Chapter 2
Asthma

Diagnosis

Asthma or reactive airways disease is one of the most common chronic illnesses in children (Akinbami, Moorman, Garbe, & Sondik, 2009; Centers for Disease Control [CDC], 2011). This illness is diagnosed when children suffer from episodic wheezing, shortness of breath, chest tightness, and coughing (Bousquet et al., 2010; National Institutes of Health, Heart, Lung, and Blood Institute, 2014). It is defined as an airway inflammation, narrowing, or obstruction that is either reversible or partially reversible with treatment. Airways can be obstructed or narrowed due to an accumulation of mucous. The clinical presentation of asthma involves a decrease in “exhaled” air flow. The clinical presentation also can involve edema (swelling) of the bronchial walls and subsequent contraction of the smooth muscles around the airways. This can cause a feeling of tightness, almost like rubber bands “constricting” or “pulling tight” with accompanying chest pain or tightness. This can feel very uncomfortable, making it difficult to breathe. When doctors are assessing children for asthma, they are examining reports of wheezing, chest tightness, reports of shortness of breath, and coughing. They assess air flow using spirometry (a device children blow through and nurses/doctors assess exhaled breaths). Children with asthma may also experience nighttime awakenings due to difficulty breathing or exacerbations of daytime symptoms. Treatment often involves administration of oral or systemic corticosteroids.

Symptoms of asthma may be diagnosed at any time during childhood. The diagnosis is most often made during the first 4 years of a child’s life. Asthma is most common in childhood and then it is likely to decline in adolescence. In general, females are more likely than males to be diagnosed with asthma (American Academy of Allergy, Asthma, and Immunology, 2014; CDC, 2011). Asthma is a difficult disease to diagnose and, at present, cannot be cured (National Institutes of
Health, National Heart, Lung, and Blood Institute, 2007). However, symptoms of asthma can be effectively managed through medication and by reducing exposure to environmental triggers and allergens (American Academy of Allergy, Asthma, and Immunology, 2014; National Institutes of Health, National Heart, Lung, & Blood Institute, 2007).

Prevalence

Over 8% of the individuals in the United States have asthma, and the prevalence of this disease is higher among children than adults (Akinbami et al., 2012). Asthma is a common illness for children, occurring in 40 per 1000 children. Asthma affects about 9.5–10% of school-age children in the United States (Akinbami et al., 2012; American Academy of Allergy, Asthma, and Immunology, 2014; CDC, 2014). Asthma is more common in black, American Indian, and Alaskan native groups than for whites. Asthma rates were lower in groups of Asian descent (Akinbami et al., 2012). The prevalence of asthma has been increasing and this chronic illness also may be increasing for youth residing in poverty, especially those residing in poverty in areas where environmental risk factors, such as pollution, are high (Akinbami et al., 2012; Gergen & Togias, 2015; Wilson et al., 2015).

Genetic and Environmental Determinants. There is a genetic component to this disease, but the environment plays a large part in the onset and maintenance of symptoms. In terms of genetic influence, multiple genes play a role in determining asthma. In addition, prenatal exposure to different stimuli has been associated with the development of asthma in children. Two studies demonstrating this idea come from Project Viva, a longitudinal study (study conducted over time with measurements as the children age) to determine the impact of prenatal nutrition on child health. Specifically, Project Viva examined the relationship between food intake during pregnancy and health indicators during infancy and asthma during childhood (Bunyavanich et al., 2014; see https://www.hms.harvard.edu/viva/project-viva-publications.html). In a study examining links between food allergens and allergies and asthma during pregnancy, Bunyavanich et al. (2014) discovered that higher milk intake during the first trimester of a pregnancy was associated with lower levels of allergic rhinitis and asthma in childhood. Similarly, Bunyavanich et al. found that higher intake of wheat and peanuts during pregnancy was related to lower levels of allergic rhinitis and asthma in children. Other variables, such as medication use, may impact child propensity toward asthma. Sordillo et al. (2015) examined the relationship between acetaminophen use and asthma in 1,490 mother–child dyads from Project Viva. Study findings did indicate a positive relationship between prenatal acetaminophen use and childhood asthma. However, the authors also emphasized the further study of number of respiratory tract infections during infancy is important as this factor could account for increased risk for asthma in the childhood years.
Impact on Children

Asthma is often considered a chronic illness with more “mild” severity levels and consequences. However, asthma attacks can be life threatening. Moreover, there is a significant subgroup of individuals with asthma with uncontrolled or very poorly controlled asthma, such that their symptoms are considered severe (Bousquet et al., 2010). If asthma symptoms are exacerbated, emergency room visits can become commonplace for youngsters. When symptoms of asthma are poorly managed, children can have serious attacks that lead to use of the emergency room or increased medical visits, which can be very expensive (Barnett & Nurmagambetov, 2011; McPherson & Redsell, 2009). Use of the emergency room may be more common for youth with severe asthma. In addition, these youth may be more likely to react negatively to their asthma medications and have poor lung function (e.g., loss of elasticity in lungs; Bousquet et al., 2010). However, severity levels change over time and a child can move from more severe to mild or moderate symptoms. Asthma remains difficult to diagnose and at present cannot be cured (National Institutes of Health, National Heart, Lung, & Blood Institute, 2007).

Assessment of Asthma. Current guidelines for asthma management (National Institutes of Health, National Heart, Lung, & Blood Institute, 2007; Wilson et al., 2015) recommend assessment of patient (in the case of children, child and parent) knowledge about disease management so that appropriate health education can be provided. Part of this knowledge involves understanding of factors, such as allergens and stress, which can trigger an asthma attack, as well as knowledge about the need to use an inhaler regularly. Children need to know how to use an inhaler, by expelling a breath, taking in a full breath with a puff from the inhaler, and closing their mouths around the tube for the inhaler. Children should then hold their breath for a few seconds and then expel it. Information about chest tightness and wheezing also should be familiar to children and parents because these symptoms can signal an asthma attack. These types of questions should be assessed (and be key items on questionnaires) when working with children with asthma and their parents or caregivers.

Researchers working with evaluation data from the Head-off Environmental Asthma in Louisiana (Heal) Project (http://heal.niehs.nih.gov/) have analyzed data for asthma risk using the CARAT or Child Asthma Risk Assessment Tool (Wilson et al., 2015). The CARAT is available at http://carat.asthmarsk.org/ (accessed July 7, 2015). Development of this tool was sponsored by the Agency for Healthcare Research and Quality (AHRQ). There are many helpful pieces of information at the aforementioned website, such as information that will help health educators explain asthma to children and parents and information on the development and utility of the Child Asthma Risk Assessment Tool or CARAT. The CARAT is a survey that comprises 36 items examining asthma status as well as triggers or risk factors for asthma management including exposure to smoke, environmental risk factors (e.g., humidifier in child’s room, mildew in the home), medication adherence, child well-being, and attitudes toward asthma. The CARAT may be a practical tool for health educators to determine if education is needed and to determine baseline information about child and caregiver well-being.
When examining information for children whose caregivers completed the CARAT ($n = 155$), Wilson et al. (2015) found that 46% of the children were at high risk when considering medication administration. A third of the children were at risk in terms of child well-being and a similar number of parents were at risk for relatively poor well-being. Medical care and exposure to allergens were relatively lower “risk areas.” The children with asthma were typically over 5 years of age and were receiving Medicaid and had “persistent” asthma symptoms. Wilson et al. highlighted the importance of education and control of environmental triggers for asthma attacks with children. They also highlighted the importance of improving caregiver and child feelings of self-efficacy for adherence and disease management. Wilson et al. (2015) discussed the importance of working with parents to change any negative beliefs they might have about management of their child’s asthma. Improving parent knowledge about asthma management may help them reduce negative beliefs, which in turn could improve their abilities to coach their child and help their child with improved asthma management. Wilson et al. suggested that parents remain active in supervising their child’s asthma management, in order to improve adherence to medical recommendations.

**Disease Management.** For children to maintain control of their asthma symptoms and reduce risk of asthma flare-ups and attacks, ongoing monitoring of disease management is important. The Monitoring Asthma in Children statement was developed from review of the literature and input from 22 clinical and research experts in children’s asthma (Pijnenburg et al., 2015). A task force was formed to develop an expert statement. First, it was suggested that physicians or pediatricians and parents and children regularly monitor children’s symptoms. Parents and children should record peak expiratory flow (peak flow), which is typically recorded using a peak expiratory flow monitor. Children blow into one end of the device and there is a scale at the other end. The child’s peak flow (assessment of breathing ability) is assessed compared to normal rates of others in the same height and weight range. Previous assessment of peak flow data also can be reviewed. Records of peak flow can be brought to the physician’s office.

The child’s physician is also clinically assessing change in symptoms, including times when asthma flares (symptoms) increase, adherence to the medical regimen (parent and child following medical recommendations), inhaler technique, control of asthma triggers (stimuli that trigger asthma symptoms), use of asthma care plans, and child height and weight. Poorly controlled asthma is defined as three to four indicators of problems, which can include symptoms for more than two times per week, nighttime awakening due to asthma, reliever medication use more than two times a week, and activity limitations due to asthma (Pijnenburg et al., 2015). Physicians should also be examining bronchial responsiveness and markers of lung inflammation as needed. A thorough review of medical management is beyond the scope of this introductory chapter. Those interested in learning details of medical management could consult local medical experts specializing in the treatment of asthma or experts at local children’s hospitals. Information in this section of the chapter focuses on typical practice, rather than the management of severe asthma. It is noteworthy that management of severe asthma is complex and involves
consideration of a myriad of factors (see Guilbert, Bacharier, & Fitzpatrick, 2014 for a review of management of severe asthma in children).

**Use of Inhalers.** One typical medication for children with asthma is the delivery of steroid or other asthma medications (e.g., bronchodilators used for quick relief of symptoms) through an inhaler. Many children do use inhalers to administer asthma medication and there is risk that they will not use the inhaler appropriately. Closing one’s mouth over the inhaler when administering medication and insuring that the inhaler is primed are two important steps in inhaler use. It is noteworthy that inhalers are primed differently and parents should consult the directions (often inhalers are primed before the first use and if they have not been used, by shaking them and maybe by pumping the inhaler one time). Making sure that the child exhales prior to administration of medication is also important. This author would recommend several steps including: (1) remove the cap, (2) prime the inhaler, (3) blow out the air in your lungs, (4) put your mouth around the inhaler and administer the puff or puffs the doctor recommended, and (5) hold the puff in your lungs for a few seconds before exhaling. These instructions help with using a metered dose inhaler (the most common type of inhaler). Information on other types of inhalers is available at [http://www.aaaai.org/conditions-and-treatments/conditions-dictionary/asthma-inhalers.aspx](http://www.aaaai.org/conditions-and-treatments/conditions-dictionary/asthma-inhalers.aspx) (accessed July 7, 2015).

Detailed recommendations on administration of asthma medications using an inhaler are available at [http://www.aaaai.org/conditions-and-treatments/library/at-a-glance/inhaled-asthma-medications.aspx](http://www.aaaai.org/conditions-and-treatments/library/at-a-glance/inhaled-asthma-medications.aspx). These guidelines are provided by the American Academy of Allergy, Asthma and Immunology. This national group of experts has provided excellent information on use of inhalers, medications, and asthma treatment. There are many sources for education of asthma medications and use of inhalers. For example, other resources are available from the American Academy of Pediatrics, Section on Allergy and Immunology (example, guidelines for Asthma by this section are available at: [http://www2.aap.org/sections/allergy/guidelines.cfm](http://www2.aap.org/sections/allergy/guidelines.cfm)). The reader of this chapter is encouraged to ask medical experts and search websites reviewed by national experts to learn more about asthma medications and administration of these medications.

**Triggers for Asthma Symptoms.** The environmental causes of asthma, such as poor environmental conditions and allergies, serve as triggers for asthma symptoms to flare and a child to have an asthma attack. Emotions can trigger an attack as well. In fact, stress, anxiety, and being emotionally reactive are possible causes of asthma attacks. Children with asthma are at increased risk of having new asthma attacks directly after and even weeks after experiencing stressful life events (Sandberg, Jarvenpaa, Penttinen, Paton, & McCann, 2004). Table 2.1 presents a listing of “asthma triggers” developed from the author’s experience working with children who have asthma and from research (e.g., Bousquet et al., 2010; Chen, Bloomberg, Fisher, & Strunk, 2003; Wilson et al., 2015). Children with asthma often have airways that are hyper-responsive or very sensitive to stimulation from their asthma triggers (e.g., exercise, exposure to environmental irritants). Consequently, children and their parents or caregivers need to learn to use medications as directed and avoid triggers when their asthma symptoms appear to be worsening.
As shown in Table 2.1, dust and mold in older homes, such as those in inner city or urban areas, can cause symptoms of asthma or increase symptoms in children who have asthma. Other environmental conditions can impact symptoms of asthma and these include: having viral infections or pneumonia that damage the lungs or having allergies. Exposure to cigarette smoking can also cause symptoms. Second-hand smoke can cause an exacerbation of symptoms and adults should attempt to be careful to smoke outside the home if they have a child with asthma, if they continue smoking. Exposure to allergens, such as pet dander, can also trigger an attack.

Adherence to Medical Regimens. Adherence to the doctor’s recommendations or following the doctor or medical professional’s recommendations for asthma management can be a significant concern for children with asthma. Not following medical recommendations, particularly administration of oral steroids, may be directly related to serious asthma flare-ups resulting in over-use of emergency rooms. Family, particularly parental support, may be needed to ensure that the child remains “on track” in terms of following medical recommendations. The health professional can be very helpful in supporting parent supervision of and leadership in adherence efforts. Before providing recommendations to improve adherence it may be advisable to assess how parents are managing the child’s asthma. If children and parents manage the child’s asthma using a team approach, then directing questions to both parent and child may be an appropriate way to gather information. Table 2.2 provides key questions for understanding how well parents are managing their child’s asthma and trouble-shooting various “asthma triggers.”

Table 2.2 presents questions and tips to improve asthma management—many of the ideas presented in Table 2.2 are key areas to following what doctors recommend in terms of adherence to recommendations for care of asthma.

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<th>Table 2.1 Triggers or factors related to asthma symptom exacerbation</th>
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<td>1. Inhaler misuse—the child can use the inhaler inappropriately. This can occur when the child does not close his or her mouth over the inhaler. To use the inhaler the child should expel a breath, place the inhaler in his or her mouth around the inhaler to prevent medication escaping, and release the intended dosage or “puff”</td>
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<td>2. Not taking medications as prescribed—this is a lack of adherence to the medication regimen. Many parents can under-dose their children as they may be concerned that the medicine changes their child’s behavior (e.g., “it makes my child hyper”)</td>
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<td>3. Inadequate treatment/inadequate disease control by doctors—many pediatricians and asthma specialists recommend aggressive treatment of asthma symptoms so as to prevent asthma flare-ups (e.g., severe asthma attacks)</td>
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<td>4. Exposure to environmental irritants—strong cleaners, dust, allergens, mold</td>
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<td>5. Passive smoking—exposure to second-hand smoke</td>
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<td>6. Viral respiratory tract infections, colds, sinusitis</td>
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<td>7. Psychological and emotional stress</td>
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<td>8. Residing in low-income areas with high pollution and environmental irritants</td>
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Asking questions about administration of medications are important steps in learning if parents need to be more effective in following medical recommendations. In addition, having a trigger-free environment is critical. Some suggestions for a trigger-free environment include: keeping areas clean and free of dust, reducing exposure to second-hand smoke, not having pets, and using air filters. If there is a pet in the home, remind parents that regular baths (e.g., weekly and as needed during allergy seasons) are important and, if possible, keep pets outside the bedroom. Other helpful recommendations for the home setting include: reducing humidity levels, washing bedding regularly, and encasing pillows and mattresses in plastic. It may be beneficial for parents to keep a notebook or chart detailing their care of the child and their efforts to control or reduce the impact of asthma triggers. Parents can show these records to the child’s doctor at appointments so that the doctor can understand what happens with medical management between appointments. This may lead to better recommendations from the doctor.

**Psychosocial and Emotional Functioning**

Children who have asthma may experience emotional problems, most commonly depression or anxiety (DuPlessis-Erickson, Spett, Stoltzfus-Mullett, Jensen, & Bisson-Belseth, 2006; García-Walker, 2012). They may feel “different” from their

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<th>Question</th>
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<td>Are you keeping a written record of peak flow measurements?</td>
<td>Record your child’s peak flow measurements. With this record you will be able to determine when additional or rescue medication is needed</td>
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<td>Are you recording information about asthma triggers—that can signal an attack or escalate symptoms?</td>
<td>Keep a list of your child’s asthma triggers. Then, ask your child’s medical team or read current literature and learn ways to eliminate or reduce the impact of asthma triggers, such as dust and exercise</td>
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<td>How are you doing in terms of filling prescriptions on time?</td>
<td>Make sure that your child’s most current prescriptions are filled and are up-to-date</td>
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<td>Are you administering the recommended dose of oral steroids and other medications?</td>
<td>Talk to your child’s doctor about his or her recommended dose and why it is important to use the full dose and administer it regularly. If children are not using the full dose, they might be more prone to asthma attacks and then face additional emergent care visits</td>
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<td>How are you asthmaphoing the indoor environment? (at home and at school?)</td>
<td>Assist the parent on brainstorming about use of cleaning products, mattress covers, HEPA filters, and other environmental changes that can help the child. Stress the need to maintain environmental surveillance to manage triggers. At school, have the child bring wipes to school (to clean/sanitize areas). Educate teachers about asthma management needs of each child using a written care plan</td>
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peers because they have an illness, have to administer medication, or have to miss school for doctors’ appointments related to their asthma. Some children with asthma may experience low self-esteem related to feeling isolated and different from peers. In the long run, frequent problems with asthma management can lead to feelings of poor quality of life for children with this disease (DuPlessis-Erickson et al., 2006; Mosnaim et al., 2013; Stewart et al., 2012). Children with asthma may feel conspicuous at school or in other public settings where they have to administer their inhalers. Inhalers typically allow children to administer steroid medications immediately. Guilbert et al. (2014) reported that experiencing depression and anxiety are markers for increased emergency room visits in children with asthma. If a child has frequent emergent care visits and presents with anxiety and depression, then referral for counseling may be indicated.

It is important to rule out side effects of medications when considering the child’s school functioning, mood, and academic performance. For example, steroid medications can make children appear very active, and in extreme cases it may look like the child is experiencing very active behaviors akin to being hyperactive. The medications can negatively affect memory and attention, which can be problematic in the classroom. As mentioned, children who have poor control of their symptoms at night may not get enough sleep and may be tired during the school day. Thus, tiredness could negatively influence attention, recall, and concentration in the classroom. The health specialist needs to assess the reasons for a child’s change in mood and then provide appropriate education about illness management. In most cases, it is advisable to maintain a strong relationship with the child’s doctor and have a release of information to talk with the doctor. A release of information is a written statement, signed by the child’s legal guardian, which then permits health care providers to converse about the child’s medical condition and care. It is recommended that health educators and counselors frequently contact the medical professional so that he or she is aware of how the child and parent(s) are managing triggers for asthma attacks and get an update about the child’s general functioning.

**Interventions for Children with Asthma and Their Caregivers**

Educational interventions can be effective in changing behavior, especially in the short-term. Horn et al. (2014) conducted an educational intervention to improve parents’ sense of connectedness with primary care physicians and their communication with them. Horn et al.’s study was a randomized controlled trial recruiting 150 parents of children (aged 1–12 years) who were randomly assigned to receive an educational intervention ($n=77$) versus receiving care as usual ($n=73$). Parents resided in an urban area and the majority of study participants were African American. Over 90% of the children had persistent asthma, and many were using the emergency room on a frequent basis. Parents in the intervention group participated in the Parent Empowerment for Asthma Care (PEPAC) Program where they received education on sharing information about and clarifying information about their child’s asthma plan with their child’s primary care physician. At 2 months
post-intervention parents receiving the training (delivered by research assistants) reported increased identification with their child’s primary care physician and there were reduced visits to the emergency room. The gains were not evident at a later assessment (6 months later). This could have occurred because the dose of the intervention or strength of the intervention was not sufficient to cause long-term change. It may be that parents need reminders and frequent visits to maintain a sharing and connected relationship with their child’s primary care physician. Nonetheless, this study was encouraging as it provided evidence that an educational program could have an impact on emergency room use, which may improve care in the long run, should the physician–parent relationship remain strengthened and communication channels remain open. More research is needed to examine the long-term impact of educational interventions and to determine the correct dose of the intervention for maintaining long-term changes in parent behavior.

Although we know that clinical interventions can improve emotional and behavioral functioning in children with asthma, less is known about positive parenting interventions and how they impact child functioning. Clarke, Calam, Morawska, and Sanders (2013) developed an intervention to improve child health-related quality of life. After reviewing the literature, these researchers noted that educational interventions were more common than behavioral ones. They selected the Triple P (Positive Parenting Program) to implement with parents of children who had asthma. This Triple P Program is an evidence-based program to improve parent self-efficacy for child-rearing and reduce behavioral and emotional problems in children (Sanders, 1999). For Clarke and her colleagues’ study, parents of children between the ages of 2 through 8 years who had asthma were randomly assigned to an intervention versus a nonintervention group. When patients are randomly assigned to groups, they have an equal chance of being assigned to the intervention or to the control group. Parents received asthma tip sheets showing the links between positive behavior for children and asthma management. In addition, parents participated in the Triple P Program, learning many positive behavioral techniques for childhood behavior management and ideas to promote children’s positive functioning. This intervention was innovative in that it was delivered online, using video clips.

Unfortunately, parents did not always review information provided on web pages (Clarke et al., 2013). Very few parents engaged in the study after review of the video clips in the first lesson. Thus, the impact of this intervention could not be fully examined due to low enrollment in the study. This study was presented in this chapter because it was well designed and has ideas that may be helpful to students who want to engage in future research with parents. However, the asthma information and the link between emotional problems in children and asthma management may not have been made clearly enough, via the internet, to involve parents in the training. Parent training during in-person sessions, where one can engage parents around their own personal issues with their child and the child’s specific asthma management difficulties may be a “stronger” intervention for reaching parents. Finally, the Triple P Program was designed for prevention of behavioral and emotional problems. Use of the positive parenting techniques in the Triple P Program may be more meaningful for parents of a child with asthma when their child is experiencing emotional and behavioral difficulties which are impacting asthma management.
Horner and Brown (2014) evaluated the impact of a self-management intervention for elementary school-age children (7–12 years of age) with asthma and their caregivers. Children received the intervention at school and parents learned of about the intervention during a home visit. This intervention was delivered in a rural setting, and the authors mentioned that more research is needed in rural areas. Children participated in the intervention during their lunch periods, in 15-min sessions (3 days per week for 5 and one-half weeks). Children learned to correctly use their metered dose inhaler and self-efficacy for correct and consistent use of the inhaler was emphasized. Children learned problem-solving and coping skills around asthma management and they learned tips about management of asthma during and after school through group discussion. Content of lessons included learning about use of the inhaler, how to avoid asthma triggers, how to get help in different situations, how lungs work, and how to interpret scores on a peak flow meter. Eighty-one children and caregivers participated in the intervention and 72 were in a comparison group. Children in the comparison group received attention during lunch-time groups and they learned about problem-solving, but this information was not tailored to asthma management. Children in both groups showed improved health, quality of life, and reduced emergency room visits (Horner & Brown, 2014). Parents were told at the start of the study if their child was assigned to the intervention versus the comparison group, and perhaps this impacted study findings. It may also be the case that children in the comparison group were applying problem-solving skills to key issues related to their asthma management.

Cicutto, To, and Murphy (2013) examined the impact of a school-based intervention to educate children with asthma, their parents, and the school community (teachers, principals, school staff). Nurses lead intervention efforts for children in elementary school (grades 1–5, 1316 children who were in 130 schools). Children learned about asthma management by reviewing the Roaring Adventures of Puff Asthma Management Program (http://www.educationforasthma.com/; accessed August 2, 2015). Information from the Creating Asthma Friendly Schools Resource Kit (http://www.asthmainschools.com/) was also reviewed by nurses. Information on controlling asthma triggers and asthma management was reviewed with children, parents, and school staff. Control schools—where asthma education was not implemented—were included in this study. Children with asthma who participated in the intervention showed better “inhaler technique.” Inhaler technique was assessed by providing points for removing the cap, priming the inhaler, exhaling, using the inhaler appropriately (placing mouth over inhaler without spaces while administering medicine), and holding one’s breath. Findings indicated that urgent health care visits decreased for children with asthma in the intervention schools. School absences also reduced in the intervention relative to the control schools. Cicutto et al. (2013) concluded that results were positive, suggesting that broad-based educational efforts delivered by school nurses can be effective in improving asthma management in schools. Cicutto et al. mentioned that having insurance may not always ensure that children with asthma have access to the care that they need, such that school-based education and intervention efforts are a mechanism for improving health care and knowledge about asthma management for children, their families, and the broader school community.
Turcotte, Alker, Chaves, Gore, and Woskie (2014) conducted home assessments and provided a home-based intervention, focusing on education, cleaning, and controlling environmental triggers in the home, in an urban area. After the intervention, children’s asthma symptoms were improved and costs—in terms of money spent on asthma care—decreased. Hence, “asthma-proofing” the environment at home may be a method for reducing costs and improving health outcomes for youth with asthma who reside in urban areas. Trouble-shooting and then improving the home environment is good for children with asthma irrespective of whether they reside in an inner city area, although such interventions may be especially helpful for children in urban areas. Others have described improving the home environment as consisting of parent and child education, frequent and thorough cleaning, pest management, and using high-efficiency particulate (HEPA) filters (Wright & Phipatanakul, 2014). Cleaning can reduce exposure to many household allergens, including but not limited to fecal matter from dust mites, saliva and secretions from cockroaches, mold and mildew, second-hand smoke, and dander from pets. Education is critical to learning these practices, but also is an opportunity to teach parents or caregivers that cleaning and other asthma-proofing practices need to be maintained on a long-term basis (Wright & Phipatanakul, 2014).

Roles for Health Educators and Mental Health Professionals

The health educator has a role in helping with adherence and monitoring of symptoms. There are many great sources for asthma education interventions. One of the many examples is material developed by the American Lung Association (http://www.lung.org/lung-disease/asthma/?referrer=https://www.google.com/; accessed August 2, 2015). Among materials at the American Lung Association are asthma fact sheets, asthma plans to use at school, and a myriad of resources for health educators and clinicians. This association has good resources for health professionals and parents. Health educators and counselors should review web-based resources in light of evidenced-based guidelines presented by pediatricians/physicians and information from peer-reviewed journal articles to learn about asthma management for children.

Helping the child feel comfortable and developing a care plan for school is another important role for health educators. Referral to trained mental health professionals, who specialize in the treatment of mood disorders or behavioral problems, may be necessary if the child is displaying significant problems with behavioral or emotional functioning that interfere with tasks of daily living, such as going to school, making friends, and functioning at home and during extracurricular activities. The health educator or counselor can also provide referral to asthma specialists when needed. Asthma proofing the child’s environment and helping the child plan to avoid and control allergy triggers are other important roles for health educators. Parents or caregivers should be involved in the planning and educational process whenever possible, as a shared management approach or having the parent/caregiver check in and “supervise” medication administration and adherence to medical recommendations can be critical to positive disease management.
The health professional needs to assess how well the child perceives his or her respiratory symptoms as well as his or her knowledge of how to treat symptoms in order to design an educational plan. Understanding the child’s perceptions indicates whether the child will be receptive to education and his or her abilities to understand written educational materials versus verbal instructions. Moreover, the practitioner can also gain an understanding of the child’s willingness to implement treatment recommendations. It is important to ask about self-confidence or self-efficacy for being able to manage symptoms and do what the doctors recommend in terms of avoiding asthma triggers and using an inhaler. Health professionals can also help families make the home environment “better” for asthma patients. Improving the home environment may be especially important in the inner city, in high-poverty areas.

Case Study

Sashay is an 8-year-old girl attending an elementary school in an inner city neighborhood. She has two older brothers, ages 12 and 18. She does not see her father very often, about every 3 months. Her mother and Sashay have a very close relationship. Her mother works two part-time jobs. Sashay has been diagnosed with asthma since she was 3 years of age. She has been to the emergency room about twice a year since she was diagnosed with asthma. At times she has also been hospitalized and treated for pneumonia. She has become afraid of entering the hospital through the emergency room. However, once she is in the ER she calms down and interacts well with the medical staff. Here longest hospitalization was for 5 days when she battled pneumonia when she was in kindergarten.

Sashay has allergies, primarily to dust and mold. Living in older apartment homes and residing with an older brother who occasionally smokes at home has at times exacerbated her asthma. Dust and mold can trigger her allergies, which present as a runny nose and cough which, in turn, can cause her asthma symptoms to flare up. Sashay has weekly appointments for allergy shots and takes medication as necessary to treat her allergies. Addressing her brother’s smoking in the home has been attempted, but her mother’s pleas for him to smoke outside the apartment have met with limited success.

Sashay makes good grades at school. She is an especially proficient reader, with good reading comprehension. She enjoys reading in front of the class. She has several friends in her classroom and these girls interact regularly at weekly Girl Scout meetings. They also regularly have play dates after school and on weekends. Sashay is described by her mother as a “happy” child with a positive outlook on her life. She typically is “sunny” and outgoing. She is able to “speak up” for herself and stand her ground when engaging in normal sibling battles. She is likely to state her opinion and argue her views in a very positive manner and her good verbal abilities and good skills for expressing her emotions contribute to her positive emotional adjustment. Thus, she copes well and is functioning well in all areas of her life.
The exception to this is coping with emergency room visits. Sashay has had negative experiences in the ER in the past where she has needed IV administration of fluids and had to have steroid shots because she was very congested related to allergies, asthma, or pneumonia. She becomes very agitated, with rapid shallow breathing, upon entry into the ER. Her reactions do not generalize to treatments at the doctor’s office. Her mother describes Sashay’s behavior as being as “good as gold” in this setting. This is interesting because Sashay has had breathing treatments and shots on an emergency basis in the doctor’s office as well as in the ER. There is one other issue for the health professional to address and this is infrequent use of her inhaler at school. Sashay is apt to forget to use her inhaler during the school day. Moreover, it is often missing when she needs to use it to the playground.

In order to address Sashay’s issues her pediatrician has referred her for consultation with the health educator connected to the medical practice. This health educator has a master’s degree in community health. After graduating, the health educator, who completed internship experiences with the asthma team and other medical teams at the local children’s hospital, developed her consultation firm, Kid’s First, designed to work with children and their parents. The health educator met Sashay’s mother during her medical visit and discussed next steps to address school issues and medical fears. The health educator asked Sashay’s mother and then Sashay about reasons for her not using her inhaler. One reason for not using it was embarrassment over other children watching her use it. The health educator made a trip to Sashay’s classroom and explained to her classmates why the inhaler was important and how it helped Sashay. After this, her embarrassment decreased and peer support and encouragement helped her to use her inhaler in the classroom. While at the school, the health educator met with Sashay and the school nurse and during this team meeting she demonstrated appropriate use of the inhaler for Sashay.

Not having her inhaler on hand was a more difficult issue to resolve. The health educator initiated a conference with the school nurse and teacher via Skype. During this meeting they developed a written care plan for Sashay’s records that demonstrated her need to keep her inhaler with her. The health educator networked with the pediatrician to get a note for the school records supporting the need for keeping an inhaler with Sashay at all times during the school day. This documentation was necessary to facilitate the use of her inhaler as needed during the school day.

At first, this plan was not successful. Sashay’s mother called the health educator, and she, the health educator, and Sashay talked by telephone to understand what was causing the continued issues. Sashay mentioned that her clothes did not have pockets. Her mother stated that Sashay did have clothes with pockets. However, Sashay said that she was not wearing these outfits because they were “not cool.” Through further discussion the health educator helped Sashay talk about a solution with her mother. They agreed that Sashay would wear or carry a fanny pack with her inhaler it during the school day. She would wear the fanny pack on her waist on the playground. Sashay agreed to this plan if she could use her mother’s pink pack with the designs on it. Her mother readily agreed to this and the health educator planned a follow-up telephone call to check on progress with Sashay’s mother.
At the follow-up call, Sashay’s mother reported that inhaler use was improved at school. The health educator then had an opportunity, as rapport had been established, to ask if there were other issues they could discuss. Sashay’s mother mentioned her oldest brother’s smoking at home as a trigger for difficulty with her asthma. The health educator provided useful websites for Sashay’s mother to review with her brother. They agreed that if the websites, which featured education on the dangers of second-hand smoke, did not serve as a catalyst for her brother’s behavior to change, then he would need to attend a meeting with the health educator. Alternately, they discussed him going to meet with a nurse when Sashay went to receive her allergy shots so that he could discuss the dangers of second-hand smoke with this professional.

The health educator met with Sashay and her mother at Sashay’s next visit, which involved her receiving a breathing treatment for her asthma flare-up, because she had a bad cold. At this visit, Sashay discussed her significant fears of the emergency room. She was not at afraid of the breathing treatment or anything that could happen in a doctor’s office visit. She indicted she was very afraid that she might have to go to the ER. After discussing her fears more, the health educator asked Sashay to rate her fears on a scale from one to seven, with one indicating very low fear and seven indicating very high fear. Sashay indicated her fear was a “10” and “way too high” to even be on the scale. After this discussion, the health educator spoke briefly with Sashay’s mother and let her mother know that the intensity of Sashay’s fear could be indicative of a phobia about ER visits. Her mother shared this concern, and the health educator provided referrals, with names and contact information for two local child psychologists, each of whom specialized in treating anxiety in children. Sashay’s mother made an appointment with one of the psychologists. After a review of background information the psychologist indicated that Sashay did appear to have a phobia related to being seen in the ER for medical treatments. A phobia is a very intense fear of an event or object that can result in extreme anxiety or panic as well as avoidance of the feared event or object.

The psychologist recommended treatment with a systematic desensitization procedure to try to reduce Sashay’s fears. The psychologist helped Sashay develop a list of all the things about the ER that she feared. Then, Sashay rated each experience on the list in terms of how much it scared her on a scale from “0,” the lowest level, to “20,” the highest level. The fears were written on note cards and ordered from the lowest to the highest fear. In the meantime, Sashay was learning relaxation—using deep, slow breathing and thinking about going on her favorite vacation. The fear images were paired with relaxation over a series of sessions and slowly Sashay learned to feel relaxed and less afraid when discussing ER visits. After the desensitization procedure had finished, Sashay and her mother made a trip to the ER when Sashay was well. Her mother had called staff there and arranged a visit. Sashay did not appear afraid and did not report fear at this visit. The psychologist reviewed this visit with Sashay’s mother during a subsequent visit. They agreed to stop sessions for the time being, but they planned to renew sessions should Sashay indicate re-experiencing her fears or have significant fears related to going to the ER.

After working with health professionals there was improvement in using her inhaler and reduced fear related to going to the ER. The watchful eye and expertise
of the pediatrician and subsequent referrals added to feelings of well-being and positive functioning for Sashay. Her medical team had plans for continued involvement as needed to help Sashay and her mother as she coped with her asthma.

**Summary**

This chapter reviewed critical information on diagnosing asthma and learning to manage asthma symptoms. In addition information on educational interventions was reviewed. Health educators can play a key role in helping the child and his or her caregivers develop plans to manage the child’s asthma. Written care plans also may facilitate asthma management at school. Key aspects of care plans include written instructions for administration of medications, ideas for reducing or controlling the impact of asthma triggers, and ideas for how to handle an asthma attack (e.g., take medication, sit or lie down and rest, call parent). Informing peers at school about how to help a child with asthma may help the child feel a sense of “belonging” in the school setting. Children with asthma may benefit from being involved in support groups, especially in the weeks and months immediately following diagnosis. These groups can provide critical information on signs of an asthma attack, what to do to manage an asthma attack, how to identify and reduce exposure to allergy triggers, how to use an inhaler, and how to find support at school and other settings where the child is engaged in extracurricular activities.

**Exercises/Review Questions**

1. After reviewing the case study, develop a list of key areas for intervention for health educators.
2. What are your ideas for helping a child referred to you by a physician because he or she is not using the inhaler as needed and also using it incorrectly?
3. If you were asked to design a training session to educate teachers about helping children with asthma, what would be key components of your session? What key educational topics would you address and why?
4. If a child with asthma, who was your client, was having difficulty communicating with a coach about feeling short of breath during a soccer game how could you help?
   (a) What are your ideas for sharing information with the child’s parent?
   (b) If you had a signed release of information form (a written form, which is signed by the child’s parent or legal guardian and permits the health professional to talk with another individual about the child’s case), showed it to the coach, and had parent permission to talk with the coach, what recommendations might you have?
(c) How would you help the child learn to advocate—in order to let others know when he or she was experiencing asthma symptoms (what are your advocacy tips for the child?)

5. Review key websites on asthma management and develop a resource list for parents of children with asthma.

(a) Develop a list of key websites as a parent resource.
(b) Write a paragraph discussing your tips for parents after reviewing the websites provided in your resource list.

Key Concepts

- Reactive airways disease
- Symptoms of an asthma attack
- CARAT—Child Asthma Risk Assessment Tool
- Asthma triggers
- Use of an inhaler
- Adherence
- Side effects of steroids to manage asthma
- Roaring Adventures of Puff Asthma Management Program

References


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