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Implementing a Diabetes Optimization Protocol for Elective Surgery Patients

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This is to certify that the doctoral study by

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Walden University
2020

Abstract

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MSN, Walden University, 2009

BSN, Lycoming College, 1995

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Diabetes is a recognized risk factor for postoperative infection, acute renal failure, ileus, and lengthy hospital stay. Optimal screening, management, and scheduling of elective surgery for diabetic patients has been shown to improve quality care, decrease complications, and increase the efficiency and lower the costs of preoperative patient care. However, surgery cancellations are common due to inadequate preoperative glycemic control and poor intraoperative glycemic control, which is a recognized risk factor for perioperative or postoperative complications. There were no clinical practice guidelines or optimization protocols for elective surgery patients at a small rural hospital in the Northeast United States. The purpose of this project was to develop a clinical practice guideline for elective surgery patients in this hospital outlining the acceptable HgbA1C level for surgical clearance. The Walker and Avant change theory guided this project. Based on the current evidence, the HgbA1C level approved to be acceptable for surgery clearance was 8.5% mg/dL. An 18-member expert panel consisting of anesthesiologists, nurse anesthetists, an endocrinologist, a diabetic nurse educator, an administrator, physician assistants, nurse practitioners, and surgeons reviewed the proposed guideline using the AGREE II tool. Using a scale of 1 to 7 (strongly disagree to strongly agree), the team members agreed with a score of 6 or higher in each domain with the proposed guideline. Utilization of this guideline may promote positive social change by addressing the gap in practice at this hospital and significantly reducing the number of surgery cancellations among diabetic patients.

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Dedication

This project and paper are dedicated to my husband for his love and support during my Doctor of Nursing Practice education and project completion. Without his countless hours of maintaining household duties, cheering me on when fatigue was setting in, and providing mini-relaxation adventures to help me rejuvenate my energy, I would never have been able to complete this educational journey in the timeframe that occurred. Lastly, my strength and confidence were bestowed to me by my Lord and Savior, Jesus Christ.

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Section 1: Nature of the Project

Introduction

The practice focused problem addressed in this project was the inadequate preparation of diabetic patients for their planned elective surgery. The practice problem was surgery cancellations due to preoperative patient condition instability, which puts the patient at risk for complications related to comorbidities. This problem can also lead to poor postoperative outcomes. The concern was that diabetic patients go through the preadmission process, which included a medical clearance, diagnostic testing, and anesthesia screening, but still arrived for elective surgery on the designated day too unstable to go through the surgery. HgbA1C often was not found to be part of the routine anesthesia screening process. The reasons for same day surgery cancellations included (a) an extremely elevated blood glucose reading, (b) an elevated HgbA1C, and (c) an unstable cardiac rhythm or an uncontrolled elevated blood pressure reading.

Diabetes is a recognized risk factor for postoperative infection, acute renal failure, ileus, and lengthy hospital stay. Poor preoperative glycemic control portends poor intraoperative glycemic control, which is an established risk factor for perioperative morbidity (Turner, Ma, Lorig, Greenberg, & DeVries, 2018). Surgical patients with perioperative hyperglycemia have a higher risk for infection and associated adverse consequences after surgery likened to patients without hyperglycemia. When patients with poorly controlled diabetes present for surgery, they impose a significant financial health resource burden, including prolonged ventilator dependence, longer hospital stay, and greater postoperative loss of productivity (Turner et al., 2018).

Problem Statement

There were no clinical practice guidelines or optimization protocols for elective surgery patients of any kind at this small rural hospital. As the incidence of diabetes increases, optimal screening, management, and scheduling of elective surgery for patients with diabetes has become an issue of increasing significance. Although analysis of the cost-effectiveness of postponing scheduled surgery to treat poor glycemic control in presurgical populations is crucial for enhancing the value proposition of the pronouncement to have surgery, the optimal preoperative care delivery model for diabetes management remains unclear (Turner et al., 2018). The practice question was: "Based on current evidence, what preoperative diabetic optimization protocol for adult elective surgery diabetic patients should be recommended in a small rural hospital?"

Purpose Statement

Hospitals have been continually exploring methods to reduce operational costs while providing safe efficient delivery of healthcare in a changing healthcare system. Implementation of the Affordable Health Care Act in 2010 for healthcare reform has been one of the major driving forces to reduce costs in the health care system as more Americans have been looking for health care. Operating rooms have been one of the costliest areas of hospital operations, and with the growing concerns to lower health care costs, hospitals have been faced with multiple mounting financial pressures. Surgical operating rooms are vital resources for patient care and financial profitability and are often the largest contributors to a hospital's financial success. Surgical cancellations can

negatively impact an organization's financial revenue; therefore, efficient utilization of operating room time is critical to reduce expenses (Minor, 2018).

Operating room cancellations have a negative financial burden for the institution, and may also generate dissatisfaction for the surgeon, anesthesiologist, and operating room staff, as well as the patient. According to research, 35% of operating room cancellations for elective surgeries were because of patients "not arriving" for their appointment, 28% were cancelled because of improper preadmission testing and workup or health status change, and 20% of the elective cases were cancelled due to facility issues related to improper scheduling issues (Argo, Vick, Graham, Itani, Bishop, Hawn, 2009). A study conducted by Tulane University Medical Center in 2009 documented that 327 of the 4,876 total cases cancelled were analyzed by characteristics and cost associated with surgery cancellations and determined 32.4% of cancellations were due to patient "no-show" with an estimated loss of $4,550 per case based on Medicare payment rates (Bent, Mora, Perre, Rosinina, Campbell, 2012). Redesigning the surgical work process, improving management, and performing early evaluations of patients have been suggested to reduce operating room cancellation rates, which will improve operating room efficiency and reduce lost revenue (Bent et al., 2012). Improving coordination of care and management of surgical patients have been shown to increase quality care, reduce complications, and increase the efficient and cost-effectiveness of preoperative care, while also improving patients' perceptions of their surgical experiences (Schweitzer, Fathy, Leib, & Rosenquist, 2013). Optimizing a patient's medical condition during the preoperative period can also reduce mortality and morbidity rates for elective

surgical procedures. Based on the preliminary literature review, it was proposed that implementing a diabetic optimization protocol to measure if a patient's health status is optimal during the preoperative, consultation period could reduce operating room cancellations for "change in patient's medical condition" within 48 hours of the surgery date.

Nature of the Doctoral Project

The identified setting was a small rural hospital in northcentral United States. The department was the surgical department and the preadmission testing center. The practice problem was surgery cancellations due to preoperative patient condition instability which puts the patient at risk for complications related to comorbidities and leads to poor postoperative outcomes. Approximately 43 same-day surgery cancellations occur each month within 48 hours of the scheduled surgery date. Of these cancellations, 37% of those elective surgery cancellations each month are due to poor optimization of the diabetic patient. There was an identification of the problem by the one-day surgery administrative staff. They were extremely agreeable to the project. The other stakeholders in this project included the anesthesiologists and nurse anesthetists, who also supported the project. In addition, the preadmission center was a major stakeholder in this project. Another group of stakeholders in the project was the surgeon specialty groups. They were of questionable support for the project because they wanted their surgeries to take place and not be cancelled. The surgeons wanted to keep their daily surgery slots in the operating room full, while also maintaining quality surgical patient outcomes. An expert panel was solicited from members of these groups. An

endocrinologist and a diabetic nurse educator were also invited to participate in the expert panel.

The project followed the Walden University Manual for Clinical Practice Guideline Development for the DNP scholarly project. Specific inclusion and exclusion criteria were identified for a literature search. Evidence was graded using Fineout-Overholt and colleagues' appraisal tool (Fineout-Overholt, Melnyk, Stillwell, & Williamson, 2010). The Appraisal of Guidelines Research and Evaluation (AGREE II) tool was used as the framework to develop the clinical practice guideline.

Significance

A struggle to improve operating room efficiency was a significant priority, as health care cost became more challenging for this specific facility. A small delay in a surgical case onset time, lengthy turnover between surgical cases, or time lost searching for operating room equipment and supplies can harshly hinder operating room efficiency resulting in a loss of revenue (Gamble, 2013). Despite surgery being the pillar for hospital profitably, there was limited formal data on operating room cost because of the multiple variables associated to accurately calculate such information. Literature evidence showe that in 100 U.S. hospitals, operating costs range from $22-$133 per minute with the average being $62 per minute (Argo et al., 2009). The cost of unused operating room time has been estimated at $600 per hour or $10 per minute (Argo et al., 2009). Operating room cost per minute can be contingent on various factors including reimbursement fee structures as determined by payer systems, intricacy of the procedure, overhead expenses, and provider fees (Macario, 2010).

Unexpected delay or cancellation of elective surgeries have a substantial impact on hospital performance and can cause undesired patient outcomes. When surgery has been cancelled for any reason, productivity is affected, time delay increased, patient care may be compromised, resources are squandered, and the cost increased. Cancellation of prearranged elective surgeries has been a substantial problem that undesirably effects health care quality, harms the patient, and wastes resources. An optimization protocol that clearly outlines preparation steps, combined with treating the patients as adult learners, and justifying the reasoning behind the interventions can deliver guidance to the health care team on optimizing the diabetic patient for their elective surgery. Optimization protocols improve quality of care and assist in social change which allows the nurse to identify barriers and thus choose more appropriate and achievable outcomes, further personalizing patient care.

Given that the epidemiological data suggest that 'good' pre-operative glycemic control is linked with a lower risk of postoperative complications, it has been promoted that HgbA1C concentrations should be optimized before an elective procedure (Levy & Dhatariya, 2019). Therefore, most surgeons and anesthesiologists seek glucose levels < 200 mg/dL on the day of surgery (LaBoone, McLarney, & Reynolds, 2014). There is some evidence in the literature that primary care physicians have never ordered baseline HgbA1C on their diabetic patients preoperatively (Lee, Wyatt, Walker, Topliss, & Stoney, 2014). Review of glycemic control and any successive glycemic optimization should originate at the moment of the referral for a surgical consultation and should endure at all stages of the patient preparation: (a) primary care, (b) surgical outpatient

office visit, (c) preoperative assessment clinic, (d) hospital admission, (e) operative theaters and recovery room, (f) postoperative care unit, and (g) discharge home. At all these phases, communication between the pertinent staff and the patient is crucial to help to certify that optimal glycemic control is attained and maintained. Preoperative glycemic optimization should be expedited by either primary care or hospital specialists. Patient engagement is crucial for positive surgical outcomes (Lee et al., 2014; Levy & Dhatariya, 2019). In view of the excessive cost of patient care in the acute hospital setting, it is important to review the current evidence related to improving diabetic postoperative outcomes. Stakeholders for this project included the pre-surgical diabetic patients, pre and post operative nursing staff, surgeons, hospital administration, and caregivers. Positive social change may occur for the patients, families, caregivers, and health care providers by improving the diabetic patients' quality of life and the financial outcomes for the facility.

Summary

Diabetes accounts for up to 10% of health care expenses in industrialized nations, and these costs are related in part to the excess amount of admissions (Levy & Dhatariya, 2019). Persons with diabetes (both known and unknown) have a considerably lengthier hospital length of stay, significantly more major complications, a higher necessity for postoperative critical care admission, a higher need for postoperative ventilation, and higher mortality incidences and event costs equated with people without diabetes admitted for the same conditions. In surgical patients, the hospital admission stay is up to 45% longer than those without diabetes, with general surgical and

orthopedic patients often having the longest stays (Levy & Dhatariya, 2019). The death rate of surgical patients with diabetes is two-fold as that of those without diabetes (Lee et al., 2014). There is growing evidence that diabetes is a modifiable risk factor and that the care of the surgical patient with diabetes and pre-diabetes can be optimized, with a consequent reduction in complications and mortality (Levy & Dhatariya, 2019). Allowing enough time to assess the level of diabetes control should be evaluated four to six weeks before the scheduled surgery date. This allows time for the patient to receive optimization interventions in order to adjust their condition to make the patient a better surgical candidate. The hospital has been evaluating the HgbA1C two weeks before surgery. This time frame has not allowed enough time to improve the patient's condition to prevent post-operative complications.

Understanding of the extraordinary cost associated with operating room cancellations have led health care administrators to explore opportunities to decrease elective surgical cancellation rates. The purpose of this project was to determine if preoperative risk assessments for diabetic patients and optimization of this medical condition for surgical patients would significantly reduce elective operating room surgical cancellations. The practice question was: "Based on current evidence, what preoperative diabetic optimization protocol for adult elective surgery diabetic patients should be recommended in a small rural hospital?" In Section 1, the problem, purpose, and nature of this DNP project was acknowledged. Stakeholders were identified and the approach to developing a clinical practice guideline was introduced. In Section 2, the framework that supported this project, the relevant evidence, the local background and

content, and my role in developing and implementing the project was explored. Stakeholder involvement was defined.

Section 2: Background and Context

Introduction

The setting for this project was a small rural hospital in the Northeast United States. The department was the surgical department and the preadmission testing center. The practice problem was surgery cancellations due to preoperative patient condition instability which puts the patient at risk for complications related to comorbidities and leads to poor postoperative outcomes. The concern was that diabetic patients go through the preadmission process, which includes a medical clearance, diagnostic testing and anesthesia screening, but still arrive for elective surgery on the designated day, too unstable to go through the surgery. The reason for cancellation could be an extremely elevated blood glucose reading, unstable cardiac rhythm, or an uncontrolled elevated blood pressure reading. The practice question was: “Based on current evidence, what preoperative diabetic optimization protocol for adult elective surgery diabetic patients should be recommended in a small rural hospital?” In Section 2, the theory framing this project, the evidence supporting the practice question, the local background impacted by this practice problem, and my role in developing a recommended practice guideline was introduced.

Concepts, Models, and Theories

Nurses, in collaboration with other health partners, have been called to lead change and transform healthcare delivery systems to provide higher quality, safer, more affordable, and more accessible care (Institute of Medicine, 2011). During change, leadership has been significantly associated with quality improvement, optimal

organizational performance and outcomes, and population health outcomes (Nelson-Brantley & Ford, 2017). Nurses are the main sector of the healthcare system and function from a holistic, health-oriented ideology and framework. As such, nurses are perfectly positioned to lead the redesign of the health care system and its many practice environments. The need for efficiency and cost reductions in health care worldwide are placing new demands on nurses as leaders of change (Institute of Medicine [IOM], 2011).

Leading change is not a new concept, yet it remains one of the most difficult tasks of leadership (Karp, 2006). A clear theoretical or operational definition for nursing and healthcare professionals is missing. Conceptual clarity about leading change in the context of nursing and health care systems is needed to provide an empirical direction for future research and theory development that can advance the science of leadership studies in nursing (Nelson-Brantley & Ford, 2017). According to Walker and Avant (2011), identifying defining attributes involves clustering the attributes most commonly associated with the concept, using the fewest possible to sufficiently differentiate the concept from others. Five defining attributes of leading change were identified: (a) individual and collective leadership, (b) operational support, (c) fostering relationships, (d) organizational learning, and (e) balance (Nelson-Brantley & Ford, 2017).

Individual and Collective Leadership

Leading change requires both individual and collective leadership. Often an administrative level leader recognizes the need for change and communicates a clear vision to internal and external stakeholders (Nelson-Brantley & Ford, 2017). From there, leading change is a united endeavor to foster energy by a partnership of change-

supporters often at the middle level of the organization and then eventually disseminated throughout all levels of staff. Collective leadership is a defining attribute of leading change because knowledge expertise to problem solve is not something held by just those in formal leadership roles (Nelson-Brantley & Ford, 2017). Collective leadership occurs throughout the organization, especially by those who are nearest to it. Each member of the system becomes a leader of change by contributing their individual knowledge, skills and commitment to the collective action of the whole (Nelson-Brantley & Ford, 2017).

Upper management did not initiate the interest in addressing the issue of last-minute surgery cancellations for same day surgery patients. The idea for addressing the issue was initiated by the anesthesiologists and nurse anesthetists because they were experiencing patient dissatisfaction when their surgeries were being cancelled upon arrival to the department in the morning. The anesthesia department was also experiencing discontent among the surgeon groups because they suddenly had an open surgery slot. However, when the issue was brought to the table, all levels of management, department heads, and collaborating departments and staff were ready to problem solve and seek solutions.

Operational Support

Leading change requires multiple, simultaneous adjustments in staffing, work-flow, decision making, and reward systems (Weiner, Amick, & Lee, 2008). Providing operational support is a core responsibility of nurse managers, nursing directors and public health leaders when leading change (Nelson-Brantley & Ford, 2017). Operational support necessitates gathering resources, evolving strategic approaches for conducting

tasks, categorizing matters and prospects, and supervising progress. This project had full operational support including manpower, budgetary funds, engineering resources, and quality improvement monitoring.

Fostering Relationships

With change comes uncertainty and loss (Foltin & Keller, 2012). Leaders must create an atmosphere of psychological safety where individuals feel safe to let go of previously held understandings and engage in new behaviors to test the waters of an emerging culture (Foltin & Keller, 2012). Therefore, a defining attribute of leading change is fostering relationships, and building an interconnectedness of individuals in and outside the organization. This attribute enables members to work as a team, empowering them to make decisions and achieve collective accountability. Embedded in the attribute of fostering relationships is effective communication internal stakeholders want unrestricted and authentic communication, truthful information, and a system that effectively tolerates questioning and answering at various levels. Nurse executives need to demonstrate commitment by being visible, asking for progress reports, and sharing information transparently with organization members. The use of inclusive language, such as referring to the change project as ‘our project’ rather than ‘my project’ helps facilitate ownership of the change initiative, empowerment of team members, and engagement of stakeholders in the process, thereby ensuring the sustainability and impact of the change (Nelson-Brantley & Ford, 2017). Messages need to be reliable in both statements and actions. ‘Telling the story’ in a cohesive voice is essential for fostering relationships with internal and external stakeholders (Foltin & Keller, 2012).

The beginning of this project started with perceptive inquiry. Interviews were conducted with staff, surgeons, anesthesia staff, administrative personnel, and patients to seek to understand the issue of last-minute surgery cancellations. Hours were spent in observation in various departments to discern the patient flow through the preadmission process. Time was spent to analyze the preadmission testing process from start to finish. Anesthesia policies and protocols were analyzed and compared to the evidence in the literature. During all these explorations, open ended inquiry from a non-biased approach was utilized. This approach assisted in the fostering of relationships as the project progressed through its stages.

Organizational Learning

The attribute of organizational learning was consistently identified with leading change. Organizational learning is the process of change in thought and action, embedded in and affected by the institutions of the organization. It includes four processes: (a) intuiting, (b) interpreting, (c) integrating, and (d) institutionalizing. Learning begins as a subconscious process at the individual level (intuiting), moves to the conscious, and is shared with the group(interpreting), who in turn integrate a collective understanding Learning is finalized when it moves across the organization and is embedded in its systems, structures, routines and practices (institutionalizing; Nelson-Brantley & Ford, 2017).

As the evidence was searched in the literature concerning diabetes optimization, documented clinical practice guidelines, and the impact of surgery cancellations on the hospital system, information sharing took place consistently and constantly. Evidence in

the literature gave support towards developing a facility specific clinical practice guideline. Evidence in the professional databases validated the recommended HgbA1C level acceptable for preoperative surgery consideration. Evidence in the literature revealed fiscal implications for the facility when surgeries are cancelled at the last minute. Finally, substantiation in the literature validated patient concerns and dissatisfaction with the realization of a surgery being cancelled even after progressing through the preadmission certification process.

Balance

Leading change characteristically poses inconsistent challenges or circumstances where electing one option proceeds to contradict another. Twenty-first century challenges underscore the need for balance between radical reform and incremental changes to move the organization forward (Nelson-Brantley & Ford, 2017). Leading change in nursing was commonly described as a balancing act (Karp, 2006). Nurses direct change by adjusting their leadership approach to the circumstance that is imminent. Nurses that lean too heavily on either the structural side (operational support) or the human side (fostering relationships) of leading change destabilize foundations and erode trust (Nelson-Brantley & Ford, 2017).

Nurses leading change must balance creating a sense of urgency with realistic patience, toughness with empathy, optimism with realism, and self-reliance with trust in others (Bunker, 2006). Predominantly difficult for nurses is balancing firmness with responsiveness. To effectively lead change, nurses must balance their ability to be caring and supportive with showing more proactive behavior in ensuring their voice is heard at

the table of change efforts (Bunker 2006). The Robert Wood Johnson Nurse Executive Fellows program identified the ability to use different leadership styles to motivate and inspire others as a core competency for leading change. Others contend that, at certain times, organizational learning thrives best under the guidance of transformational leadership (inspirational, intellectually stimulating, and individually considerate) and, at other times, under the direction of transactional leadership (setting goals, articulating expectations, and keeping everyone on task) and that both styles coexist in an individual (Nelson-Brantley & Ford, 2017). A mixture of top-down and bottom-up, compliance and commitment, and individual and team efforts is essential for successfully leading change (Karp, 2006).

One department in this change process was particularly cautious with the inquiry and information sharing. The preadmission center demonstrated some resistance to the inquiry because of their pride in the work that they do every day. However, most of the nurses in that department have been long-term nurses who have not worked outside this facility. They also did not profess to read any current nursing or other professional journals. They did not see the value of seeking the evidence in the literature. They have been very comfortable in the job they have been performing every day and showed some resistance to "looking outside the box." The nurse manager also demonstrated the same tunnel vision. Of course, the identified need for change in this department is an entirely different change project for another change agent.

Leading change is a complex process where nurses individually and collectively balance paradoxical priorities to provide operational support, foster relationships, and

facilitate organizational learning to achieve improved performance and outcomes and new organizational culture and values. Leading change originates from external or internal driving forces and requires organizational readiness characteristic of adaptive systems. From there, leading change is a complex, interactive process where nurses operate in a gyroscopic fashion, continuously balancing human elements of leading change (fostering relationships) with structural elements (providing operational support), and radical attempts at change with more incremental approaches (Nelson-Brantley & Ford, 2017). This middle-range explanatory theory delineates attributes that can be used to construct testable statements of relationship (Walker & Avant, 2011). A middle-range theory of leading change advances nursing leadership practice by facilitating a greater understanding of how to lead change and providing possible explanations for the degree of effectiveness of change interventions (Nelson-Brantley & Ford, 2017).

Relevance to Nursing Practice

Surgery Cancellations

Level 1. Talalwah & McIltrot (2019) were concerned about unexpected delay or cancellation of elective surgeries which has a significant impact on hospital performance and causes undesired patient outcomes. The purpose of this integrative review (Level I study) was to explore the impact of unanticipated changes in the elective surgery schedule and determine the best interventions to reduce the delay and cancellation rate of surgeries. A secondary purpose was to guide the quality improvement team in measuring improvement and assessing the progress of the implemented interventions.

Last minute cancellation has a negative emotional consequence on patient satisfaction and instigates noteworthy displeasure and frustration for patients and their families. The patient may have arranged for absence from work, a post-surgery escort, or childcare—all of which may be difficult to reschedule. Cancellation also affects staff self-esteem and makes interacting with the strained patient who has waited for surgery to be scheduled, difficult for the hospital staff. Prolonged waiting time for surgery coupled with a prolonged hospital stay causes both pain and possible deterioration of the patient's medical condition, which might lead to an impaired recovery (Talalwah & McIltrot, 2019).

The problem of last-minute changes in a surgical schedule is complex and involves multiple clinical systems such as the day surgery unit (DSU), operating room (OR), OR scheduling team, post-anesthesia care unit (PACU), and the hospital admitting unit. When the surgical scheduling members neglect to inform the DSU about a surgical case order variation, the patient waiting time for surgery turns out to be uncertain, nursing assignments have to be altered, and workload increases. These outcomes affect the DSU nurses, deterring their skill to prioritize patient needs and work as a team. In the event of cancellation, the OR workflow is interrupted, instrument kits previously prepared must be returned to central supply, resources are wasted, and the use of the room is reduced (Talalwah & McIltrot, 2019).

Results from this integrative review revealed that elective surgery cancellation is a multifactorial problem that is documented worldwide and can vary from one hospital to another. Similarly, poor preoperative medical optimization was responsible for

approximately 40% of cancellations. Studies in this integrative literature review recommended addressing cancellations through preoperative assessment in a preadmission clinic. Further studies recommended that preoperative assessment be done within 30 days before the surgery to increase patient compliance with preoperative instructions and reduce no-show patients on the day of surgery. Equally, a surgery coordinator or nurse-led preoperative clinic with centralized patient preparation, including a nurse's role in educating the patient and family for surgery preparation, also reduced the cancellation rate from 10% to 1.6%. Furthermore, reducing patient absenteeism on the day of surgery can be approached by calling patients two days before the surgery date to confirm attendance and assess patient compliance with a preoperative instruction, which has proven to reduce the cancellation rate by 30%. The discoveries of this literature review delivered adequate suggestions for interventions that have the potential to decrease cancellation of elective surgery.

Level IV. Approximately 312.9 million surgical procedures were conducted globally in the year 2012 (Turunen, Miettinen, Setala, & Julkunen, 2019). Surgeries are performed during 29% of hospitalizations and comprised 48% of the $387 billion in healthcare expenditures in 2011 (Boggs, Tan, Watins, & Tsai, 2019). Surgery cancellations are regrettable circumstances that have a demonstrative and financial effect on patients. Cancellations lead to financial loss for organizations and inefficient use of the operation room (OR) time (Turunen, et al., 2019). The loss to an organization of a single cancellation has been reported as an average of 4,802 US dollars, and the financial loss of a 1.4% cancellation rate was estimated to be more than 32 million U.S. dollars.

Approximately 50% to 65% of the cancellations are potentially avoidable (Turunen et al., 2019). This study measured reasons, frequencies, and timing of surgery cancellations after a patient is scheduled for elective surgery and compared those findings with background characteristics of operative specialties (Turunen et al., 2019). In summary, total cancellation rate is commonly used when reporting outcomes of remodeling preoperative care, and several structured categorizing systems are widely used (Turunen et al., 2019). Previous research focuses strongly on day of surgery (DOS) cancellations, as those have an instant effect on costs and optimal use of OR time However, it is also essential to appraise cancellations that transpire earlier in the preoperative stage after patients are scheduled for surgery. Earlier cancellations may cause waste of resources, extra work for preoperative nurses and other preoperative staff, financial loss for the organization, and unnecessary stress for the patients (Turunen et al., 2019).

The sample of 290 cancellations was segregated into seven key groupings by reasons. Approximately 50% of all the reasons were because patients were not in a suitable condition for the operation or because of organizational factors such as lack of resources The condition of the patient was the largest single category, as 34.2% of all cancellations were because patients were sick, had teeth or skin problems, or for some other health reason. Resource-related reasons were the second largest category (23.3%), approximately half of these were because surgeons were not available, there were more urgent cases, or the OR was too busy. This study delivers evidence for nursing staff regarding explanations that lead to elective surgery cancellations. Cancellations can lead to wastage because they cause extra work for preoperative staff, harm to patients, and

decrease the use of OR time. Cancellations may have a negative effect on job satisfaction for staff, patients' experiences, and can be used for developing smooth and efficient preoperative processes as it provides knowledge for preventing unnecessary cancellations (Turunen et al., 2019).

In another research study done in Sarajevo, similar findings were discovered. Elective case cancellation (scheduled surgical procedure not performed on the day of surgery) is an ongoing problem in most higher-level medical facilities (Solak et al., 2019). This descriptive study reviewed 8,201 planned elective cases, 7,825 were performed, whereas 376 (4.58%) elective cases were cancelled on the day of the surgery. The most common reason for cancelling elective cases was "lack of time to perform surgery", 33.51% out of the total number of cancelled cases (Solak et al., 2019). The second most common reason for cancelling cases on the day of surgery was "surgery cancelled due to medical/anesthetic reasons" (31.38%). This cause is placed under unavoidable causes given that the condition of the surgical patient worsened prior to the surgical procedure. These cancellations caused an increase in costs and under-utilization of hospital resources. The percentage of cancelled elective procedures on the day of surgery varied in different studies and can be as low as 3.9% or extremely high at 40% (Solak et al., 2019). The reasons for cancelling elective cases on the day of surgery were numerous, and they vary from facility to facility. Some of the possible reasons for cancellations were patient-related factors such as inadequate preoperative preparation of the patient, a change in the medical condition of the patient right before the surgical procedure or the patient decides not to undergo surgery. Surgeon-related factors that

included inadequate interpretation of indications and inadequate scheduling of the surgical procedure were identified. Operating room-related factors included emergency procedures which interfere with the regular operating schedule, lack of space and time to perform surgery or shortage of staff and materials necessary for the surgical procedure (Solak et al., 2019).

A descriptive study conducted by Turunen et al, (2019) discussed the sensitive and economic results of surgery cancellations, the loss to an organization of a single cancellation was reported as an average of $4,802, and the financial loss of a 1.4% cancellation rate was estimated to be more than $32 million dollars. Cancellation is one of the widely used nursing sensitive quality indicators when evaluating and reporting the efficiency and outcomes of preoperative care and measuring the results of developments in the preoperative setting.

Turunen et al., (2019) discussed the importance of preoperative nurses as essential in the preoperative process. These nurses are specialized coordinators of surgical patient care who meet patients' needs individually while working together with patients and their families as well as other health care workers. Preoperative nurses share the responsibility for patients arriving to hospital on time, holistically prepared, and without anxiety or fear, and ensure a safe and effective care process. Preoperative nurses provide careful patient screening and assessment fostered with enhanced communication between professionals impacting last minute cancellations and nonattendance. Preoperative nursing care is cost-effective when the surgical process and patient-specific management are optimized (Turunen et al., 2019). This study affords evidence for nursing staff concerning details

that lead to elective surgery cancellations. Cancellations can lead to wastage because they cause extra work for preoperative staff, harm to patients, and decrease the use of operating room time

Last-minute cancellations of elective surgeries have substantial mental, societal and economic implications for patients and their families. Patients may have prepared provisions for time off from work or supervision for their children in order to appear for their procedures and it may be problematic to arrange their obligations again for the rescheduled surgery day. The commonest reasons for cancellation, as reported in the literature, are bed unavailability due to increased number of emergency admissions, lack of operating room time, failure of patients to arrive for surgery, and patients being not fit for the operation (Dimitriadis, Iyer, & Evgeniou, 2013). Cancellations can have a negative effect on job satisfaction for staff, patients' experiences, and the hospital's financial budget. (Turner et al., 2018). A discussion of cancellation of elective and emergency procedures were identified retrospectively in a Level IV study conducted by Dimitriadis et al. (2013). During 2012, there were 19,368 emergency and elective surgeries completed at the two hospitals of the study. The rate of cancellation on the day of surgery for elective and planned emergency procedures during the period from January 2012 to December 2012 was 5.19%. The reasons for cancellation can be classified into "patient-initiated cancellations," such as patient medically unfit, operation not necessary, patient failed to attend and hospital-initiated cancellations, including shortage of theatre time and lack of beds. The main reason for cancellation during 2012 was patient not fit for operation (33.73%), followed in decreasing frequency by lack of beds (21.79%), lack

of theatre time (17.31%), patient failed to attend (6.87%) and operation no longer necessary (4.08%) (Dimitriadis, Iyer, & Evgeniou, 2013). Although there was a well-established pre-assessment service at the hospitals in the study, the most common reason for cancellation on the day of surgery at the hospital was the patient not being medically fit for the operations of the reasons identified were disagreement between the outcome at pre-assessment and the opinion of the responsible anesthetist on the day of the operation or deterioration of the patient's condition between pre-assessment and the day of operation. The second most common reason for day of surgery cancellations at this hospital is lack of beds. Another common reason for cancellation on the day of surgery at our hospital is lack of theatre time, which agrees with studies from around the world.

According to the researchers in this study, a common approach to deal with the problem of cancellation on the day of surgery because the patient is not fit for the operation is the establishment of preassessment clinics. Pre-operative assessment of the patient before the operation, performed by junior doctors, nurses supervised by an anesthetist or nurses assisted by a computer software has been shown to reduce cancellations on the day of surgery significantly. Although it has been shown that early patient pre-assessment, 30 days before the operation, is associated with a reduction in the number of cancellations compared to pre-assessment 24 hours before the operation, a balance should be maintained. If patients are pre-assessed too early before the operation their health status can change in the time period until their operation and if patients are pre-assessed too late, the time available for any interventions implemented in order to optimize the patient pre-operatively is limited (Dimitriadis et al., 2013). Also, if the

patient is deemed not fit to have the operation at a late pre-assessment clinic, there is no sufficient time to make the appropriate changes to the operative list, therefore compromising the effectiveness of surgical service provision The conclusive findings in this study provide various examples of successful and unsuccessful strategies to reduce surgery cancellations, even when they are caused by factors that are sometimes considered unavoidable. Although some solutions to these problems, such as the development of preassessment clinics, may require significant resources in order to be implemented, the benefits from the reduction in hospital cancellations may outweigh the costs (Dimitriadis et al., 2013).

Diabetes Preoperative Optimization for Surgery

Level 1. Diabetes is a substantial risk element for problems following many types of surgery. It increases the incidence of infection, as well as general morbidity and Mortality. Diabetes is associated with other comorbidities which increase the risk of surgical intervention, particularly cardiovascular adverse events. Perioperative short-term glycemic control is associated with poor surgical outcomes both in patients with and without diabetes, underpinning the role of stress hyperglycemia in this relationship (Rollins, Varadhan, Dhatariya, & Lobo, 2016).

Glycosylated hemoglobin (HgbA1C) has been used as a measure of diabetic control, reflecting long-term glucose concentrations over the preceding months, and tight control is associated with reduced incidence and slower progression of diabetes related complications, myocardial infarction, and stroke (Rollins et al., 2016). The American Diabetes Association (ADA) released guidelines recommending that target HgbA1C for

people with diabetes should be <7% as a general rule of thumb. The twenty studies comprised a sum of 19,514 patients with diabetes; 9590 males and 6392 females. There was significant variability in HgbA1C cut-off, however, the most frequently employed measure was the ADA guideline of <7% representing good control. This systematic review highlighted the lack of good quality prospective observational studies in the area of preoperative HgbA1C level as a predictive factor of postoperative morbidity and mortality (Rollins et al., 2016).

Further evidence from this systematic review identified studies that appraised usefulness of tight glycemic control on all patients receiving glucose control in intra and/or post-operative surgery. This review covered any randomized or pseudo-randomized controlled trial for inclusion. Results from these studies revealed similar conclusions: patients with the diagnosis of diabetes identifies those at higher risk of morbidity and mortality after surgery and implies that poor glycemic control before surgery, indicated by an elevated HgbA1C, remains an important risk factor for adverse outcomes after surgery (Ogurtsova, Fernandes, & Huang, 2018; Rollins et al., 2016). Logically, therefore, patients with diabetes and especially those with high HgbA1C should be triaged to pathways of care dedicated to higher-risk populations (Ogurtsova et al., 2018).

Clinical Practice Guidelines and Diabetes Optimization Clinics

Level II. A level II randomized control trial (Mendez et al., 2018) has validated the development of a clinical practice guideline. Unless a diabetic patient's HgbA1C was less than 8%, surgery would be rescheduled until the patient was fully optimized. In

contrast to the comparison group, in which complications were found in three patients, no complications were documented in the charts of any of the intervention group participants within 30 days of surgery (Mendez et al., 2018). The introduction of a program aimed to improve glycemic control in patients with an A1C > 8% within the established preoperative clinic proved suggested that participants experienced significant improvement in glycemic control and underwent their surgeries without complications. Using fructosamine as a short-term surrogate for glycemic control allowed patients with improved glycemic control to undergo their procedures in a shorter period than if A1C had been used to assess glycemia. A clinical practice guideline was developed that all patients with a HgbA1c more than 8% would receive specialized treatment in a diabetes optimization clinic (Mendez et al., 2018).

Level IV. A 2014 study of 272 patients were screened at an outpatient clinic. Sixty-five (24%) were found to have diabetes (Lee et al., 2014). A clinical practice guideline was validated to halt surgery until the patient's HgbA1c has reached < 8%.

Evidence Summary

Healthcare facilities have the goal of taking appropriate steps that will have an impact on the avoidable factors for cancelling elective cases in order to reduce the hospital's costs, shorten the number of hospitalization days, enhance the utilization of the operating rooms, enable better distribution of the staff and increase the patient's satisfaction level (Solak et al., 2019). Evidence supports both the problem of same day surgical cancellations for diabetic patients as well as the importance of a recommended facility driven guideline for assessing and managing these surgical patients.

Local Background and Context

This patient care problem has been escalating over the past two years for this small rural facility. Surgeons have been upset that their cases have been getting cancelled on the morning of the scheduled surgery. They have lost a case for the day and have an open surgery time slot assigned by the facility that cannot be used, resulting in a revenue loss. Patients are upset because they have prepared for the surgery. They have taken off work. Families have rearranged their schedules and the case must be rescheduled. The hospital has wasted time, money and supplies because the case was cancelled at the last minute. Lastly, the hospital gets bad publicity because of patient dissatisfaction. Surgeries are cancelled on the morning of surgery or within 48 hours of the scheduled surgery time for a variety of reasons. Some of the reasons are explainable and expected. One reason for cancellation is the patient arrives ill with a cold or a fever. Another reason is the patient did not follow preoperative instructions to hold their anticoagulant for the designated number of days before surgery. This is discovered during the admission intake process. Another reason is uncontrolled high blood pressure or an abnormal heart rhythm. Perhaps lab work revealed abnormal results that were not addressed preoperatively for whatever reason. Lastly, a diabetic patient has an elevated HgbA1C chronically that has not been treated or managed so that the patient is at risk for post-operative complications.

Another interesting component of this issue is the Department of Anesthesia consists of nurse anesthetists and anesthesiologists. These are the professionals that make the decision to cancel the surgery. The surgeon may also participate in the decision if the issue is not following the preoperative directions or the patient has a cold. However,

issues such as cardiac rhythm abnormalities, elevated HgbA1C levels, and elevated blood pressures, are handled by anesthesia. The anesthesiologists have been getting bad comments from the surgeons because their cases are getting cancelled. The surgeons just wanted to perform their surgeries and are not focused on the total health of the patient. So, there has been tension between the surgeons and the anesthesia department. Of course, the hospital does not want poor post-operative outcomes. The hospital does not want dissatisfied patients. The nurses in the One Day Surgery unit have been the caregivers and have no voice in the issue. There has not been any standard protocol for each disease process. For instance, diabetics are rejected for surgery if their HgbA1C is elevated, however, there has not been any policy stating what number is too high. Each anesthesiologist sets their own tolerable level and base their decision on that level. This is another area that frustrates the surgeons.

Role of the DNP Student

Today's progressively complex healthcare landscape increasingly demands leaders who are adept at managing change in uncertain environments (Rodriguez, 2016). Representing this country's largest group of healthcare workers, RN's influence how research translates to practice and ensure quality patient outcomes. The DNP degree supports the growing need for well-prepared nurse leaders who can navigate complicated health systems and successfully implement innovations that change practice. Advanced practice nurses working at the bedside or in administrative positions require leadership skills to rapidly synthesize information and apply new, setting-specific knowledge to improve patient outcomes (Rodriguez, 2016). My role in this project is to explore current

evidence and develop a clinical practice guideline for adult elective surgery diabetic patients for a rural hospital in the northeast United States. The expert panel for the development of the clinical practice guideline has incuded an endocrinologist practicing at this facility, a CRNP focused on diabetic patients, a diabetic nurse educator, the anesthesiologist, who is the Director of the Anesthesia Department; a surgeon affected by the frequent surgery cancellations and a nurse anesthetist actively involved with same day surgery patients. The project followed the guidelines in the Walden University Manual for Clinical Practice Guideline Development.

Summary

The project question was: "Based on current evidence, what preoperative diabetic optimization protocol or clinical practice guideline for adult elective surgery diabetic patients should be recommended in a small rural hospital?" In Section 2, the importance of developing a clinical practice guideline to address the project question was discussed. The five defining attributes of leading change were discussed. The literature review identified both systematic reviews and quantitative studies discussing the importance of pre-surgical screening as well as the use of guidelines to improve diabetic post-surgical outcomes. My role in answering the project question was discussed. Section 3 presented the evidence supporting this project, the participants, procedures, and protections identified for the project and the analysis and synthesis that was completed.

Section 3: Collection and Analysis of Evidence

Introduction

The setting for this project was a small rural hospital in the northeast United States. The department focus for the project was the surgical department and the preadmission testing center. The practice problem was surgery cancellations due to preoperative diabetic patient condition instability, placing the patient at risk for complications related to comorbidities. The concern was that patients go through the preadmission process, which included a medical clearance, diagnostic testing and anesthesia screening, but still arrived for elective surgery on the designated day too unstable to go through the surgery. Reasons for cancellation are often an extremely elevated blood glucose reading or an elevated HgbA1C. There was no clinical practice guideline in place at this facility for consistent rulings on acceptable HgbA1C levels for elective same day surgery patients. In Section 3, the sources of evidence, the evidence supporting the practice question, the local background impacted by this practice problem, and my role in developing a recommended practice guideline was introduced.

Practice-Focused Question

Given the epidemic levels of diabetes in the overall population, hyperglycemia around the time of surgery is often identified, with estimated rates of 80% in cardiac and 40% in noncardiac surgical patients (Levy & Dhatariya, 2019). This is of significance because hyperglycemia has been associated with increased morbidity and mortality in patients undergoing cardiac surgery and is thought to be the most important predictor of surgical site infections in noncardiac surgical patients (Levy & Dhatariya, 2019).

To reduce the risk of post-operative difficulties in diabetic patients, a conventional method is to delay surgery until glycemic control has been achieved. This potentially results in increased health care utilization from progression of the pathology for which surgery was originally planned, as well as patient and surgeon dissatisfaction (Levy & Dhatariya, 2019). In other instances, patients undergo surgery with suboptimal glycemic control, carrying a potential increased risk for perioperative complications (Levy & Dhatariya, 2019). Patients may also present on the day of surgery with significant hyperglycemia, a risk for same-day procedural cancellation (Levy & Dhatariya, 2019). The practice focused question was: "Based on current evidence, what preoperative diabetic optimization protocol/clinical practice guideline for adult elective surgery diabetic patients should be recommended for a small rural hospital?"

Relevance to Nursing Practice

Diabetes mellitus is a recognized risk factor for postoperative difficulties including infection and mortality. Acute hyperglycemia during the perioperative period has been studied extensively in the literature. It is also connected to poor clinical outcomes in patients with and without diabetes. This connection is well recognized for hyperglycemia on the day of surgery, within 24–48 hours of surgery, and during the full hospital stay in the literature. Further, insulin infusion protocols designed to prevent hyperglycemia in the perioperative and postoperative period demonstrate improved surgical outcomes. However, few studies have examined the relationship between preoperative HgbA1C levels and surgical outcomes. Studies in the literature concerning patients undergoing surgery document an association between elevated HgbA1C values

and surgical complications, including mortality, cerebrovascular accidents, and wound infection. Persistent chronic hyperglycemia (elevated HgbA1C) is undoubtedly a predictor of long-standing complications of diabetes and is the key target for glycemic control in diabetes. It remains unclear whether chronic hyperglycemia has an adverse effect on surgical outcomes over and above acute perioperative hyperglycemia and whether standards of care that address elevated HgbA1C levels prior to surgery would improve clinical outcomes (Underwood et al., 2014). The ADA has consistently published guidelines for perioperative glycemic control but there are no specific guidelines for preoperative HgbA1C recommendation for diabetes optimization preoperatively for the elective surgery patient. Because of the deficiency in data, arbitrary HgbA1C cutoffs are used by surgeons, anesthesiologists, internists, and endocrinologists. This rural hospital practiced in this manner and needed a clinical practice guideline to optimize the hospital's preoperative surgical care of the elective surgery diabetic patient.

Sources of Evidence

The goal of this project was to review current evidence and guidelines and to develop a clinical practice guideline (CPG) that could be recommended to this surgical department in a small rural hospital. A clinical practice guideline is a document that defines a standard of diagnosing care and treatment that is generally accepted and presumed followed by a group of healthcare providers (Kobak, 2019). A guideline is grounded upon dependable standards and measures. The guideline should exhibit a systematic approach to the issue. It should be founded upon reliable research and studies. It should draw upon physicians and healthcare providers who are knowledgeable and

experienced in the topic at hand (Kobak, 2019). The essential importance of a clinical practice guideline is the commitment of a physician population to implement the guideline into their daily clinical practice. A well-written guideline will endorse superior and more dependable medical decision-making. The National Practitioner Clearinghouse, part of the Federal Government's Agency for Healthcare Research and Quality (AHRQ), is the website for thousands of clinical practice guidelines that sustain tough federal standards for quality.

To complete the literature review for this project, a search for evidence included the following keywords and terms: *elective same day surgery procedures, diabetes mellitus, pre-operative optimization, glycosylated hemoglobin, HgbA1C, post-operative complications, A1C, hyperglycemia, surgical outcomes, glycemic control, glycemic index, undiagnosed hyperglycemia, clinical practice guideline, pre-operative diagnostic testing, preadmission testing, elevated A1C, Canadian Diabetes Association, American Diabetes Association, American Surgical Association, pre-operative hemoglobin A1c, elective surgery, glycemic optimization, undiagnosed diabetes, surgery cancellations, lost revenue related to surgery cancellation, diabetes optimization, surgery preparation, APACHE II scoring system, American Society of Anesthesiologists, American Association of Clinical Endocrinologists, American Association of Nurse Anesthetists, American Society of Peri-Anesthesia Nurses,* and *pre-operative control of diabetes.* The Walden University library was accessed to explore the following databases: CINAHL, Medline, ProQuest, PubMed, Google Scholar, Embase, Cochrane Database of Systematic Reviews, OVID Nursing Journals, Science Direct, and BioMed Central. Inclusion criteria included

the English language in articles that were from peer-reviewed sources and published within the past 5 years.

Analysis and Synthesis

Step 1: Critically Appraise the Evidence

A critical appraisal of the literature on the project topic led to 15 current articles. Each article was reviewed to determine if it was pertinent to the project topic and was published in a peer-reviewed professional journal source. The analysis completed on each journal article included reviewing the background information, analyzing the study objectives, appraising the research method, reviewing the limitations, contemplating the conclusions, and scrutinizing the references. The search results included systematic reviews, peer-reviewed articles by concept experts, experimental studies, guideline development manuals, and several professional organization clinical practice guidelines. Various authors gave recommendations for HgbA1C levels that are acceptable for preoperative screening for elective surgery cases. The articles were reviewed utilizing the following criteria: (a) author, date, and title; (b) levels of evidence; (c) analysis; (d) conclusions; and (e) implications for practice.

Professional organizations such as the American Diabetes Association, American Association of Diabetes Educators, the American Surgery Association, the American College of Surgeons, the American Society of Anesthesiologists, American Surgical Association, American Association of Nurse Anesthetists, and American Society of Peri-Anesthesia Nurses were reviewed to assess clinical practice guidelines documented for diabetes.

Step 2: Synthesize the Evidence from the Literature

Evidence was synthesized according to the levels of evidence, as indicated in Table 1.

Table 1

Hierarchy of Evidence

Type of evidence	Level of evidence	Description
Systematic Review or meta-analysis	I	Synthesis of evidence from relevant RCT's
RCT	II	Experiments where subjects are randomized
Controlled trial without randomization	III	Experiments where subjects are nonrandomly assigned to a group
Case-control or cohort study	IV	Comparison groups or observations of groups to predict or determine outcomes
Systematic review of qualitative or descriptive studies	V	Systematic Review of gathering data on human behavior or describing background of an area of interest
Qualitative or descriptive study	VI	Gathering data on human behavior or describing background of an area of interest
Expert opinion or consensus	VII	Opinions of experts or consensus of experts

Note. Adapted from "Critical Appraisal of the Evidence: Part 1," by E. Fineout-Overholt, B. Melynk, S. Stillwell, and K. Williamson, 2010, *American Journal of Nursing, 110*(7), p. 48.

Level 1. Glycosylated hemoglobin (HgbA1C) has been used as a measure of diabetic control, reflecting long-term glucose concentrations over the preceding months, and tight control is associated with reduced incidence and slower progression of diabetes-related complications, myocardial infarction, and stroke (Rollins et al., 2016). The American Diabetes Association released guidelines recommending that the target HgbA1C for people with diabetes should be <7% (Rollins et al., 2016). Despite this,

HgbA1C measurement is currently not a standard part of the preoperative workup of the surgical patient, nor is it specifically recommended in the United Kingdom National Institute for Clinical Excellence (NICE) preoperative care guideline (Rollins et al., 2016). A systematic review of patients with preexisting uncontrolled diabetes with an A1C > 7.5% had greater incidence of surgical site infections, greater length of hospital length-of-stay and other post-operative complications (Setji et al., 2017). This team then developed a preoperative diabetes optimization program that included standardized diagnostic testing, endocrinology referral, delay in the date of surgery and extensive patient teaching.

Level II. A large randomized control trial tested the effect of tight glycemic control on outcomes among 6,104 surgical patients. The research study validated that post-operative complications were greater in patients with an A1C > 8% (Morshed, Munn, & Lockwood, 2014). A randomized study was conducted to evaluate the impact of diabetes status on the outcome of patients having a transcatheter aortic valve implantation. The findings revealed that patients with a higher HgbA1C have a greater mortality risk after cardiac surgery (Chorin, Finklestein, Banai, et al., 2015).

Level III. Another research study was conducted to determine the feasibility and acceptability of a specialist consultation model for diabetic patients in the cardiac surgery setting. A rapid preoperative clinical, medical and educational intervention was examined to determine whether it could stabilize HgbA1C to improve outcomes of cardiac surgery such as reduced incidence of wound infections and length of stay (Lee et al., 2014). The study results validate that it is reasonable to provide specialist consultation to diabetic

patients prior to cardiac surgery which will significantly impact their HgbA1C levels by a 6-10% reduction in the level.

Level IV. A comparison study of an implemented preoperative diabetes optimization program revealed that the group with a mean HgbA1C of 8.6% had a significantly higher number of post-operative complications than the control group with an HgbA1C average of 7% before surgery (Mendez et al., 2018). Another retrospective cohort study conducted at Brigham and Women's Hospital compared surgical outcomes of healthy individuals and individuals with diabetes. Diabetics were separated into groups based on their A1C levels ninety days before surgery. Hospital length of stay and post-operative complications were significantly higher in the patients with A1C > 8% (Underwood, Hurwitz, Chamarthi, & Garg, 2014). Another retrospective cohort study found that the patients who were not optimized effectively by reducing the HgbA1C before surgery had more post-operative complications than the cohort with a better optimization. The recommended preoperative HgbA1C for optimal surgical outcomes was found to be 7.5% in each category (Bernstein et al., 2018). A retrospective cohort study using the Department of Veterans Affairs Informatics and Computing Infrastructure was conducted utilizing data from a 10-year timeframe (Chrastil, Anderson, Stevens, et al., 2015). There was an increased incidence of periprosthetic joint infection with patients having a preoperative HgbA1c > 7%.

Level V. A qualitative descriptive study took place in Ontario, Canada utilizing seventy-five patients in a bariatric center preparing for surgery. Seventy-five adult patients with non-optimally controlled diabetes with a preoperative HgbA1C level >

7.5% were included in the study. The purpose of the study was to use a preoperative model to optimize patients or lower their HgbA1C level significantly before their scheduled surgery. The model was successful by concluding that glycemic optimization can be obtained for diabetic patients in a short time with modification of antihyperglycemic medication and diet by an interprofessional diabetes team and without weight gain (Houlden, Yen, & Moore, 2018).

Level VI. A prospective, observational study measured the HgbA1c of surgical inpatients age ≥ 54 years. Patients were diagnosed with diabetes if they had pre-existing diabetes or an HbA1C ≥ 6.5% or with prediabetes if they had an HbA1C between 5.7–6.4% and they were followed for 6-months. As part of this hospital initiative, patients with HgbA1C of 8.3% were seen by an endocrinology advanced trainee who generated a personalized plan for glycemic control (Ogurtsova, Fernandes, & Huang, 2018). Patients undertaking high-risk surgery, including cardiac, orthopedic, and general surgery, with HbgA1C between 7.5% and 8.2% and patients with recently diagnosed diabetes were evaluated by the internal medicine advanced trainee. From the outcomes, it was noted that the elevated HgbA1c was independently connected with adverse postoperative outcomes, including 6-month mortality, major complications, ICU admission, mechanical ventilation, and hospital length of stay (Ogurtsova et al., 2018). A prospective observational study was performed to establish whether a high HgbA1C is correlated with a higher occurrence of surgical wound problems, surgical site infection, or infection elsewhere within the initial postoperative week. The results were expected as patients with diabetes who had an HgbA1C > 7% had a higher incidence of postoperative

infection and surgical wound problems than those with an HgbA1C < 7% (Chen, Hallock, Mulvey, Berg, & Cherian, 2018).

Level VII. Glycemic management is primarily assessed with the HgbA1C test, which was the measure studied in clinical trials demonstrating the benefits of improved glycemic control (ADA, 2019). HgbA1C suggests average glycemic control over approximately 3 months. The test is the most important tool for assessing glycemic control and has convincing predictive value for diabetes complications. The use of point-of-care HgbA1C testing may provide an opportunity for more timely treatment changes during encounters between patients and providers (ADA, 2019). Recommendations for a practical HgbA1C goal for many nonpregnant adults is <7%. Providers might judiciously recommend stricter HgbA1C goals such as <6.5% for selected individual patients if this can be attained without substantial hypoglycemia or other adverse effects of treatment. Appropriate patients might include those with short duration of diabetes, type 2 diabetes treated with lifestyle or metformin only, long life expectancy, or no significant cardiovascular disease. Less stringent HgbA1C goals, such as <8%, may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, extensive comorbid conditions, or long-standing diabetes in whom the goal is difficult to achieve despite diabetes self-management education, appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin (ADA, 2019). These are all general recommendations by the ADA; however, there are no specific guidelines related to preoperative goals for clearance for elective surgery for the diabetic patient.

The American Association of Diabetes Educators has recommendations for the glucose management of the diabetic patient preoperatively, perioperatively and post-operatively with insulin types, sliding scale management and discharge insulin manaement. This professional organization does not address pre-operative HgbA1C recommendations for the diabetic elective surgery patient. The following organizations specific to this project have no preoperative guidelines for optimal HgbA1C levels for the elective diabetic surgical patinet: American Surgical Association, American College of Surgeons, American Society of Anesthesiologists, Anesthesia Patient Safety Foundation, American Assocation of Nurse Anesthestists, and the American Association of Peri-Anesthesia Nurses. These organizations do have some blood sugar guidelines for the perioperative phase of surgery; however these guidelines do not apply to this project focus.

Step 3: Develop Clinical Practice Guideline

The proposed clinical practice guideline was as follows:

1. Patient identified as a possible surgical candidate should be screened when identified as high risk if they have Type I diabetes, Type II diabetes, take insulin, take oral hypoglycemics or have a BMI $\geq$ 28 kg/m3.
2. For “high risk” patients, HgbA1C results are to be reviewed if drawn within three months of preadmission center appointment. If not done, HgbA1C test to be drawn as soon as possible.
3. If patient has HgbA1C result < 8% can proceed with surgery as planned.

4. If HgbA1C result is ≥ 8%, surgery is postponed, and patient is referred to endocrinology or primary care physician for optimization.
5. Patient receives handouts, a referral to the diabetes education center and a letter of condition for the endocrinologist or primary care physician outlining the need for diabetes optimization and goal necessary to reschedule surgery.
6. Patient to return to preadmission center after 8 weeks with a HgbA1C report after optimization if result is < 8%. If level does not meet criteria, optimization will continue until goal level is reached.

Step 4: Identify an Expert Panel

The expert panel consisted of three anesthesiologists, three nurse anesthetists, one endocrinologist, one diabetic nurse educator, one administrator, three physician assistants, two Certified Registered Nurse Practitioners, one vascular surgeon, one general surgeon, and two orthopedic surgeons. All of these panelists worked with these diabetic elective surgery patients on a variety of points in their service of pre-operative care. All panelists have greater than 10 years of experince in their field.

Step 5: Obtain Institutional Review Board Approval

The facility signed the site approval form for the clinical practice guideline development project.

Step 6: Obtain Expert Panelists' Signatures

Upon Walden Institutional Review Board approval, the expert panel received the form for anonymous questionnaires.

Step 7: The Expert Panelists Will Review the Guidelines

The panelists used the AGREE II instrument and made recommendations for revisions. Each panel member reviewed the proposed guidelines using the following domains:

1. Scope and purpose,
2. Stakeholder involvement,
3. Rigor of development,
4. Clarity of presentation,
5. Applicability, and
6. Editorial independence (AGREE Research Trust, 2019).

Step 8: Identify Key Stakeholders and/or End Users

The revised guideline was presented to the end users, stakeholders, and other experts for further discussion on content, feasibility and usability.

Step 9: Develop a Final Report

The clinical practice guideline was adjusted with revisions from the expert panel. The majority of the members of the expert panel recommended that the key HgbA1C for surgery to progress would be $\geq$ 8.5%.

Step 10: Disseminate Final Report to Key Stakeholders

The new finalized clinical practice guideline was written based on the results of the AGREE II tool. It proceeded through committee approval and was recently implemented.

Summary

To address the issue of cancelled 1-day surgery cases related to poorly optimized diabetic patients, a clinical practice guideline was developed to standardize the HgbA1C levels that will be accepted in the preadmission process to proceed with a scheduled surgery. A standardized timeframe for the completion of this HgbA1C test was set for the diabetic patient. Guidelines for the preadmission staff to follow for initiating diabetes optimization by an endocrinologist or the primary care physician when the HgbA1C level is $\geq$8.5% were developed. Finally, after the optimization has been completed and laboratory tests meet the acceptable level, a protocol has been written to reschedule the elective one-day surgery procedure. In this project, the *Walden University DNP Manual for Clinical Practice Guideline Development* was followed to guide the process. Through a lengthy literature search, it was identified that surgical outcomes are improved and complications are prevented by optimizing the diabetic patient. In the next section, the results of the expert panel reviews and any revisions to the proposed guideline are discussed. Also, the process for the final guideline implementation was presented to end users.

Section 4: Findings and Recommendations

Introduction

The setting for this project was a small rural hospital in the northeast United States. The department focus for the project was the surgical department and the preadmission testing center. The practice problem was surgery cancellations due to preoperative diabetic patient condition instability, placing the patient at risk for complications related to comorbidities. The concern was that patients go through the preadmission process, which includes a medical clearance, diagnostic testing and anesthesia screening, but still arrived for elective surgery on the designated day too unstable to go through the surgery. Reasons for cancellation included an extremely elevated blood glucose reading or an elevated HgbA1C. There was no clinical practice guideline in place at this facility for consistent rulings on acceptable HgbA1C levels for elective same day surgery patients.

To reduce the risk of post-operative difficulties in diabetic patients, a conventional method was to delay surgery until glycemic control has been achieved. This potentially resulted in increased health care utilization from progression of the pathology for which surgery was originally planned, as well as patient and surgeon dissatisfaction (Levy & Dhatariya, 2019). In other instances, patients undergo surgery with suboptimal glycemic control, carrying a potential increased risk for perioperative complications (Levy & Dhatariya, 2019). Patients may also present on the day of surgery with significant hyperglycemia, a risk for same-day procedural cancellation (Levy & Dhatariya, 2019).

The purpose of this project was to provide the healthcare providers at this facility with a clinical practice guideline that would provide an algorithm for the diabetic patient scheduled for surgery based on the HgBA1C level. Developing a clinical practice guideline addressed the gap in practice at this site and could significantly reduce the number of surgery cancellations among diabetic patients each month. In Section 4, a description of the findings and recommendations from the expert panel were provided. The practice question was: "Based on current evidence, what preoperative diabetic optimization protocol/clinical practice guideline for adult elective surgery diabetic patients should be recommended for a small rural hospital?"

Findings and Implications

In order to appraise the legitimacy of the proposed clinical practice guideline, the proposed clinical practice guideline was evaluated by an expert panel utilizing the AGREE II tool. The expert panel consisted of three anesthesiologists, three nurse anesthetists, one endocrinologist, one diabetic nurse educator, one administrator, three physician assistants, two Certified Registered Nurse Practitioners, one vascular surgeon, one general surgeon, and two orthopedic surgeons. All of these panelists worked with these diabetic elective surgery patients on a variety of points in their service of pre-operative care. The AGREE II tool included 23 criteria to measure the six domains. There are also two final global, overall rating assessment questions. Each question was appraised or scored on a 7-point scale with 1 paralleling to *strongly disagree* and 7 paralleling to *strongly agree*. Each domain score was summed by totaling the scores of

the individual items and dividing by the maximum possible score. Table 1 describes the results of the expert panel AGREE II tool responses (see Appendix).

Domain 1

Domain 1 of the AGREE II tool concentrates on the scope and purpose of the clinical practice guideline with three inquiries that focus on the guideline objectives. Setting an acceptable HgbA1C level for pre-operative clearance is the purpose of the guideline. The target population that is served is also addressed. In this project, the target population was the diabetic elective surgery patient. The overall score for this domain was 99%. There were no questions or recommendations for improvement from the expert panel in this domain. The purpose of the guideline was specifically attained and the aim of the guideline, the target population, and the clinical concerns were clearly defined.

Domain 2

Domain 2 of the AGREE II tool spoke to stakeholder involvement with three questions that focused on the participants who assisted in the guideline development, the targeted users of the guideline, and the considerations of the views and preferences of the target population. The overall score for this domain was 100%, which supported that stakeholder involvement was met. The stakeholders were the anesthesiologists, the nurse anesthetists, the endocrinologist, the diabetic nurse educator, the administrator, three physician assistants, the nurse practitioners, and the four surgeons.

Domain 3

Domain 3 of the AGREE II tool addressed the rigor of the development of the clinical practice guideline with eight questions focused on the search for evidence that

supported the development of the clinical practice guideline. This domain also addressed the process to formulate the recommendations that the clinical practice guideline was built on in its entirety. The overall score was 78%, reflecting the expert panel was in agreement with the development of this guideline. There was one recommendation for improvement in this area. The recommendation was a request for a process to review the clinical practice guideline on a routine basis for continued use in practice.

Domain 4

Domain 4 of the AGREE II tool focused on the clarity of presentation with three questions focused on the clinical practice recommendations with reference to being specific and identifiable. The inclusive score for this domain was 100% revealing a consensus that the guideline presentation as an algorithm was easily understood and easy to follow. There were no recommendations for improvement or change.

Domain 5

The AGREE II tool Domain 5 addressed the applicability of the clinical practice guideline by utilizing four questions focusing on barriers to implementation of the guideline. Domain 5 also attended to the guidance or ease of use for integrating the guideline into practice. Finally, this domain sought inquiry on the process for monitoring and auditing the impact of the guideline on surgery cancellations in the future. The overall score was 100% with no recommendations offered.

Domain 6

Domain 6 of the AGREE II tool focused on the editorial independence of the guideline with two inquiries focused on competing interests. The overall score was 100% with no suggestions or recommendations given.

Recommendations

Eighteen expert panelists completed a clinical practice guideline assessment tool utilizing the AGREE II tool. The final overall score for the quality of the guideline was 96.2% with all experts stating they are recommending the clinical practice guideline. Fourteen of the expert panelists made the same recommendation to modify the HgbA1C acceptable result from 8.0 mg/dl to 8.5 mg/dl. Six expert panelists recommend adding a periodic review process to ensure evidence-based efficacy for the clinical practice guideline.

Based on these recommendations, the clinical practice guideline was adjusted to include these recommendations. The algorithm now has the HgbA1C at 8.5 mg/dl for the acceptable level for diabetic elective surgical patients. The recommended final clinical practice guideline was:

1. Patient identified as a possible surgical candidate should be screened when identified as high risk if they have Type I diabetes, Type II diabetes, take insulin, take oral hypoglycemics or have a BMI $\geq$ 28 kg/m3.
2. For “high risk” patients, HgbA1C results are to be reviewed if drawn within three months of preadmission center appointment. If not done, HgbA1C test to be drawn as soon as possible.

3. If patient has HgbA1C result < 8.5%, the patient can proceed with surgery as planned.
4. If HgbA1C result is ≥ 8.5%, then the surgery is postponed, and the patient is referred to endocrinology or primary care physician for optimization.
5. Patient receives handouts, a referral to the diabetes education center and a letter of condition for the endocrinologist or primary care physician outlining the need for diabetes optimization and goal necessary to reschedule surgery.
6. Patient to return to preadmission center after 8 weeks with a HgbA1C report after optimization if result is < 8.5%. If level does not meet criteria, optimization will continue until goal level is reached.

In addition, a formative evaluation process will take place three months after implementation. Once again, recommendations and changes can be discussed and addressed. Finally, a summative evaluation process can be conducted again after six more months of implementation. More adjustments can be made if needed. The goal for end results is the reduction of surgery cancellations for diabetic patients having elective surgery. The goal reduction in surgery cancellation rate is set for ≤ 5%.

Strengths and Limitations of the Project

Cancellation of elective surgeries on the day of the procedure precedes unproductive use of operating room time and a waste of resources. Day of surgery cancellations also instigate trouble for patients and families. Moreover, day of surgery cancellation creates logistic and financial burden associated with extended hospital stay and repetition of pre-operative preparations as well as opportunity costs of lost time and

missed income (Kaddoum, Fadlallah, Hitti, Jardali, & Eid, 2016). Having a clinical practice guideline to reduce unnecessary cancellations related to poorly optimized cases, will impact these issues. This clinical practice guideline has been developed for this clinical site but is also applicable to other health care facilities. A significant strength of this project was the support of the stakeholders to agree to be a part of the expert panel. Because a sample from each discipline considered to be a major stakeholder was involved in the critique of the clinical practice guideline, it is expected that adoption of the guideline will be without incident. Buy-in is supported by the results of the survey. Limitations related to the continued success of the clinical practice guideline would be advanced practice nurse, anesthesiology and surgeon turn-over in practice. It is important for the quality assurance process to stay in effect to ensure continued success.

Section 5: Dissemination Plan

Introduction

For this scholarly project, a clinical practice guideline for optimization of diabetic elective surgery patients in order to prevent unnecessary surgery cancellations was developed for the project site. A diversified expert panel, involving the major stakeholders, were involved in the development process from the very beginning of the project inception. The AGREE II tool was utilized to evaluate the clinical practice guideline and to allow for critique of the content. It was found to be appropriate for implementation with a change in the acceptable HgbA1C level at 8.5% instead of 8.0% at the project site. Upon receiving the positive evaluation, the revised clinical practice guideline was presented to the surgical operations committee and the administrative staff. If the project site decides to implement the guideline, I will assist with the education of staff and stakeholders. This will be followed by the guideline implementation. Another prospect to disseminate the information would be submitting the clinical practice guideline to other healthcare systems' quality improvement teams for their review. This would allow the clinical practice guideline to be disseminated to other local facilities in the area. As others are reviewing the content locally, the guideline could be disseminated to other similar sized healthcare facilities through the state of Pennsylvania. Finally, the project manuscript will be submitted for publication to several nursing journals such as the *Advances in Nursing Science, Journal of Perioperative & Critical Care Nursing, American Operating Room Nurse, Journal of PeriAnesthesia Nursing, Journal of*

Ambulatory Care, and *Perioperative Care and Operating Room Management* in order to further distribute the information to a broader audience nationwide.

Analysis of Self

Scholar

Because of my DNP education and involvement in this project, I have experienced significant personal and professional growth. Fulfilling this project endeavor has allowed me the opportunity to function as a team member at a leadership and administrative level. I have gained the ability to conduct an extensive literature search when there is an evidence-based practice question to be evaluated. I have learned that researching to find the most current evidence is essential to developing a clinical practice guideline. This project has also provided me with the knowledge of how to create a clinical practice guideline. This involvement has shown me how such a project can have a positive impact on a patient population in need. As a DNP-prepared scholar, in the future, I intend to participate in the additional development of more clinical practice guidelines.

Practitioner

My growth as a practitioner has been the most exponential of all my DNP education. I have developed my own personal respect for my knowledge and expertise in my career. I have not been in the position in the past to be able to sit at the table with other advanced professionals in order to discuss clinical issues at an innovative level. Becoming an expert in clinical issues and sharing that new information with other practitioners has been so rewarding. Because I have learned how to use scholarship and

research, I can discuss cutting-edge evidence at a knowledgeable level. This has also enhanced my confidence level for the next project. My project has assisted me to align my knowledge and skills with existing theoretical frameworks to implement a new clinical practice guideline for diabetic elective same day surgery patients. This has allowed me to develop better practices to improve the quality of patient care.

Project Manager

The development of this clinical practice guideline gave me the experience to develop my leadership skills as a project manager. It allowed me to demonstrate my leadership abilities as outlined in the AACN (2006) DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking. Thus, advanced nursing practice includes an organizational and systems leadership component that emphasizes practice, ongoing improvement of health outcomes, and ensuring patient safety (AACN, 2006). My education has equipped me with advanced proficiency in evaluating organizations, recognizing systems' concerns, and expediting organization-wide changes in practice delivery. Lastly, my Walden education has developed my ability to think politically, analyze systems, and utilize my business and financial judgement for the analysis of practice quality and costs.

Summary

The goal of this project was to develop a clinical practice guideline for diabetic elective same-day surgery patients to prevent last-minute surgery cancellations on the day of surgery. An evidence-based clinical practice guideline was developed to address this clinical practice issue. This guideline could be placed into practice and have a significant

positive effect on the hospital project site by reducing the number of cancelled surgeries each month, improving patient satisfaction, reducing surgical supply waste, and reducing revenue loss. The journey of earning a DNP provided me with the knowledge, leadership experience, and confidence to make a positive impact on patient care outcomes while promoting social change. Even though this is the terminal degree in the career path of a professional advanced practice nurse, I plan to continue my education by becoming a Certified Nurse Educator. As a nurse educator, I will continue to communicate my passion about nursing as a professional career by sharing my expertise, knowledge, and experiences with future generations.

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Appendix: AGREE II Summary

Criteria ******	R 1	e 2	v 3	i 4	e 5	w 6	e 7	r 8	s 9	- 10	- 11	E 12	x 13	p 14	e 15	r 16	t 17	s 18	Comments *******
The overall objective (s) of the guideline is (are) specifically described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	clearly
The health question(s) covered by the guideline is (are) specifically described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	completely
The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	ODS patients who are diabetics
The guideline development group includes individuals from all relevant professional groups.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Well done including all of the stakeholders; even included endocrinologist; thank you for include specialty surgeons; administration included; PA's and CRNP's included
The views and	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	All stakeholder

preferences of the target population (patients, public, etc.) have been sought.																				s were addressed; many committee meetings to address; all department s discussed
The target users of the guideline are clearly defined.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Definitely; all hospital involved department s and services included in the planning
Systematic methods were used to search evidence.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Several databases utilized
The criteria for selecting the evidence are clearly described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	certainly
The strengths and limitations of the body of evidence are clearly described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	ADA involvemen t in pre-operative guidelines are limited;
The methods for formulatin g the recommen dations are clearly described.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
The health benefits, side effects, and risks have been considered in formulatin g the recommen dations.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Clearly discussed and planned for in early stages
There is an explicit link between the recommen	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	ADA was consulted; ASA was utilized; perioperativ e nursing

dations and the supporting evidence.																			society addressed
The guideline has been externally reviewed by experts prior to its publication.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Extensive review
A procedure for updating the guideline is provided.	6	7	6	7	7	7	7	7	6	6	7	6	6	7	7	7	7	7	Not included; none noted; needs to be included
The recommendations are specific and unambiguous.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
The different options for management of the condition or health issues are clearly presented.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
Key recommendations are easily identifiable.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Easy to follow
The guideline describes facilitators and barriers to its application.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
The guideline provides advice and/or tools on how the recommendations can be put into practice.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Algorithm clear and concise; easy to follow; guideline specific and clear

The potential resource implications of applying the recommendations have been considered.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
The guideline presents monitoring and/or audit criteria.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	QAPI already in place can continue; data already under review can continues; already in place
The views of the funding body have not influenced the content of the guideline.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	No funding body involved; not an issue; don't think this is an issue
Competing interests of guideline development group members have been recorded and addressed.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	yes
OVERALL GUIDELINE ASSESSMENT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rate the overall quality of this guideline.	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
I would recommend this guideline for use.	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes & alter	Yes	Yes	Yes	Yes	Yes & alter	Yes & alter	Yes & alter	Change HgbA1C to 8.5 is the suggested modification by 14 members of the expert panel