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After-hours care
What’s happened to the pediatric medical home?

Kids deserve the best care when they are ill or injured, and the best care should come from seeing their pediatrician in the medical home.

MICK CONNORS, MD, FAAP

A child becomes ill or injured and the pediatric office is closed. What does a parent do? Where does a parent turn for care? What matters most to parents? Do they choose where to go based on cost, convenience, or pediatric expertise?

These questions are top of mind for us in pediatric emergency medicine as we witness the evolution, or perhaps dissolution, of after-hours care for kids. The current after-hours marketplace offers more options, easier access, and inconsistent quality. I often wonder, what has happened to the inclusion of the pediatric medical home? What has happened to the value of a pediatrician?

Are pediatricians fully aware of the current landscape? Are we all doing enough to educate patients and families about where, when, and how to seek care? The referrals we see in the pediatric emergency department (ED) come less and less frequently from pediatricians and more and more from retail clinics, urgent cares, and local EDs. My perspective, from the pediatric ED, suggests that access is improving but the variation in quality of care is widening. We witness the variation in care and the challenge to the family as parents mistakenly choose convenient and low-cost care before they realize the need for expert pediatric care when their child needs it most.

These current fragmented offerings threaten the relationship of the pediatrician and his/her patients. It is also big business. Estimates suggest that nearly $30 billion is spent annually on after-hours pediatric care, which encompasses more than 24 million visits.1 Visits to EDs, urgent cares, and retail clinics continue to grow exponentially. Direct-to-consumer telemedicine is the newest offering, which again disrupts the continuity of care.

Look at the current landscape

EMERGENCY DEPARTMENTS: Although we as pediatricians might think that all these patients go to the local children’s hospital ED, the data suggest that only 25% of pediatric ED visits are seen in academic children’s hospitals.2 Seventy-five percent of children are seen in the close-by ED and by a variety of providers. Of course, visits to regional EDs often result in a transfer to the pediatric ED. Data would suggest that many of the children transferred even by ambulance are deemed unnecessary, and ED costs are very high.

URGENT CARE: The number of these offices is growing rapidly, and you just need to drive around your town to see the inundation of these offerings. These centers are staffed with a wide variety of personnel and with a variety of pediatric experience, if any. Urgent cares are not created equal, but they do offer lower costs compared with an ED visit. Pediatric-specific urgent cares are a small percentage.

RETAIL CLINICS: You see them on virtually every corner. These centers offer a nurse practitioner and routine point-of-care testing, including an adenoviral test for pink eye. The clinics don’t have pediatricians and are found inside the retail pharmacy. These centers are convenient and are generally lower cost than urgent cares or EDs.

Continued on Page 4

$30 billion
Estimated amount spent annually on after-hours pediatric care, which encompasses more than 24 million visits.1
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Pediatricians can’t see all patients at all times, but they should be able to help families prepare and understand where to go in time of need.

**TELEMEDICINE:** New to the market is direct-to-consumer telemedicine. Many corporations and even some insurance companies are seeking to reduce ED visits by offering in-home video visits. The family logs onto a computer and requests a visit with a physician who is not their own doctor but one who is employed by the telemedicine service. The presence of a pediatrician is rare, and the providers have a variety of backgrounds and are generally licensed in many states.

**What should pediatricians do for starters?**
Encourage parents to call the pediatric office after hours. Whether you utilize a telephone nurse call center or your own service, Dr. Barton Schmitt’s standardized protocols offer parents triage advice. The nurse is able to handle 60% to 70% of after-hours calls for the families over the phone and keep the family connected to the medical home.

Investigate your area’s offerings and educate your families on best places to go in case of an urgent or emergent need. Pediatricians can’t see all patients at all times, but one should be able to help families prepare and understand where to go in time of need. Hopefully, parents can call the office and get the advice they need or be prepared prior to leaving the home.

**Pediatricians should think outside the box**
Identify and track your patients’ utilization data. Understand where your patients are going and ask them why and how you can innovate to provide better care and better access.

Partner with your nurse triage call center. A recent article in *Contemporary Pediatrics* suggested that fewer than 10% of pediatricians take calls from these after-hours centers, and, as mentioned, 30% of these calls are referred for additional evaluation before the office opens. Taking these calls or ensuring your call center recommends quality pediatric care is an excellent way to save your families time and money and foster relationships. Of course, this call burden is not reimbursed and must be balanced with the added burden to your pediatricians.

Consider expanding after-hours or walk-in hours so to meet the ill child on demand. Families often report being unable to get an appointment with their primary care provider as a reason to visit the ED. The cost of an ED visit is incredibly high compared with an office visit. Of course, additional hours that add additional overhead costs are an added burden and a challenge for us all.

Finally, don’t ignore the presence or impact of direct-to-consumer telemedicine. Families are being encouraged to see other doctors by their employers and the same insurance companies that you contract with to provide care. Make sure you and your families are aware of the care being offered and by whom. Have you considered offering telemedicine? See the American Academy of Pediatrics (AAP) guidelines on after-hours care and telemedicine. Pediatricians need to innovate to stay connected to their patients and provide the pediatric care their patients need.

Kids deserve the best care when they are ill or injured. In my biased opinion, the best care comes from seeing a pediatrician and ensuring continuity with the medical home. We all need to foster the value of the pediatrician and the value of the relationship with the medical home to ensure that families seek expert pediatric care for their child.

The kids deserve it. ■

**Dr Connors** is a pediatric emergency physician who is currently providing locum tenens support at multiple children’s hospitals. He is also founder and CEO of Anytime Pediatrics PLLC, Knoxville, Tennessee, a mobile and web application that seeks to connect patients with their local pediatrician via telemedicine.

**For references, go to** [ContemporaryPediatrics.com/after-hours-care](https://www.ContemporaryPediatrics.com/after-hours-care)

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Inded it does, according to a randomized trial conducted during a 3-year period in England and Wales in more than 1300 exclusively breastfed infants.

The investigation found that infants who were gradually introduced to solid foods beginning at the age of 3 months—while continuing to breastfeed—slept significantly more at night and awoke less often than infants who were not introduced to solid food until they were aged 6 months.

Mothers of the early-introduction group (EIG) were encouraged to continue breastfeeding while also introducing nonallergenic foods initially and then adding 6 allergenic foods to their infant’s diet. Mothers of the standard-introduction group (SIG) remained with exclusive breastfeeding for about 6 months before introducing solid foods, although many mothers in this group fed their babies nonallergenic solids before this time.

Each month families completed an online questionnaire about food consumption and breastfeeding frequency and duration until their child was a year old, and then every 3 months until age 3 years.

Compared with infants in the SIG group, EIG infants slept significantly longer during the night from the time they were aged 5 months to beyond age 1 year. Investigators estimated that EIG infants slept a mean of 7.3 minutes more each night on average than their SIG peers during the duration of the study. The difference between the 2 groups peaked at about age 6 months when EIG infants slept 17 minutes longer than those in the SIG group and were waking at night 2 fewer times a week.

In addition, families of the SIG group were significantly more likely to report a sleep problem in their child, while parents of the EIG group reported fewer serious sleep problems. The 2 groups did not differ in how much they slept during the day (Perkin MR, et al. JAMA Pediatr. July 9, 2018. Epub ahead of print).

So, early introduction of solids in breastfeeding babies may increase duration of sleep, but just a little. On the other hand, a total of 2 hours per week of extra sleep in the family of a 6-month-old might make a real difference in the long run. It may be that the most significant difference between the 2 groups noted in this study is the parents’ report of fewer serious sleep problems in the EIG.

I wonder if this is really a reflection of parents’ having less anxiety about their babies being hungry overnight.
Journal Club

Infant feeding practices influence gut microbiota

Breastfeeding may help to protect against overweight by modifying the gut microbiota, particularly early in life, a longitudinal Canadian study in more than 1000 infants suggests.

Mothers completed questionnaires at 3, 6, and 12 months postpartum, reporting on breastfeeding and the introduction of formula and complementary foods. Investigators collected fecal samples for microbe analysis at 3 to 4 months and at 12 months, at which time infants also were weighed and measured.

Infants fed formula were at higher risk of overweight than those who were breastfed; by 12 months, 33.3% of infants who were fed formula exclusively were overweight or at risk of overweight as were 27.6% of those who were fed both formula and breast milk. This compares with 19.2% of infants who were exclusively breastfed. Briefly being fed formula in the hospital, followed by exclusive breastfeeding, did not increase the risk of overweight.

This dose-dependent increase in risk of overweight associated with substituting formula for breast milk seemed to go in tandem with changes in microbiota that are related to overweight. (Complementary foods did not have the same effect.) Most significant, at age 3 to 4 months, was the abundance of Lachnospiraceae seen in formula-fed infants who became overweight by 12 months. Furthermore, compared with breastfeeding infants, formula-fed babies had a higher ratio of organisms associated with obesity to those known to be beneficial.

Formula-fed babies had much more diverse gut bacteria, some forms of which may contribute to the risk of becoming overweight (Forbes JD, et al. JAMA Pediatr. 2018;172[7]:e181161).

Obstructive sleep apnea treatment may be a therapeutic option for NAFLD

Treatment of obstructive sleep apnea/nocturnal hypoxia with continuous positive airway pressure (CPAP) in children with non-alcoholic fatty liver disease (NAFLD) reduces the severity of liver injury and of oxidative stress. These were the findings of a study in 9 Hispanic boys (mean age, 11.5 years; mean body mass index [BMI], 29.5) with liver biopsy-confirmed NAFLD and severe obstructive sleep apnea/hypoxia who were studied before and after CPAP therapy. At baseline, participants also had elevated aminotransferases, metabolic syndrome, and significant oxidative stress (high F(2)-isoprostanes).

Participants were treated with CPAP an average of 89 days, which resulted in longer total sleep time as well as improvements in obstructive sleep apnea and hypoxia. Also, although BMI increased over time, biomarkers of liver injury improved: Alanine aminotransferase decreased significantly, and there was a trend toward improved aspartate aminotransferase.

In addition, investigators saw reductions in metabolic syndrome markers and F(2)-isoprostanes. They also noted that increased minutes of CPAP use per day were strongly correlated with reduced insulin and increased leptin levels (Sundaram SS, et al. J Pediatr. 2018;198:67.e1-75.e1).
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Syndromic Testing: The right test, the first time.
Breath-actuated inhalers in childhood asthma

Tailoring drug delivery modalities to the individual patient based on age, ability level, and preference can optimize control of pediatric asthma.

In February 2018, the pharmaceutical company Teva (Petah Tikva, Israel) replaced its QVAR (beclomethasone dipropionate) pressurized metered-dose inhaler (pMDI) with a breath-actuated inhaler (BAI) known as the RediHaler. Drug delivery of inhaled corticosteroids has traditionally been accomplished using a pMDI. However, some patients have difficulty synchronizing device actuation with inhalation. The BAI was developed to overcome hand-breath coordination problems and utilizes the patient’s inspiratory flow to trigger release of an aerosol.1

Although theoretically easier to use than a pMDI, the BAI is not used with a spacer and requires a sustained inspiratory effort that may be difficult for young children to perform.2 This article discusses the use of BAIs in children and poses alternative treatments for those who cannot perform the inhalation maneuvers required for use of this device.

Advantages of BAIs

In a randomized trial, BAIs were shown to be therapeutically equivalent to pMDIs, assuming appropriate pMDI technique.3 However, a BAI device achieves improved drug deposition in the lungs compared with a pMDI device that is used with poor hand-breath coordination.2,4 The BAI also has increased ease of use, with 55% of subjects in 1 study reporting it to be “extremely easy,” compared with only 41% in the pMDI group.3

The BAI was developed to overcome hand-breath coordination problems and utilizes the patient’s inspiratory flow to trigger release of an aerosol.1

Additionally, the BAI is triggered by a relatively low flow rate compared with currently available dry powder inhalers (DPIs) and may be considered a good choice for children who cannot generate powerful inspiratory flows. It is a valuable delivery device and should be considered for pediatric patients who meet the criteria for its usage.
Disadvantages of BAI s

There are several important limitations of the BAI device. A flow rate below the activating threshold will not trigger the dose-delivery mechanism, which precludes drug release. Thus, a BAI is not appropriate for infants and children who cannot perform a sustained inhalation of sufficient magnitude or whose only possible inhalation technique is restful breathing. Among children who can trigger the device, those aged 5 to 7 years appear to receive less drug deposition into the lungs and more into the oropharynx compared with older groups. Another drawback of the BAI device is the requirement of breath holding after inhalation. A study examining the effect of various breath hold times on inhaled corticosteroid deposition in the lungs found a 16% reduction following a 1-second versus a 10-second breath hold time.

Other delivery systems

A summary of currently available inhaled corticosteroids and corresponding delivery devices is provided in the Table. Each delivery device has its own set of advantages and limitations, which should be carefully considered before treatment.

Similar to BAI s, DPI s such as the Arnuity Ellipta can overcome hand-breath coordination problems. However, the delivered dose is flow- and acceleration-dependent, such that suboptimal inhalation velocity leads to larger particle size and more deposition in the mouth and oropharynx. Children also may be unable to generate adequate inspiratory flow during periods of acute wheezing. Respiratory trainers are available to determine if patients can generate sufficient flow for specific devices.

Nebulized treatments likewise eliminate the need for coordinated breathing but result in nonuniform particle sizes and drug loss to the environment. They additionally require a power source and long treatment times, which may impose an unnecessary burden on patients and their families.

Guidelines for inhaler selection

To assist the practitioner, the Global Initiative for Asthma (GINA), other expert consensus panels, and au-
Authorities in the field have proposed guidelines for inhaler selection in young children. Breath-actuated devices should only be used in children aged 6 to 7 years and older, as the inspiration time in patients aged younger than this is generally too short to complete an effective inhalation. A pMDI with a valved holding chamber is the preferred delivery system for patients aged 5 years and younger. The spacer should be used with a face mask in children aged 0 to 3 years because restful breathing is the only possible inhalation method in this group. Nebulizers should be reserved for the minority of these patients who cannot be trained to effectively use a spacer.

Once an effective delivery mechanism has been identified, it should not be switched without a clinical visit or consultation, because this has been associated with worsened asthma control.

**Summary**

Staying informed about the advantages and limitations of currently available inhaler devices, including the new QVAR RediHaler, is an essential duty of asthma practitioners and pharmacy benefits management-plan providers alike. Ultimately, tailoring drug delivery modalities to the individual patient based on age, ability level, and preference can optimize disease control and should be highly encouraged.

The authors 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.

For references, go to ContemporaryPediatrics.com/breath-actuated-inhalers

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Thomas understood the need for kid-friendly educational materials to teach children and their families about the diagnosis of asthma and their medication’s underlying mechanism of action. The story-driven collection includes comic books with activity pages, an asthma action plan, trading cards, videos, inhaler labels, stickers, and posters that work together to engage children and provide a deeper understanding of asthma through engaging illustrations and text.

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A 6-day-old, late-preterm male neonate presents to his pediatrician’s office with bilious emesis and is admitted for further evaluation. He was born at 36 weeks and 6 days via spontaneous vaginal delivery to a 23-year-old G4P4 mother with negative serologies, negative antenatal Group B Streptococcus testing, and no significant prenatal events. His stay in the newborn nursery was unremarkable. The neonate is exclusively breastfed, has no history of rectal bleeding, and passed meconium within the first 24 hours of life.

**Physical exam**

On admission, the patient was afebrile with a pulse of 115 beats/minute, respiratory rate of 32 breaths/minute, blood pressure of 67/31 mm Hg, and a pulse oximetry reading of 96% on room air. His weight was 2850 grams, down 13% from birth weight. He was alert, interactive, and in no apparent distress. His anterior fontanel was slightly sunken, and his mucous membranes were dry. His abdomen was soft and nondistended, without obvious palpable masses or hepatosplenomegaly, and there were active bowel sounds in all quadrants. The infant did not appear disturbed with attempts to examine his abdomen.

**Further testing**

Initial laboratory studies, including a complete blood count, comprehensive metabolic profile, lactic acid, and inflammatory markers, were within normal limits.

An abdominal radiograph demonstrated nonobstructive bowel distension but was also notable for a 4-cm by 2.5-cm radiopaque structure within the right lower quadrant (Figure 1). Further imaging with an abdominal ultrasound revealed a 4-cm ovoid cystic structure in the right flank with a “double wall sign” consistent with a duplication cyst (Figure 2).

**Differential diagnosis**

The neonate presenting with bilious emesis can occasionally present the clinician with a diagnostic challenge, as the differential diagnosis can be deceivingly narrow (Table). Classically, neonatal bilious emesis is presumed to be malrotation with volvulus until proven otherwise. However, several other conditions are possible.
are capable of producing symptoms of bowel obstruction distal to the ampulla of Vater, including duodenal atresia, jejunoileal atresia, meconium ileus, necrotizing enterocolitis, and duplication cysts.

Often, the clinician chooses an abdominal radiograph for the initial evaluation of bilious emesis to evaluate for an obstructive bowel gas pattern, “double bubble” sign, or an underlying mass. If the abdominal film is unremarkable, further evaluation with an upper gastrointestinal (GI) series is the next step. In this patient, there was concern for a space-occupying mass in the right lower quadrant, prompting further investigation with an abdominal ultrasound instead of an upper GI series.

Hospital course
Surgery was consulted and took the patient to the operating room. An exam under anesthesia was notable for a palpable, well-circumscribed mobile mass in the right lower quadrant. The mass was found to be a duplication of the cecum sharing a common wall but not directly communicating with the true intestinal lumen. An ileocecectomy was executed with subsequent end-to-end ileocolotomy. There was no surgical evidence of intestinal malrotation or other obstructive lesions.

Discussion
Enteric duplication cysts are congenital anomalies involving duplication at any point throughout the GI tract from the mouth to the rectum. They are most commonly found in the small intestine, although there have been cases describing lesions in the esophagus, colon, jejunum, and stomach. These lesions are highly variable in character, but they do not usually communicate directly with the true intestinal lumen. Rather, they are frequently found sharing a common smooth muscle wall and blood supply with the neighboring enteric tract.

The incidence of enteric duplication cysts is estimated in the range of 1 in every 18,000 live births. Enteric duplications may be suspected in the presence of a cystic mass in the fetal abdomen on prenatal ultrasound during the second or third trimesters. However, even with advancing technology, prenatal ultrasound only identifies approximately 20% to 30% of lesions.

Clinically, the majority of symptomatic enteric duplications present in the infantile period. Approximately 70% of symptomatic enteric duplications will present within the first year of life, with up to 85% presenting by age 2 years. Their clinical presentation varies based on their size, location, and presence or absence of gastric mucosa. Accumulation of secretions can lead to fluid collection and subsequent mass effect, causing abdominal pain, distension, obstruction, or a lead point for intussusception. Moreover, the presence of gastric mucosa within the cyst, although rare, can cause ulceration and perforation of the neighboring mucosa leading to melena or hematochezia.

The diagnosis is made via ultrasonography, either prenatally or postnatally. The lesions appear cystic in the majority of cases. The classic
ultrasound finding consists of the “double wall” sign resulting from the relative hyperechogenicity of the mucosa-submucosa in relation to the hypoechoic muscularis propria.10 This sign is considered pathognomonic of duplication cysts.11,12

Treatment and management
Management of enteric duplication cysts is surgical. Many authors recommend complete primary excision of any symptomatic lesion close to the time of diagnosis to prevent repetitive or worsening symptoms. In asymptomatic cases, surgical resection is still the standard of care to prevent future complications and the risk of malignant transformation, although the optimal timing remains variable.8,10,13-14

Patient outcome
Pathology confirmed this patient’s diagnosis in the immediate postoperative period. Over the next 3 days, the infant’s bowel function recovered, he was able to tolerate breast-feeding without emesis, was able to appropriately gain weight for his age, and was subsequently discharged.

Conclusion
Enteric duplication cysts are rare congenital malformations that occasionally may present with signs of bowel obstruction in the neonatal period. Clinicians should be mindful of these lesions when developing their differential diagnosis for the neonate presenting with bilious emesis.

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Pediatric psoriasis comorbidity screening guidelines

Children with psoriasis may have higher rates of associated medical comorbidities. Newest recommendations say such kids should be screened for these risk factors.

A growing body of evidence suggests that adults with psoriasis are at risk for a litany of systemic and behavioral comorbidities. Among them: obesity, hypertension, dyslipidemia, type 2 diabetes mellitus, psoriatic arthritis, nonalcoholic fatty liver disease (NAFLD), depression, anxiety, suicidality and impaired quality of life.¹

“We’re beginning to see similar changes in adolescent patients with psoriasis,” says Douglas W. Kress, MD, clinical associate professor of Dermatology, University of Pittsburgh School of Medicine, Pennsylvania.

One example is that whereas providers generally know arthritis is an adult psoriasis comorbidity, pediatricians might not suspect it in their adolescent psoriasis patients, and kids shouldn’t have joint pain, according to Kress. “Any child with psoriasis and unexplained joint pain should be evaluated by a subspecialist for the possibility of psoriatic arthritis, which would warrant more aggressive therapy,” he says.

By identifying comorbidity risk factors early, pediatricians and other providers can intervene to minimize health effects in the patient’s lifetime and lessen the impact of psoriasis.¹
Newest guidance

Until last year, pediatricians and other providers treating children with the disease lacked comorbidity screening guidelines looking specifically at pediatric psoriasis. That changed in July last year, when a multispecialty panel of psoriasis experts released the first such consensus statement. It offers recommendations that are relevant for all healthcare providers who care for pediatric psoriasis patients, including pediatricians and dermatologists. 1

Pediatricians have long known that having psoriasis is a major psychosocial issue for kids, says Bernard A. Cohen, MD, professor of Pediatrics and Dermatology, Johns Hopkins University School of Medicine, Baltimore, Maryland.

“We’re aware that especially adolescents with things like psoriasis, bad eczema, and moderate-to-severe acne actually score worse on quality of life studies than kids with things like liver disease, renal failure, heart disease,” Cohen says.2

With today’s knowledge that psoriasis is associated with so many other medical comorbidities, pediatricians and others are realizing psoriasis is a systemic disease—not just a skin thing, Cohen says.

“If you have uncontrolled psoriasis or psoriasis that has been active for long periods of time, it puts kids at risk for atherosclerotic disease, obesity, and complications that come with that. It puts kids at increased risk for being hypertensive, having elevated lipids. It also affects quality of life because those kids are afraid to go to school and show off their skin,” Cohen says. “[The recent guidelines] give us data to support the things that we have thought for the last number of years, but now we have something official for pediatricians—not just for dermatologists.”

Screening recommendations

The Pediatric Dermatology Research Alliance (PeDRA), a consortium of pediatric dermatology researchers, and the National Psoriasis Foundation evaluated and graded evidence quality after doing a literature review from 1999 to 2015. Of the 153 manuscripts they analyzed, 26 studies involved children and teenagers. 1

OBESITY, OVERWEIGHT

The panel recommends screening for overweight and obesity annually using body mass index (BMI) percentile, starting at age 2 years. Pediatricians identifying patients as overweight or obese should counsel patients and families about the importance of making lifestyle changes. Pediatricians should consider referral to a pediatric tertiary weight management center for children whose BMIs are greater than 120% of the 95th percentile. 1

Studies show pediatric psoriasis patients are more likely to be obese or overweight. The theory is that excess adipose tissue is linked with a proinflammatory state, including increased cytokine expression, which could predispose some people to develop psoriasis. 1

TYPE 2 DIABETES MELLITUS

Recommendations include: In pediatric psoriasis patients who are overweight and have 2 risk factors for diabetes, screen every 3 years for diabetes, beginning at age 10 years or the onset of puberty. In patients who are obese, screen every 3 years regardless of whether they have risk factors for diabetes. Pediatricians should use fasting serum glucose to screen patients. Psoriasis is an independent risk factor for diabetes, according to adult studies. 1

DYSLIPIDEMIA

There is evidence of early metabolic and lipid abnormalities in children with psoriasis, and adult studies suggest associations between psoriasis and dyslipidemia, as well as abnormal lipid function and composition. However, the literature in this area is limited in children. For now, the panel suggests that pediatric psoriasis patients should have the general age-related universal lipid screenings, unless...
these patients have other cardiovascular risk factors. The panel recommends using a fasting lipid panel.¹

HYPERTENSION
Hypertension screening, using AAP guidelines, should start at age 3 years. Adult studies show an association between psoriasis and hypertension, and 1 retrospective study supports the association in children.¹

NONALCOHOLIC FATTY LIVER DISEASE
Panel members note they have not seen evidence to recommend screening pediatric psoriasis patients with normal BMI for NAFLD, but they do recommend screening those who are obese or overweight with diabetes or family history of NAFLD, and suggest alanine aminotransferase measurement starting at ages 9 to 11 years.³

POLYCYSTIC OVARY SYNDROME (PCOS)
Adult studies suggest psoriasis might be associated with PCOS, but such studies have not yet been done in children. For now, the panel recommends pediatricians should be aware of a potential association with psoriasis in case patients develop symptoms of hirsutism or oligomenorrhea.¹

GASTROINTESTINAL DISEASES
Because psoriasis patients have higher rates of inflammatory bowel disease, the panel recommends performing a gastrointestinal evaluation in pediatric psoriasis patients with a decreased growth rate, unexplained weight loss, or inflammatory bowel disease symptoms.¹

ARTHRITIS
It’s a priority for providers to identify and treat psoriatic arthritis early, and asking patients and families about arthritis symptoms should be a standard part of ongoing psoriasis management. Psoriatic arthritis can be destructive and debilitating and mimics clinical characteristics of juvenile idiopathic arthritis.

“Notably, 80% of children with psoriatic arthritis develop arthritis 2 to 3 years prior to skin findings, whereas adult patients tend to develop cutaneous manifestations first,” the researchers write.

Pediatricians should screen for arthritis development by reviewing symptoms and with a physical examination, looking for features such as joint pain and swelling, dactylitis, joint stiffness after rest, a limp, enthesitis, or uveitis.¹

MOOD DISORDERS, SUBSTANCE ABUSE
Providers should screen annually for depression and anxiety regardless of age, and yearly for substance abuse starting from age 11 years.¹

Researchers have found that pediatric patients with psoriasis were at about 25% to 30% higher risk for developing depression and/or anxiety versus children without psoriasis.

Although more research is needed to determine if pediatric psoriasis patients are more likely than those without psoriasis to develop alcohol abuse, adult studies suggest a link.¹

QUALITY OF LIFE
Children who have psoriasis tend to be more notably impaired emotionally and socially, compared with children without the disease. They’re more likely to have trouble functioning at school and often are bullied and teased. The psychosocial effects of psoriasis can be profound.¹

Providers should ask patients and families about the effects of psoriasis and consider using a quality of life screening instrument, such as the Children’s Dermatology Life Quality Index.¹

Pediatricians play a role
Pediatricians play a pivotal role not only in performing screenings early on, but also in referring these patients and in partnering with dermatologists, according to Amy S. Paller, MD, chair of Dermatology at Northwestern University Feinberg School of Medicine, Chicago, Illinois, and PeDRA immediate past co-chair and founding co-chair.

“Pediatricians should become familiar with the clinical features of psoriasis in children for early recognition and referral to a dermatologist for confirmation. This may be particularly important when a parent has a history of psoriasis, since 30% to 35% of affected children have an affected parent,” Paller says. “Good communication about our shared patients will increase the opportunity for early detection of a comorbidity.”

Disclosures: Dr. Kress is on the speaker’s bureau for Amgen. Drs. Eichenfield, Cohen, and Paller have nothing to disclose.
Ultraviolet (UV)-free blue light therapy in icteric newborns could help prevent atopic dermatitis (AD) for at least the first 5 years of life, according to a recently published study in *Neonatology*.1

The study’s author, Min-Sho Ku, MD, PhD, compared AD, allergic rhinitis, and asthma prevalence in 4744 children with neonatal jaundice who received neonatal blue light phototherapy to more than 5000 newborns with jaundice who didn’t receive phototherapy and nearly 107,300 children without jaundice. He found that AD prevalence was 10.52% in the icteric-phototherapy group versus 12.33% in the icteric–non-phototherapy group. Phototherapy appeared to have no impact on the respiratory allergic diseases studied.1

Among the other important findings: Children aged 1 to 4 years who received blue light therapy in their first days of life were much less likely than those who didn’t to spend time in the clinic for allergic skin disease. From ages 1 to 5 years, children who received neonatal phototherapy also were less likely to be prescribed topical agents for allergic skin disease. The decreased clinical visit times for allergic skin disease and prescription of topical agents could reach 64.29%.1

The apparent benefits of blue light therapy came without increases in cancer or skin complication risks through age 5 years, according to the study.1

**The bigger picture**

Atopic dermatitis is common in US children. Researchers analyzing the 2003 National Survey of Children’s Health found that 10.7% of children had a diagnosis of eczema in the prior 12 months.2 An estimated 1 in 10 persons worldwide are affected by AD, according to the National Eczema Association.3

Researchers have reported an association between neonatal jaundice and AD. In one Danish study, researchers found low birth weight and preterm birth were inversely associated with AD, whereas neonatal jaundice and cold seasons of birth were associated with an increased risk of AD.3 Kù, who works in the School of Medicine, Chung Shan Medical University, Division of Allergy, Asthma, and Rheumatology, Department of Pediatrics, Chung Shan Medical University Hospital, Taichung, Taiwan, did not find an association between preterm and low birth weight and AD in his study.

Given that AD treatment is prolonged, expensive, burdensome, and often unsatisfactory, preventing allergic skin disease from developing would be the best way to treat it. Physicians should consider the advantages and disadvantages of phototherapy when treating patients with neonatal jaundice, according to the study author.

“This study offers a new perspective for physicians and parents to decide whether phototherapy is necessary,” Ku writes in an e-mail to *Contemporary Pediatrics*.

"Phototherapy could decrease allergic skin disease frequencies and decrease the use of drugs dramatically. The effect lasts at least 5 years.” —Min-Sho Ku, MD, PhD

This is an interesting study, and it generates some excitement when one talks about a treatment to prevent AD, according to Peck Ong, MD, associate professor of Clinical Pediatrics at Children’s Hospital Los Angeles and Keck School of Medicine, University of Southern California, Los Angeles, and a diplomate of the American Board of Allergy and Immunology, who specializes in AD, food allergy, and asthma.

The challenge is to identify which infants are at risk for developing eczema. It’s too early to suggest all newborns should undergo such a treatment to prevent eczema, Ong writes in an e-mail to *Contemporary Pediatrics*.
Pediatrics. “One thing is for sure: Do not put your healthy baby under blue light therapy just yet,” he cautions.

About blue light phototherapy
Providers have long used UV-free blue light phototherapy at 390 nm to 470 nm wavelengths to treat neonatal jaundice.¹ Researchers also have reported that it’s an effective, safe treatment for people with eczema.⁵

“During the neonatal period, the immune system, skin, and skin microbiome develop. Therefore, phototherapy at that period might have the same or better effect, and the effect might last longer,” Ku writes. However, blue light phototherapy might not prevent AD after the neonatal period because the immune system has matured, he notes.

Blue light irradiation appears to suppress dendritic cell activation and lessen keratocyte proliferation, but only on the skin—not the entire immune system. This could explain why blue light phototherapy didn’t impact respiratory tract allergic disease in this study.¹

The heightened risk of cancer from phototherapy, however, remains a concern. “Although inconclusive, after phototherapy, the increased rate of cancer [has been] reported,” Ku points out.

In one such study, researchers retrospectively studied children at Kaiser Permanente Northern California hospitals and found exposure to phototherapy was associated with increased rates of some cancers, including leukemia. However, when they controlled for confounding variables, it eliminated or attenuated the associations. They concluded that the potential for even partial causality suggests that it may be prudent to avoid unnecessary phototherapy.⁶

Future studies should help determine if blue light phototherapy is hazardous to neonatal health.

Need for further research
Ku writes that his was an observational study. He did not study biological effects of blue light phototherapy.

This is the first study to report on the effect of UV-free blue light therapy on allergic skin disease in newborns.¹

“Phototherapy could decrease allergic skin disease frequencies and decrease the use of the drugs dramatically. The effect lasts at least 5 years,” Ku writes. “No other treatment has a better effect. In the future, phototherapy may be a preventive approach to use in all newborns. However, the major consideration is its safety. Future study is necessary.”

Future research should include longer observation periods and more data on hyperbilirubinemia severity, age of peak bilirubin, and phototherapy type, according to Ku.

“Determination of the most appropriate protocols, duration, and wavelength for the treatment and prevention of allergic skin disease also requires more studies,” he writes. ■

Ms Hilton is a medical writer who has covered health and medicine for more than 25 years. She resides in Boca Raton, Florida. She has 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.

For references, go to ContemporaryPediatrics.com/blue-light-phototherapy
Microbiome-based therapy for eczema: On the horizon?

New research examined the potential role of Gram-negative skin bacteria in the pathogenesis and exacerbation of atopic dermatitis, and the effectiveness of these organisms to treat it.

MARY BETH NIERENGARTEN, MA

Results of preclinical and early clinical trials conducted by investigators at the National Institutes of Health (NIH) showing the effectiveness of using bacteria to treat eczema are paving the way for further study into the potential for microbiome-based therapy to treat this common skin disease.

“I think the days of viewing eczema as a genetic disease that we just can’t find the genes for are coming to an end,” says Ian A. Myles, MD, MPH, assistant clinical investigator, Chief Medical Officer, US Public Health Service Commissioned Corps, National Institutes of Health, National Institutes of Allergy and Infectious Disease, Bethesda, Maryland, and lead author of the study. “Soon enough, the treatment focus will shift to microbiome and environmental modulation instead of expensive drugs that target human pathways.”

The foundation for this shift is coming from research showing the involvement of skin bacteria on the pathogenesis of atopic dermatitis (AD). Although it is known that Staphylococcus aureus is among the underlying pathologic factors creating susceptibility to developing AD, no evidence has yet shown the effectiveness of these bacteria to treat eczema.

In this new study, Myles and colleagues expand on this research by looking at the potential role of Gram-negative skin bacteria in the pathogenesis and exacerbation of eczema, and, importantly, the effectiveness of these bacteria to treat eczema. Specifically, their research isolates a new Gram-negative commensal, Roseomonas mucosa, as a promising candidate for microbiome-based therapy for eczema.

Early results show promise
In their research article published in JCI Insight, Myles and colleagues discuss preclinical research in mice in which they considered the role of Gram-negative organisms on the skin as playing a role in eczema.

“When we looked at the distribution of eczema on the body and compared that to the distribution of the Gram-negative organisms on the skin, we saw a clear overlap,” explains Myles. “That made us think that Gram-negative bacteria might play a role in the disease.”

Working from that hypothesis, Myles and colleagues figured out how to culture the bacteria and test it in cell cultures and mice. What they found was that R mucosa emerged as promising bacteria to test in humans based on its ability to improve barrier function, immune balance, kill S aureus, and protect mice from developing eczema in specific models.

To test the therapeutic potential of R mucosa in humans with AD, the investigators conducted an open-label, Phase I/II, safety and activity trial. Called the Beginning Assessment of Cutaneous Treatment Efficacy for Roseomonas in Atopic Dermatitis trial (BACTERiAD I/II), the trial first included 10 adults and later added 5 children with AD. In the trial, live strains of R mucosa isolates were sprayed on eczema of each participant twice weekly for either 6 weeks (adults) or 4 months (pediatric).

The study found a significant reduction in itch, objective rash, and

CONTINUED ON PAGE 26
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topical steroid requirements in both the adults and children, says Myles. In addition, the study found that strains of *R mucosa* from healthy people differ in genetics and lipid production compared with strains from patients with eczema.

Finally, the study also looked at topical commercial products that may harm the good strains of *R mucosa* more than *S aureus* or other unhealthy strains. According to Myles, the study found several skin products with common chemicals that hurt the healthy bacteria without affecting *S aureus* or disease-associated *Roseomonas*.

“Since this is the first-in-human phase trial, we are being cautious, but we have exposed mice to this via injection into the veins, spraying into the eyes, feeding into the stomach, and inoculating directly into the lungs,” he says. “Each time with the mice it was 350,000-fold the exposure that the kids get and literally nothing has happened in the mouse—no signs of illness in the mouse, no signs of inflammation or infection in the tissues.”

**What’s next?**

Commenting on the study, Bernard A. Cohen, MD, professor of Pediatrics and of Dermatology, Johns Hopkins University School of Medicine, Baltimore, Maryland, says the study is a good proof-of-concept study but cautions about the preliminary nature of the evidence.

“All the study really does is raise the issue that looking at Gram-negative bacteria should be looked at and may be useful,” he says. “But I don’t think it adds much more to what we already know about the potential benefits of probiotics.”

Which, Cohen points out, is not a lot. “There is a lot of research looking at gut organisms to see what role they may play in worsening or improving atopic dermatitis, but currently the data are pretty mixed,” he says. That said, he sees this line of study as useful and one to pursue more in depth.

“We are very aware that our work is in the early stages and that we have a long way to go before anyone might pick up *Roseomonas* at their local pharmacy,” says Myles in response. “However, no one had previously identified that this specific strain of bacteria could improve symptoms in AD while being steroid sparing. So cautious optimism seems more appropriate here than pessimism.”

According to Myles, the investigators are currently finishing the Phase I/II study that they hope to wrap up by this fall. They then intend to discuss what is needed for pursuing a Phase III trial with the US Food and Drug Administration.

**REFERENCE**

Managing enuresis in primary care

The primary care physician needs to have in place appropriate strategies for evaluation of urologic issues and recommendations to parents who broach these topics.

NAN E TOBIAS, MSN, APRN

Primary care offices in the pediatric world are busy with numerous topics to cover during well-child visits. Development, prevention, and safety issues rank as high priority. By the time the primary care provider (PCP) asks if there are any other outstanding issues besides the required topics, the visit may already be winding to a close.

What does the busy PCP recommend when the parent brings up the topic of incontinence, urinary frequency, or nocturnal enuresis? If the child is of an age deemed likely to outgrow these issues, the PCP may say just that. Advice to not worry about the urinary issues because they will spontaneously resolve often will be offered. Yet, is this advice ideal or just the best that can be offered in the time allotted?

The purpose of this article is to provide the pediatric PCP with the best knowledge available so that the child and family can be counseled adequately. What are appropriate strategies for evaluation and for recommendations to a parent who broaches these topics? What are the red flags that the pediatric PCP needs to recognize? What are the most important caveats during the evaluation and management of enuresis and incontinence?

Impact of urologic issues

Many pediatric PCPs have educated themselves on urologic issues or sought education from pediatric urology specialists. They may begin the evaluation of urinary issues, recommend treatment, and order diagnostic testing where appropriate. Perhaps one particular care provider in the office could develop an expertise in such issues and begin an educational program with the family. A nurse practitioner (NP) with such an interest would be a good choice for this role. This article provides evidence-based algorithms for diagnosing urologic complaints and is a starting point for the evaluation and management of common pediatric bladder and bowel issues (Figure 1,1,3 Figure 2,1,4,5 and Figure 3,1,6).

It is important to remember that while reviewing the medical history and conducting the physical exam, potential physical causes of enuresis should be ruled out. These varied etiologies are included in Table 1. Physical issues, however, are not the single concern here. The psychologic and emotional harm...
that can result from urinary tract dysfunction is imperative to consider. Bladder issues including bedwetting and incontinence are legitimate problems. Families may be told, “Don’t worry about it . . . your child will outgrow it in due time,” or “Return to see me if it persists until the age of 10 years” (or the age a particular care provider deems appropriate). Whereas these statements may be made with the best intentions, families report much frustration over the presence of urinary issues.

One study that involved direct interviews with parents showed that having a child with enuresis can be stressful as parents feel the need to protect their children from teasing. Parents feel that enuresis is socially stigmatizing and say that support from healthcare providers would help.7 Other studies have shown that children with enuresis suffer lowered self-esteem and, when treated, actually exhibit increases in the same.8,9 The wetting creates a physical, financial, and emotional burden on the parents as they must do extra laundry, buy incontinence briefs, and deal with a malodorous house. It has been shown that between 30% and 80% of parents punish their children and adolescents for wet nights.10-12 Punishments described include reprimanding, deprivation of sleep, and beating.12 In addition, punishments for bedwetting have been associated with childhood depression.13 Punishments have been inversely correlated with successful treatment of bedwetting.12

The International Children’s Continence Society (ICCS) is an organization that includes multiple disciplines and specialties that care for children with bladder and bowel dysfunction. This group recommends that pediatric PCPs, includ-

**FIGURE 1**
**EVALUATION AND MANAGEMENT OF THE CHILD WITH NOCTURNAL ENURESIS**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal H and P, normal UA, negative urine culture</td>
<td>Use appropriate criteria.</td>
</tr>
<tr>
<td>Abnormal H and P or abnormal UA and/or positive urine culture</td>
<td>Use appropriate criteria.</td>
</tr>
<tr>
<td>Abdominal film, voiding diaries. Treat constipation if present.</td>
<td></td>
</tr>
<tr>
<td>Not ready: Delay treatment until readiness is present. Give fluid and fiber recommendations.</td>
<td></td>
</tr>
<tr>
<td>Ready: Discuss treatment modalities. Give fluid and fiber recommendations. Discuss behavior modification techniques.</td>
<td></td>
</tr>
<tr>
<td>Bedwetting remains: Specialist referral.</td>
<td></td>
</tr>
<tr>
<td>Bedwetting resolves.</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 1**
**CONDITIONS THAT MAY LEAD TO ENURESIS AND/OR INCONTINENCE**

<table>
<thead>
<tr>
<th>Abnormalities associated with large urine volumes</th>
<th>Diabetes mellitus, diabetes insipidus, renal insufficiency, obstructive sleep apnea, sickle cell disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormalities associated with neurologic dysfunction</td>
<td>Cerebral palsy, tethered spinal cord, spinal cord tumors</td>
</tr>
<tr>
<td>Abnormalities of the urinary tract</td>
<td>Urinary tract infections, ectopic ureter (girls), meatal stenosis (boys), posterior urethral valves (boys)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Vulvovaginitis, viral cystitis, bladder and bowel dysfunction, pinworms</td>
</tr>
</tbody>
</table>

Author created.
ing pediatricians, nurse practitioners, and family physicians, develop early recognition and appropriate management skills of bladder and bowel dysfunction (BBD). These care providers can serve an important role in the initial evaluation and management of BBD and reduce the associated morbidity.14 Nocturnal enuresis, daytime incontinence, and functional constipation all impact the physical and emotional well-being of the child and family.

Urologic terminology
For this article, the ICCS terminology and definitions will be used. Monosymptomatic nocturnal enuresis is defined as night wetting without any lower urinary tract symptoms. By the age of 4 years, most children void 5 to 6 times a day.15 The definition of daytime urinary frequency is said to occur in children who void 8 or more times a day and the definition of daytime infrequency is those who void 3 or fewer times a day.16 Daytime urgency is the sudden development of an overwhelming need to void.

Dysuria is defined as discomfort during urination.16 Holding maneuvers are visible postures or positioning of the body when a child is postponing urination, such as placing pressure on the perineum, the potty dance, or crossing the legs. Intermittent wetting during daytime (awake) hours is termed daytime incontinence (not enuresis). Any wetting during sleeping hours is called enuresis. This would include wetting during sleep at night or during daytime naps.

Dysfunctional elimination syndrome and dysfunctional voiding are terms no longer recommended. Instead, BBD is used as it is a term that describes lower urinary tract symptoms combined with fecal problems consisting of primarily constipation and encopresis.

Nocturnal enuresis and/or daytime incontinence
Many theories exist as to the etiology of enuresis. Various factors have been proposed as potential causes, including physical, psychological, and neurological factors. It is important to rule out physical causes such as urinary tract infections or bladder neck obstruction.

FIGURE 2
EVALUATION AND MANAGEMENT OF THE CHILD WITH DAY INCONTINENCE WITH OR WITHOUT NIGHT ENURESIS

<table>
<thead>
<tr>
<th>H AND P, UA WITH MICROSCOPIC, URINE CULTURE.</th>
<th>ABDOMINAL FILM FOR CONSTIPATION.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal H and P:</td>
<td>Normal UA and negative urine culture (use appropriate criteria).</td>
</tr>
<tr>
<td>Treat constipation if present.</td>
<td>Enuresis resolves.</td>
</tr>
<tr>
<td>Incontinence resolves, Enuresis continues:</td>
<td>Voiding diaries.</td>
</tr>
<tr>
<td>Treatment of nocturnal enuresis:</td>
<td>Discuss treatment modalities.</td>
</tr>
<tr>
<td>Discuss behavior modification.</td>
<td></td>
</tr>
<tr>
<td>Enuresis does not resolve:</td>
<td></td>
</tr>
<tr>
<td>Enuresis resolves.</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: H, history; P, physical; UA, urinalysis; US, ultrasound; UTI, urinary tract infection.
ogy of nocturnal enuresis including genetics, small bladder capacity, detrusor overactivity, nocturnal polyuria, and sleep arousal thresholds. Figure 1 shows an algorithm for the evaluation of the child who presents with nocturnal enuresis. The history should include determining the presence of daytime wetting or other lower urinary tract symptoms. The frequency of nocturnal enuresis and its effects on the family should be determined. Is the child developmentally appropriate? Were milestones such as gross motor skills and toilet training reached on target? Are there behavioral issues or family stressors that could affect the child’s and family’s ability to participate in working on the bedwetting? Of utmost importance is whether the child is bothered by the enuresis. If the child is motivated to work on the enuresis, it is time to assist the family. When the child is developmentally ready, and especially when the child’s life is negatively impacted by enuresis, the family needs help.

In the case of daytime and nighttime symptoms, the algorithm in Figure 2 should be followed. The history needs to elicit voiding habits in particular with children who exhibit daytime incontinence and/or urinary tract infections (UTI). Many of these children are found to have poor fluid intake and also may void infrequently. Both habits predispose to the development of incontinence and UTIs. Daytime incontinence may occur when the child has never been toilet trained or may have been trained for several months and then regressed.

**Constipation and enuresis**

Typically, the physical examination of the child with monosymptomatic nocturnal enuresis is normal. Certain findings could elicit an underlying medical cause. One finding is palpable stool in the abdomen, which suggests constipation. It is important to note, however, that many times copious amounts of stool are present in the bowel but not palpable. It is not safe to assume that a soft abdomen indicates the absence of bowel issues. Furthermore, the definition of constipation is not uniform in the medical literature, nor is it uniformly understood by physicians and lay people. Most pediatric PCPs would identify infrequent or large, hard, and painful stools as evidence that constipation is an issue. The presence of these symptoms would likely cause the care provider to initiate a bowel management program.

Most parents and many care providers think that a daily stool indicates that constipation does not exist. This could not be further from the truth. Oftentimes, multiple daily stools are an indication that the rectum has become stretched and does not empty completely. The rectum being in such close proximity to the bladder then places pressure on the bladder, never allowing it to fully expand or empty to completion. Furthermore, stool backed up in the transverse and descending colon continues to empty into the rectum, placing more pressure on the bladder.

The relationship between enuresis and constipation was initially described in 1986. O’Regan and colleagues measured rectal distention in 25 enuretic children to determine the presence of constipation. Twenty-two of the 25 patients with enuresis showed decreased perception of rectal distention, and the majority tolerated very large balloon insufflation in the rectum. Seventeen of these 22 patients were treated with an enema program and a regimen of increased fiber content in the diet. All 17 showed total or partial improvement of nocturnal
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80% of children remained flare-free for six months¹
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enuresis within 6 weeks by managing the bowels alone. The remaining 5 patients did not undergo bowel management. Whereas rectal distention is probably not at the top of the list when identifying constipation, it is clear from this data that it has an important impact on treatment.

To add further clarification to the concept of rectal distention affecting bladder function, Hodges and Anthony undertook a retrospective study to review 30 consecutive patients who presented with nocturnal enuresis. The researchers used specific radiologic criteria to measure rectal distention and abnormal stool burden. Results showed that all 30 patients showed rectal distention and 80% had an abnormally high stool burden. Only 10% of those patients with an abnormally heavy stool burden by radiography had a history of being constipated. Aggressive bowel management alone cured about 80% of those with nocturnal enuresis within 3 months. The use of polyethylene glycol caused the nocturnal enuresis to resolve in 80% of children. For those children that continued with rectal distention at a month’s follow-up, stimulant laxatives and/or enemas were added.

Because the history and physical exam of children who present with enuresis often does not identify the presence of constipation or fecal impaction, alternative sources of identification are recommended. Children and their parents often do not know that constipation exists. Initially when questioned, children may say they have soft, easy-to-pass stools. Children may not pay attention to their own bowel habits and may not possess the ability to discern whether their stools are hard or soft, large or small. They may have no comparison in their limited experience. Parents often deny that any difficulties with their child’s bowel movements have ever existed. Once toilet training has been accomplished, parents may rarely or never see another of their child’s bowel movements.

The Bristol stool scale is a visual chart of 7 types of stool that can be used to determine if constipation is present (Table 2). Types 1, 2, and 3 are constipated stools, whereas types 4 and 5 are stools with more desirable consistency. Children may say their stools are soft until they are shown the Bristol chart. When they point out types 1 or 2 as their usual stools, it is apparent this is not the case.

Another source for determining the diagnosis of functional constipation is the Rome classification, which is accepted by both pediatric and adult gastroenterologists. This system consists of 6 criteria, 5 of which are based on clinical history (Table 3). When clinical history does not identify a child who is constipated, a plain abdominal radiograph can be obtained. Many children who are determined to be constipated by abdominal radiograph and the Bristol stool chart will not meet Rome criteria. This could be considered a shortcoming of the Rome criteria as the majority of findings are obtained through history, which can be difficult for families to recall or identify. The 1 physical finding of a rectal fe-

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>BRISTOL STOOL CHART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Separate hard lumps, like nuts (hard to pass)</td>
</tr>
<tr>
<td>Type 2</td>
<td>Sausage-shaped but lumpy</td>
</tr>
<tr>
<td>Type 3</td>
<td>Like a sausage but with cracks on the surface</td>
</tr>
<tr>
<td>Type 4</td>
<td>Like a sausage or snake, smooth and soft</td>
</tr>
<tr>
<td>Type 5</td>
<td>Soft blobs with clear-cut edges</td>
</tr>
<tr>
<td>Type 6</td>
<td>Fluffy pieces with ragged edges; a mushy stool</td>
</tr>
<tr>
<td>Type 7</td>
<td>Watery, no solid pieces; entirely liquid</td>
</tr>
</tbody>
</table>

Adapted from Lewis SJ, et al.19
Abdominal radiographs and constipation

Primary care physicians may be hesitant to order a plain abdominal x-ray (AXR), particularly when obvious symptoms of functional constipation are not present. The sixth Rome criterion, that of fecal impaction, is made by rectal examination, radiography, or ultrasound (US). Rectal examination is not the norm in pediatric primary care. For children and adolescents, rectal examination can be frightening and potentially painful and may sour a good relationship between care provider and patient. Often, the main concern about ordering an abdominal film is the radiation exposure. To ease concern about this, it is helpful to realize that the radiation exposure from 1 AXR is equivalent to about 2 months’ worth of natural background radiation. Taking this into consideration makes the occasional abdominal film a highly justifiable tool.

Speaking from years of experience, this author has found that many parents will not even consider treating constipation in their child who shows no outward evidence. However, showing parents the computer image and pointing out the large colonic stool load, and in particular the recto-sigmoid, will likely convince the parents. Leech and colleagues also found that showing the abdominal film image to parents and children encourages compliance with treatment. The transabdominal US to measure rectal diameter is a useful method to diagnose fecal impaction, but it is not widely used. Its use has been described in Europe and Japan, and it has shown to be reliable when performed by an experienced clinician. It is extremely important to note that when an abdominal radiograph is obtained, the ordering provider

Table 3

<table>
<thead>
<tr>
<th>Rome Criteria for Functional Constipation in Children, Developmental Age ≥4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Two or fewer BMs in the toilet per wk</td>
</tr>
<tr>
<td>2 At least 1 episode of fecal incontinence per wk</td>
</tr>
<tr>
<td>3 History of painful or hard BMs</td>
</tr>
<tr>
<td>4 History of retentive posturing or excessive volitional stool retention</td>
</tr>
<tr>
<td>5 History of large diameter stools that can obstruct the toilet</td>
</tr>
<tr>
<td>6 Presence of a large fecal mass in the rectum</td>
</tr>
</tbody>
</table>

Abbreviation: BM, bowel movement.
From Benninga MA, et al.20

Table 4

<table>
<thead>
<tr>
<th>Findings That May Indicate an Organic Cause of Constipation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Respiratory problems or FTT—cystic fibrosis</td>
</tr>
<tr>
<td>• Growth delay or developmental delay—celiac disease or hypothyroidism</td>
</tr>
<tr>
<td>• Passage of first meconium after 48 h, bloody diarrhea, FTT, abdominal distention—Hirschsprung disease</td>
</tr>
<tr>
<td>• Ribbon-like stools, tight anal canal on rectal exam, abnormal anal position—anal stenosis</td>
</tr>
<tr>
<td>• Weakness in legs, off-the-midline sacral dimple, asymmetric gluteal folds, sacral hair patch—spinal cord anomalies</td>
</tr>
</tbody>
</table>

Abbreviation: FTT, failure to thrive.
Adapted from Tabbers MM, et al.21
must assess the image, not just read the radiologist’s report. Over time, the PCP will become familiar with images that constitute a small, moderate, or large stool load and to pay specific attention to the recto-sigmoid. Of note is the recognition that not all PCPs will have access to the actual radiographic images via their electronic medical records system. Perhaps, families may be more inclined to begin a bowel regimen without an AXR when suggested by their trusted PCP with whom a professional relationship has already been developed. When the pediatric specialist has been consulted, the recommendation for bowel management often occurs during the first visit.

Significance of urinalysis and importance of urine culture

When BBD exists, or a UTI is suspected, it is necessary to review the results of a macroscopic and microscopic urinalysis. It is not sufficient to check the urine with a reagent test strip. Two significant substances to look for on the test strip when evaluating for UTIs are nitrates and leukocyte esterase.

Nitrites are the reduced form of nitrates in the urine. Some bacteria that cause UTIs produce enzymes that reduce urinary nitrate to nitrite. For this reaction to occur, the urine must have been present in the bladder for a minimum of 4 hours. Children may not hold urine in their bladders for this long. In addition, not all bacteria that cause UTIs produce this reaction. Furthermore, numerous other reasons for a false-negative test result exist (Table 5). A false-positive result may occur from urine that has been left sitting at room temperature or from highly pigmented urine. If the urine is red due to blood or orange due to nitrofurantoin or phenazopyridine, for example, a positive result is not valid. The leukocyte esterase reaction is based on the fact that neutrophils contain enzymes known as esterases. The esterases are detected by reagent strips that contain an appropriate substrate. False negatives can occur with a high urine specific gravity and in urines that contain glucose and protein. In this environment, white blood cells (WBCs) will crenate (become notched) and are not able to release esterase.

Also, the presence of certain chemicals and drugs in the urine can cause false negatives to occur. Because of these limitations with testing for nitrates and leukocyte esterase in the urine, it is necessary to always obtain a microscopic analysis of the urine. If the resources are not available in the PCP’s office, it is necessary to send the urine to a lab. Importantly, the nitrite and leukocyte esterase tests are screening measures and are not meant to take the place of a urine culture.

The microscopic urinalysis result will report the presence of red blood cells (RBCs), WBCs, and bacteria, in addition to other cells and microorganisms. On average, normal urine contains up to 5 RBCs and 5 WBCs per high-power field. A properly collected normal midstream urine specimen will not contain bacteria. When the urine specimen contains large numbers of bacteria, particularly when accompanied by many WBCs, it is indicative of a urinary tract infection. The type of bacteria will not be identified on urinalysis, which necessitates the sending of a urine specimen for culture. Should the urine grow bacteria, the colony count will be reported. A clean catch midstream urine culture growing 50,000 or more colony forming units per milliliter of a single organism is indicative of a UTI. This along with a microscopic urinalysis that shows pyuria or bacteriuria confirms a UTI.

Next month, Contemporary Pediatrics will present part 2 of “Managing enuresis in primary care” in which the author addresses treatments for nocturnal enuresis, constipation, extraordinary daytime urinary frequency, and UTIs. Watch for it.
Parental postpartum depression: More than “baby blues”

Pediatricians need to recognize symptoms of perinatal depression in new mothers, provide basic counseling and treatment, and refer for appropriate services when needed.

PAT F BASS III, MD, MS, MPH; NERISSA S BAUER, MD, MPH

With more than 400,000 infants born to mothers who are depressed, perinatal depression is the most underdiagnosed obstetric complication in the United States.\(^1\)

This article will review the spectrum of disease the pediatrician is likely to encounter, risk factors, and basic management when faced with this common problem.

**Spectrum of postpartum depression**

Postpartum depression (PPD) can be seen as a spectrum of disease across 3 main categories: 1) postpartum blues, 2) PPD, and 3) postpartum psychosis.\(^1,2\)

**POSTPARTUM BLUES**

Postpartum blues reportedly occurs in 50% to 80% of new mothers and occurs in the first few days after delivery. Symptoms typically resolve within a few days to 1 to 2 weeks following delivery. Postpartum blues do not impair maternal function and mothers can be treated with emotional support and reassurance.\(^1,2\)

**Symptoms of postpartum blues include:**
- Anxiety
- Crying
- Decreased appetite
- Exhaustion
- Loss of interest in usual activities
- Mood swings
- Sadness
- Sleeping problems
- Worrying

**POSTPARTUM DEPRESSION**

Postpartum depression occurs in 13% to 20% of women following childbirth and meets the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* criteria for depression. It is distinct from postpartum blues in several ways. Symptoms occur beyond the first 2 weeks postpartum, peaking within the first 4 months following delivery, but PPD can occur anytime within the first year of the child’s life.\(^1,2\)

Whereas the symptoms experienced may be similar to postpartum blues, the severity and duration of symptoms of PPD dif-
ferentiate it from postpartum blues. Symptoms in PPD last longer than 2 weeks, occur almost daily, last throughout the day, and may result in functional impairment. Symptoms may persist for several months up to a year.1,2

**POSTPARTUM PSYCHOSIS**
Postpartum psychosis is an uncommon mental health emergency that puts both mother and child at risk. It typically occurs in the first month postpartum with mothers experiencing paranoia, hallucinations, delusions, and suicidal or homicidal thoughts. Bipolar disorder increases the risk, but it can occur in patients without a prior psychiatric history.2

**Risk factors**
The most significant risk factor for PPD is a history of depression—increasing the risk of PPD by a factor of 20. Other factors such as maternal age, pregnancy complications, and obstetric issues all potentially contribute. In relation to maternal age, both adolescent (relative risk [RR], 1.48) and advanced maternal age (>35 years: RR, 1.25) mothers were at higher risk of PPD.3

Diabetes also increases risk, but gestational diabetes (RR, 1.7) surprisingly increased risks more than pregestational diabetes (RR, 1.32). Similarly, prematurity increased risks of PPD with earlier prematurity having an incremental impact (32 weeks’ gestation: RR, 1.36; and 32-36 weeks: RR, 1.2).3

**Other possible risks include:**
- Being single
- Multiparous
- Family history of PPD
- History of prior abuse

**Impact of PPD**
Maternal depression adversely impacts an infant’s development and can decrease attachment and bonding. Infants living in a setting of maternal depression demonstrate less social interaction and suffer from delays in development. Failure to identify and treat maternal depression can lead to persisting attachment issues that are less likely to respond to intervention over time.1,2 Further, depression can lead to a neglectful environment that impacts early brain development and subsequent visible changes on magnetic resonance imaging of the brain.1

Maternal depression is associated with a number of cognitive and social-emotional aspects of development. A number of behaviors associated with language development (eg, reading to, speaking to, and cuddling with an infant) are less likely to occur with maternal depression. Infants of depressed mothers may look at the mother less often and show less engagement with their environment as early as age 2 months.1

Maternal depression is also associated with a number of negative practices and beliefs related to breastfeeding. Depression is associated with decreased mother-infant interactions that may lead to the mother failing to interpret her infant’s cues and may result in the infant becoming fussy, withdrawn, or more likely to develop feeding or sleeping problems. This attachment issue can lead to failure to thrive, increased risk for accidents resulting from parental inattention, nonaccidental trauma, as well as increased sick visits and emergency department use.2

Although maternal depression has not been associated with decreased well-child visits, it seems to be associated with increases in the likelihood of parenting practices that are inconsistent with national guidelines and are associated with poorer health outcomes.1,2 Depressed mothers are less likely to integrate well-child advice from the pediatrician. Depressed mothers are less likely to place their infant on its back, more likely to put their child to bed with a bottle, and less likely to engage in other preventive healthcare practices.8,9 Other research has shown depressed mothers are more likely to smoke, to appropriately administer vitamins, to use a car seat appropriately, to cover electrical plugs, or to have syrup of ipecac in the home.10,11

Long-term PPD may result in an increased risk of the infant developing behavioral issues and mood disorders as an adolescent or adult.2

**Postpartum blues**
occurs in 50% to 80% of new mothers in the first few days after delivery.

**Postpartum depression** occurs in 13% to 20% of women following childbirth.

From Earls MF, et al; Sriraman NK, et al.2

**READ MORE**
**Paternal PPD**
Although not discussed as often as maternal PPD, paternal PPD occurs more commonly in the United States with a 14% prevalence rate. Paternal PPD is more likely to occur between 3 and 6 months postpartum, and risk factors include prior depression history, lower socioeconomic status, having other children, and maternal prenatal depression. Paternal PPD is similarly associated with behavioral and emotional problems later in childhood.² (See "Why screen new fathers for postpartum depression?" on page 39.)

**Most pediatricians don’t screen for PPD**
Fewer than half of pediatricians ask mothers about depressive symptoms. Screening for PPD among pediatricians increased from 33% to 44% between 2004 and 2013 in periodic surveys performed by the American Academy of Pediatrics (AAP). The increase was felt to result from pediatricians’ responsibility for addressing social-emotional familial factors within their practice.¹²

There is a tremendous opportunity for pediatricians to address this disparity as mothers appear to be willing to discuss mental health issues at pediatric visits, so incorporating screening and treatment into busy pediatric practices is feasible.¹³¹⁴

The AAP recommends screening for maternal depression at 1, 2, 4, and 6 months.¹

There are a number of validated tools that can be used in the office to screen for PPD:
- Edinburgh Postnatal Depression Scale (EPDS)
- EPDS-3
- Patient Health Questionnaire (PHQ-9)
- PHQ-2
The EPDS is a 10-item questionnaire that asks about symptoms of emotional distress within the prior 7 days and takes less than 5 minutes to complete. The items are scored on a 4-point scale with a maximum score of 30. Scores of 10 or greater indicate a risk for depression is present. Additionally, item 10 is a suicidality indicator and indicates a positive screen if answered affirmatively. Scores of 10 or greater should be repeated in 2 weeks, and 2 scores above 12 indicate a need for further intervention.

A shortened version of the EPDS uses 3 items from the anxiety subscale that can be used to identify patients who need to complete the entire instrument. The EPDS-3 identifies symptoms of self-blame, feeling panicky, and being anxious or worried for no good reason. Scores are multiplied by 10 and divided by 3. Scores of greater than or equal to 10 are considered positive. The sensitivity for the instrument is 0.95 and the specificity is .80. The positive and negative predictive values were .56 and .98, respectively.

The PHQ-9 and PHQ-2 are not specific for PPD but are validated instruments for identifying depression in the primary care setting. The PHQ-9 asks about symptoms over a 2-week period that are rated on a 4-point scale. Scores grade symptoms as mild (10-14), moderate (14-19), or severe (20+). The PHQ-2 asks about frequency of depressed mood and anhedonia over a 2-week period that is also assessed on a 4-point scale. Many organizations utilize a stepped approach with patients who answer 1 of the 2 items positively rather than complete the entire instrument. Of note, in 1 study utilizing the PHQ-2 in PPD, the instrument performed poorly among economically dis advantaged, multiethnic mothers seeking pediatric primary care in an urban setting, and the authors recommended caution if using in this population and to consider lowering the screen positive threshold.

One algorithm for screening can be seen in the Figure on page 37. Sometimes the issue of medical-legal risks arises when considering implementing screening for maternal depression in pediatric offices. However, there is a strong ethical case in support of implementation of validated screening tools to identify mothers at risk of PPD as early as possible to optimize outcomes for mother and baby.

Next steps after a positive depression screen
The next steps will depend on the severity of the mother’s symptoms, and they range from reassurance to supportive strategies or referral. With milder symptoms associated with postpartum blues, demystification and parent education may be sufficient. Combined with close follow-up, support may be all that is needed. Special attention should be paid to promotion and encouragement of breastfeeding because PPD is associated with discontinuation of breastfeeding.

If symptoms for mild or moderate depression require further intervention, the pediatrician should provide resources and information on possible treatments. Psychotherapy is effective and considered a first-line treatment. Interpersonal therapy, cognitive behavioral therapy, and psychodynamic psychotherapy (nondirective therapy) all have demonstrated similar effectiveness in the treatment of PPD. Psychotherapy and behavioral therapy also have the benefit of not impacting the breastfeeding mother.

Although not as often discussed as maternal PPD, paternal PPD occurs more commonly in the United States with a 14% prevalence rate.

Pharmacologic management is beyond the scope of this article, but mothers may be referred to their obstetrician, primary care physician (PCP), or to a mental health provider. Few pediatricians provide medical management for mothers’ PPD. However, it is important for the pediatrician to communicate with the mother’s obstetrician/gynecologist or PCP and relay symptoms and impressions from the office visit.

Postpartum depression is a significant problem for families with newborns. Given the long-term impacts of untreated PPD, pediatricians need to be cognizant of its symptoms, provide basic counseling and treatment, and refer for appropriate services when needed.
Why screen new fathers for postpartum depression?

New research shows that treating new fathers for postpartum depression benefits their children’s development and well-being.

MARY BETH NIERENGARTEN, MA

Dads get sad, too. Postpartum depression (PPD) in mothers has long been recognized and receives considerable attention, but the same is not true for fathers—until recently.

Accumulating research and study on the influence of fathers on the early development of their children is shining a needed light on the challenges men encounter as they become parents and face the many similar situations that new mothers face. One challenge is PPD and the cascading difficulties that this can have on new parents as well as their children.

Data show that between 2% and 25% of fathers experience PPD, a prevalence that increases up to 50% if the mother also is depressed.1

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The American Academy of Pediatrics (AAP) recently published a clinical report on the evolving understanding of the important role fathers play in early childhood development, highlighting the influence of paternal mental health on the well-being of their children and urging pediatricians to take a more active role in supporting new fathers as they transition into parenting.1

“Dads are an important member of the team when we think about supporting families today, and one we often fail to include in pediatrics,” says Craig F. Garfield, MD, professor of Pediatrics, Northwestern University Feinberg School of Medicine, Chicago, Illinois, a coauthor of the report published in 2016. “This is unfortunate because father involvement and father well-being can benefit children and mothers.”

“If we want to optimize child outcomes, we should be sure fathers and mothers are both supported and able to be the best parent they can be,” Garfield says.

One main way pediatricians can support fathers is by recognizing the real and increasing rates of paternal PPD. Although screening mothers for PPD is now recommended by the AAP,2 no such screening is yet recommended for fathers.

Screening fathers for PPD

Recently published data from Cheng and colleagues adds to the growing body of evidence on the prevalence of PPD in fathers and the importance of paternal PPD screening.3

In the study, investigators used a computer-based decision support system for pediatric health surveillance, and management—called the Child Health Improvement Through Computer Automation (CHICA) system—to estimate the prevalence of paternal and maternal PPD found during pediatric well-child care visits. Between August 1, 2016, and December 31, 2017, 9572 parents responded to a prescreening form that included assessment of PPD.

Of the parent responses from 9572 clinical visits, 2946 (30.8%) were attended by fathers and 806 (8.4%) responded to the prescreening questionnaire. Among the fathers who responded to the questionnaire, 4.4% screened positive for depression. This was comparable to the 5.0% of mothers who screened positive.

“Our study found that depression in new fathers is almost as common as it is in mothers,” says lead author of the study Erika R. Cheng, PhD, assistant professor of Pediatrics, Indiana University School of Medicine, Department of Pediatrics, Division of Children’s Health Services Research, Indianapolis.

“The fact that so many new dads are experiencing this is significant because depression can have serious consequences if left untreated,”

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“The fact that so many new dads are experiencing this is significant because depression can have serious consequences if left untreated,”
Cheng says, adding that depressed fathers are less engaged with their children, and this can lead to cognitive and behavioral problems. Among previous studies that also highlight the prevalence of PPD in fathers, data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) provides additional information on specific variables of PPD in men. Using data from a nationally representative sample of 10,623 adolescent boys in the United States who were followed for nearly 20 years into young adulthood, the study found that the prevalence of PPD rates in this cohort differed based on where the father lived (in the same home as the child or not). 1

Garfield, who was the lead author of the study, says the study showed that fathers who lived with their child had lower depressive scores before the child’s birth but that the depressive symptoms increased on average by 68% over the first 5 years of the child’s life. Conversely, fathers who did not live with their child had higher depressive symptoms prior to the child’s birth and lower depressive symptoms during the child’s first years.

An important issue highlighted by this study is that fathers can and do play a diverse role in their children’s lives, living either with them or apart as described by the above study, and often are not the biological father but an adoptive father, stepfather, grandfather, or foster father.1 Given this diversity, the AAP defines a father broadly as “the male or males identified as most involved in caregiving and committed to the well-being of the child, regardless of living situation, marital status, or biological relation.”1

**Including fathers in ongoing care of children**

“Pediatricians are in a unique position to screen parents for depression, and well visits provide an opportunity to address family health by screening fathers who otherwise might not get assessed or treated,” says Cheng.

The AAP clinical report provides a list of ways to help pediatricians include fathers in the child well visit (Table 1). Included in the list is screening fathers for perinatal depression (Table 2). The AAP recommends that pediatricians have a plan in place (such as a referral to a parent’s primary care physician) if a father or mother screens positive for depression or exhibits depressive symptoms.

Garfield urges pediatricians to use this list and the clinical report as a guide. “Making sure to talk with both parents, regardless of marital status, about the transition to parenthood is important,” he says. “Checking in on how they are both dealing with the new roles and responsibilities and seeing if there is a way the pediatrician can help both parents is key.”

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**TABLE 1** WAYS TO INCLUDE FATHERS IN WELL-CHILD VISITS

- Welcome fathers and express appreciation for their attendance.
- Introduce yourself to the father and the mother or other parent, especially during the early critical years.
- Recognize that mothers and fathers may not always agree on how best to raise a child.
- Emphasize how children look to their fathers as role models of behavior and are likely to imitate behaviors they see.
- Screen fathers for perinatal depression (see Table 2).
- Review the need for parents to keep updated on adult vaccinations.
- Stress the unique role many fathers play in encouraging age-appropriate physical play and modeling such activity.
- Explore the family composition of cultural beliefs about such things as fathering and men’s roles in families.
- Encourage fathers to assume some roles early on in the care of the child.
- Inform the family about the normal elation and fatigue and challenges of being a father.
- Educate fathers about the practicalities of breastfeeding and how to support mothers’ nursing.
- Discuss how the couple is adapting to parenthood.

**TABLE 2** SCREENING TESTS FOR PERINATAL DEPRESSION IN FATHERS

- **Edinburgh Postnatal Depression Scale (EPDS), or a version that uses the partners report (EPDS-P)**
- **Patient Health Questionnaire-9 (PHQ-9)**
- **Gotland Male Depression Scale (GMDS)**
- **Center for Epidemiological Studies Depression Scale (CES-D)**

From Yogman L, et al.1

Cheng says, adding that depressed fathers are less engaged with their children, and this can lead to cognitive and behavioral problems.

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For references, go to ContemporaryPediatrics.com/paternal-PPD
Spondylolysis: Underrecognized cause of low back pain

When teenaged athletes complain of lumbar back pain that worsens with activity, there should be a high index of suspicion for a spondylolysis.

IGINRID K ICHESCO, MD; GARY L FREED, MD, MPH

A 15-year-old female competitive gymnast presents to the clinic with 3 months’ history of right-sided lumbar back pain. She reports no specific injury but the pain has been worsening over time and has not improved despite 2 weeks of rest. The pain worsens with extension maneuvers such as back walkovers, back flips, and back handsprings. The pain is sharp in quality and does not radiate down her legs. Ice, heat, and anti-inflammatory medications have not helped. She denies neck pain, limping, nighttime pain, and incontinence of bowel or bladder.

Exam and workup

A physical exam reveals tenderness on palpation at the midline of the L4-L5 level and pain with lumbar extension. The patient also has a positive 1-legged hyperextension (Stork) test consisting of pain when she lifts up her right leg, flexing at the hip and knee while extending her lumbar spine (Figure 1). She has 5/5 strength in her lower extremities bilaterally and symmetric 2/4 patellar and Achilles deep tendon reflexes.

Possible etiologies of this athlete’s pain include mechanical (muscular) back pain, sacroiliac dysfunction, lumbar disk herniation, spondylolysis, and spondylolisthesis (Table). Although mechanical back pain is most likely, pain with extension in a gymnast raises concerns about the possibility

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FIGURE 1 One-legged hyperextension (Stork) test. Patient stands on 1 leg and hyperextends lumbar spine. The test is positive if the patient reports low back pain.
A FABER test (hip is flexed, abducted, and externally rotated to evaluate for development of pain at the ipsilateral sacroiliac joint) may help evaluate for sacroiliac joint involvement in addition to palpation and compression of the joint. This gymnast does not have a positive FABER test, which makes sacroiliac joint dysfunction less likely. Disk herniation often causes pain with forward flexion and this athlete’s pain worsens with lumbar extension, making disk herniation less likely and the possibility of spondylolysis more concerning.

Initial diagnostic workup consisting of lumbosacral radiographs (anteroposterior [AP] and lateral views) is normal, which rules out spondylolisthesis. A spondylolysis, however, is not always apparent on x-ray. Given a high suspicion for this condition, and this athlete’s desire to continue to participate in her sport, the next step is to proceed with magnetic resonance imaging (MRI), which confirms a spondylolysis of the right L5 vertebra.

What is spondylolysis?
The most common identifiable etiology of lumbar back pain in adolescents is spondylolysis. One recent study identified spondylolysis as the cause in 30% of adolescent athletes presenting with lumbar back pain. Another study found that 40% of pediatric patients presenting for evaluation for lumbar back pain had a spondylolysis (9% of elementary students, 60% of junior high students, and 32% of high school students had a spondylolysis). In this study, all patients who had spondylolysis were athletes. The study was performed in an orthopedic clinic, but general pediatricians should consider this injury in patients presenting for evaluation for low back pain.

A spondylolysis is a stress fracture to the pars interarticularis, which is a portion of the vertebral bone that joins the facet joints in the posterior aspect of the spine (Figure 2). A spondylolysis is usually caused by chronic stress applied to the lumbar spine, most likely due to repetitive lumbar hyperextension and rotation that cause shear and compressive forces on the pars interarticularis. In a small proportion of cases, an acute incident may cause this injury. A spondylolysis may be unilateral or bilateral and is most commonly seen at the L5 level (85% to 95% of the time), followed in frequency at L4. Spondylolysis is possible, but is much less common, at higher lumbar vertebral levels.

Sports such as gymnastics, dance, diving, volleyball, rowing, and football (linemen) have traditionally been thought to present high risk for spondylolysis. However, a recent study of nonelite athletes found that baseball, soccer, and basketball had the highest prevalence in males whereas gymnastics, marching band, and softball had the highest prevalence in females. Another recent study in New York found that soccer, basketball, lacrosse, baseball, tennis, and football were sports most associated with spondylolysis.

It is important to consider the sports common to the surrounding geographic area. In general, adolescent athletes with back pain have a higher prevalence of spondylolysis compared with nonathletes.

The adolescent growth spurt is a common factor in development of this injury as increased growth velocity places additional force on the spine during extension activities.
Spinal deformities such as kyphosis and spina bifida occulta are also associated with spondylolysis. Tight hamstrings as well as gluteal and lumbar extensor weakness may increase risk of this condition.

Spondylolisthesis is a potential complication of a spondylolysis (Figure 3). This occurs when there is a bilateral spondylolysis with an anterior translation (slip) of 1 vertebra. Spondylolistheses are graded based on the amount of slippage of the width of the vertebral body. A grade 1 spondylolisthesis is the most common and least severe, with the amount of slippage less than 25% of the width of the vertebral body. Grade 2 is 25% to 50%; grade 3 is 50% to 75%; and grade 4 is slippage greater than 75% of the vertebral body width.

Patients with spondylolysis may complain of midline or lateral back pain that typically worsens with extension. It is unusual to have complaints of numbness, tingling, or limping, but these may occur if a spondylolisthesis is present and progresses to impact the spinal cord.

**Diagnostic evaluation**

The primary care physician should evaluate for the presence of any “red flags” that might raise concerns for malignancy or other worrisome etiology prompting further workup. Red flags would include symptoms starting at younger than age 4 years; nighttime pain; incontinence of bowel or bladder; fever; weight loss; history of malignancy; or severe and worsening pain.

As long as none of these factors are present, appropriate initial workup consists of AP and lateral radiographs (Figure 4). The radiographs may or may not show the presence of a spondylolysis. However, the lateral view evaluates for the presence of spondylolisthesis, which would indicate that there is a bilateral spondylolysis. Previously, oblique view radiographs of the lumbar spine were recommended to look for the “Scottie dog” sign. However, these views are not usually helpful as they may be normal even in the presence of spondylolysis. Given the additional radiation exposure without added value, these oblique views are no longer typically obtained.

If radiographs are completely normal, and there is high clinical suspicion for spondylolysis, it is prudent to consider initiating treatment that includes prolonged rest and physical therapy. Many athletes are anxious to return to sport, and finding a definitive diagnosis with advanced imaging can be helpful. There is variation of practice in the choice of advanced diagnostic imaging. Options include...
MRI, computed tomography (CT), bone scintigraphy, and single-photon emission computed tomography.

Computed tomography is the best way to visualize bone and it has been considered a gold standard for diagnosing spondylolysis. However, MRI is becoming more popular due to the lack of associated radiation. Dhouib and colleagues found that an MRI has 81% sensitivity and 99% specificity. Although typical MRI protocols usually are geared toward evaluation for disk pathology, which is more common in the adult population, a protocol that includes thin-cut oblique sequences may be helpful for visualizing the pars interarticularis to help assess for the presence of spondylolysis at this location (Figure 5). It may be useful to discuss the most appropriate test for the patient with a local radiologist.

Treatment protocols
Treatment of spondylolysis is typically very successful with conservative management. The cornerstones of initial treatment are rest, activity modification, physical therapy, and gradual progression back to activity when the athlete is pain free. Physical therapy can address lower extremity inflexibility and core weakness. One approach may be to wait until the athlete’s pain is decreased to initiate physical therapy. However, a recent study demonstrated that early initiation of physical therapy

ICD-10 CODES FOR DIAGNOSING LUMBAR BACK PAIN

The following are suggested ICD-10 codes for the diagnosis and treatment of lumbar back pain in children and adolescents. Check with your contracted plan and individual state Medicaid program for coverage policy.

**Spondylolysis:**
- **M43.00** Spondylolysis, site unspecified
- **M43.01** Spondylolysis, occipito-atlanto-axial region
- **M43.02** Spondylolysis, cervical region
- **M43.03** Spondylolysis, cervicothoracic region
- **M43.04** Spondylolysis, thoracic region
- **M43.05** Spondylolysis, thoracolumbar region
- **M43.06** Spondylolysis, lumbar region
- **M43.07** Spondylolysis, lumbosacral region
- **M43.08** Spondylolysis, sacral and sacrococcygeal region
- **M43.09** Spondylolysis, multiple sites in spine
- **Q76.2** Congenital spondylolisthesis

**Spinal deformities:**
- **Q76.0** Spina bifida occulta
- **Q76.412** Congenital kyphosis, cervical region
- **Q76.413** Congenital kyphosis, cervicothoracic region
- **Q76.414** Congenital kyphosis, thoracic region
- **Q76.415** Congenital kyphosis, thoracolumbar region
- **Q76.419** Congenital kyphosis, unspecified region
may decrease time to return to sport by an average of 25 days. Some providers may place athletes in a brace to immobilize the spine to help promote bony healing, but there is concern for further weakening of abdominal and core muscles with prolonged immobilization. The use of bracing in treatment of spondylolysis is debated. However, braces may be used to help reduce pain, allow for bony healing, and make the patient more comfortable with activities such as prolonged sitting in school. Bony healing is not necessary for resolution of symptoms as many athletes may have fibrous healing and still will be successfully able to return to sport pain free. Return to sport is typically achieved within 3 to 6 months, after the athlete has gradually added back extension-based activities and is able to participate in his/her sport without back pain.

Complications include development of spondylolisthesis if a patient has a bilateral spondylolysis. There is a small risk of progression that is highest around the adolescent growth spurt, which typically will occur prior to skeletal maturity. Referral to a spine surgeon should be made for spondylolystheses greater than grade 2, for significant change in degree of spondylolisthesis, or persistent symptoms for longer than 6 months despite conservative treatment and compliance (Figure 6). Development of neurologic symptoms such as progressive radiculopathy and cauda equina syndrome warrant urgent referral to a spine surgeon.

**Prognosis for the patient**

When teenaged athletes complain of lumbar back pain that worsens with activity, there should be a high index of suspicion for a spondylolysis. Careful consideration should take into account appropriate further workup with diagnostic imaging and course of treatment, the cornerstones of which are rest, physical therapy, and gradual return to activity.

Most patients do very well with conservative management, particularly in the short term. Of a small group of elite male ice hockey players, 96% were able to return to elite-level play with an average return to play at 8 weeks. In another study in which a retrospective review with telephone follow-up found that most patients (67%) are able to return to their previous level or higher of sport, however, 45% of patients reported recurrence of symptoms at long-term follow-up and 34% required medical treatment.

There is no evidence that sports participation increases the chance of progression of spondylolisthesis.
Every day, pediatricians encounter children and adolescents in need of mental health services. We usually refer these patients to mental health professionals who can provide diagnosis, counseling, or medication management. In many circumstances, unfortunately, mental health providers have limited availability. This article will detail ways we can provide services within the walls of our practices. As you will see, pediatricians are quite capable of caring for both the physical and mental health of patients.

The problem

According to Best Principles for Integration of Child Psychiatry into the Pediatric Health Home, published by the American Academy of Child and Adolescent Psychiatry (AACAP) in 2012:

- 20% of all children in the United States have a mental health problem, but only 20% of them receive treatment.
- 13% of children aged 8 to 15 years have a mental illness that impairs daily living.

In the group aged 13 to 18 years, the percentage rises to 21%.
- 50% of lifelong mental illness begins by age 14 years; 75% by age 24 years.
- The average delay between symptom onset and intervention is between 8 and 10 years.

Even more impressive are the statistics reflecting the lack of mental health services for our patients. According to the AACAP website, the current need for child and adolescent psychiatrists (CAPs) is 30,000, but only 8,300 are practicing, and this pool is shrinking. Because of the severe shortage of child psychiatrists, 75% of all mental health services are provided by pediatricians.

Practice-based mental health access

Pediatricians have identified several barriers to providing mental health services on their own. These include lack of mental health training, time restrictions, and reimbursement concerns, as well as lack of mental health resources in many communities.

Nine years ago, the American Academy of Pediatrics (AAP) Committee on Psychosocial Aspects of Family Health and the Task Force on Mental Health recommended that pediatricians integrate mental health screening into routine practice and provide office-based mental health services whenever possible. The policy stated that pediatricians should partner with mental health specialists to petition insurers to improve payment for mental health services, and collaborate with community mental health specialists to improve provider knowledge and skills, with the goal of providing mental health services within the “medical home.”

There are 2 ways pediatricians can provide on-site mental health care. One involves embedding services directly into a practice, while the other involves seeking collaboration with existing community mental health professionals for training and support.

Integrative mental health care

To facilitate provision of mental health services for patients, you might consider embedding one or more mental health professionals in your practice. You may choose to employ a prescribing mental health nurse practitioner and/or a psychologist/
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psychotherapist. Alternatively, you can provide office space to these professionals who may prefer to remain independent. This would be a very attractive option, especially for those who are building their practices, as it provides immediate access to a large referral base. Having mental health professionals in your office under a rental agreement enables provision of services on a sliding scale for uninsured or underinsured patients. This may be difficult for pediatricians to do on their own due to restrictions imposed by insurance contracts.

Another integrative approach is to incorporate telepsychiatry into your practice. Via telepsychiatry, parents and patients can participate in a virtual face-to-face visit with a mental health professional in a room equipped with a televideo setup. There are several nationwide telepsychiatry services available, and these can be implemented at little or no cost to your practice. In many ways, telepsychiatry may be the easiest and most expeditious method for practices to expand their behavioral health capabilities (see “Perhaps pediatricians should consider telepsychiatry,” page 49).

Collaborative mental health care

Another way to improve practice-based mental health services is to form an alliance with a child and adolescent psychiatrist (CAP) in your community. One can invite motivated CAPs to join your practice for “lunch-and-learn” sessions. Over time, these will improve your ability to render mental health services independently.

There are many states that have implemented programs that facilitate mental health access. In 2003, the University of Massachusetts Medical School in Worcester initiated a pilot program to provide support services to pediatricians who wanted to provide behavioral health services within their practices. A year later, with funding from the state, the program, then called the Massachusetts Child Psychiatry Access Program (MCPAP), expanded statewide. The MCPAP improves an enrolled pediatrician’s ability to assess patients and to treat patients with anxiety, mood disorders including depression, and substance abuse problems (Figure). The program also facilitates referrals and care coordination for patients who need community-based specialty services.

The MCPAP uses 6 hubs to effectively cover 95% of the children in Massachusetts. The Massachusetts Department of Mental Health receives a $3.1 million annual appropriation from the commonwealth to fund the project. The MCPAP website (www.mcpap.org) has numerous resources for pediatricians including webinars on diagnosis and management. As a result of the program, the screening rate of children for behavioral health problems who had Medicaid insurance increased from 17% at program onset to 80% as of 2014.3,4

Kyle S. John, MD, coauthor of this article, is a child and adolescent psychiatrist employed by Mercy Kids and Mercy Virtual in Chesterfield, Missouri, to train and support the 250 community-based pediatricians affiliated with the medical center.

The Mercy Kids/Mercy Virtual–Behavioral Health program was established in January 2018 after 2 years of preparation and has trained 200 of the 250 targeted providers. Mental health diagnostic tools are embedded into the practice’s electronic health records (EHRs) and participants receive comprehensive training in their use as well as recommendations for management and follow-up.

Important to the success of the program is that pediatricians can consult an on-call child psychiatrist for recommendations regarding diagnosis or management. When necessary, a timely telepsychiatry session with a patient or family will be arranged. The program has an extensive registry of community resources when referrals for counseling or other services are required. In the near future, the program will integrate counseling for patients and family utilizing HIPAA-compliant telemedicine technology.

Abbreviation: HIPAA, Health Insurance Portability and Accountability Act.

Kyle S. John, MD, conducts a telepsychiatry session at Mercy Kids/Mercy Virtual in Chesterfield, Missouri.

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The success of the MCPAP has led to the creation of similar programs throughout the country. Currently there are similar Child Psychiatry Access programs operating in more than 28 states. These programs are coordinated via the National Network of Child Psychiatry Access Programs (NNCPAP). The NNCPAP website (www.nncpap.org) lists state-by-state resources as well as contact information.

**Time to decide**

As discussed earlier in this article, pediatricians have many options regarding expanding the ability of their practices to provide direct mental health services to patients, even in communities where resources may be wanting. It’s time for pediatricians to be proactive and either integrate mental health services into the medical home or upgrade skills so we can assume responsibility for patients in need.

Dr John is medical director, MentalWellness Program, Mercy Virtual, Chesterfield, Missouri. He has 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.

Dr Schuman, section editor for Practice Improvement and Peds v2.0, and Editorial Advisory Board member of Contemporary Pediatrics, is clinical assistant professor of Pediatrics, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire. He is CEO of Medgizmos.com, a medical technology review site for primary care physicians.

**FIGURE** The Massachusetts Child Psychiatry Access Program (MCPAP) improves an enrolled pediatrician’s ability to assess and treat patients with anxiety, mood disorders including depression, and substance abuse problems.

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**PERHAPS PEDIATRICIANS SHOULD CONSIDER TELEPSYCHIATRY**

The success of the collaborative models detailed in this article depend on pediatricians expanding competencies. Obviously, this takes time and effort, and many practices may be unwilling or unable to evolve their practices in this way. Many pediatricians already treat patients with attention-deficit/hyperactivity disorder (ADHD), but many of these patients have comorbid mental health problems as well. If pediatricians are reluctant to assume the care and medical management of patients with anxiety and mood disorders, including depression, an alternative is to integrate telepsychiatry into their practice.

Scott Bernard, PhD, MBA, MPH, is a psychologist and CEO and president of one of the largest telepsychiatry services in the country. His e-Psychiatry service is based in Columbus, Indiana, and provides services in all 50 states. Patients log into the e-Psychiatry HIPAA-secure portal from a computer system in your office to consult with a mental health provider. Patients can be seen by a child and adolescent psychiatrist or a nurse practitioner, psychologist, or therapist, depending on the situation and need. These providers are licensed in your state and fully insured.

The program accepts insurance payments, and, in most cases, Medicaid is accepted as well. Noninsured patients usually can expect to pay $175 per hour for a session with a child psychiatrist, or $135 per hour for a session with a psychiatric nurse practitioner. The psychiatrist or nurse practitioner renders a diagnosis and provides appropriate prescriptions, arranges follow-up sessions, and transmits a consultation note to include in the patient’s chart. Patients can have regular therapy sessions in your office as well.

Bernard recommends that telepsychiatry sessions be conducted in your office, because many insurance companies will not reimburse if the session is conducted with a patient at home. In his experience, practices benefit by integrating telepsychiatry into their offices with expanding enrollment for routine pediatric care as many parents intentionally seek out practices that provide telepsychiatry.

Abbreviation: HIPAA, Health Insurance Portability and Accountability Act.
Dr. Bobby Lazzara discusses findings of a study published in *Neurology* that looked at the prevalence of atopic dermatitis—eczema—in children aged 1 to 5 years who had undergone ultraviolet-free blue light therapy as newborns for neonatal jaundice.

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Dr. Bobby Lazzara discusses a recent review published online in *Cochrane* that looked at the correlation between early preterm birth and symptoms of attention-deficit/hyperactivity disorder in preschool- and school-aged children.

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Dr. Bobby Lazzara discusses a landmark observational study published in *JAMA Pediatrics* that looked at the correlation between early preterm birth and symptoms of attention-deficit/hyperactivity disorder in preschool- and school-aged children.

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Lacrimal fistula CONTINUED FROM PAGE 54

canalculus failing to fuse and aberrant budding.¹,² The majority of these fistulas are lined with squamous epithelium, but rarely columnar epithelium or cuboidal epithelium have been found.²

The diagnosis of lacrimal fistula is mostly clinical, but irrigation of the lacrimal sac with fluorescein balanced salt solution can be used to detect skin ostium and the patency of the nasolacrimal duct. Dacryoendoscopy, computerized tomography, and polyvinyl siloxane cast also have been used to confirm diagnosis.¹,⁴

Congenital lacrimal fistulas are supernumerary lacrimal canaliculi connecting skin to common canaliculus or lacrimal sac.¹,²

Congenital lacrimal fistulas are mostly asymptomatic; however, there can be complications or undesired symptoms attributed to the fistula. For example, chronic epiphora through the fistula or eye, or mucoid discharge from the fistula, can occur. In addition, coughing and blowing one’s nose may cause clear discharge.¹ There also may be redness of medial canthal angle, or constant tearing during crying. A mucocele can be found if associated with nasolacrimal duct obstruction.

There is no evidence of any systemic associations, but congenital lacrimal fistulas have been found with Down syndrome; naso-orbital meningocele; VACTERL association-like VATER (vertebral defects, anal atresia, tracheoesophageal fistula, esophageal atresia, and radial dysplasia); ectrodactyly-ectodermal dysplasia-clefting syndrome; and CHARGE syndrome (coloboma, heart defects, atresia choanae, growth retardation, genital abnormalities and ear abnormalities).¹

The most common differential diagnosis would be congenital nasolacrimal duct obstruction or stenosis attributed to failure of the opening of the lacrimal duct at birth. Dacryostenosis is commonly attributed to an imperforate membrane at the valve of Hasner.³ Duct obstruction or stenosis there is typically constant epiphora unrelated to crying, and it typically gets better with time and lacrimal sac massage.

Asymptomatic patients are managed conservatively. Symptomatic fistulas are treated with various surgical procedures such as probing, fistulectomy, and dacryocystorhinostomy.⁵

Patient outcome
In this infant, there was no inflammation or discharge from the opening. The remaining eye examination was normal.

The patient is currently being managed conservatively for epiphora. He is awaiting evaluation by an otorhinolaryngologist for fistulectomy with or without dacryocystorhinostomy. ■

Dr Davé is a board-certified pediatrician practicing general pediatrics in rural Ottawa, Illinois.

Ms Davé is a board-certified nurse practitioner at the same practice.

Dr Cohen, section editor for Dermcase, is professor of Pediatrics and Dermatology, Johns Hopkins University School of Medicine, Baltimore, Maryland. The authors 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.

For references, go to ContemporaryPediatrics.com/dermcase-0918

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Fistula spied near infant’s eye

AMAR DAVÉ MD, FAAP; PAHROUL DAVÉ, APRN

The mother of a healthy 4-week-old boy brings him to the office for evaluation of a small pit on the medial canthus of the left eye, noted since birth. There is constant drainage of tears onto the left side of his face and exudate on the bottom of the left medial canthus (Figure).

CONGENITAL LACRIMAL FISTULA

History

A mother brought to the clinician’s attention a small opening located inferonasally from medial canthus during a well-check examination of a 4-week-old male infant. Symptoms included epiphora and exudation from the left eye. There was no inflammation or discharge from that opening, which appeared exactly like preauricular pit/preauricular sinus. The remaining eye examination was normal. The infant’s birth history was normal except for acquired left clavicular fracture because of birth trauma.

Discussion

Congenital lacrimal fistulas are developmental, rudimentary, supernumerary lacrimal canaliculi connecting skin to common canaliculus or lacrimal sac. These fistulas are located inferonasally from the medial canthus and are unilateral, but bilateral cases have been reported. The incidence is 1 in 2000. Etiopathogenesis based upon histopathology suggest outgrowth from common
Green mucus meant a bacterial infection and warranted antibiotics (we are still paying for teaching that to grandparents). A cough for more than 10 days meant a sinus infection and also meant we could use antibiotics. Respiratory syncytial virus (RSV) infection was routinely treated with albuterol and sometimes steroids (some physicians still do this). Prior to that, ribavirin use was common in the hospital. Even before that, there was actually a vaccine for RSV, which unfortunately resulted in children getting “enhanced RSV,” making them much sicker than they would have been otherwise (this last was before my time).

In my day, I have treated serous otitis media with antihistamines, decongestants, steroids, prophylactic antibiotics, and placement of tubes (even if hearing was normal).

A boy of any age, or a girl who was not toilet trained, who developed a first urinary tract infection (UTI) needed a renal ultrasound and voiding cystourethrogram (VCUG). If it showed reflux, they were then put on prophylactic antibiotics until a subsequent VCUG could show the reflux was gone.

Because reflux could run in families, if such a child had siblings aged younger than 10 years or so, they also needed a VCUG and treatment if positive.

Codeine was used for coughs in children aged 3 years and older. We had prescription decongestant/dextromethorphan combinations that came with droppers, so that we could dose infants with colds “properly.”

A first febrile seizure, even if a child looked great, could mean meningitis. We would do a spinal tap, admit for intravenous antibiotics until the culture was negative (regardless of whether the tap looked clear or not), and send the child home on phenobarbital for 2 years to prevent further seizures. Some pediatricians would give phenobarbital during a fever. We more knowledgeable doctors would scoff at them, knowing, correctly, that the phenobarbital would not build up to a protective level in the blood in time. Of course, because phenobarbital was dangerous, those doctors were providing better care—albeit out of ignorance.

Interestingly, for everything on this list, doing nothing turned out to be a better choice than intervening.