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Erin Shaye Semeyn
erin.semeyn@louisville.edu

Erin Shaye Semeyn
University of Louisville, erinssemeyn@gmail.com

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**Quality Improvement: Piloting a Pediatric Obesity Prevention Screening Tool and
Intervention in a Family Practice Setting**

by

Erin Shaye Semeyn

Paper submitted in partial fulfillment of the
requirements for the degree of

Doctor of Nursing Practice

School of Nursing, University of Louisville

7/15/22

Dr. Emily McRae
Signature DNP Project Chair

7/15/22
Date

Dr. Sarah Schirmer
Signature DNP Project Committee Member

7/15/22
Date

Dr. Sarah Robertson
Signature Program Assistant Dean

7/21/22
Date

Dr. Mary DeLetter
Signature Associate Dean for Academic Affairs

7/21/22
Date

Dedication

This project is dedicated to my husband, David, and to our son, Daniel. I could not have accomplished this degree without you two supporting me and cheering me on.

Acknowledgments

I would like to thank my husband, David, for supporting me through this journey to obtaining my Doctor of Nursing Practice. He took care of so many details for our family, so I could focus on obtaining this degree. I absolutely could not have completed this project without him. I would also like to thank my mother-in-law for spending extra time with my son so I could research and write; and my mom, stepdad, and grandparents for cheering me along each step of the way. You have always believed I could do anything I set my mind too.

Thank you, Dr. Emily McRae, for your dedication to this project and for all the time you devoted to helping this project succeed. You were always so encouraging each step of the way. You have inspired me to mentor others as well. Thank you, Dr. Sarah Schirmer, for helping me to think about obesity prevention from the prospective of a mental health provider and for also providing great encouragement throughout this entire process.

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Abstract

Background: In the United States today, nearly one third of children fall into the category of overweight or obese. Because it is extremely difficult to treat childhood obesity once it occurs, prevention is the optimal approach to childhood overweight and obesity (Brown & Perrin, 2018; Cooper & Mandel, 2020). An ideal time to address obesity prevention health behaviors is during pediatric primary care visits. Since the COVID-19 pandemic began in the United States in 2019, visits to primary care offices, including visits to an urban university-based family practice clinic in Kentucky, dropped as some pediatric patients and their caregivers worried they could be at risk for contracting COVID-19 by visiting a primary care office (O’Leary et al., 2021).

Purpose: The purpose of the project was to pilot an evidence-based obesity prevention intervention developed by Maine Health at the project site during both well-child and sick visits to ensure as many children as possible were provided with anticipatory guidance related to obesity prevention during both well-child and sick visits.

Intervention: Children two to 18 years of age and/or their caregivers were asked to fill out an obesity prevention healthy habits questionnaire (HHQ) prior to seeing their provider. The provider then discussed the results of the questionnaire with the patient and caregiver during their well or sick child visit, went over 5210 behavioral goals developed by the Maine Youth Overweight Collaborative (MYOC), and the provider and child-caregiver dyad then collaborated to identify a health behavior goal related to obesity prevention. The provider then documented discussion of the child’s goal in the electronic health record (EHR) using a smart phrase that was created as a part of this quality improvement (QI) project.

Methods: The primary outcome evaluated through the obesity prevention intervention was documentation of health promotion related to obesity prevention in the EHR. Evaluation of

documentation of key phrases and health behavior goals were evaluated pre and post intervention to measure improvement in promotion of obesity prevention health behaviors with the implementation of this obesity prevention intervention. Secondary outcomes measured included improved recognition and diagnosis of overweight (OW) and obesity (OB) in children, fidelity to the intervention, number of follow-up appointments generated as a result of the intervention, and the qualitative measurement of provider satisfaction with the intervention.

Keywords: pediatric obesity prevention, childhood obesity, primary care, family practice, Maine Health, quality improvement

Quality Improvement: Piloting a Pediatric Obesity Prevention Screening Tool and Intervention in a Family Practice Setting

During the COVID-19 pandemic, providers at an urban family practice clinic in Kentucky who provide primary care to patients across the lifespan, including approximately 50 pediatric patients (5-10% of the overall patient population) a month, were concerned about the number pediatric patients visiting the clinic for well child visits during the recent COVID-19 pandemic. The drop in number of pediatric patients visiting the clinic during the pandemic, meant providers had fewer opportunities to provide patients and families with counseling related to health promoting behaviors, including counseling related to obesity prevention.

Childhood obesity is a concerning problem among the pediatric population served by this urban clinic. Obesity is defined as a state of having excess body fat that is the result of more calories being consumed than utilized, (Pujalte et al., 2017). Although an imperfect measure, the recommendations developed by the American Medical Association (AMA) and Centers for Disease Control and Prevention (CDC) Expert Committee in 2007 regarding the prevention, assessment and treatment of child and adolescent OW and OB recommend using Center for Disease Control and Prevention (CDC) definitions for OW and OB in children (Barlow, 2007). BMI percentiles compare children's BMIs to BMIs of other children who are the same age and sex (Center for Disease Control and Prevention [CDC], 2021). The CDC (2021) classifies children with a BMI in the 85th to 94th percentile as overweight, and children with a BMI \geq 95th percentile as obese.

In the past twenty years rates of childhood OW and OB have risen in the United States. Currently, 17% of children ages two to 19 years of age are obese, and 32% of children are either overweight or obese, (Cooper & Mandel, 2020). Low socioeconomic status has been linked to

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pediatric obesity risk, with low socioeconomic status children 40% more likely to be obese than their higher socioeconomic status peers, (Mandelbaum et al., 2020). Childhood obesity is also more common in non-Hispanic black (22%) and Hispanic (25.8%) young people two to 19 years than in non-Hispanic white (14.1%) and non-Hispanic Asian (11.0%) young people two to 19 years of age (Callahan, et al., 2018).

Six providers meet the primary care needs of patients served by this urban clinic. Four of these providers are advanced practice registered nurses (APRNs), and two are medical doctors (clinic website). One of the six providers sees the majority of the pediatric patients who visit the clinic and is especially concerned about the drop in the number of patients coming into the clinic for well child visits, due to the COVID-19 pandemic. This provider also considers OW and OB to be significant problems that need to be addressed among pediatric patients served by the clinic.

Fewer caregivers scheduling well child visits, means providers have fewer opportunities to influence the health behaviors of pediatric patients served by the clinic, many of whom are at increased risk for becoming overweight or obese, (Neighborhood Scout, n.d.)

Key stakeholders at the clinic including clinic administration believe an intervention focused on promoting obesity prevention in pediatric patients visiting the clinic for both well and sick visits, will meet the organization's primary goal to enhance the health of the urban community (University of Louisville Physicians [U of L Physicians], 2021).

Having the support of key stakeholders to pilot a new pediatric obesity prevention intervention made this project very feasible to implement. Barriers to project implementation, however, included the small number of pediatric patients that visit this clinic in comparison to the large number of adult patients and the time constraints to implementing the project,

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considering the clinic is a fast-paced environment. On average providers at the clinic see 15 or more patients a day, leaving a small window of time to address obesity prevention during each pediatric visit. Childhood obesity is also a complex problem to address in the primary care setting considering it is a consequence of numerous factors including environmental factors, genetic factors, and ecological factors and is also influenced by social determinants of health (Kumar & Kelly, 2017; Kuo et al., 2012). Providers sometimes shy away from addressing obesity prevention in the primary care setting as well due to fear of offending patients and families (Hersch et al., 2021; Tanda et al., 2017). These barriers were addressed in the design of the obesity prevention intervention piloted at this family practice site.

Literature Review

Literature Search Strategy and Methods

To develop an obesity prevention intervention for primary care based on the best evidence, the literature was searched using PubMed, CINAHL, Embase, and the Cochrane Database of Systematic Reviews. A research librarian was consulted from the University of Louisville to ensure the literature search would result in the most relevant literature related to the topic of pediatric obesity prevention in primary care. To focus on the most current evidence, only articles from the last six year and a half years published in English were included. This search included articles from the last six and a half years, because there is less literature available focused on obesity prevention in primary care than obesity intervention in primary care. In PubMed, an advanced search was conducted mixing headings, subheadings, keywords and meSH terms. PubMed was searched using the meSH terms “Pediatric Obesity/prevention and control,” OR “pediatric obesity” with the key terms “obesity in childhood,” OR “childhood obesity” OR “adolescent obesity,” OR “obesity in adolescents” AND the meSH term “Primary Prevention,”

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OR the keyword “prevention” OR “early intervention,” AND the MeSH terms “Physicians, Primary Care,” OR “Primary Care Nursing Or “Family Practice,” along with the keywords “primary care,” OR “family practice.” This search yielded 319 articles to review in PubMed. In searching CINAHL, an advanced search was undertaken using “pediatric obesity” and “primary care” as a CINAHL subheading and “prevention” as a keyword. Initially the Boolean connector “or” was used which yielded an abundance of articles: 284, 283. Changing the connector to “and” using the CINAHL subheading “pediatric obesity” and the keywords “primary care” and “prevention,” yielded 128 English language articles. Next, an advanced search of Embase was conducted using the Emtree search term “pediatric obesity,” and the keywords “primary health care,” and “prevention.” This search yielded 136 articles. Finally, in the Cochrane Database of Systematic Reviews, an advanced search was also conducted using the meSH term “pediatric obesity,” and the subheading “prevention & control,” which yielded four systematic reviews. After removing duplicate articles from the literature identified from each search engine, 448 non-duplicate articles were identified for screening.

The abstracts and titles of these 448 articles, were then individually reviewed and included or excluded based on the following criteria. Any articles which dealt specifically with pediatric obesity prevention intervention in the primary care setting or provided helpful background knowledge to better understand the problem of obesity in childhood were included in the synthesis of literature, while articles which focused on obesity treatment interventions with children who were identified as overweight or obese (BMI greater than or equal to the 85th percentile) were excluded. Prevention interventions targeting children and adolescence and the parents of children and adolescence who were between two years to 18 years of age were

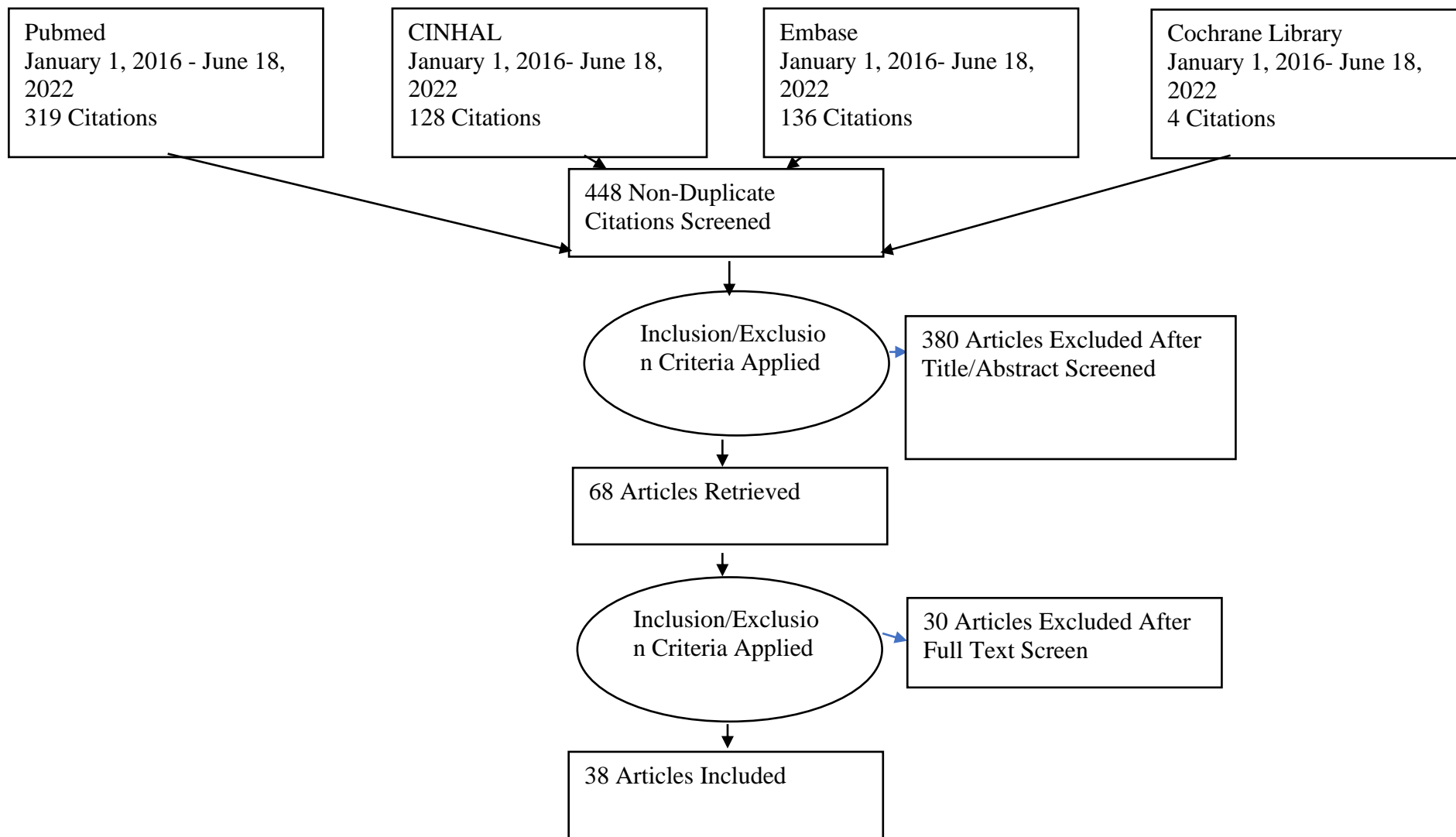
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included in the review, while prevention interventions targeted specifically for newborns, infants, and adolescents were excluded.

Prevention interventions set in the primary care setting were included, but any articles set in community-based settings were excluded. Articles which included background information related to obesity prevention interventions in primary care settings, such as expert guidelines for obesity prevention in primary care; information related to providers current obesity prevention intervention practices; barriers identified in providing obesity prevention interventions in primary care; and cost analysis of implementing an obesity prevention intervention in primary care were also included. After inclusion and exclusion criteria were applied, 380 articles were excluded for further review, leaving 68 articles to screen the full text of each of these articles. Once full text of the 68 articles was screened and inclusion and exclusion criteria were applied to each of these articles, 30 articles were excluded, leaving 37 articles and one Cochrane systematic review to include in the literature review for this QI project. See this process of article searching and elimination diagramed in Figure 1, a PRISMA flow diagram. All the literature identified provides relevant and timely information synthesized below.

Figure 1

PRISMA Flow Diagram for Literature Search for Obesity Prevention QI Project



Synthesis of the Evidence

Each of the 37 articles and one Cochrane systematic review included in this literature search were evaluated for quality or level of evidence based on the John Hopkins Nursing Evidence-based Practice Levels of Evidence and some common themes and concepts were identified throughout the literature. Table 1 provides criteria for John Hopkins Nursing Evidence-based Practice Levels of Evidence. Studies included in this review ranged from Level I Randomized Control Trials to Level V QI Projects. Although less literature is available which specifically addresses obesity prevention as compared to the literature available to address obesity treatment intervention in primary care, the literature identified provides some strong guidance for developing an effective obesity prevention intervention for the primary care setting. Of the 38 articles included in this literature review, 21 articles provided background information related to the problem of pediatric obesity, especially as it relates to primary care, and 17 articles provided examples of pediatric obesity prevention interventions that can be implemented in primary care.

Table 1

<i>John Hopkins Level of Evidence</i>	
Level I	Experimental study, randomized controlled trial (RCT) Explanatory mixed method design that includes only a level I Quantitative study Systematic review of RCTs, with or without meta- analysis
Level II	Quasi-experimental study Explanatory mixed method design that includes only a level II Quantitative study Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis

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Level III	Non-experimental study Systematic review of a combination of RCTs, quasi-experimental and nonexperimental studies, or nonexperimental studies only, with or without meta-analysis Exploratory, convergent, or multiphasic mixed methods studies Explanatory mixed method design that includes only a level III Quantitative study Qualitative study Meta-synthesis
Level IV	Opinion of respected authorities and/or nationally recognized expert committees or consensus panels based on scientific evidence Includes: <ul style="list-style-type: none"> • Clinical practice guidelines • Consensus panels/position statements
Level V	Based on experiential and non-research evidence Includes: <ul style="list-style-type: none"> • Integrative reviews • Literature reviews • Quality improvement, program, or financial evaluation • Case reports • Opinion of nationally recognized expert(s) based on experiential evidence

Adapted from (Dang & Dearholt, 2017)

Literature Addressing the Problem of Childhood Obesity

Childhood obesity is a concerning public health trend in the United States that is gaining increased attention today. As stated previously, approximately one third of children in the U.S. today are overweight or obese (Reed et al., 2016). Kentucky has some of the highest rates of obesity in the nation (Kentucky Cabinet for Health and Family Service, n.d.). In 2016, 34.2% of adults in Kentucky were reported to be obese. The percentage of Kentucky high school students considered overweight and obese also increased from 35.5% in 2015 to 36.3% in 2017 (Kentucky Cabinet for Health and Family Services, n.d.). In 2018, Kentucky's projected

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healthcare costs that could be attributed to obesity were estimated to be around six billion dollars.

At the local level, obesity is a major health concern in Jefferson County. According to a Community Health Needs Assessment performed by the University of Louisville (U of L) Hospital for 2020 to 2022, adult obesity rates for Jefferson County were at 33% and diet and exercise were the number one factors that led to death in Jefferson County (University of Louisville Hospital [U of L Hospital], 2019). Jefferson County Public Schools also reported 18% of kindergartners and 24.2% of sixth graders attending public schools in the county were obese in 2012 (Center for Health Equity, 2017). According to U of L Hospital's Community Needs Assessment (2019), 14.1% of Jefferson county's population live in poverty, 60% of children in Jefferson County are eligible for free or reduced lunch, and 41% of children in Jefferson County live in single parent households, which are significant factors when considering the obesity problem particularly among low socioeconomic status children in the county. According to data from Kentucky Youth Advocates and the Kentucky State Data Center (2013), approximately 48% of children 10-13 years of age with a zip code associated with the family practice project site were identified as overweight or obese during school health exams.

Childhood-onset obesity is particularly concerning considering childhood obesity is a strong predictor of adult obesity and is related to numerous risk factors for cardiometabolic disease; including elevated blood pressure, high cholesterol, and coronary heart disease; type two diabetes; various cancers; obstructive sleep apnea and reactive airway disease; nutritional deficiencies such as vitamin D and iron deficiencies; and premature death (Harrison & Greenhouse, 2018; Pujalte et al., 2017). Children who are overweight or obese are also at increased risk for psychological distress including: anxiety and depression, bullying, and low

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self-esteem, which can also impact academic success (Cooper & Mandel, 2020). The economic burden of childhood obesity is also significant. In comparing the lifetime direct medical costs of an obese 10-year-old compared to a child who is normal weight, the lifetime medical costs are around \$19,000 more for the obese child (Tanda et al., 2017). When considering the costs of medical care for all overweight and obese children in the U.S., childhood obesity costs fourteen billion dollars in direct healthcare expenses annually (Robert Wood Johnson Foundation, 2020).

Causes of childhood obesity are multi-factorial. Research shows there is a link between elevated levels of parental stress and children's higher weight status and unhealthy lifestyle behaviors (Smith et al., 2020). Food insecure children are also more likely to be overweight or obese (Mejia de Grubb et al., 2019). Nutritional research has also shown adult role modeling is the single largest influence of children's food preferences and daily food consumption (Cooper & Mandel, 2020).

Literature Surrounding Childhood Obesity Prevention in Primary Care

Because it is extremely difficult to treat childhood obesity once it occurs, the American Academy of Pediatrics says prevention is the optimal approach to childhood OW and OB (Brown & Perrin, 2018; Cooper & Mandel, 2020). Primary care clinics can be ideal settings to address childhood obesity prevention, considering primary care providers (PCPs) have regular contact with children and families during well-child and sick visits and are considered trusted sources of information related to health risks and prevention behaviors (Harrison & Greenhouse, 2018.) In 2007, the AMA and CDC Expert Panel recommended primary care providers assess weight status for children and adolescence yearly using BMI percentiles; assess diet and physical activity patterns at each well-child visit; and use a staged approach to obesity intervention when a patient is found to be overweight or obese (Barlow, 2007; Mandelbaum et al., 2020). Use of

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BMI alone to measure obesity, however, has its limitations. In the future, advanced technologies could help in measuring both boy fat percentage and BMI measurements to assess for obesity in children (Durbin et al., 2016).

According to Hersch et al. (2021), primary care providers consider well-child visits to be the most ideal time to assess children's health behaviors related to diet and exercise and to have weight related discussions. Nonetheless, school and sport physicals and even sick visits are appropriate times to provide anticipatory guidance to related to health behaviors proven to decrease risk of developing the long-term consequences of OW or OB (Cooper & Mandel, 2020). Nationwide primary care visits have significantly decreased during the COVID-19 pandemic, giving primary care providers less opportunities to provide patients and caregivers with anticipatory guidance related to health promoting behaviors (O'Leary et al., 2021; Kujawski et al., 2022). Reserving discussion of weight and health behaviors related to diet and physical activity for well-child visits, could mean missing an entire population of children who miss well-child visits, considering many families only seek care when their child is acutely ill, especially families of children who are uninsured or publicly insured who may miss one-third to one-half of their child's well-child visits (Hersch et al., 2021).

Several barriers to integrating obesity prevention into pediatric primary care have been identified in the literature by providers including: lack of knowledge and training related to evidence-based practices surrounding obesity prevention in primary care, a perception that there is a lack of time to discuss these topics during well-child and sick visits, discomfort in discussing weight related topics with patients and families, and lack of reimbursement available for prevention services (Harrison & Greenhouse, 2018).

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According to Harrison & Greenhouse (2018), PCPs receive minimal training related to nutrition and diet and health promotion, leaving providers with gaps in knowledge and limited confidence in their ability to incorporate counseling on these topics into their practice. In a study looking at nurse practitioner childhood obesity preventive practice patterns which surveyed 11,000 APRNs working in primary care settings in Ohio, half of the 11,000 APRNs surveyed said they lacked knowledge related to childhood obesity, physical activity, and dietary guidelines (Tanda et al., 2017). Only 35-50% of participating APRNs were also able to correctly identify the definition of OW and OB in children, the recommended amount of fruit and vegetable consumption using the plate method, and the daily requirement for moderate physical activity for school children.

Many providers also still do not feel comfortable diagnosing pediatric patients as overweight or obese based on BMI percentiles. According to Ray et al. (2022), although pediatricians use of BMI at well-child visits has increased over time, many PCPs reported not using BMI because they were not aware of guidelines for BMI classifications of OW or OB in children; there was lack of agreement among PCPs regarding the predictive potential and usefulness of BMI, especially in young children; and lack of automatic BMI calculators in some settings.

In the literature, PCPs, many of whom are expected to see patients in 15-minute intervals, also identified lack of time as a major barrier to addressing obesity prevention in primary care. In Hersch et al. (2021), 70% of primary care physicians said they shied away from having weight related discussions with pediatric patients and their parents because of lack of time and competing visit priorities. According to Tanda et al. (2017), 27% of APRNs said they had lack of time during visits to discuss obesity prevention practices.

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Primary care providers also fear offending patients and families by bringing up weight related discussions. A study published by Hersch et al. (2021), reported 80% of primary care physicians were intentional to avoid weight and appearance-focused discussions, but instead formulated discussions around health behaviors and lifestyle choices. Parental resistance was also identified in the literature. Tanda et al. (2017), reports parental resistance as the most significant barrier (64.5%) APRNs face in evaluating and managing pediatric patients' nutrition, physical activity, and weight. The same authors found providers reported parents, many of whom are also overweight themselves, can get offended by weight discussions.

Lack of reimbursement for time spent in lifestyle counseling was also identified as a barrier to providing obesity prevention guidance in pediatric primary care, considering providers have not historically billed for providing nutrition and physical activity counseling (Mandelbaum et al., 2020; Tanda et al., 2017). In a study analyzing pediatricians' practices and attitudes concerning childhood obesity in 2016 and 2017, half of pediatricians surveyed in 2017 (n=558), believed there was inadequate coverage by insurers to screen, counsel, and make referrals for childhood obesity (Belay et al., 2019).

Literature Review of Obesity Prevention Interventions in Primary Care

Considering obesity prevention is such an important topic to address in the primary care setting, but must be addressed in a very timely manner, the literature provides evidence-based options for effective, efficient ways to address obesity prevention in the primary care setting. Studies reviewed detailing obesity prevention interventions, ranged in rigor from Level I randomized controlled trials (RCTs), to Level V QI projects. See Table 2 for common elements of pediatric obesity prevention interventions for primary care identified in the literature and the leveling of the evidence supporting common elements identified.

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Table 2*Key Elements of Pediatric Obesity Prevention Interventions Delivered in Primary Care Settings*

Key Elements	Strength of Evidence	Supporting Evidence
Screening tools used to start the conversation about obesity prevention health behaviors	II, V	(Bailey-Davis et al., 2019) (Camp et al., 2017) (Camp et al., 2020) (Gibson, 2016) (Judge et al., 2020) (Sharp et al., 2016) (Thomas et al., 2022)
Technological elements incorporated into the intervention including screening tools incorporated into the EHR, clinical decision supports, and brief e-health tools.	I, II, III, V	(Avis et al., 2016) (Bailey-Davis et al., 2019) (Bryne et al., 2016) (Camp et al., 2020) (Shook et al., 2018) (Williams et al., 2020) (Wright et al., 2017)
Nurse-led telephone follow-up phone calls	I, V	(Schlottman et al., 2019) (Sherwood et al., 2019)
Goal setting with providers and child-caregiver dyads	I, III, V	(Camp et al., 2017) (Gibson, 2016) (Judge et al., 2020) (Sharp et al., 2016) (Williams et al., 2020) (Wright et al., 2017)
Obesity prevention handouts given to patients and their caregivers at the end of the visit	I, II, III, V	(Avis et al., 2016) (Bailey-Davis et al., 2019) (Bryne et al., 2016) (Camp et al., 2020) (Thomas et al., 2022) (Williams et al., 2020) (Wright et al., 2017)
Incentives given out to patients	III	(Williams et al., 2017)

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and their caregivers matching
health behavior goals

Training provided to providers
and staff related to motivational
interviewing and/or goal setting

V

(Camp et al., 2017)
(Judge et al., 2020)
(Thomas et al., 2022)

Among the studies reviewed, many of the studies used screening tools administered to patients and their caregivers with questions about health behaviors to broach the subject of obesity prevention with patients and caregivers. The most commonly used screening tool in the literature was the 5210 Healthy Habits Questionnaire (HHQ) developed by the Maine Overweight Collaborative (MYOC) (Camp et al., 2020 [V]; Camp et al., 2017 [V]; Gibson, 2016 [V]; Judge et al., 2020 [V]). The HHQ is a 10-item behavioral screening tool first introduced by MYOC which asks about factors that promote a healthy weight (Camp et al., 2020 [V]). The MYOC couples the HHQ with provider discussion of MYOC 5210 behavioral goals which include: “**5** (fruits or vegetables), **2** (hours or less of screen time), **1** (hour or more of physical activity), and **0** (sugary drinks) every day.” These goals have been adopted by the American Academy of Pediatrics (AAP) as obesity prevention recommendations as well (American Academy of Pediatrics (AAP), 2020). Thomas et al. (2022 [V]) utilized a screening tool developed by the National Institute for Children’s Healthcare Quality (NICHQ) which assesses many of the elements of 5210 also addressed by the HHQ.

Another previously validated screening tool used in a study included the Family Nutrition and Physical Activity (FNPA) risk assessment tool, a 20-question assessment tool that

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takes less than 20 minutes to complete (Bailey-Davis et al., 2019, [II]). Questions included in the FNPA risk assessment included some of the questions included in the HHQ but also asked questions related to fast food consumption, snacking, using candy as a reward, involvement in organized sports, bedtime routine, and hours of sleep each night. One study developed a new screening tool for their study. Sharp et al. (2016 [V]) developed a Starting the Conversation seven question pediatric tool based on a validated (reliability coefficient of 0.75), Starting the Question 4-12 (STC 4-12) tool developed for adults that consists of 20 nutrition and physical activity questions. The STC tool for pediatrics developed in Sharp et al. (2016 [V]), consisted of seven health behavior questions that assessed many of the factors also included in the HHQ including: fruit and vegetable intake, sugary drink intake, physical activity, and screen time. The STC 4-12 also asked about unhealthy snacking in children and perception of cost of healthy foods. See Table 3 for a table detailing the different elements included in each screening tool.

Table 3

Comparison of Elements Included in Different Obesity Prevention

	HHQ	FNPA	STC Pediatric	NICHQ
Servings of fruit and vegetables	√	√	√	√
Eating dinner at the table or eating meals as a family	√	√		√
Eating breakfast	√	√		√
Eating fast food and/or take out/amount in a week	√	√		

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Unhealthy snacking (chips, cookies, and candy)		√		
Consumption of soda, juice, and other sugary drinks	√	√	√	√
Consumption of water	√			
Consumption of whole milk and non-fat, low-fat, and reduced fat milk	√			
Consumption of microwavable or ready to eat foods		√		
Use of candy as a reward for good behavior		√		
Perception of healthy food costing too much			√	
Eating in front of the television and/or computer		√	√	√
Hours of screen time/television in a day	√	√	√	√
Computer and television in bedroom	√	√		√
Hours of/ or	√	√	√	

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opportunities for
active
play/physical
activity in a day

Participation in
sports or dance
in or outside of
school three or
more times a
week

Favorite sport or
physical activity

Family is
physically active
together

Child enrolled in
sports or
activities with a
coach or a leader

Family has daily
routine for
child's bedtime

Child gets 9
hours of sleep a
night

√

√

√

√

√

√

Technology was a critical component of many of the studies reviewed as well. Studies incorporated technological components including: risk assessment results alone and/or risk assessments plus BMI screening data added into the electronic health record (EHR), (Bailey et al., 2019 [II]; Camp et al., 2020 [V]; Shook et al., 2018 [III]; Williams et al., 2020 [III]), opportunities for patients and families to fill out screening tools via a patient portal, iPad, or kiosk (Bailey-Davis et al., 2019 [II]); clinical decision supports (Bailey-Davis et al., 2019 [II]);

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brief electronic health (e-health) tools conducted on a study-designated tablet (Avis et al., 2016 [III], Byrne et al., 2016 [I]), and computer-based tailoring systems to tailor reports for families based on obesity prevention topics of interest (Avis et al., 2016 [III]; Wright et al., 2017 [I]).

Two studies also utilized nurse-led telephone follow-up phone calls that occurred after an obesity prevention intervention conducted in a primary care office to promote healthy behaviors in children (Schlottman et al., 2019 [V]; Sherwood et al., 2019 [I]).

In many of the studies, providers utilized screening tools to launch into a goal setting portion of the intervention, encouraging parents and children to set a goal related to obesity prevention to work on at home (Camp et al., 2017 [V]; Camp et al., 2020 [V]; Gibson et al [V], 2016; Judge et al., 2020 [V]; Sharp et al., 2016 [V]; Williams et al. [III], 2020; Wright et al., 2018 [X]). In some of the studies, this goal was documented in the EHR, so the provider could follow-up on the goal with the family in a future visit (Camp et al., 2017 [V]; Camp et al., 2020 [V]). In many of the studies, handouts related to obesity prevention based on families' topics of interest or health behavior goals were given out or emailed to families (Avis et al, 2016 [III]; Bailey-Davis et al., 2019 [II]; Byrne et al., 2016 [I]; Gibson, 2016 [V]; Thomas et al., 2022 [V], Williams et al., 2020 [III]; Wright et al., 2017 [I]). In one study, Williams et al. (2020 [III]), families were also given an incentive that matched one of their agreed upon lifestyle goals, such as a pass to a recreational center or a grocery store voucher.

Prior to implementing the interventions in several studies, staff were provided with training related to motivational interviewing and goal setting. For instance, in Camp et al. (2017 [V]), prior to intervention implementation, providers were coached on sample language to use during the intervention based on motivational interviewing techniques, and in Judge et al. (2020 [V]), providers participate in the American Academy of Pediatrics' (AAP) Module six on

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Obesity Training and Motivational Interviewing. Thomas et al. (2022 [V]), also provided information to providers related to motivational interviewing and access to the Change Talk App from the AAP prior to implementing their obesity prevention intervention.

Success of Pediatric Obesity Prevention Interventions

Pediatric obesity prevention interventions reviewed varied in how successful they were in achieving positive outcomes related to obesity prevention in primary care. In their systematic review of RCTs in the Cochrane Database of Systematic Reviews, Brown et al. (2019) concluded with obesity prevention interventions there was low-certainty evidence from 20 RCTs in children six to 12 years of age that diet combined with physical activity interventions, compared with a control, reduce BMI z-score or BMI percentiles in children. Nonetheless, some of the studies reviewed included interventions developed for the primary care setting which did result in positive changes in BMI z-score overtime. For instance, in the level II quasi-experimental study by Bailey-Davis et al. (2019) one-year follow-up intervention, children in the intervention group of the study had a smaller increase in mean BMI z-score than did the non-respondent group. In a large study with 986 participants sited in several of the studies reviewed in this literature review trialing the Maine Youth Overweight Collaborative (MYOC) by Gortmaker et al. (2015), a decrease in growth of BMI z-scores were found following the start of the intervention. In this study, a statistically significant decline in the rate of increase in BMI z-score was found for participants both who were overweight and were healthy weight as well. In Sherwood et al. (2018), a RCT using phone coaching to reinforce an intervention in the well child visit, mean BMI percentile values decreased significantly from baseline through 12 and 24 months.

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In addition to looking for decline in BMI z-score, many of the studies also measured other primary and secondary outcomes to determine if their interventions were successful including: decrease in obesogenic behaviors, parent satisfaction with the intervention; provider satisfaction with aspects of the intervention; parent motivation to change; parent 24 hour diet recall, report of screen time watched post intervention, adherence to goals post intervention, EHR reviews and provider interviews; and parental use of resources provided by PCPs. Some studies also looked specifically at documentation of BMI percentile and proper classification of overweight and obese patients as overweight and obese (Gibson, 2016 [V], Thomas et al., 2022 [V]). For instance, in Gibson (2016), documentation of BMI percentile and education and counseling increased dramatically from 27% to 98% and from 9% to 87% and proper diagnosis of OW and OB increased from 0% to 32%.

Gaps and Limitations Identified in the Literature

When considering the overall strength of the evidence included in this literature review, the literature makes a strong case for the validity of an obesity prevention intervention in primary care potentially promoting modest long term health behavior changes among families, considering several level I RCTs and level II quasi- experimental studies (Level I & II studies= 5), with large sample sizes [(Bailey- Davis et al., 2019) (N= 10, 647); (Sherwood et al., 2018) (N= 421); (Bryne et al. 2016) (N= 226)] were included in the review. Intervention durations for many of the studies were relatively short, but Sherwood et al. (2018) measured changes in BMI six months and one year post intervention, and even as far out as two years post-intervention, and noted significant trends in BMI z-score in intervention groups as compared to control groups.

Unfortunately, some studies included smaller sample sizes, short durations for post-intervention assessments, and measured outcomes that are less reliable measurements of true

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health behavior change, meaning it is more unclear whether these primary care interventions were truly effective in preventing childhood obesity. For instance, in Gibson (2016) only 74 charts were reviewed pre-intervention, 60 charts reviewed post-intervention, and the program was only in place a very short time before it was evaluated. Sharp et al. (2016) (Level V QI study) also only used a convenience sample of only 60 children in their study which resulted in no statistically significant decrease in STC score post intervention. In the Level I RCT by Wright et al. (2017), the pilot study also included a very small sample size of 28 participants and merely evaluated the feasibility of their tailored report intervention measuring parents' responses to questions about acceptability of the report.

Clinical Significance of the Literature

Some of the literature reviewed discussed interventions that were statistically significant but less clinically significant considering some aspects of the intervention would be difficult to implement considering the time and staffing constraints many busy pediatric primary care offices face. Although the phone coaching interventions implemented by Sherwood et al. (2018) resulted in statistically significant changes in BMI in participants, most primary care clinics would not have the staff available to provide families with six biweekly phone coaching calls from trained phone coaches over the course of three months and eight monthly phone coaching calls during the rest of the first year of intervention. Considering inadequate reimbursement is a significant barrier PCPs face when addressing obesity prevention in primary care setting, cost is an important factor to consider when implementing an obesity prevention intervention in the primary care setting (Mandelbaum et al., 2020; Tanda et al., 2017). Some of the studies included used technological innovation to make it easier to screen patients and distribute information to patients and families. Nonetheless, cost and availability of technological innovations such as

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EHR changes, clinical decision support technology, and things like iPads for patients and families to use could be a barrier to implementing some of these time saving interventions in primary care clinics. According to Brown et al. (2019) few of the studies reviewed in this systematic review of RCTs, included information about cost or cost effectiveness of obesity prevention interventions in general. This review, however, did include one study by Jordan et al. (2019) which looked at the cost of implementing a family-based intervention to prevent pediatric obesity in primary care. This study found labor costs needed to implement an obesity prevention intervention were quite costly.

Choosing a Pediatric Obesity Prevention Intervention

After considering the various evidence-based options for implementing an obesity prevention intervention to best meet the needs of the family practice clinic, it was decided an intervention would be implemented at the clinic using the MYOC guidelines for implementing an obesity prevention intervention. The MYOC intervention incorporated many of the key elements of an obesity prevention intervention identified in the literature review. It is an intervention that has been widely used in numerous studies and in practices nationwide (Gortmaker et al., 2015). It is an intervention which allows providers to convey the key AAP recommendations related to obesity prevention and use motivational interviewing and goal setting techniques to promote health behavior change promptly in a fast-paced family practice clinic. The HHQ was to be administered to children and the parents or caregivers of children two to 18 years of age. The providers were to discuss the results of the HHQ with the child and their caregiver, and the provider then was to work with the child-caregiver dyad to set a goal related to obesity prevention. The provider then was to document the intervention and the patient's stated goal into the EHR using a smart phrase. Lastly, the provider was to give the child-parent dyad a

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handout that included information related to obesity prevention goals which could benefit the child-parent dyad in meeting their obesity prevention goal.

Purpose and Aims of an Obesity Prevention Intervention in a Family Practice

External evidence suggests using an obesity prevention screening tool and brief intervention facilitates discussion between providers and patients and families regarding healthy behaviors which prevent obesity in children. With limited time to provide anticipatory guidance about health promotion and disease prevention in pediatric visits, utilizing an evidence-based tool provides busy providers with an opportunity to promote obesity prevention in pediatric patients in an effective and efficient way. The purpose of this project was to successfully implement a sustainable screening tool and obesity prevention intervention in the family practice setting, which would result in improved documentation of discussion of obesity prevention health behaviors and goal setting with patients and caregivers of children and adolescents visiting the clinic for both well-child and sick visits. The first aim was to measure compliance with documentation of provider discussion of MYOC/AAP 5210 obesity prevention recommendations and documentation of a health behavior goal in 70% of pediatric patients visiting the clinic during the intervention period. The second significant aim was to measure an increase in the quantity and quality of documentation related to obesity prevention by providers during well-child and sick child visits after implementation of the MYOC obesity prevention intervention at the family practice clinic, in comparison to documentation from visits six weeks prior to the intervention period. The third specific aim was to measure an increase in providers diagnosing pediatric patients as overweight and obese using proper ICD 10 codes based on the CDC definition of OW and OB using BMI percentiles in children. The fourth specific aim was to measure an increase in the number of follow up visits generated by providers with pediatric

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patients identified as overweight and obese. The last significant aim was to qualitatively measure provider's perceptions related to the obesity prevention intervention, and find providers were satisfied with the ease of use of the MYOC intervention.

Theoretical Framework

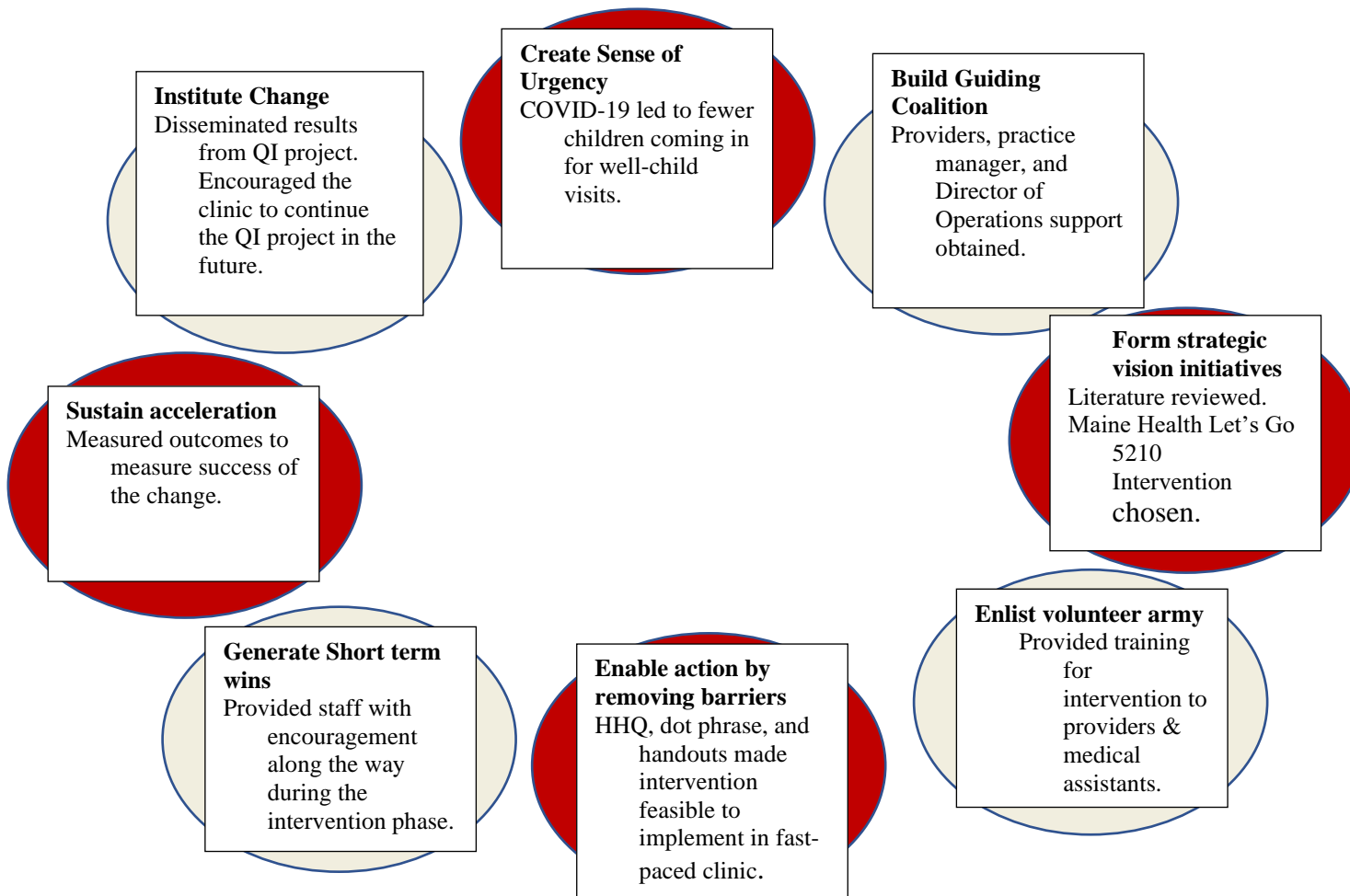
John Kotter's Eight-Step Plan for Implementing Change was the theoretical framework for this project. This theory builds upon Kurt Lewin's Theory of Change, which divides planned change into three phases: unfreezing, implementing change, and refreezing (Oberleitner, 2019). Kotter provides an eight-step process to accelerate change in an organization including: creating a sense of urgency for the change, forming coalitions to have enough power to lead the change, creating a new vision and initiatives to direct the change, recruiting a volunteer army, removing barriers to change, generating short-term "wins", sustaining the acceleration, and instituting the change (Kotter, 1996). Because many children in the clinic were missing well-child appointments due to the COVID 19 pandemic, there was a sense of urgency within the clinic to provide anticipatory guidance and promote health behaviors that prevent obesity when the opportunity arose. Key stakeholders for the project were engaged about the importance of this project in various positions including: the Director of Operations for the outpatient portion of the organization, the practice manager for the clinic, several providers, and multiple medical assistants. Barriers to change were removed by incorporating stakeholders into the design of the project to create a plan for project implementation that should flow seamlessly in a fast-paced clinic environment. Wins were celebrated along the way as the project was implemented. The hope was that outcomes measured after project implementation would result in providers wanting to use this intervention long term with their pediatric patients. See Figure 2 which shows

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how John Kotter's Eight-Step Plan for Implementing Change guided implementation of this QI project.

Figure 2

John Kotter's Eight Step Plan for Change



(Kotter, 1996)

Methods

Context/Design

This quality improvement project with a pre and post study design was focused on bringing about provider behavior change to improve the quality of discussions providers have with pediatric patients regarding obesity prevention health behaviors. The project intervention was designed to give providers a screening tool that would facilitate obesity prevention discussions with children and their caregivers in a fast-paced clinic environment. This project intervention aimed to demonstrate provider behavior change. Provider change was to be demonstrated in the following ways: 1) improving provider discussions related to obesity prevention and healthy lifestyles, 2) improving provider documentation, and 3) by demonstrating a change in billing practice by generating follow up appointments related to pediatric obesity and obesity prevention.

Setting

The project intervention was conducted at an urban, university-based family practice clinic in Kentucky. This family practice provides care to patients of all ages. It is not uncommon for providers in the clinic to see infant and geriatric patients in the same day, and all ages in between. The clinic serves approximately 1000 patients a month. Providers estimate five percent of the patients served by the clinic are pediatric patients.

Conducting this intervention in a family practice setting was ideal considering studies have found family practice providers address pediatric obesity less than do pediatric providers. For instance, Huang et al. (2012), found 68% of pediatricians and 39% of family physicians throughout the country consistently assessed patients for obesity using BMI percentiles.

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Sample

Children and young adults from two to 18 years of age who visited the family practice clinic for both well-child and sick visits were included in the intervention. On average this clinic saw approximately three pediatric patients between two and 18 years of age a day, five days a week. The intervention was implemented over a six-week period, so it was anticipated approximately 50 pediatric patients would be included in the intervention. Children under two years of age were excluded from the intervention, considering the Maine Health Intervention was designed to provide obesity prevention recommendations for children two years of age and older. Obesity prevention interventions targeting children two years of age and under focus on promoting behaviors such as breastfeeding which were not emphasized in the Maine Health Intervention.

Implementation

Intervention

This QI intervention included a Healthy Habit Questionnaire (HHQ) administered to all pediatric participants (see Appendix A). Providers reviewed the results of the HHQ with children and their caregivers, reviewing the AAP's "5210 Let's Go" key messages related to obesity prevention, and used motivational interviewing techniques to encourage children and their caregivers to come up with one goal they wanted to work on related to obesity prevention. The provider also gave patients and their caregivers with handouts developed by Maine Health to assist patients and their caregivers in meeting the goal or goals they identified (see Appendix B). Lastly, the provider documented a smart phrase within the EHR documentation of the visit, documenting obesity prevention counseling provided during the visit and the specific goal the patient and family chose to work on (see Appendix C). No permission was needed to use the

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HHQ and handouts from Maine Health, considering Maine Health allows providers to download and distribute materials from their website free of charge and does not require permission before using any materials (Maine Health, 2021).

Procedure

Prior to implementation of this quality improvement initiative, the providers and medical assistants (MA) participating in this project were asked to watch a 10-minute video emailed to the staff detailing the steps of the intervention. Handouts from Maine Health addressing motivational interviewing and obesity prevention and intervention, were also be included in the email sent to participating staff (See Appendix D). The email sent to staff also included CDC definitions of underweight, normal, overweight, and obesity for children based on BMI percentiles and ICD 10 codes for underweight, overweight, and obesity. The providers also received education on how to use the Epic smart phrase to document the intervention and quickly add this note to their documentation (see Appendix C).

During the six-week implementation period for this quality improvement initiative, all children between the ages of two and 18 years of age visiting the family practice for a well-child or a sick visit, were included in the intervention. No informed consent was needed prior to patients and families participating in the intervention, considering the study looked at improvement in provider documentation surrounding obesity prevention because of the intervention. No patient specific outcomes were measured.

Prior to coming back to an exam room, a medical a MA measured the height and weight of all patients, and the EHR automatically calculated the patient's BMI percentile from these measurements. Prior to leaving the room, the MA asked the patient or caregiver to fill out the Maine Health HHQ. If the patient was two to 10 years of age, the caregiver filled out the

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caregiver version of the HHQ, and if the patient was 10 to 18 years of age, the patient was asked to fill out the HHQ on their own. The questions asked on each version of the HHQ were the same. The only difference in the surveys is that the two-nine -year-old survey asked parents to answer questions while the survey for those 10-18 directed questions to the child or teenager. The HHQ was available in Arabic, French, Somali, and Spanish. Patients whose primary language was one of these languages were provided with the Arabic, French, Somali, or Spanish version of the HHQ. The last question of the HHQ asked parents and children if there was one thing, based on 5210 obesity prevention recommendation that they wanted to change. This question helped with facilitation of goal setting during the motivational interviewing and goal setting portion of the intervention which occurred when the provider came into the room.

Prior to entering the room, the provider was to review the patient's BMI percentile and note if the patient was underweight, normal weight, overweight, or obese, based on CDC definitions utilizing BMI percentile. During the provider's time with the patient and caregiver during the visit, the provider reviewed the HHQ filled out by the patient or caregiver and discussed the HHQ with the parent-child dyad. The provider then utilized motivational interviewing techniques to encourage the parent-child dyad to develop a goal related to obesity prevention. Before the provider left the exam room, the provider also provided the parent-child dyad with several handouts from Maine Health providing families with more information related to 5210 Obesity Prevention Goals. If the patient was identified as underweight, overweight or obese, the provider was to explain to the patient and caregiver, while BMI is sometimes an imperfect measure, the patient's BMI percentile classified them as either underweight, overweight or obese, and was to ask the patient caregiver dyad would like to schedule a follow-up visit to discuss health behaviors and weight status further. Any patient of normal weight who

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wanted to discuss AAP 5210 obesity prevention goals further was also encouraged to schedule a follow-up visit. In discussing BMI percentiles and weight status, the provider focused the discussion on health and healthy behaviors rather than weight status with patients and caregivers.

After each visit, the provider then documented obesity prevention education provided during the visit in the EHR using a smart phrase. The provider also documented the specific goal or goals identified by the patient and/or caregiver in the EHR visit documentation.

Prior to the implementation period of the QI project, chart reviews of all pediatric patients between two and 18 years of age who visited the clinic for well and sick child visits during the six-week period before the implementation period were reviewed to look at the quality and quantity of documentation surrounding obesity prevention. During the implementation period, all charts of pediatric patients between two and 18 years of age visit the clinic for well and sick child visits, were also be reviewed to look at the quality and quantity of documentation surrounding obesity prevention during the six-week implementation period. Charts were reviewed to determine if patients with a BMI percentile greater than the 85th or 95th percentile were appropriately diagnosed as overweight or obese with appropriate ICD-10 diagnosis codes and if follow-up appointments were generated for patients identified as overweight or obese after the intervention. Figure 3 outlines the steps of the QI project intervention.

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Figure 3

Steps of QI Project Intervention

The MA will ask all children and/or their caregivers to fill out a Healthy Habit Questionnaire (HHQ) prior to provider entering the room.

The provider will go over the HHQ with families and review AAP's "5210 Let's Go" key messages related to obesity prevention during the visit.

Child/caregiver dyad encouraged to come up with one health behavior goal to work on during the visit.

Maine Health handouts related to obesity prevention given out to child/caregiver dyad.

Obesity prevention counseling and healthy habit goal documented after visit using previously developed dot phrase.

Provider should diagnose patient as OW/OB during visit using appropriate ICD code if patient is OW/OB.

Chart audits will assess whether key phrases related to obesity prevention were recorded in visit documentation, whether one obesity prevention goal was recorded, whether appropriate ICD codes were entered for OW/OB children, and whether follow-up visits were generated.

Data surrounding quality of documentation were collected, but no identifiable information such as names, phone numbers, or medical record numbers were recorded or included in the data collection or analysis. No identifiable demographic data were published. All data were gathered following HIPAA guidelines to ensure patient information was kept confidential and protected against unauthorized disclosures (Center for Disease Control and Prevention [CDC], 2021). All data were collected and stored on an encrypted and password protected laptop. All data were collected using a Microsoft Excel spreadsheet. A codebook was developed using a Microsoft Excel spreadsheet. Each patient included in the intervention was

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assigned a number. Different columns of the spreadsheet recorded demographic information, the patient's BMI percentile, whether key phrases related to obesity prevention were recording in visit documentation (Y or N), whether a healthy habit goal was recorded for the patient (Y or N), whether appropriate ICD-10 codes were entered for overweight and obese pediatric patients (Y or N), and whether a follow-up visit was scheduled for a patient who met criteria for overweight or obesity (Y or N); see Appendix E.

After the implementation period was complete, the providers participating in the project were also be asked to fill out a qualitative survey asking for the providers evaluation of the QI project (See Appendix F).

Table 4

Timeline for Intervention

Week -1	Week 1-2	Week 6
<ul style="list-style-type: none"> Email sent to all participating providers and MA's which included a 10-minute instructional video on how to how to implement the intervention (have pediatric patients complete the Healthy Habits questionnaire (HHQ), how to go over 5210 recommendations, and choose a healthy habits goal). 	<ul style="list-style-type: none"> Performed chart audit of all pediatric charts (two-18 year-olds) looking for documentation of obesity prevention education for the six weeks prior to the intervention. Audits looked to see if appropriate ICD 10 codes used for OW/OB children. Data collected using Audit Tool created by QI project leader. Began implementing intervention and collecting process measure data. 	<ul style="list-style-type: none"> Intervention completed Finished collecting process data. Collected data related to follow up visits generated as a result of the intervention. Had participating providers fill out a qualitative evaluation of the intervention.

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Materials needed for implementation of the project included printer paper, ink, printer use, writing utensils, and staff's time. Accounting for materials needed and staff time, it cost approximately \$86 to complete the project. The healthcare organization donated the materials needed to complete this project.

Measures

As depicted in Table 5, a retrospective chart review was completed on all pediatric patients seen at the family practice during the six-week period prior to the implementation of the intervention, so that pre-intervention visits could be compared to intervention visits, to assess for the outcome measure of improvement in discussion of obesity prevention health behaviors during the intervention. Chart documentation was reviewed looking to see if any documentation for visits included documentation of anticipatory guidance by providers related to obesity prevention health behaviors. The primary investigator looked for documentation of key phrases such as "discussion of American Academy of Pediatrics' 5210 key messages related to obesity prevention" and documentation of a health behavior goal during pediatric visits during both the six-week period prior to the intervention and also during the intervention period. Pre-intervention pediatric charts were also reviewed to identify if any child in the pre-intervention group who are overweight and obese were accurately diagnosed as overweight or obese with a proper pediatric overweight or obese ICD-10 code. Process measures were studied during the intervention, to assess for adherence to the intervention steps during the intervention phase. The chart review which occurred during the intervention evaluated whether participants completed the HHQ correctly and completely, whether the provider documented going over the 5210 obesity

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prevention recommendations during the visit, whether the provider documented a health behavior goal chosen by the patient and caregiver during the visit, and whether the provider documented handouts were given to the patient and family related to obesity prevention at the end of the visit. The chart review also evaluated whether the provider accurately diagnosed the patient as overweight or obese based on the CDC definition of obesity in children during the visit. Additionally, the chart review looked to see if follow-up appointments were generated during the intervention for children identified as overweight or obese. Demographic data of patients included in the pre-intervention and post-intervention chart review were obtained including age, sex, insurance coverage, weight, height, BMI percentile, and weight status (underweight, normal weight, OW, or OB). Providers participating in the intervention were also asked to complete a post-intervention qualitative survey to evaluate providers' perception of the effectiveness and feasibility of the intervention (Appendix F). These measures were consistent with the project purpose and project aims.

Table 5

Outcomes for QI Project

Outcome	Measure	Measurement	
		During the 6 weeks prior to intervention	During the 6 week intervention period
Compliance filling out HHQ	Percentage of surveys filled out		√
Compliance documenting discussion of "5210" obesity recommendations	Percentage of compliance	√	√
Compliance documenting health	Percentage of compliance	√	√

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behavior goal			
Compliance documenting OW/OB using appropriate ICD code in OW/OB patients	Percentage of compliance	√	√
Follow up appointments with OW and OB pediatric patients generated	Number and percentage of follow up appointments generated		√

Data Analysis

Data analysis occurred using the latest version of IBM SPSS, version 28.0.1.1 (14). Demographic data of pre-intervention and post-intervention groups were analyzed using descriptive statistics. The mean age of participants was determined. It was also determined what percentages of children took part in the intervention based on sex and insurance status. It was also determined the percentage of children in each group that were underweight, healthy weight, overweight, and obese, based on CDC definitions of underweight, healthy weight, overweight, and obesity based on BMI percentiles in children. Inferential statistics using independent t-tests and one-way ANOVAs were utilized to look for mean differences of participants BMIs among different groups such as age groups, sex, and insurance status.

Process measures used during the intervention period were also analyzed via descriptive statistics. Of those participating the following were calculated: the percentage of children-caregiver dyads that filled out surveys completely, the percentage of visits that included documentation of discussion of AAP's 5210 obesity prevention recommendations, the percentage of visit documentation that included an identified a health behavior goal, the

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percentage of overweight and obese children who were diagnosed as overweight or obesity during the intervention phase, and the percentage of overweight or obese children who made a follow-up visit with providers as a result of the intervention.

Outcome measures were analyzed post-intervention, comparing pre-intervention and intervention visits, using inferential statistics. An independent t-test was used to compare pre-intervention and post-intervention documentation of discussion of obesity prevention counseling and health behaviors and healthy habit goals documented. An independent t-test was also used to compare diagnosis of overweight and obese in the pre-intervention group versus the post-intervention group and follow-up visits generated with overweight and obese patients in the pre-intervention group versus post-intervention group. A qualitative analysis of provider responses to survey questions was also conducted analyzing providers' perception of the usefulness of this intervention for their practice.

Ethical Considerations

The proposal for this project was submitted to the University of Louisville IRB as a quality improvement project. The project also received approval from the Senior Director of Operations for the organization and from the Interdisciplinary Research Oversight Council (IROC) for the organization (see Appendix G).

Results

Pre-intervention Group

The pre-intervention retrospective chart review found 45 pediatric patients between the ages of two to 18 visited the clinic for well child or sick visits during the six weeks prior to the intervention between January 17th 2022 and February 25th 2022. Fifty-three percent of patients in

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the pre-intervention group (n=24) were coming to the clinic for a well-child appointment. Males accounted for 51.1 % (n=23) of the pre-intervention group. The mean age of the group was 13.8 years (SD= 3.95). As shown in Table 6, data analysis found that 64% of the sample were Medicaid participants and 46.7% of pre-intervention patients (n=21) met criteria for being classified as overweight or obese with a BMI of 85% or greater. A one-way ANOVA and two independent t-tests were used to assess the pre-intervention group for differences in mean BMI percentiles between groups of children categorized based on age (2-5 years of age, 6-11 years of age, and 12-18 years of age); gender (male or female); and insurance status of children (Medicaid or private insurance). A one-way ANOVA was used to compare means between age groups of children and independent T-tests were used to compare means between males and females and patients covered with Medicaid versus private insurance. Forty-three patients were included in this sample because two patients did not have a recorded height and weight. During the pre-intervention period and the intervention period, a few patients were seen in their car due to COVID-19 protocols.

There were no statistically significant differences in BMI percentiles between the groups, but the mean BMI percentiles were much higher for children in the 6-11-year (BMI percentile=73.56) and 12-18-year (BMI percentile= 75.5) age groups than in the 2-5-year (BMI percentile= 38) age group. The mean BMI percentile for females (BMI percentile= 76.25) was slightly higher than the mean percentiles for males (BMI percentile= 70.83). The mean BMI percentile for participants with private insurance (BMI percentile= 81.4) was higher than the mean BMI percentile for participants with Medicaid (BMI percentile= 69.04), although a higher percentage of overweight and obese patients in this group were on Medicaid (57.1) than private

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insurance (42.9). Table 7 depicts these mean percentiles for the pre-intervention group and Table 11 depicts characteristics of overweight and obese children included in the study.

Table 8 shows the percentage of visits during which providers documented that they discussed AAP 5210 obesity prevention recommendations prior to the delivery of the intervention. During all the pre-intervention visits (n=45), providers documented discussion of AAP 5210 obesity prevention recommendations with patients, 0% of the time.

Providers appropriately diagnosed the 21 overweight and obese patients in this group as overweight or obese during the visit only 23.8% of the time (Table 11).

Table 6*Demographic Characteristics of Children in Pre and Post Intervention Groups*

Characteristic	Pre-intervention Group (n=45)		Intervention Group (n=42)		Combined Group (N=87)	
	n	%	n	%	N	%
Gender						
Male	23	51.1	15	35.7	38	43.7
Female	22	48.9	27	64.3	47	56.3
Age Range						
2-5	2	4.4	6	14.3	8	9.2
6-11	9	20.0	12	28.6	21	24.1
12-18	34	75.6	24	57.1	58	66.7
Insurance Status						
Medicaid	29	64.4	29	69	58	66.7
Private	16	35.6	13	31	29	33.3
Weight Status						
Underweight	0	0	1	2.4	1	1.1
Normal Weight	22	48.9	15	35.7	37	42.5
Overweight	8	17.8	7	16.7	15	17.2
Obese	13	28.9	17	40.5	30	34.5
Missing Weight	2	4.4	2	4.8	4	4.6

Visit Status

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Well Child	24	53.3	20	47.6	44	50.6
Sick Visit	21	46.7	22	52.4	43	49.4

Table 7

Differences in BMI Percentiles of Participants by Characteristics in Pre-Intervention Group (n=43)

Characteristic	BMI			MD	Confidence Interval		df	t	p
	n	M	SD		Lower	Upper			
Age in years							2		0.210 (between groups)
2-5	2	38.0	39.598	-35.55 (6-11 y) -37.5 (12-18 y)	-317.77	393.77			0.210
6-11	9	73.56	35.147	35.55 (2-5 y) -1.94 (12-18 y)	46.54	100.57			
12-18	32	75.5	26.114	37.5 (2-5y) 1.94 (6-11y)	66.08	84.92			
Gender				-5.424	-23.445	12.597	41	-	0.547 .608
Male	23	70.83	30.623						
Female	20	76.25	27.426						
Insurance Status				-12.364	-30.903	6.17	41	-	0.185 1.347
Medicaid	28	69.04	30.623						
Private	15	81.4	24.532						

**n=43 because 2 patients in sample did not have a height and weight recorded.*

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Table 8*Provider Participation and Discussion of 5210 Pediatric Obesity Prevention Behaviors*

	Pre-intervention Group (n=45)		Intervention Group (n=42)		Combined Group (N=87)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Provider Participation						
APRN 1	11	24.4	26	61.9	36	41.9
APRN 2	8	17.8	5	11.9	13	14.9
APRN 3	16	35.6	9	21.4	25	28.7
APRN 4	8	17.8	0	0	3	3.4
MD 1	1	2.2	2	4.8	8	9.2
MD 2	1	2.2	0	0	1	1.1
Documentation of 5210 Obesity Prevention Recommendations Discussion	0	0 %	36	85.7%	36	41.4%

Post-Intervention Group

Fifty-three pediatric patients between two and 18 years of age visited the clinic during the intervention period between February 28th, 2022- April 1st, 2022, and April 18th, 2022- April 22nd, and were included in the retrospective chart review. Of the 53 patients that visited the clinic, 42 patients received the intervention (n=42). Four out of six providers at the clinic participated in the intervention. One of the providers, who agreed to participate in the intervention stopped working at the clinic during the intervention period. Eleven of the 53 pediatric patients who visited the clinic during the intervention period did not participate in the intervention, either because their provider at the clinic opted to not participate in the intervention, or because the provider chose to not implement with a particular patient. Approximately 52% of the intervention group (n=22), were visiting the clinic for a sick visit. Females accounted for 64.3%

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(n=27) of participants. The average age of the participants in this sample was 11.83 years (SD=4.65). Sixty-nine percent of participants were Medicaid participants. 57.1% of intervention recipients (n=24) met criteria to be classified as overweight or obese with a BMI percentile of 85% or greater. A one-way ANOVA and two independent t-tests were used to assess the intervention group for mean differences in BMI percentiles between groups of children grouped based on gender, age range, and insurance status. Forty patients were included in this sample, because two patients did not have a height and a weight recorded.

Table 9 shows differences in mean BMI percentiles by group characteristics. The mean BMI percentile was highest in the 6-11-year age group (BMI percentile= 82.83), compared to the 2-5- year age group (BMI percentiles= 63.5) and the 12-18-year age group (BMI percentile= 77.8). The mean BMI percentile for males (BMI percentile= 80.86) was higher than the mean percentiles for females (BMI percentile= 75.15). The mean BMI percentile for participants with private insurance (BMI percentile= 83.54%) was higher than the mean BMI percentile for participants with Medicaid (BMI percentile= 74.1), although a significantly higher percentage of overweight and obese patients in this group were on Medicaid (62.5%) than private insurance (37.5%).

As is shown in Table 9, during intervention visits (n=42), providers documented discussion of AAP 5210 obesity prevention recommendations with patients 85.7 % of the time (n=36). Table 10 shows the four providers at the clinic who participated in the intervention adhered to all elements of the intervention protocol 71.4% of the time. As is shown in Table 11, providers appropriately diagnosed OW and OB in patients during visits 33.3% of the time (n=8).

HHQ survey results were also analyzed post-intervention as is depicted in Table 12. Forty-one surveys were analyzed as one HHQ survey was kept by a participant. Results of the

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HHQ surveys revealed the following: 48.8% of participants ate 0-1 fruits or vegetables in a day; 31.4% of participants spent >2 to 4 hours a day in front of screens for recreational purposes with 12.1% of participants admitting to >6-13 hours a day of recreational screen time; 31.1% of participants reported getting 0-1 hour a day of physical activity, and 51.7% of participants reported drinking 1-2 8-ounce sugary drinks in a day. Data was missing in each of these categories for a few participants who did not provide quantifiable answers to questions, but instead answered questions with responses such as “a lot” or “all the time.” When asked on the survey, “Is there ONE thing you would like to help your child change now or ONE thing you would like to change now,” most participants chose more than one goal to work on, while four participants left this question blank, choosing no goal to work on. The two most chosen goals were to eat more fruits and vegetables (43.9%), and to be more active or get more exercise (39.1%).

Table 9

Differences in BMI Percentiles of Participants by Characteristics in Intervention Group (n=40)

Characteristic	BMI				95% CI		df	t	p
	n	M	SD	MD	Lower	Upper			
Age in years							2		0.364 (between groups)
2-5	6	63.50	31.361	-19.333 (6-11 y) - 14.273 (12-18 y)	30.59	96.41			
6-11	12	82.83	18.285	19.333 (2-5 y) - 5.061(12-18 y)	71.22	94.45			
12-18	22	77.77	29.568	14.273 (2-5y) - -5.061	64.66	90.88			

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				(6-11 y)					
Gender				5.703	-12.569	23.976	38	0.632	0.531
Male	14	80.86	30.465						
Female	26	75.15	25.383						
Insurance Status				-9.464	-27.910	8.981	38	-1.039	0.305
Medicaid	27	74.07	28.153						
Private	13	83.54	24.282						

*n=40 because 2 patients in sample did not have a height and weight recorded.

Table 10

Fidelity to Intervention Protocol (n=42)

	<i>n</i>	%
Healthy Habit Questionnaire filled out completely	38	90.5
5210 handouts given out	42	100
Provider documentation of 5210 recommendations	36	85.7
Healthy habit goal documented	30	71.4
Overall compliance to intervention protocol	30	71.4

Table 11

Characteristics of Overweight and Obese Children, Proper Diagnosis of Overweight and Obese Children Using Appropriate ICD 10 Codes, and Follow-up Appointments Generated

	Pre-intervention Group (n=21)		Intervention Group (n=24)		Combined Group (n=45)	
Characteristic	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	11	52.4	10	41.7	21	46.7
Female	10	47.6	14	58.3	24	53.3
Age						
2-5	0	0	2	8.3	2	4.4
6-11	5	23.8	7	29.2	12	26.7
12-18	16	76.2	15	62.5	31	68.9

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Insurance Status						
Medicaid	12	57.1	15	62.5	27	60
Private	9	42.9	9	37.5	18	40
Visit Status						
Well child	14	57.2	11	45.8	25	55.6
Sick Visit	7	42.9	13	54.2	20	44.4
Proper ICD 10 Diagnosis used for OW or OB						
Follow-up Appointments	5	23.8	8	33.3	13	28.9
	1	4.8	2	8.3	3	6.7

Table 12*HHQ Survey Results (n=41)*

	<i>n</i>	<i>%</i>
Servings of fruits and vegetables eaten in a day		
0-1	20	48.8%
>1-3	19	46.3%
>3-5	2	4.9%
Occurrences of fast food or take out eaten in a week		
0-1	14	34.1%
>1-3	19	46.3%
4-7	4	9.8%
Missing responses	4	9.8%
Amount of recreational screen time in a day		
0-0.5 hours	1	2.4%
1-2 hours	11	26.8%
>2-4 hours	13	31.7%
>4-6 hours	6	14.6%
>6-8 hours	3	7.3%
>8-10 hours	1	2.4%
>10-13 hours	1	2.4%
Missing responses	5	12.5%
Amount of physical activity in a		

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day		
0	2	4.9%
0.5-1	11	26.8%
>1-2	4	9.8%
>2-4	8	19.5%
>5-8	8	19.5%
Missing responses	8	19.5%
Number of sugary drinks consumed in a day		
0	9	22%
1-2	22	53.7%
>2-4	3	7.3%
>4-8	3	7.3%
>8-12	2	4.9%
Missing responses	2	4.9%
Healthy Habit Goals Chosen		
Eat more fruits and vegetables	18	43.9%
Eat with family more often	4	9.8%
Eat less fast food/takeout	6	14.6%
Drink less soda, juice, or punch	10	24.4%
Drink more water	14	34.1%
Be more active - get more exercise	16	39%
Spend less time watching TV or using a tablet/smartphone	11	26.8%
Get more sleep	10	24.4%
No goal chosen	4	9.8%

**41 survey results analyzed because one survey was kept by participant*

Pre-Post Intervention Combined Group

Current literature has found one third of children in the U.S. today are overweight or obese with children of low socioeconomic status children 40% more likely to be obese than higher socioeconomic status children. As shown in Table 6, data examined from the total sample (N=87) found 51.7% of the pediatric patients were identified as either overweight or obese, which was higher than the national average. In the combined group, 68.9% (n=45) of overweight and obese children were in the 12-18 age range and 60% of children in this group were also

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Medicaid patients, supporting the literature which shows children of lower socioeconomic status are more likely to be overweight or obese (Table 11). A one-way ANOVA and two independent t-tests were used to assess the pre-post intervention group for differences means of BMI percentiles between groups of children grouped based on gender, age range, and insurance status. Eighty-three patients were included in this sample, because two patients did not have a height and a weight recorded. As is shown in Table 13, the mean BMI percentile was highest in this group in the 6-11-year age group (BMI percentile= 76.4). The mean BMI percentile for females (BMI percentile= 75.63) was slightly higher than the mean percentile for males (BMI percentile= 74.62). The mean BMI percentile for participants with private insurance (BMI percentile= 82.39) was higher than the mean BMI percentile for Medicaid participants (BMI percentile= 71.51), although a significantly higher percentage of overweight and obese patients in this group were on Medicaid (60 %) than private insurance (40%) (Tables 11 and Table 13).

Table 13

Differences in BMI Percentiles of Participants by Characteristics in Combined Pre-Post Intervention Group (n= 83)

Characteristic	BMI			MD	95% CI		df	t	p (between groups)
	n	M	SD		Lower	Upper			
Age in years									
2-5	8	57.13	32.647	-	29.83	84.42	2		0.149
				21.7323 (6-11 y)					
				-19.301 (12-18 y)					
6-11	21	78.86	26.460	21.732 (2-5 y)	66.81	90.90	81	-0.163	
				2.431 (12-18					

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12-18	54	76.43	27.323	y) (2-5y) -2.431 (6-11y)	19.301	68.97	83.88		
Total	83	75.18	27.939						
Gender					-1.009	-13.358	11.340	81	-0.163 0.871
Male	37	74.62	30.538						
Female	46	75.63	25.997						
Insurance Status					-10.884	-23.644	1.867	81	-1.697 0.094
Medicaid	55	71.51	29.274						
Private	28	82.39	23.985						

**n=83 because 4 patients in sample did not have a height and weight recorded.*

Comparing Pre-Intervention and Post Intervention Data

To evaluate provider discussion of 5210 AAP Pediatric Obesity Prevention Recommendations, provider documentation of a chosen healthy habit goal, and provider diagnosis of overweight and obese patients between pre-intervention and post-intervention groups, independent t-tests were completed. This analysis was used to determine if the mean number of obesity prevention discussions, healthy habit goals documented, and diagnosis of OW and OB patients was significantly different between groups. See Tables 14 , 15, and 16. There was a statistically significant ($p < 0.001$) difference in documentation of discussion of 5210 Obesity Prevention Recommendations and documentation of a healthy habit goal ($p < 0.001$) in the intervention group as compared to the pre-intervention group. There was not a statistically significant difference ($p = 0.493$) in diagnosis of overweight and obesity in overweight and obese patients between pre-intervention and intervention groups.

Table 14

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Difference in 5210 Obesity Prevention Discussion by Group

Group	Discussion of Recommendations	<i>n</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	95% CI		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>D</i>
						Lower	Upper				
Pre-intervention		45	2.00	.000	.857	.747	.968	41.000	15.684	<.001*	.246
Post-intervention		42	1.14	.354							

p* < 0.05Table 16***Difference in Documentation of a Healthy Habit Goal by Group*

Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	95% CI		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>D</i>
					Lower	Upper				
Pre-intervention	45	2.00	.000	.905	.812	.997	41.000	19.736	<.001*	.206
Post-intervention	42	1.10	.297							

p* < 0.05Table 16***Difference in Diagnosis of OW and OB Patients with Proper ICD 10 Code by Group*

Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	95% CI		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>D</i>
					Lower	Upper				
Pre-intervention	21	1.76	.436	0.95	-.183	.373	43	.691	.493	.461
Post-intervention	24	1.67	.482							

Follow-up Appointments Generated During Intervention

One aim of the project implementation was to demonstrate a change in billing practice by generating follow-up appointments for children who were identified during the intervention as

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overweight or obese. As is shown in Table 11, 8.3% of overweight and obese patients made follow-up appointments to discuss weight status more, compared to 4.8% of patients in the pre-intervention group. Thus, there was only a very slight increase in follow-up appointments made during the intervention as compared to the pre-intervention period. Table 17 illustrates there was no statistically significant increase in follow-up appointments generated for overweight and obese patients during the intervention period ($p=.470$). One participant in the intervention group was also referred to a specialist due to complications related to obesity, but number of referrals for overweight and obese status were not measured in this project.

Table 17 *Difference in Follow-up Appointments Generated Pre and Post Intervention*

Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	95% CI		<i>Df</i>	<i>t</i>	<i>Cohen's D</i>
					<i>Lower</i>	<i>Upper</i>			
Pre-intervention	21	1.95	.218	0.36	-.118	.189	43	15.684	.255
Post-intervention	24	1.92	.282					.470	

Qualitative Survey to Measure Provider's Satisfaction with Intervention

After the intervention period was complete, four of the providers who participated in the intervention were asked to complete a brief survey to evaluate providers' satisfaction with the intervention. Three of the four providers completed the survey. All three providers indicated the intervention helped them to address pediatric obesity prevention in a timely manner and that they would want to use the HHQ to facilitate conversation with patients and caregivers about obesity prevention in the future. When asked an opened ended question about what they liked and did not like about the project, providers responded positively commenting, "this project is a tactful and comprehensive way to address a subject that is often difficult to discuss with patients and

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parents,” and “I like that it asks for one change persons are willing to make.” Providers mentioned one thing they did not like about the intervention was the time it took to complete. One provider commented, “sometimes opening this conversation leads to longer office visits, but the 99401-counseling code helps to offset the time spent.” See Table 17 for results of the qualitative data collected from providers.

Table 17

Qualitative Provider Survey Results

	Responses
1. Did this evidence-based intervention help you address obesity prevention with your pediatric patients in a thorough and timely manner?	
Yes	3
No	0
2. Would you want to use the HHQ to facilitate conversation with your patients and caregivers about obesity prevention in the future?	
Yes	3
No	0
3. What did you like about this QI project?	<p>“This project is a tactful and comprehensive way to address a subject that is often difficult to discuss with patients and families. The survey helps to focus needs.”</p> <p>“I like that it provides patients and providers opportunities to discuss, educate, and providers accountability. Patients are more aware and are willing to take further steps in provider their health and outcomes.”</p> <p>“I like that it asks targeted questions about healthy and at risk lifestyles, prompts one to make changes accordingly. I like that it asks for</p>

one change a person is willing to make.”

4. What did you not like?

“Sometimes opening the conversation leads to longer office visits, but the 99401 counseling code helps to offset the time.”

“Nothing, but this does require extra time.”

Discussion

Rates of childhood OW and OB are rising in the United States, especially among children of low socioeconomic status (Cooper & Mandel, 2020; Mandelbaum et al., 2020). Visits to primary care offices for well child appointments have decreased since the COVID-19 pandemic began in the United States in 2019, making it important for providers to provide anticipatory guidance related to health promotion during both well child and sick visits in family practice settings. Evidence-based pediatric obesity prevention interventions utilizing a screening tool, discussion of AAP’s 5210 recommendations by a provider, and goal setting with patients and families have proved to be effective and efficient methods of addressing pediatric obesity prevention in primary care, but very few studies in the literature have implemented this type of intervention in a family medicine setting. In our literature review, only one study of this nature took place in a family medicine setting (Williams et al., 2020). Using quantitative and qualitative methods, this QI project sought to establish that this obesity prevention intervention can be effectively implemented in a family medicine setting serving pediatric patients during both well and sick child visits.

Key Findings

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The findings of this QI project support a small body of literature specific to obesity prevention interventions implemented in pediatric primary care settings. The key findings of this project include: 71.4 % compliance by participating providers in documenting provider discussion of AAP 5210 obesity prevention recommendations and a health behavior goal for pediatric patients visiting the clinic during the intervention period, a statistically significant increase in documentation related to obesity prevention post-intervention as compared to pre-intervention ($p < .001$), a small increase in follow up visits generated post-intervention as compared to pre-intervention ($n=2$ follow-up appointments post-intervention as compared to $n=1$ pre-intervention), and providers satisfaction with the clinical benefits and reported ease of implementing the intervention. No statistically significant difference was measured post-intervention as compared to pre-intervention for providers diagnosing overweight and obese patients using appropriate ICD 10 codes ($p = .493$).

Significance of Findings

Results of this QI project indicates the MYOC intervention is an efficient and effective way to address pediatric obesity prevention in a family practice setting. A statistically significant increase in providers documenting discussion of AAP 5210 obesity prevention recommendations post-intervention shows it is feasible to implement an intervention of this nature in a fast-paced family practice setting.

This project also shows this sort of intervention can be implemented with patients and families during both well child and sick visits without taking too much time out of either a well child or a sick visit. In this study, 52.4% of intervention participants were visiting the clinic for a sick visit. In the literature, the MYOC intervention was rarely implemented during sick visits, but in this study implementing with patients coming in for sick visits allowed the opportunity to

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provide anticipatory guidance regarding obesity prevention to children and families, some of whom may only seek care when their children are ill (Hersch et al., 2021).

This project did not show a statistically significant increase in providers diagnosing overweight and obese patients as overweight and obese using correct ICD-10 codes, but there was an increase in the percentage of overweight and obese patients accurately diagnosed as overweight and obese in the post-intervention group (33.3%) as compared to the pre-intervention group (23.8%). This 10% increase in correctly diagnosing patients as overweight or obese is comparable to a similar study which showed an increase in correct diagnosis from 52.2% preintervention to 68.1% postintervention (Camp et al., 2017).

In this study, providers in both the pre-intervention and post-intervention groups never diagnosed any patient with a BMI equal to or greater than the 85th percentile but less than the 95th percentile as overweight. All patients appropriately diagnosed as overweight or obese met criteria for obesity with a BMI of equal to or greater than the 95th percentile. This is similar to Camp et al. (2017) which found recognition of abnormal weight in the post-intervention group occurred at a higher rate in the obese group, than in the overweight group. According to Ray et al. (2022), PCPs reported feeling it was sometimes inappropriate to intervene if a child's weight had just crossed over into overweight range.

The qualitative assessment of provider's satisfaction of the intervention was very positive. One provider commented that the intervention was both a tactful and comprehensive way to address obesity prevention with pediatric primary care patients. Considering the literature shows many providers shy away from discussing health behaviors related to obesity prevention out of fear of offending patients and families or out of a perception that there is a lack of time to address this topic, this intervention overcame two of the biggest barriers in the literature to

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addressing obesity prevention in primary care (Hersch et al., 2020; Tanda et al., 2017). In the qualitative survey, one provider also identified the 99401 preventative medicine CPT counseling code to overcome any billing concerns related to the extra time it takes to address obesity prevention with pediatric patients during sick visits (Madelbaum et al., 2020; Tanda et al., 2017).

Patient Characteristics and HHQ Survey Results

Prior to implementing this project, a needs assessment revealed OW and OB was a problem among pediatric patients that needed to be addressed, but it was somewhat surprising to discover rates of OW and OB in the combined group sample (51.7%) were greater than the national average in children (33%,) although rates were comparable to overweight and obesity rates for children in the clinic zip code (48%) reported by the Kentucky Youth Advocates and Kentucky State Data Center (2013). Approximately 52% of children in the combined group were identified as overweight and obese based on CDC definitions of OW and OB, making this a priority health concern among patients to continue addressing in the future at this clinic. These numbers may have been skewed, however, by the percentage of patients seen at the clinic who were 12-18 years of age (66.7%), considering adolescents are more likely to be overweight and obese than are younger children (CDC, 2022). It is also important to note many patients (66.7%) visiting this clinic during the pre-intervention and intervention periods were Medicaid recipients, meaning many of the patients were of lower socioeconomic status. Thus, they were more likely to be overweight and obese (Mandelbaum et al., 2020).

Results of the HHQ analysis also revealed some common health behaviors among patients that need to be addressed further at the clinic including intake of fruits and vegetables (48.8% of patients ate 0-1 servings of fruit and vegetables a day), recreational screen time

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(58.4% of patients admitted to getting greater 2 hours of screen time a day), and sugary drink intake (24.4% of patients admitted to drinking more than 2 sugary drinks each day).

Limitations

This QI project has several limitations. This project setting was in an urban community and results may not be generalizable to small, rural family practice clinics. The sample size was a small, and a convenience sample was used for this project, which could introduce bias into the project results and make them less generalizable to a variety of family practice settings. The small sample size also made the statistical analysis in this project less robust. It is unfortunate, 11 pediatric patients visiting the clinic during the intervention period did not receive the intervention either because their specific provider did not participate in the intervention or because the provider felt constrained by time limitations and chose not to implement with their patient. As previously stated, there was not an equal distribution of patients in each pediatric age range in the study sample. A large percentage of participants in this study were older: 21% of participants in the combined pre-post intervention group were 6-11 years of age and 58% of participants in this group were 12-18 years of age, meaning the large percentage of overweight and obese participants could have been influenced by the large distribution of participants who were 12-18 years of age.

Next Steps

Although the intervention was feasible and was sustained through the QI project period and received positive feedback from providers at the end of the intervention period, the intervention has only been sustained by one provider subsequently. It is, however, encouraging to see one provider found this intervention to be valuable enough for their patient population, they are continuing to use the HHQ screening tool and documenting discussion on 5210 MYOC

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Obesity Prevention Recommendations using the smart phrase developed for this QI project with all their pediatric patients.

Because OW and OB was found to be such a pervasive problem in many of the pediatric patients in the combined pre-post intervention group, we recommend all providers at the clinic continue using the HHQ to discuss OW and OB prevention with patients coming to the clinic for well child and sick visits. As results are disseminated and providers see how many pediatric patients are impacted by OW and OB, the hope is that there will be a sense of urgency to keep utilizing the HHQ during all well child and sick pediatric visits, and that the clinic as a whole will adopt this intervention long-term, as is laid out in John Kotter's final step of his Eight Step Change Model, "Instituting Change."

In the future, providers at the clinic should also receive further education related to proper diagnosis, of overweight, not just obese pediatric patients based on BMI percentiles. Further QI data should be collected to determine if there is an increase in proper diagnosis of both overweight and obese pediatric patients, after this continuing education is provided related to diagnosis of OW and OB in pediatric patients. In the future, providing providers at the clinic with an algorithm for managing pediatric patients with OW and OB, such as the algorithm from NICHQ on this topic, could help providers to know when to draw labs such as fasting lipid levels, fasting blood sugars, and thyroid levels on overweight and obese pediatric patients, when to follow up with overweight and obese pediatric patients, and when to refer to a specialist or specialty program (see Appendix H). This algorithm would provide providers with greater guidance on how to manage patients identified as overweight and obese, and result in more follow up appointments generated for overweight and obese patients.

Implications for Nursing Practice

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With APRNs playing an increasingly key role in the provision of primary care in the United States, it is important APRNs have the tools needed to both address pediatric obesity prevention during well child and sick pediatric visits, and to recognize and diagnose OW and OB in pediatric patients (Barnes et al., 2018). MYOC's 5210 Pediatric Obesity Intervention provides APRNs with a feasible and efficient way to do this.

Conclusion

This QI project's findings showed a statistically significant increase in documentation of discussion of the AAP 5210 Obesity Prevention Recommendations during both well child and sick visits. Implementing this QI project among a population with a large percentage of overweight and obese children (57.2% post intervention group) during the COVID 19 pandemic when visits to primary care clinics for well child visits had decreased, has the potential to result in positive health behavior change among these at-risk children (O'Leary et al., 2020). Bailey-Davis et al. (2019), found using a similar risk assessment with their patients resulted in smaller increase in BMI z-score than in the non-intervention group.

The MYOC intervention was well received by providers and should be incorporated into more family practice settings. Future implementation of this project in family medicine could look at patient and caregiver perspectives related to the intervention and look at rates of proper diagnosis of overweight and obese patients and follow up appointments generated using a QI approach such as a PDSA cycle or John Kotter's Eight Step Change Model (IHI, 2016; Kotter, 1995). Future research studies and QI projects should include family practice settings to improve implementation of pediatric obesity prevention interventions and proper diagnosis of overweight and obese children in these settings, considering family practice providers feel less confident in addressing pediatric obesity in primary care than do pediatric specific providers (Huang et al.,

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2011). Additionally, future studies can look at the impact of completing anticipatory guidance on prevalent health issues for specific patient populations at both well and sick visits to better reinforce the importance of providing health promotion related to prevalent health issues at every visit, regardless of visit type.

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Appendix A

HHQ

5-2-1-0 Healthy Habits

AGES 2-9

LET'S GO!
5-2-1-0

We want to know how your child is doing! Please take a moment to answer these questions.

Child's Name: _____ Age: _____ Today's Date: _____



1. How many servings of fruits and vegetables does your child have a day? _____
One serving is: 1/2 cup of fresh or frozen (the size of a fruit cup), 1 cup of leafy greens (a small salad), or a piece of fruit the size of a tennis ball.

2. How many times a week does your child eat dinner at the table with the family? _____
3. How many times a week does your child eat breakfast? _____



4. How many times a week does your child eat takeout or fast food? _____
5. How much screen time does your child have each day? *Don't include school work.* _____
6. Does your child have a TV or keep a tablet or smartphone in their bedroom? _____



7. How many hours does your child sleep each night? _____
8. How much time each day does your child spend being active? _____
This means they are breathing harder and their heart is beating faster.



9. How many 8-ounce servings of these does your child drink a day?
 _____ 100% juice _____ Water _____ Fruit or sports drinks _____ Whole milk
 _____ Soda or punch _____ Nonfat (skim), low-fat (1%) or reduced-fat (2%) milk
10. Based on your answers, is there ONE thing you would like to help your child change now?
 Eat more fruits and vegetables Eat with your family more often Eat less fast food/takeout
 Drink less soda, juice, or punch Drink more water Be more active – get more exercise
 Spend less time watching TV or using a tablet/smartphone Get more sleep

Please share this form with your provider, then take it home with you. Thank you!

Turn this over for tips to get started. 

QUALITY IMPROVEMENT: PILOTING A PEDIATRIC OBESITY

5-2-1-0 Healthy Habits

AGES 10+

LET'S GO!

5-2-1-0

We want to know how you're doing! Please take a moment to answer these questions.

Your Name: _____ Age: _____ Today's Date: _____



1. How many servings of fruits and vegetables do you have a day? _____
One serving is: 1/2 cup of fresh or frozen (the size of a fruit cup), 1 cup of leafy greens (a small salad), or a piece of fruit the size of a tennis ball.

2. How many times a week do you eat dinner at the table with your family? _____

3. How many times a week do you eat breakfast? _____



4. How many times a week do you eat takeout or fast food? _____

5. How much screen time do you have each day? *Don't include school work.* _____

6. Do you have a TV or keep a tablet or smartphone in your bedroom? _____



7. How many hours do you sleep each night? _____

8. How much time each day do you spend being active? _____
This means you are breathing harder and your heart is beating faster.

9. How many 8-ounce servings of these do you drink a day?

_____ 100% juice _____ Water _____ Fruit or sports drinks _____ Whole milk

_____ Soda or punch _____ Nonfat (skim), low-fat (1%) or reduced-fat (2%) milk



10. Based on your answers, is there ONE thing you would like to change now?

Eat more fruits and vegetables Eat with your family more often Eat less fast food/takeout

Drink less soda, juice, or punch Drink more water Be more active – get more exercise

Spend less time watching TV or using a tablet/smartphone Get more sleep

Please share this form with your provider, then take it home with you. Thank you!

Turn this over for tips to get started. 

Appendix B

Obesity Prevention Handouts

Help your child live 5-2-1-0 every day!					
 <p>5 or more fruits and vegetables</p>	<p>Give foods fun names, like “x-ray vision carrots” and “mighty broccoli trees.”</p>	<p>Add veggies to foods you already make like pasta, soups, casseroles, pizza.</p>	<p>Keep washed and chopped veggies and fruits in the fridge so they are ready to grab and eat.</p>	<p>Add fruit to cereal, pancakes, or other breakfast foods.</p>	<p>Try fruits and veggies with dip such as salad dressing, yogurt, nut butter, or hummus.</p>
 <p>2 hours or less of recreational screen time</p>	<p>Put away phones and turn off the TV during meals. Make it a time to sit and talk about the day.</p>	<p>Have craft items ready to go. You can even find supplies in your recycling bin!</p>	<p>Stock up on books, coloring sheets, and board games. Print free activity sheets from the internet.</p>	<p>Create an obstacle course with chairs, blankets, and other household items.</p>	<p>Play hide and seek!</p>
 <p>1 hour or more of physical activity</p>	<p>Try jump ropes and hula hoops to keep the whole family active.</p>	<p>Use a balloon to keep your child moving. Try to keep it from touching the floor!</p>	<p>Turn on music and have a family dance party.</p>	<p>Go for a hike on trails or in the park. Look for animal tracks or collect leaves and stones.</p>	<p>Get outside and ride bikes or play tag. Look up different tag games online.</p>
 <p>0 sugary drinks, more water</p>	<p>Freeze fruit, like berries, in ice cubes. Watch your water change color as they melt!</p>	<p>Use cool cups, bottles, or straws to make water extra fun!</p>	<p>Add fresh fruit or herbs to water for natural flavor. Try mixing flavors, like watermelon and mint.</p>	<p>Try mixing seltzer with a splash of juice.</p>	<p>Suggest a glass of water or milk instead of juice.</p>

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Live 5-2-1-0 every day!



5
or more fruits
and vegetables

Want something quick? Grab a piece of fruit, some yogurt, a cheese stick, or whole grain crackers.

Squeeze in veggies where you can. Add things like cucumber, avocado, or sliced peppers to your sandwich or burger.

Keep washed and chopped veggies and fruits in the fridge so they are ready to grab and eat.

Add fruit to your cereal, pancakes, or other breakfast foods.

Try fruits and veggies with a dip such as salad dressing, yogurt, nut butter, or hummus.



2
hours or less of
recreational screen time

Put away your phone during meals. Make it a time for slowing down and catching up with family or friends.

Put on some headphones or ear buds and listen to music while you draw, journal, or craft.

Forget social media! Meet up in person to grab a bite, play a game, or get some studying done.

Need to relax? Instead of a TV binge, find a great book.

Make your free time count. Help a neighbor, play a sport, or get outside!



1
hour or more of
physical activity

Fit activity into your busy day. Play some music and dance while you get ready or do chores.

Grab a friend and make it fun! Walk or bike together and catch up on your day.

You can get outside year-round. Hike, bike, swim, sled, or skate to stay active!

Time for a study break? Walk around the block, or do some sit-ups and squats to get your blood flowing!

Challenge yourself! Try a new activity, sign up for a race, or learn a new skill in your favorite sport.



0
sugary drinks,
more water

Keep water on hand—carry a reusable bottle or bring some bottled water when you're away from home.

Fill a pitcher with water and keep it in the fridge.

Add fresh fruit or herbs (like mint or basil) to water for natural flavor. Try mixing flavors, like strawberry and lemon!

Try mixing seltzer with a splash of juice.

Drink a glass of water or milk instead of juice or soda.

5 EAT AT LEAST FRUITS + VEGETABLES EVERY DAY

REDY'S RULES

Try it!

- Try fruits and veggies different ways and try at least a couple of bites each time. It can take 7 to 10 tries before you like a new food, so be open to trying again and again. It may become your new favorite!
- Many fruits and veggies taste great with a dip or dressing. Try salad dressing, yogurt, nut butter, or hummus.
- Make a fruit smoothie with yogurt.

Mix it!

- Add veggies to foods you already make, like pasta, soups, casseroles, pizza, rice, etc.
- Add fruit to your cereal, pancakes, or other breakfast foods.

Slice it!

- Keep washed and chopped veggies and fruits in the fridge so they are ready to grab and eat.
- Most people prefer crunchy foods over mushy ones. Enjoy vegetables fresh or lightly steamed, and avoid overcooking.

Did you know?

A diet rich in fruits and vegetables provides vitamins, minerals, and phytonutrients, important for supporting growth and development, and for optimal immune function.

What is a serving?

Kids

- Size of the palm of their hand

Adults

- A whole fruit the size of a tennis ball
- 1/2 cup of chopped fruit or veggies
- 1 cup of raw, leafy greens
- 1/4 cup of dried fruits

MaineHealth

LET'S GO!

5-2-1-0





LIMIT RECREATIONAL SCREEN TIME HOURS OR LESS EVERY DAY

Keep TV/Computer out of bedroom. No screen time under the age of 2.

Life is a lot more fun when you join in!

Try These Activities Instead of Watching TV.

- Ride a bike.
- Go on a nature hike.
- Put together a puzzle.
- Turn on music and dance.
- Read a book or magazine.
- Spend time catching up with your family.
- Take your kids to the park or beach.
- Play board games.
- Walk, run, or jog.
- Start a journal.
- Play ball (basketball, catch, soccer, etc.).
- Go to the library.
- Explore free activities in your community.
- Rollerblade.
- Play charades.
- Go play in the snow (e.g. sled, ski, snowshoe, build a snowman or fort).

Tame the TV and Computer!

Set Limits and Provide Alternatives.

- Set some basic rules, such as no TV or computer before homework or chores are done.
- Do not watch TV during mealtime.
- Use a timer. When the bell rings, it's time to turn off the TV.
- Eliminate TV time during the week.
- Set family guidelines for age-appropriate shows.
- Make a list of fun activities to do instead of being in front of a screen.
- Keep books, magazines, and board games in the family room.

Healthy Screen Time Means:

- No TV/computer in the room where the child sleeps.
- No TV/computer under the age of 2.
- One hour of educational TV/computer time between ages 2 and 5.
- After the age of 5, two hours or less per day.

Did you know?

- Screen time includes time spent on TVs, computers, gaming consoles/handhelds, tablets, and smartphones. It's important to limit the use of ALL screens.
- Watching TV is associated with more snacking and increased obesity.
- Too much TV has been linked to lower reading scores and attention problems.

0

SUGARY DRINKS... DRINK WATER!

Put limits on juice!

- Juice products labeled “-ade,” “drink,” or “punch” often contain 5% juice or less. Sometimes, the only difference between these “juices” and soda is that they have added Vitamin C.
- Always try to choose whole fruits over juice.
- Suggest a glass of water or milk instead of juice.
- If you choose to serve juice:
 - Buy 100% juice.
 - Each day, juice should be limited to:
 - 4-6 ounces for children 1-6 years old.
 - 8-12 ounces for children 7-18 years old.
 - No juice for children 6 months and under.

Did you know?

Soda has no nutritional value and is high in sugar. Just 9 ounces of soda has up to 150 empty calories. Many sodas also contain caffeine, which kids don't need.

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LET'S GO!

5-2-1-0

Water!

Keep It Handy, Keep It Cold:

- Keep bottled water or a water bottle on hand.
- Fill a pitcher of water and keep it in the fridge.

Liven It Up, Make It Fruity:

- Add fresh lemon, lime, or orange wedges to water for some natural flavor.
- Try mixing seltzer with a splash of juice.

Be a Role Model:

- Drink water when you're thirsty.
- Replace soda with water, instead of other sugar-sweetened beverages, such as juice or sports drinks.

Water is Fuel For Your Body:

- Between 70-80% of our body is made up of water.
- When you exercise, you sweat, and when you sweat, you LOSE water– it is important to replace the water you lose when you sweat.
- Water is the #1 thirst quencher!



Appendix C

Smart Phrase for Pediatric Obesity Prevention Intervention

.PedsBMI

-15 to 30 minutes of counseling was provided today using an intervention developed by Maine Health.

-The patient/caregiver filled out a Healthy Habits Questionnaire (HHQ) at the beginning of the visit.

-Discussed the results of the HHQ with the patient and caregiver and provided obesity prevention education reviewing the American Academy of Pediatrics 5210 recommendations related to obesity prevention with the patient and caregiver.

-Using motivational interviewing techniques, I collaborated with the patient and caregiver identify a goal the patient and caregiver would like to work on related to obesity prevention. The patient and caregiver identified:

1. eating more fruits and vegetables.
2. Eat with your family more often.
3. Eat less fast food/takeout
4. Drink less soda, juice, or punch
5. Drink more water
6. Be more active- get more exercise
7. Spend less time watching TV or using a tablet/smartphone
8. Get more sleep.

-Pediatric obesity prevention handouts were given out including: “Help your child live 5-2-1-0 everyday!” (2-9 year olds) or “Live 5-2-1-0 everyday!” (10-18 year olds), “Eat at least 5 fruits and vegetables everyday,” “Limit screen time to 2 hours or less everyday,” and “O Sugary drinks...drink water!.”


Appendix D

Provider Handouts

MOTIVATIONAL INTERVIEWING
MaineHealth
LET'S GO!

Motivational Interviewing: A Behavior Change Tool

Motivational Interviewing (MI) is a collaborative, goal-oriented method of communication, with particular attention to the language of behavior change. It is designed to strengthen an individual's motivation for and movement toward a specific goal by eliciting and exploring the person's own arguments for change.*



MI is a paradigm shift for many, especially those trained in a prescriptive style of communication. We engage in MI as we dialogue with people about many areas of behavior change. MI is NOT a technique, and it is NOT a switch that we turn on and off.

The spirit of motivational interviewing includes:

- A person-centered approach
- Expressing empathy
- An invitation to a collaborative partnership between patient and provider
- Listening more than telling, and eliciting information rather than instructing
- Placing the responsibility for change with the patient and not the provider
- Asking permission
- Honoring the patient's autonomy and resourcefulness
- Avoiding coerciveness

*Miller & Rollnick, 2013

Download additional tools and resources at MaineHealth.org/Lets-Go/Childrens-Program/Pediatric-Family-Practices/Tools

Motivational Interviewing: A Behavior Change Tool

Why Should We Use MI When Working with Patients with Obesity?

There are several reasons to use MI when the focus is on achieving a healthy weight. Weight is a difficult topic to address. MI can make this tough topic a more enjoyable conversation between the provider and patient/family. However, it helps to start the conversation by asking, "Would it be okay if we discussed your weight?" or "How do you feel about your weight?"

Research outcomes demonstrate a compelling case for the use of MI.

Here are a few examples:

-
- A number of studies have shown that allowing patients the opportunity to advocate for their own change is predictive of their future behavior change. Conversely, if we force people to make a decision about change, or if we tell them they must change, they will argue for the status quo. Once a patient verbalizes an argument for change (or an argument for status quo), we can predict that their behavior will follow that argument. Therefore, allowing patients the opportunity to talk about why they want to change has proven benefits.
-
- Research has also shown that MI in addition to "active treatment" works exceptionally well.
-

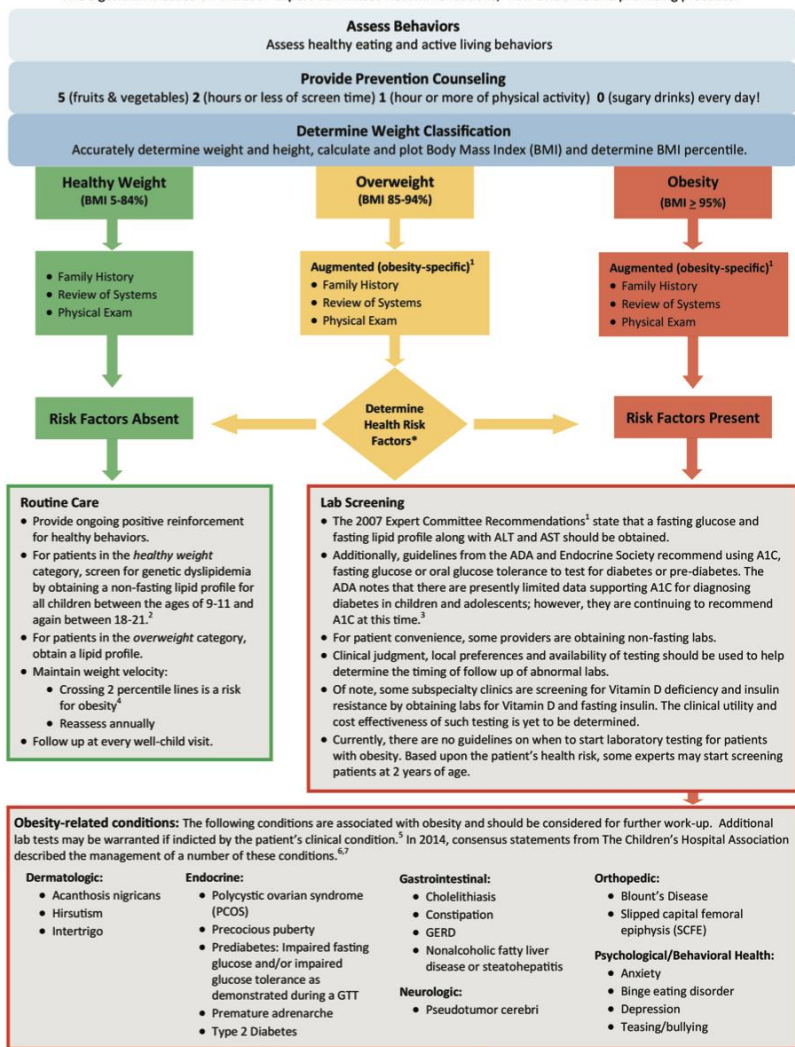
"Active treatment" can include MI and:

- 1 Nutrition education
- 2 Physical therapy
- 3 Exercise program/support
- 4 General health education

There has been demonstrated success with integrating MI into clinical encounters with improvement in outcomes. People are more likely to keep appointments, have labs drawn, and continue medication and treatment plans when MI is integrated into practice.

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Algorithm for the Assessment and Management of Childhood Obesity in Patients 2 Years and Older
 This algorithm is based on the 2007 Expert Committee Recommendations,¹ new evidence and promising practices.



*Based on behaviors, family history, review of systems, and physical exam, in addition to weight classification.

QUALITY IMPROVEMENT: PILOTING A PEDIATRIC OBESITY

Management and Treatment Stages for Patients with Overweight or Obesity

- Patients should start at the least intensive stage and advance through the stages based upon the response to treatment, age, BMI, health risks and motivation.
- An empathetic and empowering counseling style, such as motivational interviewing, should be employed to support patient and family behavior change.^{8,9}
- Children age 2 – 5 who have obesity should not lose more than 1 pound/month; older children and adolescents with obesity should not lose more than an average of 2 pounds/week.

Stage 1 Prevention Plus

Where/By Whom: Primary Care Office/Primary Care Provider

What: Planned follow-up themed visits (15-20 min) focusing on behaviors that resonate with the patient, family and provider. Consider partnering with dietician, social worker, athletic trainer or physical therapist for added support and counseling.

Goals: Positive behavior change regardless of change in BMI. Weight maintenance or a decrease in BMI velocity.⁴

Follow-up: Tailor to the patient and family motivation. Many experts recommend at least monthly follow-up visits. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 2.

Stage 2 Structured Weight Management

Where/By Whom: Primary Care Office/Primary Care Provider with appropriate training

What: Same intervention as Stage 1 while including more intense support and structure to achieve healthy behavior change.

Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.

Follow-up: Every 2 - 4 weeks as determined by the patient, family and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 3.

Stage 3 Comprehensive Multi-disciplinary Intervention

Where/By Whom: Pediatric Weight Management Clinic/Multi-disciplinary Team

What: Increased intensity of behavior changes, frequency of visits, and specialists involved. Structured behavioral modification program, including food and activity monitoring, and development of short-term diet and physical activity goals.

Goals: Positive behavior change. Weight maintenance or a decrease in BMI velocity.

Follow-up: Weekly or at least every 2 – 4 weeks as determined by the patient, family, and physician. After 3 – 6 months, if the BMI/weight status has not improved consider advancing to Stage 4.

Stage 4 Tertiary Care Intervention

Where/By Whom: Pediatric Weight Management Center/Providers with expertise in treating childhood obesity

What: Recommended for children with BMI \geq 95% and significant comorbidities if unsuccessful with Stages 1 - 3. Also recommended for children > 99% who have shown no improvement under Stage 3. Intensive diet and activity counseling with consideration of the use of medications and surgery.

Goals: Positive behavior change. Decrease in BMI.

Follow-up: Determine based upon patient's motivation and medical status.

References

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Updated 10/7/15

Appendix F**Provider Survey**

1. Did this evidence-based intervention help you address obesity prevention with your pediatric patients in a thorough and timely manner?
2. Would you want to use the HHQ to facilitate conversation with patients and caregivers about obesity prevention in the future?
3. What did you like about this QI project? What did you not like?

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Appendix G

Letters of Approval for QI Project



November 15, 2021

Re: Obesity Prevention in Family Practice

Dear Erin ~~Semeny~~,

On November 15, 2021, the Interdisciplinary Research Oversight Council (IROC) completed a scientific review of your proposed study. The committee members determined that there were no threats to internal and external validity of the study, and that the study had the potential to advance scientific knowledge in the field. In addition, the study does not appear to have an adverse operational or financial impact on any nursing unit. As a means of follow-up, the IROC would appreciate an update on your progress the last month of each quarter at their monthly business meeting.

The next step in the project approval process is submission to the Human Subjects Protection Program (HSPP) at the University of Louisville (UofL) for review by their Institutional Review Board (IRB). Applications are made using their iRIS system, which requires a sponsored account through UofL. The request form is located on the UofL HSPP website at <https://louisville.edu/research/humansubjects>. You can contact the IRB at hsppofc@louisville.edu or (502) 852-5188.

You may access the iRIS system online at the following web address: <https://iris.louisville.edu:444> or contact the UofL Health Research Office (ULHRO) for assistance at umcresearch@ulh.org. If you complete the submission process in iRIS, please select UofL Health as a Department, include UofL Health Research office as a contact, and select UofL Hospital as a study site. All study specific correspondence should be sent to the ULHRO via their service account.

Once the iRIS submission is complete, your proposal will be received and reviewed by the IRB and the ULHRO. Note that both offices will issue an approval letter upon review completion.

Please note that data collection at UofL Health cannot begin until all approvals have been received.

Thank you for advancing the nursing research enterprise at UofL Health.

Sincerely,

A handwritten signature in blue ink that reads 'Kathryn L. Robinson, MSN, RN, NPD-BC, OCN'.

Kathryn L. Robinson, MSN, RN, NPD-BC, OCN
 Chair, Interdisciplinary Research Oversight Council
 Evidence Based Practice Coordinator
 University of Louisville Hospital
 (502) 541-9770
kathryn.robinson@uofhealth.org

cc: research@uofhealth.org, Kathy Wohlschlegel

QUALITY IMPROVEMENT: PILOTING A PEDIATRIC OBESITY

UL Physicians

Primary Care Associates, Family Practice Associates North
5100 Outer Loop, Louisville, KY 40219 P: 502-968-6226, F: 502-966-5562 UofLHealth.org

December 7, 2021

RE: Doctor of Nursing Practice (DNP) Project

To whom it may concern:

University of Louisville Health is in full support of the Doctor of Nursing Practice (DNP) project entitled Quality Improvement: Piloting an Obesity Prevention Screening Tool and Intervention in a Family Practice Setting.

This project will be completed at University of Louisville Family Practice Associates North by University of Louisville School of Nursing DNP student Erin Semeyn, RN, BSN.

This letter is to provide permission for Ms. Erin Semeyn to complete her DNP project, analyze the data, and present the findings using deidentified data. I understand that the DNP project proposal will be reviewed as a quality improvement project by the University of Louisville Institutional Review Board (IRB) prior to data collection.

Sincerely,



Rachel Tindall
Practice Manager II

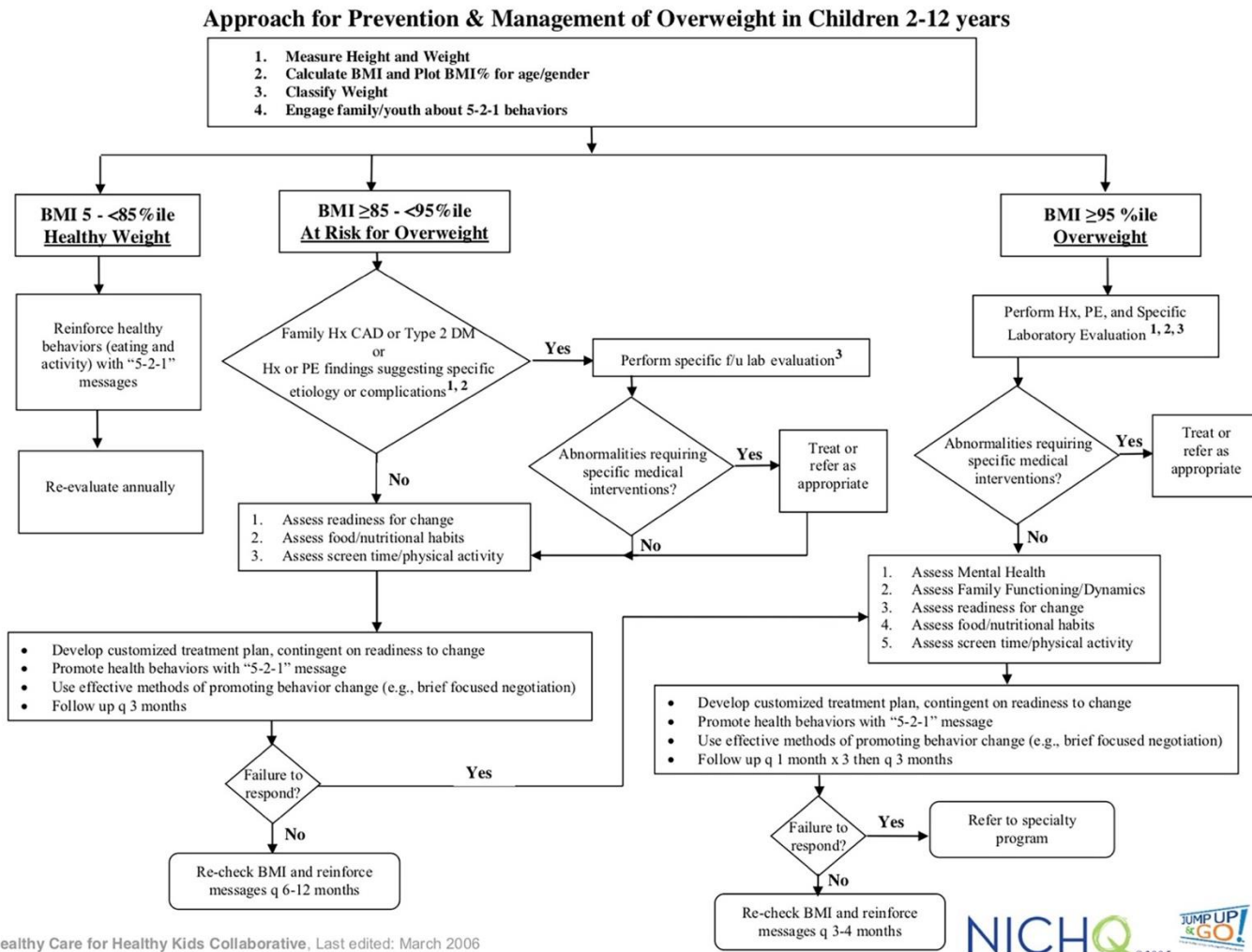
UofL Endocrine Surgery
UofL Physicians Family Medicine East
UofL Physicians Northeast Internal Medicine
UofL Physicians Family Practice Associates North

O: 502-968-6226 x239
C: 502-445-1651
F: 502.966.5562

**UL Physicians**

Appendix H

NICHQ Algorithm for Management of Overweight or Obese Children



Healthy Care for Healthy Kids Collaborative, Last edited: March 2006



(NICHQ, 2014)