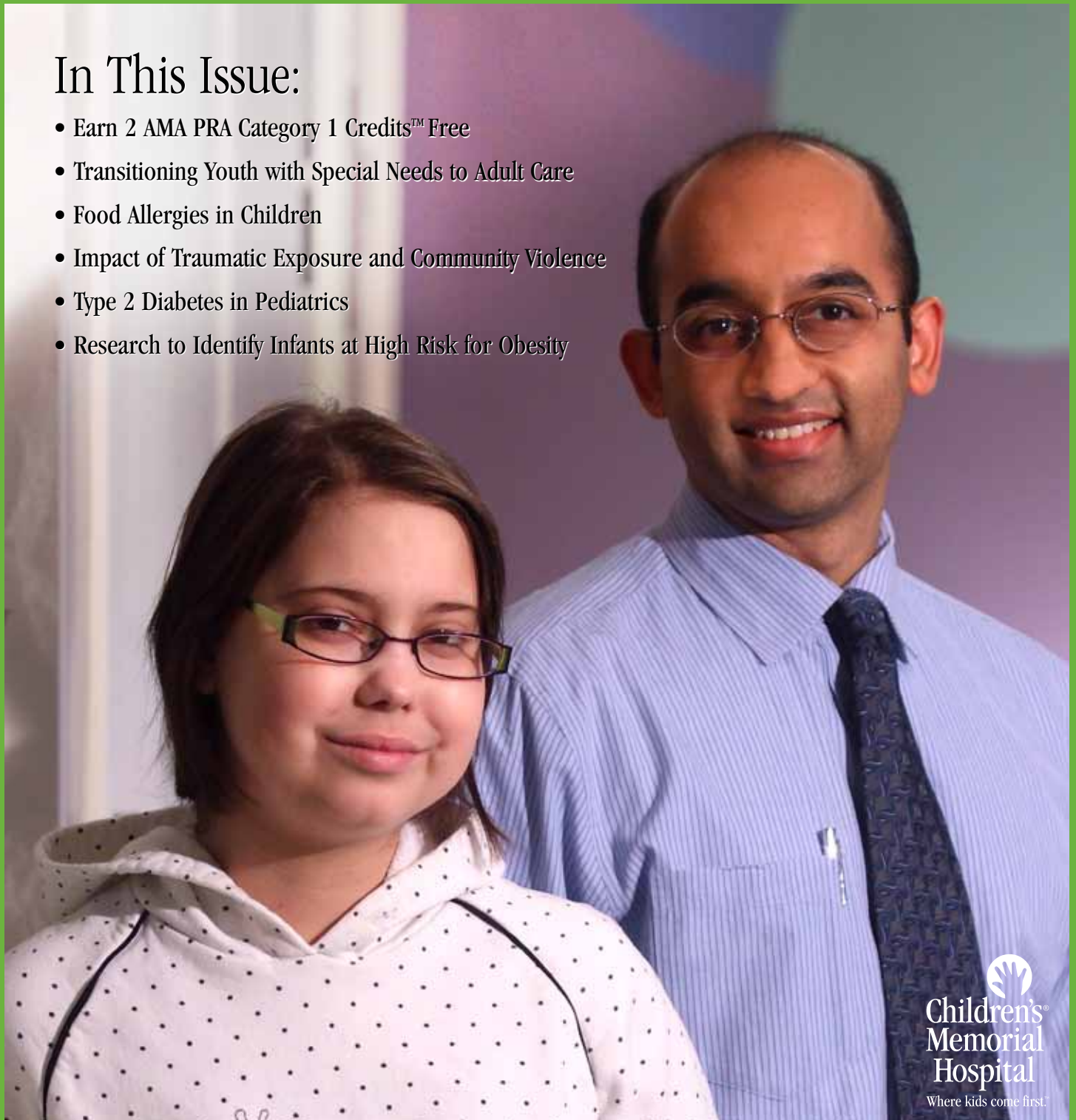



The Child's Doctor

Journal of Children's Memorial Hospital, Chicago

In This Issue:

- Earn 2 AMA PRA Category 1 Credits™ Free
- Transitioning Youth with Special Needs to Adult Care
- Food Allergies in Children
- Impact of Traumatic Exposure and Community Violence
- Type 2 Diabetes in Pediatrics
- Research to Identify Infants at High Risk for Obesity




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On the cover: Parag Shah, MD, MPH, Medical Director, Chronic Illness Transition Program, with 15-year-old patient AJ Williams.

Principal photography by Andrew Campbell; contributing photography by Children's Memorial Hospital Audio-Visual Department

The Child's Doctor

Journal of Children's Memorial Hospital, Chicago

[2] CME: Transitioning Youth with Special Needs to Adult Care

Parag K. Shah, MD, MPH, Medical Director, Chronic Illness Transition Program

Educational Objectives: Describe the challenges faced by youth with chronic conditions entering adult systems of care; discuss the elements of a structured transition program; identify billing options for transition services

[8] CME: Food Allergies in Children

Ruchi S. Gupta, MD, MPH, Attending Physician, General Academic Pediatrics

Educational Objectives: Recognize signs of food allergy and describe appropriate diagnostic evaluation; counsel families on preventing exposure to identified food allergens and correct use of epinephrine; discuss the likelihood of developing tolerance to common food allergens

[13] CME: Type 2 Diabetes in Pediatrics: A Growing Epidemic

Ellen E. Kim, MD, Attending Physician, Endocrinology

Educational Objectives: Screen children at high risk for type 2 diabetes according to established guidelines; intervene with children who have signs of insulin resistance or pre-diabetes to prevent type 2 diabetes; become familiar with treatment for type 2 diabetes and monitor for complications at recommended intervals

[18] CME: Impact of Traumatic Exposure and Community Violence: Incorporating a Trauma Lens into Pediatric Practice

Colleen Cicchetti, PhD, Director, Advocacy and Community-Linked Mental Health Services, Child and Adolescent Psychiatry

Tali Raviv, PhD, Staff Psychologist, Community-Linked Mental Health Services, Child and Adolescent Psychiatry

Educational Objectives: Describe the impact of traumatic exposure upon children across the developmental spectrum; provide anticipatory guidance to parents about potential symptoms, strategies for re-establishing a sense of safety, and techniques for dealing with emotional reactions; access resources for additional information and appropriate referrals

[24] Research: Study to Identify Infants at High Risk for Developing Obesity: Metabolic Programming and the Effects of Maternal Obesity on Neonatal Body Composition

Jami Josefson, MD, Attending Physician, Endocrinology

[26] Selected Abstracts from Children's Memorial Investigators

[28] CME: Dermatology Quiz and Case Discussion

Amal Mehanna, MD, Fellow, Pediatric Dermatology

Sarah Chamlin, MD, Attending Physician, Dermatology

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Transitioning Youth with Special Needs to Adult Care

PARAG K. SHAH, MD, MPH

In the United States, there are currently 13 million children with special needs due to chronic conditions, such as congenital heart disease, cystic fibrosis, spina bifida, and others, and 90% of these children are expected to survive into adulthood.^{1,2} Beyond the ability to survive, the potential for these children to thrive in adulthood has greatly increased as well. New laws and opportunities regarding employment, education, and independent living for medically complex youth have been instrumental in strengthening their ability to live with hope, pride, and dignity. Along with increases in survival and opportunities come the challenges of assuring that these youth are prepared to navigate an adult world not designed for youth with special needs. By implementing a structured transition program in their practice, pediatricians can help adolescents with chronic conditions acquire the necessary skills to manage the various aspects of their care in the adult healthcare systems.

Educational Objectives

At the conclusion of this activity, participants will be able to:

- Describe the challenges faced by youth with chronic conditions entering adult systems of care
- Discuss the elements of a structured transition program
- Identify billing options for transition services

Challenges of transition

Since the late 1980s, there has been an increasing awareness within the medical community of the exponentially growing number of pediatric patients with chronic illnesses who are surviving childhood and entering adulthood, as well as the formidable challenges they face in doing so. In 1989, Surgeon General C. Everett Koop convened a conference labeled “Growing Up and Getting Medical Care,” where he first coined the term “transition,” and addressed the deficiencies in the healthcare system for these youth as they enter adult systems of care.³

As children undergo the process of transitioning to adulthood, they deal with multiple changes in their lives. As they mature, all children are faced with the increased responsibilities required of adulthood, along with physical changes in their bodies and a variety of social pressures. For youth with chronic medical conditions, the responsibilities are greater, and the changes more complex.

One of the major challenges is the cultural change they encounter as they move from pediatric to adult oriented systems of care.

Pediatric healthcare provides family-centered, comprehensive services, generally in a single location, and allows parents to control decisions. In contrast, adult systems provide individual, disease-centered care, leave the responsibility for multidisciplinary management to patients, and assume patient independence in medical decision making.⁴ Furthermore, these youth are often confronted with a loss of insurance and limited access to services and providers. Given all these changes, it is not surprising that many adolescents with chronic illnesses transitioned to adult-centered care experience poor clinical outcomes, increased loss to follow-up, increased hospitalizations, and increased morbidity.

To address these issues, numerous prominent medical associations and disease-specific organizations have developed guidelines for pediatric medical homes to help successfully “transition” pediatric patients into the adult world.^{5,6} Ensuring that youth receive successful transition services is also one of the core outcomes the Maternal and Child Health Bureau listed in the “Healthy People 2010” goals.⁷

Creating a structured transition program

The American Academy of Pediatrics (AAP) has formally defined transition as “the purposeful and planned movement of adolescents and young adults with chronic conditions from child-centered to adult-centered care.”⁵ Current thinking by leading societies and expert opinion revolve around creating a structured transition program to ready young adults for adulthood and the adult care medical setting.⁶ Surveys of adult providers and focus groups of adolescents further support this approach.⁸

A written transition plan should be developed that outlines how the child is to be taught the skills necessary for managing his/her health as an independent adult. The plan should also include discussions of goals regarding education, employment, and independent living, and where the youth will obtain emergent care.⁹ Using a transition checklist can help ensure that pediatricians address all aspects of care, and completion of a checklist could entail “graduation” from the transition program. (See a sample transition checklist in Table 1.)

Transition Program at Children’s Memorial Hospital

The Chronic Illness Transition Program underway at Children’s Memorial Hospital, supported by the Office of Child Advocacy, is working toward optimizing transition outcomes for the special needs populations and continues to make steady progress in this emerging area of pediatric care.



Central to the program’s mission is to help the hospital’s specialty divisions create transition programs; establish a network of adult providers to care for young adult patients; educate community-based groups on healthcare transitioning; and conduct research to enhance knowledge of best practices to prepare children for adulthood.

The program is in the process of developing a series of educational modules that will be publicly available on the internet for hospital-based and community pediatricians. The program also is planning to work with the Illinois Chapter of the American Academy of Pediatrics in testing transition interventions.

The transition program is available for consultation to divisions within the hospital and pediatric clinics in the community on starting transition programs. Additional resources are in development, including informational sheets for families, transition checklists for providers, and medical summary templates.

For further information, please contact Parag Shah, MD, MPH, Medical Director (pshah@childrensmemorial.org), or Rebecca Boudos, LCSW, Transition Program Specialist (rboudos@childrensmemorial.org), or call 773.327.2142.

In the photo: Fifteen-year-old AJ Williams suffers from Wegener disease, which causes inflammation of the blood vessels that restricts blood flow to various organs. AJ has had open heart surgery and is awaiting a kidney transplant. The transition program will help medically complex patients like AJ prepare for the adult healthcare system.

In contrast to pediatric healthcare, adult systems provide individual, disease-centered care, leave the responsibility for multidisciplinary management to patients, and assume patient independence in medical decision making.

Using a transition checklist can help ensure that pediatricians address all aspects of care, and completion of a checklist could entail “graduation” from the transition program.

Table 1		SAMPLE TRANSITION CHECKLIST		
	Age 11-13	Age 14-16	Age 17-18	
Introduce idea of transition	<input type="checkbox"/>			
MEDICAL				
Youth can describe their illness correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Youth can give name, dosage, purpose, and common side effects of medications		<input type="checkbox"/>	<input type="checkbox"/>	
Youth knows where to go for chronic care			<input type="checkbox"/>	
Youth knows where to go for acute care			<input type="checkbox"/>	
Youth has a portable medical summary		<input type="checkbox"/>	<input type="checkbox"/>	
Youth given choice in medical decision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			Youth makes decisions	
SKILLS				
Youth can:				
Name each of their providers and phone numbers		<input type="checkbox"/>	<input type="checkbox"/>	
Make their own appointments		<input type="checkbox"/>	<input type="checkbox"/>	
Fill their own prescriptions		<input type="checkbox"/>	<input type="checkbox"/>	
Present their own medical history to providers		<input type="checkbox"/>	<input type="checkbox"/>	
Present any acute complaints to providers		<input type="checkbox"/>	<input type="checkbox"/>	
Youth is seen alone for part of the visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Youth carries insurance card and copays	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
FINANCIAL				
Youth has plans for health insurance coverage after turning 19			<input type="checkbox"/>	
Family is aware of benefits programs (SSI, SSDI) and special needs trusts			<input type="checkbox"/>	
SOCIAL				
Discussion about confidentiality and consent			<input type="checkbox"/>	
Discussion about education and employment		<input type="checkbox"/>	<input type="checkbox"/>	
Discussion about independent living			<input type="checkbox"/>	
Discussion about transportation		<input type="checkbox"/>	<input type="checkbox"/>	
Discussion about activities of daily living		<input type="checkbox"/>	<input type="checkbox"/>	
Discussion about sexual relationships, pregnancy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Discussion about substance use and how this affects medications and disease course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Adapted from: White P. Destination known: planning the transition of youth with special health care needs to adult health care. Adolescent Health Update Aug 2009;21:3.

It is important to understand that transition is a process that takes place over time, and is not just the event of transferring medical care.⁵ Transitioning will happen regardless of whether a plan exists or not. A successful transition, however, is measured by how the youth fares in adulthood, medically, financially, and socially. The following elements are recommended for all structured transition programs for youths with special needs^{5,6,10-13}:

Start early: Pediatricians should begin to discuss transitioning with patients and families at an earlier age than is commonly believed. Current expert opinions suggest starting transition discussions around age 11 and having a transition care plan by age 14.^{5,14} This sets the stage for a collective partnership between the provider, parents, and child to work on the child's preparation for adult care.

Support new pediatrician/parent/patient dynamics: The changing roles and dynamics between the pediatrician, parent, and patient need to be acknowledged. The pediatrician and parent should gradually move from a director to a consultant role, while the patient should move from recipient to participant to manager role. Pediatricians should begin giving patients new developmentally appropriate responsibilities, such as presenting their own concerns, in the early teenage years.

Educate patients on managing health needs: Pediatricians should help adolescents with chronic conditions learn about their disease and related medications, including the purpose, side effects, and dosage. Furthermore, youth should be taught the necessary skills to manage their healthcare needs, including how to refill prescriptions, make appointments, present themselves to providers, and access chronic and acute medical care.

Create portable medical record summary: This has been cited by adult providers as one of the most desirable components of transition,

and yet is very seldom done by pediatric providers.¹⁵ A portable medical summary should be short and succinct, electronic, and easily updatable. Since families obtain care at various places, the summary should ideally be accessible to the patient. Examples of such summaries and assistance in creating them are available at online sites, including Google Health (www.google.com/health) and Healthy and Ready to Work (www.hrtw.org). A good portable medical summary should contain an active problem list, important historical problems, current medications and significant past medications, devices and equipment needed, care providers for chronic conditions, plans for emergency care, and information about the patient's functional limitations. Many families may not have the means or ability to maintain such a record, however. In these cases, an attempt can be made to provide a family with something they can take to other providers, such as information on a flash drive. At the least, the primary provider can maintain a record summary at the office to be used for any transfer of care that may arise, including transition to adult providers.

Discuss general adolescent issues: Discussion should also occur not only around health issues, but general adolescent issues including sexuality, risk-taking behaviors, substance usage, mental health and depression, sleep hygiene, plans for future education or work, management of finances, consent and confidentiality issues. These are all areas where the young adult will be challenged with increased responsibility and may need guidance and support in developing a plan.

Address health insurance coverage: This remains one of the biggest challenges for young adults. The rate of uninsurance among young adults aged 19-29 is 29%,¹⁶ well above the rate for the rest of the nation, and youth with more severe disabilities may have higher rates than this.¹⁷ Health insurance and disability benefits remain complex and often state driven.

It is important to understand that transition is a process that takes place over time, and is not just the event of transferring medical care.

Pediatricians should discuss and introduce the adult emergency care system, as this may be one of the scariest elements of healthcare for the young adult patients.

Consultation from a social worker or other benefit specialist can be crucial. Public insurance is available for young adults who meet disability and income criteria (less than \$928 per month in 2009). The Health Benefits for Workers with Disabilities program further expands the amount that disabled adults can earn and still qualify for public medical insurance plans. Families with private insurance should contact their insurance company. Many children who remain dependent and are disabled are eligible to remain on parental benefit plans for life. With healthcare reform law, all dependent young adults can remain on parental insurance plans through age 26, effective with plan years beginning September 2010 and after.

Plan prior meetings with adult providers:

If possible, plans to meet the adult providers before the transfer of care occurs can ease and facilitate the transition. Pediatricians or subspecialty providers in tertiary centers can help facilitate this is by conducting joint clinics between the pediatric and adult specialty centers, having someone from the pediatric staff go with patients to their first appointments with adult providers, or creating a video introduction to the adult facility that can be viewed from the pediatric office. Pediatricians in the community may not be in a position to offer these services, but may be able to continue to provide care as the young adult starts meeting with adult providers until the patient is comfortable with the new physician, emphasizing again that transition is a process, not an event. Also, pediatricians should discuss and introduce the adult emergency care system, as this may be one of the scariest elements of healthcare for the young adult patients.

Billing for transition services

Currently, less than one-third of pediatricians report providing many of these transition services. Lack of time and reimbursement for transition services remains a significant barrier to providing care. Billing options, while limited,

do exist. Services provided by physicians or advanced practice nurses (APNs) may be billed using standard evaluation and management (E/M) codes (99201-215) or consultation codes (99241-245). Each code is associated with a typical time. Time criteria can be applied to determine the appropriate E/M level for the visit when counseling represents greater than 50% of the face-to-face time for the visit (which is common when providing transition services). Furthermore, if a consultation is done as part of the visit resulting in a long visit, prolonged services codes can be employed (99354-99355). These service codes can be used if the physician spends 30 minutes beyond the time listed for the highest E/M code in that category (99205, 99215, 99245). The key aspect to billing these services is to document the specific counseling delivered and the exact time in the note. Other codes to consider are care plan development and oversight (99339-99340), team conference (99366, 99368), group counseling visits (99411-99412), and prevention and education counseling (99401-99404).

Conclusion

As more and more youth with complex chronic conditions survive into adulthood, it becomes the responsibility of the healthcare system to fully prepare these youth for the adult world. Young adults not prepared are more likely to have poor health outcomes. A structured transition program may help improve these outcomes. Such a program should involve creation of a portable medical summary, development of skills necessary to independently care for one's own health, as well as discussions around high risk behaviors, consent and confidentiality, employment, educational, and financial planning, and procurement of health insurance. By providing these transition services according to a structured plan, pediatricians can significantly help their patients with special needs thrive in adulthood.

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Food Allergies in Children

RUCHI S. GUPTA, MD, MPH

With food allergies on the rise, primary care pediatricians increasingly are faced with the challenges of recognition and care of children with this life-threatening condition. Since diagnostic testing for food allergies can be confusing, families would benefit from a clear explanation from their pediatrician about what to expect and what the results mean for their children. After food allergens are identified, avoidance of these allergens and prompt response to the signs of accidental exposure are the only means to defend against the potentially fatal food-induced anaphylaxis. By providing critical guidance on preventing exposure and the correct use of epinephrine, pediatricians play a key role in helping families effectively protect children with food allergies.

Educational Objectives

At the conclusion of this activity, participants will be able to:

- Recognize signs of food allergy and describe appropriate diagnostic evaluation
- Counsel families on preventing exposure to identified food allergens and correct use of epinephrine
- Discuss the likelihood of developing tolerance to common food allergens

Common food allergies

Food allergies are most often mediated by IgE-induced immunologic mechanisms that cause immediate (ie, within minutes to a few hours) hypersensitivity reactions from urticaria to anaphylaxis. Other types of allergies are also immunologic, but not mediated by IgE. This article will focus specifically on IgE-mediated food allergies.

Food allergies most frequently occur in the first 3 years of life. The most common food allergies in children are milk, egg, and peanut. Adults, on the other hand, are most commonly allergic to shellfish, peanut, and tree nut. This difference reflects the fact that over 75% children outgrow their milk allergy by 5 years of age and egg allergy by 7 years of age. Recent studies, however, suggest that tolerance to milk and egg develops much later for most children. Only 22% of children at most will develop tolerance to peanuts and less than 10% of patients will outgrow tree nut allergy. Recurrence of peanut allergy is also a risk, found in children who eat peanuts infrequently.

In addition to outgrowing milk and egg allergies, most children will develop tolerance to soy and wheat. Allergies to peanut, tree nut, shellfish, fish and fruits are generally lifelong.

Signs of food allergy

The skin and gastrointestinal tract are most commonly affected by food allergy. Skin manifestations may include pruritus, flushing, rash and urticaria. Acute urticaria may occur after ingestion of a food allergen, whereas chronic urticaria is rarely related to food allergy. Food allergy testing usually is not indicated for chronic urticaria, since most cases are idiopathic.

Up to 35% of children with atopic dermatitis may have food allergy as an underlying trigger. Infants and children with moderate to severe atopic dermatitis, particularly dermatitis refractory to appropriate medical treatment, should be considered for a food allergy evaluation. A history of exacerbation after eating specific foods also might indicate food allergies, but since the reaction is typically delayed, such history is unusual. If food allergy is diagnosed, atopic dermatitis often improves after dietary elimination of that particular food.

Other signs and symptoms of food allergy may include periorbital edema, respiratory symptoms (throat tightness, coughing, wheezing, chest tightness, stridor, etc), gastrointestinal symptoms (oral pruritis, tongue swelling, abdominal cramps, nausea, vomiting, diarrhea), and cardiovascular symptoms (light-headedness,

syncope, hypotension). Any or all symptoms could occur, depending on the food allergen, the child's sensitivity or threshold for reaction, and the quantity consumed.

Food induced anaphylaxis may be life-threatening. Common symptoms of anaphylaxis include dyspnea, urticaria, angioedema, flushing, pruritus, gastrointestinal symptoms, syncope, and hypotension. Cutaneous symptoms are the most common and occur in over 90% of reported cases, but are less common in cases of fatal anaphylaxis. Signs of anaphylaxis typically occur within seconds to minutes after exposure to the allergen, although, rarely, symptoms may occur a few hours later. A late phase reaction may also occur several hours after the initial reaction.

Isolated nasal symptoms related to food allergy are unusual. Multiple nasopharyngeal symptoms may occur with food allergy, including acute rhinitis, but the rhinitis is typically associated with other oropharyngeal symptoms, such as pruritus of the throat and angioedema. Chronic rhinitis, however, is not a manifestation of food allergy.

Diagnostic testing

Food allergy evaluation should begin with a careful medical history. Questions should focus not only on the suspected food, but all foods that were eaten prior to the reaction; the nature of the symptoms; the timing of the reaction with regard to ingestion; and the response to treatment. It is also important to ascertain whether the reaction occurs with each exposure to the suspected food.

If the history suggests an IgE-mediated process, then testing is indicated. Appropriate initial tests for food allergy are serum specific IgE (sIgE) tests, which detect IgE to specific food allergens, or skin prick tests (SPT), which involve introduction of allergen extracts into the skin and measuring the wheal size.

The diagnosis of food allergy is established through clinical history, evidence of sIgE and, depending upon the scenario, an oral food challenge. SPT and sIgE tests provide evidence of sensitization and help determine if/when an oral challenge is appropriate. In situations for which the history is quite clear, such as onset of anaphylaxis within minutes of peanut ingestion with supportive evidence of sIgE to peanut, an oral food challenge is usually not necessary.

Patients may benefit from an oral food challenge if they have borderline SPT or sIgE test results, or if a false positive or false negative result is suspected based on clinical history. Oral food challenges may prevent unjustified food elimination from the diet.

A double-blind, placebo-controlled oral food challenge is the gold standard for diagnosis of food allergy, although open (non-blinded) challenges are generally used in most clinical settings. The patient is given gradually increasing amounts of the suspected food allergen over time. The process usually takes 3-4 hours and requires close physician supervision during the test and for an hour after the test. If the child experiences a severe reaction during the food challenge, a longer observation time is needed.

Testing for specific food allergens must be guided by clinical history, as opposed to testing for all food allergens haphazardly. If a child is already consuming a food without experiencing a clinical reaction, SPT and sIgE testing for that food is not warranted.

Prior to SPT, antihistamines should be discontinued. Generally, the first generation antihistamines are stopped at least 48 hours prior to SPT and second generation antihistamines about 1 week before SPT. In patients with extensive eczema or dermatographia, SPT cannot be performed. The sIgE tests can be used in these cases as the initial test. Antihistamines do not need to be stopped before the sIgE testing.

Testing for specific food allergens must be guided by clinical history, as opposed to testing for all food allergens haphazardly.

Interpreting SPT and sIgE test results

In SPT, a positive reaction is defined as a wheal at least 3 mm greater than the negative control. The negative predictive value of SPT is >95%, while the positive predictive value is <50%; therefore, there are many false positive results. The negative results, however, usually reliably identify foods that are safe for the child to eat.

Whether positive SPT results need to be confirmed through sIgE tests or a food challenge depends entirely on the clinical history and the size of the wheal. Positive SPT results are reliable when a large wheal is correlated with the clinical history. For example, a child who within minutes of eating peanuts developed urticaria and angioedema, and who has a positive skin test with a large wheal of 8 mm, does not need a confirmatory sIgE test and definitely does not need a food challenge. In this case, the only reason to get the sIgE test is for a baseline that can be followed every year or so to help predict the likelihood of outgrowing the food allergen. On the other hand, in a child with atopic dermatitis, who has a positive skin test to a food, but did not have a clear history of a reaction, the sIgE test would help to decide whether to perform a food challenge.

For the most part, SPT and sIgE should not be obtained without history of an adverse reaction or moderate to severe atopic dermatitis, as previously stated. If a child tests positive on SPT or sIgE test for a regularly consumed food that does not produce an allergic reaction, it is important to stress to the caregiver that the food continue to be consumed on a regular basis. Because testing indicates that the child is sensitized to the allergen, a prolonged absence of the food from the diet could lead to clinical symptoms upon re-exposure.

Patients with large wheals from SPT or high sIgE values are likely to have allergy to those foods. The cutoff value in the sIgE testing is the concentration of sIgE for a particular food allergen that is 90% predictive of a clinical reaction to the food. For certain foods, cutoff values associated with a high likelihood for a reaction have been published. (See Table 1.) The cutoff values for the wheal diameter and sIgE are different for each food and depend on the age of the child.

Higher levels of sIgE and larger wheal responses to SPT correlate with an increased likelihood of clinical food allergy, but not with the food reaction severity. The severity of a food allergy reaction is unpredictable, and even typically mild reactions to certain foods still pose a risk of anaphylaxis.

Testing for tolerance development

Follow-up testing to evaluate potential development of tolerance is reasonable every 1 to 2 years, depending on the food allergen and the clinical history. Since allergies to peanuts, tree nuts and seafood are less likely to be outgrown, testing for these allergens can be repeated less frequently. Also, if a child reacts to peanuts on accidental exposure 2 years after the last sIgE test to peanuts, for example, there is no need to repeat the test at that time.

Counseling families on preventing exposure

Pediatricians can help families of children with food allergies prevent accidental ingestion by pointing out related foods that also must be avoided. For example, patients with milk allergy also cannot eat yogurt, cheeses, butter, or any product that has milk as an ingredient. The importance of carefully checking ingredient lists of all packaged foods must be stressed, since food antigens may not be apparent in foods such as cookies, cakes or candy. Parents also need to be made aware of non-edible products, such as Play-Doh, toothpaste, or lotions, which may contain allergenic food ingredients and place a child at risk for a dangerous reaction.

Table 1		
TEST RESULTS HIGHLY PREDICTIVE OF FOOD ALLERGY		
Food	SPT	sIgE
Egg	≥7 mm	≥7 kU/L
Egg (child ≤ 2 yrs)	≥5 mm	≥2 kU/L
Cow's milk	≥8 mm	≥15 kU/L
Cow's milk (child ≤ 2 yrs)	≥6 mm	≥5 kU/L
Peanut	≥8 mm	≥14 kU/L
Peanut (child ≤ 2 yrs)	≥4 mm	Not established
Fish	Not established	≥20 kU/L

Sources:
American College of Allergy, Asthma, & Immunology. Food allergy: a practice parameter. Ann Allergy Asthma Immunol 2006;96(3 suppl 2):S1-S68.

Hill DJ, Heine RG, Hosking CS. The diagnostic value of skin prick testing in children with food allergy. Pediatr Allergy Immunol 2004;15:435-441.

The need to avoid foods that might have been cross-contaminated with relevant food allergens during processing, packaging or preparation is another big issue to emphasize to families. Even trace amounts of the food allergen during handling can induce anaphylaxis. Parents of children with allergies to nuts must be particularly vigilant, since many food products that do not contain nuts may have been processed on equipment that was used with nuts.

To prevent cross-contamination at home, separate dishes, utensils, cutting boards, pots and pans should be used if other family members continue to eat foods to which the child is allergic. Similarly, families must be particularly cautious with restaurant food, since even dishes without food allergen ingredients may have been cross-contaminated with those allergens in the kitchen. It is noteworthy that most accidental food reactions occur away from home.

While at school and elsewhere, children should be instructed not to share or trade food with others and to notify adults if they eat something that may contain the food to which they are allergic. Since it can be difficult to determine if foods cooked by someone else are safe for a food-allergic child, it is best to bring foods the child can eat to a birthday party or other social gatherings.

For online resources that offer helpful information and support for families of children with food allergies, see Table 2.

Use of epinephrine

Epinephrine is the primary treatment for anaphylaxis and should be given at the first sign of anaphylaxis. Two epinephrine auto-injectors need to be available at all locations in which a child with food allergies spends an extensive amount of time (eg, home, daycare, school) since a second injection may be required during anaphylaxis before the child reaches the hospital.

Demonstration of the epinephrine auto-injector and written instructions on its use should be provided to the family. Pediatricians also should discuss and provide a written anaphylaxis emergency action plan to the family. In addition, personnel at the child's daycare or school will need clear instructions on the signs of anaphylaxis, epinephrine use and the emergency action plan. On its website, the Food Allergy and Anaphylaxis Network (FAAN) offers a good emergency action plan that includes instructions on epinephrine use and is available in different languages. The document can be downloaded as a PDF file and distributed freely to patients. See www.foodallergy.org/page/food-allergy-action-plan1. All patients with food allergy should wear a MedicAlert bracelet listing the foods that cause allergic reactions.

Table 2

ONLINE FOOD ALLERGY RESOURCES FOR FAMILIES

Food Allergy and Anaphylaxis Network (FAAN)
<http://www.foodallergy.org>

Food Allergy Initiative
www.foodallergyinitiative.org

Illinois Food Allergy Education Association
www.illinoisfaea.org

Mothers of Children Having Allergies
www.mochallenges.org

After a dose of epinephrine is given, the child should be taken to the closest hospital even if the symptoms have resolved, as they may recur. Parents should be advised that a child with signs of anaphylaxis needs observation in a healthcare setting for at least 4-6 hours.

Epinephrine acts by decreasing vasodilation, edema, and bronchoconstriction. In addition, it suppresses the release of inflammatory mediators from mast cells and basophils. Antihistamines may control urticaria or other symptoms of anaphylaxis, but their use should not be substituted for intramuscular epinephrine. Diphenhydramine and cetirizine can be used in addition to epinephrine, but both medications have a slower onset of action and they do not adequately treat all the underlying mechanisms of anaphylaxis. They should never be used alone for the treatment of anaphylaxis. Corticosteroids are used mainly to control the late phase of anaphylaxis to prevent a rebound in symptoms if the reaction is biphasic. Ranitidine, an H2 antagonist, can have some useful effect, as approximately 15 percent of cutaneous histamine receptors are H2.

Epinephrine should be given intramuscularly in the thigh, as evidence shows more rapid absorption and higher plasma epinephrine levels, compared to subcutaneous injections or intramuscular injections in the upper arm. The new food allergy guidelines that are expected to be released in the fall of 2010 by the National Institute of Allergy and Infectious Diseases (NIAID) recommend the following dosage of 1:1000 epinephrine:

- 0.15 mg for children weighing 10-25 kg (22-55 lbs)
- 0.3 mg for anyone over 25 kg (55 lbs)

Since epinephrine auto-injectors only come in these 2 dosages, the lower dosage is given to children weighing less than 10 kg.

Of note, persons with asthma and food allergies are at higher risk for fatal food-induced anaphylactic reactions. Delayed epinephrine administration is also a risk factor for a fatal outcome. Teenagers with food allergies also are at higher risk for fatal anaphylaxis compared to younger children. Studies have shown that adolescents have poor understanding of when food allergy reactions are severe and when to use epinephrine. In addition, 54% of adolescents admit to intentionally eating potentially unsafe food.

Promising immunotherapy research

There is emerging evidence to suggest that regular ingestion of cooked egg in baked products by egg-allergic children or ingestion of extensively heated milk by milk-allergic children may increase the development of tolerance to these foods. However, without an oral challenge, currently there is no defined method to identify egg/milk-allergic children who would be able to safely consume products with baked egg or heated milk.

Researchers are working on various tests to identify specific protein antigens within allergenic foods (eg, heated milk proteins), which may help predict if a child is going to outgrow the allergen, but these tests are not yet available for clinical use. At this time therefore, strict avoidance of egg and milk allergens is advised until the child has consulted with an allergist.

Other research has been investigating whether tolerance to egg can be induced by a daily dose of egg white solid as oral immunotherapy, with encouraging results. This approach is not recommended for widespread use as studies have yet to determine the right dose, interval, and duration of immunotherapy, as well as the underlying mechanisms that produce tolerance in some patients.

Trials of subcutaneous allergen immunotherapy to many foods had an unacceptably high rate of systemic reactions. However, preliminary studies of oral immunotherapy with peanuts have been very promising. Children who have successfully completed an oral desensitization procedure went from having clinical symptoms with exposure to 1 peanut to tolerating approximately 14 peanuts without suffering an adverse reaction.

Conclusion

Ongoing immunotherapy research offers substantial hope for a viable treatment option for children with food allergies. Until effective treatments are established, however, families of children with food allergies need clear guidance on how to prevent accidental exposure to allergens, recognize symptoms of anaphylaxis, and respond appropriately. Since most children will outgrow their allergies to milk, egg, soy and wheat, follow-up testing will help monitor the development of tolerance and indicate when these foods can be safely reintroduced into the child's diet. Re-testing for allergens that are less likely to be outgrown can be performed less frequently and in accordance with clinical history.

FOR FURTHER READING

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Type 2 Diabetes in Pediatrics: A Growing Epidemic

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Concurrent with the dramatic rise of obesity, pediatricians are diagnosing type 2 diabetes mellitus (T2DM) more and more frequently in children and adolescents. Whereas T2DM occurred only in adults prior to the 1990s, the Centers for Disease Control and Prevention has estimated that 1 in 3 children born in 2000 will develop this condition. Lifestyle changes, however, can prevent T2DM in high-risk children and in patients whose elevated blood glucose levels are at pre-diabetes stage. In addition to timely intervention to prevent development of T2DM, pediatricians need to be well prepared to screen for T2DM and monitor for complications.

Background and epidemiology

Diabetes mellitus is characterized by elevation of blood glucose levels and can lead to increased risks for a host of medical disorders causing increased morbidity and mortality, including heart disease, stroke, peripheral neuropathy, renal disease, and blindness. Diabetes can be divided into 2 principal forms, type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM).

T1DM is caused by autoimmune destruction of pancreatic beta-cells leading to insulin deficiency and requiring exogenous insulin for survival. T1DM occurs most often in children and adolescents. T2DM is characterized by insulin resistance and/or abnormal insulin secretion typically associated with obesity, and exogenous insulin may eventually be required if oral hypoglycemic treatments and lifestyle interventions do not achieve adequate glucose control. The etiology of T2DM is multifactorial and rooted in genetic and environmental factors including obesity, family history of T2DM, and ethnic background.

The increasing prevalence of T2DM in pediatrics parallels the rise in obesity. Data from the 2005-2006 National Health and Nutrition Examination Survey (NHANES) showed that an estimated 16% to 17% of children aged

2-19 years had a body mass index (BMI) >95th percentile (for age and sex-specific BMI), doubling the prevalence 20 years ago.¹ The SEARCH for Diabetes in Youth study, using data from 2002-2003, reported that among children and adolescents over 10 years of age who were newly diagnosed with diabetes, T2DM was becoming more common, especially in minority populations – 14.9% in non-Hispanic whites, 46.1% in Hispanics, 57.8% in African Americans, 69.7% in Asian/Pacific Islanders, and 86.2% in American Indians.² The same study showed that T2DM is rare in children under 10 years of age, regardless of ethnic background.

Pathophysiology

Preceding the development of T2DM, insulin resistance and impaired beta-cell function occur. Insulin resistance is strongly associated with obesity, and initially the pancreatic beta-cells compensate by increasing insulin secretion. Over time, failure of the pancreatic beta-cell and insufficient insulin secretion result in the transition from insulin resistance to impaired glucose tolerance or impaired fasting glucose (pre-diabetes), and then to diabetes.³ There are no large-scale studies regarding the natural history of progression to T2DM in youth, but given the relatively short duration of progression

Educational Objectives

At the conclusion of this activity, participants will be able to:

- Screen children at high risk for type 2 diabetes according to established guidelines
- Intervene with children who have signs of insulin resistance or pre-diabetes to prevent type 2 diabetes
- Become familiar with treatment for type 2 diabetes and monitor for complications at recommended intervals

to T2DM, the degree of impairment in insulin secretion has been postulated to be more severe in youth compared to that in adults.⁴

Identifying high-risk children for screening

To help focus clinical decision-making in a timely manner, the American Diabetes Association (ADA) and American Academy of Pediatrics (AAP) developed testing criteria aimed at screening high-risk children for T2DM.⁵ The major criteria for performing screening are obesity in addition to 2 other risk factors (see Table 1). Screening children at high risk for T2DM should start at 10 years of age or at onset of puberty, if puberty occurs earlier, and should be performed every 2 years.

Screening and diagnosis

The ADA criteria for the diagnosis of T2DM (see Table 2) is the same for children and adults, and is based on fasting blood glucose, random blood glucose, or oral glucose tolerance testing (OGTT), which measures plasma glucose 2 hours after glucose ingestion.⁶ The ADA recommends screening with a fasting plasma glucose, which is more convenient than OGTT. Of note, the World Health Organization recommends an OGTT as there are data showing that children with impaired glucose tolerance can still have normal fasting plasma glucose,^{7,8} although large-scale studies are still needed to fully assess the progression of T2DM in children.

Pre-diabetes refers to elevated glucose levels that have not yet reached a diabetes range and includes impaired fasting glucose and impaired glucose tolerance. Impaired fasting glucose is

defined as a fasting plasma glucose of 100-125 mg/dl and impaired glucose tolerance is defined as a 2-hour plasma glucose as part of an OGTT of 140-199 mg/dl. Plasma glucoses in the diabetes range are ≥ 126 mg/dl for fasting plasma glucose and ≥ 200 mg/dl for OGTT 2-hour plasma glucose. Random plasma glucose levels of ≥ 200 mg/dl at any time are considered to be consistent with diabetes.

In the past, classification of diabetes as T1DM or T2DM could be made reliably based on clinical presentation. Clinical signs of obesity, signs and symptoms of insulin resistance (especially acanthosis nigricans), and elevated C-peptide levels were helpful in differentiating T2DM from T1DM.⁹ However, with the increasing prevalence of obesity in children, including in children presenting with T1DM, it is becoming more difficult to distinguish between the diabetes types. Antibody testing to detect markers of cellular-mediated immune destruction of pancreatic beta-cells can typically identify T1DM.

Intervening at insulin resistance or pre-diabetes stage

Currently there are no medications approved by the FDA to treat insulin resistance or pre-diabetes to prevent T2DM. The Diabetes Prevention Program (DPP), a major multi-center research study and other large studies in adults have shown that people with insulin resistance or pre-diabetes can prevent or delay diabetes with lifestyle changes, including increased physical activity and nutritional modifications necessary to treat obesity, which is at the heart of the underlying problem. The DPP showed that decrease in body weight by 5% to 7% with lifestyle interventions alone prevented or delayed diabetes by nearly 60%.¹⁰

<div style="background-color: black; color: white; padding: 5px; display: inline-block;">Table 1</div> SCREENING GUIDELINES FOR TYPE 2 DIABETES IN CHILDREN AND ADOLESCENTS		
<p>Major criteria:</p> <ul style="list-style-type: none"> • Overweight (BMI 85th-94th percentile for age and gender) OR • Obese (BMI >95th percentile for age and gender) OR • Weight for height >85th percentile OR • Weight >120% of ideal for height 	<p>PLUS</p>	<p>2 of the following risk factors:</p> <ul style="list-style-type: none"> • Family history of T2DM in 1st or 2nd degree relative • Ethnic background: <ul style="list-style-type: none"> - American Indian - African-American - Asian/Pacific Islander - Hispanic/Latino • Signs of insulin resistance: <ul style="list-style-type: none"> - Acanthosis nigricans - Hypertension - Dyslipidemia - Polycystic ovary syndrome

Table 2 ADA CRITERIA FOR PRE-DIABETES AND DIABETES				
Plasma glucose	Normal	Impaired fasting glucose	Impaired glucose tolerance	Diabetes
Fasting glucose	<100 mg/dl	100-125 mg/dl	N/A	≥126 mg/dl
OGTT 2-hour glucose	<140 mg/dl	N/A	140-199 mg/dl	≥200 mg/dl
Random glucose				≥200 mg/dl

Several drugs have been shown to reduce diabetes risk in adults to varying degrees. There are ongoing studies in adolescents to clarify the potential benefits of pharmacotherapy in preventing T2DM. The first therapy, however, should always be lifestyle modifications, since weight loss and physical activity can be more effective than medication at reducing diabetes risk.

Treatment

Management of children with T2DM is a collaborative effort among pediatric endocrinologists, diabetes nurse educators, pediatricians, nutritionists, physical education instructors, behavioral specialists, and the family. Treatment needs to be individualized, since there is no single formula that is successful for all children and families with T2DM.

If nutrition management and increased physical activity are not sufficient to maintain near-normal blood glucose levels, medication and/or insulin are used. The ultimate goal is to minimize acute and chronic complications associated with T2DM, such as atherosclerotic disease, which is the major cause of mortality and morbidity in adults with T2DM and has its origins in childhood.¹¹

A major difficulty in treatment and management lies in the limited availability of pharmacologic options and long-term studies. Other than insulin, metformin is the only drug that is approved in the US by the Food and Drug Administration for pediatric patients with T2DM.

Metformin actions include inhibition of endogenous hepatic glucose production, inhibition of gastrointestinal carbohydrate absorption, and enhanced insulin-stimulated glucose uptake in peripheral tissues.¹² Metformin can also cause a modest amount of weight loss in overweight patients with T2DM, improve

dyslipidemia,¹³ and decrease transaminases in patients with non-alcoholic steatohepatitis.¹⁴ It cannot be used in patients with renal disease, hepatic or cardiopulmonary insufficiency. Metformin also cannot be used with radiographic contrast agents, as lactic acidosis may be precipitated. The most common side effect of metformin is mild gastrointestinal discomfort.

Currently there are no national recommendations for treatment goals in children with T2DM. Treatment goals for children with T1DM have been generally applied. There are also no specific recommendations regarding initiation of insulin therapy, but insulin is generally regarded as necessary at diagnosis if there is evidence of ketoacidosis, or, if after 3-6 months of metformin and lifestyle changes, fasting glucose remains ≥126 mg/dl or Hb A1c remains significantly elevated.

Although no other oral hypoglycemic medications have approval for pediatric use, rosiglitazone, an insulin sensitizer in the class of thiazolidinedione drugs, has been studied. In one study of 195 children who were obese and diagnosed with T2DM, participants were randomized to rosiglitazone (maximum dose of 4 mg twice daily) or metformin (maximum dose of 1000 mg twice daily). The study continued for 24 weeks and the reduction in Hb A1c from baseline was statistically significant in both groups, but not statistically significant between the 2 groups. Of particular note, the rosiglitazone group gained 3 kg on average.¹⁵

Another recent study in children involved glimepiride, a sulfonylurea-type drug. These medications increase insulin secretion and are a mainstay of treatment of T2DM in adults. The study compared metformin and glimepiride in 263 children with T2DM and obesity and showed no statistically significant difference in Hb A1c reduction between the 2 groups. However, weight gain seen with glimepiride was higher than with metformin.¹⁶

The ultimate goal is to minimize acute and chronic complications associated with T2DM, such as atherosclerotic disease, which is the major cause of mortality and morbidity in adults with T2DM and has its origins in childhood.

Table 3 RECOMMENDATIONS FOR MONITORING COMPLICATIONS OF TYPE 2 DIABETES

Annual screening	Monitoring goals	
<ul style="list-style-type: none"> • Random spot urine for microalbumin-to-creatinine ratio • Ophthalmologic exam • Fasting lipid panel 	Glycemia	Hb A1c at each visit Hb A1c target <7.5% (ages 13-19) Fasting glucose <126 mg/dl
	Lipid disorders	LDL <100 mg/dl TG <150 mg/dl HDL >35 mg/dl
	Hypertension	Blood pressure check at each visit Diagnose and treat if ≥95th percentile for age, sex, height

Monitoring complications

The following recommendations (see Table 3) are drawn from ADA’s Standards of Medical Care.

Retinopathy. In T2DM, initial ophthalmologic examination is recommended after diagnosis and annually thereafter.

Nephropathy. Microalbuminuria has been found to be present at diagnosis of T2DM in children. Screening for microalbuminuria with random spot urine for microalbumin-to-creatinine ratio should occur at diagnosis and annually thereafter. Persistent microalbuminuria should be treated with an ACE (angiotensin-converting enzyme) inhibitor.

Lipid disorders. Fasting lipid panel should be checked after glucose control has been established, then yearly thereafter. Treatment goals include LDL cholesterol <100 mg/dl, HDL cholesterol >35 mg/dl, and triglyceride levels <150 mg/dl. If LDL is >100 mg/dl, treatment should include an exercise plan and a diet limiting fats to <30% of daily total calories (based on 2006 American Heart Association Diet and Lifestyle Recommendations).

After 6 months of diet and exercise, if LDL remains >160 mg/dl, lipid-lowering agents are recommended; if LDL is 130-160 mg/dl at that time, then medication should be considered. Currently there are 4 different statins approved for use in pediatrics (simvastatin, lovastatin, atorvastatin, and pravastatin).

Hypertension. Hypertension is defined as systolic or diastolic blood pressure above the 95th percentile for age, sex, and height. Lifestyle modifications should be initiated, but if hypertension does not improve, ACE inhibitors are the first-line therapy. If hypertension persists, combination therapy with angiotensin receptor blockers, calcium channel blocker, cardioselective beta-blockers can be considered.

Currently there are no treatment outcome studies of hypertension or dyslipidemia in children with T2DM.

Summary

The rapid rise of obesity and T2DM in children is an undeniable public health problem, as we have not yet seen the full effects of the earlier onset chronic complications associated with T2DM that will come at high cost to society. Prevention and treatment of childhood obesity is paramount and requires efforts of all healthcare providers. Once T2DM is diagnosed, there are limited treatment options that make this an especially challenging condition. There are currently several ongoing studies that will, in the near future, hopefully provide additional information on safe and effective pharmacological therapies that can be used in children.

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Prevention and treatment of childhood obesity is paramount and requires efforts of all healthcare providers.

Impact of Traumatic Exposure and Community Violence: Incorporating a Trauma Lens into Pediatric Practice

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There is growing awareness that increasing numbers of children and adolescents are exposed to traumatic events and experiences that may negatively impact their functioning. Coordinated efforts to understand the range of potentially traumatic events, the likely reactions to these experiences, and the best approaches to help children and their families manage these reactions and develop effective coping strategies are growing. As primary gatekeepers, pediatricians serve an important role in assessment for traumatic responses, education about handling normal reactions, and referrals to address the more severe symptoms of traumatic exposure. The pediatric community in particular needs to be aware of the risks of medical trauma and reactions that may arise in response to pain, injury, illness, invasive medical procedures or painful treatments.

Background

Potentially traumatic events include natural disasters, automobile or other serious accidents, sudden loss of a loved one through death or incarceration, witnessing community or domestic violence, painful or invasive medical care, physical or sexual abuse, and extreme neglect. From surveys conducted with elementary and middle school children in urban areas of Chicago, researchers estimate that up to 30% of children in this age group have witnessed community stabbings or shootings.¹ These estimates increase to 41% when surveying high school students in urban settings.² In a general population study, 68% of children reported experiencing at least 1 potentially traumatic event by 16 years of age.³

The majority of children and adolescents with potentially traumatic exposures do not develop the full symptom pattern associated with post-traumatic stress disorder (PTSD). However, 20% of traumatized respondents in the general population study reported impairments related to social, emotional and school functioning,

as well as physical complaints. The numbers increased to 50% for adolescents who had experienced multiple traumatic experiences.³

Key elements of trauma-informed pediatric care

One of the aspects of incorporating a trauma lens into pediatric practice is recognition that illness, injury, medical procedures and treatments can be traumatic for patients. To ensure that children and families can receive necessary support to cope with the emotional reactions to medical trauma, the National Child Traumatic Stress Network (NCTSN) and the Center for Pediatric Traumatic Stress at the Children's Hospital of Philadelphia have developed guidelines and best practices for trauma-informed pediatric care.

To assess, prevent and address traumatic stress responses, the guidelines recommend that pediatricians build upon the A-B-C model for treating illness and restoring functions (Airway, Breathing, Circulation) by adding a D-E-F protocol – Reduce Distress; Promote Emotional Support, and Remember the Family.

Educational Objectives

At the conclusion of this activity, participants will be able to:

- Describe the impact of traumatic exposure upon children across the developmental spectrum
- Provide anticipatory guidance to parents about potential symptoms, strategies for re-establishing a sense of safety, and techniques for dealing with emotional reactions
- Access resources for additional information and appropriate referrals

Overall, the key elements of trauma-informed pediatric care include the following recommendations:

- Minimize potentially traumatic aspects of medical care and procedures
- Provide child and family with basic support and information
- Address distress (pain, fear, loss)
- Promote emotional support (help parents and family help child)
- Remember family needs and identify family strengths
- Screen for acute distress and risk factors to determine which children and families might need more support, and make appropriate referrals
- Provide anticipatory guidance about what to expect and adaptive ways of coping
- Maximize continuity of care so that all providers understand child's traumatic stress reactions and coping strengths
- Attend to healthcare providers' own stress and self-care

For more information and helpful resources, see www.NCTSN.org and www.healthcaretoolbox.org. The NCTSN website also provides helpful fact sheets on other types of childhood trauma to share with parents and educators, information about a range of evidence-based treatment options, and training opportunities for professionals.

Assessment

Patients can present with a range of symptoms that may be related to traumatic exposure, including inattention, sleep disturbance, anxiety, behavioral regression, school refusal, sexual acting out, and other behavioral problems. Common symptoms that have been associated with exposure to traumatic experiences are listed in Table 1.

Pediatricians may see cases in which a parent is seeking anticipatory guidance following known exposure to a traumatic event. In these cases, parents typically seek information regarding what types of reactions are normal and how they can help. However, in many cases, parents do not report (or recognize) that the concerning behaviors are a result of exposure to a traumatic event or experience.

Parents of children exposed to chronic stress or repeated traumatic experiences may be even less likely to attribute behavioral problems and symptoms to environmental stressors. For many of these children, adaptive behavioral responses have

become habitualized or overgeneralized, resulting in negative consequences and suffering. For example, a child with chronic exposure to domestic or community violence may develop sensitivity to sounds and remain hyper-alert to perceived threats. This can be very adaptive in certain settings, but may negatively impact his ability to sleep independently or to pay attention and focus during school. Alternatively, that same child may be hyper-alert to any perceptions of aggression in his peers at school, which results in frequent fighting and subsequent suspensions or discipline reports. In these cases, adopting a trauma lens as an aspect of assessment may result in significant changes in diagnosis, treatment plans and school recommendations.

Considering exposure to trauma in the assessment process when confronted with social, emotional or behavioral concerns is the primary objective. However, it is also critical to realize that there is stigma associated with many traumatic events. It is, therefore, important that the clinician explore these issues without appearing judgmental to the family.

It can be useful to introduce this line of questioning with comments such as: "Many different types of situations can affect kids. Unlike adults, kids might not know how to cope with stress or let others know how they feel. Can you think of any situations that your child has experienced that may have been stressful or scary?"

If this does not elicit a response, then it might help to ask specifically about losses, including family members (immediate and extended), community members, or peers. It is also useful to explore with parents episodes that may have occurred in their community that their child either has witnessed or experienced vicariously through others. Adults often believe that unless a child was present for an event, it does not affect him or her. Pediatricians can explain that in addition to direct exposure, children may also be impacted by reports of particular events, as well as the emotional response of the adults and peers around them.

Having an inventory of traumatic experiences available for parents or older children to complete also might be fruitful. One option, the Child PTSD Symptom Scale, consists of both a list of possible stressors and a symptom rating scale that can be completed if children reply positively to an exposure.⁴ When provided with a list of stressors, many children and adolescents will select items or acknowledge situations that they do not mention through open-ended questions. See Table 2 for a list of possible scales.

Table 1

COMMON REACTIONS TO EXPOSURE TO TRAUMATIC EVENT OR LOSS

<p>TODDLERS AND PRESCHOOL CHILDREN</p> <p>Behavioral changes</p> <ul style="list-style-type: none"> • Regression in previously developed skills (speech, toileting, self-care) • Traumatic play (may be aggressive in themes) 	<p>Anxiety/emotional changes</p> <ul style="list-style-type: none"> • Generalized fears (may be due to uncertainty about risk for continued danger or threat) • Sleep disturbances (nightmares, fear of going to sleep alone) • Clinginess (decreased interest in independent play) and trouble separating • Tearfulness (may be due to inability to express emotional reactions verbally)
<p>SCHOOL-AGED CHILDREN/ADOLESCENTS</p> <p>Behavioral changes</p> <ul style="list-style-type: none"> • Increased restlessness or hyperactivity • Decreased attention/concentration (trouble reading or doing home work) • Angry outbursts and/or aggression • Increased oppositionality and testing of limits with adults • Decreased interest or involvement with activities and peers • Avoidance of activities, places and people associated with the event • Changes in school performance (difficulty completing work, absenteeism, tardiness) • Increased risk taking or self-destructive behavior (more common for adolescents) • Sexual acting out (more common for adolescents) 	<p>Anxiety symptoms</p> <ul style="list-style-type: none"> • Generalized fears, worries about safety of self and others • Somatic complaints (headaches and stomachaches) • Hyperarousal and startle responses to loud noises • Repetitive re-telling of experience (more common for school-aged children) • Difficulties with falling asleep, trouble sleeping independently, nightmares (more common for school-aged children) <p>Emotional changes</p> <ul style="list-style-type: none"> • Emotional numbing (demonstrating little response or feelings related to the event) • Irritability/moodiness • Poor emotional control, frequent outbursts, poor frustration tolerance • Decreased problem-solving ability • Feelings of fear, vulnerability, shame and guilt (more common for adolescents) • Foreshortened sense of future/hopelessness (more common for adolescents) • Revenge and retribution fantasies (more common for adolescents)

Education and anticipatory guidance

When families present following exposure to a traumatic event, a key role for pediatricians in primary care and emergency room settings is to provide information about likely responses to trauma and recommend coping strategies for children and their families. As indicated previously, there is a range of both immediate and long-term responses to trauma that are common. One method of communicating this information to parents is simply to review the information provided in Table 1, translating the list of potential symptoms into language a parent is likely to understand, and illustrating each with an example.

Two main messages should be communicated when discussing common responses to trauma:

First, some children will have many of the reactions on the list, while others will have very few. In the period immediately following exposure to a traumatic event, all of the symptoms in Table 1 are normal and common. This does not mean they are not distressing or unpleasant for the child and parent alike; however, it does mean that parents should respond as patiently, calmly, and compassionately as possible. Emphasizing the importance of being supportive and tolerant as the child

experiences emotions and exhibits behaviors related to trauma exposure can go a long way towards stabilizing an otherwise difficult situation.

Second, if these symptoms persist and/or are significantly impairing a child's functioning, additional therapeutic intervention may be necessary. It is typical for children exposed to a traumatic event to experience some or many of the symptoms presented in Table 1 for up to 3 months after the traumatic event. However, over time, these symptoms should ease and normal behavior and mood should gradually be restored. The children whose trauma reaction does not seem to follow this typical course should be identified for additional intervention. Similarly, some degree of disrupted daily functioning is to be expected following traumatic exposure. However, pervasive or prolonged impairment in daily functioning (ie, drastic changes in the ability to eat, sleep, attend school, maintain normal activities or personal hygiene, etc.), would be cause for concern and additional referrals should be made.

In addition to providing information about common reactions to stress or trauma, it is helpful to give parents an opportunity to ask questions about their fears so that healthcare professionals

can decrease anxiety and misperceptions. For example, families are frequently concerned that traumatic sexual victimization will impact their child's sexual orientation. Pediatricians can inform parents that research does not support this outcome.⁵ Other common misconceptions include a conviction that children cannot recover normal functioning following trauma exposure, or that there is nothing parents or family members can do that will help a child in the wake of a trauma.

Providing parents some basic, concrete ideas on how to help their child cope is very important. In the aftermath of exposure to a traumatic event, the first priority should be to ensure the child's current safety. Parents should provide ongoing reassurance that they are working hard to keep the child safe, while also recognizing that a child may have difficulty feeling safe.

Once a safe environment has been restored, children will benefit from the maintenance of routines and consistency to the extent possible. Predictability can be very reassuring and calming; however, parents should have some awareness that their daily routines might need to be modified to accommodate the child's natural reactions to stress. For example, a morning routine that previously consisted of breakfast followed by the child walking to school independently may temporarily need to be altered so that breakfast and other morning tasks still occur as usual, but the parent or another trusted adult accompanies the child on the walk to school.

More severe or prolonged trauma reaction

For some children and families, anticipatory guidance and education will not be sufficient to address the level of distress of the emotional reaction to trauma. When screening measures or discussions indicate that the child is experiencing prolonged symptoms that are negatively impacting functioning at school or at home, referral for targeted interventions or clinical treatment is warranted.

Clinical diagnosis of PTSD requires the presence of symptoms in 3 categories: re-experiencing, avoidance and hyperarousal. Table 3 provides some detail about how these symptoms can manifest in children in a language parents and children can understand. Many of the common symptoms presented in Table 1 are also present in Table 3. As discussed earlier, the key difference between the symptom lists is the duration of the symptoms (ie, more than 3 months), their severity, and the degree of disruption in day-to-day functioning. Children who experience symptoms in all 3 domains included in Table 3 should be considered for additional assessment and intervention.

Table 2	SUGGESTED SCREENING MEASURES FOR TRAUMA
<ul style="list-style-type: none"> <p>• Child PTSD Symptom Scale Foa EB, Johnson KM, Feeny NC, Treadwell KRH. The Child PTSD Symptom Scale: a preliminary examination of its psychometric properties. <i>Journal of Clinical Child Psychology</i> 2001;30:376-384.</p> <p>• Screening Tool for Early Prediction of PTSD (STEPP) Winston FK, Kassam-Adams N, Garcia-Espana F, et al. Screening for risk of persistent posttraumatic stress in injured children and their parents. <i>JAMA</i> 2003;290:643-649.</p> <p>• Child Trauma Screening Questionnaire (CTSQ) Olsson KA, Kenardy JA, De Young AC, Spence SH. Predicting children's post-traumatic stress symptoms following hospitalization for accidental injury: combining the Child Trauma Screening Questionnaire and heart rate. <i>Journal of Anxiety Disorders</i> 2008;22:1447-1453.</p> <p>• Psychosocial Assessment Tool (PAT) Pai ALH, Patino-Fernandez AM, McSherry M, et al. The Psychosocial Assessment Tool (PAT2.0): psychometric properties of a screener for psychosocial distress in families of children newly diagnosed with cancer. <i>Journal of Pediatric Psychology</i> 2008;33:50-62.</p> 	

The symptoms of chronic trauma tend to cluster in the domains of challenges with emotion regulation, attachment and interpersonal relationships.

Table 3

SIGNS OF PROLONGED STRESS RESPONSE REQUIRING CLINICAL CARE

Re-experiencing

- Nightmares and trouble sleeping
- Thinking about the trauma frequently
- Becoming very scared or upset and feeling like the event was happening again
- Trouble concentrating at home and school
- Acting or feeling like event is reoccurring

Avoidance

- Wanting to NOT think or talk about the event at all
- Avoiding places, people or things that trigger thoughts about the event
- Avoiding and not enjoying activities and people that were previously fun
- Feeling like other people do not understand (including friends and family members)
- Feeling hopeless about the future or feeling unable to avoid bad experiences again

Hyperarousal

- Feeling out of control
- Being “on guard” all of the time
- Over-reacting to sudden noises
- Easily angered and irritable
- Feeling shame, guilt, or sadness
- Having physical problems and complaints

Symptom pattern of chronic trauma

There is also growing evidence and support from many in the field of trauma treatment that children and adolescents who have been exposed to chronic stress and repeated traumatic events exhibit a pattern of symptoms that differs from the re-experiencing/avoidance/hyperarousal categories presented in Table 3. The symptoms of chronic trauma tend to cluster in the domains of challenges with emotion regulation, attachment and interpersonal relationships.⁶ While this pattern of behaviors is not yet formally recognized in the psychiatric nomenclature, awareness of the pattern and higher need for intervention is critical for primary care providers.

Treatment options and referral

For many children and families, group treatment may be the first option. School-based groups for children exposed to traumatic events are currently available in some schools in Chicago.⁷ These groups utilize an evidence-based group therapy curriculum that focuses on cognitive-behavioral strategies of feelings identification, relaxation training, gradual exposure and anticipatory problem-solving strategies. Some community mental health agencies also provide these types of group therapy.

For chronic trauma cases, short-term, focused cognitive behavioral therapy approaches may be a first step to decreasing trauma symptoms. Additional strategies are likely to be necessary, however, to address the maladaptive patterns in response to relations with others and capacity for self-soothing and regulation.

When making referrals for trauma treatment, the key factors to consider are access to services, insurance coverage, and evidence that the provider has adequate training for this type of treatment. There are many different treatment models available, but not all have been empirically shown to reduce trauma symptoms and improve functioning. Due to the potentially debilitating nature of symptoms associated with traumatic exposure, and the often sensitive and complex nature of the presenting problem, it is critical that the provider has specific training in trauma-focused therapy.

A good resource for identifying appropriate referrals is through the local Children's Advocacy Center. These centers exist in most major cities, and specialize in forensic evaluation and treatment for children who are victims of abuse and neglect. They often provide group therapy in their settings and have referrals and resources available for group and individual treatment. In Chicago, Children's Advocacy Center lists the provider directory online (www.chicagocac.org, under Programs/Resources for Parents/Network of Treatment Provider Directory; or call 312.492.3700). Additional resources for finding appropriate referrals for children and families can be found at the NCTSN website (www.NCTSN.org).

Conclusion

With increased awareness of events that may cause trauma and recognition of the common symptoms of trauma, pediatricians can more effectively assess children and adolescents presenting with a range of social, emotional, and behavioral issues. When talking to families about typical reactions to trauma, it is important to stress that all trauma symptoms are normal shortly after a traumatic exposure, but patients with severe or prolonged distress would benefit from trauma-focused treatment. Excellent informational resources from the National Child Traumatic Stress Network can help pediatricians offer valuable guidance to families on ways to cope with their children's traumatic responses, support healing, and access additional care if necessary.

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Trauma Treatment Service at Children's Memorial Hospital

This multidisciplinary service includes the Protective Services Team and the Department of Child and Adolescent Psychiatry. The full spectrum of care (medical, inpatient, day treatment, and outpatient services) can address a range of trauma symptoms children experience. Contact Emalee Flaherty, MD, Protective Services Team Medical Director (773.880.4322), or Melinda Gronen, LCSW, Protective Services Team Coordinator (773.880.3382).

Study to Identify Infants at High Risk for Developing Obesity: Metabolic Programming and the Effects of Maternal Obesity on Neonatal Body Composition

JAMI JOSEFSON, MD

As the prevalence of obesity in children increases, it has been recognized that prevention of this epidemic must occur with interventions aimed at very young children, even infants who are deemed high-risk. How do we identify infants at high risk for developing childhood-onset obesity?

Multiple early-life factors potentially increase the risk: maternal pre-pregnancy body mass index (BMI), maternal weight gain during pregnancy, maternal glucose tolerance, breastfeeding duration and feeding practices, infant birth weight, and the rate of weight gain during infancy and early childhood.

The link between high birth weight and later obesity is well recognized. However, most children who become obese had a normal birth weight. Hence, it is crucial to study other parameters beyond birth weight to identify infants at risk.

Increased proportion of body fat at birth is one parameter that may convey increased risk for childhood-onset obesity. Newborn body fat also may be a more sensitive and specific predictor of childhood-obesity risk than birth weight alone. It is my hypothesis that obesity in non-diabetic pregnant women is associated with increased newborn body fat.

New technology helps measure body fat in newborns

Few studies have reported quantitative measures of body fat in the newborn because of the challenge in obtaining accurate data. This clinical research study is evaluating body fat in full term infants of obese and non-obese mothers using the Pea Pod® Infant Body Composition System, a fast, non-invasive mechanism to measure newborn body fat.

The Pea Pod system is located at Prentice Women's Hospital and uses air displacement to assess fat mass. Newborn measurements are performed within the first 48 hours following birth. First, an accurate length is measured using an infant measuring board. The neonate is weighed on the calibrated Pea Pod scale. Finally, body volume is measured by the air displacement plethysmograph technique. From these measurements, body composition of the neonate is calculated by the Pea Pod system.

Correlation of other risk factors to newborn body fat

The technological advance of the Pea Pod system has made it feasible to study neonatal body fat as a risk factor for childhood obesity. Additionally, the study is examining metabolic biomarkers, including glucose, the appetite regulator hormone leptin, and adiposity marker adiponectin, to identify a pattern reflective of altered maternal metabolism in obese women. Other factors, such as pregnancy weight gain and gestational age of the newborn, also are being evaluated to determine the relative contribution of each factor to newborn body fat percentage.

Increased proportion of body fat at birth may convey increased risk for childhood-onset obesity.



In the photo: Researcher Jami Josefson, MD, uses the Pea Pod system to measure body fat of newborn study participant Serena Liffgens.

Study population

The study currently is recruiting pregnant women, both healthy weight (pre-pregnancy BMI 18-25 kg/m²) and obese (pre-pregnancy BMI > 30 kg/m²). Women must have had a normal glucose challenge test. Diabetic women are excluded because gestational diabetes is known to be associated with increased risk of offspring obesity. The recruitment goal is 80 mother-infant pairs, half from each maternal weight category.

Planning ahead

This research study will characterize the anthropometric and metabolic status of offspring of obese mothers. Research that focuses on the long-term effects of the perinatal environment on the developing fetus, termed metabolic programming, may provide further understanding of the obese intrauterine environment and its relative contribution to offspring obesity. The current study will provide the preliminary data and the foundation for a larger cohort study to determine if adiposity and/or other biomarkers at birth predict adiposity in childhood.

If adiposity at birth indeed identifies infants at risk of developing obesity, interventions initiated from birth forward may prevent or reduce this risk. Ultimately, developing cost-effective interventions to reduce the prevalence of childhood obesity is necessary to curtail this epidemic.

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Quality of life in adult survivors greater than 10 years after pediatric heart transplantation

Petroski RA, Grady KL, Rodgers S, Backer CL, Kulikowska A, Canter C, Pahl E
Journal of Heart & Lung Transplantation Jul 2009;28(7):661-666.

BACKGROUND: This study assessed quality of life (QOL) in adult survivors of pediatric heart transplantation who survived > or = 10 years after transplantation. **METHODS:** Prospective data were collected from heart transplant recipients who were aged > or = 18 years and had survived > or = 10 years after transplantation (transplantation between July 3, 1986, and April 4, 1997). QOL data were collected from patients using the Medical Outcomes Study 36-Item Short Form (SF-36) Health Survey. Clinical data were collected from medical records. Statistical analyses included frequencies and measures of central tendency. **RESULTS:** Twenty-three patients (65% men, 91% white) completed the study. At the study initiation, they were a mean age of 9.0 +/- 7.1 years at transplantation, and were a mean age of 25.2 +/- 5.5 years (range, 18-34 years) and a mean of 16.2 +/- 3.0 years (range, 11-22 years) post-transplantation. Most were in school or working. Mean patient QOL scores from the SF-36v2 survey were 50.56 +/- 0.5 (range, 27.3-68.9) for physical health and 49.88 +/- 11.72 (range, 23.56-62.84) for mental health, similar to the general United States population. Late complications were frequent, including transplant coronary artery disease, 3; repeat heart transplantation, 2; post-transplantation lymphoproliferative disorder, 6; kidney transplantation, 5; acute late rejection, 5; and arrhythmias, 4. **CONCLUSION:** This report of QOL in adult survivors of pediatric heart transplantation shows patient perception of physical and mental health is similar to the general population despite serious late complications. A multicenter study is planned to further evaluate QOL in this unique cohort.

Congenital melanocytic nevi of the eyelids and periorbital region

Margulis A, Adler N, Bauer BS
Plastic & Reconstructive Surgery Oct 2009;124(4):1273-1283.

BACKGROUND: Congenital melanocytic nevi of the eyelids and periorbital region are unusual. Although their malignant potential can be debated, they present a significant aesthetic concern and also disturb lid function. In this article, the authors present an expanded approach to evaluation and treatment of these patients. **METHODS:** Forty-four consecutive patients, aged 6 months to 18 years, were treated from 1980 to 2008. All patients had congenital nevi involving one or both eyelids,

with or without extension into the surrounding periorbital area and face. Follow-up ranged from 6 months to 20 years. **RESULTS:** All patients were treated successfully with excision and reconstruction of their congenital eyelid and/or periorbital nevi. The involved ciliary border was preserved in all but one case, where the exophytic lesion presented function concerns. Complications included asymptomatic lateral ectropion in three patients. Asymmetry of the palpebral apertures, before treatment, was present in at least half of the patients with extensive facial nevi, and the abnormalities causing these differences may impact efforts to obtain final lid symmetry. A single patient died as a result of extensive metastatic melanoma from an extracutaneous site. **CONCLUSIONS:** Early evaluation and treatment of these nevi may help in preventing the aesthetic, functional, and health-related issues for the patients. Although the current group of infants and young children will not reach full facial growth for more than another decade and a half, and therefore await critical assessment of their long-term outcomes, the authors hope that the experience gained to date will assist surgeons in managing these complex reconstructions.

Parent-assisted or nurse-assisted epidural analgesia: is this feasible in pediatric patients?

Birmingham PK, Suresh S, Ambrosy A, Porfyrus S
Paediatric Anaesthesia Nov 2009;19(11):1084-1089.

AIM: The aim of this study was to assess the feasibility of parent-assisted or nurse-assisted epidural analgesia (PNEA) for control of postoperative pain in a pediatric surgical population. **METHODS:** After the institutional review board (IRB) approval was obtained, an analysis of our pain treatment services database of pediatric surgical patients with epidural catheters in whom the parent and/or nurse were empowered to activate the epidural demand-dose button was evaluated. **RESULTS:** Over a 10-year period between 1999 and 2008, 128 procedures in 126 patients were provided parent or nurse assistance of the epidural demand dose. Satisfactory analgesia was obtained in 86% of patients with no or minor adjustments in PNEA parameters. Fourteen percent of patients were converted to intravenous patient-controlled analgesia (PCA) for inadequate analgesia (7%) or side effects (7%). None of the patients in this cohort required treatment for respiratory depression or excessive sedation. **CONCLUSIONS:** Parent-assisted or nurse-assisted epidural analgesia can be safely administered to children undergoing surgery who are physically or cognitively unable or unwilling to self-activate a demand dose. Additional studies are needed to compare the efficacy of PNEA with other modalities for postoperative pain control in children.

Fetal pyelectasis as predictor of decreased differential renal function

*Kim DY, Mickelson JJ, Helfand BT, Maizels M, Kaplan WE, Yerkes EB
Journal of Urology Oct 2009;182(4 Suppl):1849-1853.*

PURPOSE: A decreased percent of differential function is a common indication for infant pyeloplasty but there is no recognized fetal ultrasound parameter to predict this deficit. We determined whether there is a correlation between fetal pyelectasis and the newborn percent differential function that may enhance prenatal counseling and guide postnatal evaluation. **MATERIALS AND METHODS:** Our database was queried for fetal and newborn measures with fetal pyelectasis on ultrasound and the percent of differential function on renal scintigraphy. Fetal pyelectasis data were stratified by estimated gestational age and the percent of differential function. The affected cohort was defined as having 35% or less differential function and the unaffected cohort was defined as having greater than 35%. The Wilcoxon 2-sample test was used for statistical analysis with logistic regression to generate estimated probability models of a decreased percent of differential function vs mm fetal pyelectasis. **RESULTS:** A total of 831 cases had fetal and newborn ultrasound data available with a total of 229 renal scans identified. Of the 229 cases 36 (16%) had 35% or less differential function on scintigraphy. At estimated gestational age 33 weeks or less the affected cohort had 8 mm greater pyelectasis than the unaffected cohort (OR 1.2, $p < 0.0001$). At estimated gestational age greater than 33 weeks the affected cohort had 4 mm greater pyelectasis than the unaffected cohort (OR 1.07, $p < 0.07$). Subgroup analysis before 33 weeks of estimated gestational age showed similar significance (OR > 1 , $p < 0.001$). **CONCLUSIONS:** Approximately 16% of all fetuses with pyelectasis have 35% or less differential function as newborns, including 36% identified by pyelectasis greater than 10 mm at estimated gestational age 20 to 24 weeks. Fetal pyelectasis greater than 10 mm at estimated gestational age 20 to 24 weeks and greater than 16 mm at greater than 33 weeks is associated with 35% or less differential function in the newborn.

Laparoscopic fundoplication after previous open abdominal operations in infants and children

*Barnes KA, St Peter SD, Holcomb GW 3rd, Ostlie DJ, Kane TD
Journal of Laparoendoscopic & Advanced Surgical Techniques. Part A. Apr 2009;19(Suppl 1):S47-S49.*

BACKGROUND: There have been multiple reports in the adult literature stating that previous open operations should no longer be considered a contraindication to the laparoscopic approach. However, there are little data on this topic in the pediatric population, particularly in patients with neonatal abdominal pathology unique to the newborn population. Therefore, we reviewed our experience with laparoscopic fundoplication after a variety of previous abdominal conditions and operations in the pediatric population. **METHODS:** An institutional review board-approved retrospective chart review was performed on all patients undergoing laparoscopic fundoplication after a previous open operation between October 2000 and December 2007. The data collected demographics, comorbid conditions, previous abdominal operations, gastrostomy tube placement, time interval between the initial operation and laparoscopic fundoplication, conversions, and complications. **RESULTS:** Forty-five patients underwent a laparoscopic Nissen fundoplication after an open operation during the study interval. Mean age was 41.3 months (range, 1-233) with a mean weight of 14.3 kg (range, 2.9-63.6), and 31 were (78.9%) male. A total of 61 previous abdominal operations were performed (range, 1-4). Mean time between last open operation and laparoscopic fundoplication was 27.3 months (range, 0.5-147). Mean operative time was 161 minutes (range, 73-420). There were no conversions and 3 perioperative complications occurred (splenic hematoma, clogged gastrostomy tube, and liver bleed). Early reoperations were performed in 2 patients (4.4%): 1 for bleeding on day 2 and the other for leaking gastrostomy day 12. **CONCLUSION:** Our data demonstrate that laparoscopic fundoplication after a previous open operation is feasible and safe.



FIGURE 1



FIGURE 2

A healthy 16-year-old male presents with asymptomatic, slowly progressive and persistent skin lesions of a few months duration involving the chest and abdomen. (Figures 1, 2).

Educational Objectives

At the conclusion of this activity, participants will be able to:

- Recognize the disorder described in the vignette and shown in the photographs
- Describe clinical features and differential diagnosis
- Describe management approaches

1. What is the most likely diagnosis?

- Atopic dermatitis
- Lupus erythematosus
- Morphea
- Phytophotodermatitis
- Urticaria

2. Which of these findings would be most common in this patient?

- Arthralgia
- Dysphagia
- Dyspnea
- Peripheral edema
- Sclerodactyly

Discussion:

Morphea (localized scleroderma) is a cutaneous disorder with an estimated incidence of 0.4 to 1 per 100,000 individuals¹ and a female to male ratio of 2-3:1.² Morphea is seen in children at a mean age of 10 years. It can be clinically classified into several subtypes: plaque-type morphea, generalized morphea, morphea profunda and linear morphea (also known as linear scleroderma).

Plaque-type morphea, the most common type in adults, occurs in 36% to 48% of affected children and most commonly involves the trunk.² Most often the lesions begin insidiously as an asymptomatic plaque or patch that is flat or only slightly elevated, flesh-colored or slightly erythematous, oval or round, and which spreads centrifugally. The lesions evolve within weeks or months into firm hyperpigmented or ivory plaques, with or without localized areas of atrophy, and a surrounding area of violaceous inflammation. The patient in the above case has the plaque-type morphea.

Linear morphea is the most frequently described type in children. It primarily affects the extremities and to a lesser degree the face.² Sixty-seven percent of cases of this type are diagnosed before 18 years of age. Lesions present as linear, band-like areas of induration with hyperpigmentation, hypopigmentation and atrophy of the affected skin. When linear

Answers: 1C, 2A

morphea involves an extremity, it is associated with an increased risk of undergrowth of the affected limb (prominent atrophy of underlying subcutaneous tissues) or contractures and immobility over joints.³ When it involves the frontal or fronto-parietal region of the scalp, it is called *en coup de sabre* (ie, the cut of a sabre) because it resembles a sabre wound or cut.

Morphea profunda, the deep form of morphea, may clinically appear normal on the skin surface, but feels indurated or thickened at a deep subcutaneous level. In addition, any type of morphea may occur, albeit rarely, as part of an overlap syndrome in association with other connective tissue diseases, such as systemic lupus erythematosus, rheumatoid arthritis, Sjogren syndrome, systemic sclerosis and juvenile dermatomyositis.⁴

The use of the term “scleroderma” and the characteristic cutaneous induration found in morphea has led to confusion by families and sometimes physicians between the localized and systemic types of scleroderma. However, the clinical distribution and morphology of the lesions usually serve to distinguish between the 2 entities. As a result, the currently preferred terminology is “morphea” rather than “localized scleroderma.”⁵

The pathomechanism of morphea is unknown, with infection, trauma, genetic susceptibility, and drugs all postulated as triggers or causes. Plaque type and linear morphea tend to improve over 3 to 5 years, but many patients demonstrate periods of quiescence followed by reactivation of the disease.⁵ Diagnosis is usually based on clinical features and histologic confirmation. A biopsy often is not required, especially in children. Some patients may show an eosinophilia, a positive antinuclear antibody (ANA) and/or rheumatoid factor, but these do not seem to reliably predict the course or prognosis of the disease. Other patients with morphea (most commonly linear, generalized, or profunda type) may develop non-cutaneous manifestations, such as arthralgias, in 7% to 10% of cases. Visceral involvement is extremely rare.⁵

Treatment of morphea is usually based on the extent, location and activity of the disease. For example, involvement of the face most often requires aggressive treatment due to the resultant disfigurement, cutaneous atrophy, and loss of subcutaneous fat that can occur. Topical potent steroids or tacrolimus 0.1% ointment are reserved for mild or early cases or used as adjuvant therapy.⁶ Oral methotrexate with a short course of oral or IV corticosteroids usually produces a good response, halting disease progression and softening existing induration.⁵ Topical or oral forms of vitamin D3 also have been used with success. Severe or methotrexate-resistant cases also have been treated with mycophenolate mofetil⁷ or cyclosporine.⁸

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Costello to lead Regenstein Cardiac Care Unit at Ann & Robert H. Lurie Children's Hospital of Chicago



Children's Memorial Hospital recently recruited John M. Costello, MD, MPH, as the Medical Director of the Regenstein Cardiac Care Unit (CCU), a unique 36-bed unit at Lurie Children's – the 23-story hospital in construction on the campus of Northwestern University Feinberg School of Medicine that will replace the current facility in the

summer of 2012. The new state-of-the-art hospital is named in recognition of Ann Lurie's \$100 million gift.

The CCU will combine intensive care experience and technology with acute care family amenities to allow all cardiac patients to remain in the same room with the same caregivers from admission to discharge.

As a transition toward the CCU concept, Children's Memorial currently has 9 beds in the pediatric intensive care unit designated as cardiac intensive care unit (CICU) beds. When he starts on July 1, 2010, Costello will direct the medical care of post-operative cardiac surgery patients, heart transplant patients and cardiology patients in the CICU. Costello also will spend considerable time developing the new CCU for Lurie Children's.

Costello's background is ideal for his new role. He currently has an academic appointment at Harvard Medical School and serves on the faculty at Children's Hospital Boston, where he is responsible for the medical care of CICU patients and is an active clinical researcher.

He is returning to Children's Memorial where he completed his pediatric residency, a fellowship in pediatric critical care medicine and another fellowship in pediatric cardiology. He received his undergraduate degree from the University of Notre Dame, his medical degree from Feinberg School and his Master of Public Health degree from Harvard School of Public Health.

Costello also will be the only physician in Illinois with certifications from the American Board of Pediatrics Sub-Board of Pediatric Critical Care and Sub-Board of Pediatric Cardiology.

His research interests include the conduct of perioperative trials and outcomes research in children undergoing complex cardiac surgery. He is the principal investigator for an American Heart Association research grant that supports the investigation of perioperative natriuretic hormone infusions. Costello also collaborates on a National Institutes of Health grant evaluating the use of insulin to control glucose levels after cardiovascular surgery. He is interested in quality improvement initiatives and has published studies regarding the prevention of healthcare-associated infections after cardiovascular surgery.

Backer 15th in US to receive new congenital cardiac surgery subspecialty certification



Carl Backer, MD, Division Head of Cardiovascular-Thoracic Surgery and Surgical Director of the Heart Transplant Program at Children's Memorial, was 15th in the country to receive the new subspecialty certification in congenital cardiac surgery from the American Board of Thoracic Surgery.

This new certification recognizes surgeons who have met a high national standard and are experts in congenital heart surgery with significant professional accomplishments in the field. Backer is a Professor of Surgery at Northwestern University Feinberg School of Medicine and A.C. Buehler Professor of Surgery.

ECMO program receives international award for excellence

Children's Memorial's extracorporeal membrane oxygenation (ECMO) program was named a recipient of the Excellence in Life Support Award from the Extracorporeal Life Support Organization (ELSO). ELSO is an international consortium of healthcare professionals and scientists who are dedicated to the development and evaluation of novel therapies for support of failing organ systems. In an environment focused on outcomes, the ELSO award provides evidence of the institution's commitment to exceptional patient care, specialized equipment and supplies, defined patient protocols, advanced education of all staff and high quality standards.



TRANSITIONING TO ADULT CARE

1. When should providers and families begin thinking about transitioning?

- a. When patient is 11-14 years
- b. When patient is 16-17 years
- c. When patient is 18-19 years
- d. When an adult provider is identified

2. A 17-year-old girl with lupus is currently covered under her father's private insurance. She plans to attend a university and remain a dependent. What is the best likely insurance option for her?

- a. Medicare
- b. Coverage under father's private insurance
- c. Individual private insurance
- d. Likely will not qualify for any insurance plan

3. A provider completes a portable medical summary for a child, while spending a great deal of time teaching the child about his disease, medications, and history. Which of the following statements is true?

- a. The provider absolutely cannot bill for these services.
- b. Only social workers can bill for these services, not physicians or APNs.
- c. The provider must document that counseling regarding transition issues comprised more than 50% of the visit, and then can bill an appropriate E/M code using time criteria.
- d. None of the above

FOOD ALLERGIES

1. Which symptom below is NOT a sign of food allergy?

- a. Atopic dermatitis
- b. Acute urticaria
- c. Periorbital edema
- d. Chronic rhinitis

2. A boy with a peanut allergy weighs 35 kg. What dosage of 1:1000 epinephrine should be prescribed?

- a. 0.15 mg
- b. 0.2 mg
- c. 0.3 mg
- d. 0.5 mg

3. Most children will outgrow their allergy to:

- a. Egg
- b. Shellfish
- c. Peanut
- d. Tree nut

TYPE 2 DIABETES

1. Which patient below meets the criteria for type 2 diabetes screening?

- a. An African-American boy with BMI at 90th percentile for age/gender and hypertension
- b. An Asian girl with BMI at 80th percentile for age/gender, whose father has type 2 diabetes
- c. A Caucasian girl whose weight is 150% of ideal for her height
- d. A Latino boy with BMI at 95th percentile for age/gender and asthma

2. A child is considered to have impaired fasting glucose if the fasting glucose is:

- a. <100 mg/dl
- b. 100-125 mg/dl
- c. ≥ 126 mg/dl
- d. ≥ 135 mg/dl

3. Which statement below is true?

- a. Children with impaired glucose tolerance can prevent diabetes through lifestyle modifications.
- b. Rosiglitazone is approved for use in children with type 2 diabetes.
- c. Ophthalmologic examination is recommended every 2 years after diagnosis of type 2 diabetes.
- d. Statins are not approved for pediatric use.

TRAUMA

1. Which is true about children exposed to a potentially traumatic event?

- a. Most children will develop the full symptom pattern of post-traumatic stress disorder.
- b. Children with impairments in response to trauma cannot recover normal functioning.
- c. It is normal for children to have stomachaches, hyperactivity, or developmental regression for up to 3 months after the traumatic event.
- d. It is normal for children to have nightmares 6 months after the traumatic event.

2. Children exposed to chronic traumatic experiences tend to exhibit:

- a. Ongoing problems with emotion regulation, attachment, and interpersonal relationships
- b. Re-experiencing of traumatic events, extreme avoidance of event-related triggers, and hyperarousal
- c. Somatic complaints lasting up to 2 months
- d. Severe psychotic symptoms

3. Which initial treatment option would be best suited for children with a severe and prolonged response to trauma?

- a. Psychodynamic individual therapy
- b. Trauma-focused group therapy
- c. Antidepressants
- d. Stimulants

DERMATOLOGY**1. Plaque-type morphea in children most commonly affects:**

- a. Extremities
- b. Face
- c. Hands
- d. Trunk

2. Which statement is true?

- a. Morphea occurs more often in boys.
- b. Infection is a well-established cause of morphea.
- c. In children, biopsy is always required to confirm the diagnosis of morphea.
- d. Plaque type and linear morphea tend to improve over 3 to 5 years.

3. Mild or early cases of morphea are treated with:

- a. Topical potent steroids or tacrolimus 0.1% ointment
- b. Oral methotrexate
- c. Oral corticosteroids
- d. Cyclosporine

REGISTRATION FORM

Please Print:

Last Name	First Name	Degree
Mailing Address		
City	State	Zip Code
Phone Number	Email Address	
Date of Participation	Time to Complete Activity	

Evaluation

1. Were the activities' objectives met? Yes No

2. Do you feel the activity was fair, balanced and free of commercial bias? Yes No

If no, please explain:

3. Will you change your practice as a result of participating in this activity? Yes No

If yes, please explain. If no, what are the barriers?

4. What topic areas would you like to see covered in future educational activities?

The Child's Doctor, Spring 2010

Please circle 1 correct answer for each question in every article.

Transitioning to Adult Care

- 1. a b c d
- 2. a b c d
- 3. a b c d

Food Allergies

- 1. a b c d
- 2. a b c d
- 3. a b c d

Type 2 Diabetes

- 1. a b c d
- 2. a b c d
- 3. a b c d

Trauma

- 1. a b c d
- 2. a b c d
- 3. a b c d

Dermatology

- 1. a b c d
- 2. a b c d
- 3. a b c d

Register and take CME quiz **online** at <http://www.childrensmemorial.org/cme>. • Or **mail** completed Registration Form to: Children's Memorial Hospital, *The Child's Doctor* CME Program, 2300 Children's Plaza, Box 40, Chicago, IL 60614-3394. • **Questions?** Please contact *The Child's Doctor* CME Program at: 773.880.6855 • **Deadline for registration:** For credit to be received, the Registration Form must be received (online or via mail) no later than May 17, 2011.

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Main Chicago Campus

Children's Memorial Hospital
Fullerton and Lincoln

Children's Memorial Outpatient Center in Lincoln Park
Clark and Deming

Children's Memorial Pediatrics – Uptown
Broadway and Lawrence

Children's Memorial Research Center
Chicago

Suburban Outpatient Centers

Children's Memorial Outpatient Center in Arlington Heights
Northwest Community Hospital

Children's Memorial Outpatient Center in Glenview
Glenbrook Hospital

Children's Memorial Outpatient Center in Lake Forest
Northwestern Lake Forest Hospital campus

Children's Memorial Outpatient Center in New Lenox
Silver Cross Hospital campus (under construction)

Children's Memorial Outpatient Center in Westchester
2301 Enterprise Drive

Children's Memorial Outpatient Center in Winfield
Children's Memorial at Central DuPage Hospital

Outreach Partner Locations

Children's Memorial at Central DuPage Hospital/*Winfield*

La Rabida Children's Hospital/*Chicago*

Northwestern Lake Forest Hospital/*Lake Forest*

Northwest Community Hospital/*Arlington Heights*

Prentice Women's Hospital at Northwestern Memorial Hospital/
Chicago

Sherman Hospital/*Elgin*

Silver Cross Hospital/*Joliet*

Swedish Covenant Hospital/*Chicago*

West Suburban Medical Center/*Oak Park*

Ranked #1 Pediatric Volume in Illinois

- Asthma
- Cardiology
- Cardiovascular surgery
- Gastroenterology
- Genetics
- Hematology/oncology
- Immunology/rheumatology
- Infectious disease
- Neonatology tertiary care (0-60 days)
- Nephrology
- Neurosurgery
- Otolaryngology
- Pediatric general medicine
- Pediatric general surgery
- Plastic surgery
- Pulmonary medicine
- Transplantation (liver, kidney, heart)
- Urology

Source: IHA Compdata, CY2008, based on volume in 7 county metropolitan area.



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