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Current Assessment and Intervention Strategies for Childhood Obesity Used by Pediatric Care Providers

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DNP Final Project Report

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Dedication

My DNP project is dedicated to my amazing and supportive family. First, my husband who has encouraged me throughout the last 4 years. He never let me give up no matter how many times I may have tried. To my parents and siblings, who always believed in me and taught me to follow my dreams no matter how long it may take. Lastly, to my friends who supported me and kept me positive throughout the whole process.

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I would also like to thank all staff at this pediatric primary care clinic for fostering a learning environment that enabled me to pursue my research. I would also like to personally thank James Aaron (Biomedical Informatics) and Dr. Amanda Wiggins (statistician) who helped synthesize my research and studies. Lastly, to all employees at the University of Kentucky College of Nursing, I can't thank you enough for being such a big part in my fulfilling my dream to become a pediatric nurse practitioner and achieve my DNP degree.

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Abstract

Childhood obesity rates in the United States have tripled since the 1970s in the U.S. (CDC, 2018). Due to the persistent rise in obesity rates in children and the possible health risks associated with obesity, it is important for pediatric providers to appropriately assess and treat childhood obesity. There is limited data on what pediatric providers in the primary care setting are doing to address this growing health problem.

PURPOSE: The purpose of this study was to determine current assessment and intervention strategies for childhood obesity used by pediatric health care providers at the University of Kentucky, General Pediatric clinic. Current strategies and interventions used by pediatric primary care providers were evaluated and compared to current practice guidelines addressing screening, diagnosis, and co-morbidity assessment in overweight and obese pediatric patients.

METHODS: A cross-sectional study design was used to examine how providers are following practice guidelines, in assessing, and treating childhood obesity. Pediatric primary care providers were invited to complete an on-line survey to determine current practice behaviors in assessing and treating childhood obesity within the general pediatric clinic. A retrospective electronic medical record review to evaluate the assessment and treatment of childhood overweight and obesity was also conducted. The electronic medical records of children ages 2 years and 17 years who presented to the Kentucky Clinic South for an annual well-child exam between February 2018 and August 2018 were reviewed. Chi-Square test of association was used to compare the assessment and treatment of overweight and obese children and determine if differences between type of primary care provider existed when assessing and treating the pediatric patient in primary care. Descriptive statistics were used to summarize results from the electronic medical record

review and healthcare provider's confidence and reported practice in assessing and treating childhood obesity

RESULTS: The on-line provider survey was completed by 6 pediatric primary care providers. Most providers are confident in how they are assessing or treating childhood overweight and obesity in practice. Ninety-two percent reported appropriately following AAP guidelines in the management of childhood obesity. Barriers for treatment identified by the providers included lack of patient motivation, lack of parent involvement, and lack of clinic time.

The electronic medical record review yielded 42 records that met inclusion criteria for enrollment into the study. Diet and exercise was included in the treatment plan 69% of the records. A follow-up appointment was included in the treatment plan 21% of the time and only 9.5% of the records showed co-morbidity laboratory screenings ordered or included in the treatment plan.

CONCLUSION: Childhood obesity is a growing concern that may have significant implications on the adult health of Americans. Most pediatric health care providers were confident in how they are assessing and treating childhood obesity in practice. However, there were several disconnects between what providers are reporting and practice behaviors identified in the electronic medical records review. The results of this study may provide areas for needed improvement in the early recognition and treatment of childhood obesity by the primary care provider. The identification of provider-perceived barriers to treatment may also offer areas of needed clinical support to improve patient outcomes.

Introduction

Nearly one in five children, aged 2 years to 19 years in the United States (U.S). is obese (NHANES,2017). Obesity in childhood and adolescence is a health problem becoming very common. Childhood obesity rates have tripled since the 1970s in the U.S. (CDC, 2018). Obesity in childhood can contribute to several serious health conditions that often continue into adulthood. Due to the persistent rise in obesity rates in children and the possible health risks associated with obesity, it is important for pediatric providers to appropriately assess and treat childhood obesity. There is limited data on what providers are specifically doing to assess and treat children for obesity within the primary care setting.

Background

Childhood obesity rates are rising in the United States. From 2011-2014 obesity rates climbed to 17%, affecting 12.7 million children and adolescents aged 2-19 years (CDC,2017). In Kentucky, 15.6% of adolescents are overweight and 17.6% are obese (CDC, 2012). Childhood obesity can cause several health problems for children that may continue into adulthood and lead to premature death. Health problems affected by childhood obesity include diabetes, cardiovascular disease, and certain cancers (WHO,2018). Each year 2.6 million people worldwide die from complications of being overweight and obese (WHO, 2018). In addition to the cost of human suffering, health complications associated with childhood obesity carry significant financial costs. According to the Centers for Disease Control and Prevention (CDC;2011), 9% of all medical costs in the U.S. in 2008 were related to complications from obesity; this totaled $147 billion that year (CDC,2011).

In the primary care setting, it is common to see overweight and obese children ages 2-18 years. According to the World Health Organization, 43 million children were overweight or obese in 2010, and 92 million children were at risk for becoming overweight worldwide (World Health Organization, 2010). According to the Endocrine Society clinical practice guideline, BMI percentiles should be used to diagnose overweight and obesity in children >2 years of age (Styne et al., 2017). For children >2 years of age, overweight is defined as a BMI between the 85^{th}-95^{th} percentile for age and sex. Obesity is defined as a BMI equal to or greater than the 95^{th} percentile for age and sex (Styne et al, 2017). In the U.S., the rate of obesity (children 2 years to 18 years) is 17% and affects 12.7 million children (CDC, 2017). In Kentucky, 16% of children ages 2-5 years are overweight and 15.6% are obese; 15.6% of Kentucky adolescents are overweight and 17.6% are obese (CDC, 2012).

In the primary care setting providers continue to see increased numbers of overweight and obese children. Obesity in children can cause health problems throughout childhood and extend into adulthood (CDC, 2017). According to the Centers for Disease Control, obesity can lead to high blood pressure, cardiovascular disease, problems with insulin resistance, type 2 diabetes, as well as many other chronic conditions (CDC,2017). Pediatric primary care providers have an important role in monitoring the growth and development of their patients. Routine monitoring of growth and development allows the pediatric primary care provider the opportunity for primary prevention or early intervention if concerns develop.

Several clinical practice guidelines addressing the screening and treatment of childhood obesity exist. According to the American Academy of Pediatrics (AAP) and the Endocrine Society, pediatric providers should assess weight for height and calculate Body Mass Index (BMI) annually at the well-child exam (American Academy of Pediatrics, 2015; Styne et al., 2017). Providers should consider intervention when the child's BMI is greater than the 85th percentile for age and sex. The American Academy of Pediatrics further adds the importance of incorporating the child's age and gender, socio-economic status, and cultural needs into the assessment and treatment of childhood obesity (American Academy of Pediatrics, 2015). To augment recommendations by the AAP, the Endocrine Society further suggests, healthcare providers educate the child and family about needed dietary modifications, increased levels of physical activity, and setting limitations on screen time (Styne et al., 2017).

The clinical practice guideline to prevent and treat childhood obesity also addresses screening for co-morbid conditions associated with childhood obesity. There are slight variations that exist between the AAPs recommendations and the Endocrine Society's recommendations. However, both organizations support the screening for pre-diabetes, type 2 diabetes,

hyperlipidemias, and NAFLD in children >2 years with a BMI >85th percentile for age and sex. Neither organization identifies a specific time, age, or severity of obesity that determines the need for initial laboratory screening, nor is an interval for further screening and monitoring of laboratory studies established.

Purpose

Kentucky has high rates of childhood overweight and obesity. Due to the risk of long-term health implications associated with childhood obesity, it is important to understand how childhood overweight and obesity is being assessed and addressed by pediatric primary care providers during routine, well-child exams. The purpose of this study was to determine current assessment and intervention strategies for childhood obesity used by pediatric providers at the University of Kentucky General Pediatric clinic. How current strategies and interventions used by providers correlate with current childhood obesity practice guidelines was also examined.

The overall goal of this project as to assess the current practices of treating and assessing childhood obesity. The objectives are as follows:

1. Examine current screening, assessment, and intervention strategies for childhood obesity used by pediatric primary care providers in the pediatric primary care setting
2. Examine adherence to AAP childhood obesity guidelines related to diagnosing, screening, and treatment

Methods

Study Design

A descriptive, cross-sectional survey design was used to examine the extent pediatric primary care providers are following clinical practice guidelines in the assessment and treatment of childhood obesity. A retrospective electronic medical record review was used to compare whether current overall pediatric providers practice corresponds with survey responses.

Setting

The study was conducted at the University of Kentucky, Clinic South in Lexington Kentucky. At UKHealthcare, the health care providers and everyone who works on the pediatric team are experts in the special needs of kids. From primary care needs to specialty care, UK works with families to keep kids healthy and happy (UKHealthcare, 2017). The Kentucky Clinic South provides primary care such as well child visits and sick visits for pediatric patients from birth until 18 years of age. Pediatric care at Clinic South is currently provided by 21 physicians and 4 nurse practitioners.

Sample/Participants

Those eligible for study participation consisted of pediatric healthcare providers who work at the University of Kentucky, Clinic South. Eligible providers included physicians and nurse practitioners. Inclusion criteria for the provider survey were as follows: 1). Any provider who had performed pediatric well-child exams within the previous 12 months and 2). Willing to complete an on-line, anonymous survey. Exclusion criteria were: 1). Any provider who did not

provide pediatric care or complete a well-child exam within the previous 12 months or 2). Any provider not willing to complete an on-line anonymous survey.

The secondary subjects eligible for this study were the electronic medical records of children between the ages of 2 and 17 years who presented to a general pediatric clinic for an annual well-child exam within a 6 month period. Inclusion criteria were as follows: 1). All children between the ages of 2 years and 17 years who presented to a general pediatric clinic for an annual well-child exam between February 1, 2018 and August 31, 2018 (Table 1). Exclusion criteria consisted of: 1). Children younger than 2 years or older than 17 years, 2). Children 2 years to 17 years who presented to the general pediatric clinic for an annual well-child exam prior to February 1, 2018 or after August 31, 2018, and 3). All children regardless of age, who presented to a pediatric clinic for an acute, episodic visit.

Data Collection

Approval from the University of Kentucky Institutional Review Board (IRB) was obtained in October 2018 prior to the collection of data. The patient electronic medical record review form and The Current Assessment and Intervention Strategies for Childhood Obesity used by Pediatric Care Provider Survey were the two tools used to assess current providers' practices of the assessment and treatment of childhood obesity.

A retrospective chart review was conducted in November 2018. Data was extracted by staff in the CCTS department. Information extracted was de-identified prior to being made available for data analysis and included child demographics, provider suffix, BMI percentile, documented plan, follow-up appointment, laboratory studies ordered, and if referrals were made. The data collected from the electronic medical record review were used to determine how

providers are currently assessing and treating childhood obesity. The Current Assessment and Intervention Strategies for Childhood Obesity Used by Pediatric Care Provider Survey was used to assess how providers perceived they assess and treat childhood obesity. The provider survey also explored perceived barriers to treating childhood obesity.

The Current Assessment and Intervention Strategies for Childhood Obesity Used by Pediatric Care Provider Survey was distributed by a clinic staff member to all eligible providers at the University of Kentucky, Clinic South in January, 2019 and again 2 weeks later in February, 2019. There were 21 physicians and 4 nurse practitioners in the primary care clinic who were eligible to complete the survey. The provider survey consisted of 16 questions. The first 2 questions on the survey were provider demographics including sex and years of practice. Remainder of the questions asked providers specific questions about their assessment and treatment of childhood obesity. Most questions used a 5 point scale, these categories included: most of the time, often, sometimes, rarely, and never. 1 being most of the time and 5 being never. The survey questions were developed based on what information was important to determine how providers were assessing and treating childhood obesity. It was also important to assess barriers in the treatment of overweight and obese pediatric patients.

Data Analysis

The study utilized descriptive and correlational statistical design. Data Analysis Statistical Package for the Social Sciences (SPSS) software, version 24 was used for analysis of data. Frequencies were calculated on findings from the electronic medical record review. Chi-square test of association was used to compare assessment and treatment of childhood obesity (BMI >/= 95^{th} percentile for age and sex) compared to children who were overweight (BMI >/=

85th percentile, but < 95th percentile for age and sex). Chi-Square test was also used to determine if there was a significant difference in assessment and treatment by type of provider. Descriptive statistics were used to summarize survey responses of how providers reported they assessed and treated childhood obesity and, perceived barriers to treatment. SPSS software, version 24, with an alpha level of 0.05 was used for statistical significance throughout the analysis.

Results

Sample Characteristics

There were 118 electronic medical records reviewed for inclusion/exclusion criteria prior to provider survey distribution. Of the 118 electronic medical records reviewed, 47 records identified met inclusion criteria based on BMI percentile >/= 85th percentile for age and sex. Five records were excluded due to lack of data, leaving 42 electronic medical records enrolled in the study. 50% of records included patients who were considered obese (BMI percentile >/= 95%) and 50% of records included patients who were considered overweight (BMI percentile >/=85%). The mean age of children in the sample was 9.1 +/- 3.5 years. (Table 2).

Current Practice Data Analysis

The current practice of pediatric primary care providers in assessing and treating childhood obesity was determined based on documentation in the electronic health record. According to the electronic medical records enrolled in the study, the child's diet was assessed 88% of the time and activity level/exercise was assessed 73% of the time. Providers reviewed family history and assessed risk factors 100% of the time. Diet and exercise was included in 69% of the documented treatment plan. Follow-up was included in the plan 21% of the time and only 9.5% of records had laboratory screening included in the treatment plan. (Table 3).

Healthcare Provider Survey Data Analysis

Descriptive statistics, including mode, were used to summarize how healthcare provider's report they treat and assess childhood obesity. It was also used to look at barriers in the treatment of childhood obesity. (Table 4). The results yielded that providers answered that most of the time barriers in treatment were due to lack or patient motivation and lack of parent involvement. 50% of providers answered that they feel moderately/high proficient in modification in physical activity and sedentary behavior. 50% of providers also felt moderately proficient in behavior management. When evaluating Co-morbidity conditions, 100% of providers reported that they asked about HTN most of the time and 50% of providers answered that they ask about type 2 Diabetes often. Providers were very confident in how often they request laboratory values on overweight and obese children. Providers reported that they request AST/ALT, BUN/CR, lipid profile, HGB A1C, TSH, Vitamin D and Hemogram most of the time. Most healthcare providers reported that they almost always ask about a child's activity/exercise and screen time. When asked about treatment approaches to childhood obesity, providers reported they always recommend changes with eating patterns and most of the time/ always recommend increasing activity and exercise.

Overall, based on the survey results healthcare providers reported that they were making appropriate assessment and treatment plans for overweight and obese children and were following AAP guidelines 100% of the time.

Discussion

The overall aim of this study was to assess how healthcare providers are assessing and treating childhood obesity. Childhood obesity is becoming an epidemic in the United States and

numbers are continuing to rise along with healthcare problems associated with being overweight or obese. The assessment and treatment of childhood obesity is of great importance in the primary care setting and healthcare providers must feel confident when assessing and treating this patient population.

When comparing results from the chart review and from providers answers from the survey there were some disconnects in what providers are saying they doing to assess and treat childhood obesity and what is being done based on results from the chart review. The biggest disconnect was on healthcare providers obtaining laboratory values on children who are overweight or obese. Results from the survey found that providers were most of the time/ always obtaining laboratory results. Based on the results from the chart review only 9.5% of the patients had laboratory tests ordered on them. Providers also reported in the survey that they always/most of the time recommend changes in eating pattern and increase in activity in their treatment plan. Based on results from the chart review, changed in diet and increase in activity were only included in the treatment plan 51% of the time.

Based on AAP guidelines, for obese patient's laboratory values, changes in eating patterns and increase in activity should all be included in the treatment plan. Overall, this project identified that current assessment and treatment of childhood obesity could be improved in the primary care setting.

Limitations

There were a few limitations identified in this study that could be improved for future studies. The first limitation had to do with sample size of medical records that were reviewed. Only 118 medical records were obtained and only 42 could be used for the study based on the

BMI percentile of the patients. With a larger sample size, a more accurate interpretation of how providers are assessing and treating childhood obesity could be made. The sample size of the survey results was also a limitation. Only 6 providers took part in the survey, perhaps if I could have had reminders around the clinic then more people would have participated. If I would have had a larger sample, it would be easier to understand how providers report they are assessing and treating childhood obesity.

Another limitation in this study was the information that was obtained from the chart review. Most information from the chart review was click boxes that providers click such as assess diet and assess exercise. This leaves little information on exactly what the provider asked. This also leaves little information on the exact treatment plan such as if the provider made specific diet changes and recommendations.

Lastly, when assessing if laboratory tests were ordered on patients or if any referrals were made, I was not able to see if a patient or family member refused these interventions and so it looks like the provider did not even try these interventions when maybe there was a reason for not including these in the plan.

Recommendations for Future Studies

Recommendations for future studies include providing education to providers on the current AAP guidelines regarding assessing and treating childhood obesity. A pre and post chart review could be helpful to assess whether education on AAP guidelines changed the way providers assessed and treated childhood obesity. This study was specific to one pediatric care clinic, it would also be helpful in all pediatric clinics and family practice clinics since they care for pediatric patients as well.

Another recommendation for future studies is to expand to multiple different clinic sites instead of just one to increase sample size and draw results from several different settings. Lastly, it would be helpful to send the results of the chart review with the areas that need improvement and have a post survey to assess what could be done to improve these areas or barriers to why providers think these areas are lacking.

Conclusion

The overall goal of my project was to assess the current practice in the assessment and treatment of childhood obesity. By comparing what providers reported they did in the management of overweight and obese patients to results from a chart review, and if these results matched up to AAP guidelines. When these results were compared it showed a difference in what providers were reporting they were doing and what they were doing according to the chart review. This study can show healthcare providers what areas can be improved in the management of childhood obesity.

Table 1. Inclusion Criteria of Well-Child Exams ICD-10 and CPT Codes

Dx Code	**Diagnosis Definition**	**CPT Code**	**Diagnosis Definition**
V20.2	New and/or Established Patient Well-Child Exam	99382	(Age 2-4 years)
V20.2	New and/or Established Patient Well-Child Exam	99383	(Age 5-11 years)
V20.2	New and/or Established Patient Well-Child Exam	99384	(Age 12-17)

Table 2. Demographic Characteristics

Variable	*Mean* (SD) or *n* (%)
Age	9.1 (3.5)
Gender	
Male	21 (55.3%)
Female	26 (44.7%)
Race	
Black/AFR AMERICAN	14 (29.8%)
White	31 (66%)
UNREPORT	2 (4.3%)
Ethnicity	
Hispanic/Latino	4 (8.5%)
Non Hispanic/Latino	42 (89.4%)
Unreported	1 (2.1%)

Table 3. Current assessment and treatment results

	Overall sample (*n* =) % yes	Overweight (*n* =) % yes	Obese (*n* =) % yes	*p*
Assessed diet	88	81	95	.34
Assessed exercise	73	66	81	.29
Plan included diet and exercise	69	48	51	.79
Assessed Family HX	100	100	100	NA
Follow up Apt	21	40	28	.35
Referral to high BMI clinic	7	0	14	.07

Table 4: Provider Survey: Perceived Barriers

Perceived Barriers	**Provider Response**	**Mode (Valid Percent)**
Lack of patient motivation	Most of the time	66.7
Lack of parent involvement	Most of the time	50
Lack of clinical time	Sometimes	50
Lack of clinician knowledge	Sometimes	66.7
Lack of support services	Sometimes	50

Table 5: Provider Survey: Provider Proficiency

Provider Proficiency	**Provider Response**	**Mode (Valid Percent)**
Behavioral management	Moderate	50
Modification of patient diet/eating pattern	Moderate	66.7
Modification of patient physical activity	Moderate/high	50
Modification of sedentary behavior	Moderate/high	50
Guidance for parent teaching	Moderate	66.7
Assessment of the degree of overweight	High	83.3

Table 6: Provider Survey: Recommendations for weight control by age

Age	Provider Response	Mode (Valid Percent)
Infants (0-2)	Most of the time	50
Preschool Children (3-5 years)	Most of the time	66.7
School age children (6-12 years)	Most of the time	83.3
Adolescents (13-17 years)	Most of the time	100

Table 7: Provider Survey: Evaluate for Co-morbidity Conditions

Health Condition	Provider Response	Mode (Valid Percent)
HTN	Most of the time	100
Endocrine Disorders	Sometimes	66.7
Type 2 Diabetes	Often	50
Sleep Disorders (Sleep Apnea)	Sometimes	50
Gastrointestinal Disorders	Rarely	33.3

Table 8: Provider Survey: Requesting Laboratory Evaluations

Laboratory Test	Provider Response	Mode (Valid Percent)
ALT/AST	Most of the time	66.7
TSH	Most of the time	50
FT4	Most of the time/often/sometimes	33.3
BUN	Most of the time	66.7
CR	Most of the time	66.7
Lipid Profile	Most of the time	66.7
Hbg A1C	Most of the time	66.7
Hemogram	Most of the time	66.7

Table 9: Provider Survey: Review Family History

Health Condition	**Provider Response**	**Mode (Valid Percent)**
Overweight/Obesity	Most of the time	50
Dyslipidemia	Most of the time	66.7
HTN	Most of the time	66.7
Cardiovascular Disease	Most of the time/Often	50
Gallbladder Disease	Sometimes/Rarely	33.3
Diabetes	Most of the time	66.7
Thyroid Disorders	Most of the time	50

Table 10: Provider Survey: Provider's Assessment

Assessment	**Provider Response**	**Mode (Valid Percent)**
Diet history	Yes	100
Organized physical activity	Most of the time	83.3
Unstructured physical activity (Free play)	Most of the time	83.3
Routine activity (walking to school)	Most of the time	83.3
Screen time	Most of the time	100

Table 11: Provider Survey: Treatment Approaches

Treatment	**Provider Response**	**Mode (Valid Percent)**
Changes in eating patterns	Most of the time	100
Limitations of specific foods	Most of the time	83.8
Low fat diet	Most of the time/rarely	33.3
Calorie restriction	Sometimes/rarely	33.3
Commercial diet	Never	83.3
Increase in organized activity	Most of the time/often/sometimes	33.3
Increase in unstructured physical activity (free play)	Most of the time	83.3
Increase in routine activity (walking)	Most of the time	83.3
Decrease in screen time	Most of the time	100

Table 12: Provider Survey: Referrals

Referral	**Provider Response**	**Mode (Valid Percent)**
Behavior Modification	Never	50
High BMI clinic	Sometimes	50
Dietitian	Sometimes	66.7
Exercise Specialist	Rarely/never	50

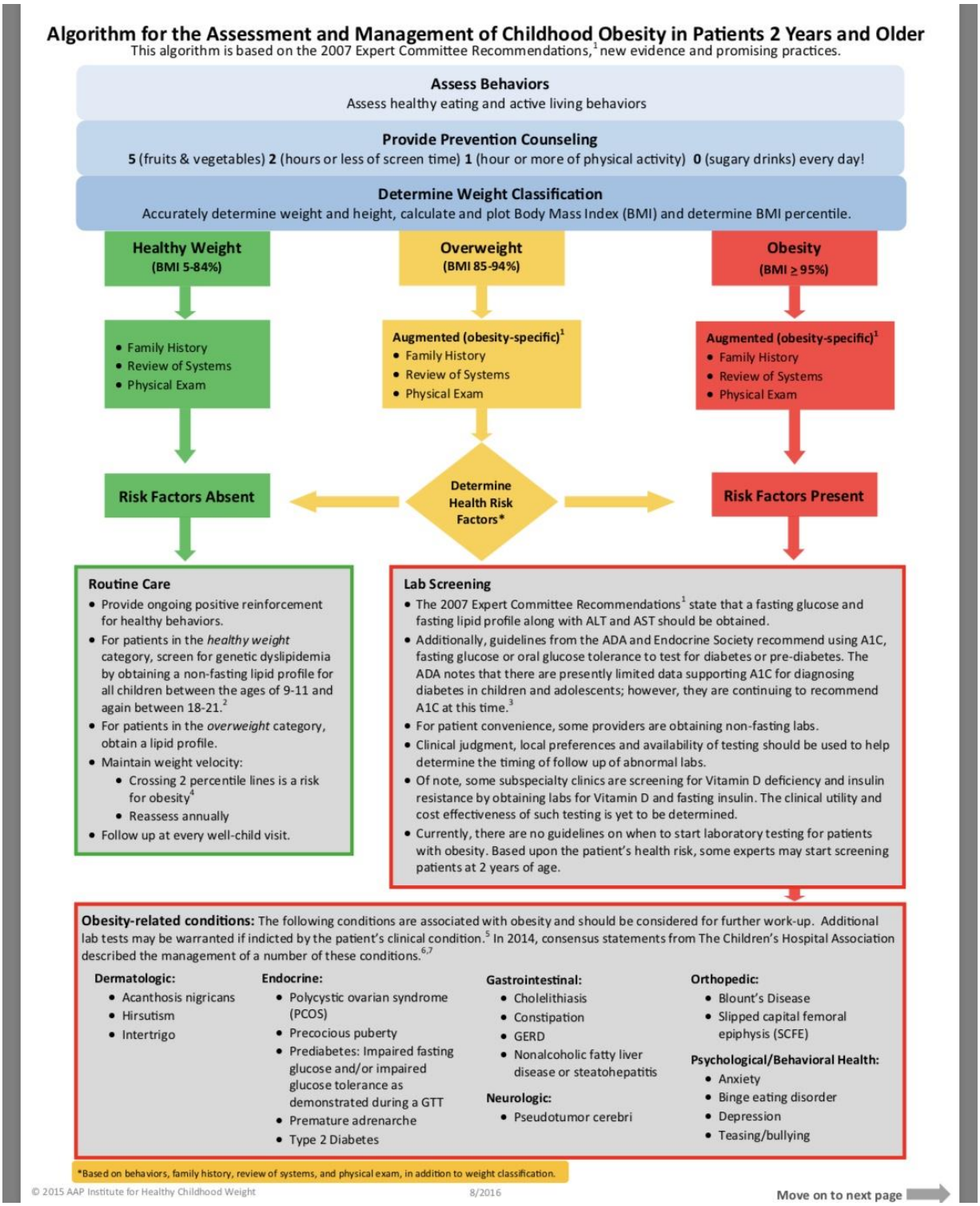
Table 13: Provider Survey: Follow Up

Follow up	**Mode (Valid Percent)**
Every 2 months	33.3
Every 3 months	50
Every 4-6 months	16.7

Table 14: Provider Survey: AAP Guidelines

AAP Guideline	Provider Response	Mode (Valid Percent)
Do you follow AAP guidelines when assessing and treating childhood obesity?	Yes	100

Figure A: AAP Algorithm for Childhood Obesity



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