8.11, Min = 20.00, Max = 142.00, Skewness = -0.02, Kurtosis = -0.18	*M* = 77.53 *SD* = 29.76, SE_M = 7.68, Min = 30.00, Max = 142.00, Skewness = 0.40, Kurtosis = -0.38)	↓ by 7.4 mg/dL. Not statistically (p=.202) significant but clinically significant
Body mass index	*M* = 32.04 *SD* = 4.95, SE_M = 1.28, Min = 24.91, Max = 43.93, Skewness = 0.62, Kurtosis = 0.30)	*M* = 31.33 *SD* = 4.88, SE_M = 1.26, Min = 24.03, Max = 42.89, Skewness = 0.57, Kurtosis = 0.23	↓ by 0.71 Statistically (p=.001) and clinically significant
PHQ-9 depression screening	*M* = 9.13 *SD* = 6.81, SE_M = 1.76, Min = 0.00, Max = 22.00, Skewness = 0.65, Kurtosis = -0.45	*M* = 5.93 (*SD* = 3.71, SE_M = 0.96, Min = 0.00, Max = 11.00, Skewness = -0.006, Kurtosis = -1.32)	↓ by 3.2 points Statistically (p=.039) and clinically significant
Diabetes treatment satisfaction questionnaire	M = 26.40 points *SD* = 7.53, SE_M = 1.94, Min = 12.00, Max = 36.00, Skewness = -0.35, Kurtosis = -1.10	*M* = 35.47 *SD* = 3.70, SE_M = 0.96, Min = 29.00, Max = 41.00, Skewness = -0.25, Kurtosis = -0.88)	↑ by 9.07 points Statistically (p=.001) and clinically significant

Discussion

Aligning Results with Project Purpose and Aims

This project aimed to determine whether implementing a 12-week diabetes shared medical appointment program at a VA primary care clinic could improve six key measures: A1C, SBP, LDL, BMI, PHQ-9, and DTSQ. Outcome targets projected for this 12-week project

included a 1-point reduction in A1C, a 5-point reduction in SBP, a 10-point reduction in LDL, a 1 point reduction in BMI, a 2-point reduction in PHQ-9, and a 5-point increase in DTSQ scoring.

The robust findings of this project indicate that SMAs for patients with diabetes appear to show a statistically and clinically significant impact on improving key diabetes-related biometrics. When comparing baseline to conclusion data, A1C improved by 1.37 points, SBP improved by 18.93 mmHg, LDL improved by 7.41 mg/dL, BMI improved by 0.71 points, PHQ-9 scores decreased by 3.2 points, and DTSQ scores increased by 9.07 points. These results were consistent with findings noted in prior research and quality improvement projects except for LDL, which did not show a statistically significant improvement.

Correlating Results with Existing Literature and Evidence-Based Practice

This project's findings align themselves well with similar findings noted in broad, robust scholarly literature related to SMAs for diabetes. Studies related to using SMAs for diabetes are noted in Chapter Two (Berry et al., 2016; Edelman et al., 2015; Hartzler et al., 2018; Heisler et al., 2020; Kirsh et al., 2007; Omogbai et al., 2018; Vaughan, et al., 2017) showed a mean reduction in A1C by 0.94, a mean reduction in SBP of 5.81, a mean reduction in LDL of 11.06, and a mean reduction of BMI by 0.56 points. Only one study in the literature (Omogbai et al., 2018) looked at DTSQ scores and SMAs for diabetes. That study showed a 13.1-point increase in DTSQ scores. No studies were found that looked at comparing PHQ-9 scores at baseline and conclusion of diabetes SMAs, making the PHQ-9 findings of this quality improvement project unique.

Findings Differed from Those Expected

LDL reduction missed its mean reduction target of 10 mg/dL for the project. Furthermore, LDL reduction (M = 7.3 mg/dL) did not prove to be statistically significant. This was due to several clinical considerations and factors. Statistical significance was affected by the lack of power related to the small sample size (n – 15). Other contributing factors include 73.3% (n – 11) of participants already having an LDL below the AHA target of 100 mg/dL at baseline with a range of 20 to 99 mg/dL and 66.6% (n – 10) of participants being on statin therapy at baseline for LDL reduction. Furthermore, within the 12-week curriculum, dietary information to improve LDL was not discussed until week four of the program, not giving participants enough time over the remaining 8 weeks to improve their LDL sufficiently. In future programs, dietary education will be offered earlier in the program. All these factors made a statistically significant reduction in LDL unlikely during the project.

Dissemination of Project Findings

Project findings were broadly disseminated across the Montana VA, National VA system, and the public across the United States through local, regional, and national virtual presentations to assist others in using the shared medical appointment model as a best practice for their patients with diabetes. On January 24, 2022, I was able to present on the project during a statewide Montana VA health system virtual meeting that included 218 attendees from across the state of Montana. On March 23, 2022, with VA leadership's approval, the project was featured on statewide television news (ABC Fox Montana) their website and on social media (https://www.montanarightnow.com/great-falls/winning-the-race-against-diabetes-with-the-mtvahcs/article_65489338-ab06-11ec-9a6c-33e2f5a86d0f.html).

The United States VA system is divided into 19 veterans' integrated services networks (see Appendix H). VISN 19 includes nurses, APRNs, MDs, DOs, and VA leadership from the states of Montana, Colorado, Utah, Oklahoma, Wyoming, Idaho, Kansas, Nebraska, Nevada, North Dakota, and Texas. On April 12, 2022, I was able to present project outcomes during a virtual meeting that included thousands of attendees from across VA VISN 19.

On April 14, 2022, I presented a successful defense of the project at Montana State University. A presentation that was open to faculty, students, and the general public. On April 29, 2022, at the invitation of conference planners, I was able to disseminate the quality improvement DNP project information and outcomes through a virtual presentation at the National Conference for Nurse Practitioners Spring 2022 conference.

A scholarly manuscript related to the project will be submitted to the MSU Graduate School in April 2022. In the coming year, a scholarly manuscript will be submitted for publication consideration in national, peer-reviewed journals including the Journal of the American Association of Nurse Practitioners, Diabetes, the Journal of the American Diabetes Association, The Science of Diabetes Self-Management and Care Journal from the Association of Diabetes Care and Education Specialists, and the Nurse Practitioner Journal by Wolters and Kluwer.

Project Challenges and Lessons Learned

Challenges for this project included time commitment, budget issues, coordinating information services activities, and convincing some individuals that this was a quality improvement project and not a research study. Over 260 hours were logged into developing and launching the project. Many of those hours were devoted to the planning process and flow

analysis, EHR panel development in addition to networking, presenting, educating, and using leadership skills to acquire approval and support for the project. Project approval and identifying the location of the project in the scholarly manuscript, defense, future publications, and presentations required approval by multiple layers of Montana VA leadership and support personnel. The time invested in planning, building support, and acquiring approval will all have a positive impact on sustainability and replicating the diabetes shared medical appointment model of care in other VA facilities.

Patients reported that one motivating factor that encouraged them to attend weekly sessions was the phone call the project leader would place to them the day before each session, checking in with them and reminding them to attend. Calling 15 patients the day prior to each weekly session required one to two hours per week, which was somewhat challenging but important to complete.

As a large federal agency, the VA sets a budget months to years in advance. I requested funding to cover healthy snacks for sessions, decorations for launch day, welcome packets, t-shirts for facilitators and patients, and incentive prizes/awards. Unfortunately, funding for these items was not available through the VA, so I donated the funds, which came to $750. In the future, these items will be submitted for consideration in the annual budget.

Information services at the VA had to build a special shared medical appointment panel to be used to document visits in the CPRS, which is the office EHR utilized at the VA. The project lead and VA leadership met with information services personnel for VISN-19 and Montana VA on December 2, 2021. They assured us that the panel would be built by the time of the program launch on January 5, 2022. The panel was completed in CPRS on January 5, 2022. In the future,

it would be better to allow information services at least three months to complete panel development and EHR adjustments, given their other commitments and staffing issues. The panel has now been created and can be used across the entire Montana and VISN-19 VA system contributing to sustainability.

Finally, it was somewhat challenging to convince some VA personnel (quality and legal departments) that this was a quality improvement project and not a research study. I had to show them that the project focused on taking existing, robust literature based on completed research and applying it to a current quality improvement opportunity. I found it extremely helpful to show them the completed worksheet titled "quality improvement vs. research" by Nosowsky, 2006 (see Appendix B,) proving that the project was truly a quality improvement project and not research.

Limitations

Major limitations of this project include a small sample size and a lack of generalizability. While the project sample size fell below the mean of other similar projects published in the literature, the number did exceed that set by Julious (2005), who suggested that 12 participants are adequate for pilot studies or quality improvement projects. A small sample size could be mitigated by having multiple shared medical appointment programs for diabetes being launched collectively at different VA clinics across Montana. Outcome data from all of those could be analyzed to build momentum and improve generalizability, supporting their launch in other VISN-19 states.

All 15 patients who participated in the project were veterans, identified themselves as male gender, had a mean age of 63.27 years, and all spoke English. All these factors can affect generalizability.

Veterans exhibit a high degree of comradery and connection related to their shared military service experiences. The comradery the patients shared during the project may have had a positive impact on the project's six key measurements (A1C, SBP, LDL, BMI, PHQ-9, and DTSQ), which may be difficult to replicate in non-veteran populations. It would be interesting to see if participants of a younger age than the mean of 63.27 years old would have similar outcomes. Studying such a dynamic would be somewhat difficult as the majority of patients diagnosed with Type 2 diabetes are 45 years old or older according to the CDC, 2019.

Given that Bedard (2018) reports that 13.5% (n = 44 million) Americans are foreign born and that 22% of the US population does not speak English at home. Having an SMA program for diabetes that only used the English language could impact generalizability, but it could also make for a fantastic opportunity to translate project handouts, curriculum, and welcome packets into other languages including Spanish.

Recommendations and Implications for Future Practice

Looking back to chapter one, only 19.2% of individuals diagnosed with diabetes meet their control target goals for diabetes and associated comorbidities, including a hemoglobin A1C value below 7.0%, blood pressure below 140/90 mmHg, and LDL below 130mg/dL (Mayer-Davis et al. 2017) The shared medical appointment modality of care for patients with diabetes is a proven model both in the literature and through this project based on the outcomes including statistical and clinically significant improvements in A1C, SBP, and LDL in addition to

improvements in BMI, PHQ-9, and DTSQ scores. Given the need for innovative models of care and the positive outcomes demonstrated by this project, I would recommend that SMA programs for diabetes be launched at every primary care clinic within VA Montana, VISN-19, and perhaps nationally across the entire VA system. The local VA CBOC in Great Falls is planning to hold at least two SMA programs for diabetes per year. Furthermore, I would recommend that the VA look at implementing the SMA modality of care for other chronic health conditions including COPD, chronic pain, hypertension, and obesity, and I am planning on developing proposals for those projects in the future. Finally, the foundation of this project would make for an exceptional research project. It would be interesting to run a randomized control trial comparing the six key outcomes (A1C, SBP, LDL, BMI, PHQ-9, and DTSQ) between patients in a 12-week shared medical appointment program for diabetes and patients who receive traditional, one-on-one care through their provider. There is robust research including RCTs related to SMAs that have been completed in the past but none that looked at all six of those key metrics in one study.

Conclusion—Overarching Implications of Project Findings

The diabetes SMAs project conducted at a VA primary care clinic proved to be an innovative, dynamic, and effective mechanism of care delivery with excellent statistically and clinically significant outcomes, including improvements in A1C, SBP, LDL, BMI, PHQ-9, and DTSQ scores. Improvement in these outcome measures can have a direct impact on reducing long-term complications (retinopathy, nephropathy, myocardial infarction, congestive heart failure, neuropathy, amputations, vascular dementia, and stroke) disabilities and death associated with diabetes. This project and its outcomes will be widely disseminated throughout the VA and hopefully serve as a best practice model of care delivery.

The conclusion of this project is best summarized by a quote on launch day from one of the 15 patients who participated. With a smile on his face, he said, “I love doing my diabetes appointments as part of a group—this is so much fun, and I feel like I can finally win the race.” He and the other 15 patients who crossed the finish line did just that—they won!

CHAPTER FIVE

REFLECTION ON DNP ESSENTIALS AND MY EDUCATIONAL JOURNEY

Introduction

"Be the fire, wish for the wind" (Taleb, 2013) speaks profoundly to me as I believe it exemplifies and illustrates the essence of who we are as nurses and APRNs. We should strive to make positive changes in the world, disrupt the norm, advocate strongly for the underserved, promote justice, and seek unity and peace while also being a positive, motivational, caring force in the lives of our patients, our communities, our country, and the world. My journey toward acquiring my DNP at MSU started off as a spark of curiosity to build knowledge. Over the past three years, that spark has grown into a blaze thanks to the winds of wisdom, intellect, passion, encouragement, discernment, commitment, and kindness passed onto me by my professors and mentors at MSU. I was a spark turned into a blaze, and thanks to my educational journey at MSU, with my doctorate in hand I have now become the wind. Wind ready to share wisdom, intellect, passion, encouragement, discernment, commitment, and kindness to others who may follow in my path and that I may serve alongside, hopefully making the world a better, more meaningful place along the way.

The following is a summary of select DNP essentials that have contributed to the life-changing, knowledge-building journey I have been honored to take at MSU these past three years.

Essential One: Scientific Underpinnings of Practice

As a board-certified family nurse practitioner since 2001, I have consistently utilized the broad base of knowledge I have gathered over the past 21 years to provide patient care based on sound evidence-based practice measures and standards of care. I have found that sound science blended with the art of nursing has allowed me to connect with patients, practice ethically, and contribute to the knowledge sharing in my profession with the goal to crush disease, wipe out disability, enhance wellness, and save lives. My DNP experience at MSU and all the brilliant professors and mentors that I have had the pleasure of meeting and learning from have been life- and practice-changing for me. My DNP experience at MSU these past three years has empowered me with the knowledge to build upon my existing practice, serving as a catalyst allowing me to provide exceptional care to the patients I serve.

I am profoundly grateful that I have been able to attend MSU starting in September 2019 to work toward achieving my DNP. While I am an experienced NP, the DNP coursework at MSU has broadened my knowledge base, enhancing the level of care that I can provide to my patients and my participation in serving on local, state, and national councils such as the Benefis Health System Stroke Council, the Montana DPHHS Stroke Collaborative Council, and the Veteran's Administration National APRN and Practice Councils in addition to being appointed to the advisory board at Carelinx by Sharecare, a multi-million dollar, publicly-traded company co-founded by the founder of WebMD and Oprah Winfrey.

N604 Evidence Based Practice served as a good introduction to evidence-based practice. Completing multiple rapid critical appraisals of qualitative and quantitative evidence was extremely helpful not only for class but for real-life practice. For the past 21 years, I often would

read qualitative and quantitative research in journals to help guide my practice. Learning to use the RCAs to quickly and systematically synthesize and analyze the data proved very helpful. Learning about different theories and applying them to a health problem or issue within a specific population through working on group projects was also very helpful. As someone who delivers presentations to local and national audiences, I found learning how to create evidence tables extremely helpful, allowing me to better organize my thoughts and, ultimately, the message I wanted to deliver. I used the scientific underpinning of practice exemplars I learned at MSU to deliver presentations at the Rocky Mountain Stroke Conference, Fitzgerald Health Education Associates, the National Conference for Nurse Practitioners, and the VA.

N610 Health Care Informatics allowed me to integrate nursing science with knowledge from organizational and informatic sciences to better understand systems of information flow at the VA outpatient clinic and the emergency department where I work as an APRN. For my DNP project, information flow and project mapping allowed me to create a patient care flow chart allowing patients to be seen efficiently in SMAs. An activity that allowed 15 patients to receive comprehensive diabetes care at 9 different stations (check-in, holding zone, mental health, pharmacy, providers, lab, tele-retinal, foot exams, checkout/vaccinations) in just three hours. Another project that I found very helpful was an analysis of workflow in the ED regarding stroke care. I was able to map out a serial approach (steps complete one by one in a serial sequence) to stroke care vs. an improved parallel approach (steps are completed simultaneously with one another to save time) to decrease treatment times and improve patient outcomes. It also offered me the opportunity to build knowledge and synthesize the benefits of tele-stroke to decrease door-to-needle (time it takes from when an ischemic stroke patient enters an ED until they are

treated with alteplase) time and save brain cells and lives. The final project/exemplar in N610 provided me the opportunity to do a deep dive into the topic of tele-stroke and then create a presentation titled, "Using Tele-stroke to Knock-Out Stroke." The outline of the project focused on 11 key elements: introduction to tele-stroke, how tele-stroke can improve patient care, how tele-stroke is relevant to DNP practice, quality indicators and American Association of Colleges of Nursing (AACN) Essentials related to tele-stroke, risks associated with tele-stroke, tele-stroke workflow analysis, evaluation and improvement plan, implementation plan, and legal considerations for tele-stroke. The presentation brought together all the key elements learned during the course allowing me to create a final product that benefited not only theoretical knowledge building but also had real-world applications. I found it very helpful to synthesize information related to determining how tele-stroke can be relevant and helpful for DNP practice and meet two of the AACN Essentials for DNP practice as outlined in the paper titled "Stroke in the ER—Introduction."

N605 built upon the knowledge acquired in N604 through a fun and very interesting deep dive into evidence-based practice. A dive which resulted in an informative final presentation that was based on the process and information gathered while completing multiple RCAs from a variety of different kinds of research articles; formulating a PICOT question, "In adults who experience migraine headaches does the use of nutraceuticals compared to treatments with Botox reduce the number of migraine headaches per month"; doing a deep dive on the clinical significance and impact of migraine headache on a population; completing an exhaustive review of the literature as illustrated in an allopathic and integrative evidence matrix; creating a Prisma Schematic illustrating our review process; conducting CPG appraisals; considering both patient

and provider perspectives; and concluding some final recommendations for the use of nutraceuticals in treating migraine headaches.

N608 was organized around content presented in nine different learning circles. I found tremendous value in each learning circle, especially because most of them had us focus on an issue, challenge, or process at our current practice. Many of the circles tasked us to develop and evaluate new practice approaches based on nursing theories and theories from other disciplines including engineering. I loved the unique aspect of N608 blending nursing and engineering students together in group projects, each offering a unique perspective. Knowledge synthesis in N608 was illustrated by multiple learning exemplars, including 5P microsystem assessment, an A3 report, fishbone diagram, process flow mapping before and after revisions, value stream mapping before and after revisions, flow charts before and after revisions, and spaghetti diagrams before and after revisions.

Essential Two: Organizational and Systems Leadership

Many of the exemplar projects in N608 provided me with opportunities to develop and evaluate healthcare delivery approaches to meet the current and future needs of patients that I work with and serve in primary care at the VA. Two of the most helpful exemplars included completing a spaghetti diagram and flow chart for lab walkthrough and flow processes and value stream mapping of the patient's journey through the clinic appointment experience. Nursing and engineering science was applied in those exemplars to improve the process of flow, increase patient satisfaction, and enhance efficiency.

Exemplars in N608 also allowed me the opportunity to illustrate process mapping related to a real-time improvement project that is profoundly important to me—improving stroke care.

For this exemplar, I illustrated the serial approach to stroke care where things are done in sequence one after the other. This approach to stroke care was used by the hospital where my wife was treated for her stroke. The process was inefficient and wasted precious time. Recognizing that 1.9 million brain cells die off every minute that a stroke goes untreated improving the process for treatment was essential. I was honored to participate in a walk-through to improve the hospital's approach to stroke care. The goal of the walk-through was to shave time off the door-to-needle time (the time it takes between when a patient arrives at an emergency department with an ischemic stroke and when they have alteplase administered for treatment. when treating stroke). The door-to-needle time in treating my wife's ischemic stroke was 233 minutes, which resulted in the death of 442 million brain cells. The national standard for door-to-needle time is 60 minutes. After the walk-through, our team designed and implemented a parallel approach to stroke care where steps are completed in conjunction with instead of after each other in the serial approach. The outcome resulted in radical improvements in stroke care and institution record door-to-needle time of 29 minutes, a feat which has been replicated since.

I have been honored to serve on the Veterans Administration's APRN Council. Twelve APRNs from around the country serve on the council. The council is an advisory council for the VA Office of Nursing Services in Washington DC. My work on the council has allowed me the opportunity to work on ensuring accountability for the quality of health care provided by APRNs within the VA system. The council meets monthly by teleconference and twice a year in person. I also serve on the VA Office of Nursing Services Primary Care Orientation and Mentoring Committee, which is currently working on revamping a streamlined primary care orientation and mentoring program for APRNs who are newly hired to work at the VA.

As a practicing nurse practitioner, I manage a panel of over 1,000 patients at the local VA primary care clinic in Great Falls. At the VA, each patient panel is called a PACT. The team is led by me as the nurse practitioner and also includes a registered nurse, licensed practical nurse, and a medical support assistant to round out the team. In addition to being accountable for providing evidence-based, high quality and safe patient care, I am also tasked with leading our team which requires me to use advanced communication skills, to employ principles of business, finance, economics, and health policy to develop and monitor budgets and conduct ongoing analysis to determine the cost-effectiveness/resourcefulness of our practice initiatives. In addition, I am also charged with leading our team to ethically deliver care to a diverse population of veterans of multiple ages, races, branches of service, gender, transgender, different social-economic backgrounds, and sexual orientation all while establishing a culture of sensitivity and acceptance to meet the patient's healthcare needs.

Finally, another exemplar completed in N604 was CITI Certification. The certificate and completion report have been uploaded to Box.

Essential Three: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

Many of the exemplars in essentials one and two cross over to meet the elements of essential three. As previously mentioned, N604 Evidence Based Practice served as a good introduction for evidence-based practice. Completing multiple rapid critical appraisals of qualitative and quantitative evidence was extremely helpful not only for class but for real-life practice. Completing the RCAs and creating a variety of evidence matrices in N604 and N605 allowed me the opportunity to critically appraise existing literature and other evidence to

determine and implement the best evidence for practice and then apply the knowledge gained to final projects in N604 and N605.

Furthermore, exemplars such as process mapping, flow charts, spaghetti diagrams, fishbone diagrams, 5P microsystem assessment, and an A3 report that were completed in N608 led me to design and implement processes to evaluate outcomes of practice, practice patterns, and systems of care within a practice setting, which helped determine opportunities for improvement, variances in outcomes and population trends.

Finally, as previously mentioned under essential two, the exemplar of process mapping stroke care in an emergency department had profound real-world implications related to designing, directing, and evaluating quality improvement methodologies to promote safe, timely, effective, efficient, equitable, and patient-centered care for stroke patients and their families.

Essential Four: Technology for the Improvement and Transformation of Healthcare

As a board-certified family nurse practitioner since 2001, I consistently utilize technology daily to document, evaluate, and monitor patient outcomes, care systems, and quality improvement. This is done primarily through using the EHR at the VHS, primary care clinic in Great Falls, Montana, where I work full time as an APRN. The EHR is called the CPRS and is used daily to document patient care, retrieve test results, including lab and imaging studies, place orders, and track trends. CPRS has an excellent patient panel dashboard which is used to track QA indicators such as healthcare effectiveness data and information sets (HEDIS). I use this information to set quality improvement goals for my patient care team and to recognize outstanding care being delivered by my team members, which include a registered nurse,

licensed practical nurse, and a medical support assistant. CPRS was also used to pull QA indicator data regarding diabetes outcomes for my DNP scholarly project.

The microsystem assessment (attached) completed as a project in N608 was helpful as an assessment of the VA microsystem. I used the assessment to study and spotlight key elements of providing healthcare at the local VA clinic the technologically driven dashboard known as the PACT profile, which is used to evaluate and track key QA metrics and measures for the team that I lead as an APRN in primary care. Another assignment completed in N608 that allowed me to study and highlight the use of technology to improve patient care was developing a process map (attached) for stroke care in the emergency department. A key element to involving stroke care was to incorporate tele-stroke into the process map improvement project. Tele-stroke allows APRNs and other providers from small rural, critical-access hospitals and larger urban medical centers to utilize technology to improve access to specialized neurology services, resulting in rapid specialist consultations to deliver timely stroke care to patients and improving outcomes. Incorporating tele-stroke technology into the process mapping improvement project reduced consultation times from 20–30 minutes down to 2–3 minutes, which is important when considering that 2 million brain cells die off for every minute that a stroke goes untreated. Another project completed in N608 highlights the importance of utilizing technology in practice was the evaluation and Pareto analysis (attached) completed to evaluate supply management at the VA primary care clinic. Information from the analysis was used to conclude that using technology such as an automated PAR system would increase efficiency in tracking and restocking inventory compared to having it done manually by nursing staff. Another project in N608 that exemplified the use of technology to improve patient safety and care was the

completion of a fishbone diagram (attached), which emphasizes potential contributory factors related to medication errors at the VA primary care clinic with the creation of an associated process map (attached). It also highlights error potentials and safeguards, including the importance of using technology to improve patient safety related to medication ordering and administration.

Information gleaned from coursework in N610 also helped build my knowledge surrounding the use of technology to provide and improve patient care. Activities in N610 which fostered this knowledge-building included a professional website evaluation project (attached) which taught and reinforced the key elements of evaluating a professional, evidence-based practice website used by APRNs to deliver care; a patient health information literacy exercise (attached) to examine how patients may use technology to access health information and what APRNs should teach their patients about how to find reputable, evidence-based practice information when "Dr. Googling"; a critical event analysis exercise (attached) to examine a health care-related event and synthesize ways that technology could improve the process; and a paper highlighting a deep dive into using tele-stroke technology to improve patient outcomes when treating stroke and also included how using tele-stroke met several AACN essentials.

Coursework in N611 also highlighted the use of technology to provide and improve patient care. For the group project in N611, the group I contributed to and created the final presentation PowerPoint slide deck for (attached) focused on using web-based technology to improve access to depression screening and treatment in rural communities across Montana to improve patient's mental health and reduce suicide rates.

Finally, recognizing how technology can empower healthcare providers and patients with dynamic knowledge sharing, I have served on the Montana DPHHS Stroke Coalition for the past seven years. Part of my duties while serving on the coalition has been to develop and maintain the organization's website on stroke www.montanastroke.org. The website gives providers and patients vital information related to stroke care in Montana and is jam-packed with tools and resources to empower APRNs and other providers to provide exceptional care to stroke patients.

Essential Five: Care Policy for Advocacy in Health Care

Care policy for advocacy in healthcare has been one of the most meaningful anthems and exemplars of my professional life as a practicing board-certified family nurse practitioner these past 20 years. I know first-hand as a health care provider and personally as a husband who lost his wife to a stroke the importance of using policy and advocacy principles to serve as a spark in local, state, and national communities to foster positive change and improve patient outcomes. After my wife passed away from a stroke after turning just 40 years old in 2011, I took up the mantle to knock-out stroke, crush stroke-related deaths and disabilities, and save and improve the lives of stroke patients by sparking positive change. Change comes through connecting with others devoted to the cause of stroke care, empowering organizations and communities through dynamic knowledge sharing, and inspiring others to join the fight in knocking out stroke by recognizing exceptional stroke care and stroke heroes. Since joining the fight after my wife's death, I have presented on stroke over 100 times at universities including Columbia University in New York City, colleges, universities, hospitals, high schools, local, state, and national conferences, pharmaceutical companies, high schools, and community events from coast to coast. My three boys and I developed a stroke curriculum for high school students, which we

have presented annually for the past three years, and we have had the honor and pleasure of recognizing over 200 stroke heroes since my wife and their mom passed away. While advocating for improved stroke care, I have served as a member of the Montana DPHHS Stroke Coalition, and I have been their lead web designer as noted under Essential 4. I also was the founder of the Rocky Mountain Stroke Conference—an annual conference for APRNs, physicians, nurses, therapists, and other healthcare professionals who are passionate about stroke care. Attendees come from across the Northwest, the United States, and at this year's conference, we had attendees from across the globe including Saudi Arabia. I have used my skillset in advocating for exceptional stroke care to connect with and invite keynote speakers for the conference year after year including Dr. Noreen Kamal, an engineer from Canada who radically changed systems of stroke care in Canada improving door-to-needle (the time it takes from when a patient arrives in the ED until the receive life-saving intravenous alteplase) from over 60 minutes down to 30 minutes or less; Dr. Jeffrey Saver, the brilliant UCLA neurologist and researcher who was able to quantify how many brain cells die off every minute a stroke goes untreated; and Dr. Ed Jauch, lead author of the AHA/ASA ischemic stroke guidelines, who was the keynote at RMSC 2021. The experience of advocating for life-saving, timely stroke care has been very humbling to me. I have met and maintained a connection with some incredible stroke heroes from the keynote speakers mentioned previously to Senator Steve Daines to high school students who recognized neighbors and family were having a stroke and they were able to activate EMS and countless numbers of EMS, nurses, physicians, and community leaders in between. For my efforts in advocating for stroke care and the work I do in caring for our national heroes—our veterans—I was honored to receive an award from United State Senator Steve Daines, which was read from

the floor of the United States Senate in 2019. The link to the award and that video clip is here: https://www.daines.senate.gov/news/press-releases/daines-honors-montanan-of-the-week-jason-gleason-of-cascade-county.

Another professional passion that is mine as I consider the role of advocate which is so vital to the APRN profession is promoting justice. My devotion to the topic of justice was best synthesized in a discussion post I had written for N615 regarding outcomes, safety, quality, leadership, and policy. I had written the post in June 2020 in the wake of George Floyd's death at the hands of the police. In the weeks after his death, I had been driving home from work at the clinic and drove past a peaceful Black Lives Matter rally and march in Great Falls. Initially, I drove past out of curiosity, but in scrubs, I had no intention of stopping. Then I noticed several pickup trucks with confederate flags firing up their engines racing past those marching shouting expletives that begin with "N." I turned my car around and parked it, got out, and joined the march thinking to myself, "As a father, as an American, as an APRN, not today will I just drive away and ignore injustice. For today, I stand and demonstrate peacefully with my African American brothers and sisters." I attended another peaceful rally and march the week after. The discussion post I had written for N615 in June (attached) focused on justice, advocacy, mentoring, and leadership not only in the community but also for and with my patients at the VA and for stroke patients. A quote from that discussion post reads, "I have no doubt that we as nurses and APRNs can use evidence and education to make a profound and vital impact on outcomes, safety and quality, leadership, and health policy to enhance the health of the patients we serve in our clinics and hospitals. We can and should also use evidence and education beyond the bedside, journeying into our community centers and the streets of our neighborhoods. We can

use evidence, education, and the essence of our bold and noble profession to shine a light on injustice and be the light to a world that is so desperately crying out for the spark to ignite the fire of justice and freedom for everyone" —Jason Gleason.

I have also demonstrated the essence of advocacy and leadership by serving as one of 12 members of the National VA Officer of Nursing Services APRN Council. Serving on the council allowed me and 11 other APRNs from across the country to develop and impact policy advocating for APRN practice and the patients we care for at the VA. Our activities have focused on promoting independent APRN practice in all VA facilities, improving pay and benefits for APRNs, and creating proficiency standards. I have served on the council for the past two years.

"Be the fire, wish for the wind" —Nassim Taleb

Thanks to my doctoral journey at MSU, the spark of wisdom, curiosity, and a tenacious passion for learning has been lit, the fire is now ablaze and like those who came before me, I have become the wind ready to empower others.

REFERENCES CITED

American Diabetes Association *Statistics About Diabetes*. Statistics About Diabetes | ADA. (2018, March 22). https://www.diabetes.org/resources/statistics/statistics-about-diabetes.

American Diabetes Association. (2021). *Standards of Medical Care in Diabetes 2021.*

American Diabetes Association. (2020, February). *The Burden of Diabetes in Montana*. American Diabetes Association. Retrieved from http://main.diabetes.org/dorg/docs/state-fact-sheets/ADV_2020_State_Fact_sheets_MT.pdf.

American Psychological Association. (2020, June). *Patient health questionnaire (PHQ-9 & PHQ-2)*. American Psychological Association. Retrieved from https://www.apa.org/pi/about/publications/caregivers/practice-settings/assessment/tools/patient-health#:~:text=PHQ%2D9%20scores%20%3E%2010%20had,been%20shown%20to%20be%20high.

Baker, M. (2019, January 12). *Agent orange worries: Diabetes now TOPS Vietnam veterans' disability claims*. Cleveland. Retrieved from https://www.cleveland.com/nation/2010/08/agent_orange_suspicions_diabet.html.

Barnes, J. (2018, October 24). *Surviving Vietnam, agent orange and diabetes*. Health Beat | Spectrum Health. Retrieved from https://healthbeat.spectrumhealth.org/surviving-vietnam-agent-orange-and-diabetes/.

Bedard, P. (2018, July 26). *22% of US population does not speak English at home*. Washington Examiner. Retrieved from https://www.washingtonexaminer.com/washington-secrets/22-of-us-population-does-not-speak-english-at-home.

Berry D.C., Williams W., Hall E.G., Heroux R., Bennett-Lewis T. Imbedding interdisciplinary diabetes group visits into a community-based medical setting. *Diabetes Educ*. 2016;42(1):96-107. https://doi:10.1177/0145721715620022

Billingham SA, Whitehead AL, Julious SA. An audit of sample sizes for pilot and feasibility trials being undertaken in the United Kingdom registered in the United Kingdom Clinical Research Network database. *BMC Med Res Methodology*. 2013;13:104.50.

Blood Pressure Lowering Treatment Trialists' Collaboration. Pharmacological blood pressure lowering for primary and secondary prevention of cardiovascular disease across different levels of blood pressure: an individual participant-level data meta-analysis. Lancet. 2021 May 1;397(10285):1625-1636. doi: 10.1016/S0140-6736(21)00590-0. Erratum in: Lancet. 2021 May 22;397(10288):1884. PMID: 33933205; PMCID: PMC8102467.

Bradley, C. & Gamsu, D. (1994). Report of a working group of the World Health Organization Regional Office for Europe and International Diabetes Federation European Region St.

Vincent Declaration Action Programme for Diabetes. *Diabetes Medicine*.

Centers for Disease Control and Prevention. (2021, June 7). *Defining adult overweight & obesity*. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/obesity/adult/defining.html.

Centers for Disease Control and Prevention. (2021, April 28). *Healthy weight*. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/diabetes/managing/healthy-weight.html.

de Boer, I. H., Bangalore, S., Benetos, A., Davis, A. M., Michos, E. D., Muntner, P., Rossing, P., Zoungas, S., & Bakris, G. (2017). Diabetes and hypertension: A position statement by the American Diabetes Association. *Diabetes Care*, *40*(9), 1273–1284. https://doi.org/10.2337/dci17-0026

Mayer-Davis E.J., Lawrence J.M., Dabelea, D., et al. Trends in incidence of type 1 and type 2 diabetes among youths— selected counties and Indian reservations, United States, 2002–2017. MMWR Morb Mortal Wkly Rep. 2020 Feb 14;69(6):161–165

Edelman, D., Gierisch, J. M., McDuffie, J. R., Oddone, E., & Williams, J. W., Jr (2015). Shared medical appointments for patients with diabetes mellitus: a systematic review. *Journal of general internal medicine*, *30*(1), 99–106. https://doi.org/10.1007/s11606-014-2978-7

Eeg-Olofsson K, et al (2012) "HbA1c reduction and risk of cardiovascular diseases in type 2 diabetes: An observational study from the Swedish NDR" ADA 2012; Abstract 415-P.

Elamoshy, R., Bird, Y., Thorpe, L., & Moraros, J. (2018). Risk of depression and suicidality among diabetic patients: A systematic review and meta-analysis. *Journal of Clinical Medicine*, *7*(11), 445. https://doi.org/10.3390/jcm7110445

Elshourbagy, N. A., Meyers, H. V., & Abdel-Meguid, S. S. (2014). Cholesterol: the good, the bad, and the ugly—therapeutic targets for the treatment of dyslipidemia. *Medical principles and practice: international journal of the Kuwait University, Health Science Centre*, *23*(2), 99–111. https://doi.org/10.1159/000356856

Erion, D. M., Park, H.-J., & Lee, H.-Y. (2016). The role of lipids in the pathogenesis and treatment of type 2 diabetes and Associated co-morbidities. *BMB Reports*, *49*(3). https://doi.org/10.5483/bmbrep.2016.49.3.268

Fox, C. S., Golden, S. H., Anderson, C., Bray, G. A., Burke, L. E., de Boer, I. H., Deedwania, P., Eckel, R. H., Ershow, A. et al., (2015). Update on prevention of cardiovascular disease in adults with type 2 diabetes mellitus in light of Recent evidence: A scientific statement from the American Heart Association and the American Diabetes Association. *Diabetes Care*, *38*(9). https://doi.org/10.2337/dci15-0012

Frates, E. P., Morris, E. C., Sannidhi, D., & Dysinger, W. S. (2017). The art and science of group visits in lifestyle medicine. *American Journal of Lifestyle Medicine*, *11*(5), 408–413. https://doi.org/10.1177/1559827617698091

Geller, J. S., Kulla, J., Shoemaker, A. (2015). Group medical visits using an empowerment-based model as treatment for women with chronic pain in an underserved community. Global Advances in Health and Medicine, 4(6), 27–60. https://doi:10.7453/gahmj.2015.057

Gencer, B., Marston, N. A., Im, K., Cannon, C. P., Sever, P., Keech, A., Braunwald, E., Giugliano, R. P., & Sabatine, M. S. (2020). Efficacy and safety of lowering LDL cholesterol in older patients: a systematic review and meta-analysis of randomised controlled trials. *The Lancet*, *396*(10263), 1637–1643. https://doi.org/10.1016/s0140-6736(20)32332-1

Goldberg, R., Chinman, M. Peer Support Specialists' Unique Contributions to Veterans' Health 2019 https://www.hsrd.researh.va.gov/publications/vets_perspectives/1803_peer_support_specialists_contribution_to_veterans_health.cfm

Gubbi, R. M. and S., Muniyappa, R., Section, C. E., Gubbi, S., KG, A., Y, B., … Rory E. Morty and John Ziebuhr. (2020, April 26). *COVID-19 pandemic, coronaviruses, and diabetes mellitus*. https://journals.physiology.org/doi/full/10.1152/ajpendo.00124.2020.

Gregg, E. W., Li, Y., Wang, J., Rios Burrows, N., Ali, M. K., Rolka, D., Williams, D. E., & Geiss, L. (2014). Changes in DIABETES-RELATED complications in the United States, 1990–2010. *New England Journal of Medicine*, *370*(16). https://doi.org/10.1056/nejmoa1310799

Harris, M. D., Kirsh, S., & Higgins, P. A. (2016). Shared medical appointments: impact on clinical and quality outcomes in veterans with diabetes. *Quality management in health care*, *25*(3), 176–180. https://doi.org/10.1097/QMH.0000000000000098

Hartzler, M. L., Shenk, M., Williams, J., Schoen, J., Dunn, T., & Anderson, D. (2018). Impact of collaborative shared medical appointments on diabetes outcomes in a family medicine clinic. *The Diabetes educator*, *44*(4), 361–372. https://doi.org/10.1177/0145721718776597

Havelock, R., (1973). In *The change agent's Guide to Innovation in Education* (p. 5). essay, Educational Technology Pub.

Heisler, M., Burgess, J., Cass, J., Chardos, J. F., Guirguis, A. B., Strohecker, L. A., Tremblay, A. S., Wu, W. C., & Zulman, D. M. (2021). Evaluating the Effectiveness of Diabetes Shared Medical Appointments (SMAs) as Implemented in Five Veterans Affairs Health Systems: a Multi-site Cluster Randomized Pragmatic Trial. *Journal of general internal medicine*, *36*(6), 1648–1655. https://doi.org/10.1007/s11606-020-06570-y

Holt, R. I., de Groot, M., & Golden, S. H. (2014). Diabetes and depression. *Current diabetes reports*, *14*(6), 491. https://doi.org/10.1007/s11892-014-0491-3

Housden, L. M., & Wong, S. T. (2016). Using group medical visits with those who have diabetes: examining the evidence. *Current diabetes reports*, *16*(12), 134. https://doi.org/10.1007/s11892-016-0817-4

Hu, H., Hori, A., Nishiura, C., Sasaki, N., Okazaki, H., Nakagawa, T., Honda, T., Yamamoto, S., Tomita, K., Miyamoto, T., Nagahama, S., et al., (2016). Hba1c, blood pressure, and LIPID control in people with DIABETES: Japan Epidemiology collaboration on occupational Health Study. *PLOS ONE*, *11*(7). https://doi.org/10.1371/journal.pone.0159071

Julious SA. Sample size of 12 per group rule of thumb for a pilot study. *Pharmaceutica Stat*. 2005;4:287-291.

Kirsh, S., Watts, S., Pascuzzi, K., O'Day, M. E., Davidson, D., Strauss, G., Kern, E. O., & Aron, D. C. (2007). Shared medical appointments based on the chronic care model: a quality improvement project to address the challenges of patients with diabetes with high cardiovascular risk. *Quality & safety in health care*, *16*(5), 349–353. https://doi.org/10.1136/qshc.2006.019158

Lee Y, Siddiqui WJ. Cholesterol Levels. [Updated 2021 Jul 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK542294/

Lippi, G., & Targher, G. (2010). Glycated hemoglobin (HbA1c): old dogmas, a new perspective?. *Clinical chemistry and laboratory medicine*, *48*(5), 609–614. https://doi.org/10.1515/cclm.2010.144

Liu, Y., Sayam, S., Shao, X., Wang, K., Zheng, S., Li, Y., & Wang, L. (2017). Prevalence of and trends in diabetes among veterans, united states, 2005-2014. *Preventing chronic disease*, *14*, E135. https://doi.org/10.5888/pcd14.170230

Misra, Anoop, and Nikhil V Dhurandhar. "Current formula for calculating body mass index is applicable to Asian populations." *Nutrition & diabetes* vol. 9,1 3. 28 Jan. 2019, doi:10.1038/s41387-018-0070-9

Montana DPHHS Diabetes Program. (2019). *Diabetes in Montana, 2019*. Montana DPHHS Diabetes Program. Retrieved from https://dphhs.mt.gov/assets/publichealth/Diabetes/Infographics/2019DiabetesInfographicFinalADA.pdf.

Montana VA Health Care System. (2020, October 22). *Montana VA Healthcare System*. Montana VA Health Care System. Retrieved from https://www.montana.va.gov/.

Montana VA Electronic Quality Measures. (2021).

Nam, S., Chesla, C., Stotts, N. A., Kroon, L., & Janson, S. L. (2011). Barriers to diabetes management: patient and provider factors. *Diabetes research and clinical practice*, *93*(1), 1–9. https://doi.org/10.1016/j.diabres.2011.02.002

Oellgaard, J., Carstensen, B., Rossing, P., Lund-Andersen, H., Parving, H.-H., & Pedersen, O. (2016). Years of life gained By Multifactorial intervention in patients with type 2 diabetes Mellitus And microalbuminuria: 21 years follow-up on the Steno-2 randomized trial. *Diabetologia*, *59*(11). https://doi.org/10.1007/s00125-016-4065-6

Omogbai, Timothy, and Milner, Kerry A. (2018). Implementation and evaluation of shared medical appointments in veterans with diabetes: A quality improvement study. *The Journal of Nursing Administration* 48.3: 154-59. Web.

Petersen, M. P. (2018, May 01). Economic costs of diabetes in the U.S. in 2017. https://care.diabetesjournals.org/content/41/5/917

Piette JD., Resnicow K., Cho, H., Heisler M., A diabetes peer support intervention that improved glycemic control: mediators and moderators of intervention effectiveness. *Chronic Illness* 2013; **9**:258-267.

Pratt J., (1907). The class method of treating consumption in the homes of the poor. Journal of the American Medical Association 1907; XLIV (9):755–9.

Sandler, C. N., & McDonnell, M. E. (2016). The role of hemoglobin a1c in the assessment of diabetes and cardiovascular risk. *Cleveland Clinic Journal of Medicine*, *83*(5 suppl 1). https://doi.org/10.3949/ccjm.83.s1.02

Schwartz, Stanley S, and Benjamin A Kohl. (2010) “Glycemic control and weight reduction without causing hypoglycemia: the case for continued safe aggressive care of patients with type 2 diabetes mellitus and avoidance of therapeutic inertia.” *Mayo Clinic proceedings* vol. 85,12 Suppl (2010): S15-26. doi:10.4065/mcp.2010.0468

Schinckus, L., Dangoisse, F., Van den Broucke, S., & Mikolajczak, M. (2018). When knowing is not enough: Emotional distress and depression reduce the positive effects of health literacy on diabetes self-management. *Patient Education and Counseling*, *101*(2), 324–330. https://doi.org/10.1016/j.pec.2017.08.006

Sherwani, S. I., Khan, H. A., Ekhzaimy, A., Masood, A., & Sakharkar, M. K. (2016). Significance of hba1c test in diagnosis and prognosis of diabetic patients. *Biomarker Insights*, *11*. https://doi.org/10.4137/bmi.s38440

Silvio, E.I.; Richard, M.B.; John, B.B.; Michaela, D.; Ele, F.; Michael, N.; Anne, L.P.; Apostolos,

T.; Richard, W.; David, R.M. Management of Hyperglycaemia in Type 2 Diabetes, 2015: A Patient-Centered Approach. Update to a Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetologia* 2015, *58*, 429–442.

Stratton I M, Adler A I, Neil H A W, Matthews D R, Manley S E, Cull C A et al. (2000). Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study *BMJ*; 321:405 doi: 10.1136/bmj.321.7258.405

Taleb, N. (2013). *Antifragile by Nassim Nicholas Taleb*. Philosophy Now: a magazine of ideas. Retrieved from https://philosophynow.org/issues/97/Antifragile_by_Nassim_Nicholas_Taleb#:~:text=This%20sentiment%20is%20captured%20in,3).

Taveira T, Friedmann P, Cohen L, Dooley A, Khatana SA, Pirraglia PA, et al. (2010). Pharmacist-led group medical appointment model in type 2 diabetes. Diabetes Educ; 36(1):109–17.

Tello, M. (2020) *Rethinking A1C goals for type 2 diabetes*. Harvard Medical School. Retrieved from https://www.health.harvard.edu/blog/rethinking-a1c-goals-for-type-2-diabetes-2018032613452.

Thompson-Lastad A., (2018). Group medical visits as participatory care in community health centers. *Qualitative Health Research*; 28(7):1065-1076. https://doi:10.1177/1049732318759528

Vaughan, E. M., Johnston, C. A., Cardenas, V. J., Moreno, J. P., & Foreyt, J. P. (2017). Integrating CHWs as part of the team leading diabetes group visits: A randomized controlled feasibility study. *The Diabetes educator*, *43*(6), 589–599. https://doi.org/10.1177/0145721717737742

Vaag AA. (2006) Glycemic control and prevention of microvascular and macrovascular disease in the Steno 2 study. *Endocr Pract.* 2006;12:89–92

Veterans Health Administration . (2009, June 10). *Veterans Affairs*. Go to VA.gov. Retrieved from https://www.va.gov/health/aboutvha.asp#:~:text=The%20Veterans%20Health%20Administration%20(VHA,Veterans%20enrolled%20in%20the%20VA

Veterans Health Administration. (2020). *US Department of Veterans Affairs VA Benefits and Healthcare*.

Wagner, J. (2019, June 5). 10.3: Theories and models of change theories.

Willcox, A., Harris, Y., Whitebear, W., Bazylewski, S., Muller, S., Udod, S., . . . Duchscher, J.

(2018, June 30). Common Change Theories and Application to Different Nursing Situations. Retrieved September 27, 2020, from https://leadershipandinfluencingchangeinnursing.pressbooks.com/chapter/chapter-9-common-change-theories-and-application-to-different-nursing-situations/

Wen, W., Staab, E. A., Ham, S. A., Campbell, A., Schaefer, C. T., Quinn, M. T., Baig, A., (2018) Economic evaluation of group medical visits for adults with diabetes in community health centers diabetes Jul 2018, 67 (Supplement 1) 8-OR; https:// doi.10.2337/db18-8-OR

Yang, L., Li, L., Cui, D., Wu, Y., Qiu, L., Qin, J., & Zhu, X. (2019). Effectiveness of group visits for elderly patients with Type 2 diabetes in an urban community in China. *Geriatric Nursing, 41*(3), 229-235. https://doi:10.1016/j.gerinurse.2019.10.001

APPENDICES

APPENDIX A

INFORMED CONSENT TO PARTICIPATE IN

SMA AND HIPPA NOTIFICATION

Montana VA – Great Falls CBOC

Patient Consent to Participate in Diabetes Shared Medical Appointments

Participant Name: _____ DOB: _____

Diabetes Shared Medical Appointments Participation & Confidentiality Agreement:

I have read, understand and agree to the following:

- I agree to participate in shared medical appointments for treatment of my diabetes. Shared medical appointments are educational and medical visits completed in a group setting.
- I understand that I have a choice to be seen by my providers and nurses for care of my diabetes either by participating in shared medical appointments, individually or both kinds of visits.
- I understand that my participation in shared medical appointments for my diabetes is voluntary and I can choose to stop attending at any time.
- I agree to keep all information shared by other participants in the group private and confidential.
- I agree to be respectful and actively attend and participate in shared medical appointment activities and group discussions.
- I agree to complete screening tests as part of the shared medical appointment experience including: Labs obtained from blood and urine samples (A1C, Lipids Panel, UA, Chem-14, Urine Microalbumin); Blood pressure measurement; Body Mass Index, and Diabetes Treatment Satisfaction Questionnaire on week one and week twelve of the program. The results will be made available to me.

Signature: _____ Date: _____

Diabetes Shared Medical Appointments HIPPA Notification:

I have read, understand and agree to the following:

- During a shared medical appointment for diabetes it is possible that some of my individually identifiable health information will be disclosed as I as the participant share that information with others.
- I understand that I have the option to be seen individually.
- I understand that I am not required to sign this form to receive health care and treatment.
- I understand that discussions may occur regarding individually identifiable health information during a shared medical appointment.
- It is possible that the information that is used to disclosed in a shared medical appointment may be redisclosed by other participants attending the shared medical appointment.
- I have been notified of this potential disclosure and I voluntarily wish to participate in the shared medical appointments for diabetes.

Signature: _____ Date: _____

Form created by: Jason Gleason, MSN, NP-C updated 10.24.21

APPENDIX B

QUALITY IMPROVEMENT PROJECT VS. RESEARCH

Quality Improvement or Research Worksheet

Rachel Nosowsky, Esq.

SEQ	Issue and Guidance	Rating
1	Are patients randomized into different intervention groups in order to enhance confidence in differences that might be obscured by nonrandom selection? *Randomization done to achieve equitable allocation of a scarce resource need not be considered and would not result in a "yes" here.*	☐ Yes ☒ No
2	Does the project seek to test issues that are beyond current science and experience, such as new treatments (***i.e.***, is there much controversy about whether the intervention will be beneficial to actual patients – or is it designed simply to move existing evidence into practice?). *If the project is performed to implement existing knowledge to improve care – rather than to develop new knowledge – answer "no".*	☐ Yes ☒ No
3	Are researchers who have no ongoing commitment to improvement of the local care situation (and who may well have conflicts of interest with the patients involved) involved in key project roles? *Generally answer "yes" even if others on the team do have professional commitments. However, where the project leaders with no clinical commitment are unaffiliated with the project site, it may be that the project site is not engaged – and does not require IRB approval/oversight – even if the project leaders' roles do require IRB oversight at their institutions.*	☐ Yes ☒ No
4	Is the protocol fixed with a fixed goal, methodology, population, and time period? *If frequent adjustments are made in the intervention, the measurement, and even the goal over time as experience accumulates, the answer is more likely "no."*	☐ Yes ☒ No
5	Will there be delayed or ineffective feedback of data from monitoring the implementation of changes? *Answer "yes" especially if feedback is delayed or altered in order to avoid biasing the interpretation of data.*	☐ Yes ☒ No
6	Is the project funded by an outside organization with a commercial interest in the use of the results? Is the sponsor a manufacturer with an interest in the outcome of the project relevant to its products? Is it a non-profit foundation that typically funds research, or internal research accounts? *If the project is funded by third-party payors through clinical reimbursement incentives, or through internal clinical/operations funds vs. research funds, the answer to this question is more likely to be "no."*	☐ Yes ☒ No

Adapted from Hastings Center, "The Ethics of Using Quality Improvement Methods to Improve Health Care Quality and Safety" (June 2006)

If the weight of the answers tends toward "yes" overall, the project should be considered "research" and approved by an IRB prior to implementation. If the weight of the answers tends toward "no," the project is not "research" and is not subject to IRB oversight unless local institutional policies differ. Answering "yes" to sequence #1 or #2 – even if all other answers are "no" – typically will result in a finding that the project constitutes research. *It is important to consult with your local IRB if you are unsure how they would handle a particular case, as the analysis of the above issues cannot always be entirely objective and IRB policies and approaches vary significantly.*

APPENDIX C

LOGIC MODEL

SHARED MEDICAL APPOINTMENTS

Multiple patients seen at once for:

- Education
- Individualized Care
- Peer Support

Proven Efficacy in:

- Reducing A1C
- Reducing Systolic Blood Pressure
- Reducing Lipids
- Reducing BMI
- Improving Patient Satisfaction

TEAM IS ASSEMBLED

PLANNING MEETINGS ONGOING

LAUNCH DAY: JANUARY 5, 2022

80 VA patients (>18 yo, Dx DM, A1C >8%, Residing in Great Falls, MT)

12 Week SMA program for patients with diabetes to improve diabetes metrics, enhance patient satisfaction and reduce long-term complications

short-term

DAY ONE:

≥12 participants
90% complete labs (A1C, Renal and Lipids)
90% complete foot exams
90% complete eye exams
80% record BP readings
90% complete baseline PHQ-9
90% complete baseline DTSQ

mid-term

END OF WEEK 12:

Primary Measures:
A1C - ↓ by 1 point (3 study mean: 0.94)
SBP - ↓ by 5 points (3 study mean: 5.81)
LDL - ↓ by 10 points (3 study mean: 11.06)
BMI - ↓ by 1 point (3 study mean: 0.56)
PHQ-9 - ↓ by 2 points
DTSQ - ↑ by 5 points (1 study: 13.1)

Secondary Measure:
80% attendance rate for 12 session

long-term

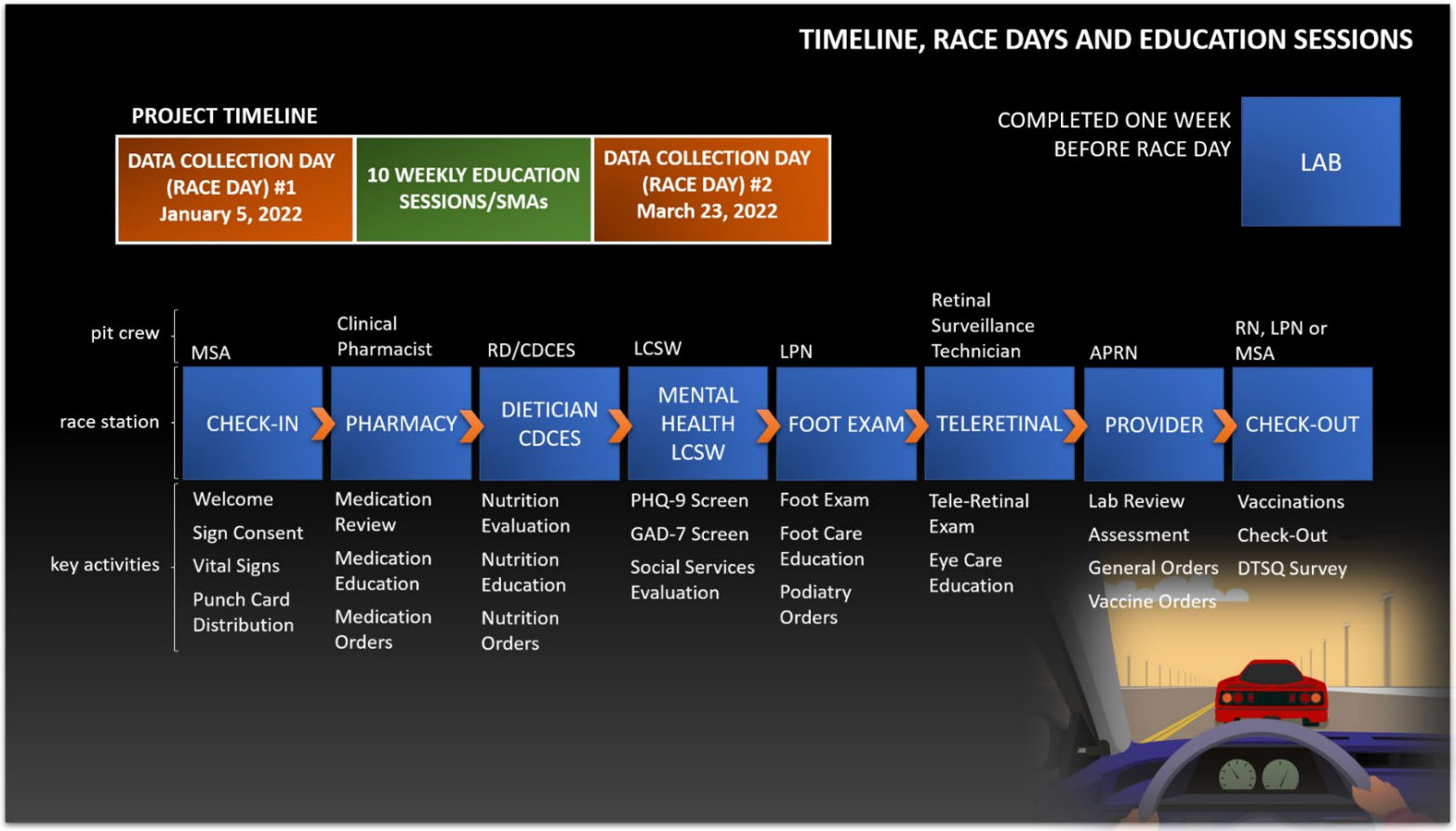
Prevent long term complications/target organ damage and premature death

Reduce the risk for:
Retinopathy
Nephropathy
Myocardial Infarction
Congestive Heart Failure
Neuropathy
Amputations
Vascular Dementia
Stroke

DATA ANALYSIS: Paired t-tests and Wilcoxon signed-rank test to determined statistical significance

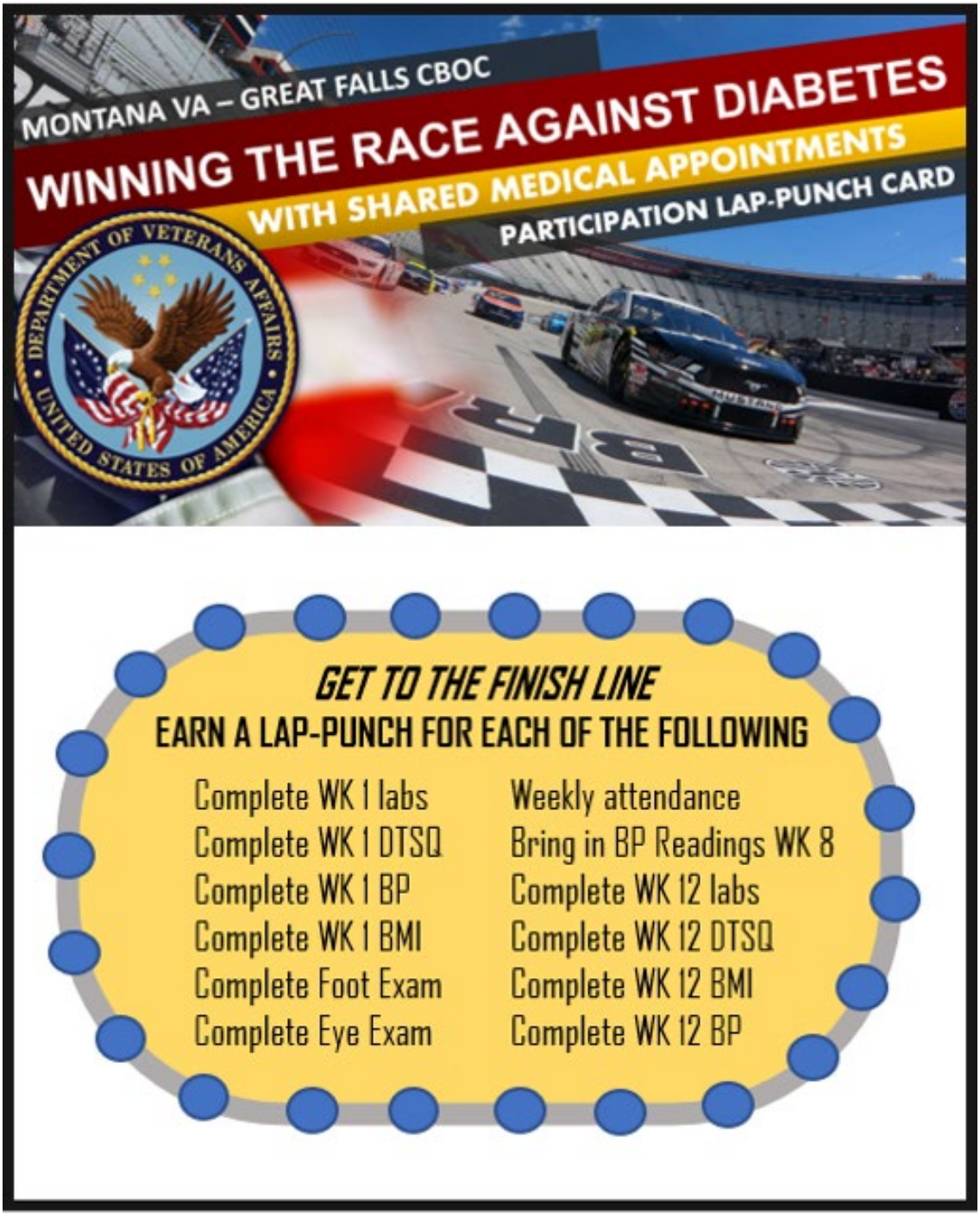
APPENDIX D

TIMELINE, RACE DAYS, AND EDUCATION SESSIONS


TIMELINE, RACE DAYS AND EDUCATION SESSIONS
PROJECT TIMELINE
DATA COLLECTION DAY (RACE DAY) #1 January 5, 2022
10 WEEKLY EDUCATION SESSIONS/SMAs
DATA COLLECTION DAY (RACE DAY) #2 March 23, 2022
COMPLETED ONE WEEK BEFORE RACE DAY
LAB
pit crew
race station
key activities
MSA
CHECK-IN
Welcome
Sign Consent
Vital Signs
Punch Card Distribution
Clinical Pharmacist
PHARMACY
Medication Review
Medication Education
Medication Orders
RD/CDCES
DIETICIAN CDCES
Nutrition Evaluation
Nutrition Education
Nutrition Orders
LCSW
MENTAL HEALTH LCSW
PHQ-9 Screen
GAD-7 Screen
Social Services Evaluation
LPN
FOOT EXAM
Foot Exam
Foot Care Education
Podiatry Orders
Retinal Surveillance Technician
TELERETINAL
Tele-Retinal Exam
Eye Care Education
APRN
PROVIDER
Lab Review
Assessment
General Orders
Vaccine Orders
RN, LPN or MSA
CHECK-OUT
Vaccinations
Check-Out
DTSQ Survey

APPENDIX E

WIN THE RACE PARTICIPANT PUNCH CARD


MONTANA VA – GREAT FALLS CBOC
WINNING THE RACE AGAINST DIABETES
WITH SHARED MEDICAL APPOINTMENTS
PARTICIPATION LAP-PUNCH CARD
DEPARTMENT OF VETERANS AFFAIRS
UNITED STATES OF AMERICA
GET TO THE FINISH LINE
EARN A LAP-PUNCH FOR EACH OF THE FOLLOWING
Complete WK 1 labs
Complete WK 1 DTSQ
Complete WK 1 BP
Complete WK 1 BMI
Complete Foot Exam
Complete Eye Exam
Weekly attendance
Bring in BP Readings WK 8
Complete WK 12 labs
Complete WK 12 DTSQ
Complete WK 12 BMI
Complete WK 12 BP

APPENDIX F

DIABETES TREATMENT SATISFACTION QUESTIONNAIRE (DTSQ)

Diabetes Treatment Satisfaction Questionnaire: DTSQs

The following questions are concerned with the treatment for your diabetes (including insulin, tablets and/or diet) and your experience over the past few weeks. Please answer each question by circling a number on each of the scales.

1. How satisfied are you with your current treatment?

very satisfied	6	5	4	3	2	1	0	very dissatisfied

2. How often have you felt that your blood sugars have been unacceptably high recently?

most of the time	6	5	4	3	2	1	0	none of the time

3. How often have you felt that your blood sugars have been unacceptably low recently?

most of the time	6	5	4	3	2	1	0	none of the time

4. How convenient have you been finding your treatment to be recently?

very convenient	6	5	4	3	2	1	0	very inconvenient

5. How flexible have you been finding your treatment to be recently?

very flexible	6	5	4	3	2	1	0	very inflexible

6. How satisfied are you with your understanding of your diabetes?

very satisfied	6	5	4	3	2	1	0	very dissatisfied

7. Would you recommend this form of treatment to someone else with your kind of diabetes?

Yes, I would definitely recommend the treatment	6	5	4	3	2	1	0	No, I would definitely not recommend the treatment

8. How satisfied would you be to continue with your present form of treatment?

very satisfied	6	5	4	3	2	1	0	very dissatisfied

Please make sure that you have circled one number on each of the scales.

For use by J. Gleason Licence ref CB1218
DTSQs © Prof Clare Bradley 9/93. English for USA (rev. 7/94)
Health Psychology Research, UK. www.healthpsychologyresearch.com

APPENDIX G

DATA COLLECTION AND ANALYSIS PLAN

Diabetes QI Project Data Collection and Analysis Plan

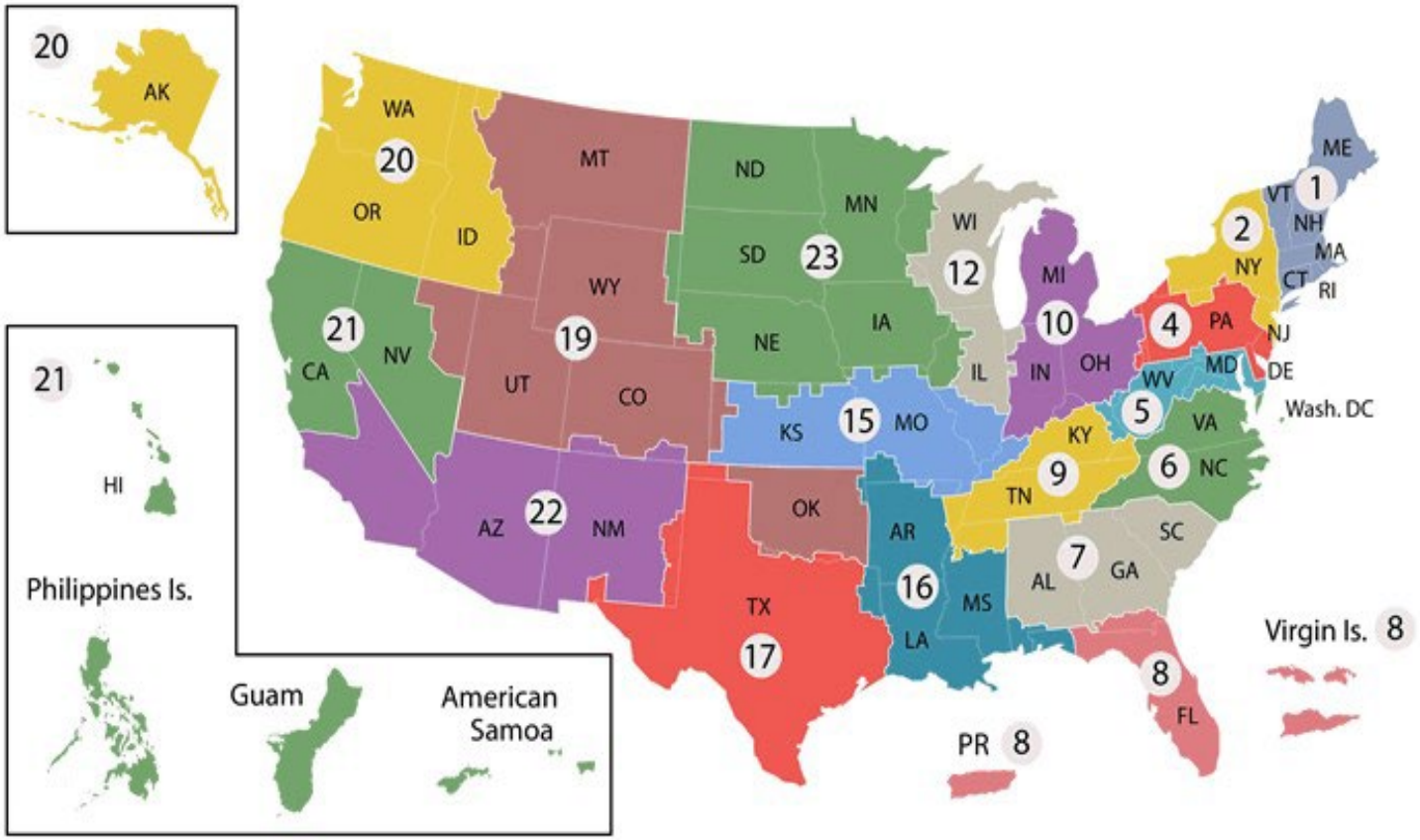
Data Security:
All data collected and analyzed for this projet is in digital format, encrypted, safe and protected under password and CAC card at the Montana VA – Great Falls CBOC. No specific protected health information will be reported.

Types of Data Utilized:
Data that will be analyzed for this project includes: Demographics (to identify population of participants who meet criteria for project inclusion: age, diabetes diagnosis, A1C >8% and living in Great Falls, Montana); Baseline and conclusion aggregate data related to 6 importance diabetes related metrics: A1C, systolic blood pressure, low-density lipoproteins, body mass index, PHQ-9 depression screening scores and DTSQ patient satisfaction scores. Secondary aggregate data which will be collected during launch day will be which participants completed foot exams, eye exams, blood pressure measurements and baseline PHQ-9 and DTSQ scores.

Data Analysis:
Descriptive statistics will be utilized to analyze and report on the project population demographics. Shapiro-Wilk test will be used to evaluate normality of the six key metrics at baseline and conclusion. Levene's test will be used to evaluate homogeneity of the six metrics. Paired t-tests will be utilized to evaluate for statistical significance and Wilcoxon signed-rank tests will be used to also evaluate and confirm statistical significance given the small sample size (n = 15).

APPENDIX H

VETERANS INTEGRATED SERVICE NETWORKS


20
AK
21
HI
Philippines Is.
Guam
American Samoa
WA
20
OR
ID
MT
ND
MN
SD
23
WY
NE
IA
21
NV
CA
19
UT
CO
KS
15
MO
WI
12
IL
MI
10
IN
OH
ME
VT
1
NH
MA
CT
RI
2
NY
4
PA
NJ
WV
MD
DE
Wash. DC
5
VA
KY
9
TN
6
NC
SC
7
GA
AL
16
MS
LA
AR
OK
22
AZ
NM
TX
17
8
FL
PR 8
Virgin Is. 8

APPENDIX I

LAUNCH DAY EVALUATION

Program Evaluation

Montana VA – Great Falls CBOC
Diabetes Shared Medical Appointments – Race Day #1
January 5, 2022

EVALUATION INSTRUCTIONS:
Thank you for attending Race Day #1 to participate in the Montana VA – Great Falls CBOC Diabetes Shared Medical Appointment Program. Please provide us some valuable feedback.

Please circle the star rating for each of the following:
(1 Star – Strongly Disagree 2 Stars – Disagree 3 Stars – Undecided 4 Stars – Agree 5 Stars – Strongly Agree)

Communication inviting me to the event was helpful…	★ ★ ★ ★ ★
I enjoyed receiving health care in small groups…	★ ★ ★ ★ ★
Attending this event will help me improve my diabetes control…	★ ★ ★ ★ ★
The handouts and orange folder I was given were helpful…	★ ★ ★ ★ ★
I would like to attend similar group care activities in the future…	★ ★ ★ ★ ★

What did you like most about the diabetes race day event?
_____
_____
_____
_____

How will attending Diabetes Shared Medical Appointments help improve your diabetes control?
_____
_____
_____

Other comments:
_____
_____
_____

NAME (OPTIONAL): _____