Severe Asthma
The Hope of the New Biologics

Pharmacologist’s Notebook
Supplements for sadness

Congenital upper limb deficiency

Practice Improvement
What to do if you’ve been sued

Fish oil for asthma control

Dermcase
Painful bullae in a 12-year-old girl

PUZZLER Teenaged boy with ankle pain and swelling
Professionally Recommended
Problem-Solving Products

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My pediatric medical home

A pediatrician praises the pediatric medical home concept for improving his patient care and family satisfaction.

RAFAEL M NUNEZ, MD

My experience working as a pediatrician in a pediatric medical home (PMH) is very positive. I have worked here since 2011, and I have been noticing great improvement in patient and family satisfaction.¹-³

Our group is a hospital-based team comprised of 10 to 11 medical providers, including 2 pediatric nurse practitioners (PNPs), 4 to 5 registered nurses (RNs), 15 to 20 licensed practice nurses (LPNs), 2 to 3 medics, and 2 to 3 staff, and together we provide pediatric care to about 9700 patients.

We are divided in 2 groups named Outback and Safari—very cool names for a PMH. In an ideal PMH world, every provider should have 2 LPNs, but because of budget constraints and movements of personnel, every provider is working with at least 1 LPN. Every team has 2 RNs.

A typical day

Our day starts at 7:30 AM (for Richmond Hill Medical Home [RHMH]) with a group meeting aiming to plan and discuss the day ahead. Also at this meeting we could receive information and feedback from leadership. The meetings usually last no more than 10 minutes. No one sits during this meeting and we gather in a T-shaped hallway inside the clinic (Figure 1). The clinic chief or chief nurse chairs these meetings.

The first appointment starts at 7:40 AM and every encounter lasts 20 minutes. Sometimes we have longer encounter for patients with complex concerns/issues such as attention-deficit/hyperactivity disorder (ADHD), autism, behavior disorders, or complex pathologies that require sophisticated management.²⁻⁴

Daily workflow

One typical encounter (Figure 2) starts with the LPN greeting the patient and family in the waiting room and directing them into an examination room for taking vital signs, including measurements of growth parameters. Also, if the visit is for a well-child evaluation, then we provide the parents with appropriate questionnaires for development, autism screening, and depression screening. Screening for ADHD is provided per specific request or parental concerns. Then, the LPN asks medical questions regarding the specifics of the visit, including questions about past medical and family history, allergies, medications, and other issues relevant to the visit. All the information gathered is documented into the patient’s electronic medical record (EMR). After completing this section of the encounter, the LPN briefs the provider on the details.

Thereafter, the provider and the LPN walk into the examination room to meet and greet the patient and family and proceed to assess and evaluate the patient. The provider completes the encounter by asking further questions, performing a physical examination, and discussing with the patient and family the assessment and plans of management. Notably, the provider and the LPN will work this part of the encounter as a team, which allows better completion of the patient medical record and provides to the patient and family a written summary of the care.

CONTINUED ON PAGE 46
EMVERM® is indicated for the treatment of patients two years of age and older with gastrointestinal infections caused by Ancylostoma duodenale (hookworm), Ascaris lumbricoides (roundworm), Enterobius vermicularis (pinworm), Necator americanus (hookworm), and Trichuris trichiura (whipworm).

**Indication**

EMVERM® is indicated for the treatment of patients two years of age and older with gastrointestinal infections caused by Ancylostoma duodenale (hookworm), Ascaris lumbricoides (roundworm), Enterobius vermicularis (pinworm), Necator americanus (hookworm), and Trichuris trichiura (whipworm).

**Contraindication:** EMVERM is contraindicated in persons with a known hypersensitivity to the drug or its excipients (mebendazole, microcrystalline cellulose, corn starch, anhydrous lactose, sodium starch glycolate, magnesium stearate, steearic acid, sodium lauryl sulfate, sodium saccharin, and FD&C Yellow #6).

**Warnings and Precautions:**

- **Risk of Convulsions:** Convulsions in infants below the age of 1 year have been reported.
- **Hematologic Effects:** Neutropenia and agranulocytosis have been reported in patients receiving mebendazole at higher doses and for prolonged duration. Monitor blood counts in these patients.
- **Mesoridazine and Serious Skin Reactions:** Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN) have been reported with the concomitant use of mebendazole and mesoridazine. Avoid concomitant use of mesoridazine and mebendazole.

**Adverse Reactions Reported in Mebendazole-treated Subjects from 39 Clinical Trials:**

- anorexia, abdominal pain, diarrhea, flatulence, nausea, vomiting, rash.

**Adverse Reactions Identified During Postmarketing Experience with Mebendazole:**

- agranulocytosis, neutropenia, hypersensitivity including anaphylactic reactions, convulsions, dizziness, hepatitis, abnormal liver tests, glomerulonephritis, Stevens-Johnson syndrome/toxic epidermal necrolysis, exanthema, angioedema, urticaria, alopecia.

*Includes mebendazole formulations, dosages and treatment duration other than EMVERM 100 mg chewable tablet.

**Drug Interactions:** Concomitant use of EMVERM and mesoridazine should be avoided.

**Pregnancy:** The available published literature on mebendazole use in pregnant women has not reported a clear association between mebendazole and a potential risk of major birth defects or miscarriages. There are risks to the mother and fetus associated with untreated helminthic infection during pregnancy.

**Lactation:** Limited data from case reports demonstrate that a small amount of mebendazole is present in human milk following oral administration. There are no reports of effects on the breastfed infant, and the limited reports on the effects on milk production are inconsistent. The limited clinical data during lactation precludes a clear determination of the risk of EMVERM to a breastfed infant; therefore, developmental and health benefits of breastfeeding should be considered along with the mother’s clinical need for EMVERM and any potential adverse effects on the breastfed infant from EMVERM or from the underlying maternal condition.

**Pediatric Use:** The safety and effectiveness of EMVERM 100 mg chewable tablet has not been established in pediatric patients less than two years of age. Convulsions have been reported with mebendazole use in children less than one year of age.

**Geriatric Use:** Clinical studies of mebendazole did not include sufficient numbers of subjects aged 65 and older to determine whether they respond differently from younger subjects.

**Overdosage:** In patients treated at dosages substantially higher than recommended or for prolonged periods of time, the following adverse reactions have been reported: alopecia, reversible transaminase elevations, hepatitis, agranulocytosis, neutropenia, and glomerulonephritis.

**Symptoms and signs of overdose:** In the event of accidental overdose, gastrointestinal signs/symptoms may occur. In the event of accidental overdose, gastrointestinal signs/symptoms may occur.

**Treatment of overdose:** There is no specific antidote.

**Patient Counseling:** Healthcare professionals should advise the patient to read the FDA-approved patient labeling (Patient Information) before prescribing EMVERM.

**Adverse Reactions Reported in Mebendazole-treated Subjects from 39 Clinical Trials:**

- anorexia, abdominal pain, diarrhea, flatulence, nausea, vomiting, rash.

**Adverse Reactions Identified During Postmarketing Experience with Mebendazole:**

- agranulocytosis, neutropenia, hypersensitivity including anaphylactic reactions, convulsions, dizziness, hepatitis, abnormal liver tests, glomerulonephritis, Stevens-Johnson syndrome/toxic epidermal necrolysis, exanthema, angioedema, urticaria, alopecia.

*Includes mebendazole formulations, dosages and treatment duration other than EMVERM 100 mg chewable tablet.

**Drug Interactions:** Concomitant use of EMVERM and mesoridazine should be avoided.

**Pregnancy:** The available published literature on mebendazole use in pregnant women has not reported a clear association between mebendazole and a potential risk of major birth defects or miscarriages. There are risks to the mother and fetus associated with untreated helminthic infection during pregnancy.
EMVERM® (mebendazole) 100 mg Chewable Tablets

BRIEF SUMMARY: Complete information about EMVERM® can be found in the Full Prescribing Information.

INDICATIONS AND USAGE
EMVERM® is indicated for the treatment of patients two years of age and older with gastrointestinal infections caused by Ancylostoma duodenale (hookworm), Ascaris lumbricoides (roundworm), Enterobius vermicularis (pinworm), Necator americanus (hookworm), and Trichuris trichiura (whipworm).

DOSAGE AND ADMINISTRATION
The recommended dosage for EMVERM® is described in Table 1 below. The same dosage schedule applies to adults and pediatric patients two years of age and older. The tablet may be chewed, swallowed, or crushed and mixed with food.

Table 1: Dosage of EMVERM in Adult and Pediatric Patients (two years of age and older)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Pinworm (enterobiasis)</th>
<th>Whipworm (trichuriasis)</th>
<th>Roundworm (ascariasis)</th>
<th>Hookworm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 tablet</td>
<td>1 tablet morning and evening for 3 consecutive days</td>
<td>1 tablet morning and evening for 3 consecutive days</td>
<td>1 tablet morning and evening for 3 consecutive days</td>
<td></td>
</tr>
</tbody>
</table>

If the patient is not cured three weeks after treatment, a second course of treatment is advised. No special procedures, such as fasting or purging, are required.

CONTRAINDICATIONS
EMVERM® is contraindicated in persons with a known hypersensitivity to the drug or its excipients (mebendazole, microcrystalline cellulose, corn starch, anhydrous lactose, sodium starch glycolate, magnesium stearate, stearic acid, sodium lauryl sulfate, sodium saccharin, and FD&C Yellow #6). WARNINGS AND PRECAUTIONS
Risk of Convulsions
Although EMVERM® is approved for use in children two years of age and older, convulsions have been reported in infants below the age of 1 year during post-marketing experience with mebendazole, including EMVERM®.

Hematologic Effects
Agranulocytosis and neutropenia have been reported with mebendazole use at higher doses and for more prolonged durations than is recommended for the treatment of soil-transmitted helminth infections. Monitor blood counts if EMVERM® is used at higher doses or for prolonged duration.

Mebendazole Drug Interaction and Serious Skin Reactions
Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN) have been reported with the concomitant use of mebendazole and metronidazole. Avoid concomitant use of mebendazole, including EMVERM®, and metronidazole.

ADVERSE REACTIONS
Clinical Studies
Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

The safety of mebendazole was evaluated in 6276 subjects who participated in 39 clinical trials for treatment of single or mixed parasitic infections of the gastrointestinal tract. In these trials, the formulations, dosages and duration of mebendazole treatment varied. Adverse reactions reported in mebendazole-treated subjects from the 39 clinical trials are shown in Table 2.

Table 2: Adverse Reactions Identified During Postmarketing Experience with Mebendazole*

<table>
<thead>
<tr>
<th>Adverse Reaction(s)</th>
<th>Blood and Lymphatic System Disorders</th>
<th>Immune System Disorders</th>
<th>Nervous System Disorders</th>
<th>Hepatobiliary Disorders</th>
<th>Renal and Urinary Disorders</th>
<th>Skin and Subcutaneous Tissue Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rash</td>
<td>Agranulocytosis, Neutropenia</td>
<td>Hypersensitivity including anaphylactic reactions</td>
<td>Convulsions, Dizziness</td>
<td>Hepatitis, Abnormal liver tests</td>
<td>Glomerulonephritis</td>
<td>TEN, SJS, Exanthema, Angioedema, Urticaria, Alopecia</td>
</tr>
</tbody>
</table>

*Includes mebendazole formulations, dosages and treatment duration other than EMVERM® 100 mg chewable tablets

DRUG INTERACTIONS
Concomitant use of mebendazole, including EMVERM®, and metronidazole should be avoided.

USE IN SPECIFIC POPULATIONS
Pregnancy
Risk Summary
The available published literature on mebendazole use in pregnant women has not reported a clear association between mebendazole and a potential risk of major birth defects or miscarriages [see Data]. There are risks to the mother and fetus associated with untreated helminthic infection during pregnancy [see Clinical Considerations]. In animal reproduction studies, adverse developmental effects (i.e., skeletal malformations, soft tissue malformations, decreased pup weight, embryo lethality) were observed when mebendazole was administered to pregnant rats during the period of organogenesis at single oral doses as low as 10 mg/kg (approximately 0.5-fold the total daily maximum recommended human dose [MRHD]). Maternal toxicity was present at the highest of these doses [see Data]. The estimated background risk of major birth defects and miscarriage for the indicated populations is unknown. All pregnancies have a background risk of birth defect, loss, or other adverse outcomes. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2–4% and 15–20%, respectively.

Clinical Considerations
Disease-Associated Maternal and/or Embryo/Fetal Risks
Untreated soil transmitted helminth infections in pregnancy are associated with adverse outcomes including maternal iron deficiency anemia, low birth weight, neonatal and maternal death.

Data
Human Data
Several published studies, including prospective pregnancy registries, case-control, retrospective cohort, and randomized controlled studies, have reported no association between mebendazole use and a potential risk of major birth defects or miscarriage. Overall, these studies did not identify a specific...
pattern or frequency of major birth defects with mebendazole use. However, these studies cannot definitely establish the absence of any mebendazole-associated risk because of methodological limitations, including recall bias, confounding factors and, in some cases, small sample size or exclusion of first trimester mebendazole exposures.

**Animal Data**

Embryo-fetal developmental toxicity studies in rats revealed no adverse effects on dams or their progeny at doses up to 2.5 mg/kg/day on gestation days 6–15 (the period of organogenesis). Dosing at ≥10 mg/kg/day resulted in a lowered body weight gain and a decreased pregnancy rate. Maternal toxicity, including body weight loss in one animal and maternal death in 11 of 20 animals, was seen at 40 mg/kg/day. At 10 mg/kg/day, increased embryo-fetal resorption (100% were resorbed at 40 mg/kg/day), decreased pup weight and increased incidence of malformations (primarily skeletal) were observed. Mebendazole was also embryotoxic and teratogenic in pregnant rats at single oral doses during organogenesis as low as 10 mg/kg (approximately 0.5-fold the total daily MRHD, based on mg/m²).

In embryo-fetal developmental toxicity studies in mice dosed on gestation days 6–15, doses of 10 mg/kg/day and higher resulted in decreased body weight gain at 10 and 40 mg/kg/day and a higher mortality rate at 40 mg/kg/day. At doses of 10 mg/kg/day (approximately 0.2-fold the total daily MRHD, based on mg/m²) and higher, embryo-fetal resorption increased (100% at 40 mg/kg) and fetal malformations, including skeletal, cranial, and soft tissue anomalies, were present. Dosing of hamsters and rabbits did not result in embryotoxicity or teratogenicity at doses up to 40 mg/kg/day (1.6 to 3.9-fold the total daily MRHD, based on mg/m²).

In a peri- and post-natal toxicity study in rats, mebendazole did not adversely affect dams or their progeny at 20 mg/kg/day. At 40 mg/kg (1.9-fold the total daily MRHD, based on mg/m²), a reduction of the number of live pups was observed and there was no survival at weaning. No abnormalities were found on gross and radiographic examination of pups at birth.

**Lactation**

**Risk Summary**

Limited data from case reports demonstrate that a small amount of mebendazole is present in human milk following oral administration. There are no reports of effects on the breastfed infant, and the limited reports on the effects on milk production are inconsistent. The limited clinical data during lactation precludes a clear determination of the risk of EMVERM® to a breastfed infant; therefore, developmental and health benefits of breastfeeding should be considered along with the mother’s clinical need for EMVERM® and any potential adverse effects on the breastfed infant from EMVERM® or from the underlying maternal condition.

**Pediatric Use**

The safety and effectiveness of EMVERM® 100 mg chewable tablets has not been established in pediatric patients less than two years of age. Convulsions have been reported with mebendazole use in children less than one year of age.

**Geriatric Use**

Clinical studies of mebendazole did not include sufficient numbers of subjects aged 65 and older to determine whether they respond differently from younger subjects.

**OVERDOSE**

In patients treated at dosages substantially higher than recommended or for prolonged periods of time, the following adverse reactions have been reported: alopecia, reversible transaminase elevations, hepatitis, agranulocytosis, neutropenia, and glomerulonephritis.

**Symptoms and signs**

In the event of accidental overdose, gastrointestinal signs/symptoms may occur.

**Treatment**

There is no specific antidote.

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**CLINICAL STUDIES**

Efficacy rates derived from various studies are shown in Table 4 below:

**Table 4: Mean Cure Rates and Egg Reductions from Clinical Studies**

<table>
<thead>
<tr>
<th></th>
<th>Pinworm (enterobiasis)</th>
<th>Whipworm (trichuriasis)</th>
<th>Roundworm (ascariasis)</th>
<th>Hookworm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cure rates</strong></td>
<td>95%</td>
<td>68%</td>
<td>98%</td>
<td>96%</td>
</tr>
<tr>
<td><strong>Egg reduction</strong></td>
<td>—</td>
<td>93%</td>
<td>99%</td>
<td>99%</td>
</tr>
<tr>
<td><strong>mean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**PATIENT COUNSELING INFORMATION**

Advise the patient to read the FDA-approved patient labeling (Patient Information).

Advise patients that:

- Taking EMVERM® and metronidazole together may cause serious skin reactions and should be avoided.
- EMVERM® can be taken with or without food.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch, or call 1-800-FDA-1088. To report SUSPECTED ADVERSE REACTIONS contact Impax Laboratories, Inc. at 1-877-994-6729.

Please see Full Prescribing Information including Patient Information at [www.emvermhcp.com](http://www.emvermhcp.com).

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Hayward, CA 94544
07/2017 PP-XPI-MEB-US-0008
Pediatric depression is increasingly recognized in the United States. The Centers for Disease Control and Prevention estimates that 1 in 20 children is diagnosed with anxiety or depression. When discussing treatment options, patients or caregivers often express an interest in complementary and alternative medicine (CAM). Nutritional supplements are touted to the public as less toxic or more effective than conventional drugs because they are “natural” and their efficacy is based on knowledge gained over thousands of years. Due to the black-box warnings on antidepressants issued by the US Food and Drug Administration (FDA) and recent negative media generated toward the scientific community, parents may shy away from evidence-based medications for their children. Providers play an important role in explaining the risks and benefits associated with nutritional supplements as well as prescription medications.

**Guideline recommendations**

Only 2 drugs, fluoxetine and escitalopram, are approved by the FDA to treat childhood depression. Nevertheless, consensus guidelines recommend fluoxetine, citalopram, and sertraline as first-line treatments for moderate to severe depression in pediatric patients. Venlafaxine, bupropion, mirtazapine, duloxetine, and lithium are alternatives for individuals with inadequate clinical response.

Pediatric practice guidelines do not suggest herbal supplements as treatment options. However, the American Psychiatric Association’s (APA) depression guideline discusses CAM. The guideline states that folate

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**Contemporary Pediatrics** is meeting your need to stay current on pharmacologic best practices by bringing you this new recurring feature titled *The Clinical Pharmacologist’s Notebook*. Our goal is to provide pediatricians and pediatric healthcare providers with the most up-to-date information— and thinking—as provided by children’s clinical pharmacology experts.
is a reasonable, low-risk, adjunctive strategy but more data is necessary to establish a role for St. John’s wort, S-adenosyl methionine (SAMe), and omega-3 fatty acids (O3FA).8

**Necessary precautions**

Federal law does not require companies to prove safety or efficacy of dietary supplements prior to manufacturing.9 Because rigorous clinical testing is not mandated, dosing is often recommended upon small, poorly designed studies. Significant uncertainty surrounds the long-term consequences of exposure to some herbal remedies for which the toxicity profiles are incompletely characterized.2

There is also considerable risk of delaying therapy with an evidence-based medication, especially for suicidal patients. Additionally, drug-drug interactions may occur with herbal supplements and prescription medications, rendering pharmaco-therapy ineffective or even dangerous. Finally, although supplements are readily available over-the-counter, they are typically not covered by insurance. Families may face significant financial burden when purchasing herbal products from a reputable source.

The Table reviews these over-the-counter supplements and the corroborating study data for each product.

Whereas there may be theoretical benefit or literature demonstrating positive outcomes in different populations, the following supplements were excluded from this review due to a lack of data in pediatric depression: acetyl-l-carnitine, B vitamins, dehydroepiandrosterone, folic acid, glutamine, 5-hydroxytryptophan, inositol, iron, phenylalanine, probiotics, saffron, turmeric, and tyrosine.

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**TABLE**

**SUPPLEMENTS WITH DATA IN PEDIATRIC DEPRESSION**

<table>
<thead>
<tr>
<th>DRUG</th>
<th>PROPOSED MECHANISM(S)10,11</th>
<th>MAJOR ADVERSE EFFECTS AND CONSIDERATIONS10,11</th>
</tr>
</thead>
</table>
| O3FA     | Anti-inflammatory, synaptic plasticity, neuroprotection, enhances neurotransmission, membrane integrity, cortisol regulation, serotonin and dopamine production | □ Large capsules  
□ Fishy taste  
□ May cause headaches, gastrointestinal (GI) symptoms, increased bleeding risk |
| SAMe     | Methylated hormones, including dopamine and serotonin | □ High pill burden  
□ Avoid use with serotonergic medications |
| St. John’s wort | Modulates serotonin, dopamine, and norepinephrine | □ Many serious drug interactions  
□ May cause GI symptoms |
| Vitamin C | Antioxidant with neuroprotective effects, modulates dopamine and glutamate neurotransmission, influences serotonin receptor activity | □ Dose-dependent adverse effects  
□ May cause GI symptoms, changes in sleep patterns |
| Vitamin D | Regulates serotonin and dopamine synthesis, influences immune system and inflammatory cascade | □ Dose-dependent adverse effects  
□ May cause hypercalcemia, azotemia, anemia |
| Zinc     | Protects against oxidative stress, enhances neuroplasticity and neurogenesis, modulates N-methyl-D-aspartate and serotonin receptors, moderates immune activity | □ Interactions with many antimicrobials  
□ Dose-dependent adverse effects  
□ May cause GI symptoms, copper deficiency, renal issues |

**NOTE FROM DR LEE** Over-the-counter supplements have emerged with aggressive marketing and project to be a $197 billion industry worldwide by 2025. Despite having some benefits for Pediatric Depression and perceived as being “safe,” clinicians are reminded that supplement-drug interaction data is incomplete and potential supplement potency and integrity may arise.

— Carlton Lee, PHARMD, MPH, FASHP, FPPAG

For references, go to ContemporaryPediatrics.com/supplements-for-sadness
### Summary of Literature

**Table Continued:**

**Supplements With Data in Pediatric Depression**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Lead Author</th>
<th>Ages (Years)</th>
<th>No. of Patients</th>
<th>Study Design</th>
<th>Intervention</th>
<th>Supplement Used as Adjunct or Monotherapy</th>
<th>Clinical Scale</th>
<th>Positive Results From Supplement</th>
</tr>
</thead>
<tbody>
<tr>
<td>O3FA</td>
<td>Fristad12</td>
<td>7-14</td>
<td>72</td>
<td>12-wk, RCT</td>
<td>1870 mg O3FA daily vs 1870 mg O3FA daily + PEP vs PEP + placebo vs placebo</td>
<td>Monotherapy</td>
<td>CDRS-R</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Gabbay13</td>
<td>12-19</td>
<td>51</td>
<td>10-wk, RCT</td>
<td>1.2-3.6 g O3FA daily vs placebo</td>
<td>Monotherapy</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>McNamara14</td>
<td>8-24</td>
<td>14</td>
<td>10-wk, open-label</td>
<td>2.4 g vs 16.2 g O3FA daily</td>
<td>Adjunct, after selective serotonin reuptake inhibitor failure</td>
<td>CDRS-R</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Nemets15</td>
<td>6-12</td>
<td>20</td>
<td>16-wk, RCT</td>
<td>1 g O3FA daily vs placebo</td>
<td>Monotherapy</td>
<td>CDRS, CDI, CGI</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Trebaticka16</td>
<td>11-17</td>
<td>35</td>
<td>12-wk, double blind RCT</td>
<td>2.4 g O3FA daily vs 2467 mg omega-6 fatty acid daily</td>
<td>Adjunct</td>
<td>CDI</td>
<td>Yes</td>
</tr>
<tr>
<td>SAMe</td>
<td>Schaller17</td>
<td>8-16</td>
<td>3</td>
<td>6-mo, case series</td>
<td>200-1800 mg daily</td>
<td>Monotherapy</td>
<td>CDI</td>
<td>Yes</td>
</tr>
<tr>
<td>St. John’s Wort</td>
<td>Hubner18</td>
<td>≤12</td>
<td>101</td>
<td>4-6-wk, open-label</td>
<td>300-1800 mg daily</td>
<td>N/A</td>
<td>Study-specific questionnaire</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Findling19</td>
<td>6-16</td>
<td>33</td>
<td>8-wk, open-label</td>
<td>150-300 mg 3 times daily</td>
<td>Monotherapy</td>
<td>CDRS-R, CGI</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Simeon20</td>
<td>12-17</td>
<td>26</td>
<td>8-wk, open-label</td>
<td>300 mg 3 times daily</td>
<td>N/A</td>
<td>CGI</td>
<td>Yes</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Amr21</td>
<td>7-14</td>
<td>24</td>
<td>6-mo, double-blind trial</td>
<td>Fluoxetine 10-20 mg daily + vitamin C 1000 mg daily vs fluoxetine 10-20 mg daily + placebo</td>
<td>Adjunct</td>
<td>CDRS, CDI, CGI</td>
<td>Yes</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Bahrami22</td>
<td>13-16</td>
<td>940</td>
<td>9-wk, cohort</td>
<td>Cholecalciferol 50,000 IU weekly</td>
<td>Monotherapy</td>
<td>Beck Depression Inventory–II</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Hogberg23</td>
<td>10-19</td>
<td>54</td>
<td>3-mo, case-series</td>
<td>Cholecalciferol 2000-4000 IU daily</td>
<td>Both</td>
<td>Vitamin D deficiency scale, Mood and Feelings Questionnaire</td>
<td>Yes</td>
</tr>
<tr>
<td>Zinc</td>
<td>DiGirolamo24</td>
<td>6-11</td>
<td>674</td>
<td>6-mo, double-blind RCT</td>
<td>Zinc oxide 10 mg 5 d/wk vs placebo</td>
<td>Monotherapy</td>
<td>CDI, Behavioral Assessment System for Children</td>
<td>No</td>
</tr>
</tbody>
</table>

**Abbreviations:** CDI, Children’s Depression Inventory; CDRS, Children’s Depression Rating Scale; CDRS-R, Children’s Depression Rating Scale-Revised; CGI, Clinical Global Impression; N/A, not available; O3FA, omega-3 fatty acids; PEP, psychoeducational psychotherapy; RCT, randomized controlled trial; SAMe, S-adenosyl methionine.

Author created.
It’s virtually impossible to check your phone for news headlines without seeing another child who has become a suicide statistic.

Kendrea’s cry The story of 6-year-old Kendrea Johnson from Minnesota, who hung herself with a jump rope 2 days after Christmas, was heart stopping. The 2 notes she left dispelled investigators’ questions about whether her death was an accident. “I’m sorry,” read one. “I’m sad for what I do,” said the second. Almost as inconceivable is that Kendrea had tried suicide before and failed. Police found healed ligature marks on both sides of her neck.

Poison in the culture Whether fueled by social media or programs like the Netflix series “13 Reasons Why,” a drama-mystery that some critics decried for glorifying suicide, the numbers sound a societal alarm bell. Recent data show that suicide is the third-leading cause of death for young persons aged 10 to 24 years—approximately 4600 lives lost each year. Over 3400% more than that number attempt suicide and survive.

Screen for life Unlike other children and despite her ultimate crisis, Kendrea had actually been assessed as having both homicidal and suicidal thoughts and was receiving intensive treatment. Experts fear other children and teenagers are flying under the diagnostic radar, underscoring the crucial role of pediatricians and other healthcare providers to be vigilant for the subtle signs, to talk with parents and caregivers, and to screen the patients themselves.

A personal gut check This month’s online quiz will test your knowledge of key diagnostic points in the screening process for depression in primary care. You’ll test your knowledge against your peers on 5 key points. Each point gives you context for the correct answer—and, most importantly, provides valuable resources.

Riddle Me This! is ready for you online now at ContemporaryPediatrics.com/quiz-0319

This month, the quiz you take may save a life.
Watching a short training video that addresses provider-related barriers to vaccination against human papillomavirus (HPV) corrects common misperceptions about HPV and the vaccine, increases providers’ comfort in counseling vaccine-hesitant parents, and facilitates vaccine completion. These were the findings of a study conducted by a California chapter of the American Academy of Pediatrics (AAP) in 96 pediatric providers, about half of whom were physicians. Participants also included nurses, pediatric residents, and other allied health professionals.

The 20-minute video included didactic teaching outlining the burden of HPV-related disease in males and females, information about vaccine efficacy and administration, misperceptions about vaccine safety and delaying vaccination, and specific strategies for counseling vaccine-hesitant parents, along with 7 clinical vignettes illustrating scenarios related to these topics. Before and after watching the video, participants completed the same questionnaire, which assessed knowledge of HPV-related disease and the vaccine and addressed attitudes and beliefs about HPV vaccination as well as comfort with vaccine counseling.

After viewing the video, participants’ knowledge about HPV increased significantly, particularly with regard to 2 areas: At baseline, most providers underestimated the prevalence of HPV-related disease in males and failed to recognize that HPV vaccine efficacy varied with age during adolescence. In addition, after the intervention there was a significant increase in the proportion of respondents who strongly believed that it was unacceptable to delay HPV vaccination until sexual debut or that vaccination for HPV was as important as immunization against Tdap and meningococcal disease.

Watching the training video also significantly improved providers’ comfort with counseling parents about:

- [HPV] vaccine safety
- Their understanding of the importance of vaccinating boys
- The rationale for vaccinating 11- to 12-year-old children before their first sexual experiences.

Feel more comfortable about recommending HPV vaccine

Michael G Burke, MD is Chairman, Department of Pediatrics, Saint Agnes Hospital, Baltimore, Maryland.

THOUGHTS FROM DR. BURKE

Human papillomavirus causes 1 in 20 cancers in the United States. Before a vaccine was developed, 85% to 90% of adults had been exposed to the virus. Although rates of uptake continue to improve, as of 2017 only 49% of US adolescents were up-to-date for HPV vaccination and only 66% of 13- to 17-year-olds had received a first dose. There is plenty of room for improvement. Spend 20 minutes watching this video to help you do your part in improving rates of vaccination: www.youtube.com/watch?v=oKWn0w_gYYw
Too few teenagers are screened for depression

Whereas rates of screening for adolescent major depressive disorder (MDD) have increased in recent years, they still are insufficient to address the current mental health crisis among adolescents, an analysis of countrywide data for 413,080 12- to 14-year-olds showed. Almost half (49%) of the teenagers, who maintained uninterrupted private insurance from 2010 to 2014, were female and most lived in urban areas. Only 1.8% of the study group had MDD screening at least once during the 4-year study period (in the context of well-visit care), although rates increased every year and ranged from 0.14% in 2010 to 0.77% in 2014. During this period, 12.8% of the adolescents in the data set were diagnosed with depression.

Analysis showed that those who lived in urban areas were twice as likely to receive MDD screening, which also was more common among adolescents who had a conduct disorder or had more well visits. Reduced likelihood of screening was associated with advancing adolescent age, living in the Midwest, and poor continuity of care. Being at high risk for depression—for example, because of a family history of depression—did not increase the likelihood of being screened (Sekhar DL, et al. J Pediatr. 2019;204:203-207).

In March 2018, the AAP recommended annual universal depression screening of children aged 12 years and older at health maintenance visits (Pediatrics. 2018;141(3):e20174081). This study looked at billing data for children with private insurance from 2010 to 2014 and showed that either few patients were screened or that few physicians who did screen for depression used the ICD-10 billing code to indicate that they did so. I suspect the latter. Nonetheless, this study is a reminder that we need to be looking for depression in our patients and know how to manage or refer when the screen is positive.

Child physical abuse is linked to Friday report card release

Release of school report cards on a Friday is associated with a significant rise in certified child physical abuse reports the following day, a retrospective study of a single academic year in Florida found. However, release of report cards on Monday through Thursday is not associated with increased incidence of abuse the same day as the release or the day that follows.

Investigators extracted a database from calls to the Florida child abuse hotline and focused on calls that became verified cases of physical abuse, defined as physical injury, bizarre punishment, asphyxiation, burns, bone fracture, or internal injury. Cases of physical abuse during the 2015-2016 academic year totaled 1943 across the state, representing 6.7% of total calls to the child abuse hotline. Almost 60% of abuse cases related to boys, 41% to girls, 48% for white children, 41% for black children, and smaller percentages for Asian, Native American, and mixed or unknown race youngsters.

Report cards were issued more often on Fridays than on any other day. On Saturdays after a Friday report card release, the incidence rate of physical abuse was nearly 300% higher than the incidence was on Saturdays following Fridays when report cards were not released. In addition, the incidence rate of physical abuse on Saturdays, regardless of whether or not report cards were released, was higher than the incidence rate for all other days (Bright MA, et al JAMA Pediatr. December 17, 2018. Epub ahead of print.).

Okay. So, go ahead and ask the local school board to distribute report cards on Monday, or any day but Friday. Then pause and think about how sad this statistic is and how scary report card day may be for some students. The authors suggest that early in the week parents are too busy to punish children for poor school performance or that they are concerned that signs of physical abuse would be detected at school the next day. I wonder if increased use of alcohol on weekends might also play a role.
Teenager with ankle pain and swelling

GIRIDHAR GUNTREDDI, MD, FAAP; SWAYAM P NIRUJOGI, MD

A 15-year-old adolescent Caucasian male with no significant past medical history presented to the clinic with gradually worsening left ankle pain over the past 2 weeks, ever since he started his football practice. He complained of dull aching pain at the lower end of his left leg for the past 4 months, which was slightly relieved by over-the-counter nonsteroidal anti-inflammatory drugs (NSAIDs). He twisted his left ankle and noticed further worsening pain, which prompted this doctor visit.

**Physical exam and testing**

On examination, the patient’s left ankle was swollen and tenderness was elicited at the lower end of the tibia, just above the medial and lateral malleolus. Ankle inversion and eversion movements were painful and the range of motion was limited. No crepitus was noted.

An x-ray (Figure 1) showed a multilocular lucent lesion within the distal anterior metaphysis of the left tibia, measuring 5.9 cm by 3.7 cm by 4.8 cm with well-circumscribed margins expanding the anterior cortex. There appeared to be a periostitis periostal reaction medially (Figure 2), which may indicate a pathologic fracture. Magnetic resonance imaging (MRI) confirmed the diagnosis. The MRI of the left tibia and ankle bones (Figure 3) showed a 6.6-cm aneurysmal bone cyst of the distal left tibial metaphysis. There were extensive marrow edema and enhancement noted, which might be due to an undisplaced pathologic fracture. A fluid-fluid level had been demonstrated.

**Differential diagnosis**

The differential diagnosis for bone pain and swelling (Table) consists of:

**SIMPLE BONY CYST**

Simple bone cyst (solitary bone cyst unicameral bone cyst UBC) is a common benign tumor of childhood and adolescence. These cysts usually occur in the metaphyseal region of the long bones such as the humerus and femur. They also can be seen in the calcaneum, fibula, ulna, pelvis, and lumbar spine areas. Proposed theories in the pathogenesis include entrapment of small nests of synovial cells in an intraosseous position, which indicates intramedullary hemorrhages. Blockage of venous drainage, localized failure of ossification in the metaphyseal area during periods of rapid growth (childhood/adolescence), and blockage of the intramedullary circulation are the other popular theories on the pathogenesis of UBC.

Most of these cysts are diagnosed incidentally on x-rays, and some can present with pain, local warmth, pathological fracture, and localized...
tenderness. They are classified as active when they are located within 1 cm of the physis and as inactive if they encroach toward diaphysis. An x-ray shows a symmetrically expansile, radiolucent lesion with a thin cortical rim. Sometimes portions of fractured bone will be seen as thin fragments at the bottom of cyst, known as “fallen fragment/fallen leaf sign.” Similarly, a gas bubble seen at the top of the cyst is known as the “rising bubble sign.” Treatment and follow-up plan will depend on the symptoms, location, the presence of fracture, and age at presentation. If UBCs are found incidentally, away from physis without any risk of pathological fractures, nonoperative management with close follow-up is indicated.

Traditionally, curettage and bone grafting have been the definitive procedures for UBC. Surgical decompression can be achieved by needles, curettage, cannulated screws, K-wires, and intramedullary nails. Dormans and colleagues used percutaneous intramedullary decompression, curettage, and bone grafting with calcium sulfate pellets, which showed a good success rate.

**OSTEOBLASTOMA**

Osteoblastoma is a rare benign bone tumor accounting for 1% of all bone neoplasms and 3% of all benign primary bone tumors. It may occur at any part of the skeleton with a predilection for the spine and sacrum. Osteoblastomas are usually larger than 2 cm in size. They present between ages 10 to 20 years with pain, stiffness, soft tissue mass, chronic back pain, fracture, and neurological dysfunction. Osteoblastoma lesions are seen as radiolucent lesions on x-ray. They may reach a size of 2 cm to 10 cm in maximum diameter, and they may attenuate the cortex and expand the bone mimicking an aneurysmal bone cyst (ABC). Some osteoblastoma lesions may show reactive osteosclerosis and bone destruction mimicking malignant bone tumors. Computed tomography (CT) scans show marginal sclerosis, exact anatomical details, expansion, and intramatrix mineralization. Treatment of stage 1 (latent) or stage 2 (active) is curettage indicated with or without local adjuvants (phenol) and for stage 3 (aggressive) tumors, a marginal/wide resection. Recently, image-guided radiofrequency thermal ablation has been used for small osteoblastoma (<2 cm in maximum diameter).

**Giant Cell Tumor of Bone**

Giant cell tumor of bone (GCTB) usually occurs after skeletal maturity with a peak incidence in ages 20 to 30 years, with a slight female predominance. It rarely occurs in persons aged younger than 15 years. Despite its benign nature, 1% to 4% of GCTB metastasize to the lungs. Long-term follow-up is important as...
malignant transformation may occur. Most commonly affected sites are the epiphysis of the long bones, distal femur, and proximal tibia, and less commonly vertebral bodies, pelvis, and sacrum. It usually presents with pain, swelling, and limitations of joint involvement. On plain radiographs, GCTB typically appears as an expansile, eccentrically placed lytic area involving the epiphysis and the adjacent metaphysis. The CT scans provide a more accurate assessment of cortical thinning and penetration, and presence or absence of bone mineralization. Characteristic MRI findings are an expansile hypervascular mass with cystic changes, heterogeneous low-to-intermediate signal intensity on T1-weighted images, and intermediate-to-high intensity on T2-weighted images. Chest CT is indicated to evaluate for the presence of pulmonary metastasis. Local appendicular GCTBs are better treated with intralesional curettage followed by polymethylmethacrylate bone cement filling to minimize the recurrence. Denosumab is a fully human monoclonal antibody against receptor activator of nuclear factor kappa B ligand [RANKL] that acts as neoadjuvant therapy in the management.

### OSTEOSARCOMA

Osteosarcoma (OS) is a primary malignant bone tumor and accounts for 0.2% of malignant tumors. It usually affects males aged 8 to 25 years. It exhibits a high degree of malignancy and tends to metastasize early. Lung metastasis is frequently observed in newly diagnosed patients and pulmonary symptoms may develop within 1 year without chemotherapy. Risk factors for osteosarcoma are prior radiation therapy for solid cancers, Paget disease, retinoblastoma, Li-Fraumeni syndrome, and Rothmund–Thompson syndrome. The majority of patients present with localized pain, soft tissue mass, and tender swelling. The x-ray findings include destructions of the normal trabecular pattern,
How to diagnose and treat severe asthma

Severe or refractory asthma places a small subset of children with asthma at risk for significant morbidity and treatment challenges, as well as for higher healthcare utilization and costs.

**Definition**

The joint European Respiratory Society (ERS)/American Thoracic Society (ATS) Task Force defines severe asthma as treatment requiring either of the following:¹

1. High-dose inhaled corticosteroids (ICS, as defined here²) and a second controller medication over the last year.

2. Systemic corticosteroid treatment for at least half the prior year to prevent uncontrolled asthma or remaining uncontrolled despite the therapy.

**Uncontrolled vs severe asthma**

Asthma is a complicated chronic illness and management is impacted by many domains. Whereas most asthmatic children can achieve good symptom control by avoiding triggers and regularly using controller medications, some will not achieve optimal results even with maximal therapy.⁴ One of the goals of the pediatrician is to identify whether a patient on maximal therapy has asthma refractory to treatment or whether symptoms are due to noncompliance, psychosocial factors, persistent environmental triggers, or comorbidities. Table 1 gives the pediatrician areas to examine to identify poorly controlled or undertreated asthma.
Children with severe asthma are more likely to have received multiple courses of systemic corticosteroids, visited the emergency department (ED), or experienced a hospital admission for an asthma exacerbation in the prior 12 months. There is concern for an increased risk of asthma mortality in this group as nearly 1 in 3 have a history of intubation for near-fatal respiratory failure.

Comorbidities such as sinusitis, gastroesophageal reflux disease (GERD), or obstructive sleep apnea.

Exposure to environmental triggers or irritants.

GENDER
Severe asthma is more common in boys compared with girls and the manifestations of severe asthma also vary by gender. Sex hormones are hypothesized to be the cause of some of these differences.

Examples for boys include:
- Experiencing more airflow obstruction and incomplete reversal with bronchodilators.
- Have greater amounts of air trapping.

RACE
Children with severe asthma are more likely to be African Americans. Although it is unclear if this is related to centers doing research being located in large urban centers, there is some research in adults indicating asthma among African Americans is phenotypically different.

African Americans with severe asthma are more likely to have a greater body mass index and more airway obstruction compared with Caucasians with severe asthma. Further, serum IgE levels, allergy testing, and family history were all significantly associated with severe asthma in African Americans, but the same association was not present in Caucasians. The relationship between race and asthma severity is complex and remains an area of active research.

ENVIRONMENTAL EXPOSURES
Although not studied specifically in severe asthma, environmental tobacco smoke (ETS) is associated with poor asthma control and increased risk of hospitalization. In adults, ETS is associated with increased damage to lungs, decreased levels of antioxidants in the lungs, and other pathophysiologic changes (e.g., increased proliferation of epithelial cells, increased apoptosis, and decreased cell death suppression) that can lead to increased airway hyperresponsiveness and use of short-acting bronchodilators.

Clusters of severe asthma
The National Heart, Lung, and Blood Institute Severe Asthma Research Program, or SARP, is a National Institutes of Health Research group that has better differentiated severe versus nonsevere asthma through phenotypic and genetic analysis. Children included in this evaluation are from 5 academic-affiliated centers.
have difficult-to-control asthma, and are representative of patients that primary care pediatricians refer for specialty care.

Through characterization procedures that include questionnaires, spirometry, skin testing, blood testing such as IgE levels, and methacholine testing, SARP identified 3 variables (asthma duration, the number of asthma controller medications, and baseline forced expiratory volume (FEV) 1 percent predicted values) that were able to cluster pediatric asthma patients into 4 groups. See Table 2 for these classifications. Further emphasizing the heterogeneity of asthma, severe asthma was identified in all 4 clusters. Identifying such “phenotypes” allows for the potential of tailoring treatment strategies toward the unique characteristics of that group’s pathophysiology. Of concern to the pediatrician, these phenotypes cross definitions of asthma severity in the current asthma guidelines.6

These different asthma phenotypes allow for investigation of specific differences and provide more potential for a personalized medicine approach. One such pathway is the type 2 or atopic pathway that involves production of IgE and release of cytokines, such as interleukin (IL)-4, IL-5, and IL-13. The clinician is able

<table>
<thead>
<tr>
<th>CLUSTER</th>
<th>PERCENTAGE</th>
<th>CLINICAL CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30%</td>
<td>Late-onset symptomatic asthma with normal lung function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Normal lung function despite bronchial hyperresponsiveness to methacholine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Minimal hyperinflation and decreased airway resistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mild disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Older age at onset and milder disease</td>
</tr>
<tr>
<td>2</td>
<td>32%</td>
<td>Early-onset atopic asthma with normal lung function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Earlier onset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Longer duration of symptoms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Slightly lower lung function compared with cluster 1</td>
</tr>
<tr>
<td>3</td>
<td>20%</td>
<td>Early-onset atopic asthma with mild airflow limitation and comorbidities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Greatest incidence of comorbid conditions such as pneumonia, chronic sinusitis, and GERD requiring treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Increased bronchial hyperresponsiveness to methacholine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lower lung function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Elevated exhaled nitric oxide compared with clusters 1 and 2</td>
</tr>
<tr>
<td>4</td>
<td>18%</td>
<td>Early-onset atopic asthma with advanced airflow limitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Highest percentage of African Americans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Highest exhaled nitric oxide levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Highest healthcare usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Most significant lung function impairment with airflow limitation and hyperinflation not completely reversed with treatment</td>
</tr>
</tbody>
</table>

Abbreviations: GERD, gastroesophageal reflux disease; IgE, immunoglobulin E; SARP, Severe Asthma Research Program.

From Fitzpatrick AM, et al.6
to look at specific biomarkers for this pathway including blood and sputum eosinophilia, fractional exhaled nitric oxide (FeNO) levels, and serum periostin levels that are usually elevated in patients with severe asthma. Blood eosinophils and exhaled nitric oxide are readily available to the clinician, whereas sputum eosinophils take laboratory preparation and careful analysis, and serum periostin can vary with normal growth in children and is a specialized laboratory test. Treatments for severe asthma in specific patients are often targeted to these cytokines or their receptors.7

[The SARP’s] different asthma phenotypes allow for investigation of specific differences and provide more potential for a personalized medicine approach.

Current biologics

Biologics target proteins and receptors that lead to inflammation and produce asthma symptoms. Current biologics target components of the pathophysiology such as IgE and IL-5, as well as IL-4 and IL-13. Currently available biologics approved for pediatric patients include omalizumab, mepolizumab, benralizumab, and dupilumab.

OMALIZUMAB

Omalizumab decreases the release of inflammatory mediators related to the allergic response and lowers IgE levels by:8

- Binding to free IgE (but not IgE bound to mast cells).
- Inhibiting IgE from binding to mast cells, basophils, and dendritic cells.
- Down regulating IgE receptors.
- Decreasing mediator release.
- Decreasing allergic inflammation.

Omalizumab is indicated for children who:

- Are aged 6 years and older.
- Experience moderate-to-severe persistent asthma.
- Have inadequately controlled symptoms with an ICS.
- Have a positive skin prick test or in vitro reactivity to perennial aeroallergens.

Real-life, long-term treatment is safe in most patients with infrequent adverse effects. In 1 study, 91 patients were followed for as long as 9 years and received a total of 10,472 injections.8 Fifty-nine patients were treated for 3 to 9 years, including 14 whose treatment exceeded 6 years. Eighteen patients dropped out in the first year for reasons unrelated to treatment. Four patients reported adverse effects of rhinitis/conjunctivitis, injection site reaction, fatigue, or thrombosis but continued treatment. Six patients dropped out for treatment-related adverse effects, including arthralgia/myalgia (3 patients), urticaria, angioedema (1 patient), metrorrhagia (1 patient), and relapsing herpes labialis (1 patient).

Anaphylaxis was not reported in this study. There was 1 case of a cancer (gastrointestinal stromal tumor [GIST] of the stomach) diagnosed 1 year after starting treatment, but it was felt to be unrelated, and omalizumab was restarted. No relapse was seen with 3 years of treatment. Four additional patients had tumors prior to initiating omalizumab—9 (2 patients), 6, and 2 years—and none experienced a recurrence.9

Omalizumab has primarily been studied in atopic children with aero-allergen sensitization and IgE levels between 30 and 1300 IU/mL. Dosing occurs every 2 to 4 weeks, is weight based, and is dependent on pretreatment IgE levels.

A Cochrane review of omalizumab use in both adults and children found improved outcomes compared with placebo in terms of:10

- Absolute reduction of asthma exacerbations from 26% to 16%.
- Decreased asthma exacerbations (odds ratio [OR], 0.55; 95% confidence interval [CI], 0.42-0.60).
- Decreased hospitalizations (OR, 0.16; 95% CI, 0.06-0.42).
- Increased likelihood of withdrawing ICS therapy (OR, 2.50; 95% CI, 2.00-3.13).
- Small decreases in rescue inhaler use (mean difference [MD], −0.39 puffs per day; 95% CI, −0.55 to −0.24).

The review, however, showed no significant difference in the number of patients able to withdraw completely from oral corticosteroids (OR, 1.18; 95% CI, 0.53-2.63). Severe asthma who were on both inhaled and systemic corticosteroids saw no decreases in rescue inhaler use.10

Randomized controlled trials have also shown benefits of omalizumab. In the National Institute of Allergy and Infectious Diseases (NIAID) Inner-City Anti-IgE Therapy for Asthma (ICATA) trial, 419 atopic patients aged 6 to 20 years with primarily moderate to severe asthma were randomized to 60 weeks of omalizumab or placebo. Treatment reduced asthma symptoms by nearly 25%, decreased exacerbations from 49% to 30%, and allowed for reductions in both inhaled glucocorticoids and long-acting beta-agonists.11

In the NIAID Preventative Omalizumab or Step-up Therapy for Severe Fall Exacerbations (PROSE) study, 513 inner-city asthmatic children aged 6 to
17 years with a recent asthma exacerbation were randomized to 1 of 3 arms for 4 months (1 month prior to starting school and the following 3-month period) after a 4- to 9-month period of guideline-based therapy.

The objective of the study was to prevent fall asthma exacerbations and included the following treatment arms:

- Omalizumab (with inhaled placebo).
- ICS boost (with injected placebo).
- Guidelines-based care with injected placebo and inhaled placebo.

Patients already at the maximal ICS dose were not enrolled in the ICS boost arm. Exacerbation rates were significantly lower in the omalizumab arm compared with placebo (11.3% vs 21.0%, respectively; OR, 0.48; 95% CI, 0.25-0.92) but not to the ICS boost arm (8.4% vs 11.1%; OR, 0.73; 95% CI, 0.33-1.64). In those patients already at high-dose ICS and not eligible for the ICS boost treatment arm, omalizumab decreased exacerbations by more than 50% (32.6% vs 15.1%). Interestingly, omalizumab primarily benefited patients having an exacerbation during the 4- to 9-month run-in phase of the study but was not beneficial for those that did not have an exacerbation during this time period. The investigators discussed a possible seasonal strategy to prevent fall asthma exacerbations for patients with severe asthma that were not eligible for ICS boost in PROSE, or patients of any severity with a recent exacerbation to provide a more targeted seasonal approach to management for those susceptible to recurrent fall asthma exacerbations as a preventive strategy.12

MEPOLIZUMAB

Through its role in the production, differentiation, maturation, recruitment, and activation of eosinophils, IL-5 is a major contributor to allergic inflammation. Mepolizumab is a monoclonal antibody against IL-5 and inhibits the production, maturation, proliferation, release from bone marrow, and activation of eosinophils.9

ICD-10 CODES FOR DIAGNOSING ASTHMA AND COMORBIDITIES

The following are suggested ICD-10 codes for the diagnosis and treatment of asthma and its associated comorbidities in children. Check with your contracted plan and individual state Medicaid program for coverage policy.

<table>
<thead>
<tr>
<th>ASTHMA</th>
<th>COMORBIDITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>J45.20 Mild intermittent asthma, uncomplicated</td>
<td>K21.0 Gastroesophageal reflux disease with esophagitis</td>
</tr>
<tr>
<td>J45.21 Mild intermittent asthma with (acute) exacerbation</td>
<td>K21.9 Gastroesophageal reflux disease without esophagitis</td>
</tr>
<tr>
<td>J45.22 Mild intermittent asthma with status asthmaticus</td>
<td>J01.40 Acute pansinusitis, unspecified</td>
</tr>
<tr>
<td>J45.30 Mild persistent asthma, uncomplicated</td>
<td>J01.41 Acute recurrent pansinusitis</td>
</tr>
<tr>
<td>J45.31 Mild persistent asthma with (acute) exacerbation</td>
<td>J32.4 Chronic pansinusitis</td>
</tr>
<tr>
<td>J45.32 Mild persistent asthma with status asthmaticus</td>
<td>J32.9 Chronic sinusitis, unspecified</td>
</tr>
<tr>
<td>J45.40 Moderate persistent asthma, uncomplicated</td>
<td>J12.9 Viral pneumonia, unspecified</td>
</tr>
<tr>
<td>J45.41 Moderate persistent asthma with (acute) exacerbation</td>
<td>J15.9 Unspecified bacterial pneumonia</td>
</tr>
<tr>
<td>J45.42 Moderate persistent asthma with status asthmaticus</td>
<td>E66.3 Overweight</td>
</tr>
<tr>
<td>J45.50 Severe persistent asthma, uncomplicated</td>
<td>E66.9 Obesity, unspecified</td>
</tr>
<tr>
<td>J45.51 Severe persistent asthma with (acute) exacerbation</td>
<td>E66.01 Morbid (severe) obesity due to excess calories</td>
</tr>
<tr>
<td>J45.52 Severe persistent asthma with status asthmaticus</td>
<td></td>
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</tbody>
</table>
Mepolizumab is given via subcutaneous injection every 4 weeks and is indicated in patients aged older than 12 years with severe persistent asthma with eosinophilic asthma.

**Mepolizumab has a low incidence of adverse effects, but the most common are:**
- Asthma exacerbation.
- Headaches.
- Injection site reaction.
- Back pain.
- Weakness.
- Fatigue.
- Oropharyngeal pain.
- Bronchitis/upper respiratory tract infection.
- Severe allergic reactions (rare).

A Cochrane review of anti-IL-5 therapies for asthma use in both adults and children found mepolizumab improved outcomes compared with placebo in terms of:
- Decreased rate of asthma exacerbation (rate ratio [RR], 0.45 [0.36-0.55]).
- Decreased rate of asthma exacerbations requiring ED treatment or hospital admission (RR, 0.52 [0.31-0.87]).
- Significant improvements in prebronchodilator FEV1 (mean difference [MD], 0.08; 95% CI, 0.02-0.15).

There was no significant change in health-related quality of life. Adverse events leading to discontinuation of mepolizumab occurred less commonly in treated patients compared with placebo (19/1000 and 26/1000, respectively; RR, 0.72 [0.18-2.92]).

The Dose Ranging, Efficacy, and Safety with Mepolizumab (DREAM) study randomized 621 asthmatics that included both adults and children to 3 different doses of mepolizumab or placebo. The DREAM study found a reduction in asthma exacerbations, ED visits, and hospital admissions.

**BENRALIZUMAB**

Benralizumab is a monoclonal antibody against the IL-5 receptor alpha that is found on the surface of basophils and eosinophils.

The most common adverse effects include:
- Nasopharyngitis.
- Injection site reaction.
- Upper respiratory tract infection.
- Worsening asthma.
- Fever, tachycardia, and anxiety.

A Cochrane review of anti-IL-5 therapies for asthma use in both adults and children found benralizumab improved outcomes compared with placebo in terms of:
- Decreased rate of asthma exacerbation (0.69; 95% CI, 0.56-0.85).
- Decreased rate of asthma exacerbations requiring ED treatment or hospital admission (0.68 [0.47-0.98]).
- Improvement in health-related quality of life (MD, 0.10 L; 95% CI, 0.05-0.14 L).

Adverse events leading to discontinuation of benralizumab occurred more commonly in treated patients compared with placebo (19/1000 and 9/1000, respectively; RR, 2.15 [1.02-4.57]).

**DUPILUMAB**

Dupilumab is a human monoclonal antibody to the alpha subunit of the IL-4 receptor, thereby blocking the activity of IL-4 and IL-13. It was approved for the treatment of moderate-to-severe asthma in children aged 12 years and older and adults as add-on maintenance therapy. It is administered every 2 weeks via the subcutaneous route. A study in adolescents noted a 47% reduction in asthma exacerbations as well as an increase in pulmonary function. It was previously prescribed for the treatment of severe atopic dermatitis in adults.

**Summary**

The pediatrician needs to be aware of how to identify poorly controlled asthma that does not respond to conventional management. There are biologics available to treat these patients and more in the pipeline that the pediatrician may see following referral to an asthma specialist.
Fish oil supplements not a fix for obese patients with asthma

Although fish oil supplements did not improve asthma exacerbations in children who are obese or overweight, the question remains whether fish oil could help other types of asthmatics.

It is possible that future research will find that certain subgroups of patients with asthma will respond, but that is speculation,” Lang says. “Our study demonstrated that among patients who took fish oil and had increases in their blood omega-3 fatty acid levels, asthma did not improve. Furthermore, a proposed mechanism has been that omega-3 fatty acids will help patients by reducing arachidonic acid pathway inflammation, specifically leukotrienes. Unfortunately, we did not see any reductions in leukotrienes in patients taking the supplements.”

Some studies have linked the omega-3 fatty acids found in fish oil to lower incidence of asthma, and the study team sought to test the theory in overweight and obese children—a population particularly at risk for poor asthma control. Lang’s trial was the largest to evaluate the effect of fish oil supplementation in asthma patients, with 98 patients aged 12 to 25 years enrolled in the study. Participants who were given fish oil supplements throughout the study showed elevated levels of omega-3 in their blood, but there were no improvements in asthma control and lung function measures or on the participants’ Asthma Control Questionnaire (ACQ) at 3 or 6 months into the study, according to the report. The only improvement noted over the study period was a decrease in the number of calls participants made to their physicians related to asthma symptoms.

John La Puma, MD, FACP, founder of Chef Clinic and co-founder of ChefMD, Santa Barbara, California, has discussed the benefits of fish oil supplements for patients with asthma on his professional blog, and says he thinks the participants in Lang’s study may have had benefits obscured by other physiologic conditions, including obesity. He isn’t ready to discount the benefits of supplementation just yet, despite Lang’s findings.

“The finding that they made fewer calls to their physician may well be simply because they were asked to take a medication and the psychological effect of so doing helped them,” La Puma says, “but their lung function was no better and, although obesity is likely a cause of chronic...
inflammation, there are many better ways to get the benefits of both omega-3s—such as eating fish—and reducing inflammation by eating foods that are very high in anti-inflammatory agents.”

**Augusto A. Litonjua, MD, MPH, division chief of Pediatric Pulmonary Medicine at the University of Rochester School of Medicine and Dentistry, Rochester, New York, has been involved in prior studies of fish oil supplementation in patients with asthma and notes that prior research has shown inconsistent results in this area.

“This study is different in that the investigators focused on obese asthmatics. We do not know if metabolism of omega-3 fatty acids are different in obese versus nonobese asthmatics,” Litonjua says. “Additionally, reviewing Figure 3 [in Lang’s study], it is clear that only a proportion of the participants in the treatment arm responded with an increase in their n-3 PUFA level. We do not know if the participants who had the significant increase in their n-3 PUFA levels responded differently from those whose levels did not increase. A larger study would need to answer this question.”

Litonjua says it has been suggested that genetic differences may help explain why some patients respond to omega-3 supplementation while others do not.

“The investigators (in Lang’s study) attempted to show whether genetic differences in the ALOX5 gene promoter modified the response to fish oil supplementation and they did not find any differences,” Litonjua says. “However, for this genetic modification study, a larger sample size may be needed, and additional genes from the metabolic pathways may need to be examined.”

Litonjua notes that fish oil supplementation is not part of the standard of care for asthmatics—something that is not likely to change.

“I think the results of this study support the notion that supplementation does not help at the dose (4 g/day) that was used for this study in obese asthmatics,” Litonjua says.

Lang says that because the study was conducted on sedentary, obese patients, future research may produce different results on patients with exercise-induced symptoms. The research team will also continue to analyze its findings, specifically pertaining to other types of inflammation, he says.

Moving forward, Lang says he hopes clinicians and patients will approach these supplements with caution. “I hope that patients with asthma will think twice before taking supplements for the purpose of improving asthma,” Lang says. “In certain cases, supplementing the diet can be beneficial but all treatments can have adverse effects and monetary costs.”

The study findings aren’t the end-all, however, says Lisa Wood, PHD, a professor in the School of Biomedical Science and Pharmacy at the University of Newcastle in Australia. Wood says recent systematic literature reviews have shown benefits of fish oil supplementation early in life (at age 6 to 9 months) and regularly throughout childhood to reduce asthma and wheezing in young children, but also acknowledges that all these studies were observational.

“The study by Lang and colleagues is a high-quality, carefully conducted intervention in the subgroup of children with asthma who are obese. Obesity, which creates a proinflammatory environment, is a potential confounder that has not been previously considered in the context of asthma/fish oil supplementation,” Wood says. “This study suggests that the presence of obesity or associated factors such as background physical activity levels and dietary intake may negate the potential benefits of fish oil.”

Although the Lang study determined supplementation yielded no benefit to asthma control in this population, supplementation with omega-3 should not necessarily be discounted altogether.

“There remains a lack of evidence supporting the use of fish oil supplementation in obese asthmatic children. However, as with the general population, it is recommended that fish be consumed as a regular component of a healthy diet,” Wood notes.

Ms Zimlich is a freelance writer in Cleveland, Ohio. She writes regularly for Contemporary Pediatrics and sister publications Managed Healthcare Executive and Medical Economics. 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 reference, go to ContemporaryPediatrics.com/fish-oil-for-asthma
For Contemporary Pediatrics, Dr Bobby Lazzara discusses a research letter that examined how well children’s and non-children’s hospitals adopted the 2011 guidelines for prescriptions for community-acquired pneumonia (CAP) treatment. ContemporaryPediatrics.com/CAP-video

For Contemporary Pediatrics, Dr Bobby Lazzara discusses the ELIANA global trial of a CAR T-cell therapy for children with refractory acute lymphoblastic leukemia that achieved promising survival rates—even remission—in some patients. ContemporaryPediatrics.com/CAR-T-cell-trial-video

For Contemporary Pediatrics, Dr Bobby Lazzara discusses the recent draft statement from the US Preventive Services Task Force on the need to refer pregnant women at risk of perinatal depression to appropriate counseling. ContemporaryPediatrics.com/USPSTF-on-PD-counseling

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Abnormalities of the limbs at birth can be devastating for the parents of a newborn. However, the primary care pediatrician, a rehabilitation team, and the family can help the child develop normal functioning and be independent.

MARGARET QUINN, DNP, CPNP; GANGA MAHAT, EDD, RN

The great majority of congenital deformities arise between the fourth and eighth weeks of pregnancy. Birth defects are typically classified as structural or developmental, causing mild to severe impairments. Approximately 3% of newborns in the United States are affected with major structural or genetic birth defects.¹ According to the Centers for Disease Control and Prevention (CDC), each year about 1500 US babies are born with upper limb reductions (about 4 of every 10,000 babies) and about 750 are born with lower limb reductions (about 2 of every 10,000 babies).² A missing or incomplete arm at birth is referred to as congenital upper limb deficiency or congenital limb amputation or limb reduction. These defects are mostly attributed to primary intrauterine growth inhibition or disruptions secondary to intrauterine destruction of normal embryonic tissues.

There are several classification systems for congenital deformities of the upper limbs such as anatomic or topographical, embryologic, teratologic sequencing, genetic, and different combinations of these. The limb deficiency disorders are a broad group of congenital anomalies featuring significant hypoplasia or aplasia of 1 or more bones of the limbs that can occur in isolation or associated with other anomalies.³

Limb deficiencies can be longitudinal or transverse. Longitudinal deficiencies are along the long axis of the limb (complete or partial absence of the radius, ulna, fibula, or tibia), and mostly genetic or teratogenic in origin. In a transverse deficiency, all the elements below a certain level in the patient’s arm are missing (loss of forearm, hand) and the limb structures before the point of the defect remain intact. It is mostly caused by early amnion rupture sequence (amniotic band).² The arm appears similar to that of an amputation stump, which is sometimes known as “congenital amputation.” Terms used may be aphalangia (missing fingers and phalanges) to amelia (absence of limb).⁴,⁵
Case study

Baby R was born full term to a G2 P1 mother via repeat cesarean delivery at 39 weeks’ gestation. There is no consanguinity with the parents, and the mother was compliant for all prenatal care visits. The mother was negative for hepatitis A, B, and C, human immunodeficiency virus (HIV), and Group B Streptococcus (GBS). Delivery was uncomplicated, but after the delivery of the head and upper body it was noted that Baby R had an absent left forearm, despite a reported “normal” prenatal ultrasound at 20 weeks’ gestation. A diagnosis of amniotic band disruption was made by the neonatologist and explained to the parents, who were distraught. The APGAR scores were 8 at 1 minute and 9 at 5 minutes. Baby R had no other physical abnormalities, no cardiac murmur, and no dysmorphic features. He had an uneventful nursery course and was discharged home with his mother on day 3 of life.

Baby R was followed in the pediatric primary care office for routine newborn care and was seen by the pediatric nurse practitioner (PNP) at the 2-month health promotion visit. Physical assessment revealed normal growth patterns, and he was feeding well. Physical exam was unremarkable with the exception of the left forearm. A small paddle of nubbins was noted at the tip of the deformity above the elbow of the left upper extremity. The infant had fleeting movements of the extremity from the shoulder with poor control. The right upper extremity appeared normal with a full shoulder, elbow, wrist, and digital range of motion, with a normal complement of digits.

Discussion

Abnormalities of the limbs originate in different stages of embryonic development. Limb buds first appear as small elevations of the ventrolateral body during the fourth week of gestation. At the tip of each limb bud, the ectoderm (outermost layer of cells and tissue in embryonic development) becomes thickened to form an apical ectodermal ridge. Interaction between this ridge and the mesenchymal cells, which become connective tissue, is essential to limb development.6 The apical ectodermal ridge has an influence on the connective tissue, which promotes growth and development of the limbs, and is essential for the elongation process. Defects such as this occur early in gestation as osteogenesis of the long bones starts in the seventh week.

As with other congenital birth defects, the exact cause of an upper limb deficiency is typically not known. Some research has suggested that the exposure of the mother during pregnancy to various viruses, chemicals, medications, and tobacco smoke can be contributing factors.7 Amniotic band syndrome is caused from rupture to the amniotic sac, which can cause various abnormalities. It is due to constriction of encircling amniotic bands, and often can affect the limbs, face, joints, abdomen, or chest wall, and cause neural tube defects.8,9 This infant was referred to the regional Shriners Hospital where he was diagnosed at age 4 months with left upper extremity transverse deficiency at the level of the distal humerus, and not an amniotic band. The orthopedist reported the defect for Baby R was the result of a failure of the ectodermal ridge functioning, most likely from vascular compromise of unknown origin.

“Upon my first meeting with Baby R (at age 3 months) and his mother, he was swaddled very tightly, and held very close to her. After asking the general questions of feeding, elimination, and sleep, the mother said to me, “He is missing an arm,” and I simply said, “I know, and it is OK.” I examined Baby R as I examine all my patients. It was at that point that I felt I had established a relationship and trust with the mother.”

–Margaret Quinn, DNP, CPNP
When a child is born with a congenital limb deficiency, it affects not only the child, but also parents and families. Parents experience grief and loss with the birth of a child with any deformity and they need guidance and support from the healthcare providers, families, and friends. In a 16-year prospective study of prenatal diagnosis of fetal malformation, the authors report the proportion of limb defects diagnosed via ultrasound was low; wherein 3 of 4 babies with a limb deficiency were not diagnosed in utero.10

Parents of children born with (unexpected) limb deficiency are often shocked and have feelings of guilt. The mother tries to think back if she did anything wrong that contributed to the defect. The parents may overprotect the child and treat him/her differently from other children because of guilt, which could be detrimental to the growth and development of the child. If parents are not adjusting to the diagnosis, it will affect how the child will feel and react to his/her body.

The main goal for treatment of this defect is the restoration of proper function of the limb and appearance. Treatment can vary for each child based on age, degree of defect, and child and parental preference. Common treatment options include prosthetics (artificial limbs), orthotics (splints or braces), surgery, and rehabilitation (physical and occupational therapy).9 A first prosthesis can be fitted as soon as the child can sit independently because the child needs upper body balance to stabilize in a seated position. Primary devices include a passive hand, progressing to an active device that can be used when the child is older and tries to hold an object with 2 hands.9 The variety of devices can be determined by function, cost, and ease of training and use for parents, children, and therapists, as this field is constantly evolving.

There is controversy surrounding the appropriate age for fitting the prosthesis. Several published reports indicate that most children receive a first prosthesis during their first year of life and receive some type of instruction in active terminal device operation during the second or third year of life.9 A 2003 study surveyed child amputee clinics in North America to explore standards of early fitting of children with unilateral below-elbow limb absence. Most therapists/providers preferred to fit at age...
6 months then add an active control system by 18 months, which was an earlier age than reported in the prior literature. It is believed that the early fitting of a prosthesis improves the child’s body image and that may be essential for normal neuromuscular development. However, a more recent study found that age at first fitting was not associated with satisfaction with the prosthesis, functional use of the prosthesis, or motor skills.11

Many children are able to adapt and function well without use of a prosthesis, but some children may need physical therapy, surgery, or other treatments to function better and be more independent.12 Children with upper limb deficiencies may experience physical as well as emotional challenges. A qualitative study reported that children and adolescents with unilateral congenital below-elbow deficiency (UCBED) experienced both negative and positive feelings about their deficiency irrespective of whether they wore a prosthesis or not.13 These feelings depended most on how the social environment accepted the child and reacted to the deficiency. Staring was the most frequently reported public reaction, and negativity affected the self-esteem of the children. Coping strategies included wearing a prosthesis and contact with peers with similar deficiencies. Support from the rehabilitation team and parents was found to be the greatest positive influence on overall psychologic functioning.

Case update
Early intervention and multidisciplinary collaboration are necessary to help these children and parents. In the case of Baby R, the PNP encouraged a multidisciplinary approach to the care of the infant, initiating an early intervention (EI) referral for physical therapy (PT) and occupational therapy (OT) that began at age 3 months. The family of Baby R has been compliant with all well visits, and the infant was fitted with a prosthetic device at age 6 months. He was fitted with a nonfunctional (cosmetic) prosthesis at the mother’s insistence with a local physiatrist at age 6 months. Baby R has progressed nicely through his first year of life and has continued weekly OT and PT. He is meeting his developmental milestones with some delays that require bimodal activities (ie, transferring objects from 1 hand to another) but is compensating well. Significant support has been provided to the mother for postpartum depression and anxiety. Currently, she is being treated with outpatient counseling and pharmacotherapy by her mental health provider.

Tips for the primary care provider
The main goals for primary care providers are to help children develop normally and be independent. Whereas medical support and consultation is important for infants and children with a congenital defect, psychologic support is paramount for the parents and family. The vision of the “perfect child” can cause grief responses, especially if the defect was not suspected. In a historic study by Gringas of children with hand anomalies, the babies’ desire to explore was limited more by the mothers’ anxiety than their functional problem.14 The authors acknowledged children can pick up devaluing attitudes in which the child feels he/she cannot overcome alone. Parents are also noted to be overprotective and project their own distress to the child, which could be detrimental to the growth and development of a child. Parents should be encouraged to treat their children as normal and allow them to make decisions and care for themselves when developmentally appropriate.

Parents play a critical role in early development of self-awareness in the child before social responses are experienced.15 The parents who have adjusted to their child’s defect will be able to look at the arm without distress, which will encourage others to do the same. As the child continues to

The main goal for treatment of [congenital limb deficiency] is the restoration of proper function of the limb and appearance.

ADDITIONAL RESOURCES

- Lucky Fin documentary film: https://www.youtube.com/watch?v=EJI23qxvfbQ
- Recorders for All program (specially designed instruments for children with limb differences): http://makers4good.org/pages/recorders-for-all.html
- Related blogs: https://luckyfinproject.org/blog/
grow and develop self-awareness, the parents need to support the awareness of a physical difference but negate self-consciousness about the defect. Primary care office staff can also model support and trust for the family.

Summary
Although congenital limb deficiency is not a common occurrence, primary care providers need to remain knowledgeable of community and regional resources to provide to the families and children with a limb defect. Support services need to be in place for both the child and family through the growth and development of the child to encourage meeting of milestones within range and provide modifications to meet the developmental needs of the child. Multidisciplinary support of the child through the school-aged years and adolescence will be paramount for development of self-awareness and positive self-esteem.

For references, go to ContemporaryPediatrics.com/congenital-limb-deficiency

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The management of a patient requires an early multidisciplinary approach: orthopedics, occupational and physical therapy, and physiatry to start as early as possible to encourage the child to meet all developmental milestones.

- Child’s overall well-being depends on family function. Parents experience grief and loss with the birth of a child with the deformity and they need guidance and support from the healthcare providers, families, and friends. Attending a support group of parents with children with limb deficiency or other cosmetic deformities (such as cleft lip) are helpful as parents share their experiences and help each other cope raising their children.

- At each visit to the healthcare provider, it is important to assess all domains of development as a child’s abilities change as they grow. A child without any cognitive impairments should attain his/her developmental milestones within the normal range or may need therapeutic modifications to meet those milestones.

- This evaluation should include activities of daily living, function with and without their prosthesis, and overall limb function.

- Detailed assessment of gross motor skills should occur as those delays are noted after infancy, such as catching or throwing a ball.17

- Walking may be slightly delayed because of the upper body balance needed for gait.17

- Assess the stump during growth periods and for hypersensation and touch pressure sensation, as this encourages functional activities with and without a prosthesis.18 As children grow, they may require prosthesis changes.

- If their child is wearing a prosthesis, parents should be made aware of prosthesis-related complications, such as skin irritation or breakdown.19

- Assist the family with preparation of an individualized education plan (IEP) when the child enters school. Developing a plan for the use of an assistive device or any classroom accommodations should be discussed with the school nurse, administrator, and teacher to allow a sense of normalcy and reduce bullying in the school environment.20

- School and daycare personnel should be educated about how to care for the prosthesis.21

- There are several sports prostheses that are available, but many children adapt to sports without the use of a prosthesis.21

- As the child gets older, assess for scoliosis as children with congenital limb deficiencies have an increase in scoliosis incidence due to the absence of counterbalance of weight on the affected side.22

- Assessment of mental health status and coping mechanisms of the child should be evaluated for any risk factors into adolescence.

- Stay abreast with latest options for the patient and families. New developments in 3-dimensional (3D) printing has the potential to increase accessibility and allow for lower cost in making repairs and upgrades for pediatric prosthetics.23
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Integrating primary and specialist care for patients with suicidal ideation

Primary care physicians have opportunities to identify patients with suicidal ideation who then can benefit from interventions in both primary and specialist care.

Although psychiatrists may be better trained to treat suicidal patients, most patients with suicidal ideation are receiving care outside of specialty psychiatric settings and can benefit from interventions in primary care. Many individuals see their primary care provider (PCP) in the months leading up to suicide death. Therefore, primary care clinicians may have important opportunities to identify and treat suicidal patients.

Recommendations about assessing suicidal risk in primary care settings are mixed, however. The Joint Commission now recommends asking patients about suicidal ideation routinely in ambulatory settings. The US Preventive Services Task Force (USPSTF) does not make a recommendation for or against screening for suicide risk in a primary care setting due to insufficient evidence regarding the accuracy of screening tests and the effectiveness of suicide prevention interventions.

The USPSTF does, however, recommend routine depression screening for adolescents and adults seen in the primary care setting when adequate systems are in place to ensure accurate diagnosis and appropriate follow-up.

Depression-assessment instruments such as the 9-item Patient Health Questionnaire (PHQ-9) often include questions about suicidal ideation. Moreover, healthcare systems are increasingly implementing screening for depression as part of behavioral health integration (BHI) in primary care to provide patients with better access to needed care and address the well-known inefficiencies of siloing care for mental health in specialty settings.

Integrating behavioral health into primary care

Kaiser Permanente Washington, a regional healthcare system in Seattle, piloted a BHI program in 3 primary care clinics in 2015. Rollout across the system’s remaining 22 clinics began in 2016. The BHI program
was designed by clinical operations leaders, including a psychiatrist and researchers, to support care for depression, suicidality, alcohol, cannabis, and other drug use.

The BHI team used 3 main implementation strategies:

- Enabling primary care teams by using external practice coaches who partnered with local implementation teams that included providers, medical assistants (MAs), and clinical social workers (trained as integrated behavioral health clinicians).10,11 This strategy addressed attitudes about depression and substance use, including stigmatization, and gave local clinics ownership of their BHI implementation.

- Supporting primary care teams with decision-support tools embedded in the electronic health record (EHR) that prompted screening, follow-up assessments, and follow-up care.12

- Performance monitoring for site leaders and teams who reviewed routine data reports on screening and assessment during routine quality improvement meetings.13

Workflow for depression and suicide care

The process designed and implemented at each clinic included annual screening for adult patients coming into primary care. Following receipt of an electronic reminder for annual screening, MAs or clinic front-desk staff gave patients a 7-item paper screen. The screen included the PHQ-2 for depression, 3 questions about alcohol use (AUDIT-C), 1 question about cannabis use, and 1 question about other drug use or nonmedical use of prescription medication.14-17 Data from the screen were entered into the EHR as patients were roomed by MAs, and additional EHR decision-support tools prompted assessment and follow-up for symptoms that patients endorsed, such as suicidal ideation.

For example, for patients with scores of 2 or higher on either PHQ-2 question, the EHR prompted MAs to ask the patient to complete the PHQ-9 to help assess depressive symptoms (Figure). If patients answered “more than half the days” or “nearly every day” to the ninth PHQ-9 question about “thoughts that you would be better off dead, or of hurting yourself” in the last 2 weeks, the EHR prompted MAs to give the patient a brief version of the Columbia Suicide Severity Rating Scale (C-SSRS) modified for patients to complete on paper.18,19 For patients with C-SSRS scores indicating some level of suicide attempt planning in the past month (eg, “yes” to question 3), an EHR “Best Practice Alert” prompted the provider to initiate a same-day referral to a clinical social worker for crisis response planning. Crisis response plans were developed collaboratively with patients to identify warning signs of a suicidal crisis and coping strategies, reduce access to lethal means (ie, firearms and medications), and create a list of resources available for emergency support. A customizable EHR template, based on prior suicide prevention research, was used to document this plan for patients and care providers.20,21

Psychiatrists were available, via telephone consult service, to provide a “real time” consultation to PCPs, clinical social workers, and other members of the care team. Psychiatrists either answered the phone directly or returned calls within 30 minutes during regular business hours (Monday–Friday, 8 AM–5 PM). Often PCPs contacted psychiatrists to help make decisions about psychiatric hospitalization, initiating psychotropic medications, or about treatment options for suicidal patients with comorbid substance use disorders and/or serious mental illnesses. Clinical social workers at all primary care clinics were also invited to join a weekly 1-hour conference call with a psychiatrist and social work manager to discuss BHI-related challenges such as best practices for handling difficult encounters with suicidal patients.

Depression screening and suicide risk assessment

Our research team is still evaluating BHI in our health care system. Pre-

SIGNIFICANCE FOR PEDIATRICIANS

- Psychiatrists can play key roles in the integration of care for suicidal patients in primary care by providing leadership and consultative support to primary care teams.
- Helping primary care clinics develop a team-based approach takes the burden off individual primary care providers (PCPs) and alleviates their fear about identifying suicidal patients and needed resources that they are unable to address alone.
Clinical feature

Luminary results from analyses of a single month of performance metric data show that of 50,703 visits when BHI screening was due, the PHQ-2 was completed for 89% and 17% of these scored positive for depressive symptoms (Figure). A full PHQ-9 was completed for 96% of visits when the PHQ-2 was positive, with 6% indicating frequent suicidal ideation (in the last 2 weeks). Of those with suicidal ideation, the C-SSRS was completed for 86% of visits and 37% of C-SSRS scores prompted a crisis response plan. These luminary data illustrate the potential reach of BHI, which translated into a need for crisis response planning in 24 per 10,000 screening visits (107 of 45,235 visits with PHQ-2 completed).

Barriers, facilitators, and positive stories

During the pilot phase of this project, the main barrier to implementation of the workflow for depression and suicide care was the fear associated with identifying patient needs without the time or resources to address them. Many PCPs worried that they did not have the capacity to address the needs of suicidal patients without compromising care provided to other scheduled patients. Another important barrier was the initial lack of an EHR alert to prompt the use of the C-SSRS for patients with frequent suicidal ideation, which was later added.

Facilitators of this workflow included familiarity with the PHQ-9, which was previously used in the primary care clinics to monitor patients diagnosed with depression. Another critical facilitator was the focus on team-based care, which included psychiatrist consultants, clinical social workers, and PCPs and their support staff. Primary care providers routinely identified the clinical social workers, who were available for same-day referrals, as key to overcoming their fear of routinely screening for depression and assessing patients with suicidal ideation. They also expressed appreciation for the psychiatrist consultants avail-
able by phone for providing supportive care to their patients at the time it was needed.

Another major facilitator of suicide risk assessment, and BHI overall, was the number of positive stories shared about suicidal patients being seen for routine medical needs who were identified and then received needed care. One clinical social worker shared the following brief case vignette.

**Case vignette**

A young man came in to seek care for cold symptoms. As the clinical social worker on staff, I was paged to come talk with this patient after he scored high on our behavioral health screening tools. I learned that not only was this patient severely depressed but also that he had attempted suicide twice in the past couple of weeks.

Next, we talked about his immediate safety, and I discovered that he had limited outside supports. Because his safety couldn't be guaranteed if he went home, we talked about inpatient psychiatric treatment, which he agreed was a good idea. I coordinated his follow-up care, and the patient was authorized for psychiatric admission within 4 hours. I also talked with his parents, who waited with him and later drove him to his psychiatric placement.

Thanks to BHI, we had systems in place that let us know this young man was in immediate danger, and we were able to intervene and help him right away.

**Implications for practice**

- Psychiatrists can play key roles supporting real-time care for patients with suicidal ideation by educating PCPs about the wide range of treatment options available and providing consultative support in the development of tailored plans of care for individual patients.
- Implementing screening for depression followed by suicide risk assessment is feasible in primary care settings, particularly when tools to guide clinical decision-making for suicidal patients are embedded into EHR systems. Moreover, the brief, self-administered suicide risk assessment tool we used was highly valuable to primary care clinicians who used the information to guide their decisions about follow-up care.
- Most importantly, developing a team-based approach to providing care for suicidal patients, including psychiatrists, clinical social workers, and other primary care staff, takes the burden off individual PCPs and alleviates fear about identifying patient needs for which they do not have resources to address themselves.

**Limitations**

Further research on this model of care is needed to know if the suicide care we implemented as part of BHI in primary care improved patient health outcomes (eg, suicide attempts). Additionally, adaptations may be required to implement this model of care in a fee-for-service environment. For psychiatrists working in these settings, however, it is important to note that team-based care is possible because consultation and care management services are reimbursable by Medicare and other payers as part of a collaborative care program. Finally, it is outside the scope of this article to provide guidance on issues related to legal liability when patients die by suicide, despite their healthcare providers’ best attempts to provide high-quality care. We recognize, however, that providers who have lost patients to suicide may make decisions about patient care based on these experiences.22 We also recognize that current laws may incentivize “overhospitalization” and coercive treatment.23,24 A core ethical challenge to working with suicidal patients is that interventions intended to increase short-term safety in the short run may not be the best long-term solution.25 The best protection for patients and providers who care for suicidal patients, in primary care and specialty care settings, may be collaborative crisis response planning and documentation.20,21,26

**Conclusion**

Healthcare systems are increasingly addressing depression through behavioral health integration in primary care to improve the well-known inefficiencies and inferiority of siloing mental health care in psychiatric specialty settings. Provider stories about the integration of care for suicidality in primary care, including depression screening and suicide risk assessment, indicate that primary care staff value the ability to provide the care to suicidal patients when needed. Integrated social workers trained as behavioral health clinicians, psychiatrist leadership, and ongoing consultative support all help primary care teams be successful.
LGBT teens and suicide risk: How you can help

A new report highlights the increased risk of suicide for lesbian, gay, bisexual, transgender (LGBT) adolescents versus their heterosexual peers.

RACHAEL ZIMLICH, RN, BSN

Suicide is already a leading cause of death among all teenagers, but a recent study reveals just how much higher the risk is for those in the sexual minorities. The new report, published in *JAMA Pediatrics*, reveals that lesbian, gay, bisexual, transgender (LGBT) youth in general are 3 times more likely to make a suicide attempt than other teenagers, and the rate is highest among transgender adolescents—6 times that of their heterosexual peers.¹

Ester di Giacomo, MD, a researcher in the Forensic Psychiatry Department at the University of Milano-Bicocca, Monza, Italy, and lead author of the report, says the problem is rooted in issues with self-acceptance because of how these young persons are seen by their peers.

Suicide is the second-leading cause of death among individuals aged 10 to 34 years—more than 13,000 lives lost in this age group each year, according to the Centers for Disease Control and Prevention (CDC).² Di Giacomo’s study sought to investigate whether sexual minority adolescents make up a larger piece of this population. The research team reviewed 35 studies involving 2 million heterosexual and 113,000 sexual minority youth aged 12 to 20 years from 10 countries and found a significantly higher risk of life-threatening behaviors in the sexual minority youth compared with their peers.

Sexual minority teenagers were found overall to be 3.5 times more likely to attempt suicide when compared with heterosexual teenagers, followed by bisexual youth, and 3.69 more likely to attempt suicide. Gay and lesbian adolescents were 3.71 more likely to try to take their own lives, and transgender teenagers carried the greatest risk at 5.87 times more likely to attempt suicide than heterosexual peers, according to the report.

**Conflict and stigma**

Di Giacomo says these figures are not surprising to those in clinical practice but adds that this is one of the first unbiased evaluations of data that shows the real context of this phenomenon. The hope is that the report will help increase awareness of the problem and promote meaningful intervention.²

Support toward self-acceptance and inclusion could be the key to help these youth,” di Giacomo says. “I think pediatricians can offer support and a timely referral to a child psychiatrist in cases of difficulty in self-acceptance or bullying.” She says increased education and intervention could help reduce the stigma for these teenagers and promote acceptance and inclusion.

**How pediatricians can help**

The American Academy of Pediatrics (AAP) is working to do its part in promoting care for gender-diverse patients, releasing a policy statement with best practices for this population earlier this year.³ The policy statement includes a number of recommendations concerning medical care, psychosocial considerations, and family and community support for gender-diverse teenagers.

The AAP’s guidance, developed in part by Jason Rafferty, MD, MPH, EDM, a pediatrician and child psychiatrist who practices at the gender and sexuality clinic and at the adolescent health center at Hasbro Children’s Hospital, Providence, Rhode Island, revealed that gender diversity is more common than previously thought, with 0.7% of those aged 13 to
According to the AAP, 56% of transgender youth endorse suicidal ideation and 31% report suicide attempts. —Rafferty J, et al.

17 years identifying as transgender.

Similar to Di Giacomo’s report, the policy statement also suggests higher rates of suicide attempts and ideation in this population, with 56% of transgender youth endorsing suicidal ideation and 31% reporting suicide attempts. Rafferty says that although mental illness is not directly related to gender diversity, these teenagers face a lot of internal conflict and limited access to healthcare providers who are able to support the problems faced by adolescents with gender differences.

The policy statement recommends comprehensive, gender-affirming, and developmentally appropriate healthcare for gender-diverse teenagers; family therapy; respect for gender identity in health records; appropriate insurance coverage for gender-diverse patients; provider education and training; and community support to promote acceptance of these teenagers. The policy was crafted to reflect recommendations made by the American Psychological Association.

For references, go to ContemporaryPediatrics.com/LGBT-teens-and-suicide

Role of infectious disease in development of mental illness

New study highlights connection between brain and body in mental disease progression.

RACHAEL ZIMLICH, RN, BSN

The etiology of mental illness has long been a question answered by many theories, but now researchers in Denmark have found a connection between infections and the development of disorders including schizophrenia, depression, and bipolar disorder.

The study, published in JAMA Psychiatry, reveals that some infections in childhood could lead to the development of mental illness later in life.

Previous studies have linked severe infections requiring hospitalization to mental illness in adults. The impact of infection on the central nervous system, specifically through immune activation, changes the microbiome and inflammatory mediators, according to the report. The goal of this most recent study was to expand on previous research and explore a variety of types and severity of infections and a possible relationship to mental health disorders. To achieve this goal, researchers investigated hospitalization and prescription data on more than 1 million children born in Denmark between 1995 and 2012 using 2 national registries.

The data revealed that infections requiring hospitalizations were associated with an 84% increased risk of a mental health disorder diagnosis in the hospital setting and a 42% increased risk in the use of psychotropic medications. On the other hand, infections treated primarily in the outpatient setting with anti-infective agents were associated with a 40% increased risk of a mental health disorder diagnosis and a 22% increased risk in the use of psychotropic medications.

“These risks increased in a dose-response association with the number of infections and the temporal proximity of the last infection, and were supported by analyses that included different reference groups and sibling analyses,” the report notes. “A detailed assessment showed that the risks differed among specific mental disorders, being most elevated for obsessive-compulsive disorder, mental retardation, and tic disorders.”

New findings

Previous studies were limited to hospitalizations for severe infections and the impact on later mental illness diagnoses, but excluded outpatient and less severe infections, the research team pointed out.

“To our knowledge, the present study is the first to indicate that any
While it’s long been established that vitamin D deficiency is a common problem in patients with cystic fibrosis (CF), there has been little success following implementation of a number of recommended protocols for supplementation. A new study examines existing guidelines and what else can be done to improve treatment of vitamin D deficiency in these patients and reduce respiratory exacerbations.

The study, published in the Journal of Pediatric Gastroenterology and Nutrition, reviewed guidelines for vitamin D supplementation published by the North American Cystic Fibrosis Foundation (NACFF) in 2012 and found they were still insufficient in raising serum levels of 25-hydroxyvitamin D (25[OH]D) but are still not sufficient in raising it in all the patients above the cutoff of 30 ng/mL (75 nmol/L),” Abu-Fraiha and her team write in the report. “Our study demonstrates that the new NACFF guidelines for supplementing vitamin D in patients with CF succeed in raising serum levels of 25-hydroxyvitamin D (25[OH]D) but are still not sufficient in raising it in all the patients above the cutoff of 30 ng/mL (75 nmol/L),” Abu-Fraiha and her team write in the report. "We hope that our findings will contribute and help to a better understanding of the complex interplay between the peripheral immune system and the central nervous system. Clearly, the central nervous system is linked to the rest of the body in an intimate connection," Köhler-Forsberg says. "Furthermore, we hope that our findings will help that more focus is on a broad and detailed somatic evaluation of children and adolescents with mental disorders, as sufficient somatic treatment may have a positive impact on the mental disorder as well.”

For reference, go to ContemporaryPediatrics.com/infections-and-mental-illness

Can vitamin D supplements help cystic fibrosis patients?

Increasing serum vitamin D levels could decrease pulmonary exacerbations.

RACHAEL ZIMLICH, RN, BSN

While it’s long been established that vitamin D deficiency is a common problem in patients with cystic fibrosis (CF), there has been little success following implementation of a number of recommended protocols for supplementation. A new study examines existing guidelines and what else can be done to improve treatment of vitamin D deficiency in these patients and reduce respiratory exacerbations.

The study highlights more than ever the connection between the brain and body.

“We hope that our findings will contribute and help to a better understanding of the complex interplay between the peripheral immune system and the central nervous system. Clearly, the central nervous system is linked to the rest of the body in an intimate connection,” Köhler-Forsberg says. “Furthermore, we hope that our findings will help that more focus is on a broad and detailed somatic evaluation of children and adolescents with mental disorders, as sufficient somatic treatment may have a positive impact on the mental disorder as well.”

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Increasing serum vitamin D levels could decrease pulmonary exacerbations.

RACHAEL ZIMLICH, RN, BSN

While it’s long been established that vitamin D deficiency is a common problem in patients with cystic fibrosis (CF), there has been little success following implementation of a number of recommended protocols for supplementation. A new study examines existing guidelines and what else can be done to improve treatment of vitamin D deficiency in these patients and reduce respiratory exacerbations.

The study, published in the Journal of Pediatric Gastroenterology and Nutrition, reviewed guidelines for vitamin D supplementation published by the North American Cystic Fibrosis Foundation (NACFF) in 2012 and found they were still insufficient to increase vitamin D to clinically beneficial levels in CF patients. Yasmeen Abu-Fraiha, MD, lead author of the report and cofounder of the nongovernmental organization GENESIS, says vitamin D deficiency is undertreated in patients with CF, even with current guidelines that already recommend high doses of supplementation.

“Our study demonstrates that the new NACFF guidelines for supplementing vitamin D in patients with CF succeed in raising serum levels of 25-hydroxyvitamin D (25[OH]D) but are still not sufficient in raising it in all the patients above the cutoff of 30 ng/mL (75 nmol/L),” Abu-Fraiha and her team write in the report. "Monitoring serum vitamin D levels while adjusting the dose according to the levels may lead to normalization..."
of the levels in most patients. More re-
search is needed to test the protocol
over longer periods with a larger sam-
ple size and higher compliance rate to
draw reliable conclusions. This study,
however, suggests that increasing se-
rum vitamin D levels in patients with
CF leads to a decrease in the number
of respiratory exacerbations.”

The study evaluated 90 patients
for nearly 17 months using the
NACFF recommendations for vita-
min D supplementation. Whereas
the number of patients with normal
vitamin D levels increased over the
study period from 20 to 27, the study
authors conclude that progress was
not enough to significantly improve
outcomes for these patients because
desired serum levels still were not
achieved in most patients.

**Benefits of vitamin D in CF**
The study is the first to test the effi-
cacy of the NACFF protocol and sup-
ports previous research suggesting
much higher doses of vitamin D are
needed for a clinical benefit in CF
patients. Increased serum vitamin D
levels are associated with fewer pul-
monary exacerbations—a change
that both improves quality of life
for patients and reduces costs from
treatments and hospital stays.

This report is unique in that it
shows the benefit of administering
active vitamin D over inactive vita-
min D, and correlates serum vita-
min D levels to the number of days
a CF patient may stay in the hospital.
Researchers note that the role of vi-
tamin D in preventing autoimmune
disease, enhancing antimicrobial
protection, and fighting viral infec-
tions has opened the door to more
research that could further help CF
patients avoid exacerbations.

Abu-Fraiha explains the role of
vitamin D in reducing pulmonary
exacerbations in CF patients.

“First, the respiratory epithelium
is able to convert inactive 25(OH)D to
active 1,25(OH)2D and this function
is impaired in CF. For that reason,
giving CF patients active vitamin
D3 may overcome this impairment.
Second, the presence of vitamin D
receptors in respiratory epithelium
may indicate an important role for
vitamin D in the lungs and the corre-
lation between vitamin D deficiency
and respiratory viral infections,” she
says. “Finally, it is known that vitamin
D has a role in the systemic immune
Clinical Roundup

Prevalence of obsessive-compulsive symptoms—maybe not enough to warrant an official diagnosis—are more common than clinicians may think and could lead to more serious psychological issues, particularly in teenaged girls, a new report reveals.

The study, published in the *Journal of the American Academy of Child and Adolescent Psychiatry,* reviewed the prevalence of self-reported obsessive-compulsive symptoms in more than 7000 teenagers to find patterns that might raise red flags for further psychiatric evaluation. The research team found that obsessive-compulsive symptoms were common in 38.2% of the cohort who did not seek mental health care, but only 3% met the threshold for a diagnosis of obsessive-compulsive disorder (OCD). Overall, these symptoms were most common in females after puberty.

RACHAEL ZIMLICH, RN, BSN

Prevalence of obsessive-compulsive symptoms—maybe not enough to warrant an official diagnosis—are more common than clinicians may think and could lead to more serious psychological issues, particularly in teenaged girls, a new report reveals.

The study, published in the *Journal of the American Academy of Child and Adolescent Psychiatry,* reviewed the prevalence of self-reported obsessive-compulsive symptoms in more than 7000 teenagers to find patterns that might raise red flags for further psychiatric evaluation. Participants in the study underwent psychiatric interviews, including screening for obsessive-compulsive symptoms. The research team found that obsessive-compulsive symptoms were common in 38.2% of the cohort who did not seek mental health care, but only 3% met the threshold for a diagnosis of obsessive-compulsive disorder (OCD). Overall, these symptoms were most common in females after puberty.

Ran Barzilay, MD, PHD, a child and adolescent psychiatrist and research associate at the Lifespan Brain Institute at the Children’s Hospital of...
Philadelphia, Pennsylvania, and University of Pennsylvania Perelman School of Medicine, Philadelphia, led the study along with Raquel Gur, MD, PHD, director of the Lifespan Brain Institute. Gur established the Philadelphia Neurodevelopmental Cohort (PNC) used to complete the study.

“Whereas for most these symptoms are not associated with serious psychiatric conditions, some obsessive-compulsive symptoms are associated with serious psychiatric conditions like depression, suicide ideation, and psychosis,” Barzilay says. “Specifically, we found that intrusive bad thoughts—violent, sexual, thoughts of having done/said something wrong—are associated with serious psychiatric conditions. Other obsessive-compulsive symptoms, such as those related to cleaning and/or contamination, are relatively benign.”

When obsessive-compulsive becomes OCD

Obsessive-compulsive symptoms are characterized by repetitive thoughts, urges, or mental images and/or repetitive behaviors, according to the report, and these symptoms can become intrusive and debilitating in some cases.

Formal diagnosis of OCD affects 2% to 4% of all children and adolescents but goes undetected in as many as 90% of cases, the study notes.

Although repetitive and ritualistic behaviors are part of normal child development, as children age these behaviors may no longer be needed to reach age-appropriate goals later in childhood. Also, whereas these behaviors do decrease in most children as they reach the teenaged years, the studies show a surge in obsessive-compulsive symptoms around eighth grade. The research team also notes that for adult-onset OCD, symptoms typically begin in the teenaged years and can present with other psychiatric comorbidities, such as depression, psychosis, and suicidal thoughts. For adolescents, obsessive-compulsive symptoms also have been associated with decreased school and behavioral function.

The goal of the study was to evaluate the prevalence and heterogeneity of obsessive-compulsive symptoms, as well as to identify patterns in obsessive-compulsive symptom presentations that might warrant further evaluation or intervention. The study is the first and largest to evaluate obsessions and compulsions, as well as their comorbidities, spanning both prepubescent and postpubescent age groups. Overall, almost 40% of the teenagers studied endorsed at least one obsession or compulsion. Those who endorsed these symptoms had a higher prevalence of depression, psychosis, and suicidal ideation, as well as lower levels of global function, according to the report.

The symptoms were classified into 4 groups—bad thoughts, repeating or checking, symmetry, and cleaning or contamination. Bad thoughts were especially associated with serious psychopathy beyond obsessive-compulsive behaviors, according to the report, whereas cleaning and contamination were not.

The research team suggests these results may indicate that behaviors of the bad-thoughts variety may be used in the future to flag an individual as at risk for major psychiatric conditions including a formal OCD diagnosis, depression, psychosis, or suicidal ideation. Specifically, the report suggests that screening for specific symptoms in the bad-behaviors category might be important for assigning risk levels to patients with these symptoms who are at a higher risk for serious psychiatric conditions. Further research is needed to make specific clinical guidelines, the report notes.

What clinicians should do

Barzilay says it’s important to note that the study is not about having an OCD diagnosis but having obsessive-compulsive symptoms and how these symptoms might relate to other psychiatric conditions in young persons in some cases.

“Obsessive-compulsive symptoms are common but for most do not mean that the child/adolescent has OCD,” he says. “Clinicians should be aware that some obsessive-compulsive symptoms, specifically bad intrusive thoughts, are associated with serious psychiatric conditions and, therefore, it might be prudent for clinicians to actively probe for these symptoms, and if present consider
Teen diets heavily influenced by peers and parents

For low-income African American teenagers in particular, parental involvement and monitoring of their diets is key to making good choices.

RACHAEL ZIMLICH, RN, BSN

Adolescent diets often leave something to be desired when it comes to meeting national dietary guidelines, but for low-income African American teenagers, poor quality diets are particularly prevalent and can lead to lifelong chronic disease, according to a new report.

Diet habits established during the adolescent years often continue on to adulthood, so a good foundation is key to a healthy life. Poor-quality diets in the developmental years can lead to chronic obesity and other health problems. A new study, published in the Journal of the Academy of Nutrition and Dietetics, sought to examine how parental beliefs about nutrition, perceived peer eating behaviors, and parental monitoring of adolescent food choices affected diet quality in African American teenagers, and whether age and gender play a role.

Researchers used data on 216 African American teenagers and their caregivers from a low-income urban community to complete the study and based diet assessments on the 2010 Healthy Eating Index. In many of these communities, residents live in “food deserts,” with a lack of grocery stores and access to healthy foods. This can make developing a good food foundation difficult, especially when less healthy convenience foods are readily available. The research team found that better diet scores were recorded when teenagers had better parental support and monitoring of food choices, and when teenagers perceived healthy eating habits among their peers. There were no differences among different ages or genders.

The report affirms previously held theories that teenagers look to their friends and family when it comes to making food choices. Margaret Wrobleski, PhD, MPH, RDN, LDN, a consultant research dietitian at the University of Maryland School of Medicine in Baltimore and owner of Downeast Consulting, led the study and notes that the findings may not be applicable across the board.

“This study focused exclusively on low-income, African American adolescents in inner-city neighborhoods in Baltimore, Maryland, and the findings should not be applied to all adolescents. Dietary habits often differ across ethnicities, geographic regions, and vary by cultural food traditions. The built environment may also affect diet quality,” Wrobleski notes. "The families participating in this study resided in urban food deserts with lim-
Limited access to healthy foods, and often had to shop at corner convenience stores to purchase groceries.

For some populations, like the one involved in this study, however, the report highlights the impact of relationships and perceptions on diet choices.

“Perceived social norms for healthy eating habits among friends and family may positively influence adolescent eating behavior. Consistent with predictions from ecological and social-cognitive theories, adolescents’ dietary behaviors reflect their perceptions of the social environment,” Wrobleski says. “This study found that adolescent diet quality was positively associated with the adolescent’s perceptions of parents’ positive nutrition beliefs, parental monitoring of adolescent dietary behavior, and friends appearing to engage in healthy eating behaviors. The relationships reported in this study describe some of the interpersonal social influences that may improve diet quality among nutritionally vulnerable low-income African American adolescents and inform future nutrition research.”

Wrobleski says teenagers may shape their eating habits by modeling the food beliefs and behaviors of their caregivers and peers.

“Among low-income, African American adolescents in poor urban communities, we found that parent’s positive attitudes about healthy eating and paying attention to their adolescent’s dietary behavior was related to the adolescent consuming more healthful foods. Improved diet quality was also related to adolescents’ perception that their friends and peers engaged in healthy eating behavior,” she says, adding there is a message in this research for clinicians. “Pediatricians may choose to explore strategies to support healthful dietary behaviors via social support networks among friends and within family groups to positively impact adolescent nutritional status.”

Wrobleski says she hopes pediatricians will take this message into practice.

“These findings imply that perceived social norms for healthy dietary behavior among family and friends might positively influence adolescent eating habits,” she says. “The results of this study may motivate clinicians to promote positive dietary behavior change strategies that target the social influencers within adolescents’ friend and family networks.”

RACHAEL ZIMLICH, RN, BSN

Infants who are regularly given milk cereal drinks to supplement regular feedings are at a higher risk for obesity, according to a new report.

Bernt Alm, MD, PHD, associate professor of Pediatrics at the Institute of Clinical Sciences, University of Gothenburg, Sweden, and one of the study authors, says it’s not so much milk cereal itself that is linked to weight gain, but rather how it is consumed.

“Milk cereal drinks are not bad as such; how they’re used is the problem,” Alm says. “That is when they are seen not as a meal but as an extra, to supplement other food.”

Milk cereal drinks—such as porridges or cereals given by spoon or added to bottles—are frequently used by parents to satisfy their infants or promote sleep. The American Academy of Pediatrics (AAP) dis-
**Clinical Roundup**

encourages parents from adding cereal to bottles but acknowledges that it is a common practice among parents. The AAP advises that not only does adding cereal to bottles contribute to overfeeding, but it can also present a choking hazard.¹

This new study, published in *Acta Paediatrica*, may give opponents more tools to fight against this practice, with researchers linking milk cereal consumption at age 6 months to higher body mass index (BMI) years later.²

Researchers at Sahlgrenska Academy, University of Gothenburg, Sweden, first linked milk cereal consumption at age 6 months to higher BMI at age 1.5 years. This new study is a follow-up to the original report, evaluating the same group of children from the original study several years later.

The study involved 2000 children from the Halland Health and Growth Study and found that 11.6% of the children were overweight and 2.3% were considered obese. The research team found that the risk for children to be overweight or obese was nearly double in children who had been given milk cereal drinks daily as infants. The report notes that 85% of the children studied had consumed milk cereal drinks daily as infants. Other contributing factors for being overweight or obese included low parental education levels, parents who were smokers, and children with a family history of obesity, according to the report.

"Drinking milk cereal drink daily in infancy increases the risk of being overweight at 5 years of age. We would advise parents, especially parents of infants with an increased risk of being overweight, to rather introduce and continue gluten in the form of porridge at about 6 months," Alm says.

"If our suspicion of the mechanism of the increased risk of overweight with milk cereal drinks, that it is very easy to drink beyond the point of satiety, is correct, it would probably be safe to feed infants with milk cereal drink by the spoonful, but from the data we have it is not possible to be sure of that."

Alm says that pediatricians should regularly check infant growth and provide nutritional counseling to parents, especially those who are worried about their infant not being satisfied by milk or formula alone.

"Many parents have these concerns, even if the infant is happy and growing well, and this checkup with subsequent adequate counseling might prevent future weight problems."

As far as changes to clinical guidance, Alm notes that the study was conducted in Sweden, where almost all infants consume milk cereal drinks on a daily basis from about age 6 months on. He hopes the study will result in some restraint when it comes to milk cereal use in infants, although the research also showed that milk cereal drinks aren’t the only contributing factors to obesity.

"Milk cereal drinks are not bad as such; how they’re used is the problem. That’s when they are seen not as a meal but as an extra.”

—BERNT ALM, MD, PHD

For references, go to ContemporaryPediatrics.com/milk-cereal-and-obesity

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**Preemie Oxygenation Updates Lack Specific Guidance**

High oxygen concentrations may not be as toxic as once thought, but a review of recommendations also failed to identify ideal FiO2 for preemies.

RACHAEL ZIMLICH, RN, BSN

Updated guidance is on the way for supplemental oxygen in preterm infants, but an ideal recommendation for the amount of oxygen to be used remains elusive.

Whereas many preterm infants require supplemental oxygen at birth, past studies have suggested that high levels of initial fraction of inspired oxygen (FiO2) are particularly toxic to preterm infants, yet there has been—and remains—no clear evidence on the optimal FiO2 levels for resuscitation in these preemies.

A new study, initiated by the International Liaison Committee on
Resuscitation (ILCOR) Neonatal Life Support Task Force and published in *Pediatrics*, reviewed current literature and guidance on morbidity and mortality effects of high versus low FiO2 for resuscitation in infants born at 35 weeks of gestation or less. Whereas the study did not identify an ideal initial FiO2 for preterm infant resuscitation, it did seem to contradict prior notions that high FiO2 could be toxic to newborns. Results of the study, which reviewed 10 randomized control studies and 4 cohort studies involving more than 5600 patients, showed no statistical significance in short-term or long-term mortality or long-term neurodevelopment impairment when starting with low versus high FiO2 support at birth.

Michelle Welsford, BSC, MD, FACEP, CCPE, FRCPC, professor and interim director of emergency medicine at McMaster University, Hamilton, Ontario, Canada, medical director of the Hamilton Health Sciences Centre for Paramedic Education and Research, staff emergency physician at Hamilton Health Services, and lead author of the study, says the study confirms that although term infants can often tolerate respiratory support with room air at birth, the majority of newborns born at 32 weeks’ gestation or less will require additional oxygen supplementation within 5 minutes of birth, starting with a low oxygen level and titrating up to targeted saturation that will support life-sustaining oxygenation while preventing injury from hyperoxia.

“There is still a knowledge gap regarding the specific ideal FiO2 for initial management in preterm infants. However, given most preterm neonates ≤32 weeks’ gestation will require some oxygen supplementation, the key questions to focus on may be less about the specific starting FiO2 (0.21-0.30), and more related to the process to titrate the oxygen and the best target saturations,” she says.

Final guidelines are coming
The study was conducted in order to update the ILCOR guidelines from 2015, and Welsford says new recommendations have now been created and posted for public comment, with a finalized recommendation due later this year.

As Welsford suggests, the proposed new guidelines recommend beginning oxygen resuscitation in preterm infants at 21% to 30%, increasing to 60% up to 100% as needed to reach the desired oxygen concentration using pulse oximetry.

“Concern remains that the oxygen concentrations to which preterm infants are first exposed if they need resuscitation immediately after birth may be a critical contributor to outcomes regardless of subsequent oxygen exposure,” according to the proposed guidelines. “It is unclear whether low or high oxygen concentrations may have undesirable effects. In still suggesting to start with low oxygen concentrations, we place value on avoiding exposure of preterm babies to additional oxygen without proven benefit for critical or important outcomes, as we are cognizant of harms in preterm animals and increased neonatal mortality in term infants exposed to high initial FiO2 concentration.”

Ms Zimlich is a freelance writer in Cleveland, Ohio. She writes regularly for *Contemporary Pediatrics* and sister publications *Managed Healthcare Executive* and *Medical Economics*. 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.
indistinct margins, destruction of the cortex, periosteal bone formation, and the formation of Codman triangle. The associated soft tissue mass is variably ossified in a radial/sunburst pattern. An MRI is useful for local staging of the bone, soft tissue extension, and joint/marrow involvement. A CT scan is best suited for metastatic disease diagnosis in the thorax. Amputation was the primary modality of therapy of osteosarcoma before the advent of chemotherapy and limb salvage surgeries. Currently, limb salvage surgery, pre- and postchemotherapy, and radiotherapy are the standard of management for osteosarcoma in children with or without any metastasis. The main line of chemotherapeutic agents is Adriamycin, cisplatin, methotrexate, cyclophosphamide, and epirubicin. With the development of neoadjuvant chemotherapy, limb salvage surgery, and lung metastasis dissection, the 5-year survival rate increased to 60% to 70%.7

CHONDROBLASTOMA
Chondroblastoma is a rare benign cartilaginous tumor composed of immature chondroblasts with a scant chondroid matrix. It represents 1% of all primary bone tumors, located at epiphysis and apophysis. Chondroblastomas are mostly located at the epiphysis of the proximal and distal parts of the femur, proximal part of the humerus, and proximal tibia. They usually occur between ages 15 to 20 years, with male predominance. Clinical symptoms include pain, local tenderness, swelling, and limited motion of the adjacent joint. The classic radiographic appearance of chondroblastoma is a well-defined, eccentric oval/round lytic lesion involving the epiphysis adjacent to an open growth plate. The x-ray may show some expansion of the bone and a sclerotic margin. Dystrophic calcification is occasionally present and may surround individual cells, giving the classic “chicken wire” appearance.6 These lesions show central tumoral enhancement after intravenous (IV) gadolinium contrast on MRI images and Brodie abscess shows peripheral enhancement.7 The gold standard for the treatment of chondroblastoma remains complete and meticulous curettage of the lesion most frequently combined with bone grafting. Various studies of chondroblastoma in adults and children have demonstrated recurrence rates ranging between 8.3% to 15%. 

ANEURYSMAL BONE CYSTS
Aneurysmal bone cysts (ABC) are benign, nonneoplastic, expansile, vascular, and locally destructive lesions. The lesion may arise de novo (65%) or secondarily (35%) in preexisting lesions such as giant cell tumor, osteoblastoma, chondroblastoma, and angioma. Almost 80% of the lesions present in skeletally immature patients aged younger than 20 years.10 

Despite being reported in almost every bone of the body, ABC is more often encountered in the metaphysis of the long bones, distal femur, tibia, and vertebrae. Approximately 60% of the lesions originate from metaphysis and 28% of them originate from metaphysis and subchondral parts.11

Clinical presentation
The clinical presentation of ABC varies widely. Most often these patients present with long-standing, dull aching pain following a trauma, which usually worsens with time. Some patients present with severe pain, adjacent bone swelling, discomfort with walking, and often pathological fractures such as in this patient. A calcaneal ABC presents with pain, discomfort with walking, and swelling as well. Having nonspecific clinical findings creates a high suspicion for ABC and the diagnosis is made radiologically.

Diagnosis
Most commonly used diagnostic modalities for ABC are x-rays, CT scan, and MRI, and very rarely, biopsy with histological examination. These ABC appear on radiographs as radiolucent lesions of eccentric origin in the metaphysis of long bones.12 The term “soap bubble” is used to describe the lesions with an erosion of the cortex of the bone and elevation of the perosteum. A CT scan will be useful to demonstrate anatomical integrity and to demonstrate cortical erosions as well. An MRI allows identification of the thin septa dividing the cyst as well as demonstrating fluid-fluid levels within the cyst. The MRI images

Roughly 85% of all acute ankle injuries are sprains, out of which about 85% are uncomplicated; ie, involving the lateral ligaments only.

Ankle pain and swelling CONTINUED FROM PAGE 14
of ABC on T1 and T2 typically show a nonhomogeneous cystic lesion and multiple fluid-fluid levels surrounded by a rim with low signal strength. The fluid-fluid levels are better evaluated on a T2-weighted MRI.

**Management**

Traditionally, these tumors are treated with an open surgery with either an intrallesional surgical approach or en bloc excisions. Furthermore, a variety of chemical/physical adjuvants have been utilized in order to reduce the risk of local recurrence after excision. Currently, there is a shift to more minimally invasive procedures in order to avoid the complications of open surgical excision. Good results have been reported during percutaneous surgery or with the use of embolization. Recently, sclerotherapy has emerged as a promising treatment. Lastly, noninvasive treatment options, such as pharmacologic treatment with denosumab or bisphosphonates have been reported to be effective in the management of the disease.

Complete excision of the ABC is accompanied by an excellent local remission rate that approaches 100%. However, this technique is undoubtedly cumbersome and accompanied by an increased risk for complications such as bleeding, pain, growth disturbances, and more. Furthermore, there is a frequent need for local reconstruction of the resulting skeletal defect.

Alternatively, intrallesional curettage is a less invasive method. It has an acceptable rate of local control—90% in large series. Various adjuvant agents such as phenol, bone cement, cryotherapy with liquid nitrogen, or a high-speed burr are used to reduce the recurrence rate.

Embolization has been used as the treatment option for ABC especially in locations where surgical management is difficult and associated with substantial risk of complications. It also has been used for ABC of the axial skeleton. Embolization is also used as a surrogate method to open surgery, in order to minimize the bleeding during excision and to reduce the risk for local recurrence.

Modern sclerotherapy treatment for ABC with a polidocanol is a safer treatment that generally lacks serious adverse effects. Rastogi and colleagues reported a cure rate of approximately 97%.

**Patient course**

The patient in this case was treated with curettage, biopsy, and allograft packing. Further on, he was advised to use a Cam walking boot for up to 8 weeks. Additionally, he will be followed for 2 years with interval follow-up x-rays every 6 months to exclude any recurrence.

**Conclusion**

Most of the benign cystic bone lesions and malignant lesions usually present with chronic bone pain, swelling of joints, limp, and gait issues. A detailed history, proper imaging studies including x-ray, CT, and/or MRI help to diagnose these lesions, and bone biopsy is rarely needed. Characteristic features of the imaging will help the physician to narrow down the differential diagnosis and guide with the appropriate management.

**Take-home points**

Roughly 85% of all acute ankle injuries are sprains, out of which about 85% are uncomplicated; ie, involving the lateral ligaments only. Most of these ankle sprains can be diagnosed clinically and managed traditionally on an outpatient basis without needing many workups. The combination of protection, relative rest, ice, compression, elevation, and support (PRICES) still holds good for conservative management of simple ankle sprains.

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**The use of radiographs in patients with ankle injuries is guided by the Ottawa Ankle Rules. These rules state that an ankle radiographic series is required only if the patient has pain in the malleolar zone and any of the following 3 findings:15**

1. Bone tenderness at the posterior edge or tip of the lateral malleolus (ie, the lower 6 cm of the fibula).
2. Bone tenderness at the posterior edge or tip of the medial malleolus (ie, the lower 6 cm of the tibia).
3. Inability to bear weight immediately after the injury and in the emergency department.

The results of the test should be used to make the diagnosis and formulate further management.

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**For references, go to ContemporaryPediatrics.com/puzzler-0319**
encounter including assessment, management, medication, education, and proper follow-up.

Our RNs also perform a triage assessment of the daily calls that improves access of care and greater utilization of same-day appointments, including proper triage of acute cases. Our RN attempts to return patient calls within 24 hours.

**Model of care**

Our daily work is divided into 2 categories: well-child visits and patients with clinical complaints.

A patient or family can book an appointment for a well visit or for any clinical complaints with their primary care pediatrician well in advance. This booking can be online through a web-based program, by phone, or in person.

Moreover, in order to fill the demand for appointments for acute illness, there are always fixed appointments per pediatrician for acute illness (about 6 to 8 per provider per day). These slots are made available only by phone beginning at 6:30 AM on the day of the appointment.

**Recent surveys showed that this model has increased patient satisfaction. For example:**

1. Satisfaction with provider: improved from 84% to 93.4%.
2. Provider explained what was being done and why: improved from 86.7% to 94.3%.
3. Provider listened: improved from 81.6% to 92.7%.

In summary, my experience working as a pediatrician in a PMH has yielded great improvement in patient and family satisfaction.

**For references, go to ContemporaryPediatrics.com/medical-home-dispatches-0319**
Pediatricians are less likely than other specialties to be sued, but when losing or settling a suit, their payouts are among the highest. Here’s what to expect if you get sued.

STEVEN BONDI, JD, MD, FAAP; JOHN RUSHER, MD, JD, FAAP; ANDREW J SCHUMAN, MD, FAAP

Over the course of their careers, many pediatricians will be sued for malpractice. Whereas it is important to implement practice strategies that can reduce the risk of malpractice, pediatricians should know what actions to take if they get sued.

**How common are malpractice lawsuits in pediatric practice?**

According to the American Medical Association’s (AMA) 2016 Physician Practice Benchmark Survey, 34% of 3500 physicians surveyed have been sued and 16.8% have been sued twice or more.1 The results also revealed that the likelihood of getting sued increases with age. Although 8.2% of the surveyed physicians aged younger than 40 years have been sued, close to 50% of physicians aged older than 54 years also reported being sued.

Specialty choice is significantly related to likelihood of a lawsuit with only 17.8% of pediatricians sued and only 6% sued more than once.1 In contrast, 63% of general surgeons and obstetricians/gynecologists (OB/GYNs) reported a claim with 50% of surgeons and 44% of OB/GYNs reported being sued multiple times. Whereas pediatricians are less likely than other specialties to be sued, when losing or settling a suit, their payouts are among the highest of all specialists.2

**Specialty choice is significantly related to likelihood of a lawsuit with only 17.8% of pediatricians sued and only 6% sued more than once.**

**Reasons for lawsuits in pediatrics**

Injuries resulting in pediatric lawsuits are typically the consequence of medical errors, poor management, or errors in diagnosis. Tables 1 and 2 show the most common reasons for claims against pediatricians from an extensive examination of Physician Insurers Association of America (PIAA) data (from 1985 through 2006).1 When a child has brain damage, a lawsuit is not uncommon, especially when there have been complications of delivery or postdelivery management. Other frequent reasons for lawsuits include conditions missed during routine exams (eg, hip dysplasia) as well as missed diagnoses of meningitis, appendicitis, and pneumonia.

Good communication leads to fewer lawsuits.

**Physicians are less often sued if they:**

1. Educate patients about what to expect during the visit;
2. Laugh and use humor during the visit; and
3. Solicit patients’ opinions and encourage patients to talk during the visit.4 (See sidebar “How to avoid diagnostic errors: Risk management techniques,” page 48.)

**Malpractice suits, first steps**

When a family feels their child has been injured by a physician, their
initial step is to seek legal consultation. Malpractice lawsuits are very expensive to bring; thus, most law firms turn down the majority of potential claims. It can take several months from the time the patient seeks legal counsel until the lawsuit is initiated, and many more months or even years until the case is dismissed, settled, or goes to mediation or trial. Initially, you may receive a letter from the potential plaintiff’s attorney asking for medical records. If you receive a request for medical records regarding a patient and you suspect a lawsuit is being investigated, you should contact your insurance carrier and comply with the applicable state and federal law when providing all requested records.

If you are sued, you will receive a summons, the official notice that a lawsuit has been initiated, as well as a complaint detailing the allegations of the claim. Once this occurs, you must immediately notify your insurance carrier who will provide you with an insurance carrier notification and will assign a defense attorney to your case.

You must comply with all legal requests, but there are many things you should not do!
- Do not attempt to contact the patient or the patient’s attorney.
- Do not agree to talk with or meet with the plaintiff attorney unless your lawyer is present.
- Do not discuss your case with anyone other than your spouse and attorney.
- Do not make any additions or alterations to the medical record.

Conversations with your attorney are legally protected and good rapport is critical. Educate your attorney in the medical concepts of the case, empowering him or her to be your best advocate. If you feel that the relationship with your attorney is not effective, discuss this with your insurer and request the appointment of new counsel.

Discovery is the phase of a lawsuit wherein the plaintiff and defendant attorneys define the legal and factual issues of the case, locate evidence, and determine if the case should be settled or go to trial. During discovery you may be presented

### Table 1

**Most Prevalent Conditions Resulting in Malpractice Lawsuits (in Order of Frequency)**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Average Indemnity (for all claims)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain-damaged infant</td>
<td>$440,379</td>
</tr>
<tr>
<td>Meningitis</td>
<td>$437,423</td>
</tr>
<tr>
<td>Routine infant or child health check</td>
<td>$155,039</td>
</tr>
<tr>
<td>Respiratory problems in newborns</td>
<td>$270,607</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>$116,285</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>$239,531</td>
</tr>
<tr>
<td>Specified nonteratogenic anomalies</td>
<td>$186,708</td>
</tr>
<tr>
<td>Premature birth</td>
<td>$250,031</td>
</tr>
<tr>
<td>Birth</td>
<td>$286,407</td>
</tr>
<tr>
<td>Asthma</td>
<td>$193,414</td>
</tr>
</tbody>
</table>

From McAbee GN, et al.³
practice improvement

with interrogatories—written questions to which you should provide honest and thorough answers. Additionally, you will likely be required to testify under oath at a deposition where you will be questioned by the plaintiff attorney and required to provide answers that can be placed into evidence at trial. A deposition is not the time to offer your defense, but an opportunity for the plaintiff attorney to “lock down” your story. You should prepare by reviewing the record, researching the problems at issue, and rehearsing with your attorney. At deposition, confine answers to only what is asked of you. During the deposition do not argue and do not offer opinions about care being rendered unless advised to do so by your counsel. Furthermore, do not acknowledge a resource as authoritative or guess the rationale for other providers’ actions.

If your case goes to trial, you can improve your chances of victory if you are present and visible during the trial, including jury selections. You should stay alert, display an appropriate demeanor, and prepare for your testimony. Do not appear arrogant or lose control while the opposing expert testifies. You should provide answers to questions consistent with your deposition and attempt to teach jurors regarding the facts of the case as well. Remember to look jurors in the eyes and express sympathy for the patient and their family.

Odds are in your favor

Fortunately, the majority of lawsuits against physicians are dismissed or settled. According to a recent report from the AMA examining 2015 data from the PIAA, 68.2% of all closed claims were dropped, dismissed, or withdrawn. Only 7% of claims were decided by a trial verdict, with 87.5% of these won by the defendants.2

Consequences of a malpractice suit

Many physicians become angry, depressed, and subject to feelings of self-doubt in the wake of a malpractice lawsuit. Symptoms may include sleep problems, fatigue, irritability, or trouble with concentration. Seek counseling and adjust or reduce work hours if appropriate. Many physicians find relief by helping their attorney build the best possible defense case.

If you have settled a malpractice claim or lost at trial, your hospital or insurance company will likely be required to report the result to the National Practitioner Data Bank. Discuss with your defense attorney whether you are required to report the result anywhere else, such as to hospitals where you are credentialed, other insurance companies, or your state medical board.

In conclusion

It is hoped that you will be among the majority of pediatricians who are never sued over the course of your career. Pediatricians would be well advised to make the time and effort to lessen the likelihood of a lawsuit by documenting visits thoroughly, seeking advice from specialists as appropriate, and ordering appropriate diagnostic tests and studies to facilitate diagnosis. Most importantly, establishing a trusting relationship with parents and patients is the best medicine to reduce your likelihood of a malpractice suit. ■

Dr Bondi, is assistant professor, Department of Pediatrics, University of Rochester School of Medicine and Dentistry, Rochester, New York.

Dr Rusher, is clinical associate professor of General Pediatrics, University of North Carolina (UNC)-Chapel Hill School of Medicine, Chapel Hill, North Carolina. 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.

Dr Schuman, section editor for Practice Improvement 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.

For references, go to ContemporaryPediatrics.com/malpractice-lawsuits
Painful acral bullae
CONTINUED FROM PAGE 52

Differential diagnosis for BDD includes contact dermatitis, bullous impetigo, fixed drug eruption, and insect bites. Contact dermatitis also can cause bullous eruptions, although not often as proliferative as the bullae seen in this patient, and does not correlate with leukocytosis or fever. Fixed drug eruptions or unusual reactions to insect bites can present as annular or bullous lesions but are generally not as edematous. Bullous impetigo associated with staphylococcal infections can present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similarly, but vesicles and bullae are usually much smaller and present similar

Patient outcome
The girl’s parents denied any new exposures to chemicals, lotions, or detergents and also denied taking any medications other than cefixime or having a family history of similar rashes.

She was started empirically on intravenous ampicillin for streptococcal and staphylococcal coverage, clindamycin for empiric MRSA coverage, and mupirocin 2% ointment to open lesions. The bullae were sterilely drained and fluid was sent for culture, which revealed Group A beta-hemolytic Streptococcus. Other significant lab values included a leukocytosis of 18,300 WBC/mm³ (neutrophil predominant); elevated CRP of 1.87 mg/dL; and elevated ESR of 26 mm/hr. After drainage of the bullae and completion of a 10-day course of oral cephalexin, the patient’s bullae completely resolved.

The importance of this case as a teaching tool is due to its exuberant presentation of an otherwise classic pediatric skin infection.

REFERENCES

Ms Zhang is a third-year medical student at the University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Dr Song is an attending dermatologist at Kaiser Permanente Orange County, Anaheim Medical Center, Anaheim, California.

Dr Gehris is Chief, Pediatric Dermatology, University of Pittsburgh Medical Center (UPMC) Children’s Hospital of Pittsburgh, and clinical associate professor, Department of Dermatology, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Dr Cohen, section editor for Dermcase, is professor of Pediatrics and of 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. Vignettes are based on real cases that have been modified. Images also may be edited or substituted for teaching purposes.

MORE DERMCASES Go to ContemporaryPediatrics.com and click the “Cases” tab.
Painful, tense acral bullae in a 12-year-old girl

SOPHIA ZHANG, BS, MS3; SILVIA SONG, MD; ROBIN GEHRIS, MD, FAAD, FAAP

A healthy 12-year-old girl presents to the clinic with 2 days of low-grade fever and enlarging, painful, tense bullae on both hands. She had recently been diagnosed with streptococcal pharyngitis and was being treated with oral cefixime.

The case

Patient at follow-up appointment showed remarkable recovery without any active intact blisters after drainage and completion of a 10-day course of oral cephalexin.

Background

Blistering distal dactylitis (BDD) is a rare, localized skin infection first described by Hays and Mullard in 1972 with poorly understood pathogenesis, most commonly caused by Group A beta-hemolytic Streptococcus and less commonly methicillin-sensitive Staphylococcus aureus or methicillin-resistant S aureus (MRSA). It classically targets children aged 2 to 16 years, is rarely seen in adults or infants, and spares the elderly.

Clinical findings

Blistering distal dactylitis presents as tense, seropurulent, fluid-filled bullae on the volar fat pad of the distal phalanx or, rarely, proximal or lateral nail folds. One case of recurrent BDD was reported on the right great toenail associated with an infection caused by an ingrown toenail but, to the authors’ knowledge, no cases of BDD have been reported on the proximal or middle phalanx or so extensively on the dorsal hand, as in this case.

Diagnosis/Management

The initial clinical diagnosis of BDD is best confirmed by bacterial culture. The classic appearance of BDD is characterized as multiple superficial, tense, acral oval bullae 10 mm to 30 mm in diameter with an erythem-
Musings about parents and children

Often we treat a child without considering the parental role, as when we prescribe an antibiotic to be multiple times a day. Other times we do need to consider the parents. Here are my thoughts how parents view, interact with, and advocate for their children in these situations.

1. **There is a difference between doing what is optimal and what is practical.** For example, consider the 4-year-old child with a strep throat who categorically refuses oral medicine, even when disguised. He can be given 1 injection of penicillin G benzathine rather than having the parents struggle to get 10-days’ worth of amoxicillin in him. For any fever, that can be left to run its course rather than wrestling the child to insert acetaminophen suppositories.

2. **I am very fond of parents recording their children when ill.** This is extremely helpful for diagnosing croup, possible seizures, tics, transient rashes, and more.

3. **Being able to access video on a tablet or similar piece of equipment is not nearly as advanced as parents think.** As such, I have to take the parents’ pride into account when discouraging electronic use in young children.

4. **Educational videos/TV are still more entertainment than education.** Hands-on play, books, and imitating others are still the best ways to go to teach children.

5. **Reading to a child from an actual book is better than reading from an e-book** (although the latter is still so much better than not reading at all). There is something different about the parent-child interaction over a real book, which is beneficial.

6. **I tell parents that when they drag themselves to the doctor for a sick visit,** they usually know they have something more serious and are likely to get an antibiotic. They have a much lower threshold for bringing in their child, who is more likely to have a virus and not need the prescription.

7. **If a parent has a treatment he or she wants for his/her child** (eg, myringotomy tubes, vision therapy), I usually know a provider with a low threshold who will be happy to comply, but I will normally only refer to that particular provider if I agree with the treatment proposed.

For reference, go to ContemporaryPediatrics.com/Farber-musings

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**Jon Matthew Farber, MD,** is a pediatrician in Woodbridge, Virginia. 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.

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