PROGRAM BRIEF

Child Health Research Findings

The mission of AHRQ is to improve the quality, safety, efficiency, and effectiveness of health care by:

- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.

Introduction

Children and adolescents are growing and developing, and their health care needs, use of services, and outcomes are very different from those of adults. Furthermore, adolescents have different health care needs than younger children. Thus, specialized research is necessary to improve health care services for children and adolescents.

The Agency for Healthcare Research and Quality is helping to fill the major gap that exists in evidence-based information on health care for children and adolescents. AHRQ-supported projects focused on children and adolescents are helping to provide clinicians and policymakers with the knowledge and tools they need to:

- Improve child health outcomes.
- Enhance the quality and safety of care children receive.
- Address issues related to access, use, and costs.
- Translate evidence-based research into improved clinical practice.

AHRQ's Commitment

Finding ways to improve the quality, safety, and effectiveness of health care for America's 70 million children and adolescents is a continuing priority for

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AHRQ. This program brief summarizes recent findings (2005 through 2008) from selected AHRQ-supported projects focused on health care for children and adolescents.

An asterisk (*) following a summary indicates that reprints of an intramural study or copies of other publications are available from AHRQ. Ordering information appears on page 40 of this program brief, as well as contacts for more information about AHRQ's research programs and funding opportunities. Visit AHRQ's Web site at www.ahrq.gov and click on "Children" to find updates on child health initiatives at AHRQ and information about current projects.

Acute Care/Injuries

In 2006, children and adolescents under age 18 had over 237 million ambulatory health care visits, including 24 million visits to hospital outpatient and emergency departments (EDs). Only 15 percent of visits to physicians' offices were for well-child care, while a high number of visits were for acute care.

Fifty-four percent of visits to hospital EDs by 5- to 14-year-olds are due to injuries, and injuries are the leading cause of death among those 1 to 24 years of age in the United States. AHRQ's research portfolio on acute care and injuries focuses on the effectiveness, quality, safety, and costs of care for children and adolescents.

- *Use of corticosteroids along with antibiotics for children with bacterial meningitis may not improve outcomes.*

Use of corticosteroids with or shortly before the first dose of antibiotics significantly reduces mortality among adults with bacterial meningitis but does not seem to be effective in children with the condition, according to this study. Researchers found no association between adjuvant steroids and children's time to death or hospital discharge. They examined data on 2,780 children (median age of 9 months) with bacterial meningitis cared for in 27 children's hospitals in various States. Mongelluzzo, Mohamad, Have, and Shah, *JAMA* 299(17):2048-2055, 2008 (AHRQ grant HS16946).

- *Blood cultures taken from children show drug resistance to a class of antibiotics usually used for adults.*

Children usually are not given the broad-spectrum antibiotics called fluoroquinolones because they cause joint toxicity. Nevertheless, two common bacteria—*Escherichia coli* and *Klebsiella*—showed fluoroquinolone resistance in 217 blood cultures taken from children at the Children's Hospital of Philadelphia. Eight of the cultures (2.9 percent) were resistant to two common fluoroquinolones, ciproflaxin and levofloxacin. These drugs are commonly used in adults, and ciproflaxin was recently approved for children to treat inhalation anthrax and problematic urinary tract infections. Kim, Lautenbach, Chu, et al., *Am J Infect Control* 36(1):70-73, 2008 (AHRQ grant HS10399).

- *Antimicrobial stewardship program improves antimicrobial use among hospitalized children.*

Use of an antimicrobial stewardship program (ASP)—in which an infectious disease consultant controls use of antimicrobials (antibiotics, antifungals, and antivirals) by hospital staff—can improve the appropriate use of these agents, according to this study. During the 4-month study period, physicians placed 652 calls to the ASP at one children's hospital. Nearly half of the calls required an intervention by the ASP to resolve drug-bug mismatches, minimize unnecessary use of broad spectrum antibiotics, prevent duplicate therapy, and improve dosing. Metjian, Prasad, Kogon, et al., *Pediatr Infect Dis*

J 27(2):106-111, 2008 (AHRQ grant HS10399).

- *Safety and effectiveness of infliximab established for children with severe ulcerative colitis.*

Researchers reviewed the charts of 27 children with ulcerative colitis who were treated with infliximab—a drug that blocks the inflammatory action of the body's tumor necrosis factor-a (TFA)—instead of undergoing surgical removal of all or part of the colon. Infliximab was found it to be a safe and effective therapeutic option for these children. Treatment was successful in 75 percent of acutely ill patients and 27 percent of chronically ill patients. Fanjiang, Russell, and Katz, *J Pediatr Gastroenterol Nutr* 44:312-317, 2007 (AHRQ grant T32 HS00060).

- *Study identifies risk factors for poor outcome in children with catheter-associated bloodstream infections.*

Of the 118 eligible patients (ages 0-9) with catheter-associated bloodstream infections due to *Escherichia coli* and/or *Klebsiella* who were identified from a hospital database, 16 (14 percent) had a poor outcome. Poor outcome was defined as recurrence of infection (eight patients) or death (eight patients). Receiving mechanical ventilation and/or total parenteral nutrition were independently associated with death or recurrence of infection. Catheter removal (64 children) did not affect either infection recurrence or death, but a significant proportion of children with catheter-associated bloodstream infection were treated successfully without catheter removal. Buckley, Coffin, Lautenbach, et al., *Infect Control Hosp Epidemiol* 28(11):1308-1310 (AHRQ grant HS10399).

- *Pediatricians are more likely to identify child abuse if they are more knowledgeable and confident they can manage it.*

A random survey was conducted among a national sample of pediatricians to determine their knowledge, attitudes, and experiences related to child abuse. They were asked their interpretation of the cause of injury to a girl in a deliberately vague vignette. Overall, nearly two-thirds of pediatricians expressed confidence in their ability to identify and manage patients injured by child abuse. Those with positive attitudes about child abuse screening were more likely to identify the vignette case as probable child abuse. Flaherty, Sege Price, et al., *Child Maltreat* 11(4):361-369, 2006 (AHRQ grant HS10746).

- *Some abdominal injuries indicate child abuse in young children.*

Using the National Pediatric Trauma Registry, researchers identified 664 cases of blunt abdominal injury not involving an auto accident in children up to age 4. Child abuse was suspected in 41 percent of cases and in 84 percent of deaths. Liver injury was the most common intra-abdominal injury. The medical diagnosis of child abuse was significantly associated with mortality, malnourishment, young age, traumatic brain injury, hollow viscous (e.g., small bowel) and pancreatic injury, and other intra-abdominal injuries. Trokel, Discala, Terrin, and Sege, *Pediatr Emerg Care 22*(10):700-704, 2006 (AHRQ grant T32 HS00060).

- *Telemedicine appears effective for evaluating acute childhood illnesses.*

Researchers randomly assigned 253 children to in-person evaluation of acute illness by study physicians and 239 children to evaluation by study physicians via telemedicine. Children were seen in a pediatric primary care practice or pediatric emergency department of a university-affiliated medical center. Results were comparable for the two groups: study physicians made a diagnosis in 74.1 percent of telemedicine visits compared with 76.7 percent of in-person visits. McConnochie, Conners, Brayer, et al., *Telemed J E Health* 12(3):308-316, 2006 (AHRQ grant HS10753).

- *Anatomic factors may play an important role in pediatric traumatic brain injury.*

Significant traumatic brain injury (TBI) occurs in 5 to 10 percent of all patients with blunt head trauma. Among emergency department patients who underwent computed tomography (CT) for blunt head trauma at 21 hospital EDs, men, children younger than age 10, and elderly people were most likely to have significant TBI. The researchers note that children have a larger head-to-body ratio that may allow more energy from a traumatic impact to be distributed to the head. Almost half of children under age 10 with TBI have had a skull fracture. Also, certain mechanisms of injury (e.g., child abuse) may increase the risk of TBI. Holmes, Hendey, Oman, et al., *Am J Emerg Med* 24:167-173, 2006 (AHRQ grant HS09699).

- *Certain clinical criteria can identify children with blunt head trauma who do not need a CT scan.*

Seven clinical criteria can be used to identify pediatric victims of blunt head trauma who are at low risk for important intracranial injury (ICI) and thus are unlikely to need a CT scan. The seven factors are: evidence of significant skull fracture, altered level of alertness, neurologic deficit, persistent vomiting, presence of scalp hematoma, abnormal behavior, and blood coagulation problems. Children who do not meet at least one of these criteria are

at low risk for ICI and thus are unlikely to require neurosurgical intervention or suffer significant long-term impairment. Oman, Cooper, Holmes, et al., *Pediatrics* 117(2), 2006; online at www.pediatrics.org (AHRQ grant HS09699).

- *Placing children in a semi-recumbent position provides better images from echocardiography.*

According to this study, placing children in a semi-recumbent position at a 70-degree angle with back support results in better quality images during exercise echocardiography procedures, compared with a 90-degree upright position. In the semi-recumbent posture with back support, children were able to maintain torso stability during cycling to facilitate better quality images in a shorter period of time. Chang, Qi, Larson, et al., *Am J Cardiol* 95:918-921, 2005 (AHRQ grant HS13217).

- *Child abuse is linked with increased risk of death in young children with abdominal injuries.*

Between 1995 and 2001, more than half (61 percent) of traumatic abdominal injuries in young children 0 to 4 years of age resulted from motor vehicle accidents. Other significant causes were child abuse (16 percent) and falls (14 percent). Children who were abused and had abdominal and central nervous system injury were more likely than other children with abdominal trauma to die while in the hospital, according to this analysis of data on 927 cases of blunt abdominal injuries in young children. Trokel, DiScala, Terrin, and Sege, *Child Maltreat* 9(1):111-117, 2004 (AHRQ grant T32 HS00060).

- *Instrument provides reliable information about children with brain injuries.*

Researchers developed and tested a measure of neurologic outcome for use in triage and clinical decisionmaking for children who have suffered traumatic brain injuries. They tested the instrument—the Neurologic Outcome Scale for Infants and Children—in 100 children of varying ages. They found the instrument to be practical and reliable and applicable to infants and children with a broad range of neurologic deficits. Okada, Young, Baren, et al., *Acad Emerg Med* 10(10):1034-1039, 2003 (AHRQ grant F32 HS00091).

Adolescent Health

Researchers are focusing on the distinctive health care needs of adolescents. Recent AHRQ-funded studies have focused on such adolescent prevention topics as screening for sexually transmitted diseases (STDs) and smoking cessation.

- *Peer counseling with added incentives is a cost-effective way to get adolescents to adhere to a TB control program.*

Activation of latent tuberculosis infection is more likely to occur during adolescence due to hormonal changes and altered protein and calcium metabolism associated with adolescent growth. Often, adolescents must be persuaded to complete treatment, since latent TB infection usually is asymptomatic. Researchers found that offering adolescents gifts, money, or outings with friends—combined with peer education counseling—increased their completion of TB treatment programs in a cost-effective way ($209 per quality-adjusted life year). Kominski, Varon, Morisky, et al., *J Adolesc Health* 40:61-68, 2007 (AHRQ grant HS00046).

- *Adolescent females are willing to undergo chlamydial screening during urgent care visits.*

A survey of 365 ethnically diverse adolescents (58 percent female) aged 13-18 revealed that sexually active adolescent and young adult females are willing to be screened for *Chlamydia* during urgent care visits, especially if their clinician can speak their language and clearly explain the meaning of confidentiality. This is important because two-thirds of sexually active adolescents use urgent care visits exclusively for their health care during a given year. Thus, limiting screening to well-care visits will miss the majority of adolescents at risk for chlamydial infection, note the researchers. Miller, Tebb, Williams, et al., *Arch Pediatr Adolesc Med* 161(8):772-782, 2007 (AHRQ grant HS10537).

- *Intervention programs that focus on already violent youth found to be most effective.*

Tertiary intervention programs are more likely to report effectiveness than primary and secondary programs for reducing violent behaviors among adolescents, according to this study. Tertiary programs focus on youths who have already engaged in violent behavior, while primary programs focus on reducing risky behaviors (e.g., substance abuse) and secondary programs focus on at-risk youths (e.g., those living in poor neighborhoods). Overall, nearly half of interventions evaluated were effective; two of six primary interventions, three of seven secondary interventions, and both tertiary interventions were effective. Limbos, Chan, Warf, et al., *Am J Prev Med* 33(1):65-74, 2007 (AHRQ contracts 290-97-0001 and 290-02-0003).

- *Today's teenage smokers are more likely to engage in risky behaviors than their peers in the early 90s.*

Researchers analyzed data from national youth risk behavior surveys from 1991 to 2003 and found that the risk profile of the adolescent smoker has changed. Today's young smokers are more likely to engage in risky sexual behaviors, risky

alcohol-related behaviors, and to not use a seatbelt or bicycle helmet than adolescent smokers in the early 1990s. Camenga, Kelin, and Roy, *J Adolesc Health* 39, 2006, online at http://www.adolescenthealth.org/journal.htm (AHRQ grant HS14418).

- *Quality improvement teams can improve Chlamydia screening among male adolescents.*

Routine screening for *Chlamydia trachomatis* (CT) infection is recommended for sexually active young women aged 15-25 years. Only the American Medical Association recommends routine screening of sexually active male adolescents. This study involved more than 1,000 sexually active male adolescents aged 14 to 18 who were seen in pediatric clinics in the San Francisco Bay area. Those youths seen in clinics that had a quality improvement team were much more likely to be screened for CT infection than those seen in clinics without such a team. Researchers found that 4 percent of those screened had CT infection. Tebb, Pantell, Wibbelsman, et al., *Am J Public Health* 95(10):1806-1810, 2005 (AHRQ grant HS10537).

- *Hospital type and location affect discharge disposition of adolescents hospitalized for suicide attempts.*

Adolescents who are hospitalized after a suicide attempt are more likely to be discharged to a psychiatric, rehabilitation, or chronic care facility if they are hospitalized in a facility that caters to children and/or is located in the Northeast United States. This suggests that factors other than the medical and emotional needs of vulnerable adolescents are driving care. Levine, Schwarz, Argon, et al., *Arch Pediatr Adolesc Med* 159:860-866, 2005 (AHRQ grant HS00002).

- *Two factors predict risk for repeat suicide attempts among youths.*

Two factors predict which youths referred for emergency psychiatric hospitalization because of suicide attempts will try to commit suicide again: more severe clinical depression and caregivers who exert more parental control. This study involved 70 youths aged 10 to 17 who had attempted suicide and their families. Most of the families were economically disadvantaged. Huey, Henggeler, Rowland, et al., *J Clin Child Adolesc Psychol* 34(3):582-589, 2005 (AHRQ grant HS10871).

- *Wisconsin study finds hundreds of hospitalizations for self-poisoning among adolescents.*

The researchers analyzed Wisconsin hospital discharge files for 2000-2002. They focused on medication-related injuries for intention to commit suicide, medications used, discharge status, and risk factors for self-poisoning (such as mental illness and eating disorders). During the 3-year study period, there were nearly 3,000 hospitalizations for medication-related injuries—of which 1,150 involved self-poisoning—among Wisconsin youths 12 to 17 years of age. Marbella, Yang, Guse, et al., *Wis Med J* 104(7):59-64, 2005 (AHRQ grant HS11893).

- *Physician attitudes and other factors affect decisions about use of growth hormone therapy.*

Growth hormone (GH) therapy is usually reserved for the shortest 1.2 percent of U.S. children at about age 10. The height goal is usually average height for a 16-year-old male (68.3 inches) or 14-year-old female (62.6 inches). A GH-deficient youngster who has received GH for several years typically shows gradual tapering of growth beginning in mid-adolescence. Some physicians advocate discontinuing therapy when the potential for continued growth decreases, while others seem to value even small gains as the final height goal approaches. The average cost of GH therapy is $26,000 per year. Cuttler, Silvers, Singh, et al., *Med Care* 43(12):1185-1193, 2005 (AHRQ grant HS00059).

- *Adolescents with special health care needs seldom receive adequate transition from pediatric to adult-oriented care.*

Each year, 750,000 adolescents with special health care needs become adults and must transition to adult-oriented health care. Researchers analyzed data for 4,332 adolescents aged 14 to 17 years and found that about 50 percent of parents had discussed transition issues with their child's doctor. Adolescents with special needs who were older, female, had more complicated needs, and had a high-quality relationship with their doctors were more likely to receive adequate health care transition. Scal and Ireland, *Pediatrics* 115(6):1607-1612, 2005 (AHRQ grant HS15511).

- *Most teens with chlamydial infections get antibiotics but may not receive counseling and other care.*

Researchers reviewed the medical charts of 111 sexually active teens, aged 14 to 19, who tested positive for *Chlamydia trachomatis* in 2001 at five pediatric clinics in California. All but four teens received appropriate antibiotics in a timely fashion, but counseling about high-risk sex, testing for other sexually transmitted diseases, and other services were provided less often. Only 36 percent of the patients were tested for other sexually transmitted diseases, and significantly fewer boys than girls received counseling about safer sex. Hwang, Tebb, Shafer, and Pantell, *Arch Pediatr Adolesc Med* 159:1162-1166, 2005 (AHRQ grant HS10537).

- *Certain practice factors are associated with more frequent screening and counseling of adolescents about risky behaviors.*

In this study, specialized clinician training and charting tools were associated with increases in rates of screening and counseling of adolescents about risky behaviors, such as substance abuse, unsafe sex, and risky vehicle use. Ozer, Adams, Lustig, et al., *Pediatrics* 115(4):960-968, 2005 (AHRQ grant HS11095).

- *Certain factors increase the likelihood of posttraumatic stress disorder (PTSD) in adolescents who suffer a serious injury.*

Researchers surveyed adolescent trauma patients aged 12 to 19 who had been hospitalized following a serious injury to assess their outcomes at various points up to 24 months postdischarge. They found that perceived threat to life and intentional or violence-related injury doubled the likelihood that the youths would experience PTSD. Girls and older adolescents had higher rates of PTSD than boys and younger adolescents, and low socioeconomic status was strongly associated with long-term PTSD. Holbrook, Hoyt, Coimbra, et al., *J Trauma Injury Infect Crit Care* 58:764-771, 2005 (AHRQ grant HS07611).

- *Adolescents underuse primary care and seldom receive counseling about risky behaviors.*

Researchers used data from two surveys (1993-2000) to examine adolescents' use of outpatient care and receipt of preventive counseling. They focused on counseling on three health topics: diet, exercise, and growth/development; and five risk-reduction topics: tobacco use/exposure, skin cancer prevention, injury prevention, family planning/contraception, and prevention of sexually transmitted diseases. Only 39 percent of routine visits included counseling for diet and/or exercise. Counseling for other topics ranged from a low of 3 percent to 20 percent, with skin cancer prevention, HIV/STD transmission, and family planning/contraception ranking the lowest. Ma, Wang, and Stafford, *J Adolesc Health* 36:441e1-441e7, 2005 (AHRQ grant HS11313).

Asthma

Asthma is a chronic inflammatory disease of the airways that affects about 9 percent of all U.S. children. An estimated 400,000 of these children have moderate to severe asthma. It is the most common chronic disease of childhood, and about one-fourth of those affected are less than 5 years of age. In 2006, there were 133,732 hospital stays for asthma among children aged 18 or younger.

Reducing asthma-related illness continues to be a major objective for the U.S. Public Health Service.

- *Children with asthma are prescribed more medications when health plans notify their doctors after a serious episode.*

When managed care programs inform health care providers that a child has had a serious asthma episode, providers tend to take action by writing prescriptions for asthma drugs to prevent future episodes, according to this study. The researchers surveyed 18 Medicaid managed care plans that served 4,498 children with moderate to severe asthma in Tennessee and Washington. Of the 18 plans, 15 provided written feedback to providers on asthma care; 11 plans alerted the provider when a child visited the ED or was hospitalized. Cooper, Ray, Arbogast, et al., *J Pediatr* 152(4):481-488, 2008 (AHRQ grants HS13076, HS10384).

- *Changing the definition of high-risk asthma may help identify those who will need the most care.*

Researchers developed a revised definition of high-risk asthma to better identify youngsters who potentially will need more care for their asthma. They compared the utility of their revised definition with the more commonly used definition from the Healthcare Effectiveness Data and Information Set and found that the revised definition more closely predicted those youngsters aged 11 to 17 who needed more hospitalizations, ED visits, and oral steroid prescriptions and had higher asthma-related medical costs over a 2-year period. Bennett, Lozano, Richardson, et al., *Am J Manag Care* 14(7):450-456, 2008 (AHRQ grant HS13853).

- *Children with asthma who get the flu are more likely than other children to wind up in the hospital.*

Researchers looked at influenza hospitalizations for children aged 6 to 59 months in three counties from October 2000 to September 2004. They found that children with asthma had about four times as many hospitalizations and twice as many outpatient visits when they came down with the flu as children without asthma who got the flu. Although immunization for influenza is recommended for children with asthma, just 27 percent of parents of a child with asthma ensured that their child received the flu vaccine. In contrast, 12 to 15 percent of healthy children treated for flu had been immunized. Miller, Griffin, Edwards, et al., *Pediatrics* 12(1):1-8, 2008 (AHRQ grant HS13833).

- *Data reported by caregivers and administrative data don't always agree on health care use by children with asthma.*

Researchers compared asthma-related hospitalizations, ED visits, use of oral steroids, and outpatient visits as reported by caregiver and administrative data over 2 years. They found disagreement between the two sources of 6.1 percent for hospitalizations, 20.2 percent for ED visits, 34.3 percent for steroid use, and 83.6 percent for outpatient visits. These differences could have a negative effect on perceived quality of care and physician compensation, particularly for physicians operating in a pay-for-performance system. Lee, Fuhlbrigge, Sullivan, et al., *J Asthma* 44:189-194, 2007 (AHRQ grant HS08368).

- *Black children with asthma are more likely than white children to be inadequately treated with controller medications.*

Researchers analyzed 2002 West Virginia Medicaid claims for 300 African-American children to determine demographic and health services use factors that predict inhaled corticosteroid (ICS) use. Approximately 38 percent of the children had a prescription claim for an ICS. Children whose prescription use indicated more severe asthma were more likely to have used an ICS. There was a direct relationship between the number of claims for short-acting medications and oral corticosteroids and the likelihood of a child having a claim for an ICS. The researchers note that barriers to adequate pharmacotherapy for black children with asthma should be considered during care. Smith and Pawar, *J Asthma* 44(5):357-363, 2007 (AHRQ grant HS15390).

- *Hospitalization rates are falling for children with asthma.*

An analysis of data from AHRQ's 2006 Kids' Inpatient Database show that hospitalizations of children principally for asthma fell by almost 60,000 admissions between 1997 and 2006. However, the number of children admitted to the hospital for other conditions who also had asthma rose nearly 70,000 during the same period. Children from poorer communities, poor children with asthma as a coexisting illness, and infants 0-12 months with asthma were much more likely to be admitted to the hospital. See *Hospital Stays Related to Asthma for Children, 2006*, HCUP Statistical Brief 58; online at www.hcup-us.ahrq.gov/reports/statbriefs/sb58.pdf (Intramural).

- *Program improves asthma care in children.*

Researchers examined asthma care and use of care among 490 children enrolled in an asthma disease management program—Easy Breathing II—and found that children with persistent asthma had a 47 percent increase in use of controller medications, a 56 percent reduction in asthma-related outpatient visits, and a 91 percent decrease in ER visits for treatment of asthma. After 5 years, 17 of the 20 private pediatric practices studied are still using Easy Breathing II. Cloutier, Wakefield, Sangeloty-Higgins, et al., *Pediatrics* 118(5):1880-1887, 2006 (AHRQ grant HS11147). See also Joesch, Kim, Kieckhefer, et al., *J Pediatr Health Care* 20(6):374-383, 2006 (AHRQ grant HS13110).

- *Modifications are needed to two algorithms commonly used to identify children with asthma.*

These researchers applied Council of State and Territorial Epidemiologists (CSTE) and Health Plan Employer Data and Information Set (HEDIS) criteria to study 3,905 Medicaid-insured children and 1,458 non-Medicaid-insured children with a confirmed diagnosis of asthma or no asthma using a validated survey instrument. CSTE identified 61 percent of children with probable asthma; HEDIS identified 44 percent of children with persistent asthma. Using modified CSTE and HEDIS algorithms substantially increased sensitivity. The researchers conclude that studies using current CSTE and HEDIS algorithms underestimate asthma prevalence and overestimate asthma severity in children. Wakefield and Cloutier, *Pediatric Pulmonol* 41:962-971, 2006 (AHRQ grant HS11147).

- *Parental use of a computer-based asthma kiosk in the emergency department elicits mixed results.*

Researchers asked parents to use a computer-based kiosk in the hospital ED to enter their child's asthma symptoms, current medications, and unmet care needs. The asthma kiosk printed out a tailored plan of recommended asthma care based on the parental input. The intent was for parents to share the recommendations with their child's ED clinicians. So far, the kiosk has had a small and variable impact on asthma care quality. Physicians' limited use of kiosk-generated asthma care recommendations may explain this disappointing result. Porter, Forbes, Feldman, and Goldmann, *Pediatrics* 117(1), 2006; online at www.pediatrics.org (AHRQ grant HS11660). See also Porter, Kohane, and Goldmann, *JAMIA* 12(3):299-305, 2005 (AHRQ grant HS11660); Porter, Cai, Gribbons, et al., *JAMIA* 11:458-467, 2004 (AHRQ grant K08 HS11660).

- *Enrollment in SCHIP can improve quality of care and access for children with asthma.*

This study of more than 2,600 children with asthma in New York State found that after enrollment, in the State Children's Health Insurance Program (SCHIP) quality of care improved for the children, and asthma-related attacks, medical visits, and hospitalizations declined. Also, the number of children lacking a usual source of care declined from 5 percent to 1 percent. Szilagy, Dick, Klein, et al., *Pediatrics* 117(2):486-496, 2006 (AHRQ grant HS10450).

- *Study uncovers higher rate of asthma among Puerto Rican children compared with other U.S. children.*

Researchers analyzed 1997-2001 data on the prevalence of asthma diagnosis and asthma attacks in a sample of more than 46,500 U.S. children aged 2 to 17. Over one-fourth of Puerto Rican children in the study group were diagnosed with asthma at some point, compared with 16 percent of black children, 13 percent of white children, and 10 percent of Mexican children. Similarly, 12 percent of Puerto Rican children had suffered a recent asthma attack, compared with 7 percent of black children, 6 percent of white children, and 4 percent of Mexican children. Lara, Akinbami, Flores, and Morgenstern, *Pediatrics* 117(1)43-53, 2006 (AHRQ grant HS00008).

- *Interventions that improve pediatric asthma outcomes in clinical trials may not translate to the practice level.*

Education for practice-based peer leaders and the presence of asthma nurse educators improved the use of asthma controller medications and reduced hospital visits for children with asthma who were enrolled in a randomized trial. However, when measured on all patients in the participating practices, these same interventions had no detectable impact on asthma medication use or asthma-related hospital and ER visits. Finkelstein, Lozano, Fuhlbrigge, et al., *Health Services Res* 40(6):1737-1757, 2005 (AHRQ grant HS08368).

- *Having a usual source of care increases wellness visits among children with asthma.*

Researchers analyzed data from the 1996-2000 Medical Expenditure Panel Survey (MEPS) to assess wellness visits, bronchodilator fills/refills, and ER visits of 1,726 children with asthma. Overall 95 percent of children had a usual source of care. Over the course of a year, one in ten children made at least one asthma-related visit to the ER, four in ten had at least one wellness visit, and half (50 percent) filled a rescue bronchodilator prescription. The researchers conclude that children who have a usual source of care are twice as likely as those who do not to have a wellness examination during the year. Kieckhefer, Greek, Joesch, et al., *J Pediatr Health Care* 19(5):285-292, 2005 (AHRQ grant HS13110).

- *Primary care programs that include nurse case managers and physician peer leaders can reduce children's asthma symptoms.*

According to this study, a primary care program that uses nurse case managers to educate children about their asthma and physician peer leaders to educate primary care practitioners about asthma treatment guidelines can reduce children's asthma symptoms. Children who were in the program had an average of two additional symptom-free weeks per year. The study involved 638 children aged 3 to 17 with mild to moderate persistent asthma. The annual costs of asthma care were $1,292 for intervention patients and $385 for patients who received usual asthma care. Sullivan, Lee, Blough, et al., *Arch Pediatr Adolesc Med* 159:428-434, 2005 (AHRQ grant HS08368). See also, Homer, Forbes, Horvitz, et al., *Arch Pediatr Adolesc Med* 159:464-460, 2005 (AHRQ grant HS10411).

- *Ethnicity, environmental factors, and reduced pulmonary function can predict asthma severity in children.*

Black or Puerto Rican ethnicity, sensitization to cockroach allergens, and spirometry tests showing reduced pulmonary function greatly increased the likelihood of severe asthma in children aged 4 to 18 who were enrolled in an asthma care program in Hartford, CT. This is the first study to show an association between asthma severity and both Puerto Rican ethnicity and decreased forced expiratory volume. Ramsey, Celedon, Sredl, et al., *Pediatr Pulmonol* 39:268-275, 2005 (AHRQ grant HS11147).

Chronic Illness

Approximately 20 million children suffer from at least one chronic health condition. About 17 percent of U.S. children have some type of developmental disorder, and 21 percent have a diagnosable mental or addictive disorder with a least minimum impairment.

Of the 200 chronic conditions and disabilities that affect young people, AHRQ's current research focuses most predominantly on diabetes, cancer, cerebral palsy, respiratory problems, and traumatic brain injury. For a description of projects and findings on other chronic illnesses, see the sections on asthma and mental health in this program brief.

- *Most parents of hospitalized children with chronic illnesses rate their child's inpatient care as excellent or very good.*

Researchers surveyed 12,562 parents of children receiving care at 39 hospitals from 1997 through 1999, to gather information about coordination of care, physical comfort, confidence and trust, care continuity, and other aspects of care. They found that even though 51 percent of parents reported that their child had a chronic health problem, most of the parents rated their child's inpatient care as excellent (47 percent) or very good (32 percent). Parents of children in fair or poor health with nonchronic conditions reported the lowest quality of care. Mack, Co, Goldmann, et al., *Arch Pediatr Adolesc Med* 161(9):828-834, 2007 (AHRQ grant T32 HS00063).

- *Benefits of antibiotics to prevent children's recurrent urinary tract infections are unclear.*

Children with vesicoureteral reflux (VUR; urine flows backwards from the bladder to the kidneys) usually take daily antibiotics to prevent recurrent urinary tract infections (UTIs), according to guidance from the American Academy of Pediatrics. However, recent clinical trials have not shown a protective effect of this approach, and there is concern about the potential for breeding antibiotic-resistant bacteria. These researchers studied children ages 6 and under in a network of 27 clinical settings in three States. Of the nearly 75,000 children studied, 611 had a first UTI, and 83 had a recurrent UTI during the study. Prophylactic use of antibiotics was not associated with decreased risk of recurrent UTI but was associated with increased risk of antibiotic resistance among children in this study. Conway, Cnaan, Zaoutis, et al., *JAMA* 298(2):179-186, 2007 (AHRQ grant HS10399).

- *Treatment of children with Crohn's disease varies widely.*

Clinicians vary in their care for children with Crohn's disease (CD)—a chronic inflammatory bowel disease—mostly because there are few clinical guidelines and many treatments. These variations in care can result in differences in health care costs, quality, and outcomes, according to these researchers. They reviewed data on drugs given to 311 children newly diagnosed with CD at 10 U.S. and Canadian gastroenterology centers from January 2002 to August 2005 and found that physicians used several types of drugs to reduce children's symptoms. The drugs that offer the most benefit (immunomodulators) also carry the greatest risk, which may explain the variation in treatment. Other drugs used included steroids, antibiotics, anti-inflammatory medications, and an antibody that reduces inflammation. Kappelman, Bousvaros, Hyams, et al., *Inflamm Bowel Dis* 13(7):890-895, 2007 (AHRQ grant T32 HS00063).

- *Chronic care model does not improve safety practices among caregivers of young children in a primary care practice.*

Researchers examined the effectiveness of a chronic care model (CCM) approach to injury prevention among caregivers of children aged 0-5 in primary care settings compared with standard anticipatory guidance. Six months later, there was no difference between the two groups in the number of medically attended injuries. Sangvai, Cipriani, Colborn, and Wald, *Clin Pediatr* 46(3):228-235, 2007 (AHRQ grant HS13523).

- *A certain skin condition may identify young patients at risk for type 2 diabetes.*

Children and young adults who develop a skin condition called acanthosis nigricans (AN) have double the risk of having type 2 diabetes as other children, even after controlling for diabetes risk factors, age, and body mass index. The presence of AN can alert physicians to high-risk youngsters who may need diabetes counseling, note the researchers. They analyzed diabetes risk factors and prevalence of AN among children and adults aged 7 to 39 years, who were cared for at clinics in a Southwester primary care practice-based research network. Kong, Williams, Smith, et al., *Ann Fam Med* 5(3):202-208, 2007 (AHRQ grant HS13496).

- *Young people with congenital heart disease are hospitalized less often as they get older.*

Between 18 and 23 years of age, many young people with congenital heart disease (CHD) lose public or parental health insurance and will struggle to obtain comprehensive coverage because of their preexisting condition. During this transition period, twice as many CHD patients aged 21 to 23 years are admitted to the hospital via the emergency room compared with those 15 to 17 years of age. Perhaps because most specialists in CHD are located at children's hospitals, older patients end up diversifying to general adult cardiologists and hospitals that have less experience with CHD, which may affect their outcomes. Gurvitz, Inkelas, Lee, et al., *J Am Coll Cardiol* 49(8):875-882, 2007 (AHRQ grant T32 HS00046).

- *Parents of children with cancer need better information about their child's long-term prognosis.*

Researchers compared parental and physician expectations for the likelihood of a cure and functional outcomes for children with cancer. They found that the majority of parents (61 percent) were more optimistic than physicians about the likelihood of a cure. On the other hand, parents were more pessimistic than physicians about the impact of cancer treatment on physical and cognitive functioning. They conclude that physicians need to be specific about the probability of a cure, as well as the possibility of long-term cancer- and treatment-related limitations. Mack, Cook, Wolfe, et al., *J Clin Oncol* 25(11):1357-1362, 2007 (AHRQ grant T32 HS00063).

- *Children with cerebral palsy who undergo surgery are at increased risk of complications and poor outcomes.*

According to this study, 5,614 surgeries were performed in children with cerebral palsy in 1997 to manage the nutritional, gastrointestinal, and orthopedic complications of the disease. The most common surgeries performed were gastrostomy tube placement, soft tissue musculoskeletal procedures, anti-reflux surgery, spinal fusion, and bony hip surgery. Together, these five procedures accounted for nearly 50,000 hospital days and more than $150 million in hospital charges. Spine surgery resulted in the largest difference between children with and without CP in hospital length of stay, charges, mortality, and complication rates. Murphy, Hoff, Jorgensen, et al., *Pediatric Rehabil* 9(3):293-300, 2006 (AHRQ grant HS11826).

- *Shortage of pediatric rheumatologists limits residency training in this area for general pediatricians.*

Less than one-fifth of pediatricians feel adequately trained to diagnose and treat juvenile rheumatoid arthritis, and 42 percent of them refer these children to pediatric rheumatologists. However, there is a shortage of pediatric rheumatologists, limiting both specialized care for affected children and medical education. More than 40 percent of medical directors of 127 pediatric residency programs in the United States reported that they did not have a pediatric rheumatologist on site. Mayer, Brogan, and Sandborg, *Arthritis Rheum* 55(6):836-842, 2006 (AHRQ grant HS13309).

- *Children with type 1 diabetes can safely use the continuous subcutaneous glucose monitoring system to monitor their blood glucose levels.*

The accuracy and reliability of the continuous glucose monitoring system (CGMS) have been established in adults. According to this study involving 27 patients (18 intervention and 9 control patients), it is also safe for use by children with type 1 (insulin-dependent or juvenile) diabetes. The CGMS is a tiny device that is inserted just under the skin of the abdomen where it measures levels of blood glucose every 10 seconds and sends information every 5 minutes to a device worn on a belt or the waistband of a garment. Information is transmitted to the doctor's office every 3 days so the diabetes management plan can be adjusted. Children in this study who used the CGMS had significantly lower blood glucose levels after 6 months, compared with children in the control group. Lagarde, Barrows, Davenport, et al., *Pediatr Diabetes* 7:159-164, 2006 (AHRQ HS10397).

- *Long-term outpatient use of central venous catheters in children with bone infections often results in complications.*

Children who are diagnosed with acute hematogenous osteomyelitis (AHO), bone infection, usually receive several days of IV antibiotic treatment in the hospital, followed by placement of a central venous catheter in a vein that leads directly to the heart for 4 to 6

weeks of IV antibiotic therapy at home. In this study, 41 percent of children who received more than 2 weeks of IV treatment at home had one or more central venous catheter-associated complications. Many of these complications were serious enough to warrant a visit to the emergency department or readmission to the hospital. Twenty-three percent of the children had a catheter-related malfunction or displacement, 11 percent had a catheter-associated bloodstream infection, and 5 percent had a local skin infection at the site of catheter insertion. Ruebner, Keren, Coffin, et al., *Pediatrics* 117(4):1210-1215, 2006 (AHRQ grant HS10399).

- *Diabetes screening practices vary widely among pediatricians.*

The American Diabetes Association (ADA) recommends screening of children at moderate or high risk of type 2 diabetes, but this study found that only one-fifth of clinicians follow the ADA recommendation. Screening practices varied widely among pediatricians responding to this survey. When presented with three hypothetical vignettes of pediatric patients with low, moderately high, and high risk for type 2 diabetes, 21 percent adhered to the ADA recommendations, 35 percent screened only children at high risk, and 39 percent screened children at all risk levels (low, moderate, and high). Rhodes, Finkelstein, Marshall, et al., *Ambulatory Pediatr* 6(2):110-114, 2006 (AHRQ grant T32 HS00063).

- *Use of stimulants to treat ADHD has leveled off in recent years.*

Stimulants, such as methylphenidate (Ritalin) and amphetamines, are commonly prescribed to treat children with attention deficit hyperactivity disorder (ADHD). Use of these medications increased four-fold from 1987 (0.6 percent) to 1996 (2.4 percent) among U.S. children aged 18 and younger, but this trend seems to have abated. According to this study, the prevalence in use of stimulants among children aged 18 or younger was 2.7 percent in 1997 and 2.9 percent in 2002, with no statistically significant change during these 6 years. Use was highest among children aged 6-12 (4.8 percent in 2002), compared with 3.2 percent among those aged 13-19, and 0.3 percent for children younger than age 6. Zuvekas, Vitiello, and Norquist, *Am J Psychiatr1*63:579-585, 2006 (AHRQ Publication No. 06-R063)* (Intramural).

- *Study reveals racial disparities in receipt of vision care among children with special health care needs.*

Nearly 6 percent of U.S. children with special health care needs (CSHCN) do not receive needed eyeglasses or other vision care. Black, Latino, and multiracial CSHCN are two to three times as likely to have an unmet need for vision care as white CSHCN, according to this study. These disparities persisted after controlling for differences in health status and other child and family characteristics such as insurance and income. Special needs children whose usual care provider was a generalist physician, nurse practitioner, or physician assistant were more likely to have an unmet need for vision care than children who saw a pediatrician for usual care. Heslin, Casey, Shaheen, et al., *Arch Ophthal* 124:895-902, 2006 (AHRQ grant HS14022).

- *Making treatment decisions for children with cancer is difficult for physicians and families.*

Pediatric cancer care usually involves difficult and emotionally troubling decisions for physicians and families. These researchers examined the decisionmaking process from the time a child is first diagnosed, during treatment, when there is a relapse, and when death is inevitable. Popular ethical theory holds that the family should make the decisions, but sometimes the physician takes the lead. Because cure is the ultimate goal, the physician is in a better position to assume decisional priority when a cure is possible or when there is one best medical choice. On the other hand, when there are two or more clinically reasonable choices, the family is better positioned to take the lead. Whitney, Ethier, Fruge, et al., *J Clin Oncol* 24(1):1690-1695, 2006 (AHRQ grant HS11289).

- *Children living in public housing are at increased risk for chronic health problems.*

Black and Hispanic children living in public housing are two to four times as likely as children in the general population to suffer from chronic physical and mental problems, according to this study. The top five chronic conditions reported by parents for one or more children in their households were: asthma (32 percent), vision problems (24 percent), ADHD (17 percent), dental problems (16 percent), and depression (8 percent). Bazargan, Calderon, Heslin, et al., *Ethn Dis* 15(suppl 5):3-9, 2005 (AHRQ grant HS14022).

- *Children with diabetes who need surgery must be carefully managed to prevent serious complications.*

Surgery can cause life-threatening complications for children who have diabetes, and they must be carefully managed prior to surgery to ensure their diabetes is under control. Elective surgery should be postponed until metabolic control is acceptable. These authors describe a surgery management protocol for managing pediatric patients with diabetes. Rhodes, Ferrari, and Wolfsdorf, *Anesth Analg* 101:986-999, 2005 (AHRQ grant T32 HS00063).

- *Low-dose insulin does not affect weight or development of children at risk for type 1 diabetes.*

The researchers compared differences in weight change, body mass index (BMI), and physical development between two groups of children and adolescents aged 4 to 19 who had more than a 50 percent risk of developing type 1 diabetes within 5 years. One group (55 children) received injections of low-dose insulin twice daily and an annual intravenous insulin infusion. Children in the other group (n = 45) were closely monitored but did not receive either insulin or placebo. The researchers found no differences over 2 years between the two groups for changes in weight, height, BMI, or stage of growth and development. Rhodes, Wolfsdorf, Cuthbertson, et al., *Diabetes Care* 28(8):1948-1953, 2005 (AHRQ grant T32 HS00063).

- *Newer HIV therapies have led to a marked decrease in illness and death among HIV-infected children.*

Children who receive highly active antiretroviral therapy (HAART) are less likely than adults to achieve HIV suppression, and HIV tends to progress more rapidly among children. Unlike adults who take HAART, most children are unable to reduce their viral load below detectable levels. Nevertheless, this study of 263 HIV-infected children receiving HAART found that the majority had near-normal CD4 counts, an indicator of good immune system function. Rutstein, Gebo, Flynn, et al., *Med Care* 43(9 suppl):15-22, 2005 (AHRQ-supported HIV Research Network).

- *Researchers find an overall drop between 1991-1992 and 2000-2001 in pediatric HIV care.*

This study revealed lower hospitalization rates and similar use of outpatient care among HIV-infected children in 2000-2001 compared with the pre-HAART era. This drop in care use can be attributed in part to the use of newer antiretroviral therapies, but it also corresponds with the general aging of the pediatric HIV-infected population, according to the researchers. In 1991-1992, 6 percent of pediatric patients were younger than 12 months, with no child older than 12 years. In 2000-2001, the children ranged from birth to 17 years, and less than 7 percent of children were younger than age 2. Rutstein, Gebo, Siberry, et al., *Med Care* 43(9):31-39, 2005 (AHRQ-supported HIV Research Network).

Costs, Use, and Access to Care

AHRQ's research indicates that 6 million U.S. children ages birth to 17 were uninsured all year in 2006. Obtaining adequate access to care and maintaining a usual source of care are special challenges for these young people and their families. There also are significant racial and ethnic differences in children's access to health care that cannot be explained by insurance and socioeconomic factors alone.

- *Access to care may be compromised for low-income children affected by hunger and unstable housing.*

Researchers examined data on 12,746 children living in households with incomes less than 200 percent of the Federal poverty line (less than $40,000 for a family of four in 2006). They found that nearly 30 percent of the children suffered from housing instability (inability of family to pay mortgage or rent and utility bills) and 39 percent from food insecurity (worry about running out of food and not having money to buy more, having reduced portions, and/or skipping meals). Nearly 12 percent of children with housing instability had no usual source of care, and 36 percent had used the ED for routine care. Food insecurity was independently associated with postponed medical care and prescriptions. Ma, Gee, and Kushel, *Ambul Pediatr* 8(3):50-57, 2008 (AHRQ grant HS11415).

- *More than 2 million children with insured parents are uninsured.*

According to this study, some 2.3 million children a year, mostly from low- to moderate-income families, have no health care coverage to pay for preventive or other health care needs, even though at least one of their parents is insured. These children account for one-fourth of the estimated 9 million children in the United States who currently are uninsured. DeVoe, Tillotson, and Wallace, *JAMA* 300(10):1904-1913, 2008 (AHRQ grant HS16181).

- *Racial/ethnic differences exist in children's health insurance coverage.*

Researchers used Medical Expenditure Panel Survey data to examine variations in health insurance coverage among children from different racial/ethnic groups. They found that certain characteristics—such as poverty, parent education level, family structure, and immigration-related factors—accounted for 70 percent or more of the coverage differences among white, black, and Hispanic children. Pylypchuk and Selden, J Health Econ 27(4):1109-1128, 2008 (AHRQ Publication No. 08-R068)* (Intramural).

- *Gaps in children's health insurance often result in unmet health care needs.*

Researchers analyzed survey results from 2,681 families with children enrolled in Oregon's food stamp program at the end of January 2005 and found that one-fourth of the children had coverage gaps during the 12 months preceding the survey. The gaps were less than 6 months (17.5 percent), 6 to 12 months (1.5 percent), and more than 12

months (3.1 percent); nearly 4 percent of the children never had health insurance. Study results showed that the longer the insurance gap, the higher the chance of a child having an unmet need for care, including medical or dental care, prescriptions, not having a regular provider, and delays in urgent care. DeVoe, Graham, Krois, et al., *Ambul Pediatr* 8(2):129-134, 2008 (AHRQ grants HS14645, HS16181).

- *Gap between charges and payments for ED pediatric visits has widened.*

This study found that payments for pediatric ED visits that did not result in hospitalization did not keep pace with charges between 1996 and 2003, falling from 63 percent to 48 percent of charges during that time period. This decline occurred in all payer groups, including public (Medicaid, SCHIP), private, and uninsured. For all years, Medicaid/SCHIP had the lowest reimbursement rates, declining to 35 percent of charges in 2003. Pediatric visits accounted for one in every four ED visits; 54 percent of children's ED visits were privately insured, 33 percent were covered by Medicaid/SCHIP, and 12 percent were uninsured. Hsia, MacIsaac, Palmer, and Baker, *Acad Emerg Med* 15:347-354, 2008 (AHRQ grant HS13920).

- *Health insurance coverage varies substantially among children of different racial/ethnic groups.*

Researchers examined 2004-2005 Medical Expenditure Panel Survey data to learn how much a given characteristic contributes to coverage differences among children. They found observable characteristics such as poverty, parent educational level, family structure (for black children), and immigration-related factors (for Hispanic children) account for 70 percent or more of the coverage differences among white, black, and Hispanic children. The most important immigration-related factor for Hispanic children was the disproportionate prevalence of native-born children with noncitizen parents. These results suggest that lower coverage rates among minority children are due to the fact that uninsurance is concentrated among poor children who happen to be minorities. Pylypchuk and Selden, *J Health Econ* 27(4):1109-1128, 2008 (AHRQ Publication No. 08-R068)* (Intramural).

- *Minority children are much less likely than white children to receive specialized therapies.*

Researchers used Medical Expenditure Panel Survey data to examine therapy use for children and found that 3.8 percent of children who are age 18 or younger obtain specialized therapies from the health care system, including physical, occupational, and speech therapy or home health services. Children most likely to use specialized therapies tended to be males (60 percent), white children (81 percent), and children with a chronic condition (39 percent). Kuhlthau, Hill, Fluet, et al., *Dev Neurorehabil* 11(2):115-123, 2008 (AHRQ grant HS13757).

- *Costs and use of care are higher for children in families with intimate partner violence.*

According to this study, children of women who are or have been abused by their partners seek more mental and other health care than children of mothers who aren't abused. Researchers compared health care use and costs of 760 children of mothers with no history of abuse and 631 children of mothers with a history of abuse over an 11-year period. Health care use and costs were significantly greater for mental health services, primary care visits and costs (15 percent higher), and laboratory costs for children of abused mothers than for other children. Rivara, Anderson, Fishman, et al., *Pediatrics* 120:1270-1277, 2007 (AHRQ grant HS10909).

- *Children with private insurance have better access to specialty care than other children.*

Researchers reviewed 30 studies on the relationship between access to specialty care and insurance coverage and found that children with private insurance have better access to such care than those who have public coverage or no insurance. Although children insured by Medicaid or SCHIP have better access to specialty care than uninsured children, their access to specialists is worse and their specialists are less likely to be board-certified compared with privately insured children. Skinner and Mayer, *BMC Health Serv Res* 7, 2007; online at www.biomedcentral.com (AHRQ grant T32 HS00032).

- *Concerns about SCHIP expansions crowding out private insurance are not borne out in New York.*

Concern that middle-class families might be using SCHIP when they could have private insurance for their children was a major point of contention in Federal SCHIP reauthorization. However, this study of New York State SCHIP families showed that crowd-out of private insurance due to expanded SCHIP eligibility is rare (7.1 percent of 2,644 new SCHIP enrollees). More than 60 percent of the new enrollees had been uninsured for a year or more, and a third had never had any insurance before SCHIP. Shone, Lantz, Dick, et al., *Health Serv Res* 43(1, Part II):419-434, 2008 (AHRQ grant HS10450).

- *Hospital costs for preterm and low birthweight infants are very high.*

According to hospital discharge data from the 2001 Nationwide Inpatient Sample, 8 percent of infants were born premature or low birthweight that year. Their hospital stays accounted for nearly half (47 percent) of infant

hospitalization costs in 2001. The true costs of caring for these vulnerable infants are actually higher because the study data did not account for physician fees, rehabilitation, outpatient expenses, and the mother's hospital costs. Russell, Green, Steiner, et al., *Pediatrics* 120, 2007; online at www.pediatrics.org (AHRQ Publication No. 07-R066)* (Intramural).

- *Access to care improves for adolescents following SCHIP enrollment.*

Researchers interviewed adolescents who were new SCHIP enrollees and their parents shortly after enrollment and 1 year later. Enrollment in SCHIP was associated with greater access to a usual source of care; increased use of preventive care, specialty care, and prescription medicines; and fewer unmet care needs. SCHIP also seemed to eliminate previous racial disparities in care access. The researchers note that there is still room for improvement, as 40 percent of adolescents reported that there were still some unmet health care needs even after SCHIP enrollment. Klein, Shone, Szilagyi, et al., *Pediatrics* 119(4), 2007; online at www.pediatrics.org (AHRQ grant HS10450).

- *Despite increases in SCHIP enrollment, over 5 million eligible children remain uninsured.*

Since expansion of SCHIP enrollment criteria in 2001, the number of uninsured U.S. children has significantly decreased. Yet 5.5 million children who are eligible for SCHIP remain uninsured, according to this study. The authors examine how various expansions and cuts in SCHIP would affect the eligibility and overage of the Nation's children. They note that eligible but uninsured children are among the Nation's most disadvantaged, are disproportionately minority, and are more likely than average to live with a single parent or no parent. Hudson and Selden, *Health Aff* 26(5), 2007; online at www.healthaffairs.org (AHRQ Publication No. 07-R078)* (Intramural).

- *Many underinsured children are not getting needed vaccines due to current U.S vaccine financing system.*

Newly recommended vaccines for children and adolescents have nearly doubled in the past 5 years, boosting the cost to fully vaccinate a child in the public sector from $155 in 1995 to $1,170 in 2007. Childhood vaccines in the United States are financed by a patchwork of public and private sources, resulting in many underinsured children being unable to receive publicly purchased vaccines in either private practices or public health clinics, according to this study. The researchers conducted a national survey of State immunization program managers in 2006 and found that only 34 percent of States had a health insurance mandate requiring insurers to cover currently recommended vaccines for children and adolescents. Lee, Santoli, Hannan, et al., *JAMA* 298(6):638-643, 2007 (AHRQ grant HS13908).

- *Caregivers of children with special health care needs say Medicaid provides better care access than traditional plans.*

Caregivers of children with special health care needs in Washington, DC, rated a partially capitated Medicaid managed care plan better than a traditional fee-for-service (FFS) plan in providing these children with access to care. Case management and care coordination services of the Medicaid plan probably account for its higher ratings, according to the researchers. Each special needs child enrolled in the plan was assigned a case manager, who scheduled appointments, arranged for transportation, and facilitated the services the child received from primary care doctors, specialists, and the public school system. Also, the Medicaid plan reimbursed pediatricians and specialists at twice the rate of the FFS plan. Mitchell and Gaskin, *Med Care* 45(2):146-153, 2007 (AHRQ grant HS10912).

- *Children sometimes must travel great distances to see a subspecialist.*

Although most U.S. children live within an hour's drive of a pediatric subspecialist, such care is less widely available in certain regions and for certain subspecialties. According to this study, the average distance to a subspecialist ranged from 15 miles for neonatology to 78 miles for pediatric sports medicine. Fewer than one-half of hospital referral regions had a provider for 7 of 16 pediatric subspecialties, suggesting that the supply of pediatric subspecialties is inadequate, pediatric subspecialists are distributed inequitably, or the market for pediatric subspecialists exceeds the hospital referral regions. Mayer, *Pediatrics* 118(6):2313-2321, 2006 (AHRQ grant HS13309).

- *Children with special health care needs benefit from Medicaid managed care programs.*

According to this study, children with special health care needs who have disabilities and are enrolled in Medicaid programs that have a managed care option, including case management services, have better access to care and receipt of occupational and physical therapy at school, compared with those in Medicaid fee-for-service (FFS) plans. The researchers evaluated use of speech, occupational, and physical therapy by children with special health care needs who were enrolled in the managed care or FFS plans of the District of Columbia Medicaid program that serviced only children with disabilities. Schuster, Mitchell, and Gaskin, *Health*

Care Financ Rev 28(4):109-123, 2007 (AHRQ grant HS10912).

- *Children with special health care needs report improved health care after SCHIP enrollment.*

Researchers compared access to care and quality of care 1 year before and 1 year after enrollment in SCHIP for children with special health care needs. Based on parental report, 17 percent of 2,290 children enrolled in New York's SCHIP in 2001-2002 had special health care needs. SCHIP enrollment was generally associated with improved access to care, better continuity of care, and fewer unmet care needs. Szilagyi, Shone, Klein, et al., *Ambulatory Pediatr* 7(1):10-17, 2007 (AHRQ grant HS10450).

- *Many adolescents newly enrolled in SCHIP have "catch up" health care needs.*

According to this study, nearly 75 percent of adolescents in Florida and New York who were new SCHIP enrollees had been without health insurance the previous year. One in five had at least one serious illness or disability, with impoverished minority youth most at risk for health problems. The quality of care received prior to SCHIP enrollment was suboptimal, and States may need to enhance outreach to older adolescents and design programs and benefits to meet their substantial health care needs, according to the researchers. Klein, Shenkman, Brach, et al., *J Health Care Poor Underserved* 17:789-807, 2006 (AHRQ Publication No. 07-R032)* (Intramural).

- *Researchers use a county-level measure of urban influence to examine children's health care use, expenditures, coverage, and quality of care.*

This analysis of data from the 2002 Medical Expenditure Panel Survey and 2002 Nationwide Sample and State Inpatient Databases found that greater percentages of children in large metropolitan (metro) counties were Hispanic or black, compared with children in small metro and large and small rural counties. Small rural areas had a greater percentage of children in fair or poor health, and they were more likely to have a hospital stay and emergency department use than children in large metro areas. Children in large metro counties had longer average hospital stays and higher hospital charges per day, compared with all other children. Chevarley, Owens, Zodet, et al., *Ambulatory Pediatr* 6(5):241-264, 2006 (AHRQ Publication No. 06-R079)* (Intramural). See also Dougherty, Simpson, and McCormick, *Ambulatory Pediatr* 6(5):265-267, 2006 (AHRQ Publication No. 06-R080)* (Intramural).

- *SCHIP programs increase access to care for previously uninsured children.*

A study of children in Georgia and Alabama who were either uninsured or lost Medicaid eligibility increased their use of office visits and well-child care once they were enrolled in SCHIP. Children in SCHIP programs that used a primary care case management system used more well-child care and less emergency care, while children in SCHIP programs that had a fee-for-service structure used more specialty care. Other factors also affected use of care, including personal characteristics (e.g., race, sex, age), community-level poverty, and health care provider proximity. Bronstein, Adams, and Florence, *Health Care Financ Rev* 27(4):44-51, 2006 (AHRQ grant HS10435).

- *Medical injuries among children result in longer hospital stays and higher charges.*

This study found that 3.4 percent of children hospitalized between 2000 and 2002 in Wisconsin suffered a medical injury while in the hospital. These injuries were due to problems with medications, procedures, and medical devices. Injured children had a longer hospital stay (0.5 day) and higher charges ($1,614) than children who were not injured. The study involved more than 318,000 children admitted to 1 of 134 Wisconsin hospitals between 2000 and 2002. Meurer, Yang, Guse, et al., *Quality Safety Health Care* 15:202-207, 2006 (AHRQ grant HS11893).

- *Immunocompromised children who acquire fungal infections have higher costs, longer hospital stays, and an elevated risk of death.*

Some children's immune systems are compromised by diseases such as cancer or treatments such as bone marrow transplantation. During 2000, 0.5 percent of hospitalized immunocompromised children developed invasive aspergillosis (IA), the most common fungal infection to strike immunocompromised children. Nearly one in five (18 percent) of the children died in the hospital; children with cancer and IA had a 13.5 percent higher risk of dying in the hospital than children who had cancer but were not infected with IA. Median length of stay was over five times as long for immunocompromised children with IA (16 days) as for children who were not infected with IA (3 days), and their total hospital charges were also five times as high ($49,309 vs. $9,035). Zaoutis, Heydon, Chu, et al., *Pediatrics* 117:711-716, 2006 (AHRQ grant HS10399).

- *Uninsured children's access to care is affected by the availability and capacity of the local safety net.*

Researchers examined data on a nationally representative sample of more than 2,600 children aged 2 to 17 who were uninsured for at least 1 year during

1996 to 2000. They found that 60 percent of uninsured children did not visit a physician's office during the year, and more than half had no care from a provider of any type in an office-based setting. Uninsured children in rural areas were more likely to make physician visits if they lived closer to a safety net provider or in an area with a larger supply of primary care physicians. Although proximity to safety net providers was not found to be a determinant of access to care among uninsured urban children, the researchers caution that other factors affecting accessibility to care (e.g., availability of public transportation, ER crowding) were not measured and may influence the services that urban uninsured children receive. Gresenz, Rogowski, and Escarce, *Pediatrics* 117:509-517, 2006 (AHRQ grant HS10770).

- *Non-English-speaking parents report better care and access for their children when interpreters are present during doctor visits.*

Hispanic and Asian/Pacific Islander parents who always use an interpreter when their child has an outpatient medical visit report enhanced care access and quality, compared with parents who don't always use interpreters. They also report better service from their health plan when compared with parents who do not use interpreters. Morales, Elliott, Weech-Maldonado, and Hays, *Med Care Res Rev* 63(1):110-128, 2006 (AHRQ grant HS09204).

- *Having health insurance coverage greatly increases children's access to care and use of services.*

Researchers pooled 1996-2002 data from the Medical Expenditure Panel Survey (MEPS) to estimate the impact of insurance coverage on children's access to and use of care. Like other researchers, they found that public and private coverage were both associated with large increases in care access and use. The large differences between public and private coverage were reduced (and often reversed) when the researchers accounted for other characteristics of children and their families that could affect health care access and use. Selden and Hudson, *Medical Care* 44(5 Suppl):19-26, 2006 (AHRQ Publication No. OM-06-0074, for single copies of the journal)* (Intramural).

- *Medicaid primary care case management reduces children's access to primary and preventive care.*

Primary care case management (PCCM) programs reimburse providers on a fee-for-service basis. However, they assign Medicaid patients to gatekeeper providers who must make specific referrals for specialty, emergency, and inpatient care. This arrangement resulted in disruptions in established patterns of care use in Alabama and Georgia and had an unexpected negative effect on children, especially minority children, according to this study. PCCM was associated with lower use of primary care for all children (except for white children) in urban Georgia and reduced preventive care for white children in urban Alabama and for black and white children in urban Georgia. Implementation of PCCM without fee increases may affect provider decisions about Medicaid participation and ultimately may reduce provider availability, note the researchers. Adams, Bronstein, and Florence, *Med Care Res Rev* 63(1):58-87, 2006 (AHRQ grant HS10435).

- *Nearly one-quarter of Latino children living in the United States lack health insurance.*

Despite State Medicaid programs for the poor and the State Children's Health Insurance Program (SCHIP), more than 8 million U.S. children are uninsured. Latino children, in particular, are likely to be uninsured. This study found that nearly one-quarter (3 million) Latino

children lack health insurance. Even in States where all low-income children are eligible for health insurance, current SCHIP and Medicaid outreach and enrollment efforts are not reaching many uninsured Latino children. Major obstacles to enrollment of these children include lack of knowledge about the application process and eligibility, language barriers, family mobility, and misinformation from insurance representatives. Flores, Abreu, Brown, and Tomany-Korman, *Ambulatory Pediatr* 5(6):332-340, 2005 (AHRQ grant HS11305).

- *Researchers examine factors that affect children's primary care experiences.*

This study found that having a regular provider and obtaining needed care have a greater impact on children's primary care experiences than having health insurance. After accounting for other factors that affect the primary care experience—such as the parent's language and the mother's education level—gaining or losing insurance during the 1-year study period did not have a significant effect on primary care experiences. Gaining a regular physician also did not have a significant effect on primary care experiences, but losing a regular physician was associated with much lower parental satisfaction scores. Seid and Stevens, *Health Services Res* 40(6):1758-1780, 2005 (AHRQ grant HS10317).

- *SCHIP decreases uninsurance among children from low-income families.*

During the period 1996-2002, SCHIP significantly increased public insurance for poor children, from 21.5 percent in 1996 to 26.3 percent in 2002. During the same period, uninsurance declined for this group by more than 3 percentage points, from 16.4 percent to 13.1 percent. Further study is needed to quantify the potential benefits to these children and their families from lower premiums and out-of-pocket expenditures, as well as improved access to care. Hudson, Selden, and Banthin, *Inquiry* 42:232-254, 2005 (AHRQ Publication No. 06-R018)* (Intramural).

- *Expanding public health insurance for children lessens the financial burden on low-income families.*

Expansions in public health insurance programs (e.g., Medicaid, SCHIP) between 1980 and 2000 have reduced out-of-pocket medical expenses for low-income families, according to this study. The researchers compared out-of-pocket health care expenditures and the associated financial burden for children aged 0 to 18 in six poverty level groups. They found that out-of-pocket expenses and financial burden decreased for all groups studied, ranging from a reduction of 36.5 percent for those below 100 percent of the Federal poverty level to 46.7 percent for those at or above 300 percent (four times the Federal poverty level). Wong, Galbraith, Kim, and Newacheck, *Arch Pediatr Adolesc Med* 159:1008-1013, 2005 (AHRQ grant HS11662).

- *Researchers examine methods for predicting Medicaid child health expenditures.*

In this study, researchers found that models with either pharmacy-based or diagnosis-based risk adjustment improved the prediction of Medicaid child health expenditures compared with demographic models without risk adjustment. They used Medicaid claims data from the mid-1990s for children in three States who were not covered by managed care. Kuhlthau, Ferris, Davis, et al., *Med Care* 43(11):1155-1159, 2005 (AHRQ grant HS10152).

- *Premium subsidy programs can help low-income families obtain health insurance.*

A growing number of States have begun to explore the use of premium subsidy programs to help low-income families purchase health insurance through the workplace or private plans. Three studies examined the benefits and difficulties encountered in several of these programs. The studies are part of AHRQ's Child Health Insurance Research Initiative (CHIRI™). The first study examined the factors that led parents to choose Oregon's premium subsidy program over SCHIP to cover their children and compared the children's experiences with regard to access, use of services, and satisfaction. The second study found that SCHIP can improve care for vulnerable children and reduce racial/ethnic disparities in health care. The third study found that families have difficulty shifting to Medicaid primary care case management programs, which limit the providers enrollees can use for routine care. Mitchell, Haber, and Hoover, *Health Aff* 24(5):1344-1355, 2005 (AHRQ grant HS10463); Shone, Dick, Klein, et al., *Pediatrics* 115(6), 2005, online at www.pediatrics.org (AHRQ grant HS10465); and Bronstein, Adams, Florence, et al., *Health Care Financ Rev* 26(4):95-107, 2005 (AHRQ grant HS10435).

- *Certain features of managed care increase access to specialists for low-income children with chronic illnesses.*

This study linked certain features of managed care—having more in-network pediatricians and offering financial incentives for meeting quality of care standards—with greater access to specialty care for low-income children with chronic conditions. The study involved 2,333 children with conditions such as asthma, diabetes, and cystic

fibrosis who were enrolled in an SCHIP program. The study also identified disparities in access to care; overall, black children were only half as likely as white children to receive specialty care. Shenkman, Tian, Nackashi, and Schatz, *Pediatrics* 115(6):1547-1554, 2005 (AHRQ grant HS09949).

- *Improving access and quality for low-income and minority children may require more than expanding coverage.*

Although low-income children account for nearly 40 percent of the U.S. child population, only about one-quarter of total pediatric medical expenditures are for these children. Access and quality challenges for these children include: problems in accessing necessary care, difficulty in getting referrals for specialty care, and lack of effective communication with physicians and other care providers. Regardless of income, black children had lower health care use and expenditures than white children, according to these researchers. Simpson, Owens, Zodet, et al., *Ambul Pediatr* 5(1):6-44, 2005 (AHRQ Publication No. 05-R048)* (Intramural).

- *One in five Latino children in the United States is uninsured.*

This study examined the use of bilingual community-based case managers to assist Latino children with public insurance enrollment in two Boston-area communities. Children aged 18 and younger were divided into two groups: one group received help from trained case managers, and the other group (control) received traditional Medicaid and SCHIP outreach and enrollment. The researchers found that 96 percent of children in the intervention group enrolled in either Medicaid or SCHIP between May 2002 and September 2003, compared with 57 percent of children in the control group. Flores, Abreu, Chaisson, et al., *Pediatrics* 116(6):1433-1441, 2005 (AHRQ grant HS11305).

- *Rollbacks in SCHIP will not save money.*

High enrollment and reduced Federal allocations for SCHIP have led a number of States to begin reversing the expansion in public coverage for children. However, this study by AHRQ researchers found that rollbacks in SCHIP will not save much money. The net cost of SCHIP—both to States and to the Federal Government—is substantially less than the average spending per enrollee would suggest, according to the researchers. They conducted a variety of simulations and found that budgetary data greatly overstate the true net costs of SCHIP and consequently the potential savings from rollbacks to reduce enrollment. Selden and Hudson, *Inquiry* 42:16-28, 2005 (AHRQ Publication No. 05-R063)* (Intramural).

- *Children of working poor parents continue to be at a disadvantage for health care access and use.*

Researchers used data from the 2001 California Health Interview Survey to compare health insurance coverage, access to care, and use of health care services for three groups of children: the working poor, nonworking poor, and nonpoor. They found that despite public health insurance, children from poor working families in California were less likely to be insured than other poor and nonpoor children in 2001. Children of the working poor also were more likely to be Latino and less likely to be black or Asian, more likely to be undocumented, and more likely to live in two-parent or larger households. Guendelman, Angulo, and Oman, *Med Care* 43(1):68-78, 2005 (AHRQ grant HS13411).

- *Children with special needs use more health services and have higher costs than other children.*

Children who have special health care needs (CSHCN) require more and/or more complex care than other children. This study found that in 2000, CSHCN had three times the health care expenditures of other children ($2,099 vs. $628). Although CSHCN made up less than 16 percent of U.S. children, they accounted for 42 percent of total medical costs and 52.5 percent of children's hospital days in 2000. Also, CSHCN used five times as many prescription drugs and substantially more home health care days than other children. Newacheck and Kim, *Arch Pediatr Adolesc Med* 159:10-17, 2005 (AHRQ/HRSA cooperative agreement). See also Jaffee, Liu, Canty-Mitchell, et al., *Psychiatr Serv* 56(1):63-69, 2005 (AHRQ grant HS10453).

Emergency Care/Hospitalization

Current studies are focused on improving ED triage and identifying risk factors for functional limitations in adolescents following major trauma.

- *Injuries account for nearly one-third of pediatric ED visits.*

More than 1.5 million ED visits by children in 2003 were due to injuries, and about $2.3 billion was spent on outpatient injury-related ED visits that year, according to this study. Infants, adolescents, children from very low-income communities, and those from rural areas were more likely than their peers to have an injury-related ED visit. Although patient characteristics were fairly consistent across the Nation, there were some State-to-State variations in admission rates and expected source of payment for injury-related ED visits. Owens, Zodet, Berdahl, et al., *Ambul Pediatr* 8(4):219-240, 2008 (AHRQ

Publication No. 08-R082)* (Intramural).

- *Researchers examine the efficiency of pediatric endoscopy units.*

Researchers looked at time to onset of sedation, procedure time, discharge time, and total time for 134 children who underwent an endoscopic procedure at a pediatric teaching hospital. Half of the children received the two-drug combination of midazolam and fentanyl and the other half received propofol. Although patients given propofol had slightly shorter median times for anesthesia onset than children in the other group, they also had longer procedure times and longer times to discharge. Overall, the time from initiation of anesthesia to release from the hospital was comparable, although earlier studies have shown that patients given propofol are faster in opening their eyes, responding to verbal commands, and orienting themselves. Lightdale, Valim, Newburg, et al., *Gastrointest Endosc* 67(7):1067-1075 (AHRQ grant HS13675).

- *Nearly half of infant hospitalizations are due to infectious diseases.*

Using data from AHRQ's Kids Inpatient Database, researchers found that more than 40 percent of infant hospitalizations are caused by infectious diseases, including lower respiratory tract infections (more than half of the admissions) and infections of the kidney, urinary tract, and bladder. Hospitalization rates for infectious diseases were higher for boys and for black and Hispanic infants and lowest for Asian/Pacific islander infants. Hospital stays lasted 3 days and cost $2,235, on average. Yorita, Holman, Sejvar, et al., *Pediatrics* 121(2):244-252, 2008 (AHRQ Publication No. 08-R049)* (Intramural).

- *High hospital occupancy rates can affect the care children receive.*

Researchers studied claims data (1996-1998) on over 69,000 respiratory and 49,000 non-respiratory pediatric admissions in Pennsylvania and New York to investigate the association between hospital occupancy and admission workload on length of stay for common pediatric diagnoses. They found the effect of admission day occupancy on length of stay was apparent only for children with respiratory conditions and was greatest when the occupancy rate was higher than 60 percent. Lorch, Millman, Zhang, et al., *Pediatrics* 121, 2008; online at www.pediatrics.org (AHRQ grant HS09983).

- *Researchers develop model to predict level of care for pediatric ED patients.*

Researchers developed and validated a model, using information available at the time of patient triage, to predict the level of care provided to pediatric emergency patients for use as a severity of illness measure. They included eight predictor variables in the final models: presenting complaint, age, triage acuity category, arrival by EMS, current use of prescription drugs, and three triage vital signs (heart rate, respiratory rate, and temperature). The Revised Pediatric Emergency Assessment Tool (RePEAT) score accurately predicted level of care provided for pediatric emergency patients. Gorelick, Alessandrini, Cronan, and Shults, *Acad Emerg Med* 14:316-323, 2007 (AHRQ grant HS11359).

- *Study finds racial/ethnic differences in hospital admission rates for children.*

Researchers examined hospital admission rates for nearly 9,000 children (3,112 white, 3, 288 black, and 2,552 Hispanic) seen at 13 sites and found that the sickest children in all three groups were admitted at similar rates. For children in the two lowest severity-of-illness categories, white youngsters were admitted at 1.5 to 2.0 times the expected rate. The researchers conclude, however, that white children were being overadmitted when not severely ill, while black and Latino children were not being denied essential services. Chamberlain, Joseph, Patel, et al., *Pediatrics* 119, 2007; online at www.pediatrics.org (AHRQ grant HS10238).

- *Color-coded tape helps EMTs calculate the correct dose of medications for children receiving emergency care.*

Children age 12 and under in Los Angeles County who suffered prehospital cardiopulmonary arrest and were treated initially by EMTs were three times as likely to receive the correct dose of epinephrine if the EMTs were required to use the Broselow tape to quickly determine medication dosing. The Broselow tape measures a child's height in color zones that correlate with body weight, which helps EMTs to rapidly estimate a child's weight, calculate weight-based drug doses, and choose the correct size of resuscitation equipment. Kaji, Gausche-Hill, Conrad, et al., *Pediatrics* 118(4):1493-1500, 2006 (AHRQ grant HS09166).

- *EDs staffed with physician residents in training are less effective than non-resident staffed ERs in deciding which children to hospitalize.*

Emergency departments staffed with physician residents in training admitted children at a rate nearly 14 times the expected rate compared with nonresident hospitals. These EDs also had far more children returning to the ED within 72 hours after discharge, an indicator that they were discharged from the ED prematurely. Chamberlain, Patel, and Pollack, *J Pediatr* 149:644-649, 2006 (AHRQ grant HS10238).

- *Some pediatric offices may not be prepared to provide emergency care.*

Pediatric offices occasionally see children with emergencies such as epileptic seizures or asthma-related breathing problems, yet they may not be prepared to treat a critically ill child while waiting for paramedics to arrive. Researchers found that four of eight pediatric offices surveyed did not have the appropriate medications for epileptic seizures, and some lacked the basic supplies necessary to handle respiratory emergencies. Four offices had written guidelines for medical emergencies, but only one office required staff to participate in mock emergency codes. The offices generally treated an average of one child a week who required emergency care or subsequent emergency hospitalization. Santillanes, Gausche-Hill, and Sosa, *Pediatr Emerg Care* 22(11):694-698, 2006 (AHRQ grant HS09166).

- *Use of a medical home managed care model can reduce ED use among children with special health care needs.*

According to this study, a managed care model that emphasizes care coordination and does not include strong financial incentives to limit care use can reduce the use of emergency department care among children with special health care needs. The researchers compared ED use before and after the children joined a managed care plan specially designed for them and found an association between managed care enrollment and a nearly one-fourth drop in ED use. The plan features a medical home approach to create an environment for the more effective management of chronic health problems and facilitate early intervention when those problems become acute, thereby reducing ED use. Pollack, Wheeler, Cowan, and Freed, *Med Care* 45(2):139-145, 2007 (AHRQ grant HS10441).

- *Study finds that use of pediatric hospitalists results in lower costs and shorter hospital stays.*

According to this review, the use of pediatric hospitalists results in lower hospital costs and shorter stays for hospitalized children. This approach does not adversely affect the experiences of the referring physician, parent, or hospital housestaff. The researchers reviewed 20 studies and found an average decrease of 10 percent in both cost and length of stay. Data on quality of care were insufficient to draw conclusions. Landrigan, Conway, Edwards, and Srivastava, *Pediatrics* 117(5):1736-1744, 2006 (AHRQ grant HS13333).

- *Children who have surgery for hypoplastic left heart syndrome fare better at more experienced hospitals.*

Treatment options for children born with hypoplastic left heart syndome (HLHS)—a congenital anomaly in which the entire left side of the heart is underdeveloped—include palliation shortly after birth, heart transplantation, or comfort care. Researchers examined in-hospital mortality rates for 754 infants with HLHS in 1997 and 880 infants in 2000. In 1997, children undergoing palliation surgery in teaching hospitals were 2.6 times as likely to die as those having surgery at nonteaching hospitals. By 2000, however, palliation surgery was centralized at teaching hospitals. This centralization, along with medical and surgical advances, was associated with an overall decrease in mortality from 28 to 24 percent. Yet mortality rates continued to approach 50 percent at low-volume hospitals, compared with 19 percent for high-volume hospitals. Berry, Cowley, Hoff, and Srivastava, *Pediatrics* 117(4):1307-1313, 2006 (AHRQ grant HS11826).

- *Children's hospitals are much more likely than general hospitals to diagnose child abuse in severely injured infants.*

Researchers examined abuse diagnosis by hospital type for children less than 1 year of age and found that children's hospitals are more than twice as likely as general hospitals to diagnose child abuse in severely injured infants (29 vs. 13 percent, respectively). General hospitals with a children's unit identified more abuse cases (19 percent) than general hospitals without a children's unit but fewer than a children's hospital. Nearly half (49 percent) of the infants studied were admitted to general hospitals, one-fourth were admitted to general hospitals with children's units, and one-fourth were admitted to a children's hospital. Infants treated at children's hospitals tended to be younger, more severely injured, and more likely to have private health insurance than those cared for at general hospitals. Trokel, Wadimmba, Griffith, and Sege, *Pediatrics* 117(3):722-728, 2006 (AHRQ grant T32 HS00060).

- *Hospitalization rate for children with cat-scratch disease remains stable.*

Despite an increase in cat ownership from 1980 to 2000, the rate of children hospitalized for cat-scratch disease in 2000 was similar to that of the 1980s. Typically, cat-scratch disease is benign and self-limited and is characterized by enlarged lymph nodes and fever. However, atypical cat-scratch disease infections can be accompanied by inflammatory responses that lead to hospitalization. During 2000, there were an estimated 437 hospitalizations for cat-scratch disease in children younger than 18. Hospital stays were as long as 19 days for typical cases and 22 days for atypical cases. The median charge was $6,140, with total annual hospital charges of about $3.5 million. Reynolds, Holman, Curns, et al.,

Pediatr Infect Dis J 24(8):700-704, 2005 (AHRQ Publication No. 05-R011)* (Intramural).

- *Children who are in the ICU and have arterial catheters are at elevated risk of dying from blood infections.*

Among 168 hospitalized children with positive blood cultures for *Candida* blood infections, 17 percent died within 1 month of the first positive culture. Children in the pediatric ICU at the time of infection were 6.3 times as likely as other children to die within 30 days, and those with an arterial line were 2.4 times as likely as other children to die within 30 days. The study involved children who were inpatients at one large hospital during the period 1998-2001. Zaoutis, Coffin, Chu, et al., *Pediatr Infect Dis J* 24(8):736-739, 2005 (AHRQ grant HS10399).

- *Limiting use of broad-spectrum antibiotics may reduce life-threatening infections in hospitalized children.*

Curtailed use of broad-spectrum cephalosporin antibiotics in children at high risk for *Escherichia coli* or *Klebsiella* species infections may reduce the incidence of such infections, according to this study. The researchers used laboratory data from the Children's Hospital of Philadelphia from May 1, 1999 to September 30, 2003 to identify children with bloodstream infections and pinpoint risk factors for such infections. Zaoutis, Goyal, Chu, et al., *Pediatrics* 115(4):942-949, 2005 (AHRQ grant HS10399).

- *Postoperative staph infection of a child's chest cavity is a risk factor for bloodstream infection.*

Up to 4 percent of children who undergo surgery that involves cutting the breastbone develop infections of the chest cavity. Children who develop postoperative chest cavity infections due to *Staphylococcus aureus* are much more likely to develop a bloodstream infection than children whose chest cavity infections are caused by other pathogens, according to this study. The researchers studied hospital data on 43 children who developed chest cavity infections after surgery between 1995 and 2003 at one urban children's hospital. Shah, Lautenbach, Long, et al., *Pediatr Infect Dis J* 24(9):834-837, 2005 (AHRQ grant HS10399).

- *Children commonly suffer from bacterial infections after stem cell transplant.*

Researchers studied 182 pediatric patients who underwent their first hematopoietic stem cell transplant for cancer and received gut decontamination with antibiotics at one children's hospital from 1999 to 2002. They examined the impact of several factors on infection, including stem cell source, donor, recent bacteremia, and graft versus host disease prophylaxis agents. Overall, 41 percent of patients developed bacterial infections. The majority were Gram-positive cocci, consistent with recent trends in immunocompromised patients. Kersun, Propert, Lautenbach, et al., *Pediatr Blood Cancer* 45:162-169, 2005 (AHRQ grant HS10399).

- *Perforated appendicitis disproportionately affects Medicaid-insured and minority children.*

In one-third of children who have appendicitis, the appendix ruptures before surgery, leading to more complications and longer hospital stays. Ruptured appendix usually results from delayed diagnosis and treatment and occurs more often among minority and Medicaid-insured children. Researchers used 1997 data from AHRQ's Kid's Inpatient Database of pediatric hospital discharges from 22 States to determine patient and hospital characteristics associated with perforated appendicitis. Smink, Fishman, Kleinman, and Finkelstein, *Pediatrics* 115(4):920-925, 2005 (AHRQ grant T32 HS00063).

Mental Health

Despite the debilitating nature and prevalence of mental health problems in children, many disorders continue to be underdiagnosed and inadequately treated. AHRQ-funded research focuses on improving delivery of mental health care in primary care practice.

- *Study provides new evidence linking antidepressants and risk of suicide in children and adolescents.*

This study of Medicaid-insured children from all 50 States provides additional evidence that antidepressants boost the risk of suicidal behavior among depressed children and adolescents. It found a two-fold increased risk of suicide attempts among children treated with any type of antidepressant medication. Olfson and Marcus, *J Clin Psychiatr* 69(3):425-432, 2008 (AHRQ grant HS16097).

- *White children are about twice as likely as black and Hispanic children to use stimulant medications.*

Stimulant medications are typically prescribed for children with attention deficit/hyperactivity disorder (ADHD), and white children are more likely than children of other races to use them, according to the study. The researchers examined data on stimulant use between 2000 and 2002 among U.S. children aged 5-17. Overall, 5.1 percent of white children compared with 2.8 percent of black and 2.1 percent of Hispanic children were prescribed at least one stimulant medication during the study period. Differences in family or individual characteristics accounted for about 25 percent of the differences between whites and Hispanics but not for the difference between blacks and whites. The source of the remaining differences in children's stimulant use is

unclear, note the researchers. Hudson, Miller, and Kirby, *Med Care* 45(11):1068-1075, 2007 (AHRQ Publication No. 08-R044)* (Intramural).

- *Youths at highest risk for attempting suicide are severely depressed and have other key stressors.*

Researchers examined suicide attempts among 451 ethnically diverse depressed youths aged 12-21 and found that in the previous 6 months, 12 percent of the youths had attempted suicide. Those who had attempted suicide were significantly more likely to be female and to have more severe depression. After controlling for depression severity, only key stressors—a romantic breakup, recent arrest, or assault—remained a significant predictor of suicide attempt, increasing the risk by 58 percent. Fordwood, Asarnow, Huizar, and Reise, *J Clin Child Adolesc Psychol* 36(3):392-404, 2007 (AHRQ grant HS09908). See also Olfson and Marcus, *J Clin Psychiatry* 69(3):425-432, 2008 (AHRQ grant HS16097).

- *Use of antidepressants in children decreased in response to regulatory warnings.*

Regulatory warnings about the potential for increased suicidal thoughts and behavior in children and adolescents led to fewer prescriptions of antidepressants for these groups in 2004 and 2005, according to this study. The researchers studied antidepressant prescribing among children insured by the Tennessee Medicaid program from January 2002 through December 2003 (before the warning) and January 2004 through September 2005 (after the warning). They found that new users of antidepressants decreased by 33 percent among children and adolescents by 21 months after the warnings. The researchers cite an urgent need for better safety and efficacy data to guide pediatric antidepressant practice. Kurian, Ray, Arbogast, et al., *Arch Pediatr Adolesc Med* 161(7):690-696, 2007 (AHRQ grant HS10384).

- *Pediatric prescriptions for antipsychotic medications increased five-fold from 1995 to 2002.*

Using data from two national surveys, researchers found that antipsychotic prescribing increased from 8.6 per 1,000 children ages 2 to 18 in 1995-1996 to 39.4 per 1,000 in 2001-2002. Although prescribing rates were similar for children aged 2 to 12 and 13 to 18, overall prescribing rates were higher for the older children. Two-thirds of prescriptions were for males. Nearly one-third of antipsychotic prescriptions were associated with visits to clinicians other than mental health specialists. Cooper, Arbogast, Ding, et al., *Ambulatory Pediatr* 6:79-83, 2006 (AHRQ grant HS10384).

- *Use of antidepressants among children increased significantly from 1997 to 2002.*

Overall use of antidepressants among children increased from 0.9 million children (1.3 percent) in 1997 to 1.4 million children (1.8 percent) in 2002. This increase was driven by a doubling in antidepressant use by adolescents, from 2.1 percent in 1997 to 3.9 percent in 2002, with no change in use among children younger than age 13. This finding is consistent with the higher prevalence of depression in adolescents (about 6 percent) than in younger children (about 2 percent). The increase in antidepressant use was most evident in groups that previously had lower levels of use, such as girls, blacks, and low-income children. Vitiello, Zuvekas, and Norquest, *J Am Acad Child Adolesc Psychiatry* 45(3):271-279, 2006 (AHRQ Publication No. 06-R037)* (Intramural).

- *Cognitive behavioral therapy used with antidepressants offers additional benefits to adolescents with depression.*

This study involved 152 adolescents aged 12 to 18 with major depressive disorder who were in treatment at an HMO pediatric primary care practice. They were randomly assigned to receive antidepressants alone or antidepressants plus brief cognitive behavioral therapy. Adolescents who received the combination treatment used approximately 20 percent less medication than those who received medication only. The researchers note that these results are consistent with recent studies indicating that depressed youths only reluctantly take antidepressant medication and look for opportunities to discontinue it. Clarke, Debar, Lynch, et al., *J Am Acad Child Adolesc Psychiatry* 44(9):888-898, 2005 (AHRQ grants HS10535 and HS13854).

- *Mental health problems among children who have special health care needs and their caregivers are barriers to care.*

The mental health problems of children with special health care needs and their caregivers appear to be barriers to obtaining needed care, according to this study. In a survey of a random sample of 1,088 caregivers in Washington, DC, in 2002, the researchers asked about children's unmet needs, mental health status, and the caregivers' mental health status. Caregivers with symptoms of depression were much more likely than those without depression to report children's unmet needs for hospital and physician care, mental health services, and other types of health care. Most of the children were black and urban, so these findings may differ for children of other races and those living in rural areas. Gaskin and Mitchell, *J Ment Health Policy Econ* 8:29-35, 2005 (AHRQ grant HS10912).

- *Despite questions about efficacy and safety, use of atypical antipsychotic drugs in children continues.*

Atypical antipsychotic drugs, such as risperidone and clozapine, are approved to treat schizophrenia in adults but not children. Some studies suggest more prevalent and serious side effects in children and adolescents, such as weight gain and sedation. Nevertheless, this study found that nearly one-fourth of children and adolescents with prescription claims for these drugs were aged 9 or younger. Since schizophrenia is seldom diagnosed before adolescence, it is likely that these drugs are being prescribed to treat behavior disorders such as ADHD, conclude the researchers. Curtis, Masselink, Ostbye, et al., *Arch Pediatr Adolesc Med* 159:362-366, 2005 (AHRQ grant HS10385).

- *Improving primary care access to effective treatment for adolescent depression improves outcomes.*

This randomized controlled trial involved 418 primary care patients aged 13-21 with depression who were enrolled in managed care and treated between 1999 and 2003. Subjects were randomized to either quality improvement (intervention) or usual care (control). After 6 months, intervention patients reported significantly fewer depressive symptoms than usual care patients, higher quality of life scores, and greater satisfaction with mental health care. Asarnow, Jaycox, Duan, et al., *JAMA* 293(3):311-319, 2005 (AHRQ grant HS09908).

Newborns and Infants

In 2006, 4.5 million babies were born in the United States. AHRQ's current research focuses on improving the babies' health outcomes, promoting breastfeeding, and reducing racial and ethnic disparities in access to care.

- *Infants born to women with asthma are at increased risk for low birthweight.*

Researchers examined data on more than 140,000 pregnancies of women enrolled in Tennessee's Medicaid program from 1995 to 2003 and found that 6.5 percent of the women had asthma. Women with asthma typically delivered babies that were smaller in size for their gestational ages and weighed 1.3 to 2 ounces less than babies born to women who did not have asthma. However, preterm birth, birth defects, and post-delivery hemorrhage of the mother were not associated with maternal asthma. Enriquez, Griffin, Carroll, et al., *J Allergy Clin Immunol* 120(3):625-630, 2007 (AHRQ grant HS10384).

- *Many premature infants with chronic lung disease can be safely cared for in the community following NICU discharge.*

Premature infants with chronic lung disease (CLD) are prone to frequent respiratory illnesses, feeding difficulties, growth problems, and rehospitalization during infancy. They also are more likely than other infants to experience cognitive, motor, and language and hearing impairment. After NICU discharge, these infants typically receive coordinated care from sophisticated medical centers, yet such centers may not be accessible for some families. This study found that premature infants with CLD can fare just as well after NICU discharge when followup care is provided by community-based providers working with a nurse specialist who coordinates the infant's care and maintains frequent contact with the family. O'Shea, Nageswaran, Hiatt, et al., *Pediatrics* 119(4), 2007; online at www.pediatrics.org (AHRQ grant HS07928).

- *Parental satisfaction with NICU care depends mostly on infant health after discharge.*

Researchers surveyed 621 older mothers (predominantly white and well-educated) about their satisfaction with the care their newborns received in the NICUs of 10 hospitals in Massachusetts and California 3 months after the infants were discharged. Results showed that parental satisfaction was related mostly to the infant's health after discharge rather than to NICU treatments or neonatal complications. Mothers were asked about such issues as the NICU staff's emotional support and other care related factors, as well as their child's current health, subsequent care use, and other family characteristics. McCormick, Escobar, Zheng, and Richardson, *Pediatrics* 121(6):1111-1118, 2008 (AHRQ grant HS10131).

- *Report summarizes a new process to nominate and review conditions for newborn screening.*

This report summarizes a new process to nominate conditions for review by the Advisory Committee on Heritable Disorders and Genetic Diseases in Newborns and Children. Conditions proposed for newborn screening occur at very low frequency in children but pose serious health risks to those affected. Randomized controlled trials on these conditions are usually sparse or lacking, meaning that new ground rules for weighing evidence are needed. Green, Rinaldo, Brower, et al., *Genet Med* 9(11):792-796, 2007 (AHRQ Publication No. 08-R030)* (Intramural).

- *More than 15 percent of newborns with necrotizing enterocolitis do not survive their hospital stay.*

Necrotizing enterocolitis (NEC)—infection and inflammation of the intestines—occurred in 1 in every 1,000 live births in 2000, and about one in seven of these infants did not survive hospitalization. Researchers examined data from AHRQ's Kid's database and found that more than 4,500 NEC-related hospitalizations occurred among U.S. newborns in 2000; the rate of NEC was highest among black newborns. The median hospital stay for NEC was 49 days, and the in-hospital fatality rate was 15.2 percent. Holman, Stoll, Curns, et al., *Paediatr Perinat Epidemiol* 20(6):498-506, 2006 (AHRQ Publication No. 07-R027)* (Intramural).

- *Researchers determine risk factors for deadly infection after open-chest surgery in infants and toddlers.*

For this study, researchers examined medical records for 224 children aged 7 days to 2 years who underwent median sternotomy (cracking of the breastbone) at a pediatric hospital to determine the risk factors for mediastinitis, a potentially fatal infection. The 43 children who developed the infection shared some common characteristics: many had underlying genetic syndromes or chromosomal abnormalities, a score of four or more on the American Society of Anesthesiologists classification scale, and/or had epicardial pacing wires for more than 3 days. These characteristics may be useful for determining who is at risk for mediastinitis. Kagen, Lautenbach, Bilker, et al., *Pediatr Infect Dis J* 26(7):613-618, 2007 (AHRQ grant HS10399).

- *Bloodstream infection occurred in 6 percent of infants undergoing median sternotomy in one urban hospital.*

For this study, 192 patients were randomly selected from those undergoing median sternotomy between January 1, 1995 and December 31, 2003. Ninety-eight of the eligible patients were male, and the median patient age was 5.4 months. Bloodstream infections developed in 12 patients within the first 30 days after surgery. Postoperative mediastinitis and the need for extracorporeal membrane oxygenation were risk factors for bloodstream infection after median sternotomy. Shah, Kagen, Lautenbach, et al., *J Thorac Cardiovasc Surg* 133(2):435-440, 2007 (AHRQ grant HS10399).

- *Management of postoperative pain in newborns found suboptimal in some NICUs.*

Researchers found that while management of postoperative pain in neonates is well accepted, the practice is highly variable. They found deficiencies in the assessment and management of postoperative pain in neonates treated at NICUs in 10 hospitals. Physician pain assessment (not postnatal age or surgery type) was the only significant predictor of postsurgical analgesic use. Taylor, Robbins, Gold, et al., *Pediatrics* 118(4):992-1000, 2006 (AHRQ grant HS13698).

- *Overcrowding in the NICU influences early discharge of moderately preterm infants.*

Decisions about discharging moderately preterm infants from hospital neonatal intensive care units (NICUs) are based in part on how crowded the units are, according to this study. The researchers found that a moderately preterm infant was 32 percent more likely to be discharged earlier than expected when the unit census was high compared with periods of low NICU census. These findings suggest that unit workload and strains on staff influence clinical decisionmaking. Profit, McCormick, Escobar, et al., *Pediatrics* 119(2):314-319, 2007 (AHRQ grants T32 HS00063, HS10131).

- *Teamwork in the delivery room is closely related to the quality of neonatal resuscitation.*

Independent observers viewed recordings of the resuscitation of infants born by cesarean section and assessed compliance with Neonatal Resuscitation Program guidelines. All 132 clinical teams involved in the study exhibited certain teamwork behaviors—communication, management, and leadership—that are correlated with the quality of neonatal resuscitation in the delivery room. Although these correlations do not confirm a causal relationship, they may be used in training providers on how to prevent and manage neonatal resuscitation errors. Thomas, Sexton, Lasky, et al., *J Perinatol* 26:163-169, 2006 (AHRQ grant HS11164).

- *Infants born prematurely at 30-34 weeks gestation may have substantial health problems.*

Compared with full-term infants (at least 37 weeks gestation), infants born at 30-34 weeks gestation are more than four times as likely to require assisted ventilation; they also are at greater risk for pneumothorax and meningitis. Within 3 months of hospital discharge, 11 percent of premature infants born at 30-34 weeks gestation were readmitted to the hospital. Hospital readmission was more likely among male infants and those with chronic lung disease. Escobar, McCormick, Zupanic, et al., *Arch Dis Child Fetal Neonatal Ed* 91(4):F238-F244, 2006 (AHRQ grant HS10131).

- *Babies being cared for in the NICU are at risk for misidentification.*

According to this study conducted in one neonatal intensive care unit (NICU), nearly half of infants cared for in the NICU on any given day were at risk for misidentification. During one calendar year, there was not a single day without at least one pair of patients at risk for misidentification. Misidentification could result in an infant being given a medication, procedure, or mother's expressed breast milk intended for another infant, perhaps with serious adverse consequences. The most common reasons for misidentification risk were similar appearing medical record numbers, identical surnames, and similar sounding surnames. Gray, Suresh, Ursprung, et al., *Pediatrics* 117(1):43-47, 2006 (AHRQ grant HS11583).

- *Catheterization may not be the best way to diagnose urinary tract infections in feverish infants.*

Urinary tract infections (UTIs) are the most common cause of serious bacterial infections in feverish infants younger than 3 months. Most doctors use urethral catheterization to diagnose UTIs in young infants, but its accuracy is only marginally better than bag collection. Also, it is technically difficult, invasive, and painful. In a study of 3,066 infants aged 3 months or younger, catheterization and bag collection demonstrated similar sensitivity, but bag collection had somewhat lower specificity as indicated by more false positives. False positives are of particular concern for doctors who manage UTIs aggressively with routine hospitalization and imaging. Schroeder, Newman, Wasserman, et al., *Arch Pediatr Adolesc Med* 159:915-922, 2005 (AHRQ grant HS06485).

- *Use of broad-spectrum antibiotics during labor is linked to late-onset serious bacterial infections in infants.*

Over one-third of women in labor are given antibiotics to prevent the transmission of group B streptococcus (GBS) to their infants. Although use of intrapartum antibiotics (IPA) has been very successful in preventing neonatal GBS infection in the first week of life, this study found a relationship between IPA and the occurrence of late-onset (7 to 90 days after birth) serious bacterial infections. Also, pathogens that caused these late-onset infections were more likely to be resistant to ampicillin if the mother received ampicillin during labor. Thus, penicillin—an antibiotic that treats a narrow range of bacteria—is recommended instead of ampicillin for IPA to prevent GBS. Glasgow, Young, Wallin, et al., *Pediatrics* 116(3):696-702, 2005 (AHRQ grant HS11826).

- *Delayed sternal closure increases the risk of infection in young infants who undergo heart surgery.*

Most median sternostomies (cracking open of the rib cage to permit open heart surgery) in infants are performed within the first few weeks of life to correct life-threatening, complex congenital heart disease. Infection of the mid-sternum strikes 1.4 percent of children who undergo this procedure and 3 percent of those who have heart and lung transplant. Delayed sternal closure appears to substantially elevate the risk of infection with Gram-negative bacteria, according to this study. Long, Shah, Lautenbach, et al., *Pediatr Infect Dis J* 24(4):315-319, 2005 (AHRQ grant HS10399).

- *Racial disparities found in survival of very low-birthweight babies.*

Researchers analyzed the medical records of more than 74,000 black and white very low-birthweight (VLBW) infants treated at 332 hospitals. Hospitals were defined as minority-serving if more than 35 percent of the VLBW infants they treated were black. They found that far more black infants were treated by minority-serving hospitals than were treated at hospitals where less than 15 percent of infants were black. Both black and white VLBW babies were 28 percent more

likely to die at minority-serving hospitals than at other hospitals, even though the hospitals treated similarly ill infants. Morales, Staiger, Horbar, et al., *Am J Public Health* 95(12):2206-2212, 2005 (AHRQ grants HS13280 and HS10858).

- *Study hints at a link between breastfeeding and intelligence.*

Researchers examined the relationship between breastfeeding history and 15 indicators of physical health, emotional health, and cognitive ability among 16,903 adolescents, including 2,734 sibling pairs. They found a persistent positive correlation between breastfeeding and cognitive ability; that is, siblings who were breastfed had higher cognitive ability than those who were not. The effect was large enough to matter, and it persisted into adolescence. Evenhouse and Reilly, *Health Serv Res* 40(6):1781-1802, 2005 (AHRQ grant HS00086).

Obesity/Overweight

The increasing number of obese children and adolescents across the Nation has led policymakers to rank it as a critical public health threat. Since the 1970s, the prevalence of obesity has more than doubled for preschool children aged 2-5 years and adolescents aged 12-19 years, and it has more than tripled for children aged 6-11 years. At present, approximately 9 million children over 6 years of age are obese.

- *Behavior modification programs help obese children manage their weight.*

Evidence shows that obese school-age children and teens can lose weight and prevent further weight gain if they participate in medium- to high-intensity behavioral management programs. The evidence shows that after completing weight management programs, obese children weigh between 3 pounds and 23 pounds less, on average, as obese children not involved in such programs. The weight difference is greater among heavier children and children involved in more intensive programs. See *Effectiveness of Weight Management Programs in Children and Adolescents* (AHRQ Publication No. 08-E014)* Also available online at www.ahrq.gov/clinic/tp/chwghttp.htm.

- *Overweight adolescents with type 2 diabetes underestimate their weight problem, as do their parents.*

Over 80 percent of children with type 2 diabetes are overweight or at risk for becoming overweight, and severely overweight adolescents (BMI of 36.4) and their parents tend to underestimate the seriousness of their weight problem, according to this study. Researchers interviewed 104 adolescents (aged 12-20) and their parents about perceptions of the adolescents' weight, diet, and exercise behaviors. While 87 percent of children were overweight (mean of 221 pounds), only 41 percent of parents and 35 percent of adolescents considered them to be very overweight; 40 percent of parents and 55 percent of adolescents with BMIs at or above the 95th percentile considered their weight to be "about right." Skinner, Weinberger, Mulvaney, et al., *Diabetes Care* 31(2):227-229, 2008 (AHRQ grant T32 HS00032).

- *Study of young Head Start children links overweight to worsened asthma.*

A study of Head Start children in Arkansas—which has the highest national rate of overweight children—suggests a link between being overweight and worsened asthma in this group of disadvantaged children. The researchers found that 19 percent of the 3- to 5-year-old children with asthma were overweight (body mass index or BMI in the 95th percentile or greater) compared with 11 percent of a national sample of children of the same age and 14 percent of Arkansas preschool children not in Head Start. The researchers suggest that the link between overweight and worsened asthma is an interaction of several factors, including hormonal, mechanical, genetic, and environmental characteristics. Vargas, Perry, Robles, et al., *Ann Allergy Asthma Immunol* 99:22-28, 2007 (AHRQ grant HS10062).

- *Many pediatricians feel they have only limited success in treating children's obesity.*

Researchers asked eight pediatricians from diverse practices about how they identify and treat obesity and how they might improve office-based obesity treatment. The pediatricians felt that they identified most overweight children, they followed recommendations to emphasize to children and parents the health problems associated with obesity, advised simple behavior changes, and adapted messages to individual families. Despite these efforts, they often considered their efforts futile and found almost no success. They cited several family barriers to success, including poor home environments where there was little time for exercise and food preparation and lack of family commitment to weight loss. Successful patients typically came to the pediatric office already motivated. Barlow, Richert, and Baker, *Child Care Health Dev* 33(4):416-423, 2007. See also: Barlow and Chang, *Acta Paediatr* 96:1360-1364, 2007 (AHRQ grant HS13901).

- *Required PE classes and State spending on parks and recreation are linked to increased youth activity.*

Physical education requirements and curriculum development are correlated with improved participation by boys and girls in PE, and State spending on parks and recreation is also correlated

with more vigorous physical activity by girls and strength building exercise by boys. An additional day of this type of activity was associated with an extra $50 in spending for boys and $21 for girls. The researchers studied the effects of State policies using data on 37,000 high school students across the United States. Cawley, Meyerhoefer, and Newhouse, *Contemp Econ Policy* 25(4):506-517, 2007 (AHRQ Publication No. 08-R025)* (Intramural).

- *Pediatricians recognize overweight or obesity in children without using proportional weight curves.*

According to this study, pediatricians quickly recognize obesity if a child's body mass index (BMI) is above the 95th percentile. However, they may overlook excess weight in children with a BMI at the 85th to 94th percentile. Doctors in this study were more likely to identify obesity in adolescents than in younger children, but identification was not associated with a child's sex or race, practice setting, insurance type, or visit length. Only 41 percent of growth charts were current, and only 6.1 percent had the BMI plotted. The researchers note that BMI plotting on children's charts may increase recognition in mildly overweight children who could be offered diet and exercise counseling. Barlow, Bobra, Elliott, et al., *Obesity* 15(1):225-232, 2007 (AHRQ grant HS13901).

- *Children's attendance at weight management programs may hinge on convenience for parents.*

Researchers studied 157 obese children (mean age of 12 years and mean body mass index of 39.9) and found that one-third did not return for their second monthly visit to a weight management program, and nearly two-thirds did not show up for future visits. Reasons given by parents whose children attended only one or two sessions included distance from home (23 percent) and scheduling conflicts (21 percent). Barlow and Ohlemeyer, *Clin Pediatr* 45:355-360, 2006 (AHRQ grant HS13901).

- *Youths are more likely to be counseled about diet and exercise following a diagnosis of obesity.*

The researchers used data from two surveys during the period 1997-2000 involving 39,340 outpatient visits by youths aged 2 to 18. Clinicians diagnosed obesity at less than 1 percent of all visits. Factors associated with diet counseling at well-child visits were a diagnosis of obesity, being seen by pediatricians, ages 2 to 5 years compared with 12 to 18 years, and self-pay compared with private insurance. Factors associated with exercise counseling were similar, but this counseling occurred only half as often in visits by black youths as in visits by white youths. Cook, Weitzman, Auinger, and Barlow, *Pediatrics* 116(1):112-116, 2005 (AHRQ grant HS13901).

- *School-based weight loss/exercise programs found effective for some children in Louisiana.*

One-fourth of the 279 Louisiana middle school children enrolled in a school-based weight loss program were overweight or obese. Most of the children enrolled in the program were black and from low-income families. Twenty-eight of the children attended a food and fitness class; the rest of the children participated in a free alternative physical education (PE) class that involved warm-up and stretching exercises, aerobic activities, and a cool-down period. Not all students completed the PE class; those who did ended with lower body mass indexes and a total weight loss of 33.25 pounds. Children in the other group ended with a total weight loss of 6.5 pounds. Edwards, *Nurs Clin North Am* 40(4):661-669, 2005 (AHRQ grant HS11834).

- *DVD for kids and parents focuses on childhood obesity.*

AHRQ and FitTV have partnered to produce a fun and interactive DVD for children ages 5 to 9 and their parents. The DVD, *Max's Magical Delivery: Fit for Kids*, is a 30-minute tool that provides fun ways to incorporate physical activity and healthy foods into the daily lives of children. Copies of the DVD (AHRQ Publication No. 04-0088-DVD) are available from AHRQ.*

Oral Health

In order to reverse trends of under use and disparities in oral care for children, researchers are studying incentives to improve access to and delivery of care.

- *Untreated tooth decay continues to be a problem for publicly insured children.*

According to this study, children enrolled in public health insurance programs such as Medicaid and SCHIP are nearly twice as likely as other children to have untreated tooth decay. The problem is less severe in children covered by SCHIP than in Medicaid-insured children; SCHIP-enrolled children are 26 percent less likely to suffer from untreated tooth decay than their Medicaid-insured peers. Researchers examined dental health outcomes through oral screening of kindergarten children in the 2000-2001 school year and used Medicaid and SCHIP claims data to determine the extent of untreated dental cavities based on insurance enrollment. Brickhouse, Rozier, and Slade, *Am J Public Health* 98(5):876-881, 2008 (AHRQ grant HS11514).

- *Family income and parental education influence children's use of dental services.*

Researchers examined data on 8,983 children from the 2003 Medical Expenditure Panel Survey to determine

the role of nondentist providers in referring children aged 2 to 17 to dentists for care. Among the children in the survey, 51 percent had a dental checkup in 2003; 60 percent of the children were from middle or high income families, and 38 percent came from poor, near poor, or low income families. About 50 percent of nondentist providers recommended that children in any income category see a dentist. However, the likelihood of that advice translating into a child seeing a dentist depended on several factors, including family income and parents' education. Chu, Sweis, Guay, and Manski, *J Am Dental Assoc* 138:1324-1331, 2007 (AHRQ Publication No. 08-R036)* (Intramural).

- *Number of U.S. children covered by government dental insurance has increased.*

About 30 percent of U.S. children and adolescents were covered by government-sponsored dental insurance in 2006, a significant increase from the 18 percent covered in 1996. Researchers analyzed data from AHRQ's Medical Expenditure Panel Survey and found that private dental insurance enrollment remained relatively unchanged during the same period. Much of the increase resulted from SCHIP, which began in 1997, and extensions of Medicaid coverage for dental services. Largely due to expanded government coverage, only 19 percent of U.S. children had no dental coverage in 2006 compared with 29 percent in 1996. See *Dental Coverage of Children and Young Adults Under Age 21, United States, 1996 and 2006*, MEPS Statistical Brief 221; online at www.meps.ahrq.gov/mepsweb/index.jsp (Intramural).

- *Rural children with special health care needs often do not receive needed dental care.*

Children with special health care needs (CSHCN) who reside in rural areas are less likely than their urban counterparts to receive needed dental care. An analysis of data on more than 37,000 CSHCN aged 2 and older revealed that children living in rural areas were 17 percent more likely than those living in urban areas to have an unmet need for dental care. The researchers cite two main reasons for this disparity: one, rural parents do not fully appreciate the need for dental care, and two, dental care may be difficult to access for rural families. Skinner, Slifkin, and Mayer, *J Rural Health* 22(1):36-42, 2006 (AHRQ grant HS13309).

Otitis Media/Respiratory Conditions

Otitis media (middle ear infection) is a common childhood illness that affects more than half of children under age 5 each year. Current debate revolves around antibiotic use and the long-term effects of ear infection on functioning, behavioral problems, and parental stress.

- *Study finds an age inconsistency when guidelines for treating otitis media are followed.*

Acute otitis media is the most common bacterial illness in children, and concern is growing about increasing antibiotic resistance by the organisms that cause children's ear infections. This study found that the guidelines for treating otitis media reduce antibiotic use among children younger than age 2 but at a relatively high cost of sick days and parental missed work days. In addition, following the guidelines for children age 2 and younger resulted in 21 to 26 percent less antibiotic use and 13 to 14 percent more sick days, compared with 67 percent less antibiotic use and 4 percent more sick days for children aged 2 to 12 years. Meropol, Glick, and Asch, *Pediatrics* 121:657-666, 2008 (AHRQ grant HS10399).

- *Allergen concentrations are lower than expected in Head Start classrooms.*

Researchers examined concentrations of common allergens (mold, cat and dog dander, mouse droppings, cockroach allergens) in dust samples collected in classrooms in 33 Arkansas Head Start centers in spring 2003. They found dog and mouse allergens in all of the facilities, dust mites in 27 facilities, cat allergens in 23 facilities, cockroach allergens in 7 facilities, and mold spores in 31 facilities. They suggest that exposure to low dose allergen concentrations in a preschool setting may play an important role in the development of allergies and asthma in young children. Perry, Vargas, Bufford, et al., *Ann Allergy Asthma Immunol* 100:358-363, 2008 (AHRQ grant HS11062).

- *Strep throat in children is associated with significant economic and noneconomic costs.*

Researchers in the Boston area surveyed 135 parents whose children had strep throat and were seen in two pediatric practices between October 1, 2005 and January 25, 2006. On average, children with strep missed nearly 2 days of school and passed along their infection to at least one other family member in 29 percent of families. Nearly half of parents missed an average of 1.8 days of work to care for sick children, and 80 percent of the caregivers were women. When the medical costs and costs for transportation and missed work are extrapolated, the burden of strep throat in the United States is between $224 and $539 million each year. Pfoh, Wessels, Goldmann, and Lee, *Pediatrics* 121(2):229-234, 2008 (AHRQ grant HS13808).

- *Outpatient and hospital visits have risen for Tennessee infants with lower respiratory tract infection.*

The number of Medicaid-insured infants in Tennessee who received medical care for bronchiolitis—lower respiratory tract viral infection—rose markedly between 1995 and 2003. During the study period, rates of bronchiolitis visits per 1,000 infant-years were: 238 outpatient visits, 77 ED visits, and 71 hospitalizations. Average annual rates for bronchiolitis visits jumped 41 percent between 1996 and 2003, from 188 visits per 1,000 infant-years in 1996-1997 to 265 visits in 2002-2003. Carroll, Gebretsadik, Griffin, et al., *Pediatrics* 122:58-64, 2008 (AHRQ grant HS10384).

- *Risk of protracted illness may be a barrier to reducing antibiotic use for otitis media.*

The author of this study performed a cost-utility analysis to gauge the risks and benefits of withholding antibiotics for otitis media, as recommended by the American Academy of Pediatrics. The study showed that for the benefits of the AAP guideline to at least balance the risks, the parents of a sick child considering foregoing a single antibiotic prescription must be willing to face the possibility that their child could be sick for an estimated 7 hours to 4 days, a prospect that might not be acceptable from the parents' perspective. The author notes that other approaches to reduce antibiotic use—such as wider use of flu vaccine—might be more successful. Meropol, *Pediatrics* 121:669-673, 2008 (AHRQ grant HS10399).

- *Community-wide interventions have some success in reducing antibiotic use among children.*

The rapid increase in antibiotic-resistant bacteria is widely believed to result from the high use of antibiotics, especially by young children. The research team tested an antibiotic education intervention in 16 small and large towns during three successive cold and flu seasons (2000-2003) in collaboration with three private insurers and a State Medicaid program. The intervention was aimed primarily at parents of children age 6 and younger and their physicians. The program was responsible for a 4.2 percent decrease in antibiotic prescribing for children 24 to 48 months of age and a 6 percent decline among those 48 to 72 months of age. Finkelstein, Huang, Kleinman, et al., *Pediatrics* 121(1):15-23, 2008 (AHRQ grant HS10247).

- *Study supports use of antibiotics in young children with bilateral otitis media.*

Researchers analyzed 1,216 cases of children with otitis media and found that very young children with infections in both ears may need antibiotics to kill the bacteria causing their discomfort. For 70 percent of children with ear infections in both ears, cultures were positive for the presence of bacteria. In contrast, only 57 percent of children with infection in one ear had bacteria present. The researchers suggest that the wait-and-see approach recommended for treating children with ear infections should be set aside for children age 2 and younger who have infection in both ears. McCormick, Chandler, and Chonmaitree, *Pediatr Infect Dis J* 26(7):583-588, 2007 (AHRQ grant HS10613).

- *Some doctors do not follow guidelines for use of tympanostomy tubes.*

Researchers reviewed the records of 1,046 children seen for otitis media in five New York City hospitals in 2002 and found that 75 percent of the children had surgery for tympanostomy tube insertion at less than the 42-day mark, and more than 50 percent had surgery after fewer than 77 days of inflammation. Two clinical practice guidelines caution against insertion of ear tubes, particularly before the 90-day mark. These surgeries may indicate overuse of ear tubes, note the researchers, and they may be the result of pressure by parents to help their child who is in pain. Keyhani, Kleinman, Rothschild, et al., *Pediatrics* 121(1), 2008; online at www.pediatrics.org (AHRQ grant HS10302).

- *Smoking in the home leads to ED visits and hospital stays for lung problems in young children.*

Smoking inside the home may more than double the risk of a young child having an ED visit and more than triple their risk of a hospitalization for a respiratory condition, according to this study. Researchers examined data on health care use, expenditures, and bed days for 2,759 children aged 4 and younger and linked that data to reports of smoking inside the home. They also found that indoor smoking was costly; it was associated with $117 in additional health care expenditures for each child exposed to indoor smoking, or $415 million in annual health expenditures for young children in the United States. There were no significant effects of living with adult smokers who smoked outside the home. Hill and Liang, *Tob Control* 17:32-27, 2008 (AHRQ Publication No. 08-R050)* (Intramural).

- *Rhinoviruses are associated with numerous hospitalizations of children under age 5.*

According to this study, rhinoviruses (which are the usual cause of the common cold) are an important cause of childhood hospitalizations for acute respiratory infection, especially among children with a history of asthma or wheezing. In 2000 and 2001, 26 percent of children hospitalized in two States for respiratory symptoms or fever

tested positive for rhinovirus infections. Historically, respiratory syncytial virus (RSV) has been regarded as the predominant virus associated with hospital stays for acute respiratory infection in young children. However, this study detected more rhinoviruses (26 percent) than RSV (20 percent) among children younger than age 5. Miller, Lu, Erdman, et al., *J Infect Dis* 295:773-781, 2007 (AHRQ grant HS13833).

- *Children with ear infections may acquire more strains of bacteria if they have been vaccinated for pneumonia.*

Researchers enrolled 417 children aged 6 months to 4 years between September 1995 and December 2004 to study the impact of the PCV7 pneumonia vaccine on nasopharyngeal colonization with various types of bacteria. They found that although the pneumonia vaccine reduced the overall incidence of acute otitis media, children with ear infections who had been vaccinated with PCV7 acquired significantly more bacteria types than nonimmunized children. Revai, McCormick, Patel, et al., *Pediatrics* 117(5):1823-1829, 2006 (AHRQ grant HS10613).

- *Short hospital stays and pulse oximetry can quickly identify failure of amoxicillin treatment in children with severe pneumonia.*

Researchers examined data from a previous trial of orally administered amoxicillin vs. injectable penicillin for the treatment of severe pneumonia in children aged 3 to 59 months. They found that a 12- to 24-hour period of observation in the hospital, ideally with pulse oximetry to measure oxygen saturation, is needed to identify children whose oral amoxicillin treatment has failed and who will need additional treatment. One-fifth of the children in the study needed supplemental oxygen at least once during the first 24 hours of observation. Fu, Ruthazer, Wilson, et al., *Pediatrics* 118(6), 2006; online at www.pediatrics.org (AHRQ grant T32 HS00060).

- *Tympanometry can indicate the probability of middle ear effusion in children under age 3.*

Traditionally, clinicians have diagnosed middle ear effusion using an otoscope, but visualizing the eardrum and interpreting findings are problematic using this approach in infants and young children. According to this study, tympanometry is more effective than an otoscope in diagnosing middle ear effusion in very young children. The researchers compared tympanometric findings and otoscopic diagnoses in a diverse sample of 3,686 otherwise healthy children aged 3 or younger. Smith, Paradise, Sabo, et al., *Pediatrics* 118(1):1-13, 2006 (AHRQ grant HS07786).

- *Researchers examine trends in antibiotic use among children.*

From 1996 to 2001, children's use of antibiotics sharply declined by 8.5 percent overall and 5.1 percent for respiratory tract infections. This decline followed the launch of several national campaigns to promote the appropriate use of antibiotics. An analysis of data from AHRQ's Medical Expenditure Panel Survey found reductions in use among all subgroups of children. However, the decline in overall antibiotic use for white children was more than double the decline for black or Hispanic children. Miller and Hudson, *Med Care* 44(5 Suppl):36-44, 2006 (AHRQ Publication No. OM-06-0074, for single copies of the journal)* (Intramural).

- *Pocket card facilitates shared parent/physician decisionmaking about treatment for acute otitis media.*

A simple pocket card has been developed to help physicians and parents work together to decide on the appropriate treatment for a child with

acute otitis media (AOM). The pocket card combines a parent's assessment of the child's symptoms (using a scale of facial expressions) with the clinician's assessment of tympanic membrane inflammation and middle ear appearance (using an otoscopy scale) to determine AOM severity. After considering this rating of AOM severity, the child's age, and the presence or absence of other risk factors, the clinician and parent can decide on the appropriate treatment plan. Friedman, McCormick, Pittman, et al., *Pediatr Infect Dis J* 25(2):101-107, 2006 (AHRQ grant HS10613).

- *Four clinical factors can help diagnose pneumonia in children seen in the ER.*

This study involved 510 children aged 2 to 59 months who arrived in the emergency department of one Cincinnati hospital during the period 2000-2002. The children presented with a cough and one or more of the following symptoms: labored, rapid, or noisy breathing; chest or abdominal pain; and/or fever; 8.6 percent of children had x-ray evidence of pneumonia. The children who had pneumonia differed from those who did not on four characteristics: older age (20.9 vs. 14.8 months), faster respiratory rate (49.8 vs. 42.7 breaths per minute), lower oxygen saturation (95.5 vs. 97.8), and nasal flaring (22.7 vs. 7.7 percent). Mahabee-Gittens, Grupp-Phelan, Brody, et al., *Clin Pediatr* 44:427-435, 2005 (AHRQ grant HS11038).

- *Parents are more satisfied when doctors prescribe antibiotics for their child's cough or cold symptoms.*

Children receive an average of two to three antibiotic prescriptions a year, many of which are unnecessary. Clinicians believe that parents will be more satisfied with their office visit when antibiotics are prescribed, and findings from this study suggest they are right. Researchers interviewed 378 parents of children 2 to 10 years of age who were seen at a pediatric clinic for cough and cold symptoms. Nearly half (47 percent) received antibiotics at the initial visit, and their parents gave higher satisfaction scores (9.25 on a 10 point scale) compared with parents whose children did not receive antibiotics (8.95). When children received antibiotics at a subsequent visit, the parents' scores averaged 7.25, compared with 6.25 for parents of children who did not receive antibiotics. Christakis, Wright, Taylor, and Zimmerman, *Pediatr Infect Dis J* 24(9):1-4, 2005 (AHRQ grant HS13195).

- *Doctors still prescribe antibiotics for over half of children with sore throats.*

Prescribing of antibiotics for sore throats—most of which are viral—has declined over the last few years, from 66 percent of visits in 1995 to 54 percent of visits in 2003. Nevertheless, doctors still are ordering antibiotics for more than half of children who have a sore throat. With more than 7 million pediatric visits each year for sore throat, inappropriate use of antibiotics continues to be a serious problem. Linder, Bates, Lee, and Finkelstein, *JAMA* 294(18):2315-2322, 2005 (AHRQ grants HS14563 and HS13908).

- *Researchers compare immediate antibiotic treatment with watchful waiting for nonsevere acute otitis media (AOM) in children.*

This study found that immediate antibiotic treatment for nonsevere AOM in children 6 months to 12 years provided superior early results compared with watchful waiting, but results were nearly identical between the two groups at 30 days. The study involved 112 children who were randomized to receive immediate antibiotics (amoxicillin and symptom medication) and 111 children who were randomized to watchful waiting (symptom medication only). Two-thirds of the children in the watchful waiting group completed the study without needing antibiotics. McCormick, Chonmaitree, Pittman, et al., *Pediatrics* 115(6):1455-1465, 2005 (AHRQ grant HS10613). See also *Trends in Children's Antibiotic Use: 1996-2001*, MEPS Research Findings No. 23 (AHRQ Publication No. 05-0020)* (Intramural).

- *Few physicians initially try watchful waiting for children with nonsevere acute otitis media.*

The investigators surveyed 160 physicians and 2,054 parents of children younger than age 6 in 16 Massachusetts communities about their attitudes toward watchful waiting in children with nonsevere AOM. A majority of physicians reported at least occasional use of watchful waiting, but few used it frequently. For example, 38 percent of physicians treating children aged 2 or older said they never or almost never used watchful waiting, 39 percent reported occasional use, and 6 percent said they used it most of the time. About one-third of parents reported that they would be satisfied if their doctor recommended watchful waiting, 26 percent said they would be neutral, and 40 percent said they would be somewhat or extremely dissatisfied. Finkelstein, Stille, Rifas-Shiman, and Goldmann, *Pediatrics* 115(6):1466-1473, 2005 (AHRQ grant HS10247).

- *Pneumococcal carriage seems to be more prevalent in communities that have more children in day care.*

Children often carry the pneumococcal bacteria that can cause pneumonia, ear infections, and other illnesses, but carriage rates differ from one community to another. Factors such as

age and number of siblings account for some of the differences, but other factors—such as the proportion of children in a community who attend child care centers—also play a role. In this study, the researchers examined data on asymptomatic children in 16 Massachusetts communities and found that the odds of carriage were two to three times as high for youngsters attending child care centers compared with those were not in child care. Huang, Finkelstein, and Lipsitch, *Clin Infect Dis* 40:1215-1222, 2005 (AHRQ grant HS10247).

- *Use of alcohol-based hand gel may reduce transmission of respiratory illnesses in homes with young children who attend day care.*

The researchers analyzed transmission rates for respiratory and gastrointestinal (GI) illnesses among 208 ethnically diverse families with children enrolled in child care who were treated at five suburban practices in the Boston area. A survey of the families revealed that a total of 1,545 respiratory and 360 GI illnesses occurred in the families from November 2000 to May 2001. Of these, 54 percent of the illnesses were brought into the home by children younger than 5. Twenty-two percent of respondents reported use of alcohol-based hand gels, and 33 percent reported always washing their hands after blowing or wiping a nose. After adjusting for education, insurance status, and other factors, the researchers concluded that hand gels had a protective effect against respiratory illness transmission in the home. Lee, Salomon, Friedman, et al., *Pediatrics* 115(4):852-860, 2005 (AHRQ grant T32 HS00063).

Palliative/End-of-Life Care

Palliative care seeks to enhance quality of life for children who are living with life-threatening or terminal conditions, regardless of whether they are being cared for in the hospital, in a hospice facility, or at home. Palliative treatments focus on the relief of symptoms (e.g., nausea, pain, shortness of breath) and conditions such as loneliness and fear that cause distress and detract from the child's enjoyment of life. Research has shown that the palliative care provided to adults may be inappropriate for children. AHRQ research in this area is focusing on identifying strategies to deliver appropriate and effective palliative and end-of-life care for children and adolescents.

- *Education and experience increase nurses' comfort and confidence in providing palliative care to dying children.*

Nurses with more years of nursing experience, more education in palliative care, and a more hopeful attitude are more comfortable and feel more confident in providing palliative care to dying children than other, less experienced nurses. More experienced nurses also find it less difficult to talk about death and dying with children and their families, according to a 2005 survey of 410 nurses at a large, urban children's hospital. Feudtner, Santucci, Feinstein, et al., *Pediatrics* 119:186-192, 2007 (AHRQ grant T32 HS00002).

- *Collaboration between hospital- and community-based palliative care providers could improve care for dying children.*

Most hospice and home care agencies are oriented toward care for terminally ill adults and are not well-equipped to provide palliative care for children who are dying at home. According to this study, better collaboration between hospital and community palliative care services could improve end-of-life care for these children. The Pediatric Advanced Care Team (PACT) at the Children's Hospital of Philadelphia developed a program that fosters joint ventures between such services in five States. In evaluations of the 5-year-old program, community-based providers felt it had helped them to learn about caring for children with complex chronic conditions and how to talk to families about death and dying, as well as provide grief and bereavement services. Carroll, Santucci, Kang, and Feudtner, *Am J Hosp Palliat Care* 24(3):191-195, 2007 (AHRQ grant T32 HS0002) .

- *Children with complex chronic conditions are more likely to die at home than in the hospital.*

Nearly one-fourth of U.S. children who died between 1989 and 2003 suffered from a complex chronic condition such as congenital heart disease, cancer, or neuromuscular disease. During that period, there was a shift in the proportion of children dying in the hospital. Researchers cite several reasons for the shift from hospital to home care of terminally ill children. These include technological advances—such as tube feeding and home ventilators—that may allow more medically fragile children to be cared for at home and increased availability of home care and hospice services for children. Feudtner, Feinstein, Satchell, et al., *JAMA* 297(24):2725-2732 (AHRQ grant T32 HS00002).

- *DNRs for terminally ill children may not be honored by public schools.*

Researchers surveyed personnel from school districts in 81 U.S. cities about written policies or procedures for student DNRs and compared school policies with relevant State laws from all 50 States and the District of Columbia. Most (80 percent) of the school districts

surveyed did not have policies for dealing with student DNRs. Also, 76 percent of those surveyed indicated they either would not honor student DNRs or were uncertain about whether they could honor them. Nineteen school districts reported that they honor student DNRs, but 13 of them have no laws to protect school personnel from civil or criminal liability for withholding CPR. Kimberly, Forte, Carroll, and Feudtner, *Am J Bioeth* 5(1):59-65, 2005 (AHRQ grant T32 HS00002).

Preventive and Developmental Services

The majority of injuries and deaths in children and adolescents are preventable. Although the importance of preventive services has been demonstrated, there still are barriers, flaws, and disparities in the content and delivery of clinical preventive services.

- *Hospital rates for intussusception declined 25 percent from 1993 to 2004.*

Rotavrius is the most common cause of severe gastroenteritis in young children, and a new rotavirus vaccine was introduced in 2006. A previous vaccine was withdrawn in 1999 after it was associated with intussusception in infants. Researchers compared annual intussusception hospitalization rates before and after introduction of the new vaccine, and found that the rates have remained stable since 2000, with about 35 cases per 100,000 infants. They note that the downward trend might reflect a true reduction in the incidence of severe intussusceptions, but it also could reflect changes in medical management that do not require hospitalization. Tate, Simonsen, Viboud, et al., *Pediatrics* 121, 2008; online at www.pediatrics.org (AHRQ Publication No. 08-R071)* (Intramural).

- *Hospital admissions for pneumonia have declined for infants immunized with pneumonia vaccine.*

Since 2000, U.S. infants have been routinely immunized with a pneumonia vaccine that has markedly reduced hospitalizations for pneumonia related to *Streptococcus pneumoniae* among children younger than 2 years. By the end of 2004, pneumonia hospital admission rates had declined by 39 percent for children in this age group, representing a decline of about 41,000 admissions in 2004. At the same time, there was no significant change in outpatient visits for pneumonia in this age group, suggesting that the decline in hospital admissions was not due to a shift to outpatient care. Grijalva, Nuorti, Arbogast, et al., *Lancet* 369:1179-1186, 2007 (AHRQ grant HS16784).

- *Pneumonia vaccine has resulted in more childhood infections with some nonvaccine serotypes.*

Although the pneumococcal conjugate vaccine has reduced infection with *S. pneumoniae* serotypes targeted by the vaccine, it has increased infection with some nonvaccine serotypes among children in Massachusetts, according to this study. Some 3 years after the vaccine's introduction, children under age 2 in that State suffered a significant increase in pneumonia due to a multidrug-resistant strain of the NVT 19A, which has emerged as the most frequent cause of invasive pneumococcal disease in Massachusetts. The researchers conclude that the *S. pneumonia* strains colonizing healthy children in Massachusetts have undergone substantial shifts since the introduction of the vaccine. Pelton, Huot, Finkelstein, et al., *Pediatr Infect Dis J* 26(6):468-472, 2007 (AHRQ grant HS10247).

- *Flu vaccinations increased among childcare staff when free immunizations were offered.*

Researchers evaluated the impact of free on-site vaccination on childcare staff vaccination rates during four flu seasons: 2002-2003, 2003-2004, 2005-2006, and 2006-2007. Free on-site vaccinations were offered in the 2003-2004 and 2006-2007 seasons. Vaccination rates among childcare workers were markedly higher in the two intervention seasons (51 percent in 2003-2004, 45 percent in 2006-2007) compared with the other two seasons (28 percent in 2002-2003, 26 percent in 2005-2006). One-third of those vaccinated said they would not have been vaccinated if they had to pay for it. Lee, Thompson, Lautenbach, et al., *Infect Control Hosp Epidemiol* 29(5):465-467, 2008 (AHRQ grant HS10399).

- *Computer kiosks can help parents in urban, low-income communities learn about their children's health.*

Researchers examined use of three touchscreen computer kiosks at sites in low-income, urban neighborhoods in Seattle. Each kiosk included 14 modules—10 focused on prevention and safety, and three focused on screening for developmental delay, tuberculosis, and attention deficit hyperactivity disorder. In all, parents completed 1,846 kiosk sessions, with nearly half of the sessions taking place at McDonald's. Although less than half of the parents had graduated from high school and more than one-quarter had never used the Internet, most found the kiosk easy to use and the information easy to understand. Half of the parents said they intended to talk to their child's doctor about what they had learned. Thompson, Lozano, and Christakis, *Pediatrics* 119:427-434, 2007 (AHRQ grant HS13302).

- *Parental visits to preventive health Web sites may enhance preventive care provided to children.*

Due to time and other constraints, pediatricians spend less than 10 minutes of well-child visits discussing preventive care. This study found that access to a prevention-focused Web site can prompt parents to bring up prevention topics with their child's provider during well-child visits and also can increase parental and physician adoption of preventive measures. Christakis, Zimmerman, Rivara, and Ebel, *Pediatrics* 118(3):1157-1166, 2006 (AHRQ grant HS13302).

- *Study supports recommendation to extend influenza vaccination to children older than age 2.*

Influenza causes significant complications, more hospitalizations, and increases care costs among children older than age 2, according to this study. These findings provide support for the 2006 recommendation by the CDC to expand the group of people who should get annual flu shots to include children aged 24 to 59 months. The researchers estimate that the new guideline would target 80 percent of children who are hospitalized for influenza each year. Ampofo, Gesteland, Bender, et al., *Pediatrics* 118(6):2409-2417, 2006 (AHRQ grant HS11826).

- *A substantial delay in administering the first dose of hepatitis B vaccine may lead to underimmunization of children.*

Researchers studied children enrolled in five large U.S. provider groups to evaluate the association between delay in the hepatitis B birth dose and a child's probability of being underimmunized at 24 months. The most substantial decreases in vaccine coverage at 24 months occurred in the two provider groups that delayed the first hepatitis B vaccine dose from birth to 45 days or 6 months of age. Children in these provider groups were about three times as likely to be underimmunized at 24 months of age compared with baseline. Lin, Kleinman, Chan, et al., *Pediatrics* 6(31), 2006; online at www.pediatrics.org (AHRQ grant T32 HS00028).

- *Two studies find low levels of preventive care and suboptimal provision of anticipatory guidance.*

Researchers studied 44 private pediatric and family medicine practices in North Carolina and found low levels of preventive care, with substantial variation among practices. Only 39 percent of children received three of four recommended preventive services: immunizations, testing for anemia, tuberculosis testing, and lead screening by age 2. The range among clinics was 2 to 88 percent. On average, physicians spent less than 2.5 minutes of each well-child visit on anticipatory guidance (i.e., counseling parents about child development, injury prevention, nutrition, and other topics). Rosenthal, Lannon, Stuart, et al., *Arch Pediatr Adolesc Med* 159:456-463, 2005 (AHRQ grant HS08509).

- *Altering the vaccination schedule for RotaShield could greatly lower the risk of intussusception.*

RotaShield, a vaccine intended to prevent severe rotavirus diarrhea among infants and children, was withdrawn in July 1999 because of a link between the vaccine and intussusception (intestinal obstruction) in vaccinated infants. These researchers found that the incidence of intussusception associated with the first dose of RotaShield increases with age (infants 90 days and older accounted for 80 percent of cases), and that altering the vaccination schedule could markedly reduce the risk. They calculated that a two-dose neonatal vaccination schedule administered at 0-29 days and 30-59 days of age would lead to, at most, a 7 percent increase in the incidence of intussusception above the annual background incidence. Simonsen, Viboud, Elixhauser, et al., *J Infect Dis* 192:S36-S43, 2005 (AHRQ Publication No. 06-R002)* (Intramural).

Quality of Care/Patient Safety

To improve quality of care and patient safety, researchers are developing quality measures, analyzing medical injuries, and assessing the usefulness of diverse strategies to enhance care.

- *Children do not benefit as much as adults from hospital computer order entry systems.*

Researchers collected data on 627 children hospitalized in a pediatric surgical or medical unit, pediatric intensive care unit, or a neonatal intensive care unit either before or after implementation of a commercial computerized physician order entry system (CPOE). Medication error rates were not significantly different after implementation of CPOE, even though studies have shown reductions of up to 55 percent in serious medication errors in adults following introduction of CPOE. The researchers note that the system they evaluated was not optimally designed to prevent common pediatric medication errors, such as mistakes in the use of weight-based dosing calculations. Walsh, Landrigan, Adams, et al., *Pediatrics* 121(3), 2008; online at www.pediatrics.org (AHRQ grant HS13333).

- *Voluntary reporting and other strategies identify adverse drug events in children.*

The best approach for detecting pediatric adverse drug events (ADEs) involves use of voluntary reporting in tandem with targeted chart review and computerized surveillance, according to researchers. They examined all ADEs

detected by one hospital's computerized surveillance and safety reporting systems over a 1-year period. Of the 849 errors entered into the reporting system, 93 caused patient harm. The two methods of detecting ADEs did not duplicate each other but were complementary. Ferranti, Horvath, Cozart, et al., *Pediatrics* 121, 2008; online at www.pediatrics.org (AHRQ grant HS14882).

- *Multiple prescriptions are linked to preventable drug reactions in children.*

Children's medications come in tablets, drops, and liquids, and in many cases, the dose depends on the child's weight. Children who are prescribed multiple drugs are at increased risk for experiencing a preventable adverse drug event (ADE). Researchers studied data on 1,689 children who were seen from July 2002 to April 2003 at six sites in Boston and received a total of 2,155 prescriptions. Of these, there were 283 ADEs in 242 children (14 percent), and 70 percent of the ADEs occurred when parents were administering the medication. Fifty-seven of the ADEs were preventable. Zandieh, Goldmann, Keohane, et al., *J Pediatr* 152:225-231, 2008 (AHRQ grant HS11534).

- *Pediatricians don't always pursue answers to questions that arise during medical visits.*

Researchers observed 890 visits with 35 general pediatricians; 19 percent of the visits involved children with special health care needs. Nearly 20 percent of the visits prompted unanswered questions, of which 60 percent were deemed important or very important by physicians. Physicians said they intended to purse answers to half of the questions but actually only pursued answers for about 28 percent of questions. They cited lack of time and inadequate information resources as barriers to getting the information they needed to answer the questions. Unanswered questions arose nearly twice as often for children with special health care needs as for other children. Nolin, Sharp, and Firth, *Ambul Pediatr* 7(5):396-400, 2007 (AHRQ grant HS11826).

- *Pediatricians appear less likely than other physicians to exhibit race bias or harbor stereotypes.*

Researchers surveyed academic pediatricians about their implicit and explicit racial attitudes and stereotypes using a specially designed test. To measure quality of care, subjects were asked how they would treat patients using four pediatric vignettes (pain control, urinary tract infection, ADHD, and asthma). Each participant was given two black and two white patients; most of the pediatricians were white, and 93 percent were American-born. The majority of pediatricians reported no difference in feelings toward racial groups; there was a much smaller implicit preference for whites relative to blacks than found with other physicians. More than 1 million individuals have taken the race/attitude test. Sabin, Rivara, and Greenwald, *Med Care* 46(7):678-685, 2008 (AHRQ grant HS15760).

- *Distance-based quality improvement approach shows promise for improving pediatric immunization rates.*

Researchers randomly assigned 29 pediatric research network-based practices into year-long paper-based education or distance-based QI groups to examine differences in immunization rates at the end of the year. Baseline immunization rates of 88 percent or less for children aged 8 to 15 months were similar for the two groups. Practices in the paper-based group received only mailed educational materials. Those in the distance-based group participated in monthly conference calls, logged into e-mail discussion groups, and made use of a Web site that shares best practices and other information. Pediatricians in the QI group boosted their immunization rates by 4.9 percent compared with 0.8 percent for the paper-based education group. Slora, Steffes, Harris, et al., *Clin Pediatr* 47(1):25-36, 2008 (AHRQ grant HS13512).

- *Parents of Medicaid-insured children may have limited access to health information.*

Inappropriate use of antibiotics contributes to antibiotic-resistant infections, yet some parents continue to pressure doctors into prescribing antibiotics for children when they are not indicated (e.g., for viral infections). Researchers conducted a 3-year, educational intervention directed at parents of children ages 6 and younger in 16 Massachusetts communities (eight intervention, eight control). Parental knowledge about antibiotics improved with time in both intervention and control groups, particularly among parents of Medicaid-insured children. This may reflect limited access of parents of Medicaid-insured children to health-related information from other sources. Huang, Rifas-Shiman, Kleinman, et al., *Pediatrics* 119:698-706, 2007 (AHRQ grant HS10247).

- *Family-centered, high quality primary care is linked to fewer nonurgent ED visits by children.*

Researchers used data from the 2000-2001 and 2001-2002 Medical Expenditure Panel Survey to examine parental reports on the quality of primary care with respect to family-centeredness, timeliness, and access to care. Of the nearly 9,000 children included in the study, parents rated access to care (88 percent), family-centeredness (70 percent), and timeliness (56 percent) as high quality. Parental report of family-centered care

was associated with 49 percent fewer ED visits for children age 2 and younger; greater access was associated with 44 percent fewer nonurgent ED visits for children ages 3 to 11 and 56 percent fewer visits for children ages 12 and older. There was no association between timeliness and nonurgent ED use. Brousseau, Hoffmann, Nattinger, et al., *Pediatrics* 119(6):1131-1138, 2007 (AHRQ grant HS15482).

- *Study documents little interaction between doctors and parents/patients during pediatric visits.*

Most parents and children accept the doctor's treatment recommendations without discussion, even though studies have shown that patient participation results in better outcomes, according to this study. The researchers reviewed videotapes of 101 visits to 15 physicians for pediatric complaints and found that 65 percent of parents and children accepted the doctor's recommendation with no discussion of their preferences. They also found that parents and children were less inclined to stay quiet during longer visits, and discussion of treatment options occurred most often when the doctor and patient were female and the doctor had been practicing for several years. Cox, Smith, and Brown, *Pediatrics* 120, 2007; online at www.pediatrics.org (AHRQ grant HS13183).

- *Medication errors were made during half of the pediatric encounters at four rural EDs.*

Researchers identified the incidence, nature, and consequences of medication errors among all critically ill children treated at four rural EDs in California between January 2000 and June 2003. They found that medication errors occurred during the care of half of the children. Among the 69 children with medication errors, 16 percent involved errors that had the potential to cause harm, although none of the errors caused significant harm. Fifteen percent of the errors were due to erroneous physician orders (e.g., wrong dose, wrong medication, incorrect route, etc.). Marcin, Dharmar, Cho, et al., *Ann Emerg Med* 50(4):361-367, 2007 (AHRQ grant HS13179).

- *Most pediatricians endorse reporting errors to hospitals and disclosing them to parents.*

Researchers surveyed 439 pediatric attending physicians and 118 residents and found that most of them had been involved in a medical error. The pediatricians indicated their willingness to report errors to hospitals and disclose errors to patients' families, but they believe current reporting systems are inadequate and struggle with error disclosure. The researchers conclude that improving error reporting systems and encouraging physicians to report near misses, as well as providing training in error disclosure, could help prevent future errors and increase patient trust. Garbutt, Brownstein, Klein, et al., *Arch Pediatr Adolesc Med* 161:179-185, 2007 (AHRQ grants HS11890, HS14020).

- *Many children treated at pediatric hospitals receive at least one off-label medication.*

Many medications prescribed for children have not been formally studied in children, and most are not labeled for use in children. However, this study found that children treated at pediatric hospitals commonly receive at least one medication off-label, i.e., not approved by the FDA for their age. The researchers examined use of 90 drugs among children treated at 31 major children's hospitals across the Nation. At least one of the drugs was used off-label in more than three-fourths of children discharged from pediatric hospitals during the study. Children who were more seriously ill and had longer hospital stays were more likely to receive off-label drugs than other patients, as were patients who were older than 28 days, underwent surgery, or died in the hospital. Shah, Hall, Goodman, et al., *Arch Pediatr Adolesc Med* 161:282-290, 2007 (AHRQ grant HS14009).

- *Doctor/patient interaction is enhanced when the child is accompanied by the mother and/or the child is female.*

Children who actively participate in their care tend to manage their chronic disease better and reduce their use of health care; also, when children and parents actively participate in conversations during visits with the pediatrician, more information is exchanged and the patient/provider relationship is enhanced. In this study, girls did twice as much relationship-building as boys, and their pediatricians gathered 34 percent more information. Also, when the father accompanied the child instead of the mother, relationship-building was reduced 76 percent, and information given by the physician was reduced 14 percent. The sex of the physician had no significant effect on participation. For this study, the researchers examined videotapes of 100 visits to pediatricians. Cox, Smith, Brown, and Fitzpatrick, *Patient Educ Counsel* 65:320-328, 2007 (AHRQ grant HS13183).

- *Parents of children with cancer want as much information as possible about their child's prognosis.*

Researchers surveyed 194 parents whose children were treated for cancer and their physicians at a Boston medical center. The majority of parents wanted as much information as possible about their child's prognosis even though they found it upsetting. One-third of parents said the oncologist did not initiate a discussion about prognosis, and this limited information may inappropriately alter the choices parents make about

treatment. The researchers conclude that parents have the capacity to hope for a cure while simultaneously preparing for the possibility of death, but they need information to do so. Mack, Wolfe, Grier, et al., *J Clin Oncol* 24(33):5265-5270, 2006 (AHRQ grant T32 HS00063).

- *Researchers examine ways to improve the quality of pediatric critical care.*

The Institute of Medicine's six aims for improving quality of care provide a useful framework to advance quality of care in pediatric intensive care. In this article, the authors discuss the relevance of the six aims, which are: safety, effectiveness, equity, timeliness, patient-centeredness, and efficiency. Slonim and Pollack, *Pediatr Crit Care Med* 6(3):264-269, 2005 (AHRQ grant HS14009).

- *Potential medication dosing errors occur often during outpatient pediatric care.*

According to these researchers, medication doses were incorrectly cited in about one in seven (15 percent) new prescriptions written during children's outpatient visits. Slightly more than half of these incorrect dosages involved potential overdoses. Young and medically complex children, who are most vulnerable to potentially serious adverse drug events, were most likely to be prescribed potential drug overdoses. These findings were based on an analysis of pharmacy data from three HMOs for 1,933 children. McPhillips, Stille, Smith, et al., *J Pediatr* 147:761-767, 2005 (AHRQ grants HS10391 and HS11843; AHRQ contract 290-00-0015).

- *Real-time safety audits can detect a broad range of errors in neonatal intensive care units.*

The researchers implemented a real-time audit system, including a 36-item patient safety checklist, in a 20-bed NICU in Vermont. The checklist included errors associated with delays in care, equipment failure, diagnostic lab and radiology exams, information transfer, and noncompliance with hospital policy. A research nurse used the checklist to perform safety audits during and after morning work rounds three times a week. The audits detected 338 errors during the 5-week study period, including unlabeled medication at the patient's bedside, missing or inappropriately placed ID bands, improper alarm settings on pulse oximeters, ineffective communication, and delays in care. Errors usually were detected at the patient's bedside. Ursprung, Gray, Edwards, et al., *Qual Safety Health Care* 14:284-289, 2005 (AHRQ grant HS11583).

- *Treatment recommendations published during physicians' residencies impact their future clinical practice.*

Using clinical vignettes, researchers found that pediatricians recommended sepsis workups 82 percent of the time, and family physicians recommended them 68 percent of the time, for febrile infants less than 3 months of age. These recommendations were more common among pediatricians who completed residency from 1975 to 1980 and family physicians who completed residency from 1981 to 1987, when specialty-specific journals published recommendations for sepsis workups of febrile infants. Cox, Smith, and Bartell, *Eval Health Prof* 28(3):328-348, 2005 (AHRQ grant HS13183).

- *Nurses have an important role in preventing medication errors in hospitalized children.*

These researchers suggest several practical steps that nurses should take to improve pediatric medication safety in the hospital. Examples include: reporting medication errors, double-checking drugs prescribed for off-label use, confirming patient information,

minimizing distractions during medication administration, communicating with parents and involving them in patient care, and many others. Hughes and Edgerton, *Am J Nurs* 105(5):36-42, 2005 (AHRQ Publication No. 05-R052)* (Intramural).

- *National reports focus on health care quality and disparities.*

AHRQ has released the 2007 national reports on health care quality and disparities. These reports, which are prepared by AHRQ annually, provide measures of quality and disparities for the U.S. population, including children and adolescents. The reports cover four key areas of health care—effectiveness, safety, timeliness, and patient centeredness—and present data on several clinical conditions, including cancer and respiratory diseases. *National Healthcare Quality Report* (AHRQ Publication No. 08-0040) and *National Healthcare Disparities Report* (AHRQ Publication No. 08-0041)* (Intramural).

Other Research

- *Results from the Healthy Steps for Young Children program appear promising.*

Even though the Healthy Steps for Young Children (HS) program ended at 3 years, its impact was sustained among 5-year-old children, according to this study. A smaller percentage of HS parents slapped their child in the face or spanked their child with an object, compared with parents in a non-HS group. Also, HS parents were more likely to negotiate with their child, ignore misbehavior, and encourage children to read and use car seat restraints than parents in the non-HS group. Minkovitz, Strobino, Mistry, et al., *Pediatrics* 120(3), 2007; online at www.pediatrics.org (AHRQ grant HS13086).

- *Behavioral problems and reduced social skills linked to heavy TV viewing by young children.*

This study found that one in five children 2.5 to 5.5 years of age watched TV more than 2 hours a day, and more than 40 percent of 5-year-old children had TVs in their bedrooms. Timing of TV exposure had varying impact: heavy viewing by 2-year-olds was associated with later behavioral problems, while 5-year-olds with current heavy TV viewing had fewer social skills than their peers without such heavy viewing. Mistry, Minkovitz, Strobino, and Borzekowski, *Pediatrics* 120(4):762-769, 2007 (AHRQ grant HS13086).

- *Pediatric autopsies shed light on cause of death in more than half of cases.*

Researchers studied autopsy records of 100 children ages 1 to 24 who died at the Children's Hospital of Philadelphia in 2003 and 2004. In more than half of the cases, autopsies were able to clarify why the child died and gave parents a clearer explanation for their child's death. Having this information enabled 20 percent of the parents to make more informed decisions about having future children. The hospital also benefitted from autopsy results, especially in cardiac cases or when a metabolic or genetic diagnosis was difficult. Feinstein, Ernst, Ganesh, and Feudtner, *Arch Pediatr Adolesc Med* 161(12):1190-1196 (AHRQ grant T32 HS00002).

- *Study shows that differences in wording can have significant effects on parental responses to survey instruments.*

Researchers compared responses of parents of 66 children with cerebral palsy to three instruments commonly used to measure function and quality of life for pediatric orthopedic patients to determine consistency in answering the same or similar questions, the impact of variations in wording, and the effects of survey language (English or Spanish). Of the eight questions that overlapped, six had poor to fair agreement in parental responses; only the two questions with nearly exact wording had similar parental responses. Wren, Sheng, Hara, et al., *J Pediatr Orthopaed* 27(2):233-240, 2007 (AHRQ grant HS14169).

- *Visits to pediatric practice-based research networks appear to be comparable to national pediatric outpatient visits.*

Practice-based research networks—in which multiple primary care practices study similar clinical problems—have become an important feature of primary care research, yet the generalizability of their patient samples has been called into question. According to this study, there is no significant difference among the top five patient visit diagnoses between data from the Pediatric Research in Office Settings Network and the National Ambulatory Medical Care Survey. Thus, the network's patient population is reasonably representative of patients who are seen in other office-based pediatric primary care practices. Slora, Thoma, Wasserman, et al., *Pediatrics* 118(2), 2006; online at www.pediatrics.org (AHRQ grant HS13512).

- *Many evidence-based interventions shown to improve children's health are not being used in clinical practice.*

This paper describes the processes used and outcomes generated from the first Evidence-Based Practice Leadership Summit focused on children and adolescents. One outcome of the summit was launching of the new National Consortium for Pediatric and Adolescent Evidence-Based Practice. Examples of future initiatives include the development of evidence-based clinical practice guidelines, the use of mentors to improve the care and health

of children and adolescents, and new tools and resources to further evidence-based practice. Melnyk, Fineout-Overhold, Hockenberry, et al., *Pediatr Nurs* 33(6):525-529, 2007 (AHRQ grant HS11675).

- *AHRQ's Kid's database facilitates child health services research.*

In August 2001, AHRQ unveiled the Kids' Inpatient Database (KID), the Nation's first all-children's hospital care research database. It was developed for use in making national and regional estimates of children's treatment, including surgery and other procedures, and for estimating treatment outcomes and hospital charges. The database includes information on the hospital care of children from birth through age 18, regardless of insurance status. The KID contains information on the inpatient stays of about 1.9 million children at over 2,500 hospitals across the country in 2000. KID is a component of AHRQ's Healthcare Cost and Utilization Project (HCUP). For more information, go to the AHRQ Web site at www.ahrq.gov and click on "HCUP" (Intramural).

- *Pediatric disaster preparedness resource now available.*

Children have increased vulnerability to injury from catastrophic events because of their unique anatomic, physiologic, immunologic, and developmental characteristics. This new resource, which was prepared for AHRQ by the American Academy of Pediatrics, can assist in the development of local, State, regional, and Federal emergency response plans that recognize and address these differences. The resource is intended to increase awareness and encourage collaboration among pediatricians, State and local emergency response planners, health care systems, and others involved in planning and response efforts for natural disasters and terrorism. *Pediatric Terrorism and Disaster Preparedness: A Resource for Pediatricians* (AHRQ Publication Nos. 06-0056, full report, and 06-0048, summary).* Also available online at www.ahrq.gov/research/pedprep/resource.htm (Purchase order 05R000190).

- *Children's use of motor vehicle restraints may be linked to parental use of seat belts and mother's psychological distress.*

Researchers analyzed data on more than 6,200 children aged infant to 17 years and found that children whose mothers have emotional problems and/or don't use seat belts are less likely than other children to be restrained by car seats or seat belts themselves. Older children were especially likely to forgo seat belts if their mothers did. More than 35 percent of children were low users of restraints if their mothers also reported low use, compared with 6.1 percent of children whose mothers buckled-up every time or most of the time. Children were less likely to be restrained if their mother was older, black, or less educated or if they lived with a single parent, in a family of four or more members, in poverty, or in a rural area. Witt, Fortuna, Wu, et al., *Ambulatory Pediatr* 6:145-151, 2006 (AHRQ grant T32 HS00063).

- *Age is a better marker than height and weight for assessing the risk of air bag deployment.*

The government requires warnings on motor vehicles that children aged 12 and younger can be seriously injured or killed by an air bag. However, this study found that the risk of serious air-bag-related injury may extend to age 14 when children are seated in the right front passenger seat in vehicles equipped with air bags. Researchers analyzed data for nearly 3,800 children aged 1 month to 18 years and found that children aged 15 to 18 years who were involved in frontal collisions were 81 percent less likely than younger children to be injured when an air bag deployed. Changes in body composition and bone mass associated with the onset of puberty (typically age 11 for girls and age 13 for boys) may play a role in susceptibility to injury from air bags, note the researchers. Newgard and Lewis, *Pediatrics* 115(6):1579-1585, 2005 (AHRQ grant F32 HS00148).

- *U.S. children use electronic media an average of more than 4 hours a day.*

Researchers conducted a survey of parents during well-child office visits to assess children's media use and parental oversight and control of media use. Children in this study were using electronic media (e.g., TV, video games, and computers) an average of 4 hours a day, or twice the recommended limit of 2 hours. More than half of parents used some type of strategy to control and inform their children's use of electronic media. About 23 percent used a restrictive approach, and 22 percent used an instructive approach, while some parents used multiple approaches. Only 7 percent of parents allowed unlimited media use and engaged in no mediation strategy. Barkin, Ip, Richardson, et al., *Arch Pediatr Adolesc Med* 160:395-401, 2006 (AHRQ grant HS10913).

- *Anthrax in children is difficult to detect and treat.*

According to an AHRQ evidence report, difficulties in diagnosing anthrax in children may lead to dangerous delays in treatment for this often deadly infection. Symptoms of pediatric anthrax infection can be easily confused with those of more common illnesses. For example, the symptoms of

inhalational anthrax are similar to those of influenza. Also, there is little evidence about the effectiveness in children of interventions currently recommended for adults. *Pediatric Anthrax: Implications for Bioterrorism Preparedness*, Evidence Report/Technology Assessment No. 141 (AHRQ Publication No. 06-E013)* (contract 290-02-0017).

- *Home routines in minority families may impede the development and future school success of children.*

According to this study, black and Hispanic children younger than age 3 experience multiple disparities in home routines, safety measures, and educational practices/resources that could impede their healthy development and future school success. For example, minority parents were less likely than white parents to install stair gates or cabinet safety locks or to lower the temperature setting on hot water heaters to prevent scalding. Minority parents also were much less likely than white parents to read to their children daily, and they had fewer children's books in the home.

Flores, Tomany-Korman, and Olson, *Arch Pediatr Adolesc Med* 159:158-165, 2005 (AHRQ grant HS11305).

- *DVD shows clinicians how to care for children exposed to chemicals used in bioterrorism.*

This 27-minute training DVD provides a step-by-step demonstration of the decontamination process and instructs clinicians about the nuances of treating infants and children. A free, single copy of the DVD, *The Decontamination of Children*, is available (AHRQ Product No. 05-0036-DVD)* (AHRQ contract 290-00-0020).

For More Information

AHRQ's World Wide Web site (www.ahrq.gov) provides information on the Agency's children's health services research agenda and funding opportunities. In addition, AHRQ also offers a child and adolescent health e-mail update service to which users may subscribe (go to https://subscriptions.ahrq.gov and follow the prompts).

Further details on AHRQ's programs and priorities in child health services research are available from:

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Items in this program brief marked with an asterisk (*) are available free from the AHRQ Clearinghouse. To order, contact the AHRQ Clearinghouse at 800-358-9295, or send an e-mail to ahrqpubs@ahrq.hhs.gov. Please use the AHRQ publication number when ordering.

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