Metabolic Screening Protocol for Patients on Second Generation Antipsychotic Medications

Debra Mayers

Touro University Nevada

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DNP Project Chair: Dr. Jessica Grimm

DNP Project Members: Denise Zabriskie

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The United States (US) correctional system has seen an increase in incarceration, and a great percentage of incarcerated persons have some form of mental illness (Barber, Gary, McDonald, Andrews, Barber, & Xu, 2015). The most common mental illnesses identified among the inmates include depression, bipolar disorder, and schizophrenia. Many states within the US continue to close publicly funded mental health beds, which have served the poorest Americans with some of the most serious mental illnesses. These cuts have led to more than 400,000 inmates incarcerated with some form of mental illness, with 10–20% of jails and 25% of prisons having inmates with serious mental illness (Allison, Bastiampillai, & Fuller, 2017). These inmates are most likely to receive second generation antipsychotic medications and therefore are at a higher risk of developing metabolic syndrome (Barber et al., 2015. Sodhi-berry, et al., 2015).

Current evidence shows standardizing care through implementing a metabolic screening protocol (MSP) can decrease rates of metabolic syndrome in individuals receiving second generation antipsychotic medications (Reeves, Tamburello, & DeBilio, 2017).
There is a current protocol in place at the project site, updates to this protocol will guide care of these individuals in prevention or management of metabolic syndrome when receiving second generation antipsychotic medications. The project site is a state funded mental health clinic. This clinic is utilized to treat the mentally ill inmates in the correctional system.

Background

Metabolic syndrome was first described in 1999 by The World Health Organization as a group of indices including abdominal obesity, insulin resistance, dyslipidemia, and hypertension that often occur together with or promote type 2 diabetes and cardiovascular disease. Reeves,

Tamburello, & DeBilio (as cited Alberti et al., 2009; National Cholesterol Education Program [NCEP], 2001) state that the presence of metabolic syndrome must meet three or more diagnostic criteria which include abdominal obesity, elevated cholesterol, elevated blood pressure, or elevated fasting glucose. In recent years, metabolic syndrome has been found to be a prevalent problem among inmates in the correctional facility. These symptoms occur together and can result in Type 2 diabetes and cardiovascular disease (Reeves, Tamburello, & DeBilio, 2017). The implementation of a MSP may serve to decrease the risk of inmates developing metabolic syndrome while incarcerated caused by taking second generation antipsychotic medications.

Significance

The development of metabolic syndrome in mentally ill inmates can lead to poor outcomes and increased cost. Castillo, Rosati, Williams, Pessin, and Lindy (2015) stated that patients with metabolic syndrome contribute more to early death rates than do suicide and injury. Wang et al., (2017) identified cardiovascular disease among inmates as being one of the most prevalent diseases developed within the correctional system. Further, metabolic syndrome contributed to a high rate of death of inmates while incarcerated and after being discharged into the community (Correll, et al., (2017). Inmates who develop metabolic syndrome from second-generation antipsychotic medications could have an increased negative impact on the medical system. Leddy, Schulkin, & Power, (2009) state that inmates who are overweight and obese have severe health risks such as cardiovascular disease and type 2 diabetes. Accordingly, in the last five years 0% to 18% inmates received cardiovascular risk calculation; cholesterol checks were rated at 31% to 91.7% and the fasting glucose in the past three years were ranked at 45% to 95%. This illustrates that metabolic screening is often neglected in the general inmate population and can lead to increased healthcare costs in correctional health centers. This impact could result in

an increase in costs to treat these patients for the health care system. The implementation of a MSP will serve to address this gap in the at-risk population of inmates receiving second generation antipsychotic medications.

Problem Statement

Mental illness is prevalent among inmates with depression, bipolar disorder, and schizophrenia being the leading diagnoses. Inmates who are prescribed second generation antipsychotic medications are at risk of developing metabolic syndrome. This syndrome presents the risk of weight gain, diabetes, and coronary heart disease and diabetic ketoacidosis DKA as started by Guenette, et al., (2013). Metabolic changes are identified early and if effective interventions are initiated, providers can target the emerging risk factor profile. Early symptom identification allows for early intervention and possibly preventing further complications (Foley et al., (2013). This MSP will serve to guide practice based on the current evidence at the project site. The project site does not follow screening for metabolic syndrome for these high-risk inmates within the correctional clinic.

Purpose Statement

The purpose of this DNP project is to implement and evaluate the MSP for inmates receiving second generation antipsychotic medications. The aims of the MSP is to decrease rates of inmates developing metabolic syndrome as well as initiate early intervention when this occurs. The MSP will be implemented in guide the healthcare provider's action regarding treatment of these high-risk inmates. The overall goal is for early interventions to be implemented by initiating the MSP to decrease the risk associated with second-generation antipsychotics medications.

Project Objectives

By the end the DNP project, the correctional system will:

- Design and Implement evidenced based MSP aimed at inmates taking second-generation antipsychotic medications
- Provide appropriate education for correctional facility staff and clinic staff administering the protocol.
- Reduce unnecessary second-generation antipsychotic use in the inmate population at the project site through use of the MSP.
- Improve early intervention rates for patients at risk for metabolic syndrome while taking second generation antipsychotic medications.

Project Question

Will the implementation of a MSP for inmates prescribed second generation antipsychotic medications, improve providers' prescriptive practices, monitoring and early intervention, and identification of the risk factor for metabolic syndrome? The P.I.C.O.T model is used to develop this clinical question. P represents patient, population or problem; I represent intervention, C represents comparison, O represents outcomes and T represents time (Rios, Chenglin, & Thabane, 2010).

- P – Healthcare staff caring for patients who are prescribed second-generation antipsychotic medications
- I – Design and implement an evidence-based MSP
- C – Standard practice without MSP
- O – early intervention and identification of metabolic syndrome in patients taking second-generation antipsychotic medications

- T – by the end of DNP project

Review Coverage and Justification

A search of the literature was conducted for the most recent and relevant studies on metabolic syndrome based on the P.I.C.O.T questions. Implementation of the metabolic screening protocol (MSP) in the correctional system required an extensive review of the literature to obtain relevant, evidence-based research. Several databases, such as Cinahl, Cochrane, ProQuest, Medline, Ovid, and Touro library, were searched for relevant articles. Search terms, such as *patients*, *prescribed antipsychotic medications*, *implement metabolic screening protocol (MSP)*, *metabolic protocol*, *standard practice*, *early intervention*, and *identification of metabolic syndrome*, returned over 300 journal articles. The 300 journal articles were narrowed down to 30 by adding and changing various terms, such as full text, scholarly journals, location, English, within five years, and United States. No more than 50% of the literature was more than 5 years old. A total of 30 articles were retrieved and accepted for this project.

Review Synthesis

What is Currently Understood

The Federal Drug Administration issued a class warning for second-generation antipsychotic medications, leading to an increase in awareness of cardiometabolic side effects that contribute to weight gain, hyperglycemia, diabetes, and hyperlipidemia. Richardson, Lee, Kalarchian, and Ren (2016) stated that patients who are seriously mentally ill have a higher risk of cardiovascular disease with increased mortality if they are prescribed antipsychotic medication. According to Cotes et al. (2015), in the United States, the number of antipsychotic-treatment visits increased from 6,200,000 to 14,300,000 by 2008 compared to a study conducted from 2006 to 2015. This study showed an overall increase in antipsychotic treatment from

18.9% to 24.9% with a brief decrease in 2014 to 2015 at 18.5%. The American Diabetic Association (ADA), American Psychiatric Association, American Association of Clinical Endocrinologists, and North American Association for the Study of Obesity approved a set of guidelines for monitoring patients taking second-generation antipsychotics. Cotes et al. (2015) stated that even though many providers have raised concerns about the cardiometabolic side effects of antipsychotic medication, monitoring of recommended intervals remained low. The outcomes of the quality intervention showed an improvement in monitoring in most of the community's mental health centers (Cotes et al., 2015). The state provided education on monitoring antipsychotic medications to several of the state organizations providers. The statistical analysis via chi square statistic and logistic regressions evaluated a randomized two-year sample of 900 records with patients on antipsychotic medications. Of these 900, 26.6% for cholesterol, 40.4% for glucose, 29.1% for triglycerides, 54.3% for weight, 33.6% for blood pressure, and 5.7% for abdominal girth. The results demonstrated that 4 out of 10 mental-health centers had shown some improvement with laboratory monitoring, but overall monitoring did not increase. Recommendations focusing on education with auditing and feedback may improve monitoring within some settings.

Foley et al. (2013) stated that side effects including increased weight gain and waist circumference may indicate a greater risk of developing diabetes and coronary heart disease after the use of an antipsychotic drug. This study sampled 1,642 participants with psychosis through a survey method. The patients who were prescribed second-generation antipsychotic medication had significantly higher rates of basic metabolic index, waist circumference, diastolic blood pressure, triglycerides, and glucose controls. These increases have led to the following recommendation: Do not use certain drugs as first-line treatment, low doses, extended dosing, or

switching to decrease the side effects. Foley et al., further recommended using the monitoring guidelines for close monitoring. The results suggest, however, that the monitoring guidelines had little impact on clinical practice. Providers who prescribed antipsychotic medication and proposed a monitoring system considered this a failure in care.

Guenette, Hahn, Cohn, Teo, and Remington (2013) listed risperidone, olanzapine, quetiapine, and clozapine (see appendix A) as some of the most common antipsychotic medications which cause metabolic syndrome. Sixty reports, yielding 69 cases of patients with schizophrenia, found that the incidence of schizophrenics with diabetes presenting as diabetic ketoacidosis (DKA) has been calculated as high as 14.93 per 10,000 patient years, 10 times higher than the calculated risk of 1.4 per 10,000 years in the general population. Additionally, 0.2% of 56,849 patients with schizophrenia receiving antipsychotic monotherapy and without a history of diabetes were hospitalized with DKA a year later. Guenette, Hahn, Cohn, Teo, and Remington, further stated that for individuals who were identified with diabetes and take atypical antipsychotics, the development of DKA is not uncommon and reported that DKA developed in five out of 11 such individuals. This would suggest that the liability for DKA may be increased in individuals with established type 2 diabetes. Long-term use of these medications are associated with a high rate of patients who develop metabolic syndrome.

Detection and Prevention of Metabolic Syndrome

Early detection is imperative to prevent inmates from establishing metabolic syndrome. Early detection has a long-term impact on the overall health of inmates. Understanding the effects of antipsychotics and metabolic syndrome would help in prescribing the most appropriate medications for patients (Sengul, Kalkanci, Karadag, & Sengul, 2013). The symptoms of metabolic syndrome—such as diabetes, cardiovascular disease, increased high cholesterol, and

high blood pressure would be decreased if changes are made early into treatment and the treatment regimen is changed by decreasing the use of antipsychotic medications or discontinuing these medications altogether ("Impact of switching," 2013).

Metabolic syndrome can be detected as early as 90 days into treatment. Weight gain and an increase in glucose levels are the first signs of early metabolic syndrome. Providers at this time must change or decrease atypical second-generation antipsychotics, and they should only be used for short time (Kram, Ahmed, Hayat, Ullah, Nawaz & Ikram, 2017; Parabiaghi, Tettamanti, D'Avanzo, & Barbato, 2016). The steps to early detection, started by consensus recommendations for patients with metabolic syndrome who are on second generation antipsychotics (ADA/APA, 2004), are 4 weeks, 8 weeks, 12 weeks, quarterly, annually, and every 5 years. Patients should be monitored by gathering information on personal/family history, weight, body mass index (BMI), waist circumference, blood pressure, fasting glucose levels (at baseline, 12 weeks, and annually), and fasting lipid profile (at baseline, 12 weeks, and every 5 years, if normal). Metabolic syndrome has a high mortality rate, making early detection even more important (Carrà, Bartoli, Carretta, Crocamo, Bozzetti, Clerici, & Bebbington, 2014).

Metabolic syndrome is a condition that can be prevented if a metabolic screening protocol is implemented early or if mental health providers select different types of medications antipsychotics based on presenting symptoms. Olanzapine, risperidone, quetiapine, and clozapine have the highest rate of in causing metabolic syndrome ("Impact of switching," 2013). The impact study was done over a 24-week period, and further shows a long-term risk reduction of 25.7 &% in cardiovascular disease over a 10-year period. One of the major findings in the prevention of metabolic syndrome was switching these medications to aripiprazole, fluphenazine, haloperidol, and ziprasidone, which have shown a decreased rate of induced

metabolic syndrome ("Impact of switching," 2013). Patients who received ziprasidone or aripiprazole developed metabolic syndrome at a much lower rate. These findings were assessed for patients who were prescribed antipsychotics for over 12 weeks (Sengul et al., 2013). Preventing metabolic syndrome starts early in treatment when prescribing antipsychotic medications. Providers need to implement an MSP to identify at-risk inmates for the development of metabolic side effects. (Gin-Liang, 2017)

Metabolic syndrome develops after inmates are prescribed antipsychotic medication and remain unmonitored for long periods of time (Topel et al., 2018). Metabolic monitoring parameters are clear when antipsychotic medications are prescribed. The ADA's monitoring parameters include personal and family history, weight, waist circumference, blood pressure, fasting plasma glucose, and fasting lipid profiles (Richardson et al. (2016). The ADA's recommendations have been accepted by providers and organizational leaders, but monitoring of patients varies among psychiatric settings, where some perform monitoring and others do not.

Metabolic monitoring has been in place for more than a decade, and although guidelines have been set, low rates of compliance still exist due to system failures (Cohn, 2013). Additionally, Gates et al. (2016) found that inmates, especially women and some minority groups, who were prescribed antipsychotic and antidepressant medication were associated with metabolic syndrome. The authors found that 15% of the inmate population had been prescribed medications due to mental illnesses. Asch et al. (2011) stated the Department of Corrections conducted a retrospective descriptive study that found that offenders who were prescribed antidepressants and antipsychotics had higher weight gain and obesity than individuals not on medication. The study further found that women had an even higher average weight gain and were more likely to be obese than the male population on antidepressants and antipsychotics.

Asch et al. (2011) found that problems in quality of care exist within the prison population and were more prevalent among patients who had been prescribed antipsychotics and antidepressants than in the overall population. The authors noted the poor development of quality-performance measures and systematic implementation. Most health plans within the United States undergo annual quality measures and public reporting of data, which shows that organizations that engage in quality-performance reporting deliver better care. Asch et al. (2011) also recognized a need to standardize and implement quality measurements across health-care systems.

The ADA, as documented by Richardson et al. (2016), recommends metabolic screenings which includes, weight, blood glucose testing, and lipids profiles for patients at risk. (ADA/APA, 2004) stated metabolic screening is recommended to completed in intervals, 4 weeks, 8 weeks, 12 weeks, quarterly, annually, and every 5 years. Additionally, Richardson et al, found that clinicians suboptimal and inconsistently adhered to the guidelines. In an effort to improve compliance, they implemented a 12-week quality-improvement project in which a metabolic protocol was placed within the electronic health system and pre- and post-intervention comparison-design surveys were given to providers. The surveys showed that 5 of 20 screening measures were completed pre-intervention, and 16 of 20 were done post intervention. The interventions not noted in the study, but the authors found significant improvements in clinician compliance with implementation of metabolic guidelines after the 12 weeks of implementation (Richardson et al., 2016),

Pérez-Iglesias et al. (2014) found that weight gain and metabolic abnormalities are a major concern in this area of clinical practice. This study interviewed 174 patients who were diagnosed with first-episode psychosis and were prescribed second-generation antipsychotic medication. After a year into the study, 67% of the patients who completed the follow-up

continued with the same treatment, compared the metabolic side effects of the initial treatments at three months, and found significant changes with an increase in metabolic side effects. Pérez-Iglesias et al. stated that most of the studies were short term, when 12 months is a critical period during treatment to observe for weight gain and metabolic changes. The aims of metabolic intervention are to start early, prevent these changes from starting, or attenuate them.

Parrinello (2012) utilized the ADA guidelines and established screening and follow-up monitoring for patients who were prescribed second-generation antipsychotic medication. These guidelines were established for early recognition and treatment of metabolic symptoms. Parrinello (2012) stated the United States has seen a rise in metabolic syndrome among patients diagnosed with a serious mental illness. Atypical antipsychotic medications have been used in past decades as the hallmark for treatment of mental illness and have shown success in the treatment of patients with schizophrenia and schizoaffective disorder. The study was conducted using a retrospective chart review and computer-generated patient summary. Even though patients with mental illness saw improvement with the use of these antipsychotics, the emergence of metabolic syndrome in these patients was strongly linked to these medications.

Metabolic Syndrome

Themes of significance that emerged were consistent among the all the literature reviewed and provided a good understanding of metabolic syndrome. The themes that emerged from the literature were weight gain, hypertension, diabetes, increased cholesterol, and abdominal obesity. Weight gain with a waist circumference greater than 40 inches in men and 35 in women, along with abdominal obesity, was identified as the most important factor in diagnosing metabolic syndrome. Hypertension is identified as having a systolic blood pressure greater than 130 Hg and a diastolic blood pressure greater than 85 mmHg. Cholesterol is defined

as a serum high-density lipoprotein cholesterol less than 40 mg/dl for males and less than 50 mg/dl. for female patient or drug treatment for cholesterol. Diabetes is required if levels of fasting plasma glucose are greater than 100 mg/dl (UpToDate, 2017). Metabolic syndrome must meet three or more diagnostic criteria which include abdominal obesity, elevated cholesterol, elevated blood pressure, or elevated fasting glucose (Reeves, Tamburello, & DeBilio, 2017).

Considerations for the Prison Population

Providers and nursing staff should easily be able to identify inmates who are in mental-health treatment and are receiving antipsychotic medication. A computer-generated list of inmates who are on antipsychotic medication should be pulled every shift to identify inmates with clinic visits that day. Current practice is a list of a list of inmates with clinic visit is generated for every shift. The nursing staff maintains a medication book with a list of patient and selected medications for the day. The provider will place orders for blood pressure, weighs, BMI, and blood levels at the recommended intervals. The current system provides a list of inmates to be escorted to the clinic these inmates are not identified specifically for antipsychotic use, since no protocol system is in place. Meigs (2017) noted that patients should be assessed at regular intervals during clinic visits. The mental health clinical area is setup with clinical nurses and medical doctors to take over the medical part of the care for the inmates in the event of emergency.

Screening for Metabolic Syndrome

To screen for metabolic syndrome, Vancampafort et al. (2013) recommended monitoring

- Blood pressure at every visit
- Waist circumference at every visit
- Fasting lipids at the start of treatment
- Fasting glucose at the start of treatment.

Treatment of Metabolic Syndrome

The treatment for metabolic syndrome includes

- Cholesterol-lowering medications;
- Glucose-lowering medications;
- Blood pressure lowering medications;
- Lower doses for second-generation antipsychotics, such as risperidone, haloperidol, olanzapine, and Seroquel, which are some of the most frequent medications prescribed in jails and prisons;
- Discontinuing second-generation antipsychotics (Lim & Eckel, 2014).

See (Appendix A).

Nonpharmacological management

Nonpharmacological management includes

- Referral to nutrition for dietary consideration, which is available to inmates
- Daily exercise (Lim & Eckel, 2014). The prison provides a gym and daily recreation to inmates.

Involving the Interdisciplinary Team

Nurses role. The basic values for metabolic monitoring, such as weights, blood pressure, and drawing of blood levels, will become a major part of nursing and leadership. Nurses within the prison health system provide primary care for inmates and are the primary people that first come into contact with the inmates (Cerra et al., 2017). Nursing and leadership should meet the care needs of inmates with the same level of care as the community. Nursing involvement will provide for improvement of inmates' outcomes through the implementation of an MSP. Nurses have the expertise and knowledge to optimize and promote positive health outcomes (Almost et

al., 2013). However, nursing leadership is faced with insufficient staffing of correctional nurses. In addition, the lack of ongoing education and training that is needed to provide evidence-based care could become a barrier to full implementation of an MSP.

Prison medical staff. The medical staff in prisons consist of medical doctors, physician assistant, and family nurse practitioners who provides medical care for inmates. The team of medical staff intervenes if inmates develop high risk side effects of metabolic syndrome such as increase blood glucose or blood pressure.

Other members of the prison staff. Other members of the prison staff include the correctional officers who are responsible for escorting inmates to clinic area for their visits. The correctional staff main goal is to ensure inmates are escorted to clinic to receive care. These individuals are not trained staff to care for inmates.

Considerations for Discharge into the Community

Discharge planning starts early in treatment during incarceration. Inmates should continue treatment after being released from prison. Inmates who were released to transitional care, known as the community reentry program, were released into the community with chronic diseases, such as diabetes and hypertension. The transitional clinic noted that within 10 days of release, 45% of 135 released prisoners were found with hypertension, 43% with diabetes and hemoglobin A_{1C} of 14% (Fox et al., 2014). These inmates who were released to the transitional Care were more likely released from the correctional system. This study concluded that inmates who are discharged with metabolic side effects most likely develop these symptoms while incarcerated.

Controversies and Summary of Findings

The review of the literature has shown some similarities and differences among the studies. No controversies were noted in any of the studies. In comparing the studies, literature authors discussed the use of antipsychotic medication among the general population and within the correctional system—a theme seen throughout most of the literature (Asch et al., 2011). The findings showed no differences in metabolic changes between the general population and those in the correctional system (Cohn, 2013; Gates et al., 2016). Patients in both the general population and correctional health system presented the same symptoms, such as weight gain, obesity, hypertension, increased lipids, and diabetes. Studies showed that after release from prison, patients showed increased rates of metabolic changes within 10 days after release (Fox et al., 2014). The studies also found that if providers completed metabolic screening, patients and inmates had better outcomes. Several studies found suboptimal compliance among providers when completing metabolic screening. Each of the selected studies implemented a quality-improvement project to increase providers' awareness when prescribing antipsychotic medications.

Significance of Evidence to Profession

The United States has seen an increase in antipsychotic-treatment visits from 6,200,000 to 14,300,000 by 2008, compared to a study conducted from 2006 to 2015 that showed an increase in antipsychotic treatment from 18.9% to 24.9% and a decrease in 2014 to 2015 at 18.5% (Rhee, Mohamed, & Rosenheck, 2018). The Federal Drug Administration's approval of many new antipsychotics for off-label use other than schizophrenia may have contributed to a $16,000,000,000 cost increase (Cotes et al., 2015). This cost will directly impact nursing due to increase staffing to meet the demands of increase visits.

Further Investigation

Even though several studies were completed within the correctional system, very few recent studies covered metabolic changes. In addition, most of the references regarding the correctional system were more than five years old. More recent studies, however, were found for the general population. This gap signifies a need for further studies on second-generation antipsychotic-medication use in correctional health.

Summary of Literature Review

A quality-improvement MSP needs to be implemented within the correctional system. The review of the literature showed some differences in compliance in monitoring, but similar patient outcomes were found in most of the literature. A screening protocol would allow providers to conduct early intervention prior to prescribing second-generation antipsychotic medication. The literature review showed that such protocols, once implemented, improve patient-care outcomes. Implementation would not only improve care while patients are incarcerated but would also provide for extended care in the community.

Imogene King's Conceptual System and Theory of Goal Attainment

Theory can serve as a guide in implementing changes within organizations. Imogene King, in early 1960, developed a nursing model with a focus on nursing as an open system that interacts with the environment (Khowaja, 2006). Imogene King's conceptual system features three interacting systems. Her approach focuses on the personal, interpersonal, and social systems that interact to meet health care needs and population outcomes (Fronczek, Rouhana, & Kitchin, 2017). The use of the conceptual system with individuals (personal systems), small groups (interpersonal systems), and complex organizations (social systems) is a major strength of King's conceptual system (Frey, Sieloff, & Norris, 2002). King identified 15 knowledge concepts that interconnect with each system, and 10 of these concepts were selected to develop

the theory of goal attainment (King, 2006). Each of these concepts are interrelated with the three systems of King's conceptual system, and she identified the conceptual system and theory of goal attainment as one system.

Tenets of the Theory

These three systems show the interrelationship of human beings as they function in a variety of situations. The concepts provide a means to organize one's knowledge for making concrete decisions in nursing situations at various levels of administration. The interaction of systems provides for a social and psychical environment wherein individuals, families, and communities perform daily activities to achieve their goals. The three systems that make up King's conceptual structure represent interconnected links for the communication of information in a high-tech world of health care and nursing (Isac, Venkatesaperumal, & D'Souza, 2013) The three tenets identified within King's conceptual system and theory of goal attainment are:

- Personal systems
- Interpersonal systems
- Social systems (King, 2006).

Personal systems: The personal systems (individuals) approach focuses on the person. In health care, the patient or physician is identified within this system as the individual. King identified individual concepts such as perception, self, body image, growth and development, time, personal space, and coping. She emphasized the concept of perception as essential and related to direct and indirect observation of raw data in every nursing situation (King, 2006). King's concept of perception is also an important link to patient outcomes because perceptions are influenced by and sensitive to nursing interventions and how raw data are turned into

information (King, 2006). The MSP project will depend on nursing as one of the main bodies to work with inmates for the implementation.

Interpersonal systems: Interpersonal systems such as dyads (two individuals), triads (three individuals identified as nurse–patient–physician), and small groups (identified as nurse, physician, pharmacist, and physical therapist) interact to meet health care needs (King, 2006). The interpersonal system functions as a collaborative body within health care organizations. As the project lead, presenting the MSP will require a collaborative interaction from the interdisciplinary group for the implementation of this evidenced-based project.

Social systems: Social systems are considered large groups. These groups are made up of health care systems, educational systems, and government systems (King, 2006). The social systems within a health care organization are important to the outcomes of inmate care. A health care organization such as the correctional system must change practice and implement MSP in the delivery of care, not only within the correctional system, but also with a focus on how the care may impact the community once the inmates are released.

Concepts Related Tenets of the Theory

Imogene King identified 10 concepts that constitute the theory of goal attainment, which she discussed as being interrelated with the conceptual system. They are:

- Perception
- Communication
- Interaction
- Transaction
- Self
- Role

- Stress
- Growth and development
- Time
- Personal space (Frey et al., 2002; Messmer, 2006).

The 10 concepts identified as being interrelated and stated that provider–patient **interactions** are characterized by verbal and nonverbal **communication**, in which information is exchanged and interpreted; by **transactions**, in which the values, needs, and wants of each member of the dyad are shared; by **perceptions** of the provider, patient, and situation; by **self** in the **roles** of patient and provider; and by **stressors** influencing each person and the situation in **time and space**. After the analysis of King's conceptual framework and theory of goal attainment, this model is appropriate to implement into the correctional health system (Williams, 2001). **Growth and development** come with providers and inmates developing a relationship and understanding the use of second-generation antipsychotic medications as well as the implementation time of the MSP on the initial use prescribing of the medications.

Of all the concepts discussed, communication regarding the interpersonal system requires the most attention. Communication among providers when starting to implement MSP is important. Providers should be able to follow-up, regardless of who started the MSP. Good communication skills are imperative within the correctional health system. As King stated, poor communication skills will lead to poor transactions and interactions, which could affect goal setting and goal attainment (Williams, 2001).

Goal attainment represents outcomes. Outcomes indicate a measure of quality care. This process requires knowledge of one's own perception of the role of the nurse, as well as the patient/family perceptions in a specific environment. The MSP project's focus is on improving

care of inmates within the correctional system. King's concepts of goal attainments allow the nurses and the providers to be educated on the process of the MSP and how the protocol will be implemented and the effects on inmates' outcomes.

Application of Theory to Current Practice

The public expects quality care within the health care system, and quality is measured by the effectiveness of care and whether goals for health promotion, health maintenance, or recovery from illness have been attained (Killeen & King, 2007). King's conceptual system and theory of goal attainment are an excellent fit with current trends in nursing, which focus on classification systems, evidence-based practice, and evidence-based nursing interventions (Frey et al., 2002). King's conceptual system and theory of goal attainment describe the nature of nurse–patient interactions that lead to transactions and achievement of goals. It presents a standard whereby nurses purposefully interact with patients, mutually establish goals, and agree upon the means used to achieve their goals. Mutual goal-setting is based on the nurses' assessment of patients' concerns, problems, and disturbances in health. The theory of goal attainment helps nurses organize elements in the process of nurse–patient transactions that result in goals attained, such as positive care outcomes. Outcomes provide data for evidence-based practice. The nursing perspective of evidence-based practice includes many concepts initially defined by King (Killeen & King, 2007).

Application of Theory to Project

The quality improvement project is the scientific foundation for nursing practice (Garritano, Glazer, & Willmarth-Stec, 2016). King's conceptual system and theory of goal attainment identified the personal systems that relate to the individual. The MSP's aim is to change processes by implementing new protocols to promote improved patient care outcomes.

The interpersonal systems of King's conceptual system and theory of goal attainment process employ this protocol, which requires interprofessional collaboration within departments to achieve such outcomes. The social system of King's conceptual system and theory of goal attainment process takes the MSP to the systems level of stakeholders as leaders to transform health care (Pritham & White, 2016). The goal for the MSP project is to initiate mental health treatment that would improve overall health functions. Inmates who are prescribed second-generation antipsychotic medications will see improved health if the MSP is implemented at the start of treatment. King's conceptual system and theory of goal attainment is an appropriate choice of nursing theory to support mental health practices (Clouse, Williams, & Harmon, 2017).

The project lead's role is to communicate information relating to the MSP and its importance to staff. The staff must understand the MSP implementation and how this process will improve care of the inmate population. The MSP project will require staff recognition of the multiple interactions in the environment, such as the health care setting (King, 1999). Presenting the MSP to the interdisciplinary team is a way to provide evidenced-based education to various team members, which enables the growth and development of the individuals involved with the project to understand how their involvement affects the outcomes of inmate care. Presenting evidenced-based information allows for a fully informed decision regarding practice change.

The inmate population is identified as the individuals whose perception, self, body image, growth and development, time and personal space, and coping will be affected if second-generation medications are prescribed and no monitoring has been implemented. Significant changes such as the development of metabolic syndrome could emerge that will affect each of the concepts identified. The symptoms of metabolic syndrome are weight gain, high blood

pressure, increased lipids, and increase in glucose levels, which, if left untreated, could lead to cardiovascular disease and diabetes

Description of Project Design

This project involved the implementation of an MSP by using a quality improvement (QI) approach with an evidenced-based methodology for improved patient care outcomes. The justification of this project is to allow health care providers to implement an MSP when they first prescribe second-generation antipsychotic medications. The MSP is designed to impact inmates who are incarcerated within the correctional health system. Variables to be documented through an MSP are as follows: glucose levels, weight, waist circumference, lipids levels, and blood pressure. This MSP project focused on the implementation. The purpose is to improve MSP documentation by providers and allow for ongoing monitoring and changes. Through implementing an MSP, correctional health providers were guided through evidence to monitor the necessary changes for inmates who are prescribed these medications (Cotes et al., 2015). Thus, the population of interest for this project includes the mental health providers. at the project site.

The project design for the DNP project implementation were as follows:

A) Design and implement an evidenced-based MSP aimed at inmates taking second-generation antipsychotic medications.

- MSP guided providers to place the orders for patients taking second generation anti-psychotic medications in the computer system for blood pressure monitoring, weight monitoring, glucose blood levels, lipid blood levels.

B) Provide appropriate education for the correctional facility staff and clinic staff administering the protocol.

C) Reduce unnecessary second-generation antipsychotic medications use in the inmate population at the project site through the use of the MSP.

- Providers were educated on alternate drugs for inmates who are not diagnosed with serious mental illnesses (SMI), such schizophrenia, bipolar disorders, and/or major depressive disorder.

D) Improve early intervention rates for patients at risk for MS while taking second-generation antipsychotic medications.

- Providers were guided through MSP to implement any necessary changes to inmates' medications by decreasing the dosages, changing the medications, or discontinuing the medications.

Population Interest and Stakeholders

The project setting was in a health clinic within the correctional health system. The population of interest were providers in the correctional health system. A total of were two providers took part in this project. The project was a pilot with proposed implementation throughout the system after the completion of the pilot project. Providers place the orders, and nursing staff will perform their regular duties of validating and processing orders for blood specimens, weighing patients, and taking waist circumferences. When inmates present for mental health services and are prescribed second-generation antipsychotic medications, the provider will initiate an MSP, and it will be documented in the computer system. The inclusion criteria were selected by providers prescribed second-generation antipsychotic medications. The exclusion criteria the selected providers who have not prescribed second-generation antipsychotic medications. For the selected providers who did not prescribed second-generation antipsychotic

medications their data will be excluded from the sample size. No inclusion or exclusion criteria exist for nursing staff because the following project is a practice change initiative.

The lead stakeholders include the quality improvement director, director of the correctional health system for mental health services, guided and facilitated the project with APA-ADA, 2004 MSP guidelines. The associate director of nursing services was a lead stakeholder, as the nursing services were a major part of this project. The charge nurses were also stakeholders that help to facilitate this information to staff during each shift. The education intervention was provided to stakeholders during scheduled meeting and the MSP were presented. The proposed protocol was approved by correctional health system business office, were a wavier was approved to complete the quality improvement project.

Recruitment Methods

Providers

This QI project focused on providers initiating the MSP at the start of prescribing second-generation antipsychotic medications. The MSP were presented to providers' in a formal meeting. During the meeting, the providers received educational handouts describing the MSP process. No incentives were offered, as these were normal functions for the providers. A total of 30 charts of selected providers who were prescribed second generation anti-psychiatric medication were audited between May 11 and June 11 and of the 30 charts audited only two of 11 providers did prescribed second generation antipsychotic medications. The providers placed the MSP orders in the computer system, and the nursing staff validate and process the orders. The pre and post implementation was conducted within three weeks after the educational intervention. Confidentiality was maintained throughout the process for all stakeholders. A statement of confidentially were will be provided to the stakeholders.

Tool and Instrumentation

MSP

The MSP (see Appendix A) was developed using the ADA and APA 2004 guidelines. The MSP were used to provide the staff with guidance on appropriate screening measures for MS when taking second generation antipsychotics. This tool was established by the ADA and APA 2004 guidelines as standard of care and were reviewed by project team and project site.

Education Materials

The staff where provided with education on MSP in a PowerPoint presentation (see Appendix A). The PowerPoint handouts were provided to the staff during the educational session discussing metabolic syndrome and second-generation antipsychotic medications. All educational materials were approved by the project team and stakeholders at the project site prior to use.

Chart Audit Tool

A data collection and audit form were used to document the data for pre and post implementation (see Appendix B). The audit was used to assess for compliance following the implementation of the MSP, and this information where reviewed post-implementation for improvements or a lack of improvements. No statistician was utilized to conduct a comparison of the pre and post data.

Data Collection Procedures

Chart Audits/ Metabolic Syndrome Variables

A retrospective chart review was conducted, and 30 records reviewed during a period of three weeks with four days prior to implementation. Information collected included documentation of selected provider who prescribed second-generation anti-psychiatric

medications taking place prior to educational intervention and post educational intervention. The collection of data was filtered by looking at selected providers who prescribed second-generation antipsychotic medications.

Data collection begin at the start of the prescribing of second-generation antipsychotic medications, and the data were reassessed three weeks after implementation to assess for improvements with MSP compliance. These intervals are outside the timeline of the MSP and the end of the DNP program due to long process of obtaining the approved waiver.

Provider protocol compliance. The computer system was used for chart reviews to assess the compliance of the implementation of the MSP, including second generation-antipsychotic prescriptions and the appropriate initiation of early intervention measures for MS. The data that were reviewed during one period of four days prior to the educational intervention and after implementation of the MSP. No comparison of the data was made since the data was pulled in one single review after the MSP implementation. The data could not assess for improvements or a lack of improvement in documentation, as well as changes to prescribed second-generation medications. The review examined if selected provider prescribed second generation antipsychotic medications and MSP were implemented by reviewing if labs were needed; if labs were ordered; patient weights, body mass index, was completed and documented (Velligan et al., 2013).

Intervention/Project Timeline

This DNP project was approved at the end of the DNP Project II course in October 26, 2018. In the anticipated timeline, the project was completed outside the timeline with approval of DNP program faculties. This MSP timeline will proceed as follows:

- Week 1 of DNP Project III May 11th through May 15th Recruitment and staff education completed: MSP recruitment and staff education were conducted during staff meetings. Educational materials from the American Diabetic Association and the American Psychiatric Association were presented at the staff meetings for educational purposes and recruitment sessions.
- Week 2 of the DNP Project III May 16th through May 24th: Start the MSP implementation; Providers start placing MSP orders and the nurses' process those orders, begin the data collection for inmates who have been prescribed second-generation antipsychotic medications.
- Week 3 of the DNP Project III May 25th through June 11: Continue the data collection Prepare for data analysis in week 3.
- The analysis was completed using excel to assess the effectiveness of educational intervention and ready to be presented to DNP faculty by June 25th. The data was pulled by the project site quality improvement lead and evaluation report of the data was sent to DNP student.

Ethics and Human-Subject Protection

The following initiative is a QI project and did not require formal IRB review. Project data analysis included analyzing compliance of the MSP implementation through a chart review. Projects that are deemed QI initiatives did not require IRB approval by TUN. The IRB determination forms per TUN policy were submitted. The project was submitted to the facility research coordinator at the projects site for approval after approved by DNP project team. Project were submitted to the facility research coordinator at the project site who made determination for the QI project to move forward to quality improvement department. This QI project presented no risk to staff members or inmates, as it was a quality improvement initiative that was

integrated into standard care. The benefits include early assessment and intervention targeting MS. No compensation was provided to staff members in exchange for their involvement in this project, as this is a process-improvement action. Staff members' privacy and confidentiality were maintained, and no names or any identifiers were used during the data collection; participants are identified by numbers. This data was in a secure area and only an evaluation of the data reported was released. The actual data remain accessible to only the project lead and quality improvement lead.

Analysis of Results

The data that were analyzed focused on inmate's hemoglobin A1C and lipid profiles and weight to follow the 2004 APA-ADA guidelines for second-generation abnormalities. The months reviewed ranged from May 11, 2019, to June 11, 2019. These records were selected based on prescribed second-generation antipsychotic medications. The data were selected from one housing area in the correctional facility within the same period. The data were reviewed from chart documentation.

The aim of this project was to implement MSP per national guidelines to improve providers' adherence to national guidelines when prescribing second-generation antipsychotic medications to inmates incarcerated in the correctional system. A total of 30 patients' records were retrieved and only two records were noted as compliant with MSP guidelines after the educational intervention. The other 28 records did not have any second-generation antipsychotic medication prescribed although this was warranted under the protocol. The intervention process was to assess the outcomes of compliance among providers implementing the MSP. A group of 11 providers names were identified to participate in the educational intervention, but only two of 11 providers received the educational intervention. **T**he Fisher's *t*-test could not be completed

due to the limited time given for comparison post intervention and the one sample *t*-test was utilized for the analysis of the data.

The SPSS software was used for the analysis of the data, which comprised the 30 records selected May 11 for the pre-educational intervention and June 11 for the post educational intervention There were no significant statistical relationship found with pre and post educational intervention (P-value of >0.05).

One-Sample Statistics

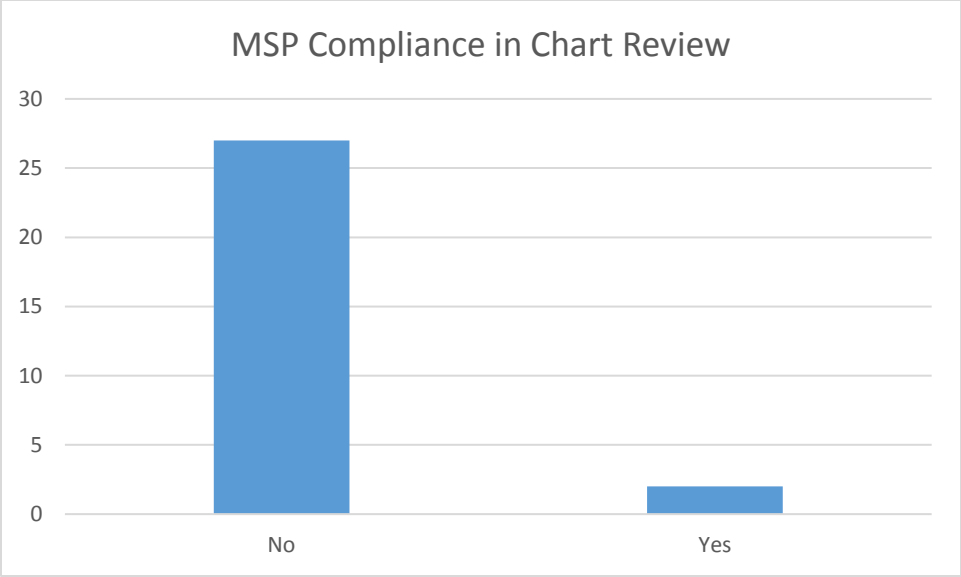
	N	Mean	Std. Deviation	Std. Error Mean
MSPT	2	1.50	.707	.500
MSPI	2	1.50	.707	.500

One-Sample Test

	Test Value = 11					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
MSPT	-19.000	1	.033	-9.500	-15.85	-3.15
MSPI	-19.000	1	.033	-9.500	-15.85	-3.15

MSPT: Metabolic Screening Protocol Training; MSPI: Metabolic Screening Protocol Intervention

The 30 records that were reviewed indicated that two charts had prescribed second generation antipsychotic medications within the implementation time period (Appendix B). This revealed that 2/30 patients or 6% of charts audited were compliant with the MSP.



Discussion of Findings

The focus of this project was implementing the MSP to answer the project question: Will the implementation of an MSP for inmates prescribed second-generation antipsychotic medications improve providers' prescriptive practices, monitoring, early intervention, and identification of the risk factors for metabolic syndrome? The results from the interventions showed no significant relationship with the implementation of the MSP after the educational intervention ($p > .05$). The objectives of this quality improvement project were met through project implementation and include designing and implementing an evidenced-based MSP aimed at inmates taking second-generation antipsychotic medications and to providing the appropriate education for correctional facility staff and clinic staff administering the protocol. This protocol was employed to standardize providers' care approaches regarding MS in accordance with evidence-based practice. The analysis was conducted in a way that was consistent with the project objectives to implement evidenced based MSP aimed at inmates taking second-generation antipsychotic medications and providing the appropriate education to providers' administering the MSP. The pre- and post-intervention had a total of 30 records that were

reviewed. The implementation of the MSP showed no significant change, with providers implementing the MSP national guidelines at the time of the prescription of the second-generation antipsychotic medications ($p > .05$). The 30 records that were reviewed indicated that only two of the 11 providers, or approximately 18% of providers, had prescribed second-generation antipsychotic medications within the implementation time period. The educational interventions did not have an impact within the project's timeframe.

Significance and Implications for Nursing

The implementation of the MSP could help decrease the number of inmates with diabetes by implementing changes to prescribed second-generation antipsychotic medications. As noted earlier, the use of antipsychotic medications has increased in the United States (Rhee, Mohamed, & Rosenheck, 2018). According to the Federal Drug Administration, costs related to second-generation antipsychotic use increased by $16,000,000 between 2006 and 2015 due to an increase in prescription of those medications (Cotes et al., 2015). This cost increase could have a direct impact on nursing by creating a need to increase staffing to meet the demands of inmates who have developed MS. MS creates a negative impact not only by causing diabetes but also by increasing the risk of developing cardiovascular disease. This heightened risk could also have an indirect impact on nursing by increasing medical visits, thereby requiring nurses to triage inmates prior to their medical visits. Inmates who become overweight are at a higher risk of cardiovascular disease and type 2 diabetes than other inmates (Leddy, Schulkin, & Power, 2009). Riordan, Antonini, and Murphy (2011) identified the cardiometabolic and endocrine constituents of MS and showed that this condition is associated with considerable medical costs due to complications. Ongoing monitoring of patients' simple laboratory and clinical measures could decrease the occurrence of important adverse events in multiple organ systems and could

ultimately improve patients' quality of life and reduce health-care costs (Riordan, et al., 2011). The costs arising from chronic diseases have been estimated as 17% of health-care expenditures, and individuals with such diseases have poor quality of life. Health-care organizations are attempting to control costs while also improving productivity (White, Lenz, Skrabal, Skradski, & Lipari, 2018). In another review, Subramanian, Midha, and Chellapilla (2017) estimated the national annual cost of type 2 diabetes care at $245 billion, with patients spending an average of $8,000 per year on medical expenses. In addition, prescreening and monitoring are recommended, as they reduce overall costs in the health-care system (Subramanian et al., 2017). The hope is that the MSP implementation increases compliance among providers and improves early detection of MS, thereby decreasing costs related to nursing and medical services while improving inmates' care outcomes. Although there are many potential benefits to implementing the MSP in the inmate population, it was determined that in the timeframe of this DNP Project, there was no significant change in practice seen. As a result, this effect could not be evaluated based on the analysis of the available data.

Limitations

This QI project has several limitations. Several delays in implementation occurred due to restrictions and regulatory guidelines at the prison. Delays over several months, required revisions to the project, and restrictions on analysis methods based on the recommendations of the prison site's QI committee occurred.

Data analysis for this QI project also has several limitations. The data analysis occurred over three weeks between the pre-educational intervention and the post intervention data review. This process did not allow enough time to obtain a sufficient sample for analysis of the data. The

actual data reported was an evaluation of the analyzed data which was accessed only by QI committee lead due to recommendations of the QI committee at the prison.

Several internal prison changes occurred during the timeframe of the DNP Project implementation which created limitations to this project. The project plan dictated that the project occur at two detention centers; instead, it was only completed in one detention center due to a new electronic computer-system change that occurred at the time of the intervention. Initially, a total of 11 mental-health providers were identified to be part of the project, but only two providers from one housing area participated in the educational intervention.

Dissemination

This DNP Project will be further disseminated at the project site after the timeframe of this DNP Project. The plan is to disseminate the MSP guidelines to all providers and other stakeholders in the correctional health system in the coming months. The nursing department has agreed to post a copy of the MSP guidelines for nurses in the staff-care area. The project lead will make herself available to attend any discussions concerning MSP guidelines. Luger and Ford 2019 state all participants took on a new role with this education and adaptive behaviors suggest a level of change was occurring with participants. Melnyk (2014) suggest nursing and the other health sciences professions have long suggested solutions for how to improve health care and the health of our nation.

This project will be further disseminated through a poster presentation and repository submission. A poster will be submitted to the American Psychiatric Nursing Association Conference in January of 2020. Additionally, this project will be further disseminated through the DNP Project repository at dnpprojects.org.

Sustainability

The MSP may be a sustainable intervention although its permanent adoption has been met with some barriers. The project site is in the process of implementing a new electronic health-record system, and the recommendation will be revisited at a within six months. Recommendations were made to project site leadership for consideration to implement the MSP guidelines into the computer system as a permanent protocol. Additionally, the MSP guidelines were submitted to the pharmacy chief for consideration, and this information will be part of monthly distribution list for inmates on second-generation antipsychotic medications.

Conclusion

The providers who participated in the pre-educational intervention understand that MSP guidelines provide a guide for safe patient care outcomes. The main focus of this MSP project was to educate the mental-health providers about implementing these national guidelines at the time of prescribing second-generation antipsychotic medications that will ultimately improve patient care outcomes. This project proved the importance of providers focusing on the implementation of initial MSP guidelines, which serves as early detection for metabolic syndrome development.

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Appendix A

Metabolic Screen Protocol

Purpose: The purpose of this protocol is to guide providers and supporting staff in the medical care of Inmates receiving second generation antipsychotic medications in screening for metabolic syndrome.

Objectives:

This Metabolic Screening Protocol will serve to:

A) Guide medical screening for metabolic syndrome in patients prescribed second-generation antipsychotic medications.

B) Guide timing and frequency of order placement in patients prescribed second-generation antipsychotic medications.

C) Provide guidance in diagnosing metabolic syndrome in patients receiving second-generation antipsychotic medications.

D) Provide an algorithm for care choices if patients developing signs and symptoms of metabolic syndrome.

Indications: Inmates prescribed second generation antipsychotic medications.

Contraindications: Inmates who are not prescribed second-generation antipsychotic medications.

Steps:

1. Providers should screen all new patients for medication regimens.
2. Where possible, second generation antipsychotic medications should be avoided. Alternatives to this therapy include Non-second-generation antipsychotic medications or mediations stated in MSP algorithm with decreased risk associated with MS.

3. Providers should examine second generation antipsychotic medications and make appropriate clinical decisions according to ADA-APA guidelines which are detailed in the table below:

Second Generation Antipsychotics and metabolic abnormalities

Drug	**Weight gain**	**Risk for diabetes**	**Worsening lipid profile**
Clozapine	+++	+	+
Olanzapine	+++	+	+
Risperidone	++	D	D
Quetiapine	++	D	D
Aripiprazole*****	+/–	–	–
Ziprasidone*****	+/–	–	–

ADA-APA (2004)

- + = increase effect; – = no effect; D = discrepant results.
- * Newer drugs with limited long-term data.

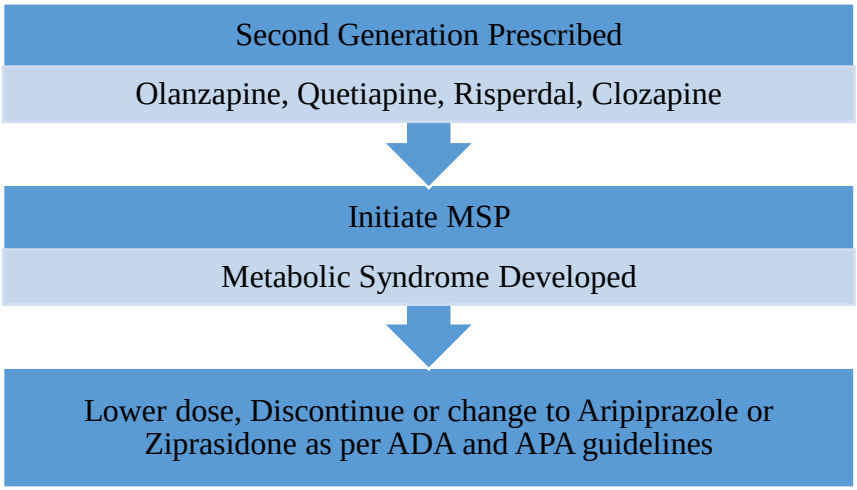
4. If second generation antipsychotic medications have been prescribed, MSP should be initiated.
    a. Baseline data to be collected when second-generation antipsychotic medications are prescribed and personal history could be collected at baseline and at any interval to quarterly.
    b. Patient data collection frequency and timing is detailed below:

	Baseline	4 weeks	8 weeks	12 weeks	Quarterly	Annually	Every 5 Years	
*Personal History	X	X	X	X	X			
Weight (BMI)	X							
Waist Circumference	X					X		

Blood Pressure	X			X		X		
Fasting Glucose	X			X		X		
Fasting Lipids	X			X			X	

c. If no abnormal changes; Waist circumference, blood pressure, fasting Glucose and Fasting Lipids will be collected annually.
d. If abnormal changes occur, the MSP Algorithm A recommended for implementation

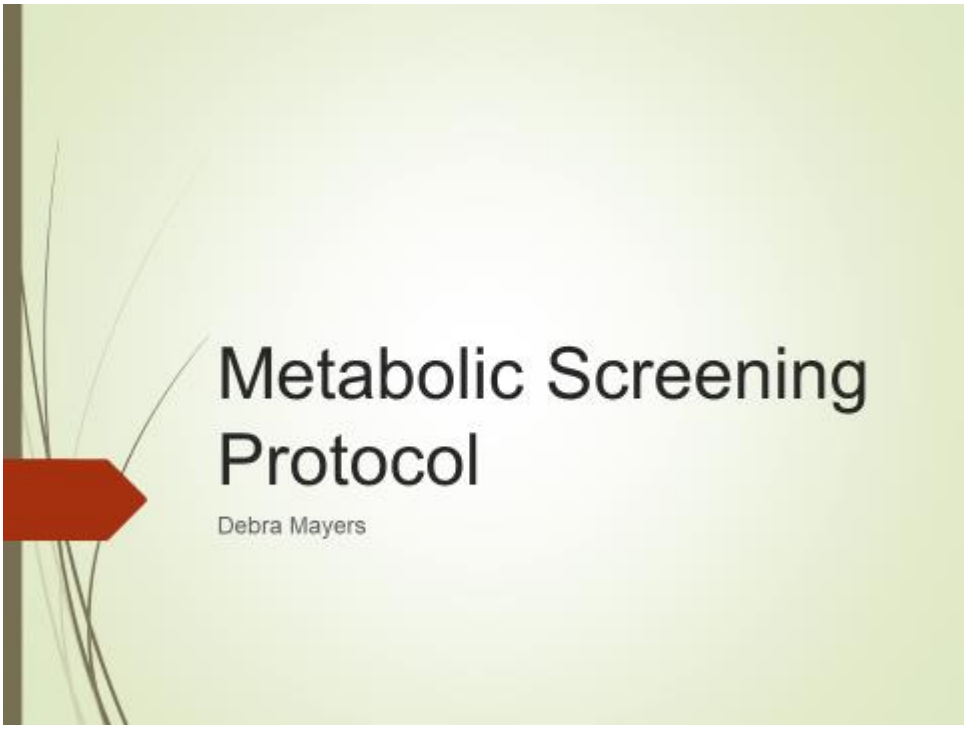
Metabolic Screening Protocol Algorithm A

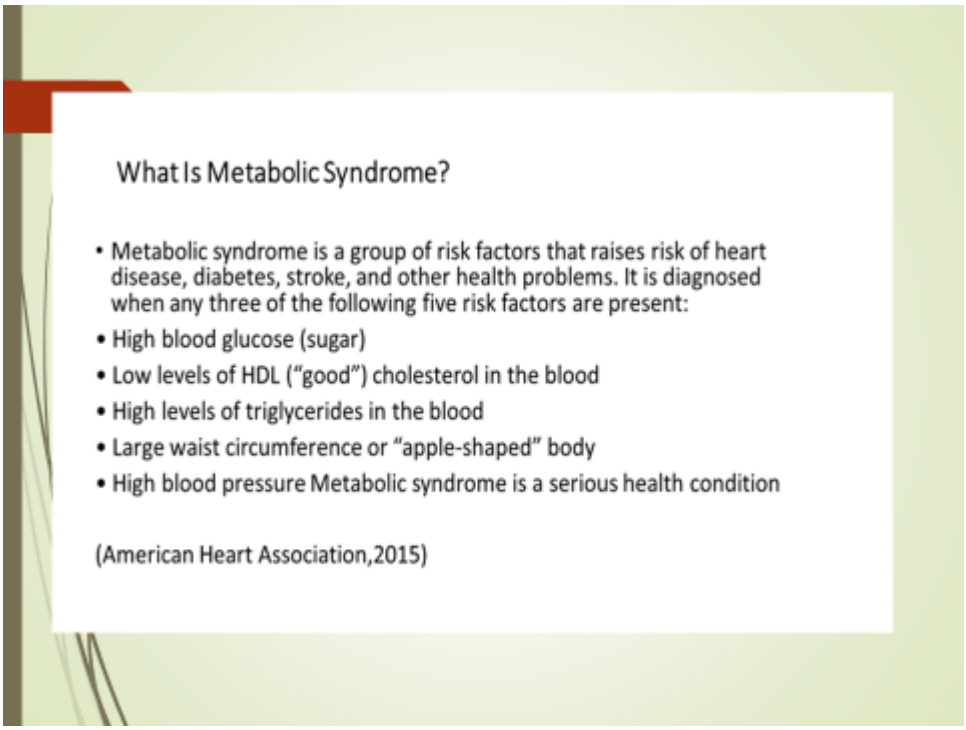


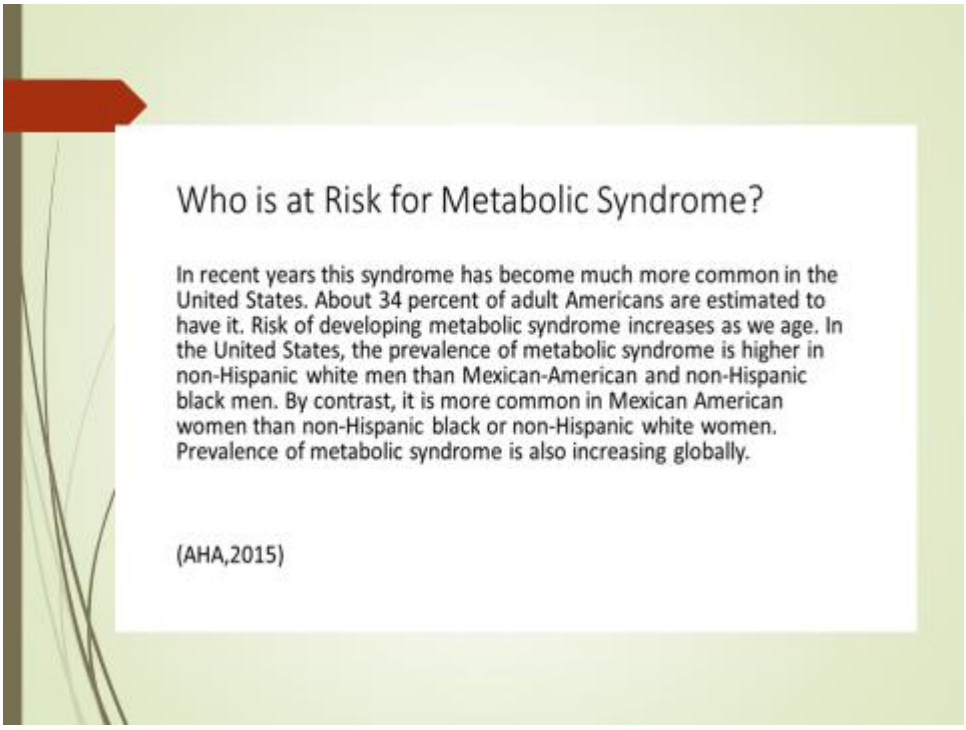
(Lim & Eckel, 2014).

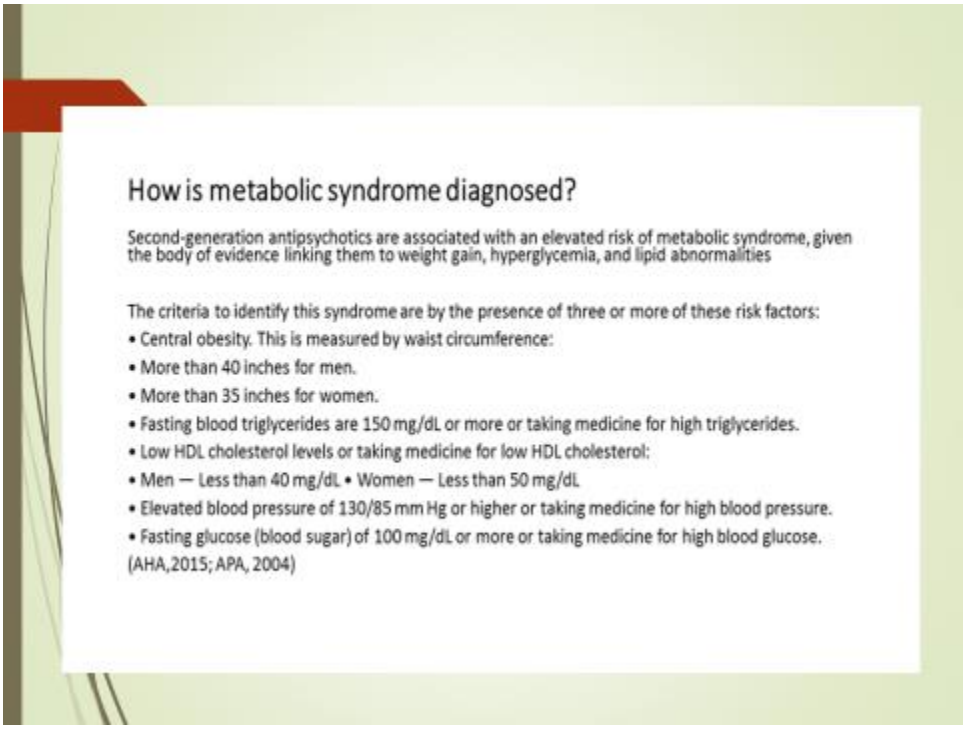
Appendix A

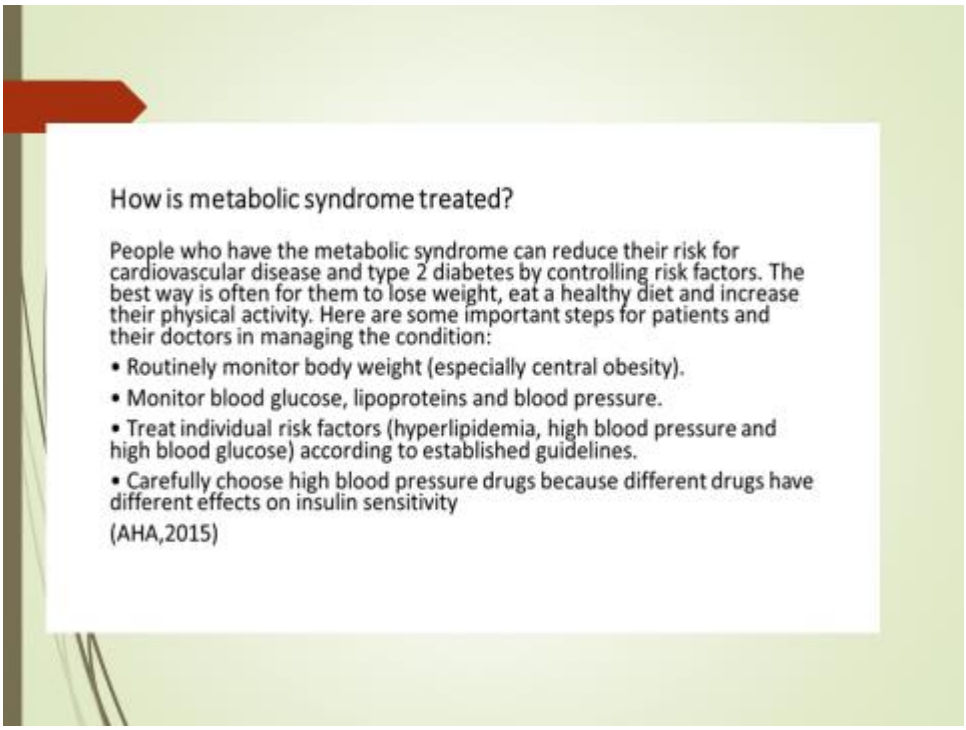
Educational Materials: The staff will be provided education on approved protocol and ADA information on Metabolic Syndrome.

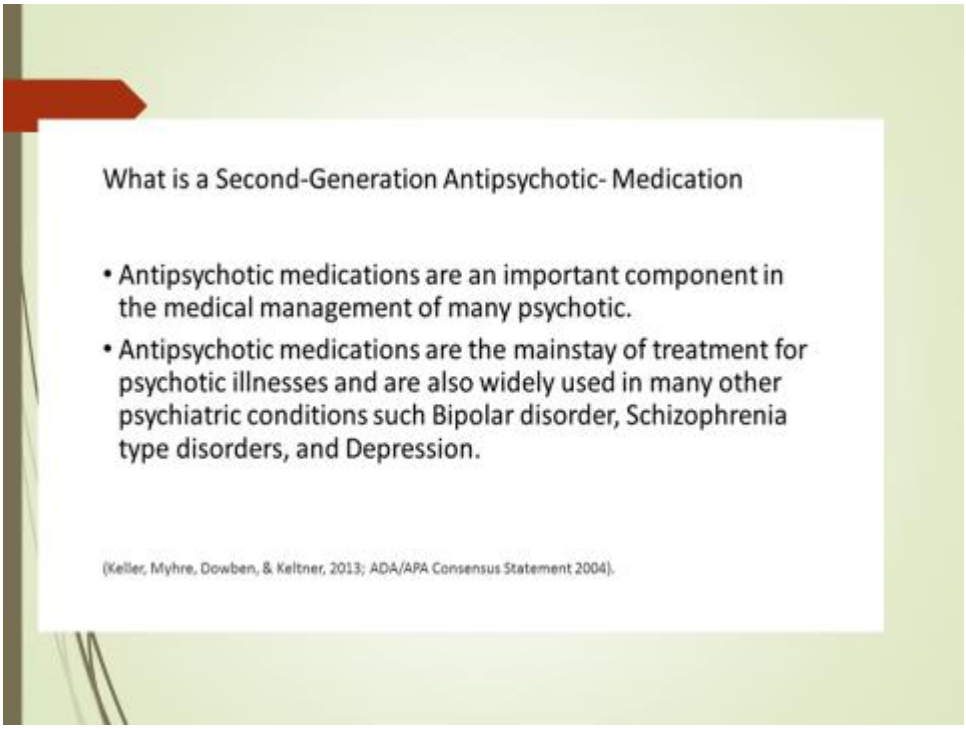


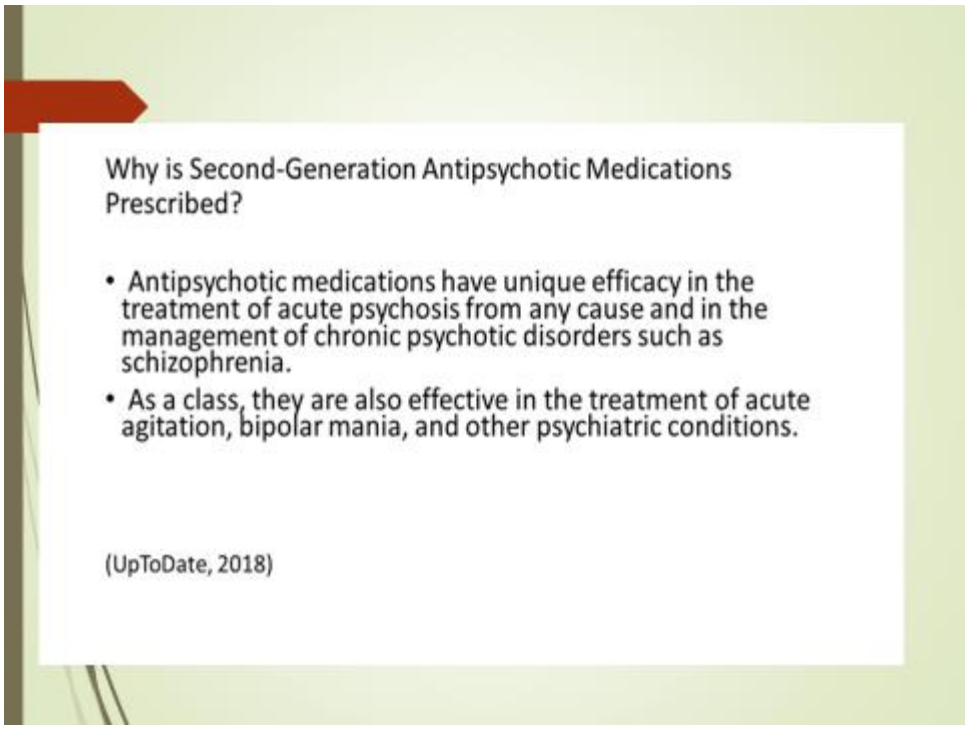


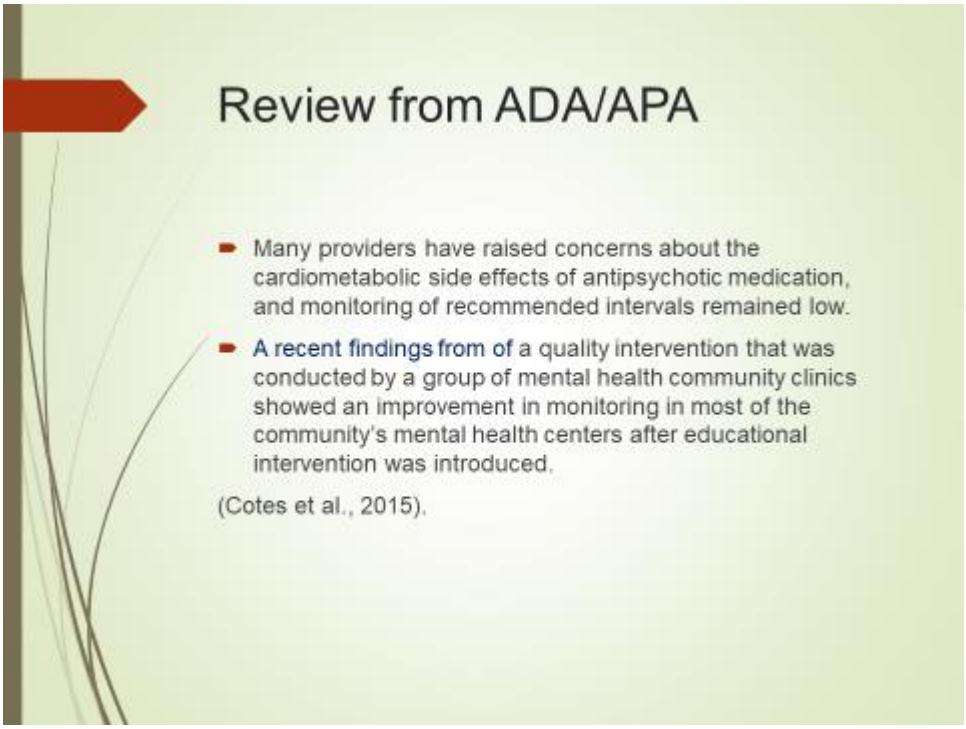

Who is at Risk for Metabolic Syndrome?
In recent years this syndrome has become much more common in the United States. About 34 percent of adult Americans are estimated to have it. Risk of developing metabolic syndrome increases as we age. In the United States, the prevalence of metabolic syndrome is higher in non-Hispanic white men than Mexican-American and non-Hispanic black men. By contrast, it is more common in Mexican American women than non-Hispanic black or non-Hispanic white women. Prevalence of metabolic syndrome is also increasing globally.
(AHA,2015)

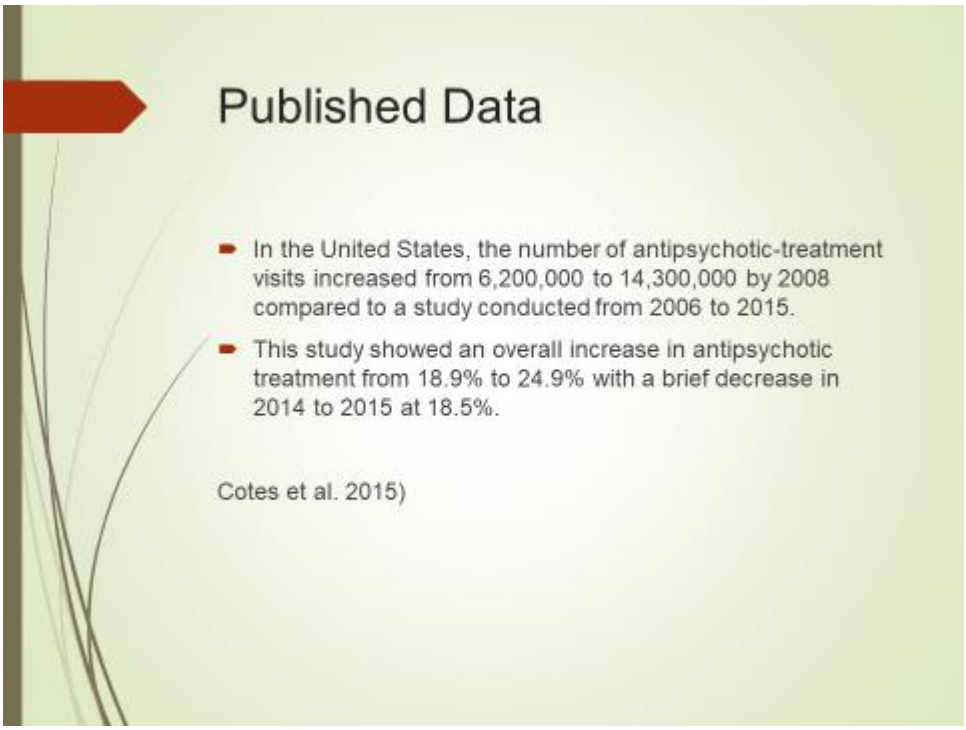

How is metabolic syndrome diagnosed?
Second-generation antipsychotics are associated with an elevated risk of metabolic syndrome, given the body of evidence linking them to weight gain, hyperglycemia, and lipid abnormalities
The criteria to identify this syndrome are by the presence of three or more of these risk factors:
• Central obesity. This is measured by waist circumference:
• More than 40 inches for men.
• More than 35 inches for women.
• Fasting blood triglycerides are 150 mg/dL or more or taking medicine for high triglycerides.
• Low HDL cholesterol levels or taking medicine for low HDL cholesterol:
• Men — Less than 40 mg/dL • Women — Less than 50 mg/dL
• Elevated blood pressure of 130/85 mm Hg or higher or taking medicine for high blood pressure.
• Fasting glucose (blood sugar) of 100 mg/dL or more or taking medicine for high blood glucose.
(AHA,2015; APA, 2004)

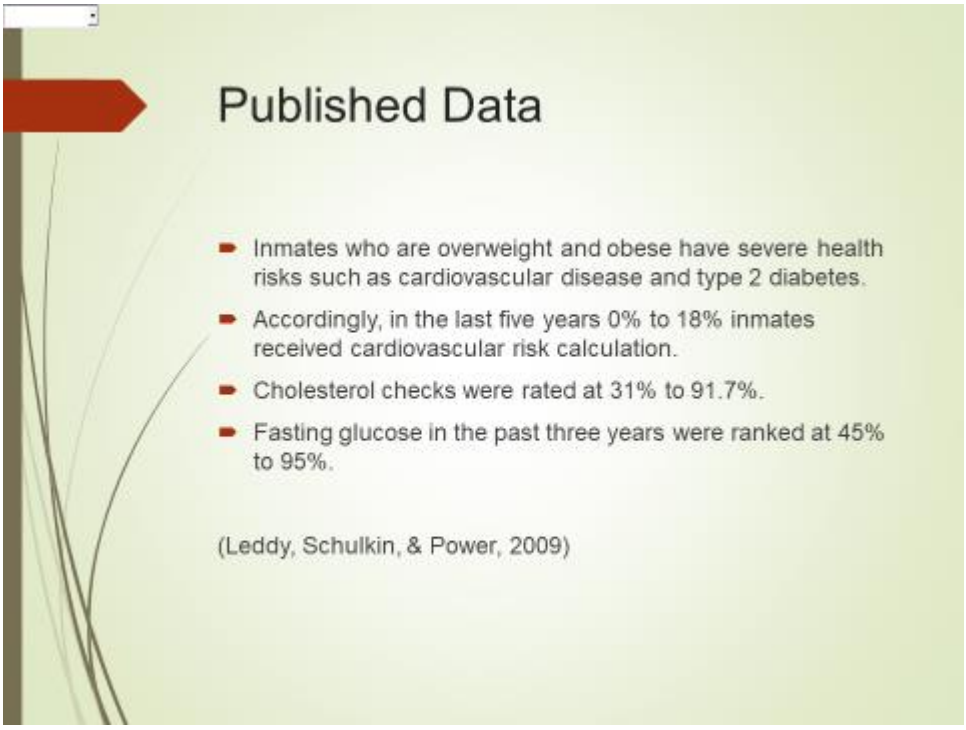

How is metabolic syndrome treated?
People who have the metabolic syndrome can reduce their risk for cardiovascular disease and type 2 diabetes by controlling risk factors. The best way is often for them to lose weight, eat a healthy diet and increase their physical activity. Here are some important steps for patients and their doctors in managing the condition:
• Routinely monitor body weight (especially central obesity).
• Monitor blood glucose, lipoproteins and blood pressure.
• Treat individual risk factors (hyperlipidemia, high blood pressure and high blood glucose) according to established guidelines.
• Carefully choose high blood pressure drugs because different drugs have different effects on insulin sensitivity
(AHA,2015)


What is a Second-Generation Antipsychotic- Medication
• Antipsychotic medications are an important component in the medical management of many psychotic.
• Antipsychotic medications are the mainstay of treatment for psychotic illnesses and are also widely used in many other psychiatric conditions such Bipolar disorder, Schizophrenia type disorders, and Depression.
(Keller, Myhre, Dowben, & Keltner, 2013; ADA/APA Consensus Statement 2004).

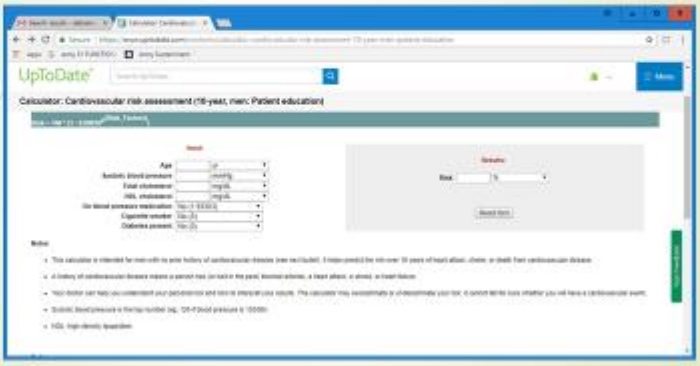

Why is Second-Generation Antipsychotic Medications Prescribed?
• Antipsychotic medications have unique efficacy in the treatment of acute psychosis from any cause and in the management of chronic psychotic disorders such as schizophrenia.
• As a class, they are also effective in the treatment of acute agitation, bipolar mania, and other psychiatric conditions.
(UpToDate, 2018)


Review from ADA/APA
Many providers have raised concerns about the cardiometabolic side effects of antipsychotic medication, and monitoring of recommended intervals remained low.
A recent findings from of a quality intervention that was conducted by a group of mental health community clinics showed an improvement in monitoring in most of the community's mental health centers after educational intervention was introduced.
(Cotes et al., 2015).


Published Data
In the United States, the number of antipsychotic-treatment visits increased from 6,200,000 to 14,300,000 by 2008 compared to a study conducted from 2006 to 2015.
This study showed an overall increase in antipsychotic treatment from 18.9% to 24.9% with a brief decrease in 2014 to 2015 at 18.5%.
Cotes et al. 2015)


Published Data
Inmates who are overweight and obese have severe health risks such as cardiovascular disease and type 2 diabetes.
Accordingly, in the last five years 0% to 18% inmates received cardiovascular risk calculation.
Cholesterol checks were rated at 31% to 91.7%.
Fasting glucose in the past three years were ranked at 45% to 95%.
(Leddy, Schulkin, & Power, 2009)

Cardiovascular risk Calculation

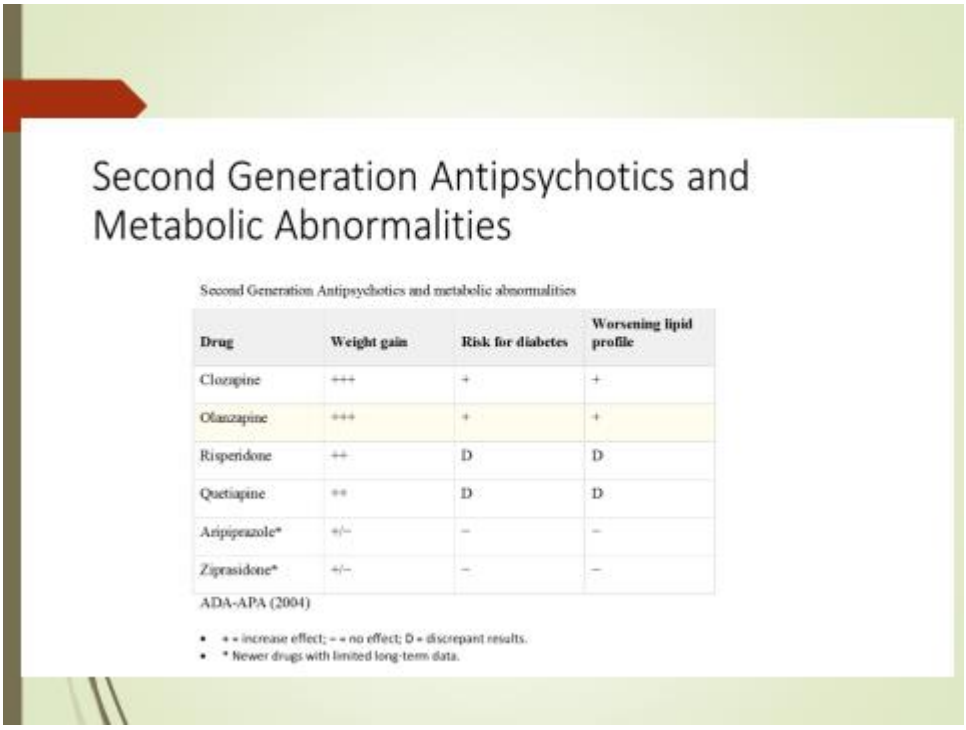


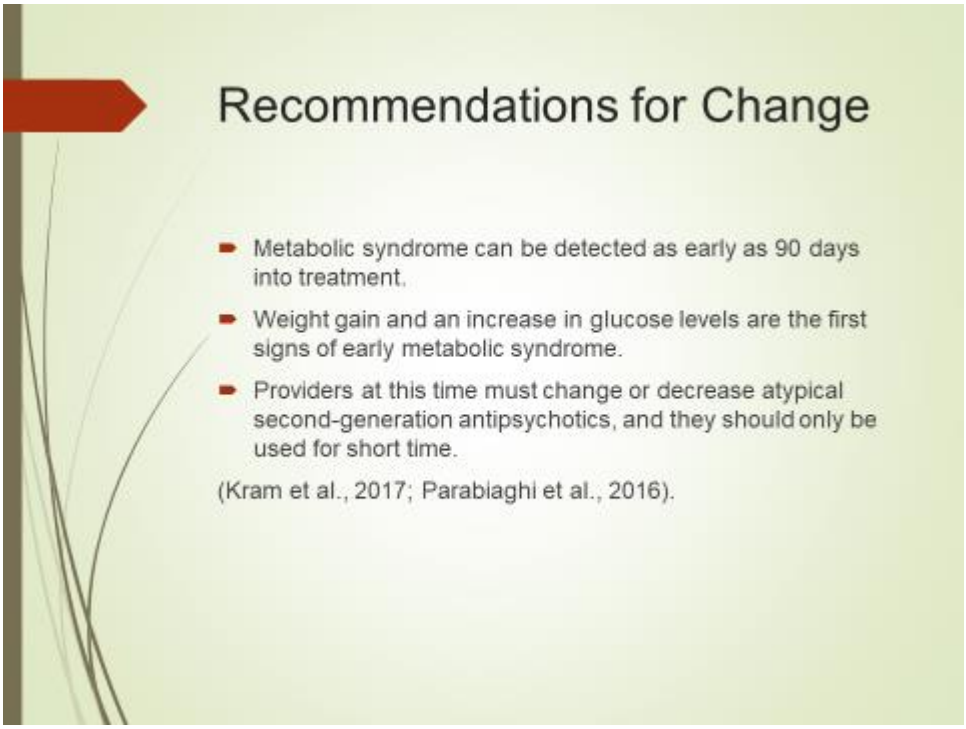
Baseline Screening Data for Metabolic Screening Protocol

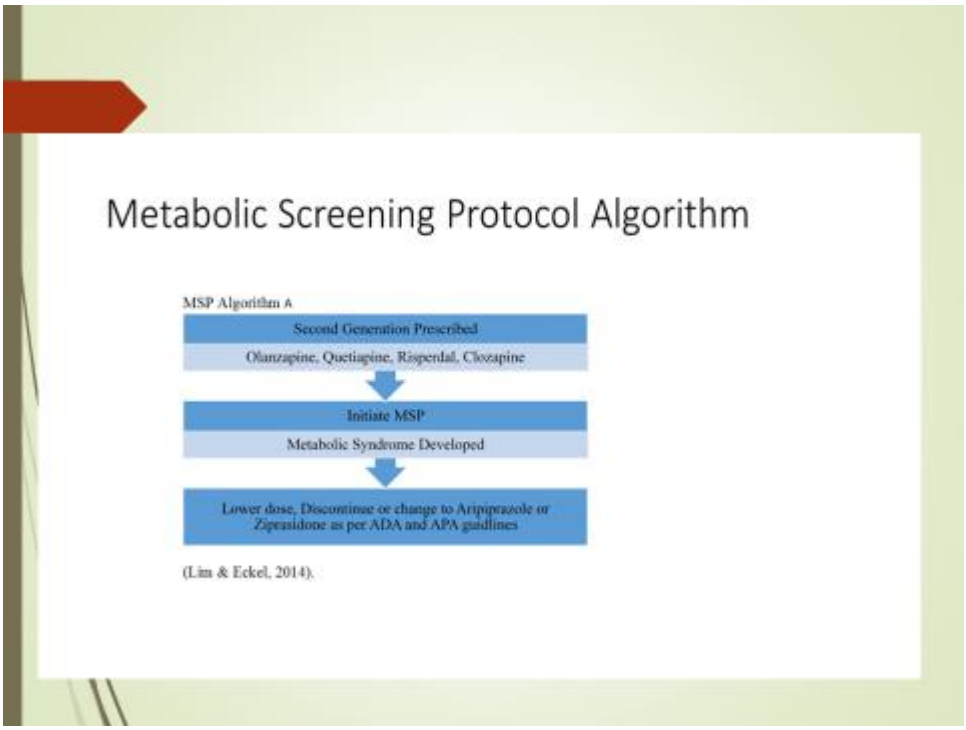
1. Providers should initiate metabolic screening evaluations at the following intervals:

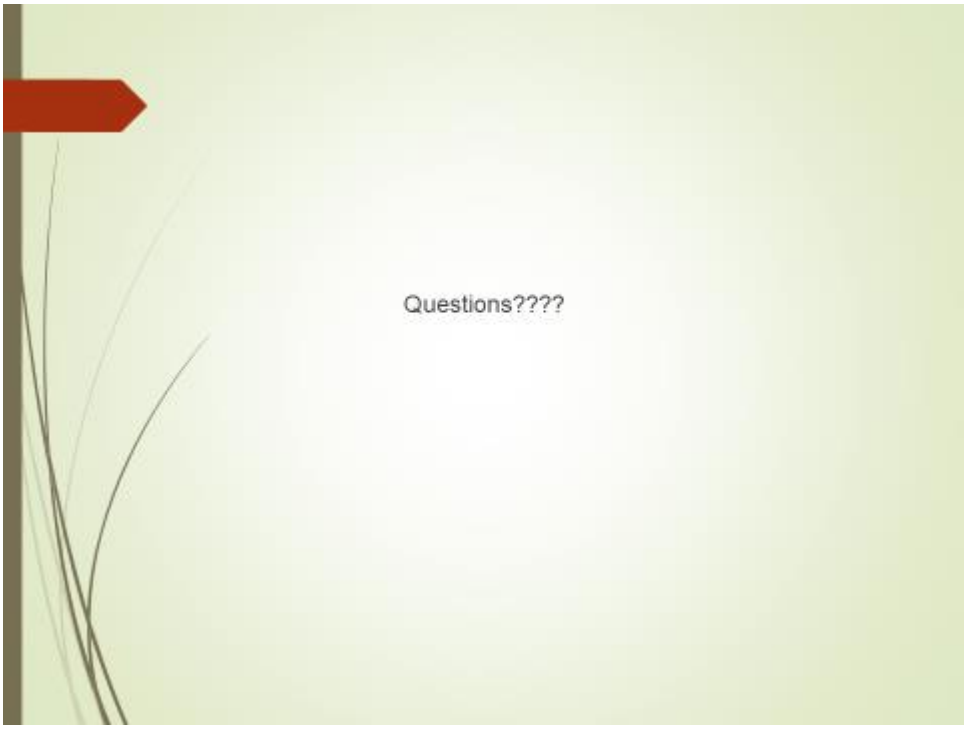
	Baseline	4 weeks	8 weeks	12 weeks	Quarterly	Annually	Every 5 Years	
*Personal History	X	X	X	X	X			
Weight (BMI)	X							
Waist Circumference	X					X		
Blood Pressure	X			X		X		
Fasting Glucose	X			X		X		
Fasting Lipids	X			X			X	

ADA-APA Consensus Guidelines (2004)
*Personal and family history of obesity, diabetes, hypertension, and cardiovascular disease BMI = Body Mass Index.

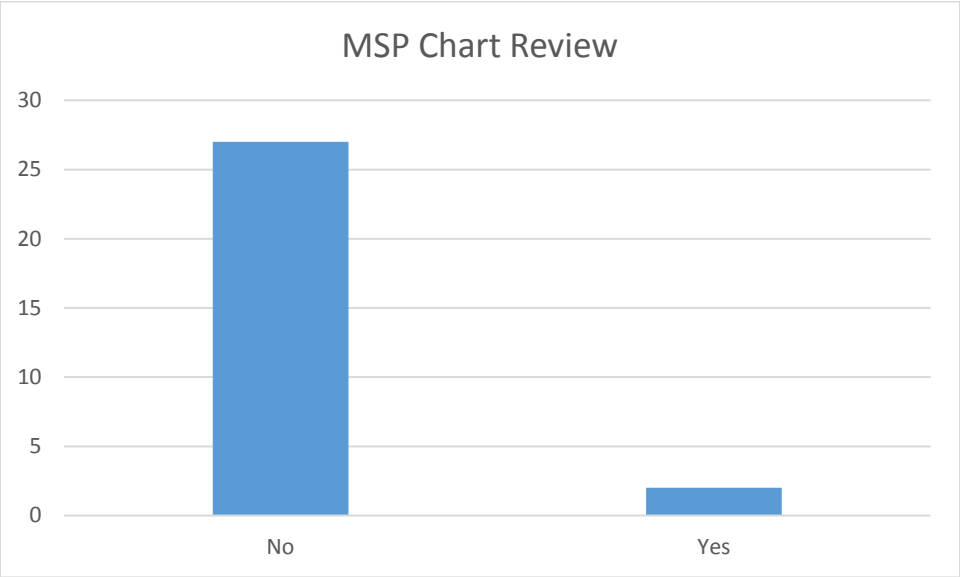

Second Generation Antipsychotics and Metabolic Abnormalities
Second Generation Antipsychotics and metabolic abnormalities
Drug | Weight gain | Risk for diabetes | Worsening lipid profile
Clozapine | +++ | + | +
Olanzapine | +++ | + | +
Risperidone | ++ | D | D
Quetiapine | ++ | D | D
Aripiprazole* | +/− | − | −
Ziprasidone* | +/− | − | −
ADA-APA (2004)
+ = increase effect; − = no effect; D = discrepant results.
* Newer drugs with limited long-term data.


Recommendations for Change
Metabolic syndrome can be detected as early as 90 days into treatment.
Weight gain and an increase in glucose levels are the first signs of early metabolic syndrome.
Providers at this time must change or decrease atypical second-generation antipsychotics, and they should only be used for short time.
(Kram et al., 2017; Parabiaghi et al., 2016).


Metabolic Screening Protocol Algorithm
MSP Algorithm A
Second Generation Prescribed
Olanzapine, Quetiapine, Risperdal, Clozapine
Initiate MSP
Metabolic Syndrome Developed
Lower dose, Discontinue or change to Aripiprazole or Ziprasidone as per ADA and APA guidlines
(Lim & Eckel, 2014).


Questions????

Appendix B



Second-Generation Antipsychotics

Data Number	SGAs Prescribed	MSP Initiated	Data Included
1	No	No	No
2	No	No	No
3	No	No	No
4	No	No	No
5	No	No	No
6	No	No	No
7	No	No	No
8	No	No	No
9	No	No	No
10	No	No	No
11	No	No	No
12	No	No	No
13	No	No	No
14	No	No	No
15	No	No	No
16	No	No	No
17	No	No	No
18	No	No	No
19	No	No	No
20	No	No	No
21	No	No	No
22	No	No	No
23	No	No	No
24	No	No	No

25	No	No	No
26	No	No	No
27	No	No	No
28	No	No	No
29	Yes	Yes	Yes
30	Yes	Yes	Yes

Note. MSP = Metabolic Screening Protocol; SGA = second-generation antipsychotic.