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Provider Adherence to Prescribing the Elimination Diet

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PROVIDER ADHERENCE TO PRESCRIBING THE ELIMINATION DIET

by

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Abstract

Allergy-related diseases, chemical sensitivities, and food intolerances have increased dramatically over the last 20 years in both the pediatric and adult populations, contributing to escalating rates of morbidity. Despite an abundance of literature supporting the negative impact food reactions can have in multiple disease states, food reactions continue to be seen as a modern enigma in medicine and are often met with great skepticism. There are a variety of interventions available to identify food reactions in both adults and children; yet, the traditional elimination diet remains the standard of care. Regardless of its utility and clinical effectiveness in the healthcare setting, the elimination diet is significantly underutilized by healthcare practitioners. The purpose of this project was to improve provider adherence rates with prescribing the elimination diet for patients with select diagnoses supported in the literature. The project was implemented in a Functional Medicine Clinic in Austin, Texas, with the goal of increasing adherence with prescribing the elimination diet in select patients from the current rate of 17% to over 80%. The project's interventions included creating a patient user-friendly elimination diet teaching guide for patients and electronic medical record integration to aid practitioners in prescribing and documenting the intervention. Implementing holistic, safe, cost-effective evidence-based interventions like the elimination diet to improve patient outcomes demonstrate how the Doctor of Nursing Practice prepared the Advanced Practice Registered Nurse to utilize their skills, knowledge, and experience to transform the future of healthcare.

Keywords: elimination diet, functional medicine, food allergy, guideline adherence

Overview of the Problem

The U.S. healthcare system has witnessed a variety of changes over the last couple of decades that have created unique challenges for individuals and organizations that provide health services. The nation's population is rapidly expanding and medical conditions are becoming increasingly complex. The implementation of the 2010 Affordable Care Act provided additional insurance coverage to millions of Americans, placing additional demands on an already burdened healthcare system with several insufficiencies (Fontenot, 2015).

Allergy-related diseases, chemical sensitivities, and food intolerances have placed an immense strain on our healthcare system over the last 20 years with prevalence rates that have dramatically increased in all ages contributing to escalating rates of morbidity (Genuis, 2010). Symptoms of food allergies, sensitivities, and intolerances manifest in a variety of systems throughout the body ranging in severity and presentation. Food reactions affect (a) the gastrointestinal tract causing abdominal pain, diarrhea, and constipation; (b) the skin causing eczema, erythema, rashes, and itchiness; and (c) the mucosa of the eyes, nose, and the pulmonary system, causing wheezing, coughing, and respiratory distress (Ohtsuka, 2015). Food reactions are also associated with neurological manifestations, such as migraines and behavioral disturbances, anxiety, ADHD, and autism spectrum disorders (Pennesi & Klein, 2012). Despite an abundance of literature supporting the negative impact food reactions can have in multiple disease states, food reactions continue to be seen as modern enigmas in medicine viewed in many scientific circles with great skepticism (Nelson & Ogden, 2008). There are several serum antibody tests and skin prick allergy tests available to identify food reactions in adults and children; yet, the traditional elimination diet remains the standard of care and the most effective tool to identify food reactions.

The elimination diet removes core groups of potentially inflammatory foods from an individual's diet for several weeks to see if problematic symptoms or behaviors resolve (Kagalwalla et al., 2006). The elimination diet is a non-invasive and cost-effective intervention that improves patient outcomes in a variety of acute and chronic health conditions. Despite its utility and clinical effectiveness in the healthcare setting, adherence with prescribing the elimination diet is very poor among healthcare providers, much of which likely stems from insufficient practitioner knowledge regarding nutrition and time restraints in the clinic setting, preventing appropriate patient education (Pennesi & Klein, 2012). A comprehensive microsystems assessment and needs assessment were performed in a Functional Medicine Clinic that revealed poor provider adherence with prescribing the elimination diet in patients with a high potential of benefiting from the intervention.

Problem Statement and General Aim

The problem addressed in this project was poor practitioner adherence with prescribing the elimination diet. The aim of this quality improvement project was to increase provider adherence with prescribing the elimination diet in appropriate patients in a Functional Medicine Clinic. The process began with identifying patients who have an International Statistical Classification of Diseases and Related Health Problems (ICD)-10 diagnosis of Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90). The process ended with the health practitioner prescribing the elimination diet before the completion of the initial patient appointment. By working on this process, the goal was to reduce morbidity in patients utilizing this cost-effective non-invasive intervention, while at the same time increasing provider knowledge of the many benefits that can be achieved through using the elimination diet within the practice. It was important to work on this issue now

because failing to prescribe the elimination diet in a Functional Medicine Clinic can result in providers overlooking food intolerances as a potential source of patient symptoms. These factors will ultimately have a negative influence on both patient satisfaction and the practices viability.

Specific Objectives

I. By July 5, 2017, all of the clinic's providers (two nurse practitioners) were to:
   A. Increase their knowledge about the elimination diet and what patients would benefit from the intervention through a 60-minute face-to-face evidence-based training session.
   B. Increase their knowledge on how to appropriately document and distribute resources on the elimination diet through a 60-minute face-to-face training session.

II. By August 15, 2017, providers were to:
   A. Document the prescribing of the elimination diet in at least 80% of appropriate patients.
   B. Distribute educational handouts to 80% of the patients who are prescribed the elimination diet.

III. By August 15, 2017, provider adherence with prescribing the elimination diet in appropriate patients with select diagnoses will increase from the current adherence rate of 17% to over 80%.

Benchmarks

Benchmarking in healthcare is a management approach for implementing the best practices at the best cost. A unique characteristic of benchmarking is the fact that it is an individual component of a comprehensive policy of continuous quality improvement (Ettorchi-

Tardy, Levif, & Michel, 2012). In regard to this quality improvement project, the literature does not provide benchmarks for utilizing the elimination in clinical practice.

Background of Problem

Understanding the medical model that the Functional Medicine Clinic adhered to was essential to comprehend the significance of the clinical problem being explored. In the early 1900s, Thomas Edison predicted, "the physician of the future will give no medicine, but will interest his patients in the care of the human frame, in diet and the cause and prevention of disease" (Mann, Gaylord, & Norton, 2004, p. 2). Although this prediction has not completely materialized, society's interest in alternative medicinal practices has expanded at exponential rates opening up new opportunities for healthcare providers. A particular medical paradigm that has sought to reach social demands and overcome many of the discrepancies in our current healthcare system is Functional Medicine. Functional Medicine is a medical model that incorporates the latest in genetic science, systems biology, and the understanding of how environmental and lifestyle factors impact the emergence and progression of disease (Jones & Quinn, 2016). In contrast to many conventional methods that solely use pharmaceuticals to improve symptoms, Functional Medicine uses a systems-based biological approach to identify the root causes of the health conditions. Functional Medicine enables healthcare providers to practice proactive, predictive, personalized medicine and empowers patients to take an active role in their health. This framework implements the latest evidence-based practices through holistic, individualized methods to achieve optimal outcomes. In contract to the conventional model in which systems are divided into specialties, the Functional Medicine model approaches the body as a whole (Jones & Quinn, 2016). As the patient population becomes increasingly proactive with their health, gaining a better understanding of specific disease

processes, there is growing interest in the ability to identify and mitigate the source of which adverse symptoms arise.

Functional Medicine is rapidly expanding in popularity on an international level giving children and adults exciting new solutions previously unexplored by traditional allopathic methods. It is attracting patients who have not found answers to complex health conditions from Western medicine practices and individuals who want to optimize their health through methods beyond pharmaceuticals. Some patients who seek out Functional Medicine have already been diagnosed with a condition and are searching for alternative treatment options, where others have not received an explanation for their symptoms and are searching for answers. Each case is unique. Some people find relief in their symptoms quickly; while with others, it can take several months to find concrete answers and effective treatment strategies.

A comprehensive microsystems assessment was completed on the Functional Medicine Clinic in the Fall of 2016 that identified multiple areas within the practice that have room for improvement. Problems identified from the microsystems assessment included the need for better time management and efficiency among practitioners, a reduction in patient wait times, additional clinical and administrative support staff, and improved patient adherence with follow-up visits. Another problem initially isolated from the microsystems assessment that was the primary focus of this needs assessment was practitioner non-adherence with prescribing the elimination diet. Several methods were utilized to gather data and explore the problem of non-adherence with prescribing the elimination diet including personal observation, a practitioner interview, and a retrospective chart audit of 30 new patient charts.

A SWOT (strengths, weaknesses, opportunities, threats) analysis is a useful planning tool that gives insight into the internal and external strengths and opportunities that contribute to an

organization's effectiveness and the weaknesses and threats that have the potential to hinder success of the organization or a planned intervention. It represents a confrontation between internal capabilities and external developments (Van Wijngaarden, Scholten, & Van Wijk, 2012). Appendix A represents a SWOT analysis performed in the Functional Medicine Clinic regarding the clinical problem of practitioner non-adherence with prescribing the elimination. The SWOT analysis describes the strengths and opportunities that will aid with instituting the project's interventions, as well as identification of organizational weaknesses or threats that need to be addressed to promote successful project implementation.

As previously mentioned, food reactions have been shown to cause significant morbidity in various disease processes. Not only can failing to identify food reactions lead to worsening patient outcomes, but overlooking dietary factors that trigger inflammation goes against the basic principles that the Functional Medicine Clinic stands to represent.

PICOT

In healthcare practitioners of a Functional Medicine Clinic (P), does implementation of a guideline specific to the elimination diet (I), versus standard of care (C), improve provider adherence with prescribing the elimination diet (O) over a 2-month period of time (T)?

Synthesis of Literature

A comprehensive literature review was first completed with the intentions of finding evidence-based interventions that were effective for improving practitioner adherence with prescribing the elimination diet. Due to insufficient evidence regarding this particular topic, two separate literature reviews were completed. The first search evaluated research that supported the elimination diet related to interventions to improve patient outcomes. Information was also

appraised to identify the specific diagnoses that showed a favorable response to the elimination diet.

The second search sought evidenced-based interventions that have been successfully implemented to improve practitioner adherence to clinical guidelines. Although the articles of the second literature review did not specifically involve the elimination diet, they did identify interventions that were used to improve practitioner adherence to clinical guidelines. The research on both topics was combined to determine the patients who were most likely to benefit from the elimination diet and the interventions that would have the highest probability of improving practitioner adherence with appropriately prescribing the intervention. The following paragraphs outline the literature on the elimination diet and evidence-based interventions to improve practitioner compliance with clinical guidelines.

The review of literature isolated studies confirming the elimination diet's effectiveness in multiple health conditions including symptoms of abdominal discomfort, constipation, or diarrhea with a diagnosis of IBS (Drisko, Bischoff, Hall, & McCallum, 2006). Food elimination has also demonstrated improved outcomes in children diagnosed with the autism spectrum disorder (Pennesi & Klein, 2012). ADHD was another diagnosis in which the removal of inflammatory foods has been shown to positively influence patient symptoms and negative behaviors (Pellser et al., 2011). Inflammatory foods were also isolated as a trigger that exacerbated migraines and chronic headaches (Aydinlar et al., 2013). The final two diagnoses where sufficient evidence was found to support the elimination diet's effectiveness was in patients with IgE-mediated allergy or eczema (Norrman et al., 2005). Table 1 lists the medical conditions and the sample research identified in the literature review that demonstrates clinical examples of the health conditions where food elimination has contributed to reductions in

morbidity and improved patient outcomes. An ICD-10 diagnosis was identified for each medical condition found in the literature to benefit from the elimination diet to assist with sampling patients who would potentially benefit from the intervention. Patients who met criteria to receive the elimination diet in this quality improvement project included those with the following ICD-10 diagnoses: Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90).

Table 1

Conditions That Respond Favorably to Food Elimination

Diagnosis	Supporting Literature
Allergy and Eczema	Norrman et al., 2005
ADHD	Pellser et al., 2011
Autism Spectrum Disorder	Pennesi & Klein, 2012
IBS	Drisko et al., 2006; Ohtsuka, 2015
Headaches/Migraines	Aydinlar et al., 2013

Elimination Diet Background

The thin single layer epithelial lining and the large surface area of the gastrointestinal tract were brilliantly designed to accommodate the physiologic need to absorb nutrition. The complexity of the gut's immune capabilities can be seen in most individuals through its impressive ability to withstand constant bombardment from foreign food proteins, while at the same time mounting attacks against foreign invaders of similar structure. This sophisticated system works efficiently in the majority of individuals; but for a certain few, this is not the case. For unexplained reasons, the immune system of select individuals reacts to food proteins as if they were pathogens, leading to a state of chronic systemic inflammation that results in increased morbidity (Aydinlar et al., 2013). Because food antigens are necessary for nutrition, illness often persists until the offending food antigen is identified and eliminated from the diet. Adverse food reactions were first documented over 2000 years ago by Hippocrates after he recognized the fact

that in certain individuals, gastrointestinal upset and urticarial outbreaks could be provoked after the ingestion of cow's dairy. Literature has continued to accumulate throughout the years linking various foods to not one, but multiple immunological mechanisms that result in chronic inflammation and disease (Ohtsuka, 2015).

The scientific literature clearly demonstrates the inflammatory effects that foods can have on individuals and the benefits that can result from removing food triggers through the intervention of an elimination diet (Ohtsuka, 2015). Randomized controlled studies, quasi-experimental studies, and observational studies were all isolated in the literature review evaluating a multitude of specific health conditions, with each demonstrating some form of reduced symptoms, improved behaviors, or enhanced quality of life after the implementation of the elimination diet. The sample sizes of trials evaluating the effectiveness of the elimination diet ranged from a small to an adequate number of participants. There were no theoretical frameworks identified by the authors that guided these studies, although speculation is that there were physiologic underpinnings to all the studies. Limitations of the studies included small sample sizes, possible discrepancies that can arise from adherence to the elimination diet, and inconsistencies that occur with the self-reporting of symptoms. Although the results can be generalized across the individual disease conditions evaluated, there is insufficient evidence to make generalized statements about the effectiveness of the elimination diet across all chronic disease states. Further research with randomized control trials on a broad range of health conditions with larger sample sizes to identify the broad clinical utility of the elimination diet is warranted.

Improving Adherence With Clinical Guidelines

There is limited evidence standardizing the best strategies to improve practitioner adherence with clinical guidelines specific to the elimination diet. With that being said, there is evidence within the literature that supports of use of an electronic health record (EHR) integration (Lee, Gogo, Tancredi, Garcia, & Shaikh, 2016), small group education sessions (Lugtenberg, Burgers, Han, & Westert, 2014), and educational guides (Schwaiger, Aruda, LaCoursiere, Lynch & Rubin, 2013) to improve practitioner adherence with other clinical guidelines. Evaluating the positive influence these interventions had on improving practitioner adherence with various clinical guidelines, it was reasonable to expect these strategies would aid in the process of improving provider adherence with prescribing the elimination diet. For practitioners to witness the influence the elimination diet can have on patient outcomes in the clinical setting, practitioners have to first prescribe and educate patients on the intervention. Health practitioner non-adherence to clinical guidelines is a global concern that threatens patient safety, increases healthcare expenditures, and has a negative impact on patient outcomes. There is extensive evidence in the literature demonstrating the prevalence of poor guideline compliance among healthcare practitioners despite the fact that the majority of providers recognize and acknowledge the importance of guideline adherence (Nicastro et al., 2015). Healthcare organizations are actively searching for innovative methods to improve clinical guideline adherence using various approaches. EHR integration (Lee et al., 2016), electronic learning modules (Nicastro et al., 2015), pocket guides (Schwaiger et al., 2013), small group education sessions (Lugtenberg et al., 2014), and facilitator-led self-assessment modules (Elward, Blackburn, Peterson, Greenwald, & Hagan, 2014) are a few of the many strategies being explored to help overcome guideline compliance issues in healthcare. Study designs isolated

within the literature that were used to test interventions that improve practitioner adherence with guidelines include randomized factorial designs, quasi-experiments, and longitudinal cohort studies. Sample sizes ranged from 24 participants to 55,779 participants. The use of EHR integration to improve guideline adherence could be generalized across multiple aspects of healthcare (Lee et al., 2016). Other interventions explored in the literature that included educational handouts, pocket guides (Schwaiger et al., 2013), and self-assessment modules (Elward et al., 2014) did not have sufficient evidence to support generalizability beyond their specific samples. Limitations of these studies included inadequate participant responses (Elward et al., 2014), self-reported results that had the potential of being prone to error (Lee et al., 2016), and practitioner bias that could arise from some individuals being motivated to improve care where others may not (Nicastro et al., 2015). Sufficient research exists supporting a variety of strategies that can be implemented on an organizational level to improve health practitioner adherence to clinical guidelines (Lee et al., 2016; Nicastro et al., 2015; Lugtenberg et al., 2014). Gaps currently exist in the literature, and further research is needed to address provider non-adherence to prescribing the elimination diet.

Methodology

Intervention Planning

Identifying the elimination diet effectiveness at the beginning of the patient care experience has the potential to reduce the need for future interventions that may hold higher risk and expense in the care of the patient. An evaluation of the Functional Medicine Clinic's prescribing practices of the elimination diet was first completed by observing the practice owner conduct patient visits on three separate 8-hour days. New patient visits were isolated in this process to see the effectiveness of the elimination diet as an initial intervention. The purpose of

the observation sessions was to identify the number of new patient appointments in which practitioners prescribed the elimination diet for individuals who could potentially benefit from the intervention. The checklist located in Appendix B was completed during each new patient visit to record if the patient met criteria for potentially (a) benefiting from the elimination diet, (b) obtaining the diagnosis that qualified him or her as meeting the specified criteria, and (c) ensuring the practitioner prescribed the elimination diet by the end of the visit.

Patients who would potentially benefit from the elimination diet were identified by the nurse practitioner. The patients of interest were identified through a comprehensive literature review completed before the observation session to determine the specific patient diagnoses supported in research that showed reduced morbidity after removing foods with a higher potential of resulting in an inflammatory response.

A personal interview with the practice owner, who also serves as a primary healthcare provider in the clinic, was conducted to gather additional data on practitioner adherence with prescribing the elimination diet. An interview questionnaire was created with open-ended questions that were designed to explore the (a) practitioner's personal beliefs about the elimination diet, (b) perceptions of current prescribing rates, and (c) barriers that hinder adherence with prescribing the intervention. The questionnaire utilized during the practitioner interview is in Appendix C. The interview was conducted face-to-face with the nurse practitioner at the end of the day after the close of clinic time. Questions from the interview questionnaire were individually read to the practitioner with pertinent information from the practitioner's responses recorded directly onto the paper questionnaire. The interview lasted approximately 25 minutes and concluded with the practitioner explaining the strategies she felt would be beneficial

to improving practitioner adherence with prescribing the elimination diet at the Functional Medicine Clinic.

The final method utilized to gather data on practitioner prescribing practices for the elimination diet in the Functional Medicine Clinic was a retrospective chart audit of 30 charts. Permission to complete the chart audit along with login credentials to the clinic's EMR was obtained from the practice owner. The retrospective chart audit was conducted from August 1, 2016 to November 1, 2016, using the clinic's MD-HQ EMR system. The audit isolated all new patient appointments during the specified timeframe that met the previously mentioned criteria. Appendix D displays a completed version of the tool that was created for the audit process. The data collection tool for the chart audit assessed the following details: (a) date of visit, (b) ICD-10 diagnosis that contributed to the patient meeting criteria, (c) patient age, (d) primary diagnosis, (e) practitioner's prescription of the elimination diet, and (f) the provider overseeing the patient visit.

Intervention Strategies

The initial intervention was implemented in a small group education session. The 60-minute face-to-face education session with the practitioners focused on (a) the purpose of the elimination diet, (b) the evidence to support the elimination diet, (c) the benefits of the intervention for the patient population, and (d) the methods that help to ensure a smooth transition of the elimination diet into daily clinic life.

As previously mentioned, the literature review that was performed assessing interventions to improve practitioner adherence with clinical guidelines demonstrated strong support for using EMR integration to achieve optimal results. An elimination diet template was incorporated into the Functional Medicine Clinic's EMR system in an attempt to duplicate the

literature's support for using EMR integration to increase practitioner adherence with guidelines. The EMR template allowed the clinic's practitioners to quickly document the intervention and automatically emailed an elimination diet handout and recipes directly to the patient. As the SWOT analysis in Appendix A demonstrates, another barrier to practitioner adherence with prescribing the elimination diet isolated in the provider interview is the absence of a user friendly handout to explain the diet. A new elimination diet handout was created to overcome this barrier with the intent of aiding practitioners to explain the intervention and to assist patients with implementation. A copy of the new handout located in Appendix E was given to patients during their initial appointment when the elimination diet was initially prescribed. The 60-minute education session demonstrated how practitioners can utilize the EMR elimination diet template and methods to incorporate the new elimination diet handout into their practice.

Evaluation Model

The Kirkpatrick model is an assessment and evaluation framework that consists of 4 levels of evaluation that include (a) reaction, (b) learning, (c) behavior, and (d) results. Each level of assessment builds upon the previous level and contributes to the precision and effectiveness of the model. The purpose of Level 1 (Reactions) is to measure how participants respond to the training, courses, instructors, and the environment. Level 1 is essential to assess the learner's initial perceptions of the process and to identify if the changes will be well received (Tan & Newman, 2013). Level 2 (Learning) evaluates what participants learn from the intervention assessing for advancements in knowledge, changes in attitudes, and additional skills. Level 3 (Behavior) seeks to measure if the skills or knowledge learned during the intervention is applied to the practice and if this resulted in a sustained change in behavior. The final level of the Kirkpatrick model, Level 4, measures if the process or project is achieving the intended results.

Level 4 evaluates features of improvement like increased revenue, decreased costs, improved safety, higher quality, better customer satisfaction, etc. (Tan & Newman, 2013).

The Kirkpatrick model has served as a primary method to organize training evaluations for more than 30 years (Bates, 2003). The model's popularity stems from several factors. The Kirkpatrick model addresses the need to educate professionals on how to implement training evaluation in a systematic way. It also provides a means for simplifying the complicated process of training evaluation through its straightforward guide that identifies the questions that should be asked and the specific criteria that are appropriate to assess. Another appealing aspect of the model is its ability to reduce the measurement demands that are traditionally present in alternative modes of training evaluation (Bates, 2003). The Kirkpatrick model was selected as a foundational guide to increase practitioner adherence with prescribing the elimination diet due to its practicality and usefulness with evaluating training. A significant component of this Doctor of Nursing Practice (DNP) project involved training the providers within the Functional Medicine Clinic on the importance of the elimination diet, the benefits that can result from adherence to prescribing, and the resources that can be utilized to evaluate and promote the interventions utility within the daily practice.

Data Collection

As a result of inadequate access to evidence-based evaluation tools to assess provider adherence to the elimination diet, the data measurement tools utilized for this project were created by the DNP student and, therefore, are not validated. The pretest and posttest used before and after the education intervention consists of 25 short answer and fill-in-the-blank questions based on evidence-based material collected from a comprehensive literature review. The test questions explore the practitioner's knowledge on the elimination diet and potential

benefit for the elimination diet as an intervention. A copy of the pretest and posttest can be found in Appendix F.

Data collection was obtained through a weekly chart audit. The audit was performed on 40 new patient appointments who met criteria of having at least one of the following ICD-10 diagnoses: Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90). Charts for patients who met criteria were analyzed for the same information that was extracted from the initial chart audit performed during the needs assessment. Adherence with prescribing the elimination diet was determined. An example of the chart audit tool that was utilized to collect post-intervention data can be found in Appendix G. Practitioner adherence rates with prescribing the elimination diet were compared before and after the interventions were implemented. The pretest and posttest results were compared to demonstrate if practitioners have an increase in knowledge regarding the elimination diet after the 60-minute education session.

Setting

The influence of an expanding workload, reductions in reimbursement, higher insurance premiums and deductibles, and shorter face-to-face times between the clinician and client have increased frustration and concern for both patients and providers (Fontenot, 2015). As a result of these changes, many patients and practitioners have begun to explore alternative health models separate from the stronghold of insurance companies. Fee-for-service clinics, membership models, and concierge practices are increasing in popularity utilizing practice models where there is a direct financial relationship between the health clinic and the patients (Miles, 2014). Although these models generate more out-of-pocket costs for patients, they also allow for longer appointments, more comprehensive physical exams, little-to-no-wait times, expedited

scheduling, and customized treatment plans that include lifestyle modification and health prevention (Miles, 2014). The microsystem that was evaluated is a fee-for-service primary care clinic in which practitioners charge an hourly rate for the care they provide. As supported in the literature, this model does allow for more comprehensive assessments and longer patient appointments to appropriately address individualized needs of both the patients and their families in the Functional Medicine Clinic.

In addition to the unique model the practice operates under, the Functional Medicine Clinic is not the typical physician-owned clinic, as it is co-owned and operated by a DNP and another nurse practitioner. In compliance with Texas law, the providers of the clinic are overseen by a physician neurologist who also subleases space from the clinic. The overseeing physician meets with the two nurse practitioners on a monthly basis to discuss challenging patient cases. Each owner is board certified as nurse practitioners with postgraduate training from the Institute of Functional Medicine and Medical Academy of Pediatric Special Needs. The clinic providers deliver care to a mix of adult and pediatric patients treating both acute and chronic illnesses. In addition to these services, the practice places a particular emphasis on their alternative approaches to caring for children with neurological and developmental disorders. The Functional Medicine Clinic prides itself in its approach to care and uses traditional and holistic medicine to create comprehensive treatment plans individualized to each patient's needs. The clinic is located in a large commercial space in Austin and houses multiple medical practices of various specialties. Patient appointments are scheduled Monday through Friday from 9 a.m. to 5 p.m. Patients and families who arrive at the clinic for an appointment are greeted by an administrative assistant who is the sole support staff of both providers. The administrative assistant coordinates the appropriate paperwork and transitions the patients back to the providers where the providers

assess vital signs and proceed to initiate the appointments. The EMR system is a staple to the clinic serving as the primary source of communication between the practitioners and the patients. Each patient and/or parent is given access to the clinic's secure Health Insurance Portability and Accountability Act compliant online portal that allows instant access to medical information, treatment plans, supplement and medication lists, and pertinent educational handouts and resources.

Pre- and Post-Comparison of Elimination Diet Prescription and Knowledge

Descriptive analysis was used to analyze the following datasets in this quality improvement project: (a) practitioner adherence with prescribing the elimination diet, (b) changes in practitioner knowledge regarding the elimination diet, and (c) distribution monitoring of educational handouts. Data for practitioner adherence with prescribing the elimination diet were collected and discussed in the previous paragraphs using the Excel chart audit template located in Appendix G. Twenty-nine new patient charts were isolated over the 8-week data collection period representing patients who met at least one of the specified ICD-10 criteria: Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90).

Project Timeline

This quality improvement project commenced the beginning of June 2017 after receiving approval from the Institutional Review Board. The elimination diet template was incorporated into the Functional Medicine Clinic's EMR, while simultaneously administering the elimination diet pretest to the two practitioners of the clinic. In the first week of July, the small group practitioner education session was conducted outlining the science, benefits, and methods that could be used to improve adherence with prescribing the elimination diet. A GANTT chart

located in Appendix H displays a timeline of the project's events that followed the education session. The quality improvement project concluded the last week in September. The dissemination of the findings was presented to the clinic staff and academic counsel on November 17, 2017.

Issues With Protection of Persons

This quality improvement project performed at the Functional Medicine Clinic was exempt from informed consent because it involved the assessment of practitioner adherence with the standard practice of prescribing the elimination diet and did not involve direct patient intervention. There was no risk to the patients of the practice. The aggregate data collected were kept confidential according to the Health Insurance Portability and Accountability Act. Information gathered from the project did not have personal identifiers linking particular patients to the Functional Medicine Clinic. A letter of support was obtained for this DNP project from the practice owner and can be found in Appendix I.

Stakeholder Involvement

The nurse practitioners and the patients of the Functional Medicine Clinic were the primary stakeholders involved in this project. During the observation session of the needs assessment, the patients were evaluated to determine their receptiveness of implementing the elimination diet. Patients demonstrated great interest in using the elimination diet as an intervention to isolate potential food triggers of inflammation. The practitioners were observed to see if they prescribed the elimination diet upon the conclusion of the new patient appointment, as warranted. At the beginning of the quality improvement project during the practitioner interviews, both providers verbalized the value behind the elimination diet and their underutilization of the intervention within the Functional Medicine Clinic.

Advanced Practice Registered Nurse Role

As the healthcare system moves away from operating under the umbrella that more actions equal better care and places a stronger emphasis on quality improvement and outcome-driven interventions, the demand for the APRN with a DNP skillset will grow (Dunbar-Jacob, Nativio, & Khalil, 2013). The knowledge of evidence-based practice that an APRN with a DNP has, strengthens the use of evidence in the design and implementation of a healthcare practice. The advanced understanding of the clinical microsystem, health finance, and health policy, in conjunction with the required professional leadership skills, adds a unique value to the role of the APRN with a DNP in this crucial period of transition within the healthcare system (Dunbar-Jacob et al., 2013). The APRN role with a DNP degree was introduced to bring nursing leaders to the forefront of change at a time where a broken healthcare system has been found to kill more Americans each year than what was seen from motor vehicle accidents, breast cancer, or AIDS (Institute of Medicine, 1999). The DNP curriculum was specifically created to aid in the design and implementation of a healthcare system that was built on safety, evidence, quality, and innovation. Healthcare is changing, much of which is due to consumer demands. Now more than ever, the healthcare system is demanding efficiency and quality with patients who are demanding holistic approaches that address the root cause of problems as opposed to temporarily covering them up with pharmaceuticals. Despite the advanced technology and innovative treatment strategies the American healthcare system has to offer, the health of our nation continues to decline. Evaluating the research for holistic, safe, cost-effective, evidence-based interventions like the elimination diet and transitioning these practices into the healthcare setting, is one of the many ways an APRN with a DNP degree can stimulate positive changes that will transform the profession and the healthcare system.

Results

A pretest was administered to the two practitioners of the clinic at the beginning of this quality improvement project revealing a significant knowledge deficit about the clinical utility of the elimination diet. A 60-minute face-to-face evidence-based training session was provided to the practitioners of the Functional Medicine Clinic with the goal of increasing their knowledge regarding implementation and documentation of the elimination diet. They were also educated on how to properly document the intervention in their customized elimination diet EMR template. A posttest was distributed to the practitioners of the Functional Medicine Clinic 8 weeks after the education session and contained the same questions as the initial pretest. The test was made up of 25 short answer and true or false questions with each question worth 4 points to total a maximum possible score of 100%. The pretest results revealed scores of 28% and 36%, with a combined average score of 32%. Eight weeks after the interventions were implemented, the posttest scores increased to 88% and 96%, a combined average score of 92%. Practitioners' combined scores were 60 percentage points higher on the posttest 8 weeks after the education session. A comparison of pretest and posttest scores is displayed in Figure 1.

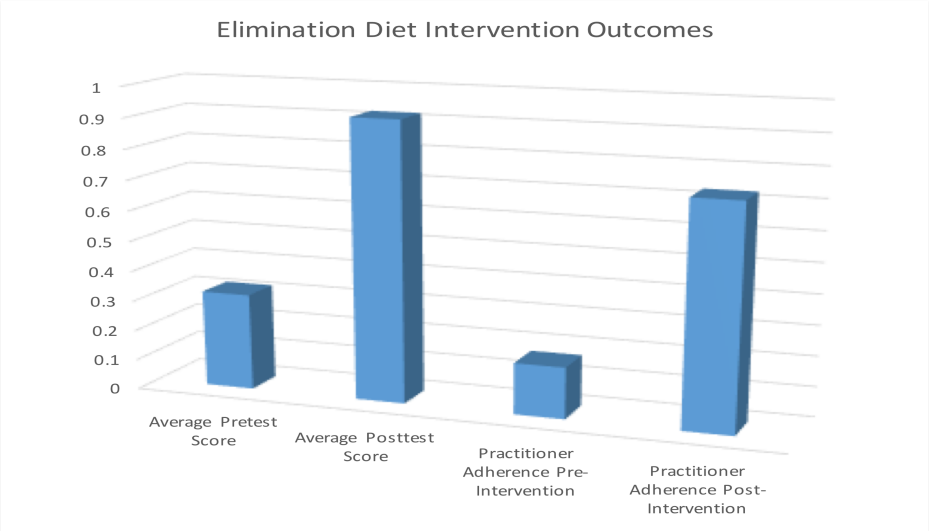

Figure 1. Elimination diet pretest and posttest comparison.

A retrospective chart audit was performed on new patient charts at the Functional Medicine Clinic over an 8-week period after the interventions were implemented. Twenty-nine new patient charts that met the predetermined criteria of having at least one of the specified ICD-10 diagnoses were identified: Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90). The sample consisted of male and female patients ranging from age 2 to 56 years old.

The second objective evaluated through the retrospective chart audit was practitioner adherence with distributing educational materials specific to the elimination diet. The results from this objective can be seen in Table 2. In the initial pre-intervention chart audit, it was identified that educational materials were not given to any of the patients prescribed the elimination diet. After an elimination diet handout was created and practitioners were educated on its use and distribution, the objective was to have 80% of the patients prescribed the elimination diet to receive an educational handout. The post-intervention retrospective chart audit revealed that 100% of the patients who were prescribed the elimination diet received an educational handout.

Table 2

Practitioner Adherence With Distributing Elimination Diet Handouts

Pre-Intervention Distribution	Post-Intervention Distribution Goal	Post-Intervention Distribution
0%	>80%	100%

The final objective of the quality improvement project was to increase practitioner adherence with prescribing the elimination diet in appropriate patients from the pre-intervention adherence rate of 14% to a prescription rate of over 80%. The results of the retrospective chart audit are displayed in Table 3. The audit revealed the post-intervention practitioner adherence rate with prescribing the elimination diet to be 73%, 8 percentage points short of the goal. A

comparison of pre-intervention and post-intervention practitioner adherence rates with prescribing the elimination diet can be found in Figure 2. Although the adherence goal was not achieved, practitioner prescribing of the elimination diet post-intervention increased by 59 percentage points. A comparison of pre-intervention and post-intervention practitioner adherence rates with prescribing the elimination diet can be found in Figure 2.

Table 3

Provider Adherence to Prescribing: Post-Intervention Audit

Patient	Diagnostic Criteria Met	Age	Prescribed ED	Handout Provided
1	ASD	6	Yes	Yes
2	Allergy	7	No	n/a
3	IBS	56	Yes	Yes
4	IBS	11	No	n/a
5	Headache	38	Yes	Yes
6	Headache	6	No	n/a
7	IBS	42	Yes	Yes
8	ADHD	8	Yes	Yes
9	ADHD	7	No	Yes
10	ASD	15	No	n/a
11	ADHD	9	No	n/a
12	Allergy	2	Yes	Yes
13	Allergy	3	Yes	Yes
14	ASD	3	Yes	Yes
15	Headache	27	Yes	Yes
16	AHDH	6	Yes	Yes
17	Atopic Dermatitis	13	Yes	Yes
18	ASD	7	Yes	Yes
19	ADHD	19	Yes	Yes
20	Allergy	4	Yes	Yes
21	Allergy	7	Yes	Yes
22	IBS	3	Yes	Yes
23	ASD	11	Yes	Yes
24	ASD	4	No	n/a
25	ASD	17	Yes	Yes
26	ADHD	7	Yes	Yes
27	Allergy	44	Yes	Yes
28	IBS	41	No	n/a
29	Allergy	4	Yes	Yes

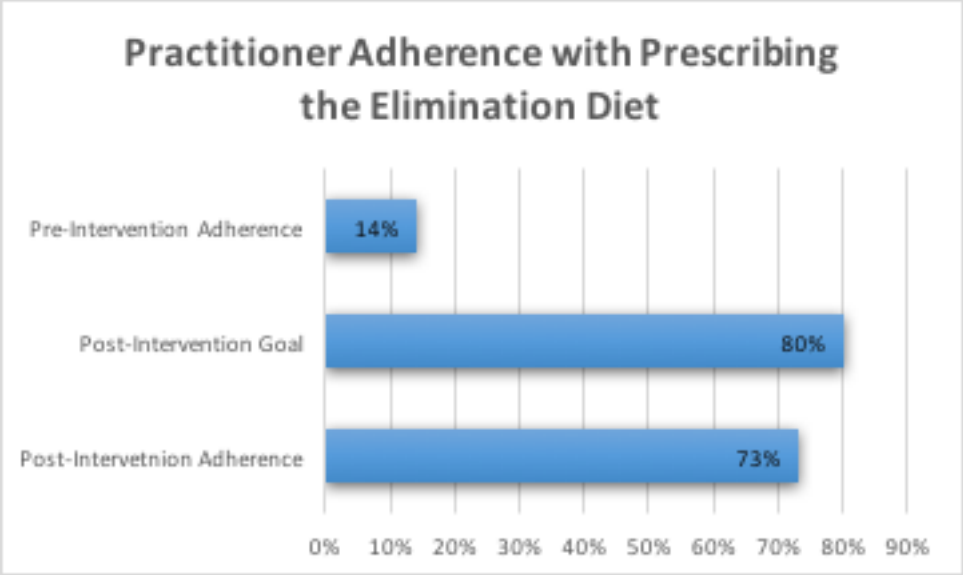

Figure 2. Practitioner adherence with prescribing the elimination diet.

When comparing the patient characteristics of the pre-intervention group to the post-intervention group, the ages were very similar. In the pre-intervention group, the participants ranged from 2 years to 56 years in age, with the median age being 7 years. In the post-intervention group, the ages ranged from 2 years to 63 years of age, with the median age being 10 years. In both groups, most of the patients were pediatric. Although each patient in the pre-and post-intervention group had at least 1 of the 6 qualifying ICD-10 diagnoses outlined in the previous paragraphs, the distribution of the qualifying categories varied considerably between the pre- and post-intervention groups. In the pre-intervention group, 43% of the patients met criteria due to IBS. In the post-intervention group, allergy was the primary diagnosis, representing 24% of the patient population. Beyond age and diagnostic criteria, other demographic characteristics in the intervention groups did not get evaluated.

Discussion and Conclusions

Limitations

This quality improvement project does have several limitations. A limitation of the project was the small sample size that only included two nurse practitioners. A sample of this magnitude significantly reduces the statistical power of the outcomes and makes it nearly impossible to generalize the results. The sample population was also too narrow. Both practitioners have a strong passion for nutrition and holistic approaches to patient care that likely serves as a bias increasing their motivation to utilize the elimination diet far beyond that of what a traditional health practitioner would do. Despite the potential bias, the goal of prescribing the elimination diet to at least 80% of the patients who met criteria was not met due to limitations within the patient population. The imitations within the patient population that prevented practitioners from prescribing the elimination diet included children who were picky eaters and reluctant parents who did not believe that food was playing a role in their child's health problems.

Discussion

The elimination diet is a non-invasive, cost-effective intervention that has the potential to reduce inflammation, optimize symptoms, and contribute to better patient outcomes in a particular subset of health conditions (Ohtsuka, 2015). A comprehensive microsystems assessment of the Functional Medicine Clinic first identified the problem of practitioner non-adherence with prescribing the elimination diet. A literature review and subsequent needs assessment later confirmed the significance of the problem. Although there is insufficient evidence that addresses evidence-based interventions that improve practitioner adherence with prescribing the elimination diet, there is evidence to support the use of educational handouts

(Schwaiger et al., 2013), small group education sessions (Lugtenberg et al., 2014), and EMR integration (Lee et al., 2016) to increase practitioner adherence with clinical guidelines. It is difficult to contrast the finding of this project with that found in the literature as there were no studies isolated that evaluated practitioner adherence with prescribing an elimination diet. With that said, the results of this quality improvement project do coincide with prior studies that suggest interventions like small group education sessions, EMR integration, and educational handouts can be used to improve practitioner knowledge and adherence with clinical guidelines.

The findings of this project are intriguing enough to suggest that the combined use of a 60-minute small group education session, elimination diet patient handout, and EMR integration may be useful methods to improve practitioner knowledge and adherence with prescribing the elimination diet. Future research is needed that involves a larger and more diverse sample size to evaluate evidence-based interventions that improve practitioner adherence with prescribing the elimination diet.

Lessons Learned

It is natural to gravitate toward topics one is passionate about while having complete confidence that the journey will be smooth and seamless. It is also easy to assume there is an abundance of research on healthcare treatments and interventions that have been successfully utilized in practice time and time again. A lesson that was learned while implementing this quality improvement project was the fact that following one's passion and making blind assumptions does not always yield expected results. Although the elimination diet is very effective in clinical practice, there is a dearth of literature specific to the intervention supporting the need for further research. The lack of evidence over the last 5 years created many barriers in this project when trying to synthesize the literature, identify benchmarks, and make

generalizations about the results. Although passion about a subject matter is essential, having sufficient current evidence about the topic is critical when one is implementing a quality improvement project.

Relevance to Nursing Practice for APRN With DNP Degree

The U.S. healthcare system is currently in a state of transition. From policymakers to the bedside providers, the entire system is working to overcome issues of quality, access, and cost. Now more than ever, there is a demand for skilled nurse leaders to help mold the future direction of healthcare (Denker, Sherman, Hutton-Woodland, Brunell, & Media, 2015). The DNP education prepares APRNs to influence change within the healthcare system that is built on safety, evidence, quality, innovation, and most importantly, improved patient outcomes (American Association of Colleges of Nursing, 2006). With growing community interest in holistic approaches to wellness in conjunction with the current demand for health organizations to provide quality care at lower costs, the nursing profession is presented with several unique opportunities. If APRNs can place a greater focus on identifying how to improve adherence with low cost, evidence based, holistic interventions like the elimination diet, quality care can be preserved while avoiding the financial collapse that threatens our current healthcare system.

Conclusion

The healthcare system is in dire need of new strategies to improve outcomes, decrease costs, and optimize the quality of care being provided. The elimination diet is an intervention that has the potential to reduce morbidity and improve health outcomes in certain individuals without significant risk, financial cost, or use of pharmaceutical drugs. The APRN with a DNP has the knowledge, skills, and education, to mold a healthcare system that is based on innovation, safety, and high-quality care. Exploring methods to improve practitioner knowledge

and adherence with holistic interventions like the elimination diet, may be one effective strategy for building a sustainable healthcare system that holds quality care and patient outcomes as a top priority.

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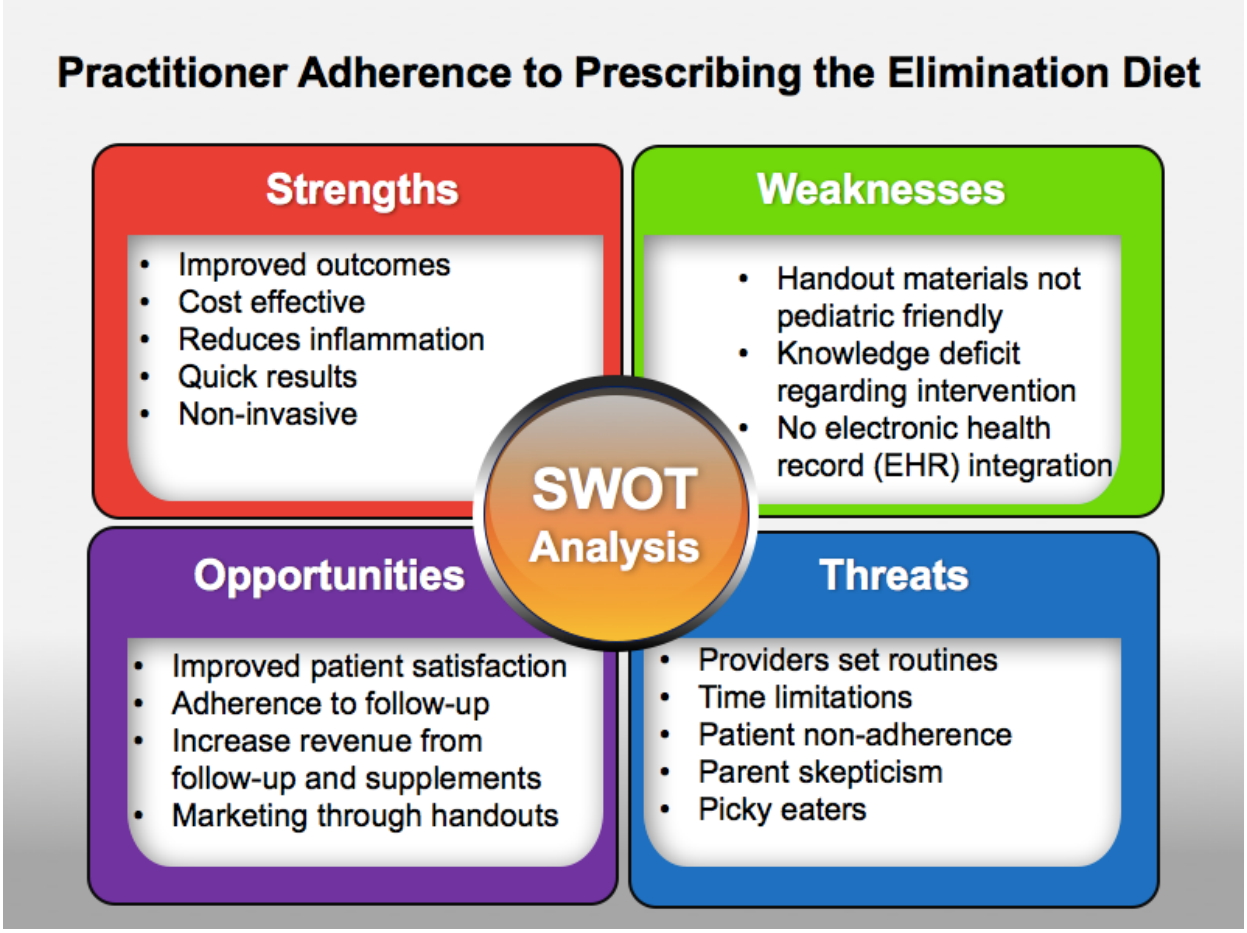
Appendices

Appendix A: SWOT Analysis



Appendix B: Observation Checklist

New Patient	Meets Criteria	Category	Prescribed ED

Appendix C: Initial Practitioner Interview

Practitioner Interview Questions:
1. To what extent do you feel that dietary factors influence the health of your patient population?
2. What are your personal feelings towards using the elimination diet as a first line intervention in patients?
3. What clinical diagnoses do you feel would benefit the most from an elimination diet?
4. How often do you prescribe the elimination diet as an initial intervention for new patients?
5. What perceived benefits do you feel would result from increased adherence with prescribing the elimination diet for both your practice and the patients you care for?
6. What barriers do you face that prevent you from prescribing the elimination diet?
7. If these barriers were overcome, do you feel as though you would utilize the intervention more frequently?
8. What strategies do you feel could be implemented to improve provider adherence to prescribing the elimination diet in this Functional Medicine Clinic?

Appendix D: Completed Pre-Intervention Excel Chart Audit Tool

Patient	Visit Date	Met Criteria	Category	Age	Diagnosis	Prescribed ED	Handout Provided	Provider
1	8/4/16	Yes	ASD	10	ASD	No	No	2
2	8/5/16	Yes	ADHD/IBS	11	OCD	No	No	1
3	8/8/16	Yes	Allergy/IBS	8	Allegy	Yes	No	1
4	8/9/16	Yes	Allergy	26	Allergy	No	No	1
5	8/10/16	Yes	Allergy	2	Eczema	No	No	1
6	8/11/16	Yes	Headache	31	Anxiety	No	No	2
7	8/18/16	Yes	IBS	9	IBS	No	No	1
8	8/19/16	Yes	IBS	3	IBS	No	No	2
9	8/22/16	Yes	Allergy	2	Eczema	No	No	1
10	21-Aug	Yes	Allergy	63	Atopic Dermatitis	No	No	1
11	8/30/16	Yes	Headache	8	Headache	No	No	2
12	9/1/16	Yes	ADHD	13	ADHD	No	No	1
13	9/1/16	Yes	ADHD	6	ADHD	Yes	No	2
14	9/7/16	Yes	IBS	5	Anxiety	No	No	1
15	9/13/16	Yes	IBS	38	Diarrhea	Yes	No	2
16	9/14/16	Yes	IBS	15	Ulcerative Colitis	No	No	1
17	9/14/16	Yes	ASD	5	Recurrent Strep Throat	Yes	No	1
18	9/15/16	Yes	IBS	38	Anemia	No	No	2
19	9/19/16	Yes	IBS	9	IBS	No	No	1
20	9/20/16	Yes	IBS	13	Constipation	No	No	2
21	9/21/16	Yes	IBS	52	Constipation	No	No	1
22	20-Sep	Yes	ASD	9	ASD	No	No	1
23	9/22/16	Yes	ASD	3	ASD	No	No	2
24	9/23/16	Yes	IBS	3	IBS	No	No	2
25	26-Sep	Yes	ADHD	9	ADHD	No	No	1
26	9/27/16	Yes	IBS	41	Headache	No	No	2
27	9/27/16	Yes	ASD	40	Down Syndrome	No	No	2
28	9/27/16	Yes	IBS	10	PANDAS	Yes	No	2
29	10/5/16	Yes	ADHD	17	Anxiety	No	No	1
30	10/10/16	Yes	IBS	12	Constipation	No	No	1

Appendix E: Elimination Diet Handout

NEURONUTRITION ASSOCIATES

ELIMINATION DIET

STEP # 1: REMOVE

Remove all eight of the potentially inflammatory food groups from diet for 21 days. Coffee, alcohol, artificial sweeteners, food additives, preservatives, and dyes are also eliminated during the 21 days. Foods are numbered from most inflammatory starting with gluten-containing grains, to least inflammatory ending with beef and pork. If you are unable to remove all food groups from the diet for 21 days, remove the most inflammatory foods groups first beginning with gluten-containing grains, dairy products, and sugar. To achieve the best possible results, remove 100% of the foods you choose to eliminate from the diet for the full 21 days. Even the slightest exposure to a food will reduce the effectiveness of the elimination diet. **People with autoimmune conditions may find added benefit removing foods on the elimination diet in addition to all grains, nuts & seeds, and nightshades.**

STEP # 2: REINTRODUCE

After foods have been completely eliminated for 21 days, start the reintroduction phase. Introduce the least inflammatory foods first, starting with beef and pork, the proceed through the list with gluten containing grains being the last introduction. For each food group introduction, eat a generous amount of that specific food on Day 1 (2-3 average portion sizes), and then monitor for problematic symptoms over days 2 and 3. **If at any point you experience a negative symptom when introducing a food, stop eating that food immediately and allow symptoms to completely resolve before introducing the next food**. After three days of monitoring for symptoms, continue to reintroduce foods every 3 days using the same technique previously mentioned. Food diaries during reintroduction can be very helpful. ***Common symptoms of a food reaction include: diarrhea, constipation, fatigue, depression, anxiety, gas, bloating, abdominal pain, headache, joint pain, muscle aches, skin irritations, insomnia, sinus congestion, itching, or flushing.***

Appendix F: Pretest/Posttest

Elimination Diet Pre/Posttest (with answers)

1. When foods are found to provoke problematic symptoms, how long should the practitioner recommend that patients keeps the inflammatory food out of the diet before an attempt to reintroduce is made?

Answer: 3-6 months.

2. What unique characteristic in regards to symptoms onset does a food allergy have when compared to a food sensitivity?

Answer: Symptoms with food allergies are severe and immediate after a food is eaten whereas sensitivities can be delayed for hours to days.

3. Food intolerances can result from the bodies reaction to specific chemicals in foods like MSG and Histamine. What is another common physiologic reason that people suffer from food intolerances?

Answer: Enzyme deficiencies (lactose, sucralose, proteases, lipases, amylases).

4. What are the top eight food categories eliminated on the Institute of Functional Medicine's (IFM) elimination diet?

Answer: Gluten-containing grains, dairy products, sugar, shellfish, peanuts, soy, eggs, and conventional red meat (beef and pork).

5. What pathologic condition results from chronic food reactions that leads to systemic inflammation and can contribute to autoimmunity?

Answer: Intestinal permeability or "leaky gut". Food reactions trigger low grade inflammatory reactions in the gut making the intestinal wall more porous and permeable. Increased permeability leads to an influx of undigested food particles, chemicals, bacteria, yeast, and other pathogens which stimulates immune system activation.

6. How often do the cells of the intestinal lining turn-over and replace themselves?

Answer: Every 2-4 days.

7. Research suggests that at least _____ percent of the immune system is clustered in the digestive tract?

Answer: Greater than 70% of the immune system is estimated to be in the digestive tract.

Appendix F—Continued

8. What feature within the digestive track that has the largest influence on how the immune system responds?

Answer: The flora or microbiota that inhabit the gut.

9. There are a variety of reasons why people cannot tolerate dairy products. What deficiency does 25-90% of the world's population have that contributes to dairy intolerance?

Answer: Lactase deficiency.

10. What potentially inflammatory component of dairy products can vary depending on the type of cow the milk came from?

Answer: Casein. Different types of casein (A1 and A2 beta casein) can impact tolerance and varies depending on the type of cow that the milk originated from (Holstein, Jersey, or Guernsey).

11. What are four gluten containing grains?

Answer: Barley, Rye, Triticale, Bulgar, Wheat (farro, kamut, spelt).

12. What structures in the small intestines do gliadins, toxic proteins contained in gluten break down?

Answer: Microvilli (finger-like protrusions in the small intestine).

13. Antioxidants provide protection against free radicals that are constantly being produced in the body. Where process in the body contributes to a large portion of free radical production and where does this occur?

Answer: The byproducts of phase I detoxification in the liver are often oxidized and inflammatory. Antioxidants and an efficient phase II detoxification system limits tissue damage from excessive free radicals.

14. What three factors contribute to an individual's total toxic burden?

Answer: Genetics, toxin exposure, and diet.

15. An obese 300 lb. 32-year-old male comes into the clinic with metabolic syndrome and Irritable Bowel Syndrome. He asks you the practitioner what specific calorie goal should he shoot for every day while on the elimination diet? What would you recommend to this patient as an appropriate caloric goal while on the elimination diet?

Appendix F—Continued

Answer: Although weight loss can happen while on the elimination diet it is not a primary goal. There are no calorie restrictions while completing the elimination diet.

16. Name four characteristics that meat should have meat when purchasing protein to consume on elimination diet?

Answer: Lean, pasture-raised, grass-fed, organic, non-genetically modified (GMO).

17. You are prescribing the elimination diet to a patient and recommending that they consume fish as a healthy source of protein. The patient recognizes that many fish are contaminated with mercury which can be dangerous. What are four low-mercury fish options you can recommend to the patient?

Answer: Herring, salmon, sardines, perch, anchovies, flounder, mackerel (Chub, N. Atlantic), tilapia.

18. You are caring for a 14-year-old adolescent male with attention deficit hyperactivity disorder (ADHD) who you feel would benefit from the elimination diet. The patient is a vegetarian and will not consume any animal products. List four vegetarian sources of protein you will instruct this patient to consume while on the elimination diet.

Answer: Spirulina, legumes, lentils, peas, protein powders (hemp, pea, rice).

19. You have a 17-year-old female patient who is being evaluated for autism spectrum disorder and also hold the diagnosis of scleroderma. You decide the patient has a high potential to benefit from the elimination diet and decide to prescribe it as a first line intervention. Seeing that the patient has an autoimmune diagnosis, what are three addition food groups you could consider eliminating beyond the standard elimination diet protocol?

Answer: In addition to the foods on the standard elimination diet protocol, the autoimmune paleo elimination diet removes all grains, nightshades, and nuts and seeds during the elimination phase.

20. A half of an avocado contains more potassium than a whole banana. Avocados also contain a variety of other nutrients that are extremely beneficial to optimal health. In addition to the potassium and healthy fats they contain, what are three other important nutrients that avocados contain?

Answer: magnesium, folate, choline, and glutathione.

Appendix F—Continued

21. Ghee or clarified butter is allowed on the elimination diet because nearly all of the inflammatory milk proteins are removed when it is made. What component in ghee makes it so beneficial to the gut influencing optimal cellular health within the gastrointestinal tract?

Answer: Ghee contains butyrate a short-chain fatty acids which stimulate the secretion of stomach acid, helps with digestion, and breaks down food into energy.

22. A serving consists of approximately ½ cup for most vegetable and 1 cup of leafy greens. What is the ideal number of servings an adult should consume each day while on the elimination diet?

Answer: 10-12 servings of vegetables a day is ideal.

23. You just prescribed the elimination diet to a patient with IBS and she is concerned about limitation from not having gluten in the diet. You advise her that there are several gluten-free grain alternatives that are permitted while on the elimination diet. What are five gluten-free grains that can be consumed while on the elimination diet?

Answer: amaranth, buckwheat, kasha, millet, oats, quinoa, rice, and teff.

24. Hydration is an essential component of detoxification and optimal health especially while on the elimination diet. What calculation would you use to determine the ideal amount of water patients should drink each day?

Answer: To determine and individuals baseline hydration status, divide the body weight in pounds in half. The resulting number is the number of ounces of water the patient should consume each day.

25. What are the six ICD-10 diagnoses that have been supported in the literature to result in improved outcomes through the implementation of the elimination diet?

Answer: Allergy Unspecified (T78.40), Atopic Dermatitis (L20), Autism (F84), Headache (R51), IBS (K58), or ADHD (F90).

Appendix G: Blank Excel Chart Audit Tool

Patient	Visit Date	Met Criteria	Category	Age	Diagnosis	Prescribed ED	Handout Provided	Provider
1								
2								
3								
4								
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Appendix H: GANNT Chart

Task	Month	April		May				June				July			
	Week	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct meeting with mentor and project chair to discuss and confirm implementation strategy for project. Complete IRB protocol.		X													
Create test that explores elimination diet knowledge and personal feelings towards clinical utility. Create patient handout that outlines the elimination diet instructions.			X												
Incorporate elimination diet template into practice EHR to remind providers and aid them in prescribing the intervention.															
Implement pretest to practitioners.												X			
Provide small group education session that informs providers about the benefits of utilizing an elimination diet from both a practice and patient outcomes standpoint. Practitioners will also be counseled on using the EHR elimination guide template.												X			
8 weeks to evaluate changes in prescribing practices for adherence to the elimination diet.													X	X	X

Task	Month	August				September				October				November	
	Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2
8 weeks to evaluate changes in prescribing practices for adherence to the elimination diet.		X	X	X	X	X									
Perform post-test to evaluate provider knowledge and personal perception of the elimination diet.															
Perform 2nd chart audit and analyze data.							X	X	X						
Dissemination of findings											X				

Appendix I: Letter of Support

NEURONUTRITION
ASSOCIATES

6618 Sitio Del Rio Blvd D102, Austin, TX 78730

4/2/2017

To Whom It May Concern:

Seth Osgood has my permission to conduct a Doctor of Nursing Practice (DNP) project for UIW with the staff at Neuronutrition Associates in Austin, Texas. I am aware that the project involves implementing interventions in an attempt to improve provider adherence with prescribing the elimination diet. The study will involve a staff education session, electric medical record (EMR) guideline integration, personal interviews with practitioners, and retrospective chart audits. The purpose of the quality improvement project will be to improve practitioner adherence with prescribing the elimination diet in appropriate new patients seen at the practice.

I support this project entitled, "Improving Practitioner Adherence with Prescribing the Elimination Diet." I can be contacted at (512) 599-8850 for further information.

Sincerely,

Emily Gutierrez DNP

Name of responsible individual