Implementation of Screening Tool for Diabetic Patients Undergoing Interventional Procedure

by

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Abstract

Background: In healthcare today, a significant proportion of diabetic patients suffer from pain due to nerve radiculitis. One known treatment for chronic pain includes the use of steroid injections under fluoroscopic guidance. The use of steroids in diabetic patients comes with an increased risk of prolonged hyperglycemia after the procedure. Diabetic patients undergoing procedures with the use of steroids need to be properly screened to reduce their risk of prolonged hyperglycemia after the procedure.

Local Problem: A large outpatient interventional pain department within a large health organization experienced an increased number of diabetic patients for steroid injections. Lacking a standardized treatment protocol, all diabetic patients received treatment in the department based on provider preference causing variations in practice. Due to this reason, the department recognize the need for a screening guideline for all diabetic patients undergoing procedure with the use of steroids. The purpose of this quality improvement project was to implement a standardized treatment protocol that included the screening of all diabetic patients prior to undergoing any interventional procedure with the use of steroids.

Interventions: During the fall of 2018, a quality improvement project implemented a guideline-based screening tool. The screening tool was used to screen all diagnosed diabetic patients to ensure they had a recent glycosylated hemoglobin (A1C) level of 9.0 or less within 90 days prior to the procedure and a random blood glucose of 250mg/dL or less on the day of the procedure. The incision criteria for screening included any patient scheduled for a procedure with an existing diagnosis of diabetes. After screening all diabetic, any patient with an A1C greater than 9.0 were reschedule to have their procedure after their blood sugar and A1C meet the guideline standard. They are also referred to the organization's diabetes management program. An educational program was developed to train provider staff on the use of the screening tool. The screening tool questions were developed and incorporated in the electronic medical record to facilitate the practice change and maintain sustainability. A total of 10 providers in two interventional pain clinics (A and B locations) received education on the screening tool prior to implementation. During the eight-week project implementation timeline, the medical records of all scheduled diabetic patients for the interventional clinics were audited to ensure that they received screening with the tool prior to their steroid injection procedure.

Results: Location A had a total of 55 patients who met the project inclusion criteria over the 8-week period. Staff compliance with using the screening tool was 96% over the 8-week period. Location B had a total of 43 diabetic patients who met the project inclusion criteria. Staff compliance with using the screening tool prior to patient procedure was 88% over the 8-week period.

Conclusions: The diabetic patient screening tool is beneficial for patients and providers. Decreasing prolonged hyperglycemic episodes in diabetic patients after the use of steroids will improve overall patient outcome for diabetic patients who undergo interventional procedure.

Background and Significance of Problem

In healthcare today, many diabetic patients also have chronic pain conditions. According to Francis et al. (2016), a significant proportion of diabetic patients suffer from pain due to nerve radiculitis. Treatment of chronic pain may include the use of steroid injections under fluoroscopic guidance. Steroids or glucocorticoids help to reduce inflammation and inhibit prostaglandin synthesis when providing pain relief (Chen, Rong & Youwen, 2017). However, steroids injection use in diabetic patients has a post procedure risk of prolonged hyperglycemia. Gozal, Atchley, and Curt (2016) reported that elevated mean blood glucose concentrations and insulin resistance can last from one to seven days following epidural steroid injection in diabetic patients with poorly controlled diabetes. The use of systemic steroids increases blood glucose levels; however, diabetic patients with uncontrolled blood glucose have a higher risk of prolonged increase in blood glucose. Prolonged hyperglycemia can cause damage to the heart, kidney, and other major organs (Alexander, Usman, Thema, Charles, Surena, Pedro, and Joseph ,2017),

Diabetic patients undergoing procedures with the use of steroids can be properly screened to reduce their risk of prolonged hyperglycemia after the procedure. Patients identified to have a higher glycosylated hemoglobin (A1C) greater than 9 and a random blood glucose greater than 250 will not be allowed to have the procedure. They will be referred into a diabetes management program. Prior to implementation, the outpatient pain intervention clinic did not have a screening protocol or guideline for diabetic patients to help decrease their risk of prolonged hyperglycemia episodes after the procedure. The purpose of the project was to implement a pre-procedure

screening tool for diabetic patients that are undergoing interventional pain procedure with the use of injectable steroids to help prevent post procedure prolonged hyperglycemia.

The first short term goal is to create and embed a screening tool for diabetic patients in the electronic medical record(EMR) . Another short-term goal of the project was to implement a screening tool to screen 100% of diabetic patients undergoing an interventional pain procedure with the use of injectable steroids by October 30th, 2018. The long-term goal of the project was to reduce the incidence of prolonged post-steroid hyperglycemia in diabetic who undergo interventional pain procedure with the use of injectable steroids by the end March 2019. When diabetes patients are properly screened during before the procedure, it increases their ability to return back to their baseline blood glucose levels. These patients will be captured in the electronic medical record through their urgent care visit for prolonged hyperglycemia.

Introduction to Literature Review

The use of injectable steroids in diabetic patients for interventional procedures causes an increase in plasma glucose levels and leads to episodes of prolonged hyperglycemia Alexander, Usman, Thema, Charles, Surena, Pedro, and Joseph (2017). The literature review will focus on the effect of injectable steroids on blood glucose in the diabetic patient and the duration for the level of blood glucose to return to baseline after a procedure with the use of steroid. Additionally, the literature will focus on blood glucose levels and A1C criteria for diabetic patients prior to undergoing a procedure with the use of injectable steroids.

Literature Review

Even, J., Crosby, C., Song, Y., McGirt, M., & Devin, C. (2012) conducted a prospective cohort study to evaluate the overall effect of epidural steroids injection on diabetic patient blood

glucose levels. The study was conducted among 30 diabetic patients for a 12-month period. These patients also had a recent A1C prior to being enrolled in the study. Patients were required to keep a diary of their blood glucose before breakfast and two hours after dinner at the same time two weeks prior to steroid injection and two weeks after the steroid injections. These patients were also required to maintain the same diabetic medication and dietary regimens to standard practice. Twenty-six of the 30 (86.7%) patients' glucose levels immediately showed significant increase after the procedure with the use of steroids. Even, J., Crosby, C., Song, Y., McGirt, M., & Devin, C. (2012) reported that the use of epidural steroids in diabetic patients resulted in an increase in blood glucose levels by an average of 125 mg/dL and return to baseline within 48 hours after the procedure. The researchers recommended counseling patients to monitor blood glucose level closely after the procedure for two days. The researchers also suggested that the use of a lower dose steroids should be considered to minimize elevation in blood glucose for diabetic patients.

Alexander, Usman, Thema, Charles, Surena, Pedro, and Joseph (2017), conducted a prospective study to quantify the effects of corticosteroid injections on blood glucose levels in diabetic patients with shoulder pain. Out of the total of 17 patients in the study, nine patients had an A1C level greater than seven. There was a significant increase in fasting blood glucose level for patients with an A1C of greater than 7 following the steroid injection as compared to patients with an A1C of less than 7. After the injection with steroids, patients with a well-controlled A1C had a smaller elevation in blood glucose and returned to baseline faster than patients with poorly controlled diabetes. Patients with uncontrolled blood glucose levels experienced elevated blood glucose levels for more than 10 days after the procedure.

A clinical systematic review was performed by Waterbrook, Balcik, and Goshinska (2017) to explore blood glucose levels in diabetic patients after local musculoskeletal steroid injection use. A total of 10 prospective and retrospective studies evaluating the effects of steroids on blood glucose level in diabetic patient after a single steroid use during interventional procedure. The results from these studies showed significant but transient increases in blood glucose level increase after a single injection of steroids in diabetic patients. The author's review showed that the increase in blood glucose level was short lived in patients with controlled blood glucose, but patients with uncontrolled blood glucose leveled experienced a longer elevation in blood sugar levels. The authors reported that diabetic patients undergoing steroid injection with uncontrolled blood glucose levels need to be educated on the of elevated blood glucose level and receive close monitoring of their blood glucose levels prior to and post-intervention.

Hye Jin, Kyoung Hyo, Sang Il, Ou Je, Jin Woo, and Tae Woo (2014) conducted a prospective study with 29 patients to explore changes in blood glucose level and cortisol level after steroid injection among diabetic and non-diabetic patients for pain. Fifteen of the 29 patients that were enrolled in the study were non-diabetic and 14 had type 2 diabetes. All enrolled patients maintained the same level of physical activity, medications and diet during the study period. In all patients, the fasting blood glucose levels increased significantly at day one after the procedure and steroid injection and then returned to baseline. Serum cortisol levels also dropped significantly in all patients by day one and day seven after injection. The researchers reported that the use of steroids in diabetic patients increased their baseline blood glucose level for seven days.

The overall literature review revealed that steroid injections raised blood glucose levels in all patients (Waterbrook et al., 2017). it is important to monitor blood sugar and A1C ranges in patients with diabetes prior to steroid injection. These ranges were also used to screen patients prior to undergoing the procedure with steroids. A limitation to the study by Hye et al. (2014), was the small sample size, and the researchers recommended further study exploration with a larger sample size. Another limitation was noted that the epidural injections were performed without fluoroscopic guidance and the A1C levels were also not noted. Hye et al. (2014), also recommended the use of a lower steroid dose to decrease prolonged high blood glucose level.

Theoretical Framework and Utilization of Framework

The theoretical framework that was selected for this project is the Knowledge to Action Framework. According to Sinden and MacDermid (2014), the Knowledge to Action (KTA) framework has been shown to be primarily applied in health care settings in various disciplines. The Knowledge to Action (KTA) framework has two components; the knowledge creation and the action components. The two cycles in the model were utilized in the quality improvement project to implement the preprocedural screening tool in the interventional pain procedure outpatient clinic. According to Sinden and MacDermid (2014), the Knowledge to Action framework shows the relationship between knowledge development and the how the knowledge is put into use to create a change in practice. The KTA framework was used to guide the study, the practice problem, and identify evidence-based solutions to help improve diabetic patients' outcome. The first step was to review the current practice problem to identify and better understand the cause and effect of the problem. The next step was to review literature to develop a practice change to help decrease episodes of prolonged hyperglycemic among diabetic patients

after the use of steroids. According to Stacey et al. (2016), the knowledge creation is developed from research and systematic reviews. The action cycle of the framework composes of series of seven steps that guides the implementation of the knowledge into practice. The seven steps comprise of identification of the practice problem and select knowledge, adapting thee knowledge to the local context, accessing barriers to knowledge use, selecting intervention, monitor knowledge use, evaluating outcome, and sustaining knowledge use. It also guided the implementation of the project. The KTA framework was used to develop the pre-procedure screening guideline tool for diabetic patients undergoing interventional pain procedures with steroid injections. The screening tool would help to identify diabetic patients who were not well-controlled and help to prevent them from experiencing prolonged hyperglycemic episode after their procedures. The KTA also helped in incorporating the seven important steps to create practice change, address potential barriers to the proposed change, and effectively sustain the change.

The Institutional Review Board

Approval from the interventional pain department service chief was obtained prior to project development. An inquiry was submitted to the organizational Institutional Review Board (IRB) board and school IRB board and the quality improvement project received a non-human subject determination. All diabetic patients seen for procedure were de-identified by the data team within the organization before data collection and review.

Project Description, Sample, and Setting

The quality improvement project involved the implementation of a screening tool for diabetic patients that are undergoing pain interventional procedure with the use of steroids. The

main aim of the quality improvement project was to decrease prolonged hyperglycemia in diabetic patients after they undergo any pain interventional procedure with the use of steroids. The implementation setting of the quality improvement project was an outpatient interventional clinic within a large healthcare organization within the East Coast. There were two interventional pain clinics within the organization where the screening tool was implemented; Location A and Location B. The quality improvement project included all diabetic patients with chronic pain scheduled for a steroid injection procedure in one of the interventional clinics.

Procedures and Timeline Plan

The theoretical framework helped guide the implementation of the screening tool. Each clinic had a total of two fulltime nurses and one clinical assistant. In addition, there were three on call nurses that are shared between all locations. There was a total of seven anesthesiologist who performed interventional procedures in all selected locations. Final approval of the tool and its implementation was received from the chief of the department by August 20th, 2018. The tool was then developed into a preset data entry in the electronic medical record (EMR) to make it easy for staff to document screening. The screening tool shown in appendix A was created and available to use by October 20th, 2018. There was one nurse superuser trained for each location. The super users were educated on the tool during a mandatory face to face department meeting and implementation process in September. All providers and clinic assistants were also given a one on one in person training on use of the screening tool. During the fourth week of September another meeting was held with all super users to address any concerns and questions about the tool and implementation. The screening tool was ready to go live on Monday 22nd October 2018. All patients with an EMR documented diagnosis of diabetes to be scheduled for any

interventional procedure were screened with the screening tool. The project champions and

project leader ensured that the screening tool was followed and documented appropriately.

Practice Changes implemented

The quality improvement project implemented a screening tool to be used with all

diabetic patients undergoing interventional pain procedure with steroid injection. The screening

tool helped to ensure that diabetic patients had a recent A1C level within 90 days prior to the

procedure and a random blood glucose level of 250mg/dL or less on the day of the procedure.

The screening tool also ensured that the diabetic patients undergoing interventional procedure

with steroids had an A1C level of 9.0 or less. The screening tool questions was developed into a

smart phase which is also known as a dot phrase to allow easy documentation in patient

electronic medical record. A smart phase is a single phrase developed to allow data or text

(screening tool questions) to be entered into a note in a patient's electronic medical record

(EMR). The smart phase was built into the EMR and accessible to all staff members within the

department in both A and B locations in the interventional pain clinics. After training, staff

members were required to screen all diabetic patients and order A1C checks for those who had

outdated A1C levels. They also followed the screening tool and informed all diabetic patients

that they needed to complete a random glucose check in the department prior to the procedure. If

their random blood glucose level was more than 250mg/dL, then their procedure appointment

was cancelled and only rescheduled after the required A1C and blood glucose level was

achieved.

Results Data Analysis and Outcome

A total of six staff and four physicians were trained for both locations prior to implementation. During the eight-week project, location A outpatient interventional pain clinic had 55 patients who had steroid injection procedures and met all screening criteria. Out of the total 55 patients, 53 diabetic patients received proper screening. All 55diabetic patients had a random blood glucose less than 250 prior to the procedure and 54 patients had an A1C level of 9.0 or less within 90 days or less. During the first week of implementation, location A had a total of two diabetic patients who underwent procedure with the use of steroids. All the patients were screened, and the staff achieved 100% compliance in the use of the screening tool. During week two, staff compliance dropped to 50% with a total of two patients. While both patients were screened with the tool, only one had a recent A1C. The staff maintained a 100% compliance in weeks three, four, five and six. Table 1 demonstrates a quantitative analysis of staff compliance from week to week during the project. Staff compliance with use of screening tool declined in week seven to 93% due to providers not adhering to the screening guideline. For example, one patient had an A1C level of 11.1 as shown on figure 4, but the steroid injection procedure was still performed because the provider ignored because the patient was upset about the new guideline. During week eight, the compliance rate went back to 100%. The overall average compliance level for location A was 96% during the eight -week period.

During the project's eight weeks, location B had a total of 43 diabetic patients who met the screening criteria. Out of the total 43 patients, only 38 patients were properly screened. Only 41 out of the 43 patients an A1C level of 9 or less and only 38 out of the 40 patients had an A1C level with 90 days. In addition, 42 out of the 43 patients had a random blood glucose less than 250. During the first week of implementation, location B had a total of six diabetic patients who

underwent procedure with the use of steroids. Five patients were screened properly, and the staff

achieved 83% compliance with the use of the screening tool. One of the diabetic patients that had

an A1C of 9.1 as shown on figure 8. The provider in the clinic decided to proceed with the

procedure although patient's A1C level was greater than 9.0. During week two, compliance level

dropped to 86% among a total of seven patients. All patients were screened, but only one had a

recent A1C of 10.8. The provider went on with the procedure and scheduled patient to have

follow up A1C level check in two weeks. The staff maintained a 100% compliance in week three

and four. Tables 2 shows quantitative analysis of staff compliance week by week. Compliance

level dropped to zero during week five. Only one patient was screened during that week and the

patient did not have a current A1C level. Compliance level went up to 66.7% in week six, and

100% in week seven and eight. Overall compliance in location B was 88.4% over the eight-

week period. One patient for location A and location B were cancelled after being screened.

They did not undergo the procedure due to high random glucose levels.

Discussion

The quality improvement project was to implement a screening tool to screen all diabetic

patients prior to them undergoing an interventional procedure with the use of steroids. The

second short-term goal of the met due to provider and staff behaviors. The number of diabetic

patients in the project was greater than the numbers seen in other publications. Both clinics had a

total of 98 diabetic patients during the project's eight-week implementation period. Comparing

the findings from the project to another prospective study was conducted by Alexander et al.

(2017), the population of diabetic patient seen in the project was greater than that of the

prospective study.

Both location A and B had an equal number of procedure appointments available to patients daily, but location A had more diabetic patients than B. Location A and B also had a great number of diabetics with A1C greater than 7. The patients in location A were more compliant and followed through with getting their lab work completed before the procedure. Patients in location B.

The staff and providers in location A also had more buy-in and seemed more vested in their patients than location B. The total number of staff compliance in location B was lower than expected especially since location A had a larger volume. The variation in compliance week by week was due to which provider was working in clinic. The lower compliance rate is due to provider behavior and their resistance to change in practice. These physician behaviors were noted as a project limitation. Not all physicians adhered to the screening tool guidelines. One strength of the project is the support of the department chief. The support of the department chief helped set the tone in the clinic and to standardize all provider practice guidelines. The leadership support also helped to influence staff buy in and compliance in the use of the screening tool in both locations.

The use of the screening tool was made mandatory and all staff were required to screen patients prior to scheduling appointments. One limitation encountered after implementation was issues with patients who already had scheduled appointments. Many patients coming to an interventional pain clinic have never been mandated to have a recent A1C and most patients had appointments scheduled prior to the implementation of the screening tool. The project leader and project champions made some attempts to have patients get a recent A1C during the confirmation of their appointments. Some patients were receptive, and others were not very

happy. Due to this reason, the department chief and the project leader decided to allow patients who already had an appointment scheduled prior to the project implementation not to be required to have a recent A1C. These patients were excluded from the data collection and results. The new screening guideline was also reviewed with patients so that they would be prepared and have the A1C completed prior to the required time frame their next appointment.

The project purpose focused on identifying poorly controlled diabetic patients who may be at increased risk for complications as result of the steroid injection and rescheduling their steroid injection appointment if necessary. Rescheduled appointments for patients identified at high risk may have contributed to further delay in the patient's pain management and departmental inefficiencies due to rescheduling down time and provider workflow. During review of the data, there was one appointment rescheduled in both locations A and B due to patient having high random blood glucose of over 250. Overall, the project was successfully implemented in both locations A and B. The recommendation for practice after reviewing the data and limitations is to continue to screen all diabetic patients with the developed guideline in all interventional clinic locations within the healthcare system.

Conclusion

It is important to identify and monitor diabetic patient blood glucose levels prior to steroid injection procedures to decrease their risk of prolonged hyperglycemic episodes and subsequent complications. For 8 weeks, a total of 98 diabetic patients in location A and B were screened with the tool prior to their steroid injection procedure. Both locations achieved over 80% staff compliance with the use of screening tool for diabetic patients.

All diabetic patients seen in location A and B outpatient interventional clinic will continue to be screened prior to their procedure with the use of steroids. Pre-procedure screening can be beneficial for diabetic patients to help prevent prolonged hyperglycemia because of complications from steroid injections.

The chief of the department will continue to monitor and educate providers to adhere to the standardized screening tool and guidelines for diabetic patients. The next step for the screening tool is to implement in location C which has the most diabetics with in the region. The use of a screening guideline for all diabetic patients helped standardize the practice for nurses and providers in the outpatient interventional clinic.

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Results data and chart for location A and B

*Table 1:*Overall staff complaince of patient screened in Location A prior to interventional procedure with steriods.

Week After Implementation	Number of Compliance	% of Compliance	Number of Non-Compliance	% of Non-Compliance
WEEK1	2	100	0	0
WEEK2	1	50	1	50
WEEK3	6	100	0	0
WEEK4	13	100	0	0
WEEK5	5	100	0	0
WEEK6	7	100	0	0
WEEK7	14	93	1	7
WEEK8	5	100	0	0
Total	53	96	2	3.64

Table 2: Overall staff complaince of patient screened in Location B prior to interventional procedure with steriods

Week After Implementation	Number of Compliance	% of Compliance	Number of Non-Compliance	% of Non-Compliance
WEEK1	5	83	1	17
WEEK2	6	86	1	14
WEEK3	5	100	0	0
WEEK4	5	100	0	0
WEEK5	0	0	1	100
WEEK6	4	66.7	2	33.3

WEEK7	9	100	0	0
WEEK8	4	100	0	0
Total	38	88	5	11.63

Figure1: Staff Compliant and non-compliant of use of screening tool each week
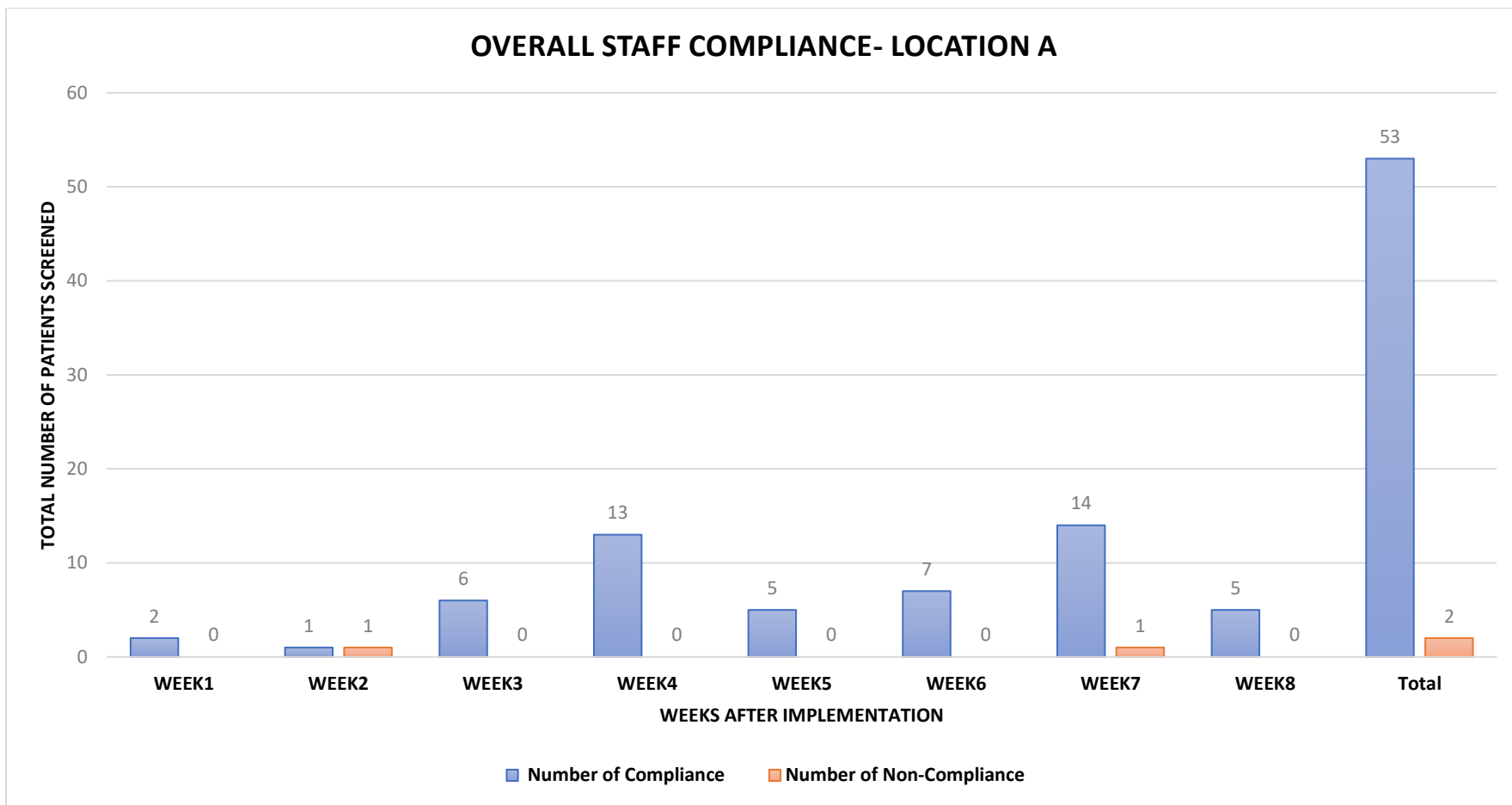
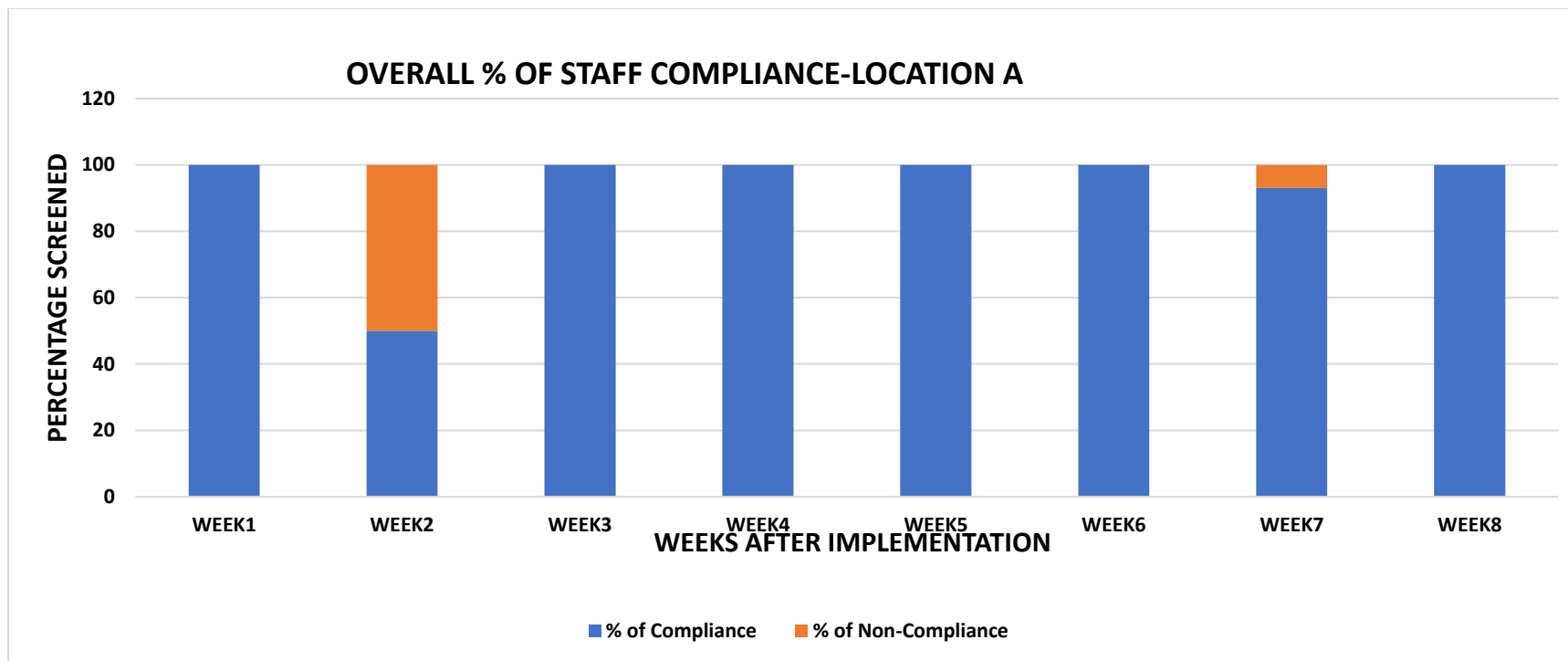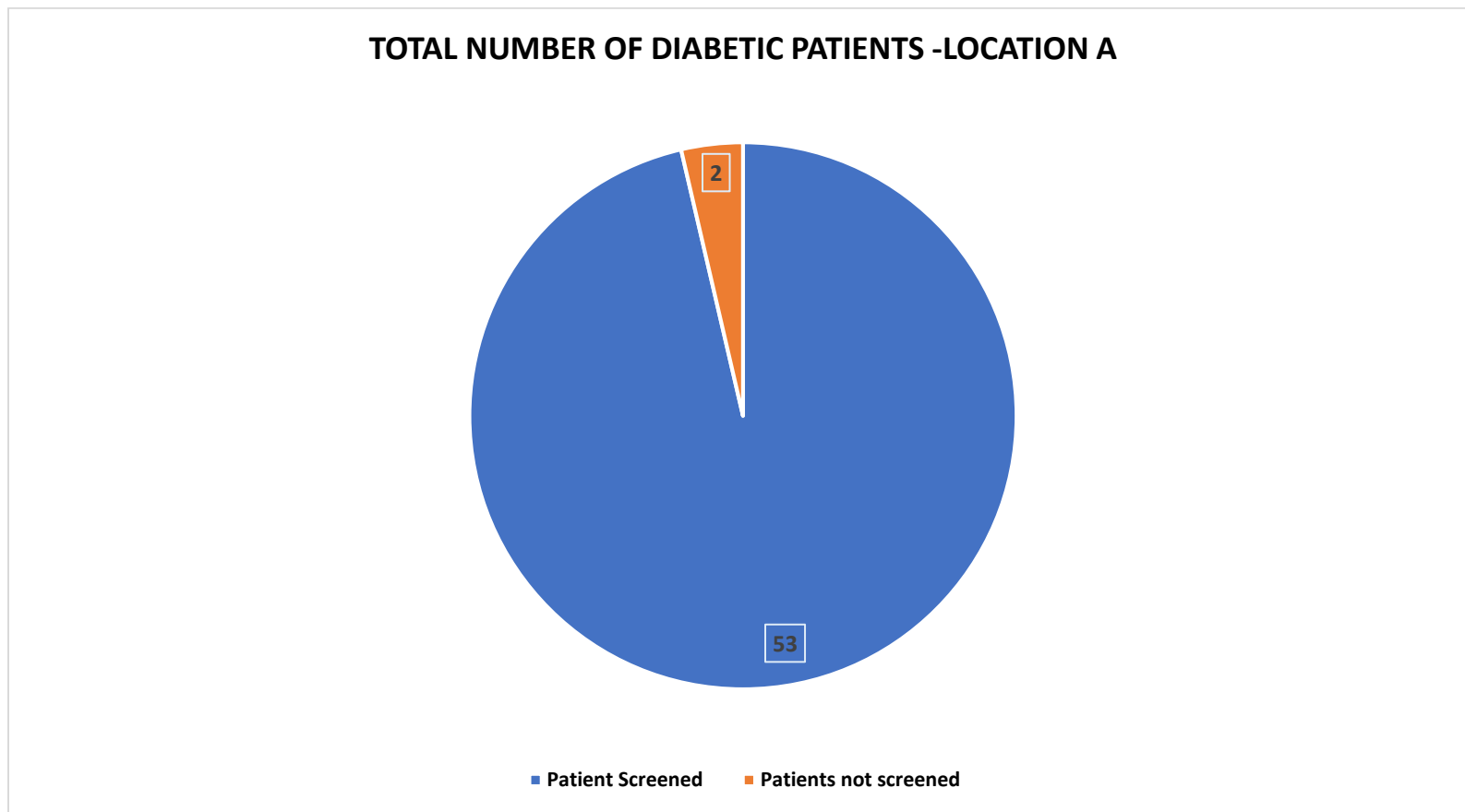*Figure2:* Graph of overall staff percentage compliance week by week

Figure 3: Cumulative patients screened over the 8 weeks by compliant and non-compliant category
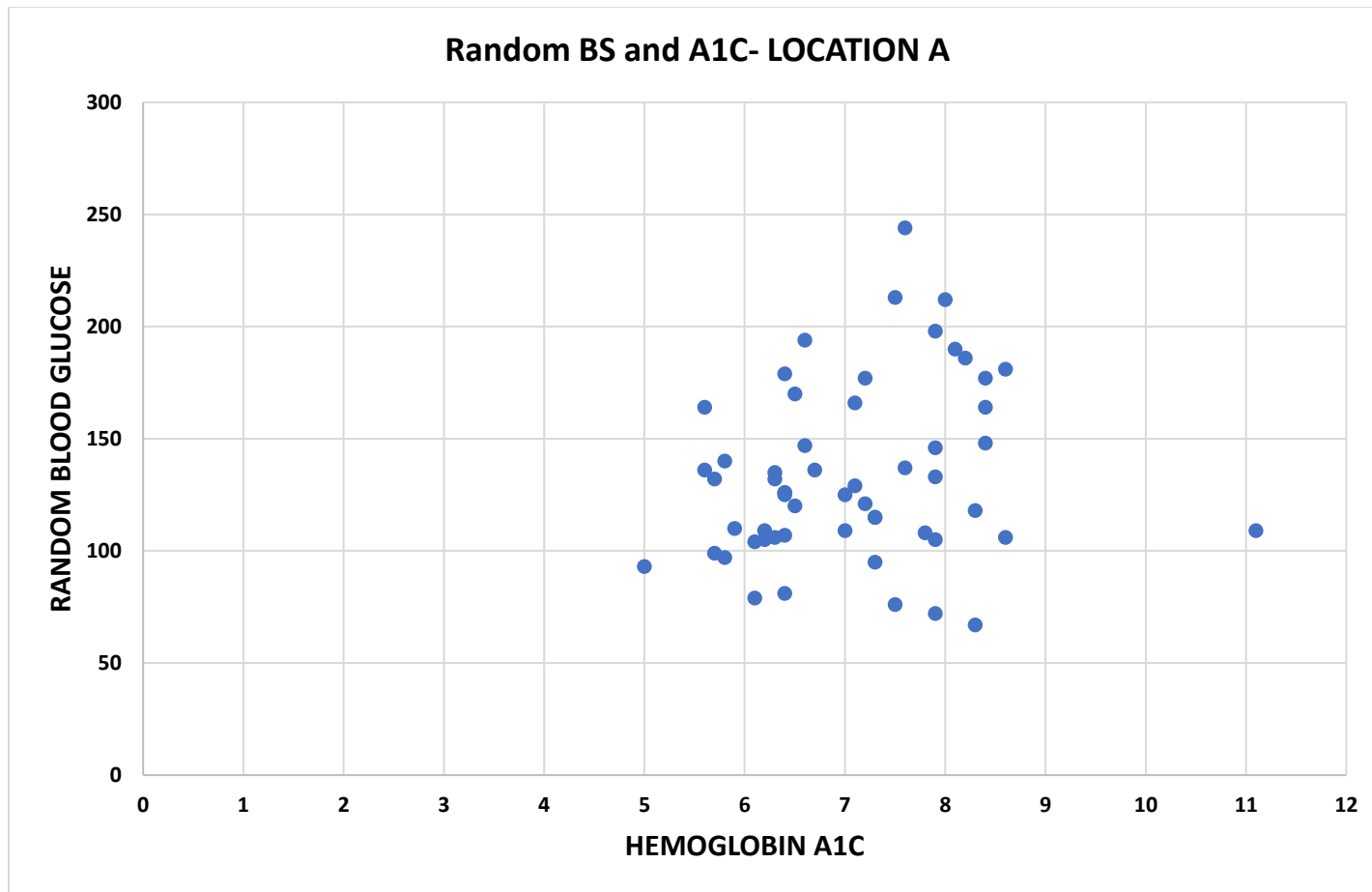
Figure 4: Scattered Plot of patients A1C and random blood glucose over the 8-week period

Figure5: Graph of compliant and non-compliant number of Staff screened each week-location B
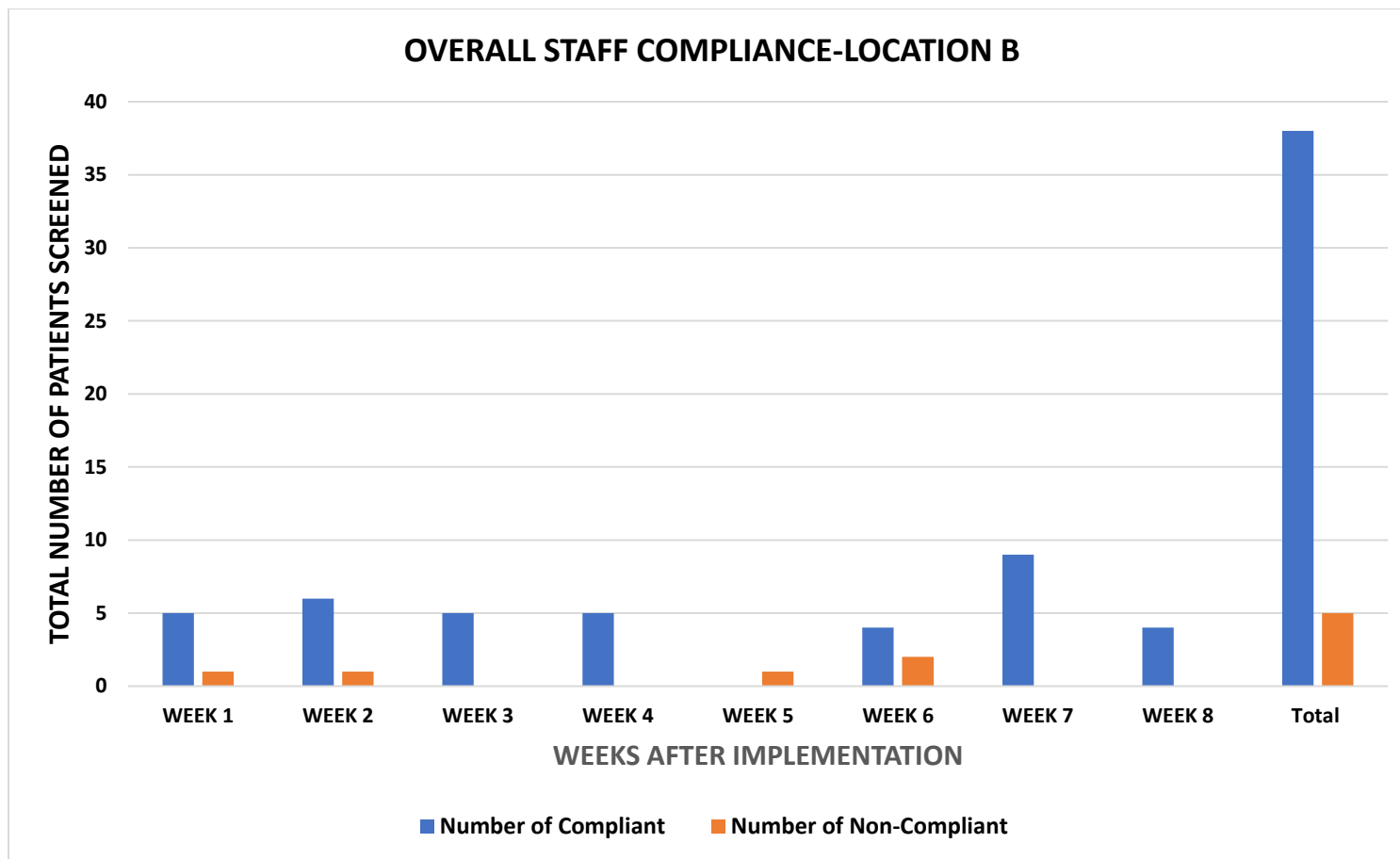
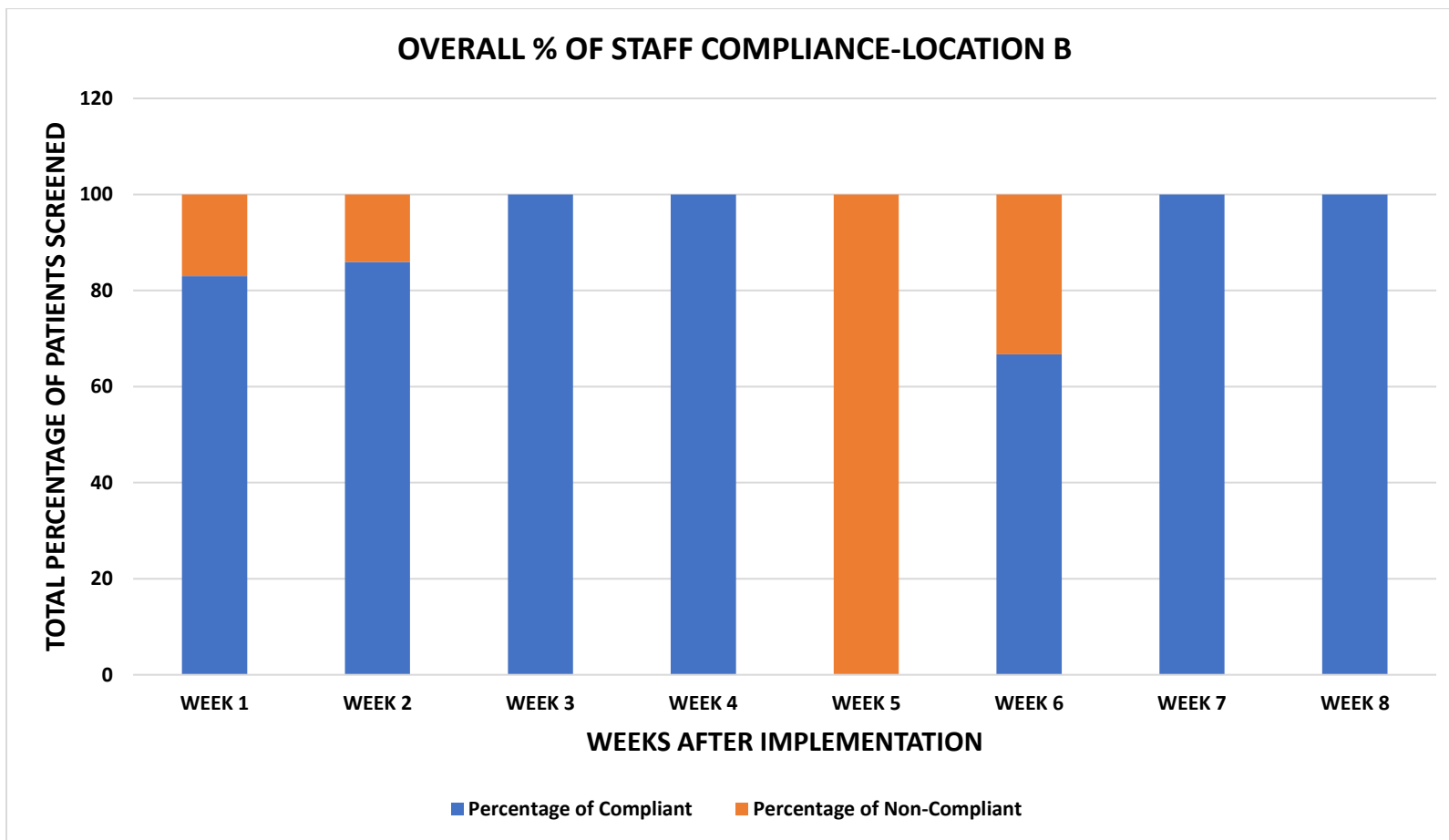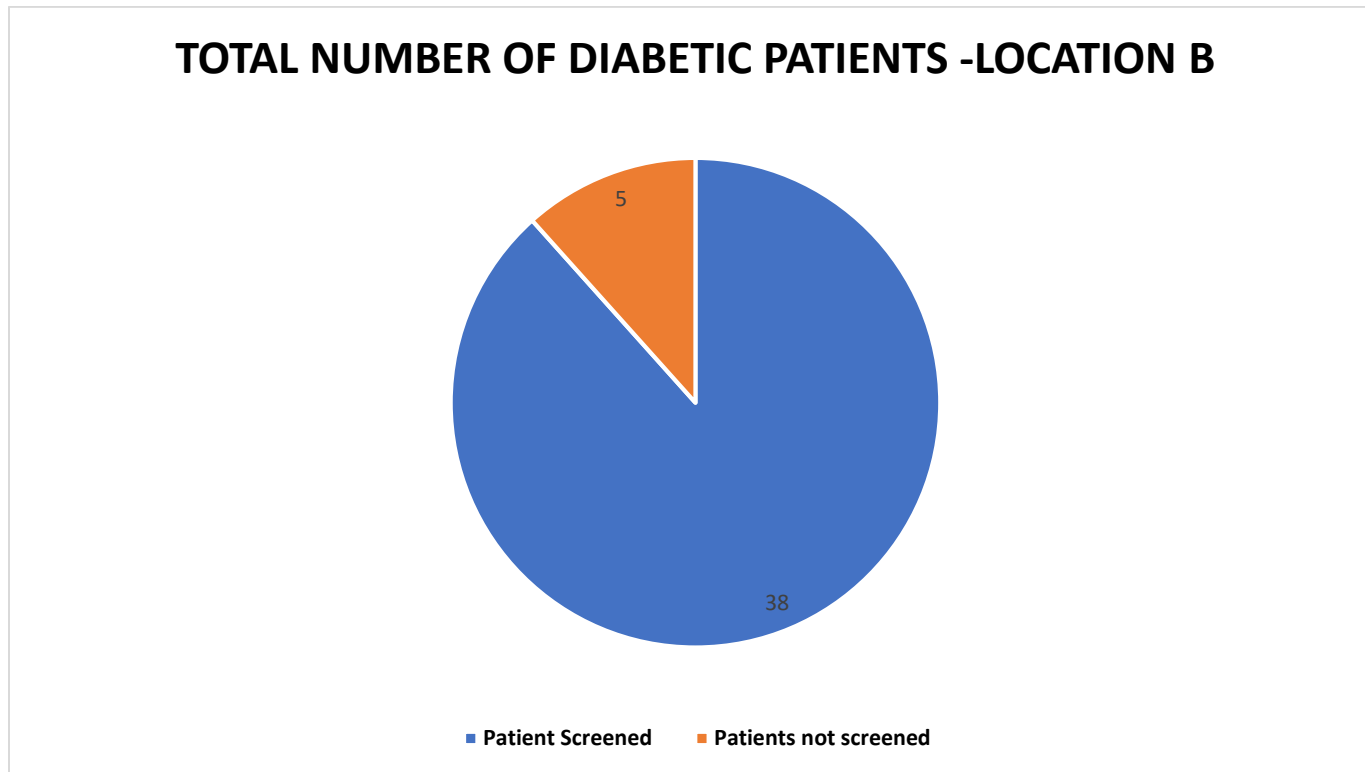*Figure 6:* Graph of overall staff percentage compliance week by week –Location B

Figure 7: Cumulative patients screened over the 8 weeks by compliant and non-compliant category
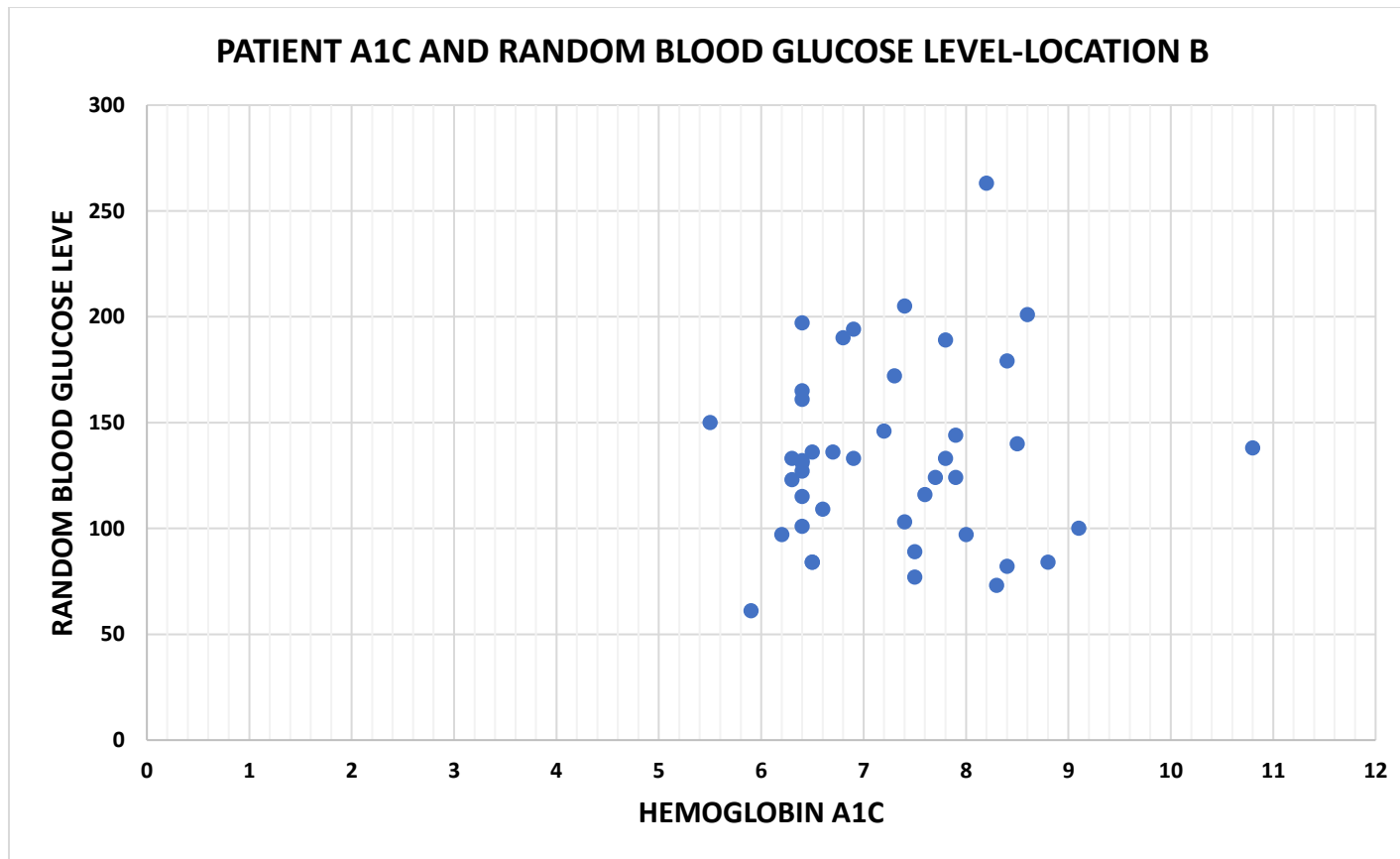
Figure 8: Scattered Plot of patients A1C and random blood glucose over the 8-week period

Revised Evidence Review Table

Author, year	Study objective/intervention or exposures compared	Design	Sample (N)	Outcomes studied (how measured)	Results	*Level and Quality Rating
Alexander, Usman, Thema, Charles, Surena, Pedro, & Joseph, 2017	To examine blood glucose levels in diabetic patients after corticosteroid injections into the subacromial space of the patient's shoulder	Prospective Study	N=17 patients	fasting glucose and Hemoglobin A1C level baseline Fasting blood sugar daily for 10 days post injection	Patients with well controlled diabetes had small elevation in blood glucose and they returned to baseline faster than patients with poor blood glucose control.	3B
Even, Crosby, Song, McGirt, & Devin, 2012	To explore the effects of epidural steroid injections on blood sugar levels in diabetic patients	Prospective Study	Patients undergoing epidural spinal injection N=30	Blood glucose level was obtained before breakfast and 2 hours after dinner for two weeks after the injection. A1C was also recorder	The study showed significant increase in blood sugar levels in diabetic patients after epidural spinal injections.	3 B

Hye Jin, Kyoung Hyo, Sang Il, Ou Je, Jin Woo, & Tae Woo, 2014.	Explore changes un blood glucose level and cortisol levels after glucocorticoid injections into epidural space in patients with or without diabetes.	Prospective Study	N= 29 patients who were planned to have local glucocorticoid. 15 were non-diabetic 14 were diabetic	A1C level Fasting plasma glucose and cortisol measured at baseline and 1,7,21 days.	Blood glucose level were significantly higher day 1 after the injection. Blood glucose return to baseline after day 7. Cortisol level was reduced significantly by day 1 and 7, then returned to baseline by day 12. 3 non- diabetic patients that received glucocorticoid had an episode of fasting hyperglycemic range which normalized by day 7	3B
Waterbrook, Balcik & Goshinska, 2017	To explore blood glucose levels in diabetic patients after local musculoskeletal steroid injections	Clinical systematic review	Ten studies reviewed. Study population ranging from 6 to 40 participants	Blood glucose level Mean HgA1C Levels	The studies show a significant increase (Mean, 125-320 mg/dl) in blood glucose level after a single dose of steroid injection. Patient with an uncontrolled DM with HgA1C > 7.0% may be at increased risk for higher BGLs that last longer	5B

Implementation Tasks Table

Implementation Plan	Week 1-5	Week 6-10	Week 11-15	Task Status	Person to complete Task
Creating draft of screening tool based on supporting evidence	x			Completed	Gloria Mensah-Acquaye
Meeting with department chief to discuss project plan	x			Completed	Gloria Mensah-Acquaye/ Dr Reddy
Reviewing draft of screening tool and supporting evidence with department chief	x			Completed	Gloria Mensah-Acquaye/ Dr Reddy
Finalizing Screening tool for approval with Department Chief and other providers	x			Completed	Gloria Mensah-Acquaye/ Dr Reddy
Creating a draft of smart phrase for the screening tool in epic/ Health connect	x			Completed	Gloria Mensah-Acquaye
Submitting draft of smart phrase to department chief for feed back	x			Completed	Gloria Mensah-Acquaye/ Dr Reddy
Finalizing the smart phrase to be used in EPIC/ Health Connect		x		Completed	Gloria Mensah-Acquaye/ Dr Reddy
Gather baseline data of diabetic patients seen in different locations		x		Completed	Gloria Mensah-Acquaye/Data team
Creating chart audit tool to review compliance after implementation		x		Completed	Gloria Mensah-Acquaye
Finalize chart audit tool		x		Completed	Gloria Mensah-Acquaye

Discussing and selecting project location with department chief		x		Completed	Gloria Mensah-Acquaye/ Dr Reddy
Selecting project location with department chief		x		Completed	Gloria Mensah-Acquaye/ Dr Reddy
Creating screening tool education for staff		x		Completed	Gloria Mensah-Acquaye/ Dr Reddy
Selecting location super users		x		Completed	Gloria Mensah-Acquaye
Educating nurses, providers, and clinical assistant on screening tool		x		Completed	Gloria Mensah-Acquaye
Getting feedback from nurses, providers, and clinical assistant on screening tool		x		Completed	Gloria Mensah-Acquaye
Review baseline data for selected location			x	Completed	Gloria Mensah-Acquaye/ Dr Reddy
Making necessary adjustments to screening guideline if needed			x	Completed	Gloria Mensah-Acquaye
Implementing the new tool in all selected locations			x	Completed	Gloria Mensah-Acquaye
Initiate data collection after implementation			x	Completed	Gloria Mensah-Acquaye
Meeting with nurses and providers from each location			**x**	Completed	Gloria Mensah-Acquaye
Reviewing feedback from the team			x	Completed	Gloria Mensah-Acquaye
Reviewing the compliance for week 1 and week 2 after implementation			x	Completed	Gloria Mensah-Acquaye

Meeting with Department chief to review progress				x	Completed	Gloria Mensah-Acquaye/ Dr Reddy
Meeting with analysis team to discuss baseline data and post implementation collection data				x	Completed	Gloria Mensah-Acquaye
Review pre and post implementation data				x	Completed	Gloria Mensah-Acquaye/ Dr Reddy

Appendix A

Screening tool for the Diabetic Patient

Please screen all diabetic patients prior to scheduling appointment for procedure and document encounter in patient's chart:

- **Review the chart to check last A1C level**

- **An A1C check must be done within 90 days of the scheduled steroid injection procedure. Order A1C lab for patient if last A1Cis over 90 days and notify the patient and the provider.**

- **Schedule patient for procedure if A1C is <9 and was last done within 90 days.**

- **Instruct the patient to continue their medication regime as order by Primary Care Provider (PCP) or endocrinology**

- **Notify the patient that a random blood glucose level will be obtained in the clinic prior to the steroid injection procedure. If random blood glucose level is greater than 250, procedure will be cancelled.**

- **If A1C is greater than9.0, schedule a telephone appointment with the provider and instruct the patient to follow up with PCP.**

Appendix B

Graham I, et al. *The Journal of Continuing Education in the Health Professions*, Volume 26, pp. 13–24. 2006