What’s ruining medicine for pediatricians?

Contemporary PEDIATRICS®

Expert Clinical Advice for Today’s Pediatrician

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NUTRITION

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Do’s and don’ts for children

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Recommendation changes for IV maintenance fluids

Infectious Disease
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4 out of 5 children remained flare-free for six months¹

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CHAIRMAN’S LETTER
Look back, move forward

As the new year begins, Contemporary Pediatrics looks at 2019 through the eyes of pediatricians who responded to its 7th annual Issues & Attitudes Survey. The responses give insight into the challenges you’re facing as you struggle to provide quality care and counseling to children and their families while losing more and more time adhering to practice mandates from government and insurance entities. Some problems are ongoing, others emerging. The challenge is how to address these stressors while maintaining professional and personal balance. Survey results begin on page 28.

Also be sure to check out this month’s clinical review of childhood nutrition that focuses specifically on special diets prescribed for children with medical conditions and how to ensure these diets provide adequate nutrients for normal growth and development. The article also examines the downside of popular exclusion diets imposed by some parents on their children because of personal preferences or beliefs, as well as the risks of using dietary supplements that are untested for safety and effectiveness in children. See “Special diets and supplements,” page 9.

Mike Hennessy, Sr.
Chairman and Founder
MJH Life Sciences

...
Teenagers with attention-deficit/hyperactivity disorder (ADHD) or parent-reported “trouble staying focused” are poorer drivers and make more driving errors than their peers during the teenagers’ learning permit period. These findings are based on an analysis of survey data from a prior randomized study in which 512 parent-teenager pairs were randomized to a web-based parent-teenager driving plan intervention or a usual practice control condition for 24 weeks during the learner’s permit period and were surveyed several times, including at the end of the study period.

Of the 134 adolescents who also underwent on-road driving assessments at 24 weeks and had complete survey data, 113 (84.3%) were typically developing (TD) adolescents, 12 (9.0%) had ADHD, and 9 (6.7%) had trouble staying focused. Sociodemographic variables were similar for all 3 groups. Overall, TD teenagers did better behind the wheel than did adolescents with ADHD or those who had difficulty staying focused.

Specifically, teenagers who had difficulty staying focused were more likely than those with ADHD or TD to have their on-road driving assessment (administered by a certified driver rehabilitation specialist) terminated because the specialist had to intervene to prevent a collision, the driver violated a traffic law, or because of another serious driver action or inaction. In addition, teenagers who had difficulty staying focused received marginally lower overall driving scores compared with TD teenagers, whereas those with ADHD made significantly more total errors than TD teenagers. As for specific tasks, teenagers with ADHD made more errors during high-demand tasks and right-turn tasks compared with TD teenagers, whereas teenagers with trouble staying focused made more errors during “straight at intersection tasks.”

Teenagers with trouble staying focused and those with ADHD also committed the most so-called critical errors, most often dangerous maneuvers, followed by disobeying traffic signs, lane violations, speeding, or striking an object or curb (Bishop HJ, et al. J Dev Behav Pediatr. 2019;40(8):581-588).

The authors also comment that no specific programs are available to help drivers with ADHD improve. Teenaged drivers, with or without ADHD, remain a concern. Just remember that a license says the state feels a child can drive, but the parents still need to decide if a child should drive. You’ll find that cdc.gov/parentsarethekey is a useful site.
A study in 512 mother-child pairs from 6 major cities in Canada found that exposure to higher levels of fluoride during pregnancy was associated with lowered intelligent quotient (IQ) scores in their children at the age of 3 to 4 years.

About 41% of participants lived in communities supplied with fluoridated municipal water. Investigators matched participants’ postal codes with water treatment plan zones to estimate water fluoride concentration for each woman. Using a questionnaire, they determined mothers’ consumption of tap water, coffee, and tea during the first and third trimesters and measured maternal urinary fluoride (MUF) concentration in each trimester of pregnancy. They assessed children’s IQ when they were aged 3 or 4 years, using standardized tests.

In the cohort group, 1.1% of the infants received at least 1 dose of palivizumab, with use increasing over time. The number of doses ranged from 1 to 15, and more than 90% of them were administered to infants aged younger than 12 months. Overall, there were 1689 positive RSV tests before the age of 2 years, representing 1506 infants (6.2%) with at least 1 RSV detection before age 2 years. More than 10% of these infants also had another episode of RSV detection before their second birthday. Overall, receiving palivizumab was not associated with lower risk of RSV detection before age 2 years.

However, results of the SCCS study, which accounted for confounding by indication and focused on 1506 infants with 1 or more RSV detections who had at least 1 dose of palivizumab, were different. The incidence of RSV detection before age 2 years was 70% lower in the 28 days after the first dose of palivizumab than it was in control periods, and the rate of RSV detections was reduced by 74% in the 28 days after any dose (Moore HC, et al. J Pediatr. 2019;214:121.e1-127.e1).

I have never been completely convinced that palivizumab is worth the cost, yet I prescribe it. This study, although hardly conclusive, makes me feel better about giving it.

A study in 512 mother-child pairs from 6 major cities in Canada found that exposure to higher levels of fluoride during pregnancy was associated with lowered IQ scores in their children at the age of 3 to 4 years. About 41% of participants lived in communities supplied with fluoridated municipal water. Investigators matched participants’ postal codes with water treatment plan zones to estimate water fluoride concentration for each woman. Using a questionnaire, they determined mothers’ consumption of tap water, coffee, and tea during the first and third trimesters and measured maternal urinary fluoride (MUF) concentration in each trimester of pregnancy. They assessed children’s IQ when they were aged 3 or 4 years, using standardized tests.

As expected, median MUF concentration was significantly higher among women who lived in communities with fluoridated drinking water, as was their daily estimated fluoride intake, compared with those who did not live in such communities. Analyses showed that an estimated 1-mg increase in maternal fluoride intake was associated with a 3.66 lower IQ score among both boys and girls. A 1-mg/L increase in MUF was associated with a 4.49-point lower IQ score in boys but not in girls (Green R, et al. JAMA Pediatr. 2019;173[10]:940-948).

I do not like giving anti-fluoride spouters ammunition, but I have to follow science where it leads. The reviewers and editors were very brave to publish this controversial study. We will see if it is replicated down the road. The study looked only at pregnant women, so continue to give fluoride, a well-proven treatment, to your pediatric patients who need it.
Good nutrition is a key component of health. Along with regular physical activity, eating well is considered fundamental to maintaining good health and reducing the risk of chronic diseases. For children and adolescents, healthy nutrition may make all the difference for lifelong physical and mental health by providing key nutrients for neurodevelopment through early childhood.\(^1\)

Guidelines on what constitutes good nutrition for children and adolescents, as well as adults, are well established. Among these are 2 guidelines published in 2015, one for all Americans (adults and children)—*Dietary Guidelines for Americans 2015-2020, 8th edition*,\(^2\) published by the US Department of Health and Human Services and US Department of Agriculture—and one published by the Academy of Nutrition and Dietetics specifically for children aged 2 to 11 years—*Nutrition Guidance for Healthy Children Ages 2 to 11 Years*.\(^3\) As shown in Tables 1 and 2, the foundation of both guidelines is a shift to more plant-based foods (vegetables, fruits, lean protein) and a reduction in saturated fats, sodium, and sugars.

For some children, however, medical conditions may mandate altering the diet to manage the condition. Examples include children with celiac disease for whom gluten is restricted; children with food allergies in whom specific foods related to the allergy are eliminated; overweight and obese children in whom overall caloric intake is reduced; and those with diabetes who need to avoid foods high in simple sugar. Table 3 lists a range of medically prescribed diets.\(^4\) Other conditions for which parents may place their

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**TABLE 1**

**DIETARY GUIDELINES FOR AMERICANS 2015-2020: KEY RECOMMENDATIONS**

<table>
<thead>
<tr>
<th>Healthy eating patterns include:</th>
<th>Saturated fats (consume &lt;10% of calories/d) and trans fats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety of vegetables from all subgroups (dark greens, red and orange, legumes, starchy, and other)</td>
<td>Added sugars (consume &lt;10% of calories/d)</td>
</tr>
<tr>
<td>Fruits, especially whole</td>
<td>Sodium (consume &lt;2300 mg/d)</td>
</tr>
<tr>
<td>Grains, half of which are whole</td>
<td>US Department of Health and Human Services, et al.(^2)</td>
</tr>
<tr>
<td>Fat-free or low-fat dairy products</td>
<td></td>
</tr>
</tbody>
</table>
children on a restricted diet, less supported by evidence but growing in popularity, may include attention-deficit/hyperactivity disorder (ADHD), non-celiac gluten sensitivity, and autism spectrum disorder.5-6 Special diets are seen not only in children with medical conditions, however. Some children are placed on special diets because of family preferences or beliefs or because of limited resources. Parents against animal proteins may choose to eat a vegetarian diet, for example, offering the same diet to their children.7 Some children may lack adequate macronutrients needed for a healthy diet because they come from food-insecure households, which were estimated to account for 6.4 million households in 2015.1

For all children, regardless of whether they receive a special diet or not, healthy nutrition is paramount for normal neurodevelopment growth and good lifelong habits of eating that nourish health and well-being.1 For pediatricians, knowing the diet of a child is critical to ensure the physical and mental health of that child. Along with educating parents...
on what constitutes a healthy diet for their child, parents also need to know the potential adverse effects of special diets on their children. This ranges from inadequate intake of essential micronutrients that may lead to, for example, anemia, to the potential for increased cardiovascular risk in children consuming some gluten-free products that may be higher in sugar and fats (Table 3).4,8,9

“Pediatricians are often unaware of the nutritional impact of various diets and do not know if a patient is receiving sufficient and balanced nutrition,” according to Diane L. Barsky, MD, a pediatric nutrition specialist in the Division of Pediatric Gastroenterology, Hepatology, and Nutrition at the Children’s Hospital of Philadelphia, Pennsylvania, who, with Maria Mascarenhas, MBBS, spoke about special diets in children at the recent American Academy of Pediatrics (AAP) National Conference and Exhibition in New Orleans, Louisiana. “Pediatric patients are also consuming vitamins and supplements that can have benefits, but parents may not be aware of potentially harmful effects from these substances.”

“It is the pediatrician’s responsibility to educate himself or herself, ask their patients about special diets and supplements, and educate/counsel families about these topics,” she says.

**Special diets for children**

**VEGETARIAN DIET**

Pediatricians may encounter children on a wide range of special diets. Among the most common are a group of diets that fall under the umbrella of vegetarianism. These are primarily plant-based diets that involve different degrees of restriction on animal products (Table 4).7,10 Data from the early 2000s estimate that about 2% of US children and adolescents aged 6 to 17 years are vegetarian with about 0.5% described as vegan.10 This number may be higher based on more recent data showing that between 20% to 25% of US adults report some level of consuming a vegetarian diet.6

Although a well-balanced vegetarian diet for children and adolescents is supported by the evidence as well as associations such as the AAP,10 special attention is needed to make sure that children and adolescents on these diets are receiving the required nutrients and protein intake needed for growth and development during these formative years.7,9 Of particular concern is the potential for deficiencies in key micronutrients needed for growth, bone mineral content, and neurodevelopment throughout childhood (Table 4).7

Table 5 provides some guidance on how to prevent micronutrient deficiencies in children who transition to a vegetarian diet.7,7

**GLUTEN-FREE DIET**

Another special diet that has gained in popularity with the broadening availability of products is the gluten-free diet.11 People on a gluten-free diet avoid food and beverages containing wheat and any wheat products (durum, einkorn, emmer, kamut, spelt, enriched flour, farina, graham flour, self-rising flour, semolina, and couscous), barley, rye, triticale, and sometimes oats. Evidence supports the

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**TABLE 4** TYPES OF VEGETARIAN DIETS

<table>
<thead>
<tr>
<th>DIET</th>
<th>INCLUSION/EXCLUSION</th>
<th>POTENTIAL NUTRIENT DEFICIENCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacto-vegetarian</td>
<td>Plant-based (grains, legumes, nuts, fruits, vegetables) including milk and milk products. Excludes eggs, meat, seafood/fish, poultry.</td>
<td>Vitamin B12, Zinc, Iron (potentially)</td>
</tr>
<tr>
<td>Lacto-ovo-vegetarian</td>
<td>Plant-based (grains, legumes, nuts, fruits, vegetables) including eggs and dairy. Excludes meat, seafood/fish, poultry.</td>
<td>Vitamin B12, Zinc, Iron</td>
</tr>
<tr>
<td>Ovo-vegetarian</td>
<td>Plant-based (grains, legumes, nuts, fruits, vegetables). Excludes milk, dairy products, meats, poultry, and seafood.</td>
<td>Vitamin B12, Vitamin D, Calcium, Zinc, Iron (potentially)</td>
</tr>
<tr>
<td>Vegan</td>
<td>Excludes all animal products.</td>
<td>Energy, Protein, Vitamin B12, Vitamin D, Zinc, Calcium, n-3 fatty acids, Iron</td>
</tr>
</tbody>
</table>

Di Genova T, et al; Amit M.10
The use of gluten-free diets when appropriately used for children with celiac disease showing that it can help eliminate symptoms of celiac disease and improve quality of life.11 However, the nutrient levels of gluten-free products vary significantly, and many may not contain key vitamins and nutrients, such as iron, calcium, fiber, thiamin, riboflavin, niacin, and folate. In addition, some gluten-free products contain more fat and sugar than non-gluten-free products and may pose a risk of weight gain and obesity in children as well as potential cardiometabolic risk.9 As such, parents need to be aware of the quality of the gluten-free product their child is consuming to ensure proper nutrition. For most children without celiac disease, a gluten-free diet is not recommended.11

**ANTI-INFLAMMATORY DIET**

A diet that has gained popularity for the entire family and is especially interesting given its well-established benefits with few if any downsides is the anti-inflammatory diet (Table 6).12,13 Data from studies looking at an anti-inflammatory diet—a diet and lifestyle approach combining Mediterranean and Asian diets—suggest that daily adherence to an anti-inflammatory diet may lower a child’s risk of obesity, type 2 diabetes, heart disease, and other conditions linked to inflammation.12,13

Much of the evidence to date on benefits of the anti-inflammatory diet come from studies on the Mediterranean diet, including a 2019 meta-analysis of over 2 million people showing a reduction in mortality (8% from any cause and 10% from cardiovascular or cerebrovascular disease) and 13% reduction in neurodegenerative diseases associated with a 2-point increase of adherence to the Mediterranean diet.14 Other benefits shown in children include a reduction in the severity of asthma and allergies as well as reduced recurrence of asthma and prevention of chronic asthma.13

Important to underscore is that the Mediterranean diet is not a specific diet but a pattern of eating habits that includes plant-based food, healthy fat sources, adequate water intake, and overall inclusion of a wide range of foods preferably eaten in season and locally grown. It is also seen as a lifestyle approach to eating that includes regular physical activi-
nutrition

ity, adequate rest, and conviviality.\textsuperscript{15}

Supplements
Although the AAP does not recommend multivitamins for children and adolescents who eat a healthy, well-balanced diet,\textsuperscript{16} many children receive dietary supplements. For some children this may be placing them at increased risk for getting too much of a certain vitamin. A 2012 national survey found that children taking multivitamins were at increased risk of getting too much iron, zinc, copper, selenium, folic acid, and vitamins A and C.\textsuperscript{17} However, the survey also found that children not on a healthy, well-balanced diet had low levels of vitamin D and E and calcium and therefore may need a multivitamin.\textsuperscript{17}

Other supplements that children may be receiving include a variety of nonvitamin, nonmineral products. The 2012 national survey found that 5\% of children in the United States used a dietary or herbal supplement. Fish oil/omega-3 fatty acids, melatonin, probiotics, echinacea, cranberry, ginseng, and garlic supplements were among the most commonly used.\textsuperscript{18}

Pediatricians need to counsel patients and families that these products are not tested for safety nor effectiveness in children, and that many of the compounds and active ingredients in these products may be unknown and do not cohere to what is on the product’s label.\textsuperscript{18} Given the developing immune, digestive, and central nervous systems in children, especially infants and younger children, patients and families need to be aware of safety concerns. A particular concern is the combination of certain supplements with medications a child may be taking, which may result in unwanted adverse effects. For example, combining vitamin C with acetaminophen slows down the processing of acetaminophen; St. John’s wort may slow down interaction with antidepressants, birth control pills, seizure control drugs, and cancer medications; and melatonin may alter hormones in young children.\textsuperscript{18}

Counsel patients and families
Asking patients and parents/caregivers what diet a child may be receiving is an important first step in evaluating if a patient is receiving adequate nutrition. Educating patients and families on the basics of good nutrition is important for all patients regardless of the diet they receive (see "Educational resources for physicians and patients," left, for additional educational resources).

For children who are placed on a special diet, additional counseling is important to ensure caregivers are aware of potential nutritional deficiencies and ways to counter those deficiencies. An overall assessment of diet may be performed by the pediatrician, but referral to a registered dietitian is important for children on special diets.

Essential to note is that common to all healthiest diets is emphasis on more plant-based food with less reliance on animal-based and processed foods. The established nutritional guidelines as well as the special diets discussed here all deliver this main message.

COMMENTS? E-mail them to cradwan@mmhgroup.com

EDUCATIONAL RESOURCES FOR PEDIATRICIANS AND PATIENTS

- US Food and Drug Administration
  Health Educator’s Nutrition Toolkit: Setting the Table for Healthy Eating (Updated November 12, 2019)
  https://www.fda.gov/food/nutrition-education-resources-materials/health-educators-nutrition-toolkit-setting-table-healthy-eating

- Children’s Hospital of Philadelphia
  Caring for your child: Food as medicine: anti-inflammatory diet (February 2017)

- University of Minnesota
  Taking charge of your health and well-being: Mediterranean diet
  https://www.takingcharge.csh.umn.edu/mediterranean-diet

- National Center for Complementary and Integrative Health (NCCIH)
  Vitamins and minerals (Modified February 9, 2018)
  https://nccih.nih.gov/health/vitamins

- US Department of Agriculture
  ChooseMyPlate.gov: Start simple with MyPlate.
  https://www.choosemyplate.gov/eealthy/start-simple-myplate

- Academy of Nutrition and Dietetics
  Eatright
  https://www.eatright.org/
New maintenance IV fluid recommendation changes decades of practice

A revised clinical practice guideline will significantly reduce the risk of hyponatremia in hospitalized children.

RACHAEL ZIMLICH, RN, BSN

The American Academy of Pediatrics (AAP) Subcommittee on Fluid and Electrolyte Therapy issued a new guideline on intravenous (IV) maintenance fluid therapy last year that was a departure from 6 decades of practice. The rationale behind those changes was discussed in depth at the recent AAP National Conference and Exhibition in New Orleans, Louisiana.

Leonard Feld, MD, PHD, MMM, CPE, FAAP, clinical professor of pediatrics at the Herbert Wertheim College of Medicine at Florida International University in Miami and chair of the AAP subcommittee, led a session titled “Water and salt: New AAP clinical practice guideline for the maintenance of intravenous fluids in children” to discuss the 2018 “Clinical practice guideline: Maintenance intravenous fluids in children.”

The clinical practice guideline was published in Pediatrics in December 2018, and the recommendation was for patients aged 28 days to 18 years in need of maintenance IV fluids to receive isotonic solutions with appropriate potassium chloride and dextrose. This recommendation has the potential to significantly reduce the risk of developing hyponatremia, according to the guideline, and it is a change from 60 years of practice in favor of hypotonic fluids in these populations.

“Each clinician has to appropriately assess the child to decide if [he/she] needs maintenance IV fluids or if they have conditions where other fluid choices may be appropriate.”

—Leonard Feld, MD, PHD, MMM, CPE, FAAP

Why a new guideline

The recommendation was based on randomized clinical trials and took into account study biases. Feld says the recommendation is important, but recognizes the limitations of the guidance. “The recommendation to use the isotonic fluids for maintenance therapy does not mean there are no indications for administering hypotonic fluids, or that isotonic fluids will be safe in all children,” he says, noting that clinical decision-making is key in all cases. “We need to emphasize that it doesn’t apply to all children such as those with high-risk disorders such as congenital heart disease, cancer, etc.”

The committee was made up of a vast spectrum of specialties, Feld says, including nephrologists, epidemiologists, hospital medicine physicians, critical care physicians, surgeons, an-
Opioids are not necessary for tonsillectomy pain

Reducing prescription opioids does not lead to complications for tonsillectomy patients.

MIRANDA HESTER, EDITOR

With a full-blown opioid epidemic making headlines, the push to use nonopioid medications to treat pain has been pervasive. However, a new study in JAMA Otolaryngology-Head & Neck Surgery indicates that children undergoing a tonsillectomy may be given opioid pain relief, going against current practice guidelines that recommend nonopioid relief.¹

Researchers used 2016 to 2017 claims data from a larger national private insurer in the United States. They looked for opioid-naïve children who were aged 1 to 18 years and had a claims code for tonsillectomy either with or without adenoidectomy between April 1, 2016, and December 15, 2017. After removing children who met the exclusion criteria, the sample included 15,793 children.

In the sample, the average age was 7.8 years and 81.1% of the sample were aged younger than 12 years. A slight majority of 52.6% were female. Researchers found that 9411 of the children had at least 1 perioperative medication fill, meaning a prescription drug claim for opioids between 7 days before to 1 day after the procedure, with a median prescription duration of 8 days. The rest of the sample had no perioperative medication fills. The probability of having a fill as well as the duration of the prescription varied across US census divisions. The data showed that having 1 or more perioperative medication fills was not linked with secondary hemorrhage (adjusted odds ratio [AOR], 0.90; 95% confidence interval [CI], 0.73-1.10) or having a return visit for pain or dehydration (AOR, 1.13; 95% CI, 0.95-1.34) when compared with children who had no opioid use. Perioperative fills were linked to increased risk of a return visit for constipation (AOR, 2.02; 95% CI, 1.24-3.28).

The researchers said their findings indicate that reducing opioid prescriptions for tonsillectomies could be possible and not lead to a risk of complications such as secondary hemorrhage or additional pain.

COMMENTS? E-mail them to cradwan@mmhgroup.com

Ms. Zimlich is a freelancer writer in Cleveland, Ohio, who writes regularly for Contemporary Pediatrics. She has nothing to disclose.

For reference, go to ContemporaryPediatrics.com/ opioids-and-tonsillectomy

¹ With a full-blown opioid epidemic making headlines, the push to use nonopioid medications to treat pain has been pervasive. However, a new study in JAMA Otolaryngology-Head & Neck Surgery indicates that children undergoing a tonsillectomy may be given opioid pain relief, going against current practice guidelines that recommend nonopioid relief. Researchers used 2016 to 2017 claims data from a larger national private insurer in the United States. They looked for opioid-naïve children who were aged 1 to 18 years and had a claims code for tonsillectomy either with or without adenoidectomy between April 1, 2016, and December 15, 2017. After removing children who met the exclusion criteria, the sample included 15,793 children.

In the sample, the average age was 7.8 years and 81.1% of the sample were aged younger than 12 years. A slight majority of 52.6% were female. Researchers found that 9411 of the children had at least 1 perioperative medication fill, meaning a prescription drug claim for opioids between 7 days before to 1 day after the procedure, with a median prescription duration of 8 days. The rest of the sample had no perioperative medication fills. The probability of having a fill as well as the duration of the prescription varied across US census divisions. The data showed that having 1 or more perioperative medication fills was not linked with secondary hemorrhage (adjusted odds ratio [AOR], 0.90; 95% confidence interval [CI], 0.73-1.10) or having a return visit for pain or dehydration (AOR, 1.13; 95% CI, 0.95-1.34) when compared with children who had no opioid use. Perioperative fills were linked to increased risk of a return visit for constipation (AOR, 2.02; 95% CI, 1.24-3.28).

The researchers said their findings indicate that reducing opioid prescriptions for tonsillectomies could be possible and not lead to a risk of complications such as secondary hemorrhage or additional pain.

COMMENTS? E-mail them to cradwan@mmhgroup.com

For reference, go to ContemporaryPediatrics.com/ opioids-and-tonsillectomy
PUZZLER

Rash triggers joint pain in an 8-year-old girl

VASUDHA MAHAJAN, MD

An 8-year-old, previously healthy girl presents to the emergency department (ED) with a rash “that looks likes bruises” and joint pain (Figure). Her mother reports that the rash started over her daughter’s lower legs a week earlier and has since spread to her thighs and buttocks. The red patchy rash is not painful and not pruritic. The girl denies new exposures to food or topical products, recent travel, camping, or recent injury.

History and examination

There is no previous history of easy bleeding or bruising. Both patient and mother deny abuse. No other family members have a similar rash. The patient also reports a 2-day history of new onset left knee and left ankle pain associated with knee swelling, which has since spontaneously resolved. No recent trauma is noted.

The patient denies swelling of her hands or shoulders. She denies chest pain, abdominal pain, dysuria, or hematuria. A week prior to the rash, she was evaluated for fever and sore throat and tested negative for streptococcal infection.

On exam, the child is well appearing, alert, and hydrated. Her weight is 87 lb (98th percentile); temperature is 98.5°F; pulse is 98; respiratory rate is 24 breaths/min; blood pressure is 110/60 mm Hg; and pulse oximetry is 100% on room air.

Her physical exam is negative for conjunctivitis, oral ulcers, or lymphadenopathy. Respiratory and cardiovascular exams are within normal limits. Abdominal exam is negative for tenderness on palpation without guarding or rigidity, and bowel sounds are normal. No hepatosplenomegaly is palpated.

The ankle joints are tender on palpation over the lateral and medial malleolus without any swelling, erythema, deformity, or restriction of motion. The knee and hip joints are normal. Neurologic exam is normal without any focal neurologic defects identified.

Her skin exam is positive for palpable purpuric rash that is nonblanchable and nontender (Figure). She also has an interspersed petechial rash over the lower extremity that extends from the ankles to the thighs, lower abdomen, and buttocks. The soles of her feet are not involved.

Laboratory testing

Initial blood work revealed a complete blood count (CBC) with a slightly elevated white blood cell (WBC) count of 10.5 X 10⁹/L (3.40-9.5 X 10⁹/L) with a normal differential; hemoglobin, 12.9 g/dL (12-14 g/dL); platelet count of 481 X 10⁹/L (150-450 X 10⁹/L). A complete metabolic panel showed normal liver function tests and a normal urea/creatinine ratio. Urinalysis was negative for protein, blood, or leukocytes. Serum antinuclear antibody (ANA) test was negative.
infectious disease

Differential diagnosis
The differential diagnosis for rash with joint pain in children is broad and includes both infectious and noninfectious causes (Table). A detailed history with pertinent positives and negatives and a thorough exam is helpful in making the diagnosis. Some of the common differentials are discussed below.

**SYSTEMIC LUPUS ARTHRITIS**
Systemic lupus arthritis (SLE) is a multisystem autoimmune condition caused by inflammation of the blood vessels and connective tissue. Because this condition can involve multiple systems of the body and occurs in episodic flares, the periodic constellation of symptoms can make it hard to diagnose.

Generalized symptoms such as fever, weight loss, lymphadenopathy, and hepatosplenomegaly along with the classic malar rash and nonerosive symmetric arthritis should raise the suspicion for SLE. Laboratory workup is usually positive for cytopenias, transaminitis, and elevated inflammatory markers. A positive ANA titer is a very sensitive marker but not specific, and in the event that it is positive, follow-up with specific anti–double-stranded DNA (anti-dsDNA) antibody and anti-smith (Sm) antibody should be done to differentiate SLE from other connective tissue and vascular disorders.

The patient in this case was well appearing without systemic symptoms and had both a normal blood count and a negative ANA, which made SLE less likely.

**LYME DISEASE**
With Lyme disease, the pathognomonic of the early localized stage (most common presentation within the first 1 to 4 weeks after a tick bite) is the erythema migrans (EM) rash, which appears as a “target-like lesion” or “bull’s-eye appearance” and can be found on the abdomen, axilla, inguinal, or popliteal areas. This is associated with systemic signs such as fever, arthralgia, and headaches.

Laboratory studies might show leukopenia or leukocytosis, elevated inflammatory markers such erythrocyte sedimentation rate (ESR), and liver function abnormalities. Early disseminated disease secondary to hematogenous spread of the bacteria presents as multiple EM, neurologic involvement including facial nerve palsy, or carditis. Lyme arthritis is the main symptom of late disseminated disease, presenting months to years after the tick bite. Lyme disease can be monoarticular or oligoarticular with small effusions and absence of fever.

No exposure to the tick and absence of the characteristic rash and laboratory abnormalities made this diagnosis less likely in this patient.

**RHEUMATIC FEVER**
Acute rheumatic fever (ARF) is one of the causes of primary acquired heart diseases due to an inflammatory reaction after a streptococcal infection. It is a clinical syndrome that includes criteria as outlined in the Jones criteria. Laboratory evidence of a preceding group A streptococcal infection is mandatory for the diagnosis. The rash associated with ARF is erythema marginatum, which is a macular blanching rash characterized by central clearing and found mostly on the trunk and proximal extremities. Migratory polyarthritis and carditis are the most common presenting symptoms.

The rash in this patient did not match the description of the classic rash seen with ARF and her rapid strep test was negative. Since the suspicion for ARF was low based on clinical findings, a throat culture was not ordered.

**IDIOPATHIC THROMBOCYTOPENIC PURPURA**
Idiopathic thrombocytopenic purpura (ITP) is an autoimmune condition resulting in increased platelet destruction secondary to antplatelet antibodies. It is the most common cause of isolated thrombocytopenia in otherwise well children. It
infectious disease

TABLE
DIFFERENTIAL DIAGNOSIS FOR RASH WITH JOINT PAIN

<table>
<thead>
<tr>
<th>INFECTIOUS CAUSES</th>
<th>NONINFECTIOUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacterial:</strong> Group A Streptococcus, Staphylococcus, Gonococcus</td>
<td><strong>Rheumatic</strong></td>
</tr>
<tr>
<td><strong>Viral:</strong> Epstein-Barr virus (EBV), parvovirus</td>
<td><strong>Systemic lupus erythematosus (SLE)</strong></td>
</tr>
<tr>
<td>Lyme disease</td>
<td><strong>Juvenile idiopathic arthritis (JIA)</strong></td>
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<tr>
<td>Rheumatic fever</td>
<td><strong>Vasculitis</strong></td>
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<tr>
<td>Rocky Mountain spotted fever</td>
<td><strong>Kawasaki disease</strong></td>
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<tr>
<td>Meningococcal septicemia</td>
<td><strong>Henoch-Schonlein purpura (HSP)</strong></td>
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<tr>
<td><strong>Neoplastic</strong></td>
<td><strong>Idiopathic thrombocytopenic purpura (ITP)</strong></td>
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<tr>
<td>Leukemia</td>
<td><strong>Thrombotic thrombocytopenic purpura (TTP)</strong></td>
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<td>Lymphoma</td>
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<td>Hemophilia</td>
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Author created

can manifest as sudden onset bruising, petechiae, or mucosal hemorrhage, usually after a viral upper respiratory infection and rarely after live vaccinations. On physical exam, lymphadenopathy might be present secondary to the viral infection, but other systemic signs are absent. Isolated low platelet count below 50 X 10^3/µL with an elevated mean platelet volume and a normal hemoglobin and total white cell count is the only significant laboratory finding. Most cases are self-limiting within 1 to 4 weeks and treatment with oral steroids, intravenous immunoglobulin (IVIG), or anti-D IG is reserved for children with severe hemorrhage or platelet count less than 20 X 10^3/µL.

Normal platelet count ruled out ITP in this patient.

**HENOCCH-SCHONLEIN PURPURA**

Henoch-Schonlein purpura (HSP) is an immune-mediated, small-cell vasculitis and can mimic different conditions depending on the system involved: Abdominal pain secondary to gastrointestinal (GI) involvement can present as acute abdomen; joint involvement may mimic juvenile idiopathic arthritis (JIA), rheumatic arthritis, or gonococcal arthritis; and the rash can look similar to ITP, rickettsial diseases, sepsis, or disseminated intravascular coagulation. Laboratory tests are nonspecific for HSP, and more useful is ruling out other potential causes of the presenting symptoms.

Given the characteristic purpuric rash in this otherwise well-appearing patient, along with laboratory findings ruling out the other potential causes, a diagnosis of HSP was made.

**Discussion**

Henoch-Schonlein purpura is the most common systemic small-vessel vasculitis in children. The mean age of presentation is 6 to 10 years, and the incidence is known to be equal in boys and girls. The disease is more common in autumn and spring.

**ETIOLOGY AND PATHOGENESIS**

The classical pathogenic feature of HSP is deposition of IgA immune complexes in the vessel walls of the kidney and other affected organs. These in turn activate the complement pathway that triggers the inflammatory cascade leading to the clinical picture discussed. The most common trigger for HSP is known to be upper respiratory infection. Several other viruses and bacteria including but not limited to influenza, parainfluenza, Epstein-Barr virus (EBV) and Streptococcus have been associated with HSP.

There have been associations of certain vaccinations such as influenza, meningococcal, measles/mumps/rubella (MMR), and pneumococcal as well as certain drugs with the onset of HSP. However, these associations have not been proven to be linked to causality, and in most cases such associations have been presumed coincidental.

**CLINICAL FEATURES AND COMPLICATIONS**

The diagnosis of HSP is clinical and based on palpable purpura along with one of the following features:

1. Diffuse abdominal pain;
2. Arthralgia or acute arthritis;
3. Renal involvement with proteinuria or hematuria; or
4. Renal biopsy with predominant IgA deposition with leukoclastic vasculitis.

Skin rash in HSP has been described as petechial or palpable purpura. The rash is symmetrical, non-tender, and most commonly observed on the extensor surfaces of the dependent portions of the lower extremities and the buttocks. Involvement of the abdomen and face have been described in rare cases. Hemorrhagic bullae have been reported in only 2% of the affected children and are not related to the severity or the progres-
sion to renal failure. In some cases, macular and urticarial rashes have been reported prior to the development of the purpuric rash.

Abdominal pain is the most common (~75%) associated symptom secondary to visceral purpura causing bowel edema and hemorrhage. Colicky diffuse pain, which is worse after meals and that may be associated with emesis, hematemesis, or guaiac positive stool, is the most common presentation. Although it is associated with purpura the majority of the time, abdominal pain may precede the classic rash in less than 40% of the cases, thereby making the diagnosis a challenge.

Intussusception is the most common complication of abdominal involvement, and an ultrasound is the initial diagnostic modality for identifying it. More severe complications such as extensive hemorrhage and bowel wall gangrene are rare.

Arthritis/arthralgia is the presenting symptom in approximately 25% of patients with HSP, however, more than 50% of patients have articular involvement. It is usually oligoarticular and involves the larger joints of the lower extremities. Even though the pain, swelling, and restricted range of movement can cause significant discomfort, the symptoms resolve spontaneously within a few days to weeks and the response to nonsteroidal anti-inflammatory drugs (NSAIDs) is well documented. There is no long-term deformity or chronic damage to the joints or ligaments.

Renal involvement is seen in 20% to 50% of the patients diagnosed with pediatric HSP. The earliest finding is microscopic hematuria with or without proteinuria. Children aged older than 4 years, purpura persisting for longer than 1 month, and severe GI bleeding are higher risk factors for developing renal disease. The renal symptoms take longer to manifest in comparison with the joint and abdominal symptoms. Several studies have shown that renal involvement was apparent within 3 months of appearance of the purpura in 97% of the patients and within 4 weeks for 75% of the patients.

Based on this, weekly urinalysis and blood pressure measurements must be performed in the first 3 months after diagnosis. About 12% of the children with HSP end up with chronic renal failure about 3 to 4 years after diagnosis.

Other clinical features that have been reported but are less common are headaches, intracranial hemorrhage, pulmonary hemorrhage, scrotal hematoma, and orchitis.

**DIAGNOSIS**

Routine blood work and imaging are not needed to diagnose HSP but may be obtained in atypical presentations in order to rule out other diagnoses. Initial investigations may include a CBC, urea, creatinine, coagulation studies, and urinalysis (UA). If the UA is positive for hematuria or proteinuria, it should be followed up with a protein/creatinine ratio and further laboratory tests to rule out other causes of glomerulonephritis. Moderate leukocytosis with a mild increase in acute phase reactants is commonly seen. Even though HSP by definition requires a normal platelet count, mild thrombocytosis may be seen in children with GI involvement. Elevated IgA levels are seen in 50% of the patients with HSP, however, it is very nonspecific and there is also no co-relation of the IgA levels with the disease severity. Complete levels are normal.

*The management of HSP is primarily supportive and involves hydration and pain control with NSAIDs, and rarely with opioids.*

**MANAGEMENT**

The management of HSP is primarily supportive and involves hydration and pain control with NSAIDs, and rarely with opioids. The treatment with NSAIDs has not shown to increase the risk of GI bleeding. However, in patients with renal involvement and on NSAIDs, close monitoring of renal function and blood pressure is of utmost importance.

The use of steroids in patients with HSP is controversial. Whereas some studies have shown that early use of steroids decreases the duration of abdominal pain and prevents GI and renal complications, other studies have shown no difference. Immunosuppressive treatment and renal biopsy are reserved for patients with nephrotic range proteinuria and progressive renal impairment. An essential part of following patients with HSP is monitoring them for complications. An abdominal ultrasound is required for patients with new onset severe abdominal
infectious disease

**KEY FINDINGS FOR HENOCH-SCHÖNLEIN PURPURA**

- Henoch-Schönlein purpura is a clinical diagnosis based on the characteristic symmetric, nonthrombocytopenic, palpable purpuric rash over the lower extremities and buttocks.
- Gastrointestinal (intussusception) and renal involvement are the most severe complications.
- Management is primarily supportive with NSAIDs for pain. The role of steroids continues to be controversial and is not well established.
- Routine follow-up with urinalysis and regular blood pressure checks is recommended for up to 6 months after the initial diagnosis to monitor for recurrence risk.

**PROGNOSIS**

The prognosis is generally excellent with the majority of the children experiencing complete resolution of the symptoms within 2 to 3 weeks. One-third of the patients experience recurrence, usually within the first 6 months of diagnosis. A recurrence is defined as reappearance of the symptoms after resolution of the disease for at least 2 weeks. It is more likely to happen in children with nephritis. The age of the patient has not been shown to have any association with recurrence risk.

**MONITORING AND FOLLOW-UP**

Close monitoring for children diagnosed with HSP is essential. Serial urinalysis and blood pressure checks should be performed weekly for the first month, every 2 weeks until 3 months, and monthly until 6 months. Renal involvement suggested by hypertension or macroscopic/microscopic hematuria or proteinuria should prompt a nephrology referral. The risk of renal involvement decreases significantly after 6 months.

**Patient course**

The patient in this case is being followed in clinic weekly for urinalysis and blood pressures, which have thus far been negative for hematuria or proteinuria. Her purpuric rash had resolved at about 2 weeks and she now has petechial rashes over the lower extremities. At 3 weeks postdiagnosis, she started complaining of intermittent abdominal pain after meals, and an ultrasound was done that was negative for intussusception. The patient will continue to be monitored as per protocol.

**COMMENTS?** E-mail them to cradwan@mmhgroup.com

**REFERENCES**


Dr Mahajan is assistant professor of Pediatrics, Preferred Medical Group, Phenix City, Alabama. She has nothing to disclose in regard to affiliations with or financial interests in any organization that may have an interest in any part of this article.

**PLUS** Results of the 2019 Issues & Attitudes Survey begin on page 28.
Racial and ethnic inequalities have an impact on child and adolescent development and health outcomes. Pediatricians can help to change this.

Pediatricians may not be able to fix racial inequality, but they certainly can and should play a role in advocating for changes, according to a recent policy statement from the American Academy of Pediatrics (AAP).

Published in *Pediatrics*, the policy statement addresses the impact of racism on the health of children and teenagers, noting that pediatricians should always be watching for opportunities to talk to parents and patients about the effects that exposure to racism could have. Although there have been improvements in racism, as the policy statement notes, clinicians have to realize the extent to which the problem still exists.

“I have been working in this area for some time so the content doesn’t surprise me. However, I think the depth of the existing data across medical, psychological, educational, and judicial and general historical literature already exists,” says Maria Trent, MD, MPH, professor of Pediatrics in adolescent/young adult medicine at Johns Hopkins Medicine in Baltimore, Maryland, and co-author of the policy statement.

The goal of the policy statement was to provide evidence-based guidance on the role of racism in child and adolescent development as well as health outcomes, and to help pediatricians understand their role in employing strategies that can optimize care and improve the health and well-being of the affected children and their families. This also means examining one’s own biases, the statement notes.

“We hope that pediatricians will examine their own biases; begin to help families unpack the impact that racism is having on the health of children; and provide effective support and anticipatory guidance that results in optimal patient-centered, family engaged care, that the overall quality of care for patients and families improves, and that patients will have optimal outcomes,” Trent says. “This will require partnership with community agencies and effective advocacy not only in the office but in our local communities and beyond.”

**How interventions can help**

Some suggested interventions that pediatricians can use to help patients who experience racism include the creation of a culturally safe medical home that is sensitive to racism, using strategies like Raising Resisters to provide support for children and their families to recognize and resist racism; training clinical staff to provide culturally competent care; assessing patients for stressors and connecting them and their families to community support organizations; watching for other mental health conditions—such as posttraumatic stress, anxiety, and depression—in victims of racism; and encouraging cultural diversity and community involvement in the practice.

Trent simplifies these interventions, suggesting that providers adopt the approach recommended by Janie Ward, PHD, a leading scholar.
in education—Read It, Name It, Oppose It, Replace It.

Acts of racism affect all children, teenagers, and families, and in all of the places they spend their time—including schools, Trent notes. Clinicians have to understand the impact to help, and are being tasked to proactively address racism as care providers, community leaders, and child advocates.

More evidence of disparity
A study out of Stanford on racial and ethnic disparities in neonatal intensive care units (NICU) accompanied the policy statement, and reveals that minority infants—particularly African-American infants—were often disadvantaged when it came to care and outcome measures in NICUs. The study reviewed 41 articles that revealed widespread and complex disparities in the structure, process, and outcome measures faced by disadvantaged infants in NICUs. Its authors hope the study provides motivation to create a new normal for these children.

“This review should be seen as an invitation for providers, NICUs, hospitals, and health systems to do quality improvement through a racial/ethnic equity lens,” says Krista Sigurdson, PHD, assistant adjunct professor of Social and Behavioral Sciences at the University of California, San Francisco, and lead author of the report.

At the same time, studies are geographically/historically contextual, she notes.

“Each area of care and healthcare system merits its own analysis. One area that stands out from the systematic review is that NICUs with higher volume black infants may provide worse quality of care,” Sigurdson says. “This suggests that health systems used by black communities deserve particular quality improvement and the same may apply to pediatric services in general.”

Sigurdson says she hopes the report will result in reflection by health systems, but also action from pediatricians.

“Pediatricians can educate themselves on systemic and interpersonal racism and how preterm birth and healthcare systems—including neonatal care—exist within these larger historical and contemporary forces,” she says.

She also suggests pediatricians take a role in helping to develop quality improvement projects that partner with affected communities of color to help define problems and develop solutions tailored to addressing racial and ethnic inequalities in neonatal care. As a frontline provider to patients affected by these disparities, pediatricians can play a vital role in helping to mitigate early exposure to racism.

“In their day-to-day work, pediatricians can advocate for families of color in the NICU and outside to help ensure that they have the supports and services needed,” Sigurdson says. “Pediatricians can make sure that families know what is available to them, particularly in terms of fostering their involvement in the care of their hospitalized infant. They can trust families of color when they voice problems or have complaints about healthcare systems or providers and help address problems that arise.”

COMMENTS? E-mail them to cradwan@mmhgroup.com

Ms Zimlich is a freelance writer in Cleveland, Ohio. She has nothing to disclose.

Fluoride exposure in pregnancy can affect offspring’s IQ. See page 8.
Bronchodilators can help assess asthma severity

Bronchodilator response may offer a diagnostic tool for the severity of a patient’s asthma and could be used to help manage exacerbations.

RACHAEL ZIMLICH, RN, BSN

For children with severe asthma, management of the disease can be more difficult, particularly in how well these patients respond to bronchodilators, according to a recent report.

The study, published in Pediatric Pulmonology, revealed that children with severe asthma have lower lung function—or predicted FEV1%—and poorer asthma control than children with moderate asthma. This information can offer clinicians new tools to help their patients manage asthma and hopefully prevent exacerbation.

Andrea Coverstone, MD, pediatric pulmonologist and professor of Pediatrics at Washington University in St. Louis, Missouri, and lead author of the report, says it’s important for pediatricians to be aware that bronchodilator response in patients with asthma can be used not only as a diagnostic tool, but also as a clinical tool for assessing asthma severity.

“The maximal bronchodilator response is associated with more asthma exacerbations and hospitalizations at baseline, as well as lower lung function and worse asthma control at 1-year follow-up,” she says.

Researchers analyzed the characteristics associated with reversibility of airflow obstruction and response to maximal bronchodilation in children aged 6 to 17 years who were enrolled in the National Heart, Lung, and Blood Institute’s Severe Asthma Research Program (SARP). Lung function is a predictor of bronchodilator response in children with asthma, according to the report, and bronchodilator response can be used to identify a phenotype of pediatric asthma with particularly low lung function and poor asthma control.

In the study, participants with diagnosed asthma were evaluated for multiple allergens, and had serum immunoglobulin testing completed. Researchers tested fractional exhaled nitric oxide (FeNO) and performed spirometry, calculating bronchodilator reversibility as ≥12% FEV1 from their baseline. These maximum relative increases were found to be significantly higher in children with severe asthma than in those with nonsevere asthma. Secondhand smoke exposure and FeNO were associated with higher reversibility after bronchodilators were given, and a higher prebronchodilator FEV1% was associated with lower odds. For the entire cohort, bronchodilator reversibility was associated with neutrophil counts, immunoglobulin E, and predicted FEV1%.

Benefit of testing

The study is important because it may help identify children with asthma who may be at risk of airflow obstruction reversibility after maximal bronchodilator administration. Coverstone says the study shows the benefit of bronchodilator response testing as a clinical tool for ongoing care.

“While it is recommended to monitor lung function at least annually in patients with asthma, it is not common practice to routinely assess the bronchodilator response outside of the initial assessment when diagnosing asthma,” she says. “This study identifies the bronchodilator response as another tool for phenotyping asthma in children.”

Coverstone says the longitudinal findings of the report surprised her most.

CONTINUED ON PAGE 25
Lichen striatus is an uncommon condition that usually affects children aged to 15 years. It often presents as a linear band of inflammatory flat-topped papules ranging in color from pink to skin-colored to tan and often resolves with postinflammatory hypopigmentation. The linear arrangement of the papules characteristically follows Blaschko’s lines and can present in a continuous band or with interrupted areas. The distribution along Blaschko’s lines points to a somatic mosaicism pathogenesis, but neither the involved genes nor the inciting factors are known. The papules tend to be asymptomatic but occasionally have associated pruritus. Lichen striatus usually appears on the extremities and less commonly on the trunk, face, neck, or buttocks. Lichen striatus rarely affects the nail, but when it does it is almost exclusively seen in children. Unlike lichen planus that can affect the whole nail, lichen striatus involves just the medial or lateral portion and may result in onycholysis, splitting, longitudinal ridging, fraying, or, rarely, total nail loss.

The condition tends to appear abruptly and reaches its maximum extent within a few days to weeks (occasionally up to several months), then spontaneously resolves over a period of a few months to 2 to 3 years. The resulting postinflammatory hypopigmentation can take a year or more to disappear. In individuals with darker skin tones, lichen striatus may not be noticeable until the appearance of a resolving band of hypopigmentation. Recurrences of lichen striatus are unusual.

**Histopathology**

The histological findings of lichen striatus can vary depending on which part of the linear band is biopsied, and how long the lesion has been present. However, most cases display a combination of spongiotic and lichenoid interface dermatitis with perivascular and periadnexal lymphocytic infiltrates.
The dermoepidermal junction. The infiltrate can surround eccrine sweat glands, ducts, and hair follicles distinguishing it from lichen planus.

Epidermal changes include hyperkeratosis, focal parakeratosis, intercellular and intracellular edema, focal spongiosis, and lymphocytic exocytosis. Dyskeratotic keratinocytes also can be found in the granular and horny layers or at the level of the dermoepidermal junction.

Differential diagnosis
The differential diagnosis includes linear lichen planus (LP), blaschkitis, linear graft versus host disease (GVHD), linear epidermal nevus, lichen nitidus, and other inflammatory disorders in a linear pattern such as linear porokeratosis, and linear psoriasis. Blaschkitis more often favors the trunk, has multiple streaks, and presents in adults, and linear GVHD occurs in a specific clinical setting. Although lichen striatus and linear LP can look similar histologically, their clinical appearance is what sets them apart. Hypopigmentation is the most common sequela of lichen striatus, whereas linear lichen planus resolves with hyperpigmentation. If lichen striatus persists beyond a year’s time, a biopsy can help distinguish lichen striatus from other entities.

Management
Lichen striatus is a benign, transitory condition not requiring treatment unless the lesion is pruritic, in which case topical steroids or nonsteroidal anti-inflammatory agents such as calcineurin inhibitors can be prescribed.

Patient outcome
For this patient, lichen striatus was diagnosed clinically and no further workup was required. The natural history of the disease was discussed with the family, and they elected to have the boy followed clinically without treatment.

**COMMENTS?** E-mail them to cradwan@mmhgroup.com

**Ms Schoenberg** is a fourth-year medical student, Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania.

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The author and section editor have nothing to disclose in regard to affiliations with or financial interests in any organizations that may have an interest in any part of this article. Vignettes are based on real cases that have been modified to allow the author and editor to focus on key teaching points. Images also may be edited or substituted for teaching purposes.

**For references, go to ContemporaryPediatrics.com/dermcase-0120**

**Bronchodilators**

**CONTINUED FROM PAGE 23**

“Children with a 12% bronchodilator response at their baseline assessment had less decline in lung function at 1 year compared with those that did not have a bronchodilator response. However, they also had lower lung function at initial assessment and despite having less decline, lung function remained lower at that 1-year follow-up assessment,” she says.

Coverstone suggests that long follow-up may help determine the trajectory of lung function in children with severe asthma.

“Is having a bronchodilator response indicative of the lung’s capability of preserving lung function? It appears that the bronchodilator response can be an indicator of a more severe asthma phenotype with lower lung function and asthma control, but also might indicate those more likely to respond to treatment,” she says. “Other studies have shown that a bronchodilator response is associated with a positive response to treatment with inhaled corticosteroids.”

Pediatricians should consider regularly assess bronchodilator response in their severe asthma patients to help in assessing their condition and their response to treatment, she adds. Additionally, practitioners should be aware of differences in asthma management at different severity levels, and be aware of other exposures patients have that may exacerbate their condition, like cigarette smoke exposure.

“It is important to note that children with less severe asthma often do not achieve the same level of bronchodilator response to lower doses of albuterol than those with severe asthma, and that the baseline lung function is strongly associated with the response to bronchodilators,” she says. “In clinical practice, using higher doses of albuterol may be useful in assessing the maximal response in combination with the use of FeNO, which is also associated with bronchodilator response. Assessing for smoke exposure in the home is a must.”

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**For reference, go to**

ContemporaryPediatrics.com/bronchodilators-and-asthma-severity
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What’s ruining medicine for pediatricians

Faced with ongoing and emerging challenges that compete for their time, pediatricians are struggling to provide quality care and counseling.

CATHERINE M RADWAN, MANAGING EDITOR

When Contemporary Pediatrics first surveyed our pediatrician readership in 2013 about being a practitioner in the day and what you thought about various issues facing the practice of Pediatrics at the time, we were surprised by what affected your professional and personal satisfaction with the job. Now, with the results of our latest Annual Issues & Attitudes Survey in hand, we can say that certain aspects of pediatric practice haven’t changed much in 7 years—but this time there are also some new problems that, like in the past, haunt you by day and keep you up at night.

What are these issues? How are you dealing with them and the changes occurring in pediatric practice? How do you handle the stress that comes with your job? Above all, are you happy with what you do?

We posed these questions and more to a population of 14,442 US-based pediatricians in an electronic survey during September/October 2019. Here are some highlights of what they said in 2019—versus their take in 2013.

About your job

In 2013, 44% of survey respondents were less optimistic about their ability to provide adequate care for patients, with healthcare reform (39%), insufficient time with patients (24%), and problematic reimbursement (17%) as the top 3 reasons for their pessimism.

In 2019, that percentage jumped to 57% feeling less optimistic— for these same 3 reasons, with insufficient time with patients (29%) taking the number 1 spot followed by inadequate reimbursement (25%) and healthcare reform (14%).

As for job satisfaction, 50% of 2019 respondents expressed satisfaction/extreme satisfaction with their current situation whereas just 16% said they were very dissatisfied.
Challenges you face
In 2013, 39% of respondents noted the top challenge to effective practice was healthcare reform mandates, with 21% stating that Maintenance of Certification requirements negatively affected their practices. In 2019, 45% of respondents cited electronic health records (EHRs) as the biggest detriment to effective practice, followed closely by 42% who cited dealing with insurance reimbursement.

Nearly 60% of 2019 survey respondents reported their workload increased this past year, and 69% said their stress level also increased. Why? They cited increased administrative workloads (27%), burdensome technology (20%) and higher patient volume (11%). Here’s a bright spot: Only 45% of 2019 respondents said they experienced stress from their EHRs compared with 82% in 2013.

The biggest challenge this year’s survey respondents anticipate for 2020 is increased throughput pressure—seeing more patients for briefer periods of time as mandated by insurance companies for reimbursement. Respondents to the 2013 survey also had ranked the insurance push to see more patients as their top challenge going forward. After 7 years, the fight for face time with patients wages on.

Top 2 challenges in 2019

- EHRs: 45% (2019) vs. 40% (2014)
- Dealing with insurance: 42% (2019) vs. 42% (2014)

Workload increased

- 2013: 61%
- 2019: 60%

Stress increased

- 2014: 73%
- 2019: 69%

Job satisfaction 2019

- Satisfied: 39%
- Some dissatisfaction: 34%

Good news
There is a silver lining to this doom and gloom. In spite of it all, 58% of this year’s survey respondents said they’d pick Pediatrics all over again if given the choice of medical specialty, far outpacing runner-up Dermatology as their next-place specialty of choice. Spoiler alert: Your love of children is showing!

E-mail comments to cradwan@mmhgroup.com

There’s much more to come about the state of Pediatrics from our 2019 Issues & Attitudes Survey. You’ll also find survey summaries on our website at ContemporaryPediatrics.com/2019-survey.
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