Simran Kahlon, M1  
CNU College of Medicine ‘19

Asthma is the most common chronic condition among children under the age of 18, resulting in almost five million physician visits and more than 200,000 hospitalizations per year. Annually, children between the ages of 5 and 17 in the United States miss approximately 15 million school days due to asthma.

Asthma is a chronic disorder where hyper-responsiveness to allergens and other irritants triggers inflammation and constriction of airways. Despite the lack of a cure, asthma is well-manageable. Short term relief can be achieved via short acting beta-agonists and inhaled corticosteroids, while long-term maintenance medications include corticosteroids, cromolyn, nedocromil, theophylline and long-acting beta agonists. Based on this information, why do so many children continue to be hospitalized and/or miss school days for a disorder that can be effectively treated?

One possibility is that asthma disproportionately affects low-income, minority, and inner city populations. As indicated in the study “Asthma surveillance in the United States. A review of current trends and knowledge gaps,” the rate of asthma among schoolchildren ranges from 6.6% to 11% yet the prevalence of asthma in low-income minority neighborhood children is 12-24%. Asthma accounted for 7.4% of all child and adolescent hospital admissions in 2002, and approximately half of these admissions were billed to Medicaid. African-American children are four times as likely to die from an asthmatic attack than Caucasian children.

Increased incidence among pediatric patients from lower-income communities is attributable to environmental factors, limited accessibility to healthcare providers, and lack of general awareness among parents. Children residing in lower-income neighborhoods have a higher risk of exposure to irritants which exacerbate asthma; this includes secondhand cigarette smoke, mold, cockroaches, dust mites, rats, mice, pets, and air pollution. Unequal access to care creates additional barriers to treatment. Lack of physicians servicing low-income and minority populations leads to longer appointment waiting times and delayed diagnosis. Discrepancies in care also extend to obtaining and properly using pharmaceutical treatments for asthma. Based on a report by The Asthma and Allergy Foundation of America and The National Pharmaceutical Council, “minority children are less likely than white children to use inhaled corticosteroids,” which are the recommended long-term medications to reduce use of emergency care. Additionally, language barriers between physicians and parents may result in improper use of inhalers by children if parents do not understand the importance and toxicity of these treatments.

As future providers of pediatric medical care, it is in the best interest of our patients to practice vigilance of asthmatic symptoms while addressing the social factors of disease. Treatment efforts should extend beyond simply medicating the disease to include educating parents of risk factors and stressing proper use of asthma medications.


The Ethos of Pediatrics

Pediatric practice is an elusive and amorphous science. The characteristics of a good pediatrician transcends the objective and thus must rely, at times, on interpretive assessments and even ‘gut feelings’ more so than the average physician. The unique and most glaring aspect of this field of medicine is that many of the patients are unable to accurately provide a history. Further, even information gleaned from a parent or guardian could be inaccurate even purposefully false. Yet, as pediatricians, our voice becomes the voice of our patients. What we accurately deem is in the best interest of our patients must be acted upon. What creates a dire conundrum is the potential for being wrong. What if our treatment is incorrect? What if our inaccuracy causally induces morbidity or worse results in mortality? The dilemma, in many ways, defines what it takes to be a pediatrician. To help and heal those in our community that are most in need has a powerful effect on a physician’s psyche. It epitomizes the essence of the Hippocratic oath, and furthers the integral need of our society for its healers.

In the end I derived no satisfaction from being right about what was best for this patient. I would have lived with any consequences from my refusal to adhere to established protocol. The Ethics of Pediatrics is what any physicians wishes to define. In my case, I wish to sleep content and without any regrets.

Dr. R. Khaira  
M.D., M.P.H., F.A.A.P.
Tetralogy of Fallot: The Baby Blues

Spencer Salazar, M1
CNU College of Medicine '19

Congenital heart disease (CHD) is often divided into two categories: pathologies that cause cyanosis and those that do not cause cyanosis. Cyanosis results when deoxygenated blood enters systemic circulation, circumventing the lungs. One would think that an atral septal defect or ventricular septal defect can cause this, however the higher pressure in the left heart versus the right heart will usually not lead to cyanosis. Cyanosis can occur in a scenario where there is a VSD and an abnormally elevated right heart pressure. This occurs in Tetralogy of Fallot, one of the more common pediatric congenital heart defects occurring in about 3 of every 10,000 live births.

“Tetra” means four and, appropriately, there are four components to Tetralogy of Fallot: a ventricular septal defect, an overriding aorta, pulmonic stenosis and right ventricular hypertrophy (which is secondary to pulmonic stenosis). Right ventricular hypertrophy can often be visualized on an x-ray as the “boot sign” in which the heart looks like a boot. What is meant by an overriding aorta is the fact that the aorta becomes more of a central structure residing directly over the ventricular septal defect and is able to receive blood from both ventricles of the heart. As a result of the stenotic pulmonary artery, deoxygenated blood flows from the right heart to the left heart via the ventricular septal defect instead of the pulmonary artery. Once in the left heart, this deoxygenated blood becomes mixed with oxygenated blood supply which continues through the aorta to the systemic circulation. This mixing is what causes the cyanosis.

Infants require increased blood flow to systemic circulation when they are breast feeding and/or exerting themselves. The areas of systemic circulation where there is increased demand will undergo arterial dilatation which decreases the resistance in the systemic circulation. This results in more blood being shunted from the right to the left in the heart leading to increased cyanosis. This is one of the proposed mechanisms for a hyper-cyanotic episode in what is called a “Tet spell.” A child who is older in age may try to relieve "Tet spells" by simply squatting. Squatting increases systemic resistance resulting in increased left-sided pressure which then shunts more blood back to the right allowing it to go through the pulmonary system to become oxygenated. This will often correct the “Tet spell” episode.

Hyper-cyanotic episodes, or “Tet Spells,” are a pediatric emergency and need to be resolved as soon as possible. The main goals of managing these hyper-cyanotic spells, as discussed earlier, is to re-establish sufficient balance between the systemic and pulmonary blood flows. Standard treatment is surgical, and it involves patching shut the VSD and widening the pulmonary outflow tract.

As initial treatment, we have the patient's parents place their child's knees to the chest in an attempt to increase systemic vascular resistance and promote systemic venous return to the right heart to increase the intra-cardiac shunting to the right heart. It is then advised that the parents contact emergency services immediately. Once the patient has reached the medical care facility, immediate intravenous access is vital to allow administration of fluid to improve right ventricular preload.

In some cases, the pediatric patient will be uncooperative and fussy. Recent studies have suggested that intranasal midazolam may be indicated in these situations to sedate the patient for IV access. Oxygen should also be initiated to decrease peripheral pulmonary vasoconstriction and improve oxygenation once blood flow through the lungs is reestablished. Often, subcutaneous morphine is administered to decrease the release of catecholamines, increasing the period of right ventricular filling by decreasing heart rate. It will also promote relaxation of spasms of the right ventricle infundibulum, which is believed to be one of the possible causes of these hyper-cyanotic episodes. In the case where these steps do not resolve the cyanosis, the child will then need to be paralyzed and intubated with co-administration of phenylephrine to increase systemic vascular resistance.

Episodes like these can be frightening to parents and life-threatening to patients. It is the privilege of physicians to be able to help families through times like these and to get the child safely back home. Currently, about 50% of these cases are caught and often resolved before birth and these techniques continue to improve every day.


Image: http://newborns.stanford.edu/images/perioralcyanosis1.jpg

CNU COM Pediatrics Interest Group 2015-2016

“Thank you CNU Pediatric Society for a fabulous year. I am so grateful for all the help to get a pediatric interest group organized for our school. I look forward to the further opportunities in learning more about the field of pediatrics and preparing for rotations, clerkships, residency, and beyond. Have a great summer and keep up the good work! Viva la Pediatric Society!”

Christopher Phillips
Pediatric Interest Group Co-President

Kirsten Lung
Pediatric Interest Group Co-President

Officer Summer Sendoff:

“As we approach the end of our inaugural year at CNU, I want to express my gratitude to the CNU Pediatric Society for everyone’s continued support in helping to launch this organization from the bottom up. I also want to specifically thank Drs. Khaira & Culler for their guidance and commitment in enhancing our interests in the field of pediatrics. I am excited and looking forward to next year as we gear up for even more learning and service opportunities!”

Kirsten Lung
Pediatric Interest Group Co-President