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# Increasing Staff Knowledge on Obesity in Pediatric Patients With Asthma

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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## Abstract

Asthma is a chronic life-long lung disease that contributes to morbidity and mortality around the world. The increased prevalence of asthma, particularly in children who are obese, inadequate assessment of obesity in pediatric patients, and a gap in staff knowledge regarding the Centers for Disease Control and Prevention (CDC) body mass index (BMI) percentiles resulted in a need for strategies to minimize this health concern. The purpose of this staff education project was to increase staff's knowledge about identifying asthma patients who are clinically obese using the CDC BMI percentiles. The framework for the project was based on Knowles's adult learning theory (andragogy); and the chronic care model. The practice-focused question for this project was whether implementation of a training program on the use of the CDC BMI percentiles as an assessment tool for overweight or obesity in children would increase staff's knowledge about pediatric asthma patients with obesity. The overall design and method for the project was a staff education intervention provided to interdisciplinary healthcare professionals in an outpatient clinic. Data collection and evaluation was completed using pre- and post-test questions to analyze participants' knowledge before and after the intervention. 16 participants attended the educational session and completed the pre- and post-test questions. Findings and recommendations indicated that the post-test scores were higher than pre-test scores, the educational session significantly increased the staff's knowledge, and that evidence can be accelerated into clinical practice through interdisciplinary teams. Implications for positive social change include future policy development, use of best practice initiatives, and improving systems of care in pediatrics.

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# Dedication

I would like to dedicate this DNP project to my beautiful children Naomi and Isaiah Orogbemi, my loving parents Adewale and Mary Taiwo, and my phenomenal siblings Oyinlola Oludiran, Abiola Ojeyinka and Adewale "JJ" Taiwo Jr. Their continued love, support and encouragement was pivotal to the successful completion of this journey.

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I acknowledge my family, friends, colleagues, committee members, and the journey it took to get here.

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Section 1: Nature of the Project

## Introduction

The prevalence of asthma in the United States is a population health problem. There is an estimated 25 million of the U.S. population affected with this chronic disease, 6.8 million of them being children (Kuhn et al., 2015; McCarty & Rogers, 2012). Worldwide, asthma is among the most common pediatric medical conditions and accounts for frequent and repetitive visits to the emergency department (Al-Muhsen, et al., 2015). In addition, the frequency of hospitalizations and emergency room visits for asthma in the pediatric population is more than twice as that for adults (Al-Muhsen, et al., 2015). Annually, asthma accounts for 439,000 hospitalizations, 2 million emergency department visits, and 3,000 deaths (Kuhn, et al., 2015). As a result, the burden of this chronic airway disease is exceedingly high.

Management of specific medical conditions such as asthma can be accomplished using evidence-based tools and strategies such as an Asthma Action Plan (AAP), discharge or after visit summaries, patient education, and timely follow- up appointments post discharge for an asthma exacerbation (Atzema & Maclagan, 2016). Despite these tools and strategies, asthma remains as one of the chronic respiratory diseases leading to increased morbidity and mortality in the world. The World Health Organization (WHO, 2015) asserted that chronic diseases such as stroke, diabetes, heart disease, cancer, and chronic respiratory diseases are by far the leading cause of mortality worldwide, representing 60% of all deaths. In addition, asthma affects more than 6 million children in

the United States, with an associated 200, 000 hospital admissions annually (Nkoy et al, 2015). Therefore, asthma management initiatives are imperative to the hospital setting.

Nursing practice is led by nurse-sensitive or quality indicators. The American Nurses Association 2010 described quality indicators as reflections of nursing processes, structures, and outcomes. As a result, monitoring and comparing asthma- related hospital readmission rates and clinical outcomes among hospitals has become a national standard. For example, the National Association of Children Hospital and Related Institutions, in collaboration with The Joint Commission (TJC) developed Children's Asthma Care (CAC) measures to improve the quality of pediatric asthma care. Also, in January 2013, the Centers for Medicare and Medicaid Services (CMS) implemented a payment incentive for follow-up appointments within 7 to 14 days of discharge. Thus, benchmark data regarding quality indicators not only enable health care organizations to identify problem areas and opportunities for improvement, but also compare measures of nursing quality against norms for comparable hospitals.

Research shows that asthma is one of the leading causes of pediatric admissions and emergency room visits. Emergency departments account for nearly 2 million asthma-related visits annually in the United States (Buyantseva, Brooks, Rossi, Lehman, & Craig, 2016)). Likewise, Nkoy, et al. (2015) asserted that preventable hospitalizations and emergency department admissions among children in the United States are commonly related to asthma, and that more than 679,000 children were admitted to the emergency department or hospital in 2009. Thus, reducing the number of pediatric asthma-related

hospital and emergency room admissions remains a patient safety and quality improvement initiative.

Childhood obesity is also a common chronic health problem in children that is associated with asthma. According to Ginde, Santillan, Clark, and Carmargo (2010), compared to the general population, obesity is more prevalent in children with asthma, making these two conditions important public health problems in the United States. As asthma and obesity remains the most common chronic respiratory disease and childhood illness, organizations such as WHO, Centers for Disease Control and Prevention (CDC), TJC, and many others are committed to improving the safety and quality of patient care.

To understand current staff's knowledge of asthma and obesity, a pediatric pulmonary department in Texas used the results of an annual learning needs assessment and department specific skills grid to assess educational opportunities. Obesity, asthma management, and lack of documentation of body mass index (BMI) and weights was identified by the clinic manager. Based on the results of the assessment, a staff education intervention was developed to address any gaps in the staff's knowledge regarding obesity prevention and management in patients clinically diagnosed with asthma at the clinic.

## Problem Statement

Asthma management requires the use of evidence-based practice that results in better quality of life and asthma control. This can be achieved using specific tools and strategies to support patient understanding and compliance with individualized treatment plans. The AAP is an example of a written treatment plan that can be used collaboratively

between the patient and the health care provider for management and maintenance of asthma symptoms (Gillette et al., 2013; Khan, Maharaj, Seerattan, & Babwah, 2013; Tolomeo, 2013). Individualized AAPs are associated with improved asthma outcomes and have been shown to increase a patients' quality of life (Booth, 2012; Schultz & Martin, 2013). Effective AAPs provide patient information regarding exacerbation management, asthma triggers, and medication parameters in an assessable format for use in emergency situations. Additionally, the AAP is used to teach patients how to make appropriate changes to their treatment regimen based on asthma symptoms, and how to recognize signs indicating worsening asthma. According to Kuhn, et al. (2015), most AAPs outline specific medications and actions in three zones: green zone for everyday medications and actions, yellow zone for rescue medications and follow-up instructions, and red zone for exacerbations and emergencies (See Appendix A).

In a comprehensive meta-analysis from 11 case-control studies, Azizpour, Delpisheh, Montazeri, Sayehmiri, and Darabi (2018) concluded that the risk for asthma in overweight and obese children was significantly higher than in children who are underweight or normal weight. Thus, the need to use evidence-based tools to assess for obesity in pediatric patients with asthma is imperative. These resources were all sources of evidence for the doctoral staff education project. Interventions to improve childhood obesity should be addressed from the multidisciplinary team in different care settings to ensure effective change in eating habits and encourage expenditure of the child's energy (Healthy People 2020, 2017). Barriers to the use of specific interventions include weight-related concerns not being addressed by providers during routine visits, parents' inability

to identify weight concerns and addressing the topic, and routine office visits focusing on acute care needs only without attention to chronic conditions such as obesity (Perrin, Skinner, & Steiner, 2012).

Management of childhood obesity and pediatric asthma can be done by nurses, who are in an ideal position to implement and adhere to best practice initiatives. The AAP incorporates a multidisciplinary approach with the inclusion of physicians, dieticians, nurses, and other ancillary or support staff. In addition, the Institute of Medicine (IOM, 2015) has recommended collaboration among nurses and other clinical teams. The assessment analysis indicated a gap in knowledge among the pulmonary staff at the local practice site. There was a need for staff training and education regarding anthropometric measurements used for BMI percentiles, and education related to obesity prevention and management in patients clinically diagnosed with asthma identified by the local clinic manager at the practice. The local practice site identified a deficit in charts and documentation, and after discussing it with the doctors identified a staff knowledge deficit regarding the material. As a result, this project is relevant to the training needed at the local practice site and highlights the importance of using best practices in the management of chronic conditions through an education initiative to increase staff knowledge. Overall, this can improve care and clinical outcomes for children with asthma and obesity in the outpatient pulmonary setting.

## Purpose Statement

A gap in knowledge exists between clinical practice and evidence-based guidelines for the prevention, assessment, and management of asthma and obesity in the

pediatric population. There is a lack of information on the cost and effectiveness of asthma and childhood obesity prevention efforts within the outpatient setting (Daniels & Hassinik, 2015; Lang, 2014). The CAC measures were developed by TJC to encourage the design of effective asthma prevention programs (Rangachari et al., 2015). Likewise, childhood obesity prevention programs have also been encouraged by the IOM. TJC and the American Academy of Pediatrics have highlighted the fact that clinical team members should be aware of efforts to prevent asthma and childhood obesity and collaborate with the healthcare team to promote prevention and management of these conditions (Daniels & Hassinik, 2015: Kenyon, Auger, Adams, Loechtenfeldt, & Moses, 2015). Education regarding recommendations is the initial step towards the change in practice required to meet these goals.

The department level practice-focused question is as follows: "Will the implementation of a training program on the use of the BMI percentiles as an assessment tool for overweight or obesity in children and adolescents increase the staff's knowledge about pediatric asthma patients with obesity?" The purpose of this staff education project is to increase the staff's knowledge about identifying asthma patients who are clinically obese using the CDC BMI percentiles (See Appendices B and C). This project addresses the gap in knowledge through education and training that can facilitate collaboration among the multidisciplinary healthcare professionals. The project supports preceding scholarly DNP projects through the implementation of an educational program for healthcare staff to increase their knowledge regarding evidence-based practice and

clinical practice guidelines that have been recommended by TJC, CMS, IOM, and CDC (Booth, 2012; Schultz & Martin, 2013).

## Nature of the Doctoral Project

Sources of evidence for the DNP project were from multiple avenues such as best practices, and clinical practice guidelines regarding the treatment of asthma and obesity in pediatric patients. The National Association of Children Hospital and Related Institutions, in collaboration with TJC developed CAC measures to improve the quality of pediatric asthma care. Also, in January 2013, the CMS implemented a payment incentive for follow-up appointments within 7 and 14 days of discharge. Similarly, in 2005, the American Medical Association, the Health Resources and Services Administration, and the CDC gathered a panel of experts to revise the childhood obesity recommendations. In addition, free online educational modules and algorithms for primary care clinics were developed by the Institute for Healthy Childhood Weight. The pediatric asthma quality measures, obesity expert panel recommendations, and CDC guidelines; were the fundamental resources used to develop the teaching tools for this project.

This project is a staff education project to provide education to an interdisciplinary team from pediatric outpatient clinics regarding best practices, clinical guidelines, and expert panel recommendations on the prevention, assessment, and management of asthma and obesity in the pediatric patient. Outcomes were measured through a pre- and post-test used to show staff knowledge on the use of best and evidence-based practice related to the management of obesity in pediatric patients who

have asthma. Evaluation of the results were completed to determine if the intervention was successful in increasing staff knowledge regarding the guidelines and recommendations.

## Significance

The WHO (2015) has advised implementation of evidenced based prevention tools and interventions that can contribute to positive patient outcomes for chronic disease management. Hospitals frequently find it difficult to apply consistent evidence-based prevention strategies in the management of chronic diseases (Brady, Anderson, & Kobau 2014). However, the IOM (2010) asserted that nurses are challenged with the responsibility of actively translating evidence into practice. Also, based on the diverse levels of experience and communication skills, nurses have the ability to assist in this process through nurse-led research and incorporation of knowledge translation into clinical practice.

Development of an educational intervention in the outpatient pulmonary department of this pediatric hospital is aligned with the current priority for many health care systems to analyze and improve performance on asthma and obesity management in children using best practices and clinical guidelines. Increasing staff knowledge on asthma and obesity management has the potential to improve the use of best practices and clinical guidelines, increase the number of scheduled 30-day follow-up appointments post discharge, and reduce the overall readmission and hospitalization rates for these patients in the outpatient setting. The results of the project was the basis for planning and implementing practice changes to improve patient care in this population through the use

of best practice and evidence-based guidelines for early recognition, diagnosis, and treatment of obesity in patients with asthma.

The project can be transferred to other clinical areas and chronic conditions based on the elements and foundations of the chronic care model (see Davy; et al., 2015). Successful implementation can also impact clinical practice in other pediatric hospitals where there is a lack of staff knowledge regarding the assessment, prevention, and treatment of chronic health problems. In addition, Chin (2010); asserted that principles of the chronic care model can be applied to both adult and pediatric patients because they are based on integration of community resources, healthcare services, and patient self-management. This model has been used to improve overall patient care and health outcomes (Coleman, Austin, Brach, & Wagner, 2009).

The practice focused DNP program identifies several benefits as defined in the Essentials of Doctoral Education for Advanced Nursing Practice (see American Association of Colleges of Nursing, 2006). For example, Essential II addresses quality improvement through systems leadership. This aligns with the role of the DNP graduate to advance healthcare delivery through initiatives that improve patient and healthcare outcomes. Determining staffs' knowledge, perception, and practice regarding asthma and obesity management in children is the initial step for implementation of additional prevention elements to the existing practice. Implementing additional elements can then be piloted in other clinical care areas within the hospital. The education intervention has the potential to impact clinic, department, and organizational concerns for asthma and obesity management.

## Summary

Obesity in children with asthma is a growing health concern with long-term effects. The outpatient care area of pediatric hospitals has the ability to make a positive impact on these health concerns. Researchers have highlighted the health and financial effects of both asthma and obesity in children (Kuhn; et al., 2015). Despite the availability of best practices and guidelines to address asthma and obesity in children, multiple barriers have been identified as limiting the implementation of these best practices and guidelines in the outpatient setting. However, the use of education opportunities to apply the principles of adult learning have the potential to impact the use of best practices and guidelines that could result in positive patient outcomes. In Section 2, I describe the background and context of the project which includes the models and theories, relevance to nursing practice, local background and context, role of the DNP student, and role of the project team.

## Section 2: Background and Context

### Introduction

The purpose of this staff education project was to increase the level of knowledge among the multidisciplinary team regarding the recommended best practices and guidelines on the prevention, assessment, and treatment of children with obesity and how this impacts pediatric asthma management. Exploration of the literature was completed to justify the gap in knowledge related to asthma and obesity management interventions in this population; and the need to implement evidence-based nursing practice and clinical guidelines. I used an educational theory to facilitate collaboration and training among clinical team members within the outpatient department to successfully increase staff knowledge regarding pediatric asthma patients with obesity.

### Models and Theories

The use of evidence-based practice (EBP) as an approach used by clinicians, scholars and educators to solve clinical problems ensures the consideration of updated research to provide guidelines regarding patient care decisions. In addition, safe, transparent, effective, and efficient healthcare provisions are based on the translation of research evidence into clinical practice (Curtis, Fry, Sheban, & Considine, 2016). As a result, clinical care provided to patients should be led by evidence-based guidelines and recommendations. However, translation of peer-reviewed articles and guidelines into information that can be shared among the healthcare team is challenging (Curtis; et al., 2016; Sadeghi-Bazargani, Tabrizi, & Azami-Aghdash, 2014). Multiple factors serve as barriers to the uptake of research into practice. Factors such as clinician behavior, lack of

time, difficulty in the development of evidence-based or informed guidelines, lack of continuing education and unsupportive organizational culture all contribute to this challenge (Curtis; et al, 2016).

Researchers have supported interventions, which use partnerships among the multidisciplinary team in the conversion of evidence into clinical practice (Breslau, Weiss, Williams, Burnes, & Kepka, 2015). For example, Bayliss-Pratt (2013) argued that teams inclusive of different professionals provide better overall care to patients. In addition, the role of nursing leadership in facilitating the implementation of evidence-based practice is imperative. Generally, workplace culture, resources, and structure either support or hinder the promotion of evidence-based practice in clinical areas by nurse leaders (Keuny, Shever, Mackin, & Titler, 2015). Thus, the translation of evidence into clinical practice should include the use of multidisciplinary teams and nurse managers to ensure better patient outcomes.

Interventions provided in primary care and outpatient settings can be critical components in the management of asthma and childhood obesity (Daniels & Hassink, 2015). However, effective prevention and treatment of these chronic conditions requires the use of a longitudinal, developmentally appropriate, life-course approach between patients, parents, and the multidisciplinary team. Interventions that support this approach include identifying children early on the path to obesity, considering family dynamics when determining prevention efforts, and reducing high-risk activity and dietary behaviors (Daniels & Hassink, 2015). Pediatricians and other healthcare professionals are encouraged to promote a diet with fewer foods with high caloric density, increased intake

of fruits and vegetables, and a diet free of sugar-sweetened beverages. According to Davy; et al. (2015), these interventions can be delivered using the CCM which supports practice redesign.

The CCM has been used to guide clinical quality initiatives such as providers' expertise and skills, educating and supporting patients, making care delivery more team-based and making better use of registry-based information systems. It has been widely adopted in the outpatient setting (Coleman; et al., 2009). This model is based on changing the routine delivery of care using three common realms: the community, the health care system, and the provider (Davy; et al., 2015). The three common realms are defined below.

1. Community: Range of services and coordination of other specialists.
2. Health care system: Comprehensive and coordinated healthcare.
3. Provider: Single practitioner or multidisciplinary team of professionals.

The three realms provide a structure used to better understand the elements of managing chronic illnesses (Stellefson, Dipnarine, & Stopka, 2013). For example, the role of the community, health care system, and provider are all imperative to the systematic approach required for patients with chronic illnesses such as asthma. Within the three realms are six interdependent elements which are described below.

1. Community resources and policies: Mobilize resources for patient needs.
2. Health system: Create organizations that promote safe, high quality care.

3. Self-management support: Empower patient to manage their health.
4. Delivery system design: Assure delivery of efficient and effective care.
5. Decision support: Promote care based on best practice and evidence.
6. Clinical information: Organize patient data to facilitate care.

The main goal of the CCM is to support a systematic approach to redesign care that involves community resources through a multidisciplinary team when caring for patients with chronic conditions (Stellefson; et al., 2013). Through this DNP project, I aim to educate the multidisciplinary team, which consists of both the physicians within the pulmonary department; and other clinicians, such as the respiratory therapists, nurses, nurse practitioners, physician assistants, dieticians, care coordinators, and social workers regarding best practices for assessment, prevention, and management of asthma and childhood obesity. Based on this diversity of the intended audience, an adult learning model was also selected for this project.

Adult educators and trainers are aware that learning theories are fundamental to any educational or training plan; and that no single learning theory can be applied to all learners (Billings & Halstead, 2015). Inclusion of learning theories that are relevant to the training when designing adult educational offerings can be beneficial. Thus, health professionals are required to use learning theories for clear reasoning during interactions with patients and other staff, continuing education, management, and employee trainings, and health promotion programs (Aliakbari; et al 2015).

Learning theories such as Knowles's adult learning theory (andragogy), is imperative in nursing and other healthcare professions when acquiring new knowledge

and problem solving (Aliakbari, Parvin, Heidari, & Haghanti, 2015). Andragogy was developed in the 1970s by Knowles to explain the characteristics of learning in adults (as cited in Blondy, 2007). According to Knowles, there are six basic assumptions to this theory: the learner's need to learn, self-concept, experiences, readiness to learn, orientation to learning, and motivation (as cited in Palis & Quiros, 2014). Andragogy is one of the several theories that underpin adult learning, but it is most relevant to this project due to application of the six assumptions to the adult learners in this staff education project.

The use of andragogy in nursing has been shown to be significant in regards to nursing performance. For example, Draganov, Andrade, Neves, and Sanna (2012), stated that andragogy is important in nursing due to the number of competencies that must be developed to meet the demands of the nursing profession. Due to this continuous search for information and learning by the nurse, the principles and assumptions of the andragogy theory are appropriate and fundamental to their professional knowledge development. The staff education intervention for this project incorporates the principles of andragogy through the establishment of specific objectives and opportunities for discussion and knowledge sharing among the attendees.

## Relevance to Nursing Practice

The WHO (2015) advised the implementation of EBP tools and interventions that could contribute to positive patient outcomes for asthma management. Hospitals frequently find it difficult to apply consistent evidence-based prevention strategies in the management of chronic diseases. For example, Lv, Xiao, and Ma (2015), argued that

adequate evidence is needed to establish causality between obesity and asthma, and addressed how obesity prevention interventions affect asthma onset for those at risk, or improves disease outcomes in patients already diagnosed with asthma.

In addition, in a systematic review and meta-analysis of case-control studies to determine the effect of childhood BMI on asthma, Azizpour; et al. (2018); found a significant relationship between BMI (obesity/overweight) and asthma among children and adolescents. Specifically, results of the meta-analysis from the case-control studies indicated there was a significant relationship between asthma and BMI greater than the $85^{th}$ percentile.

In a recent retrospective cross-sectional evaluation by Genova, Penta, Biscarini, Discara, and Esposito (2018), they found that in a total of 510 patients aged 3 to 17 admitted with an asthma diagnosis, BMI and BMI percentiles were missing in 493 (96.7%) of the patients' records in the total sample. The authors also reported that more than 19% of patients were obese and more than 13% of patients were overweight (Genova; et al., 2018). Overall, evidence has revealed that overweight and obesity were unrecognized, underdiagnosed, and undertreated in pediatric patients with asthma (Borgmeyer, Ercole, Niesen, & Strunk, 2016).

In children, asthma presents with many nonmodifiable risk factors such as sex, allergies, and family history of asthma. However, obesity is one of the few modifiable risk factors for asthma (Willeboordse; et al., 2013). Based on evidence regarding the risk of asthma in overweight and obese children being higher than those who are underweight or normal weight, this implies the need to routinely assess pediatric patients' with asthma

weights for being clinically diagnosed with obesity using calculated BMI and BMI percentiles (Gungor, 2014). Accordingly, weight reduction and diet are recommended strategies for management of obesity in pediatric patients with asthma (Willeboordse; et al., 2013).

At the pediatric hospital, the pulmonary department had previously tried strategies such as diet counseling, weight reduction, and patient education to address obesity in pediatric patients with asthma. However, there was a gap in staff knowledge regarding the use of CDC BMI percentiles to assess pediatric asthma patients who were overweight or obese. Development of an educational intervention related to the use of BMI and the CDC's BMI percentiles as assessment tools for pediatric patients in the outpatient pulmonary care setting is aligned with the current priority for many health care systems to analyze and improve performance on asthma and obesity. Educating the multidisciplinary team on the use of BMI percentiles to assess for obesity in pediatric asthma patients in the outpatient pulmonary department has the potential to increase physician and staff knowledge and improve patient outcomes.

## Local Background and Context

The project site is a large pediatric hospital in the southern region of the United States. The specific department is a pulmonary clinic and pulmonary diagnostic lab within the outpatient setting of the hospital. The clinic is staffed with a pulmonologist, registered nurses, respiratory therapist, medical assistants, and other healthcare administrators who manage the day-today operations of the department. According to the pulmonologist and clinic leaders, a majority of the asthma patients seen in the pulmonary

medicine clinic are obese or have some type of weight problem. According to the pulmonary department clinic chief, more than half of the pulmonary department's pediatric patients who have asthma are currently overweight or obese. Despite current documentation of patients' height and weight data in the electronic medical record, these data do not include documentation of patients' BMI. In addition, there is a lack of documentation regarding the patients' BMI as a part of the patients' asthma action plan or overall care plan.

## Role of the DNP Student

My professional context and relationship to the doctoral project as the DNP student positions me to serve as a change agent for the staff education project. Due to my role and time at this project site, I have established a relationship with the outpatient pulmonary department physicians, staff and leaders. As a result, I am aware of the department's workflow, process, barriers, and educational needs. My role as the change agent has assisted me in better understanding the topic, participants, target audience, evidence, and outpatient setting as a whole. In addition, I have gained an understanding of the challenges encountered in the pulmonary department's management of patients with asthma and obesity. My specific role as the change agent and department educator involves development and implementation of the education module. I will create an education module based on elements of the chronic care model and principles of the adult learning theory. Post development of the education module, the content will be presented to the outpatient pulmonary staff during a scheduled staff meeting. My interests in this project are a result of my experience as a nurse educator, leader, and change agent in the

outpatient setting. These roles, particularly the educator role, serves as the basis for my interest in obesity related to asthma. As the clinic and department educator, I am interested in providing the necessary training and education related to these chronic conditions.

Potential bias to this doctoral project may have been present based on the DNP student's assumptions regarding participant demographics, level of knowledge, and previous pediatric clinical experience. Participants of the educational in-service came from different backgrounds, cultures, professions, and had a variety of clinical experience. In addition, personal customs and generational influences varied among the participants. Finally, the participants all had different learning styles that required consideration when developing the educational in-service. Overcoming the biases involved use of Knowles' principles of adult learning and incorporating these concepts to the educational offering. Also, participants were encouraged to use past clinical experience and knowledge and apply this to newly acquired knowledge. Lastly, a mix of different teaching techniques were used to accommodate the different learning styles of the participants.

## Role of the Project Team

Assembly of a project team was used to analyze individual learners' needs and to help with establishing requirements for the staff education project on the use of BMI in the assessment of obesity for patients with asthma in the outpatient pulmonary clinic. The team included organizational leaders such as directors, practice administrators, clinic managers, dieticians, pulmonologists, nurse practitioners, respiratory therapists, medical

assistants, and the staff educator. The project team attended monthly meetings to discuss information related to current practices and the existing knowledge gap. In addition, the team met to discuss key components to be included in the staff education module that would address best practices and guidelines for use of BMI in assessing overweight and obesity related to asthma. The project team also outlined opportunities for collaboration among staff members when caring for patients within the clinic and department as a whole. Furthermore, the project team identified strategies for implementing elements of the chronic care model and principles of the adult learning theory into clinical practice, staff meetings, and future staff education offerings. Lastly, the project team evaluated the curriculum plan, validated the content for the pre and post-test developed, and provided a summative evaluation of the educational offering. Between the scheduled meetings, additional correspondence with team members was accomplished through e-mails, and or conference calls as needed.

## Summary

This literature search focused on pediatric asthma management, childhood obesity, prevention strategies for both health conditions, and education of clinical staff who care for and manage asthma patients with obesity. Two theoretical frameworks (chronic care model and the adult learning theory or andragogy) were discussed to provide contextual understanding of the population and spread of ideas. Although research supports the use of specific initiatives to decrease the incidence of childhood obesity related to pediatric asthma in the inpatient hospital setting, a significant gap still exists in knowledge related to outpatient or ambulatory obesity prevention strategies and

management of this in the pediatric patient with asthma. Accelerating the adoption of identified best practices in asthma and obesity prevention in the pediatric population can be accomplished using both the chronic care model and the adult learning theory (andragogy).

The literature search included use of multiple databases such as Cochrane, the Cumulative Index of Nursing and Allied Health Literature, and PubMed of the National Library of Medicine. Additionally, sites such as the National Association of Children Hospital and Related Institutions, the National Institute for Children's Healthcare Quality, National Guidelines Clearinghouse, Agency for Healthcare Research and Quality, and the National Institute for Nursing Research were used as a part of the literature search. The following keywords were included in the search phrases used to retrieve appropriate articles: *asthma, definition of asthma, asthma in children, impact of asthma in children, interventions for asthma in children, asthma in outpatient or ambulatory care, asthma clinical practice guidelines for children, asthma best practices in children, definition of obesity, obesity clinical practice guidelines, asthma and obesity, childhood obesity, impact of childhood obesity, childhood obesity in outpatient or ambulatory care, impact of asthma and childhood obesity, relationship between asthma and childhood obesity, adult learning theories, adult learning principles,* and *andragogy*.

The evidence discovered from these sources was reviewed and incorporated in the development of the staff education program. This review assisted in addressing the healthcare team's knowledge regarding recommendations for assessing, preventing, and managing the patient with pediatric asthma related to childhood obesity. The purpose of

this staff education project is to increase the staff's knowledge about identifying asthma patients that are overweight or obese using the CDC BMI percentiles. The evidence obtained from the literature search was used to develop content for the educational module and incorporate concepts from the chronic care model and adult learning theory into clinical practice.

In Section 3 of this paper, I describe the approach to the proposed staff education initiative to assess the clinical staff's knowledge, perception, and practice to management of asthma patients with obesity in the outpatient setting. The process, involving the needs assessment, data collection, interdisciplinary team, and evaluation plan will be presented along with plans for implementation of the staff education project.

## Section 3: Collection and Analysis of Evidence

### Introduction

The issue of asthma in children has been prevalent worldwide. Similarly, in recent decades, the issue of obesity has been prevalent among children (Dabrowska, 2014). The purpose of this staff education project was to increase the staff knowledge level of a multidisciplinary team regarding the use of BMI percentiles as assessment tools for overweight or obesity in pediatric patients with asthma. Distribution of a pre- and post-test was used before and after the educational module to determine the effectiveness of the staff education project.

### Project Focused Question

There is a gap in knowledge between clinical practice and evidence-based guidelines for the prevention, assessment, and management of asthma and obesity in the pediatric population. The department level practice-focused question was as follows: Will the implementation of a training program on the use of the BMI percentiles as an assessment tool for overweight or obesity in children and adolescents increase the staff's knowledge about pediatric asthma patients with obesity? The purpose of this staff education project was to increase the staff's knowledge about identifying asthma patients who are overweight or obese using the CDC BMI percentiles.

### Sources of Evidence

The National Association of Children Hospital and Related Institutions, in collaboration with TJC developed CAC measures to improve the quality of pediatric asthma care (as cited in Subramony; et al., 2016). Compliance with the three elements of

the CAC, reliever medication use, systemic corticosteroids use, and establishment of a home management plan of care, has been shown to enhance continuity of care and reduce readmission rates for pediatric patients with asthma (Bergert, Patel, Kimata, Zhang, & Matthews, 2014). In addition, the Pediatric Endocrine Society has developed an evidence-based clinical practice guideline to diagnose obesity in children and adolescents 2 years of age or older using the grading of recommendations, assessment, development, and evaluation approach (Styne, et al., 2017). In this clinical practice guideline, recommendations state that the BMI and CDC's normative BMI percentiles be used in the diagnosis of obesity; and that obesity be defined by a BMI greater than the 85$^{th}$ percentile but less than the 95$^{th}$ percentile.

Evaluation of the evidence supported use of the BMI and CDC's BMI percentiles to assess obesity in children with asthma and provided an opportunity for me to acquire additional information related to the project. For example, information regarding use of a multidisciplinary approach, the importance of translating knowledge to clinical practice, and the need to incorporate concepts and principles from evidence-based models and theories were all considered. An assessment of the evidence also allowed for increased knowledge regarding education of the clinicians to best practices and clinical guidelines. In addition, the literature supported recommendations for early prevention and treatment of obesity in the pediatric patient with asthma. The information and statistics were used to inform stakeholders about the synergistic relationship between asthma and obesity and validated the integrity of the educational project.

## Evidence Gathered for the Doctoral Project

### Participants for the Educational Program

The participants for this project included healthcare team members from the outpatient pulmonary clinic and nutrition department. Together, they have approximately 30 staff members who were invited to participate in the educational session. All staff are qualified to receive the educational module and complete the pre- and post-test. It is essential to measure the current knowledge of the staff related to best practices and guidelines on asthma and childhood obesity in order to evaluate the effectiveness of the educational module. The goal is to provide an educational module that should increase knowledge regarding management of patients with childhood obesity related to asthma, and to improve patient outcomes in the pediatric outpatient setting.

### Procedures

The educational program consisted of a pre- and post-test that I developed and was provided to all participants at the beginning and end of the education program. The pre- and post-test were be used to test the participants' knowledge regarding the recommendations for assessing, preventing, and managing pediatric asthma and childhood obesity. The pre-tests were completed prior to the staff education module. Subsequently, the same tests were administered as post-tests to assess change in knowledge regarding management of childhood obesity in pediatric patients with asthma.

**Development and review of educational material.** After review of the research was completed, learning objectives were determined with the leadership and project team members. A review of the education module, pre and post-tests, and training timeline was

done to allow the department leaders and project team an opportunity to provide feedback and suggestions regarding the staff education program plan. After consideration of the suggestions and feedback, I revised the PowerPoint that would be used for the staff education module; and pre- and post-test based on the feedback provided (See Appendices D and E). The presentation methods for the education module consisted of lecture, visual, and interactive dialogue formats to address individual learning styles for the participants and allow for collaboration and knowledge sharing between the interdisciplinary team.

**Development of educational materials.** Specific learning objectives and content for the staff education module were based on the synergistic relationship between childhood obesity and pediatric asthma. Information in the module define what asthma and obesity are, identifies common symptoms of both conditions and contributing factors, addresses care gaps related to treatment of these conditions, and highlight the evidence-based tools to be used in the management of obesity and asthma. Both the AAP and CDC BMI percentiles are outlined in the staff education module. Lastly, the education module includes elements of the chronic care model and principles of the adult learning theory as methods of enabling vision through the use of evidence-based models and theories.

**Protections**

Approval from Walden's Institutional Review Board and site agreement was obtained before the project began. Members of the clinical interdisciplinary team over the age of 18 were asked to participate in the staff education training and complete the pre and post-tests. Vulnerable subjects were not included in the project. Participants'

responses did not place them at risk of liability and will not be shared outside of the project. Tests did not include the participants' names to ensure anonymity, and results for the project were obtained through volunteered attendance and participation in the educational session. Implied consent for the project was obtained through completion of the knowledge tests pre and post the educational session.

## Evaluation and Synthesis

Evaluation of the clinical staff's knowledge were completed using the Statistical Package for Social Sciences (SPSS) Version 24 software designed by the IBM Corporation. The SPSS software was used for descriptive statistics to compare the pre- and post-test scores with a *t* test to compare the pre- and post-test results and determine if there was an increase in the test score percentages. The SPSS statistical package is the preferred comparison analysis and is easily able to perform both parametric and non-parametric comparison analysis (Puteh & Ong, 2017). Therefore, pre and post-test score percentages were compared to evaluate the participants' knowledge using the SPSS statistical software.

## Summary

Pediatric asthma and childhood obesity have significant impacts on the future of healthcare. Interventions focused at increasing knowledge regarding evidence-based practices and clinical guidelines for healthcare professionals caring for the pediatric population have the potential to improve patient outcomes. In this project, an educational module was used to describe evidence-based recommendation on the management of pediatric asthma and obesity, as well as to evaluate if the learners have an increase in

knowledge after the intervention. In the next section of this project, I address the findings and additional recommendations to include plans for the dissemination of the findings.

# Section 4: Findings and Recommendations

## Introduction

Obesity often precedes asthma symptoms and comorbidities because high body weight may worsen or even mimic asthma characteristics leading to misdiagnosis and mistakes in the design of therapeutic strategies (Styne; et al., 2017). Routinely assessing BMI and providing recommendations to prevent obesity in pediatric patients with asthma could improve short- and long-term asthma control (Forno & Celedon, 2017). Increased obesity among pediatric patients with asthma not only complicates their asthma but puts them at risk for other chronic conditions (Genova; et al., 2018).

In this doctoral project, I used a staff educational in-service to address the gap in practice between healthcare professionals' lack of knowledge regarding identification and treatment of pediatric patients who have asthma and are overweight or obese. The department level practice-focused question was as follows: Will the implementation of a training program on the use of the BMI percentiles as an assessment tool for overweight or obesity in children and adolescents increase the staff's knowledge about pediatric asthma patients with obesity? The purpose of the project was to provide an educational session using the principles of the chronic care model and andragogy on the recommendation for the prevention and management of overweight and obesity in pediatric patients with asthma.

The sources of evidence for the educational session came from two main resources. The clinical practice guideline developed by the Pediatric Endocrine Society for diagnosing overweight and obesity was used as the primary source of evidence for

this initiative. In addition, the CAC measures endorsed by TJC and the National Association of Children Hospital and Related Institutions provided an additional source of evidence for this project. Lastly, sources of evidence included the theories of chronic care model and andragogy, which were used as frameworks for planning the project in order to change the routine delivery of care for pediatric patients with chronic conditions such as asthma and obesity; and facilitate discussion and knowledge sharing among attendee of the educational in-service. An extensive review of the literature related to asthma and obesity in the pediatric population was completed to obtain the sources of evidence mentioned above.

Results of the pre- and post-tests were evaluated to determine if the intervention was successful in increasing participant knowledge regarding use of the CDC BMI percentiles as an assessment tool for identifying pediatric asthma patients who are clinically defined as obese. The pre- and post-tests were used as a measurement tool to determine each participant's knowledge regarding assessment of overweight and obesity in pediatric patients who have asthma. A paired sample *t*-test analysis using SPSS Version 24 software was performed to evaluate whether an increase in knowledge regarding the current evidence-based recommendations on asthma and childhood obesity occurred after the educational session was provided.

## Findings and Implications

The educational session was attended by 16 participants out of a potential 30 participants (53% participation rate) with 16 (100% completion rate) completing the pre- and post-test, which served as the consent form for the project. The 1-hour educational

session significantly increased the staff's knowledge regarding the use of CDC BMI percentiles as an assessment tool for identifying pediatric asthma patients who are overweight or obese. Analysis of scores were based on the 20-item pre and post-tests.

Pre-test scores ranged from 55% to 85% while post-test scores ranged from 85% to 100%. The average pre-test score was 75% while post-test scores averaged 96%. In this participant sample (N = 16), the test scores increased after the educational program was presented. I found the change in participant scores was significant ($p < 0.05$), which confirmed that the educational in-service was effective in increasing participant knowledge about the use of CDC BMI percentiles for identifying pediatric asthma patients who are overweight or obese. The .05 alpha criterion has conventionally been used by most psychologists as the law of the land for statistical significance (Pritschert, Powell, & Horne, 2016). The pre and post-test scores and statistical analysis are summarized in Table 1.

Table 1

*Pretest and Posttest Scores for All Participants*

| Test | *N* | Mean | *SD* | *t* | *P* |
|---|---|---|---|---|---|
| Pretest | 16 | 74.69 | 11.47 | -6.81 | < 0.01 |
| Posttest | 16 | 95.94 | 4.91 | | |

There were two unanticipated limitations that occurred during the planning of the educational in-service that might have impacted the findings. The department leadership felt the in-service needed to take place within a specific time frame due to departmental

commitments, competing priorities, and other department-specific trainings. Therefore, the dates that were available for providing the educational in-service were limited and may not have allowed the opportunity for more staff to participate. In addition, the educational in-service location was moved to another building due to scheduling conflicts. The change in location to a conference room outside of the department's work building may have affected some of the staff members' willingness to attend the educational in-service.

However, the findings of this project suggest that a 1-hour educational in-service can significantly increase staff knowledge regarding the use of CDC BMI percentiles when caring for pediatric patients who have asthma and obesity. Researchers have shown that asthma specialty providers should routinely assess the patient's BMI and provide recommendations for weight reduction in children who have asthma (Forno & Celedon, 2017). In addition, early diagnosis of overweight or obesity using evidence-based tools and guidelines is important when treating asthma symptoms in pediatrics and can improve short- and long-term asthma control (Styne, et al, 2017). This project supports those findings by showing that a 1-hour educational in-service can impact the staff's knowledge.

Recommendations from the United States Preventative Services Task Force stated that children should be screened for obesity and interventions implemented to improve their weight status (Borgmeyer, Ercole, Niesen, & Strunk, 2016). This project has shown improvement at the departmental and clinic level in increasing in the staff's knowledge level. A similar educational in-service can be employed in other pediatric ambulatory

pulmonary departments and clinics in order to increase staff knowledge regarding best practices in addressing this population health problem. This project can help improve systems of care within the entire pediatric sector by helping to advance the implementation of these recommendations.

Obese children have nearly a one third higher risk of developing asthma compared with children of healthy weight (Lang, 2014). In addition, obesity in children increases the risk of new asthma diagnosis (Lang et al, 2018). This project has the possibility to have a positive impact on social change due to the potential effect on asthma and childhood obesity by introducing education regarding the use of evidence-based tools for the treatment of these conditions. This project provided an educational session on the use of CDC BMI percentiles and Asthma Action Plans for the prevention, assessment, and treatment of asthma and childhood obesity, while significantly increasing the multidisciplinary staff's knowledge regarding these health conditions.

## Recommendations

One recommendation to address the gap in practice problem between best practice and clinical practice guidelines for the prevention, assessment, and treatment of overweight and obesity in children and adolescents with asthma is to ensure the use of the CAC measures to improve the quality of pediatric asthma care (Rangachari; et al., 2015). Efforts are needed to accelerate evidence into practice through education of the multidisciplinary team and collaboration among healthcare professionals (Daniels & Hassinik, 2015; Kenyon; et al., 2015). A priority in addressing these recommendations include staff education on best practices and clinical practice guidelines that can be used

for the prevention, assessment, and treatment of obesity in children and adolescents with asthma. This project could be used as a template to educate staff members on an interdepartmental and organizational level. An additional recommendation from this project is to identify a clinical practice or nurse coordinator who would serve as a champion for this initiative in the department. This individual would collaborate with the department educator to lead educational in-services related to asthma and obesity and ensure the implementation of best practices in patient care.

## Contributions of the Doctoral Project Team

The staff education project required the development of a project team to guide the formation of objectives and goals, and the establishment of criteria for the staff education program. The team consisted of the ambulatory assistant clinical director, department practice administrator, clinic managers, clinical nurse coordinators, and the staff educator. An overview of the relevant evidence regarding obesity in children and adolescents with asthma was provided to the team as an initial step. In an effort to provide team members an opportunity to share their expertise in the development of the staff education program, additional correspondence regarding the project was completed through meetings, e-mails, and skype-based conference calls. Team members were all tasked with the responsibility of assisting in the creation of in-service goals and objectives and evaluating the proposed educational in-service. An initial, secondary, and final review of the staff education in-service was provided to the project team prior to the implementation of the training.

Extension of the DNP staff education project can be accomplished through the establishment of an asthma and obesity champion using the clinical program or nurse coordinator role. In this role, the champion would assist the department and organizational leaders in implementing best practice recommendations from the in-service within the individual clinics, departments, and system wide at various hospital-based and community site locations. In addition, one of the pulmonologist who attended the in-service was interested in serving as the physician lead and moving forward with the use of CDC BMI percentiles to screen all asthma patients within the pulmonary medicine clinic and pulmonary diagnostic lab to identify current asthma patients as risk for or already defined as clinically obese.

Furthermore, the dieticians are interested in partnering with me to extend efforts in standardizing the process for nutritional consults and interventions for asthma patients who are identified as obese using the CDC BMI percentiles. Initial thoughts include development of a template in the electronic medical records that would be completed by the physician or coordinator and routed to the dieticians for a consult. There were also discussions regarding the possible implementation of a nutritional healthy-weight program where dieticians would talk to parents and patients as a group and share community resources that are available.

## Strengths and Limitations of the Project

The staff education project had some identified strengths and limitations. One strength was that the in-service was based on the most current clinical practice guideline for the prevention, assessment, and treatment of overweight and obesity in children and

adolescents as endorsed by the Pediatric Endocrine Society. An additional strength of the staff education project was the use of resources and tools that have been identified as best practice and evidence-based tools and resources. The project team also served as a strength of the staff education project with feedback, recommendations, and evaluation of the in-service prior to implementation.

Limitations of the staff education project included a small participant sample size. This can be attributed to other limitations such as timing and location for the in-service. Because of competing priorities within the department, the staff education in-service had to be completed within a certain time frame, which may not have allowed for all participants to attend the in-service. The in-service was moved to another location and building, which could have also affected the number of participants able to attend the in-service.

Implications or future studies include the incorporation of an evaluation tool for the participants to provide feedback on the educational in-service, inclusion of more participants for the training, and conducting similar studies in other departments and locations within the organization to help determine transferability.

## Summary

A gap in knowledge exists between clinical practice and evidence-based guidelines for the prevention, assessment, and management of asthma and obesity in the pediatric population. After an extensive review of the literature, an educational in-service was developed based on best practices and use of adult learning principles to facilitate communication and collaboration among the multidisciplinary team. The in-service

consisted of a 1-hour PowerPoint lecture. An overall analysis of the data from the staff education in-service showed a significant improvement in participant knowledge based on the pre- and post-test scores. This finding suggests that offering a 1-hour in-service can significantly increase staff's knowledge. In Section 5 of this paper, I will discuss an analysis of self and the process for dissemination

## Section 5: Dissemination Plan

The dissemination plan for sharing the results from the project will be to present the PPT highlighting the results to different areas where pediatric patients with asthma, obesity, and general well checks are conducted. After sharing this with the project team, department leaders, and outpatient executives, I hope to provide more opportunities for other nursing professionals to attend the lecture and gain the knowledge that can improve their practice. Internally, results of the project will also be shared with organizational councils and committees in the hospital such as the Education Council, Ambulatory Quality Practice Council, and Evidence Based Outcomes Committee. Another possible option is that this project can be highlighted in a poster or podium presentation at a national conference or meeting such as the American Academy of Ambulatory Care Nursing annual conference. Because this project follows EBP and CDC recommendations, there are many opportunities in the community as well to disperse the information such as schools, churches, and public facilities (e.g. library).

## Analysis of Self

Nurses are in a position to conduct research and use evidence to change practice. One significant role of the DNP student is the ability to disseminate findings from evidence-based research, theories, and concepts related to the practice issue and setting to develop and implement new practice approaches. I was able to use my knowledge and expertise as a practitioner, scholar, and project manager to develop and implement a staff education intervention for professional healthcare clinicians in an outpatient pulmonary clinic setting that significantly increased staff knowledge regarding the use of CDC BMI

percentiles as an assessment tool in the management of obesity in the pediatric patient with asthma.

As a practitioner, I was able to impact patient care in the clinical setting regarding the diagnosis, treatment, and plan of care for pediatric patients with asthma and obesity. This project provided me an opportunity to position myself in adding value to the interprofessional efforts to improve pediatric healthcare. In addition, as a DNP scholar, I was able to use critical evaluation and application of current research and best practice to change nursing practice. I will be able to use the design, evaluation and influence of the staff education project to promote health and policy development on multiple levels. Furthermore, as a project manager, I was able to use strategic planning and resource utilization in the development and management of this quality improvement initiative. The staff education project was successfully designed, planned, initiated, and evaluated. Overall, my role as a DNP prepared practitioner, scholar, and project manager has positioned me to be a healthcare leader and change agent. The culmination of my educational process, knowledge, and competencies has prepared me to be an executive nurse and healthcare leader. My plan is to continue with the project after completion of the DNP program through collaboration with the physician lead, dieticians, and other team members who have discussed possible next steps and interventions as a result of this project.

## Summary

The purpose of this staff education project was to increase the staff's knowledge about identifying asthma patients that are overweight or obese using the CDC BMI

percentiles. The goal was completed by creating an evidence based educational in-service using the chronic care model and principles of adult learning. Findings of the project showed the significance of a 1-hour training and how this increased staff knowledge regarding the recommendation for the prevention and management of overweight and obesity in pediatric patients with asthma. Education regarding these recommendations was the initial step towards the change in practice required.

Although healthcare challenges exists with the management of asthma and obesity in the pediatric population, completion of the staff education project provided insight on recommendations, best practices, resources, tools, care models, and frameworks that should be used in the prevention, diagnosis, and treatment of pediatric asthma patients who are overweight or obese. Findings and insights from the staff education project may be important for future policy development and practice initiatives within the organization and community.

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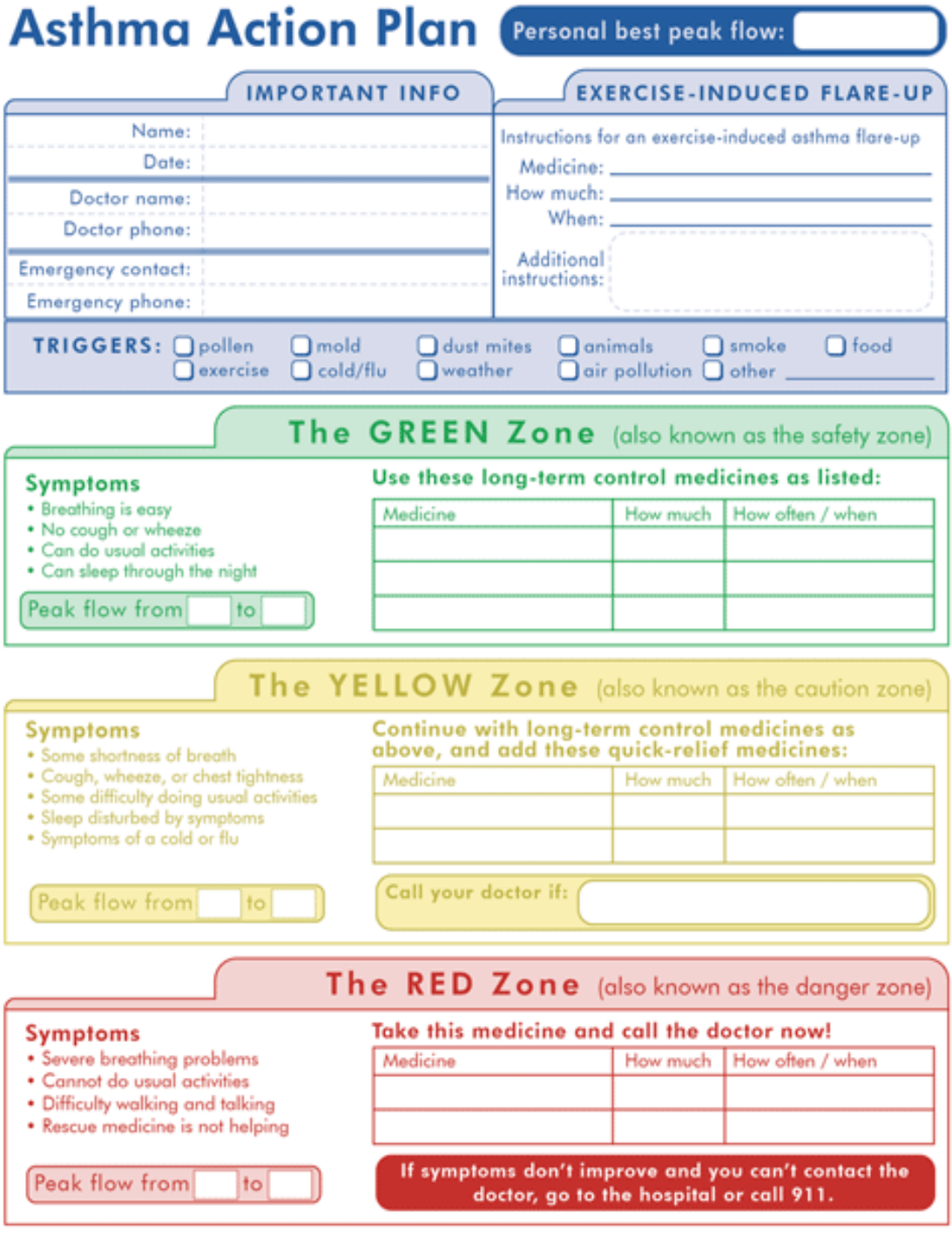
Appendix A: Sample Asthma Action Plan



# Asthma Action Plan

Personal best peak flow: ____

## IMPORTANT INFO

Name:
Date:
Doctor name:
Doctor phone:
Emergency contact:
Emergency phone:

## EXERCISE-INDUCED FLARE-UP

Instructions for an exercise-induced asthma flare-up

Medicine: ____
How much: ____
When: ____
Additional instructions:

**TRIGGERS:** ☐ pollen ☐ mold ☐ dust mites ☐ animals ☐ smoke ☐ food ☐ exercise ☐ cold/flu ☐ weather ☐ air pollution ☐ other ____

## The GREEN Zone (also known as the safety zone)

**Symptoms**
- Breathing is easy
- No cough or wheeze
- Can do usual activities
- Can sleep through the night

Peak flow from ____ to ____

**Use these long-term control medicines as listed:**

| Medicine | How much | How often / when |
|---|---|---|
| | | |
| | | |
| | | |

## The YELLOW Zone (also known as the caution zone)

**Symptoms**
- Some shortness of breath
- Cough, wheeze, or chest tightness
- Some difficulty doing usual activities
- Sleep disturbed by symptoms
- Symptoms of a cold or flu

Peak flow from ____ to ____

**Continue with long-term control medicines as above, and add these quick-relief medicines:**

| Medicine | How much | How often / when |
|---|---|---|
| | | |
| | | |

Call your doctor if: ____

## The RED Zone (also known as the danger zone)

**Symptoms**
- Severe breathing problems
- Cannot do usual activities
- Difficulty walking and talking
- Rescue medicine is not helping

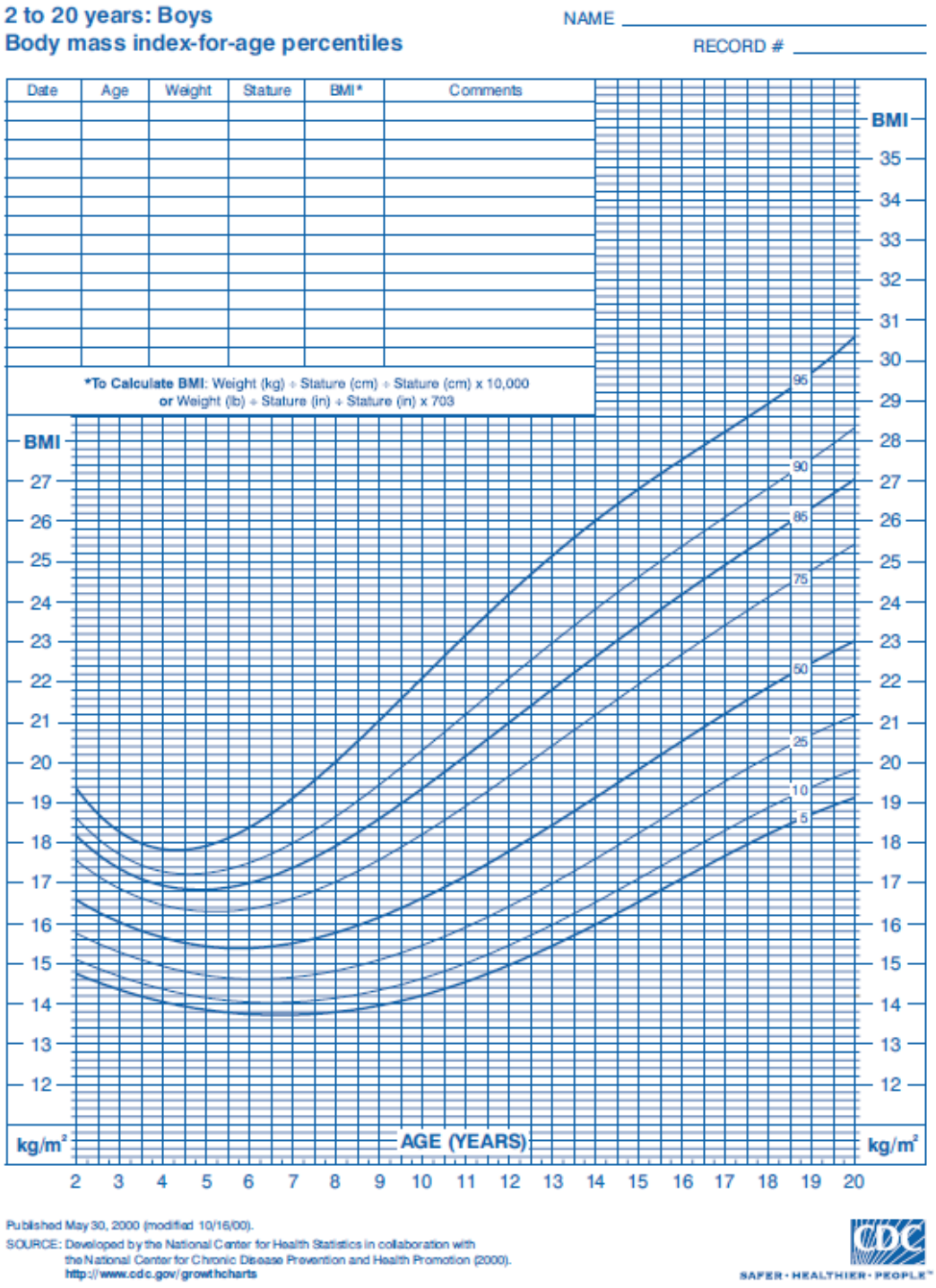
Peak flow from ____ to ____

**Take this medicine and call the doctor now!**

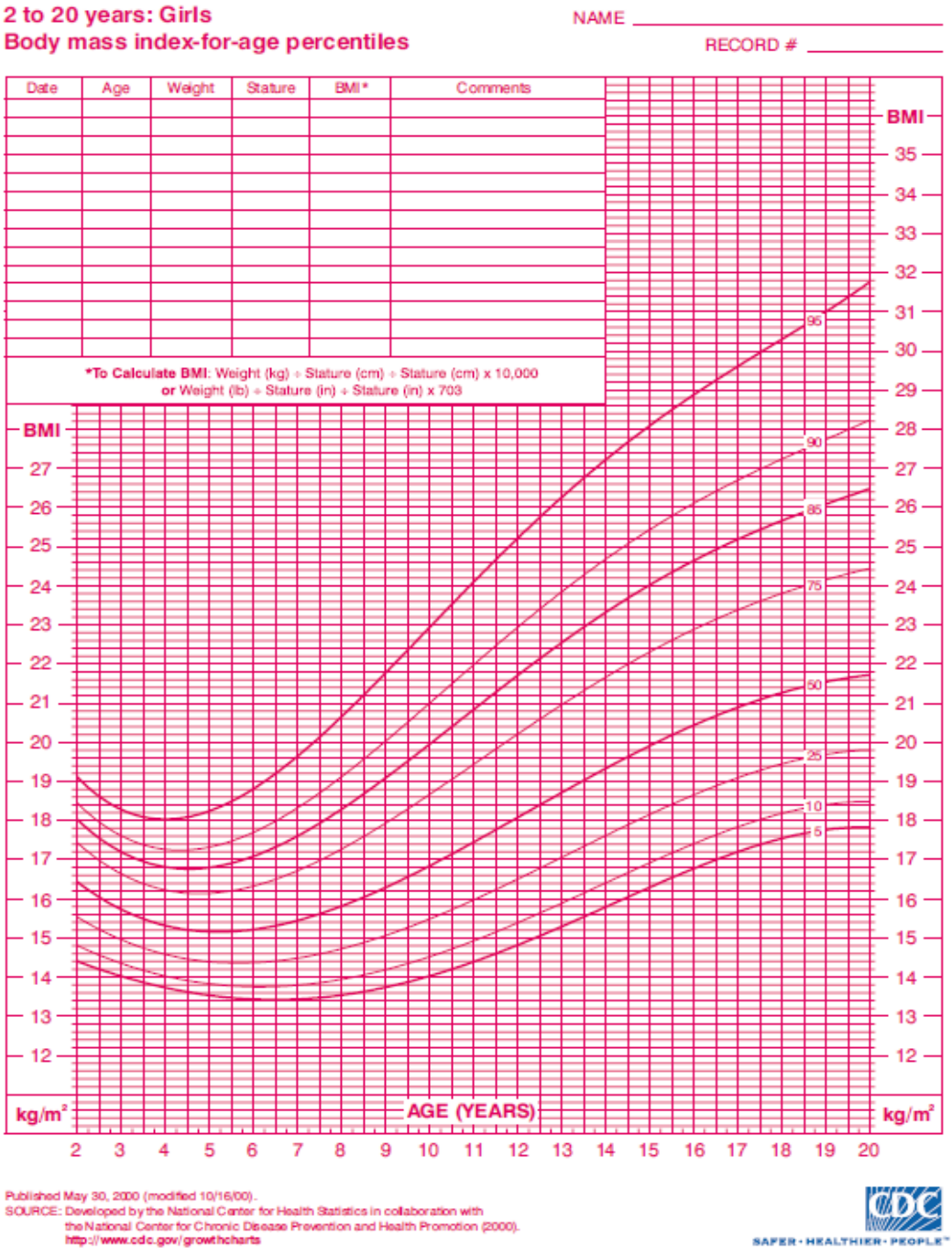
| Medicine | How much | How often / when |
|---|---|---|
| | | |
| | | |

**If symptoms don't improve and you can't contact the doctor, go to the hospital or call 911.**

Appendix B: Boys – CDC Body Mass Index for Age Percentiles



Appendix C: Girls – CDC Body Mass Index for Age Percentiles



# Appendix D: Pre Test/ Post Test

**Pediatric Asthma and Obesity Education Pre/Post-Test**

**Name:** _____ **Date:** _____

**Department:** _____ **Title:** _____

1. True or False? Asthma is a chronic respiratory disease that causes swelling and narrowing of small airways?

A.) True B.) False

2. Select all that apply. Common asthma symptoms include:

A.) Frequent cough B.) Shortness of breath C.) Chest Tightness D.) Wheezing

3. Asthma accounts for an associated _____ hospital admissions annually?

A.) 20 B.) 200 C.) 2000 D.) 200, 000

4. Overweight is defined as _____ BMI percentile, while obesity is defined as _____ BMI percentile?

A.)30$^{th}$, 95$^{th}$ B.) $\geq$ 95$^{th}$, 85$^{th}$ – 94.99$^{th}$ C.)85$^{th}$, 90$^{th}$ D.) 85$^{th}$ – 94.99$^{th}$, $\geq$ 95$^{th}$

5. BMI is an anthropometric index of height and weight that can be used continuously from age ____ years?

A.) 2 to 10 B.) 6 to 20 C.) Birth to 20 D.) 2 to 20

6. Select all that apply. Childhood obesity can cause the following pulmonary complications?

A.) Asthma B.) Sleep Apnea C.) Exercise Intolerance

7. If Mat weighs 18.9kg and his height is 107.4cm, what is Mat's BMI?

A.) 16.4 B.) 15.2 C.) 18.4 D.) 20.2

8. True or False? Pediatric asthma prevalence and incidence is linked to, and increased by childhood obesity?

A.) True B.) False

9. Select all that apply. Common care gaps in asthma and obesity management include all of the following?

A.) Delayed follow-up B.) Inadequate assessment of BMI C.) Lack of staff knowledge

10. Select all that apply. Shifting the paradigm of asthma treatment to include weight management involves?

A.) Dietary guidelines B.) Routine assessment of BMI C.) Weight reduction interventions

Charlene, a 4 year-old girl, comes in for a routine visit to the outpatient pulmonary clinic. After she is placed in an exam room, her medical assistant documents the following information:

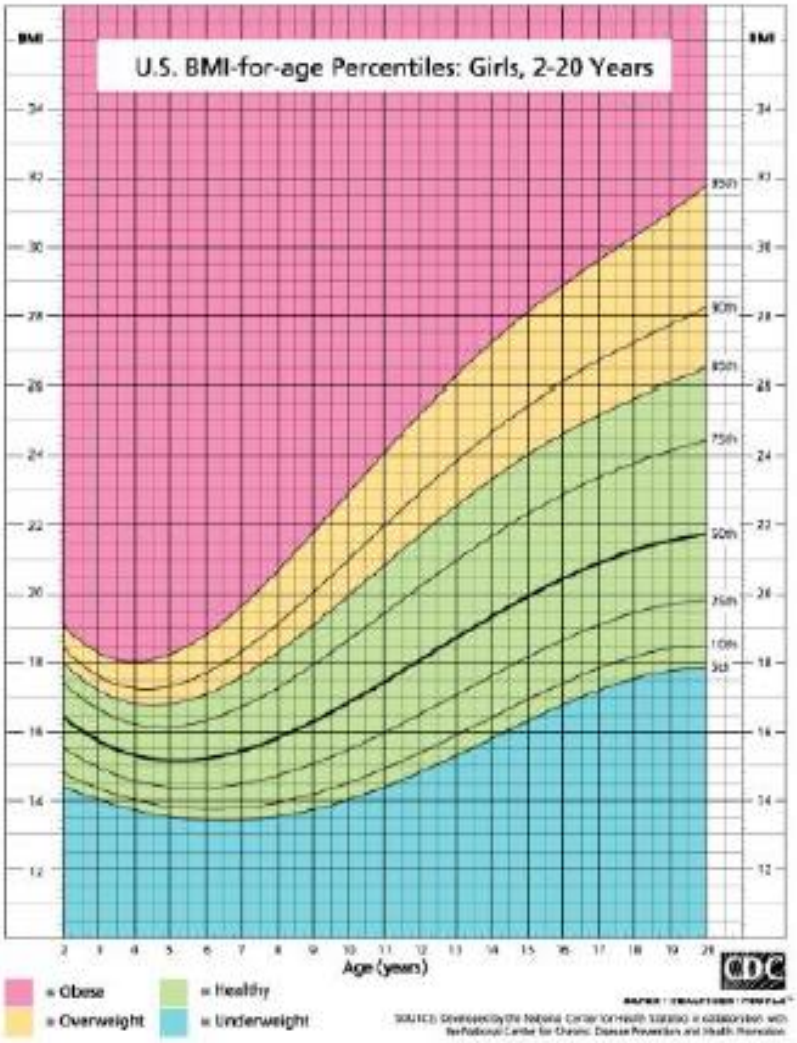
**General Information:**

Heart Rate = 94 / Resp. Rate = 25 / Blood Pressure = 98/68 / Temp = 98.6 F / SpO2 = 99%
Weight = 18.3 kg
Height = 103.5 cm

**BMI Formula:**

BMI = Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000

**CDC Growth Chart:**



Use Charlene's information above, along with the growth chart and BMI formula to answer the next five questions.

11. Which CDC growth chart would be used to calculate Charlene's BMI?

a. CDC BMI – for – age

b. CDC Stature – for – age

c. CDC Weight – for – age

12. Using Charlene's information and the BMI formula provided, what is her calculated BMI?

a. 19.5

b. 17.1

c. 12.2

13. Based on Charlene's BMI and the CDC growth chart, what is her BMI percentile?

a. $\geq 95^{th}$ percentile

b. $< 5^{th}$ percentile

c. $\geq 85^{th}$ and $< 95^{th}$ percentile

14. Based on Charlene's BMI and the CDC growth chart, what is her BMI classification?

a. Overweight

b. Underweight

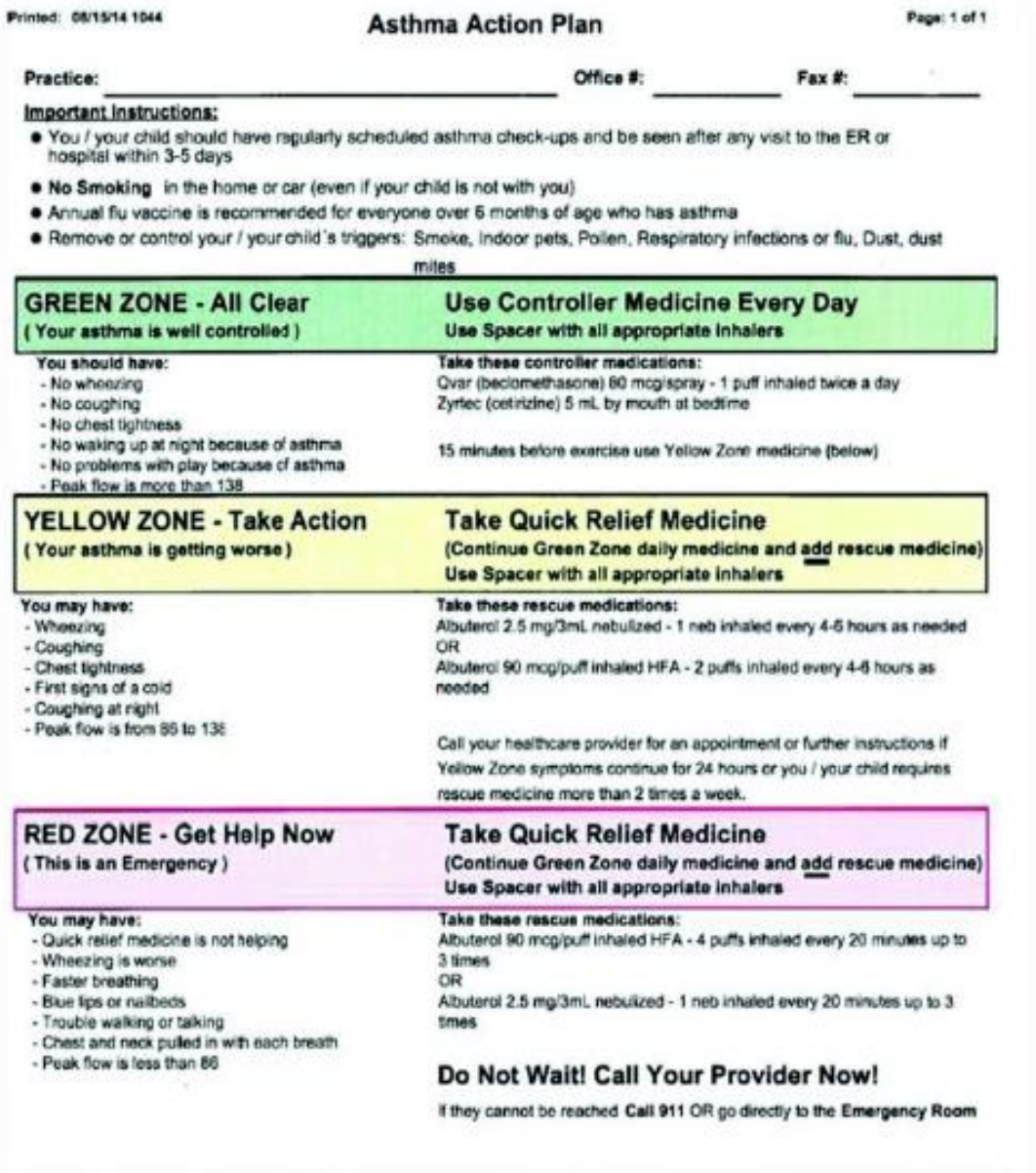
c. Obese

15. Based on Charlene's BMI percentile and classification, what should be included in her treatment plan?

a. No changes are required in her treatment plan at this time

b. Increase in exercise and physical activity, but no changes to her diet at this time

c. Increase in exercise and physical activity, and improve adherence to dietary guidelines



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## Asthma Action Plan

Page: 1 of 1

**Practice:** _____ **Office #:** _____ **Fax #:** _____

**Important Instructions:**

- You / your child should have regularly scheduled asthma check-ups and be seen after any visit to the ER or hospital within 3-5 days
- **No Smoking** in the home or car (even if your child is not with you)
- Annual flu vaccine is recommended for everyone over 6 months of age who has asthma
- Remove or control your / your child's triggers: Smoke, Indoor pets, Pollen, Respiratory infections or flu, Dust, dust mites

### GREEN ZONE - All Clear
**( Your asthma is well controlled )**

**You should have:**
- No wheezing
- No coughing
- No chest tightness
- No waking up at night because of asthma
- No problems with play because of asthma
- Peak flow is more than 138

### Use Controller Medicine Every Day
**Use Spacer with all appropriate inhalers**

**Take these controller medications:**
Qvar (beclomethasone) 80 mcg/spray - 1 puff inhaled twice a day
Zyrtec (cetirizine) 5 mL by mouth at bedtime

15 minutes before exercise use Yellow Zone medicine (below)

### YELLOW ZONE - Take Action
**( Your asthma is getting worse )**

**You may have:**
- Wheezing
- Coughing
- Chest tightness
- First signs of a cold
- Coughing at night
- Peak flow is from 86 to 138

### Take Quick Relief Medicine
**(Continue Green Zone daily medicine and add rescue medicine)**
**Use Spacer with all appropriate inhalers**

**Take these rescue medications:**
Albuterol 2.5 mg/3mL nebulized - 1 neb inhaled every 4-6 hours as needed
OR
Albuterol 90 mcg/puff inhaled HFA - 2 puffs inhaled every 4-6 hours as needed

Call your healthcare provider for an appointment or further instructions if Yellow Zone symptoms continue for 24 hours or you / your child requires rescue medicine more than 2 times a week.

### RED ZONE - Get Help Now
**( This is an Emergency )**

**You may have:**
- Quick relief medicine is not helping
- Wheezing is worse
- Faster breathing
- Blue lips or nailbeds
- Trouble walking or talking
- Chest and neck pulled in with each breath
- Peak flow is less than 86

### Take Quick Relief Medicine
**(Continue Green Zone daily medicine and add rescue medicine)**
**Use Spacer with all appropriate inhalers**

**Take these rescue medications:**
Albuterol 90 mcg/puff inhaled HFA - 4 puffs inhaled every 20 minutes up to 3 times
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### Do Not Wait! Call Your Provider Now!

If they cannot be reached **Call 911** OR go directly to the **Emergency Room**

**Case Presentation:**

Max is a 12-year-old boy, and he is coming into your outpatient pulmonary clinic today. School is going to be starting soon, and he's here for his yearly asthma check-up. You did his exam, including a spirometry with pre- and post-albuterol testing. Based on his history and spirometry, he looks fairly stable. He's just very intermittent with his asthma problems; he only uses albuterol about once a month. His concern, though, is he's going to be playing soccer this fall and he does have a seasonal allergy component to his asthma symptoms.

Use the Case Presentation and Asthma Action Plan (AAP) above to answer the next five questions.

16. Based on the case study, what zone is Max currently in?

a. Green

b. Yellow

c. Red

17. Based on Max's AAP, if Max starts to have the following symptoms when he starts to play soccer (wheezing, chest tightness, coughing at night, and peak flow of 96), what intervention should be anticipated?

a. None

b. Changing the treatment plan to include Yellow Zone actions

c. Changing the treatment plan to include Red Zone actions

18. Based on Max's AAP, what rescue medications are available if Max's treatment plan required actions from the Red Zone?

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a. Peanuts, exercise, and smoke

b. Exercise, seafood, and eggs

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20. Based on Max's AAP, how soon should a follow up visit be scheduled after a visit to the ER?

a. 3 months

b. 3 to 5 days

c. 1 month

# Appendix E: Pre Test/Post Test Answer Key

**Pediatric Asthma and Obesity Education Pre/Post-Test Key**

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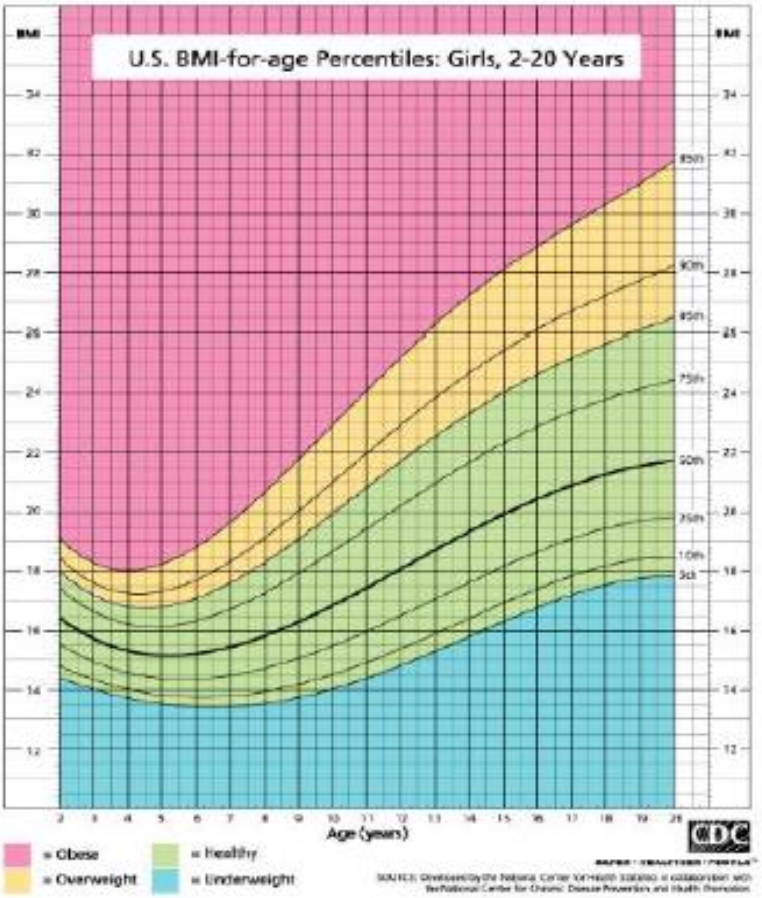

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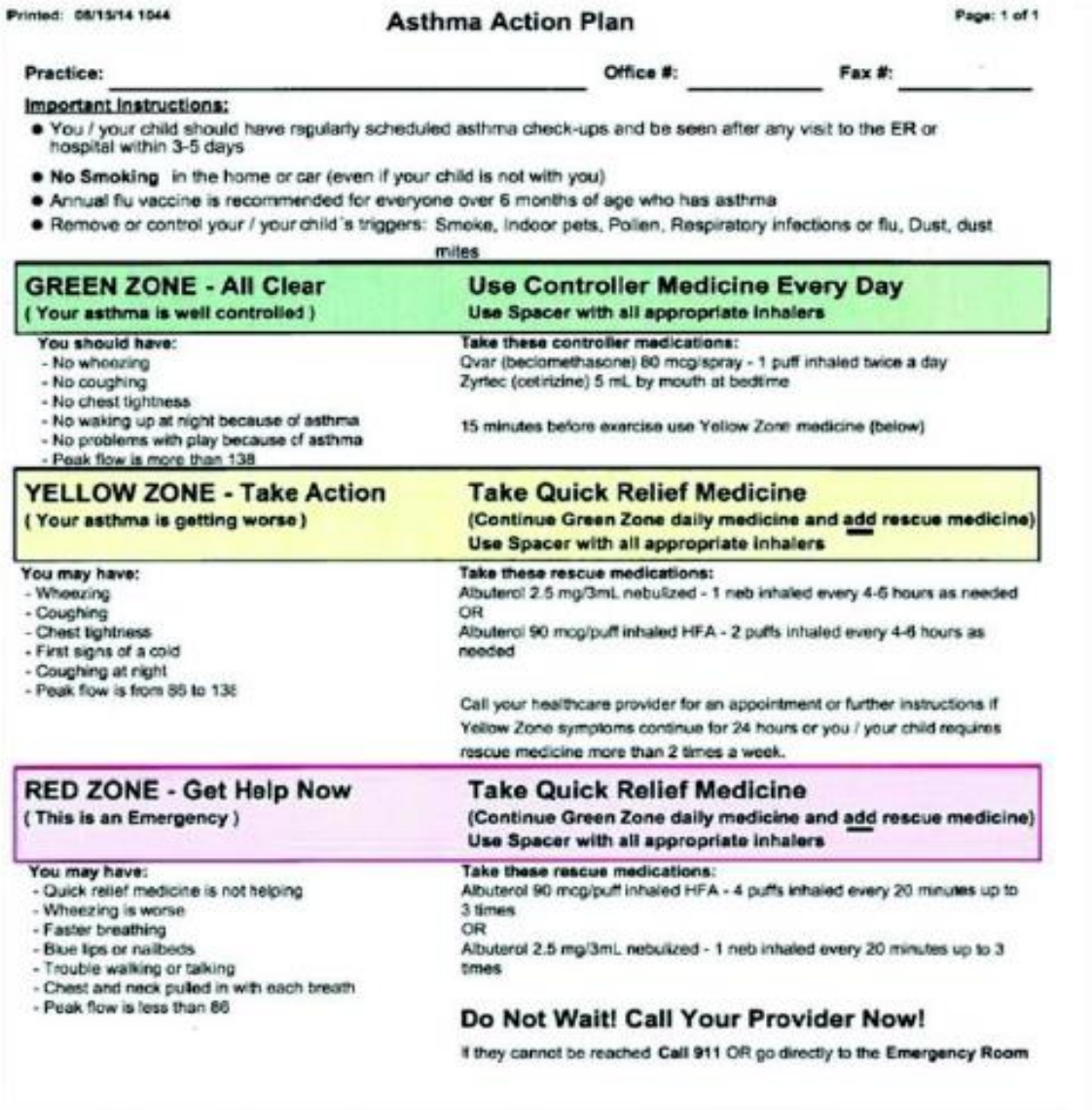

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## Asthma Action Plan

Page: 1 of 1

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20. Based on Max's AAP, how soon should a follow up visit be scheduled after a visit to the ER?

a. 3 months

b. 3 to 5 days

c. 1 month

Appendix F: PowerPoint Presentation

# Management of Pediatric Patients with Asthma and Obesity

By: Oluwakemi Taiwo Orogbemi, MSN, RN

## Objectives

After completion of this educational training, the learner will be able to:

1. Understand asthma and obesity as population health problems in the pediatric patient
2. Recognize the association between asthma and obesity in children, and determine contributing factors
3. Identify existing care gaps in the management of children with asthma and obesity
4. Discuss and state the use of evidenced-based interventions (Asthma Action Plan and CDC BMI Percentiles) for managing pediatric patients with asthma and obesity
5. Acknowledge use of the Chronic Care Model (CCM) and Adult Learning Theory (Andragogy) for management of asthma and obesity in pediatric patients in the outpatient clinic setting

# What Is Asthma?

Asthma is a chronic respiratory disease that causes:

- ✓ Tightening of the muscles surrounding the airways and difficulty breathing (bronchoconstriction/spasm)
- ✓ Swelling and narrowing of small airways (bronchioles)
- ✓ Over production of sticky mucus liquid that further narrows the airways


# Airway Obstruction in Asthma

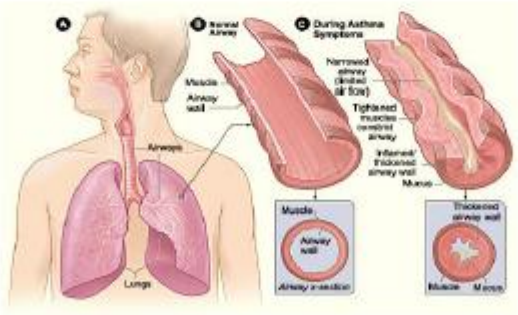



Figure A shows the location of the lungs and airways in the body.
Figure B shows a cross-section of a normal airway.
Figure C shows a cross-section of an airway during asthma symptoms.

## Common Asthma Symptoms

- ✓ Frequent cough, especially at night or early in the morning
- ✓ Shortness of breath or rapid breathing
- ✓ Chest Tightness
- ✓ Chest pain
- ✓ Wheezing
- ✓ Fatigue

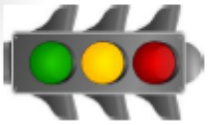

## Pediatric Asthma Facts

1. Asthma is the most common chronic respiratory disease and childhood illness
2. In the U.S., more than 9 million children are affected with asthma as a chronic disease and the prevalence increased by 1.4% annually between 2001 and 2010
3. The prevalence of asthma in children less than 18 years old was 9.5% between 2008 and 2010
4. Asthma accounts for an associated 200,000 hospital care for asthma admissions annually, and the number of children who seek urgent and acute is increasing
5. The frequency of hospitalizations for asthma in the pediatric population is more than twice as that for adults
6. Worldwide, asthma accounts for frequent and repetitive emergency room visits and is among the most common pediatric medical conditions

# Asthma Action Plan

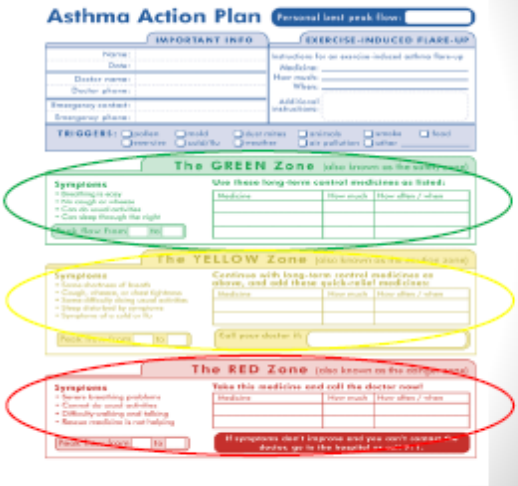
- Management of asthma can be accomplished using evidence based tools such as the Asthma Action Plan (AAP).
- The AAP is an example of a written treatment plan that can be used collaboratively between the patient and the healthcare provider for management and maintenance of asthma symptoms.
- Individualized AAP's are associated with improved asthma outcomes and have been shown to increase patients' quality of life.
- Effective AAPs provide patient information regarding:
  - Exacerbation Management
  - Asthma Triggers
  - Medication Parameters
- The AAP is used to teach patients how to make appropriate changes to their treatment regimen based on symptoms, and how to recognize signs indicating worsening asthma.


# Asthma Action Plan



## Stop Light Zone Classification

- Green Zone = Safety Zone
  - Breathing easy, no cough or wheezing, usual activities
  - Control medications used
- Yellow Zone = Caution Zone
  - Shortness of breath, wheezing or cough, usual activities are difficult
  - Rescue medications used
- Red Zone = Danger Zone
  - Severe breathing problems, unable to due usual activities, unable to walk or talk
  - Emergency medications used and contact MD



# What Is Childhood Obesity?

Childhood obesity is the accumulation and storage of excess body fat based on body mass index (BMI, kg/m2) and is defined as:

- ✓ Overweight = 85th to 94.99th BMI percentiles
- ✓ Obese = ≥95th BMI percentiles

| BMI | Recommended Classification |
|---|---|
| < 5th Percentile | Underweight |
| 5th – 84th Percentile | Healthy Weight |
| 85th – 95th Percentile | Overweight |
| > 85th – 90th Percentile | Obesity |
| > 99th Percentile | Severe Obesity |

# What is Body Mass Index (BMI)?

- **An anthropometric index of weight and height**
  - Body Mass Index (BMI) is an anthropometric index of weight and height that is defined as body weight in kilograms divided by height in meters squared
  - BMI is the commonly accepted index for classifying adiposity in children, teens, and adults
- **BMI formula and calculation**
  - BMI formula = weight (kg) / height $(m)^2$
  - BMI calculation = weight (kg) / height (cm) / height (cm) x 10,000
- **A screening tool**
  - BMI is a screening tool used to identify individuals who are underweight, overweight, or obese. BMI is NOT a diagnostic tool

## Using BMI – For – Age As a Screening Tool

- There are several advantages to using BMI-for-age to screen for obesity, overweight, and underweight among children and teens:
  - BMI-for-age is the only indicator that allows plotting a measure of weight and height, also referred to as stature, with age on the same chart. The BMI-for-age percentile ranking indicates the relative position of the child's BMI number among children of the same sex and age from the reference population.
  - BMI-for-age is the measure that can be used continuously from age 2 to 20 years to screen for obesity, overweight, or underweight.
  - BMI-for-age is not recommended for use in the United States before 2 years of age to screen for overweight, obesity, or underweight. For children younger than 2 years old, the CDC recommends using the WHO growth charts to monitor growth.
  - BMI can be used to track body size throughout the life cycle. (Among children and teens, BMI for age and sex is used, and among adults, BMI is used).
  - BMI-for-age in childhood is a determinant of adulthood BMI.

## Calculating BMI Using the Metric System

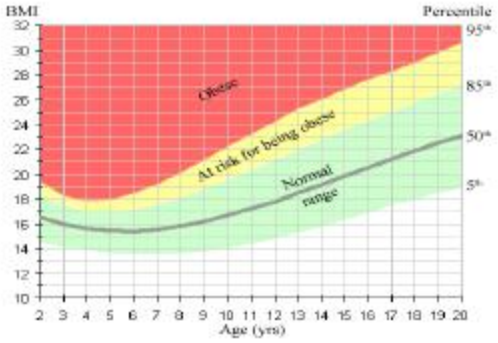
- **Formula: weight (kg) / [height (m)]$^2$**
- **Calculation: [weight (kg) / height (cm) / height (cm)] x 10,000**

Example:

*We know that Mat's weight is 16.9 kg and his height is 105.4 cm. What is Mat's BMI?*

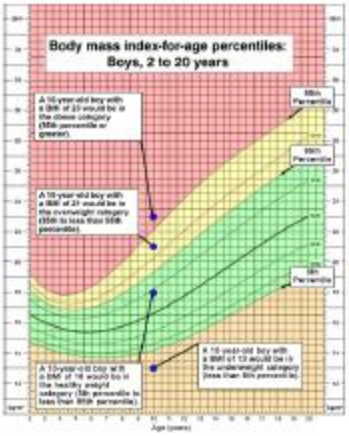
(16.9 kg / 105.4 cm / 105.4 cm ) x 10,000 = **15.2**

# BMI-Related Childhood Obesity

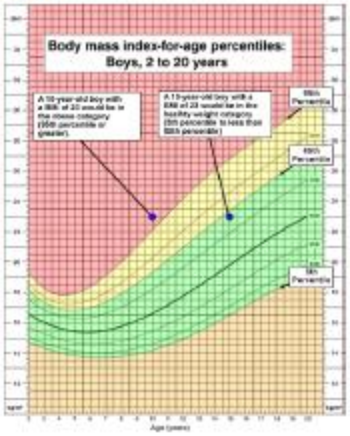



# BMI INTERPRETATION

The following is an example of how sample BMI numbers would be interpreted for a 10-year-old boy.




The following graphic for an example for a 10-year-old boy and a 15-year-old boy who both have a BMI-for-age of 23.

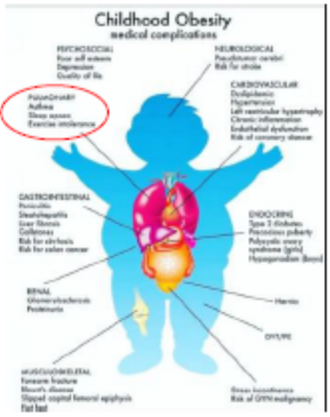


# Childhood Obesity Facts

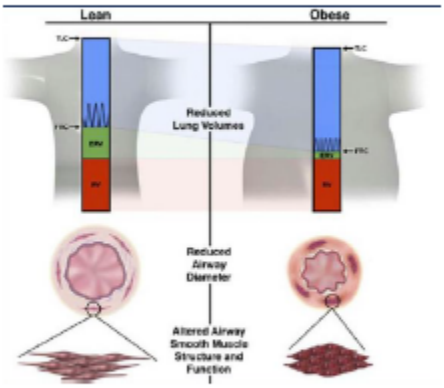
1. Childhood obesity is one of the most serious problems of the 21st century
2. Childhood obesity in increasing and has tripled since 1970 with an estimated 43 million children considered overweight or obese
3. The incidence of childhood obesity is 4 times higher in youths compared to 30 years ago, and currently, 1 out of every 6 children are obese or overweight
4. Pediatric obesity is associated with higher risk for several comorbidities such as asthma, diabetes, cardiovascular disease, high cholesterol, liver disease, and depression
5. Overweight children are defined as having a body mass index (BMI) at or above the 85th percentile and lower than the 95th percentile when compared to other children of the same age and gender

# Childhood Obesity Pulmonary Complications

- **Asthma**
- Sleep Apnea
- Exercise Intolerance



## Asthma and Obesity: Pathophysiology




Copyright: Obesity and Asthma, *Am J Respir Crit Care Med* 2006; 174. 112-119

## Link Between Asthma & Obesity

- Studies show that pediatric asthma prevalence and incidence is linked to, and increased by the presence of obesity in children
  - Overweight and obese children were found to have more beta agonist and oral steroids dispensed than non-obese children
  - Prevalence of obesity is higher in children who present to the emergency department with asthma, and these children are more likely to be admitted
  - Overweight or obese children experience decreased asthma control, high medication use, and frequent asthma-related hospital admissions
  - Overweight or obese children admitted to the hospital for asthma have a longer length of stay and receive longer courses of medication management
  - Overweight or obese children who lose weight results in significant improvements in asthma symptoms

## Summary of Research Findings…

- Early diagnosis of obesity is important when treating asthma symptoms.
  - According to Styne, Arslanian, Connor, Farooqi, Murad, Silverstein, and Yanovski (2017), overweight and obesity often precede asthma symptoms and comorbidities due to the fact that high body weight may worsen or even mimic asthma characteristics leading to misdiagnosis and mistakes in the design of therapeutic strategies. Therefore, using the correct data such as the evaluation of BMI to define obesity is important.
  - According to Borgmeyer, Ercole, Niesen, and Strunk (2016), it is important for health providers to recognize overweight/obese asthmatic children since weight reduction remains a therapeutic option to asthma management. In their retrospective cross-sectional study, the authors evaluated a total of 510 patients aged 3 to 17 years admitted to the hospital with asthma and found the following:
    - Data of BMI percentile was recorded in only 3.3% of the total ,11% of children with obesity, and 0% of patients who were overweight.
    - MBI percentile by the provider were missing in 493 (96.7%) of the records in the total sample.
    - Only 8% of asthmatic children with obesity were treated, and the authors underlined that overweight and obesity were underrecognized, underdiagnosed, and undertreated in patients hospitalized for asthma.
- Asthma specialty providers are not routinely assessing BMI.
  - According to Forno and Celedon (2017), many asthma specialty providers are not routinely assessing BMI or providing recommendations for weight reduction in children, which could improve short and long term asthma control.

## Summary of Research Findings…

- Obese children have nearly a one third higher risk of developing asthma compared with children of healthy weight.
  - According to a retrospective study to determine current and future therapeutic options for obesity and asthma in children, Lang (2014), found risk for incident asthma in children who were overweight (BMI in the 85$^{th}$ to 94$^{th}$ percentile) or obese (BMI $\geq$95$^{th}$ percentile) was higher when compared with children of healthy weight (BMI ranging from 25$^{th}$ to 64$^{th}$ percentile).
- Obesity in children increases the risk of new asthma diagnosis even when the asthma diagnosis is confirmed by rigorous diagnostic means.
  - In a new study by Lang, Bunnell, Hossain, et al. (2018), the researchers found that relative risk for incident asthma confirmed by spirometry was 29% higher in obese children compared to healthy weight children.
- Despite the lack of specific asthma guidelines for obese children, there is strong recommendation for weight-loss as a therapeutic option.
  - Weight loss is listed as evidence category grade B for individuals if all ages by the National Asthma Education and Prevention Program – Expert Panel Report 3 and is also recommended in the Global Initiative for Asthma guidelines.
- Obese children have an increased risk for asthma exacerbations.
  - In a meta-analysis of 46, 070 asthmatic children and adolescents, obese children (BMI >95$^{th}$ percentile) compared with non-obese peers had a significant increased risk of asthma exacerbations (Ahmadizar, Vijverberg, Arets, Boer, Lang, Kattan, Palmer, et al., 2016).

## Asthma - Obesity Contributing Factors

- ✓A diagnosis of asthma can result in behavioral changes, such as diminished enthusiasm for physical activity
- ✓Weight gain can occur when asthmatic patients avoid exercise since it could trigger symptoms and cause exacerbations
- ✓Excessive body fat restricts the free movement of air and compresses the lungs
- ✓Ethnic minorities may have increased risk for asthma and obesity which can be attributed to indoor allergens, urban air quality, poverty, lack of education, and inadequate medical care

## Care Gaps in Asthma & Obesity Management

- ✓Inadequate asthma and obesity assessment and control
- ✓Delayed follow ups with pulmonary and nutrition specialists post admission
- ✓Underutilized screening tools and evidence-based interventions
- ✓Failure to provide asthma and obesity treatment plans
- ✓Lack of staff knowledge regarding asthma and obesity management
- ✓Lack of asthma and obesity education to patient and family
- ✓Patient-driven care gaps (noncompliance and lack of knowledge)

## Enabling the Vision through Models + Theories


**Vision-Driven Evidence Based Practice**

## Vision

### Shift the Paradigm of Asthma Treatment to Include Weight Management

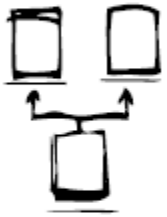
**Asthma Treatment**

- Control and avoid asthma triggers
- Monitor asthma symptoms and lung function
- Understand how and when to use medications

**Asthma Treatment + Weight Management**

- Implement strategies centered on prevention and appropriate lifestyle changes (Increasing exercise and improving adherence to dietary guidelines) for effective weight control and optimal asthma management
- Routinely assess body mass index with scheduled pulmonary appointments when monitoring symptoms
- Provide specific recommendations for weight reduction in children when controlling and avoiding triggers

## Chronic Care Model (CCM)



Model

- Practice redesign using three common realms
  - Community – service and care coordination
  - Healthcare System – comprehensive delivery of care
  - Provider – single provider or multidisciplinary team
- Routine delivery of care to include six elements
  - Community resources
  - Health system
  - Self management support
  - Delivery system design
  - Decision support
  - Clinical information

## Adult Learning Theory (Andragogy)

Theory

- Knowledge acquisition based on six assumptions:
  - Need to learn
  - Self concept

    → Identify health care professionals/clinicians requiring education (MD, NP, PA, RN, RT, RD, SW)
  - Experiences
  - Readiness to learn

    → Determine all stakeholders and the multidisciplinary collaborative practice required
  - Orientation to learning
  - Motivation

    →
    - Department-specific educational needs assessment
    - Staff Education Training aligned to specific topic
      - Anthropometric Training (Height and Weight)
      - Asthma and Obesity Staff Education Module

## Closing Care Gaps
### Evidence Based Clinical Interventions

- ✓ Timely Follow-Up Appointments
  - ✓ Post-admission follow up appointments for patients admitted with a respiratory-related diagnosis
  - ✓ Follow up appointments with pulmonary clinic scheduled within 30 days of discharge
  - ✓ Nutrition referral and consultation based on BMI assessment
- ✓ Improved Asthma & Obesity Assessment & Control
  - ✓ Completion of clinic-specific asthma questionnaire during routine visits
  - ✓ Documentation of patients height and weight in the electronic medical record
  - ✓ Graphing or plotting of the BMI on the patients growth chart for comparison and interpretation

## Closing Care Gaps
### Evidence Based Clinical Interventions

- ✓ Use of evidence-based tools and guidelines
  - ✓ Asthma Action Plan
  - ✓ CDC BMI Percentiles
- ✓ Staff education to increase knowledge regarding asthma and obesity management
  - ✓ Educational in-services
  - ✓ Staff meetings and clinic huddles
  - ✓ Online modules using the learning management system
- ✓ Provision for asthma and obesity-related patient education
  - ✓ Asthma and obesity patient education materials and handouts
  - ✓ Patient education information printed as a part of the After Visit Summary (AVS)

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