Introduction

Many diseases and disorders of childhood, adolescence, and adulthood can be prevented or lessened in severity if detected early. Regardless of the health professional or the setting, preventive care can be key to staying healthy throughout life.

Effective preventive care includes providing many kinds of screening, counseling, and immunization services: immunizing children against a range of diseases; routinely measuring children's height and weight; conducting hearing and vision screening regularly; counseling children and their parents about which foods to eat and which to avoid; talking to them about the importance of exercise in staying healthy throughout life; and screening those at risk for high cholesterol, sexually transmitted diseases, alcohol problems, tobacco, lead poisoning, and more.

This Program Brief presents an overview of research in progress and selected findings of research on preventive health services for children.

AHRQ's Prevention Research

The Agency for Healthcare Research and Quality (AHRQ) supports evidence-based research into the effectiveness of preventive services and quality improvement interventions for children and adolescents, and disseminates this information to health professionals, health plans, parents, and other groups. The next section highlights research in progress. Findings from published studies follow in the section on research findings.

Research in Progress

- Effectiveness of teen smoking cessation intervention tested in hospital emergency departments.
- Researchers are comparing health outcomes of home and office-based screening for chlamydia and gonorrhea.

Females aged 14 to 29 who were diagnosed with chlamydia trachomatis cervicitis are being randomized to home screening or office-based screening groups. Primary outcomes include adherence to screening and number of chlamydia infections detected. Secondary outcomes include number of gonorrhea infections, rates of treatment, and diagnosis of pelvic inflammatory disease.
disease, and prevalence of chlamydia infections at the end of the study. Roberta B. Ness, Principal Investigator (AHRQ grant H S10592).

- Does primary care access decrease respiratory ED visits?

This study compares use of the emergency department (ED) for respiratory problems with characteristics of the patient's primary care provider. The sample population comes from parents of children with asthma, otitis media and other respiratory problems who are enrolled in a Medicaid managed care organization. Robert A. Lowe, Principal Investigator (AHRQ grant H S09261).

- The role of a regular source of care for at-risk youth.

This project will determine disparities in use of physician services among adolescents, the mediating role of a regular source of care, and the relationship between a regular source of care and receipt of preventive care. Tanisha V. Canino, Principal Investigator (AHRQ grant F31H S00150).

- Do quality improvement interventions increase preventive services for adolescents?

A systems intervention for primary care providers in pediatric clinics in a large health maintenance organization is being implemented in three clinics and compared to the usual standard of care in two other clinics. The intervention involves training workshops, booster training, an adolescent health screening questionnaire, and a customized charting form. Investigators will assess provider and patient self-reports following routine well visits. Charles E. Irwin, Principal Investigator (AHRQ grant H S11095).

- Do urine tests increase chlamydia screening in teens?

Researchers are implementing and evaluating a quality improvement intervention at five clinics to improve screening for STDs among asymptomatic but sexually active teenagers. A designated nurse/medical assistant will receive training and support to improve the ascertainment of sexual activity among teenagers and will collect urine samples for STD screening. Findings will be compared with a concurrent control group of five clinics using the traditional physician-initiated STD screening model. Mary-Ann Shafer, Principal Investigator (AHRQ grant H S10537).

- An Internet intervention to increase chlamydia screening.

Study physicians will complete a year-long series of Internet learning modules that integrate case-based education with audit, feedback, and benchmarking of practice profiles. The interventions are expected to result in improved screening and treatment rates, and lowered rates of pelvic inflammatory disease among the 16- to 26-year-old patients who are the focus of the study. Jeroan J. Allison, Principal Investigator (AHRQ grant U 18H S11124).

- Evaluating computer decision support for preventive care.

A system that tracks preventive services and provides physicians with reminders will be implemented and change in parent and physician knowledge of preventive services assessed. This system will contain scanned-in documents in order to create tailored educational literature. Stephen Downs, Principal Investigator. (AHRQ grant H S09507).
• Increasing delivery of preventive services in private pediatric practices.

In this 4-year randomized trial, the researchers will implement and evaluate an intervention to increase rates of preventive services in 48 private pediatric practices in North Carolina. Pediatricians will be encouraged to develop practice-specific "office systems" that involve members of the office staff as a team to provide preventive care and patient education. Children on Medicaid, who are less likely to receive needed preventive services, will receive special attention. Peter A. Margolis, Principal Investigator (AHRQ grant HS08509).

Recent Findings

Several AHRQ supported studies demonstrate the value of preventive services for children.

• A regular source of preventive and acute care ensures the receipt of preventive services.

Based on surveys at two rural middle schools and two rural high schools, researchers found that rural adolescents without a regular source of care are much less likely to obtain preventive or acute care than adolescents with a regular source of care. Also, those with a regular provider are less likely to seek emergency care. The researchers suggest that regular preventive care ensures timely acute care and limits inappropriate emergency room use. Ryan, Riley, Kang, et al., Arch Pediatr and Adolesc Med 155:184-190, 2001 (AHRQ grant H S07045).

• The quality of primary care affects the rates of hospitalization for childhood illnesses.

Research using medical charts of a random sample of 614 children found that use of effective medications may prevent hospitalization of many children with asthma. For example, use of inhaled rather than oral bronchodilators, long-term anti-inflammatory therapy for children with moderate to severe disease, and short-term anti-inflammatory therapy as soon as an acute episode becomes worse frequently prevents a child's asthma from progressing to the point at which hospitalization becomes necessary. Homer, Szilagyi, Rodewald, et al., Pediatrics 98(1):18-23, 1996 (AHRQ grant H S06060).

The same research group compared medical records of children admitted to hospitals in Boston, New Haven, and Rochester. Results show a lower rate of pediatric hospitalizations in communities in which primary care physicians are more involved in the care of children before and during hospitalization. Perrin, Greenspan, Bloom, et al., Arch Pediatr Adolesc Med 150:479-486, 1996 (AHRQ grant HS06060).

More recently, AHRQ researchers assessed preventable illness and out-of-area travel of children by analyzing hospital discharge data in New York counties using AHRQ's Healthcare Cost and Utilization Project data. Findings show that children who live in areas with a higher availability of primary care physicians and hospital-based outpatient services are less likely to go to hospitals outside their local area for conditions such as asthma and diabetes. Basu and Friedman, Health Econ 10:67-78, 2001. Reprints (AHRQ Publication No. 01-R033) are available from AHRQ.*
AHRQ researchers investigate strategies to increase the delivery of preventive services to children.

- Study finds that office-based quality improvement systems significantly improve delivery of childhood preventive services.

Project staff worked with providers of primary care to children to develop tailored quality improvement systems to assess and improve the delivery of immunizations and screening for anemia, tuberculosis, and lead exposure. Office-based quality improvement systems included chart prescreening, risk assessment forms, flowsheets, reminder/recall systems and patient education materials, as well as redistribution of responsibilities among staff. After the period of assistance, the overall rates for all preventive services except tuberculosis screening increased by amounts that were both clinically and statistically significant. Margolis, Stevens, Bordley, et al., Pediatrics 108(3):e42, 2001 (AHRQ grant HS08509).

- Study finds that feedback and incentives do not increase provision of preventive care.

Investigators randomly assigned primary care sites serving children in a Medicaid health maintenance organization to one of three groups: a feedback group (physicians received written feedback about compliance scores); a feedback and financial incentive group (physicians received financial bonuses when compliance criteria were met); and a control group. Investigators evaluated compliance with pediatric preventive care guidelines through semiannual chart audits and found no significant difference in provision of preventive health services among the groups. Hillman, Ripley, Goldfarb, et al., Pediatrics 104:931-935, 1999 (AHRQ grant HS08509).

Studies examine factors that affect immunization rates for children and strategies to increase childhood immunizations.

- Linking clinical and public health approaches improves access for disadvantaged families.

According to investigators, linking primary care and public health efforts increases the availability and continuity of care for poor families with pregnant women and newborn infants. Their study included 93 Medicaid-eligible, first-time pregnant women in their third trimester and their subsequently born infants. Investigators tested the feasibility of linking home visits by public health nurses with assistance to primary care offices in the delivery of preventive services. Margolis, Lannon, Stevens, et al., Arch Pediatr Adolesc Med 150:815-821, 1996 (AHRQ grant HS07106).

- Studies vary in conclusions about the effects of potential litigation on immunization practices.

Claims that 30 percent of 2-year-olds had not received the recommended doses of diphtheria-tetanus-pertussis (DTP), polio, and measles-mumps-rubella vaccines prompted investigators to conduct a nationwide telephone survey of 1,236 physicians. Findings show that 32 percent of respondents overestimated the risk for serious adverse effects related to DTP vaccines, and 13 percent overestimated the risks of the measles vaccines. Among physicians who were not concerned about DTP-related risks, 15 percent were highly concerned about litigation. Lastly, 38 percent of physicians who were concerned about the adverse effects of DTP vaccines also were highly concerned about vaccine litigation. Zimmerman, Schlesselman, Mieczkowski, et al., Arch Pediatr Adolesc Med 152:12-19, 1998 (AHRQ grant HS08068).
Survey data of 1,165 pediatricians and 1,849 family physicians on their perceptions of legal and financial risks of providing childhood immunizations suggest that clinical factors (not concern about lawsuits) usually cause physicians to delay childhood immunizations. The researchers report that with few exceptions, liability issues were not significantly associated with vaccine practices, according to these survey data. Freed, Kauf, Freeman, et al., Arch Pediatr Adolesc Med 152:285-289, 1988 (AHRQ grant H S07286).

Researchers say lack of vaccination during acute care visits, overly cautious interpretation of contraindications, and lack of simultaneous administration of all needed vaccines cause physicians to defer age-appropriate vaccinations. The results of a nationwide telephone survey on the likelihood that physicians would vaccinate children with an upper respiratory infection (URI) were as follows: 4 percent of physicians who thought the risk for side effects was increased by URI were likely to vaccinate a child with a URI versus 55 percent who thought there would be no increased risk and 8 percent of physicians who thought the efficacy of the measles-mumps-rubella vaccine would decrease versus 83 percent who thought the efficacy would not be affected. In addition, 11 percent would not administer three injectable vaccines simultaneously based on beliefs about side effects, parental objections, and vaccine efficacy. Zimmerman, Schlesselman, Baird, et al., Arch Pediatr Adolesc Med 151:657-664, 1997 (AH R Q grant H S08068).

Investigators showed that significantly more children seen by primary care providers who received free vaccines were vaccinated on time compared with children seen by providers who did not receive free vaccines.

Economics has been suggested as a barrier to vaccination, but data that link clinician reports to actual immunization rates are limited. This study examined the relationship between clinicians’ self-report regarding likelihood of vaccinating and actual age at vaccination from a registry of children seen by the clinicians. Zimmerman, Mieczkowski, and Michel, Fam M ed 31(5): 317-323, 1999 (AH R Q grant H S08068).

Researchers develop a model that can be used to identify characteristics that impede or facilitate guideline adoption. The model also traces the steps from awareness to adoption and adherence to the guideline, and identifies factors that can slow or speed movement through the stages. Freed, Pathman, Konrad, et al., Matern Child Health J 2(4):231-239, 1998 (AH R Q grant H S07286).

A survey of pediatric nurse practitioners (PNPs) found that PNPs who received free vaccine supplies were less likely than those who did not receive free supplies to say they would refer children to public clinics for vaccinations. Researchers note that these results are similar to those from a survey of physicians, and discuss the disadvantages of referring children to public vaccine clinics. Zimmerman, VanCleve, Hyg, et al., Matern Child Health J 4(1):53-58, 2000 (AH R Q grant H S09527).

Data reflect the dependence of rural families on the public health system and the potential for successful health care delivery through public clinics. Based on an analysis of county-level immunization data, rural counties in 11 eastern States had average immunization completion rates 2.5
percent higher than metropolitan counties. The data were generated by State public health agencies in 882 counties and were controlled for socioeconomic characteristics. Slifkin, Clark, Strandhoy, et al., J Rural Health 13(4):334-341, 1997 (AHRQ contract 290-93-0038).

- Most primary care physicians recommend hepatitis B vaccination, although a number of concerns exist.

A telephone survey asked 1,236 primary care physicians to rate the importance of immunizing all young children against hepatitis B virus (HBV). Most physicians (78 percent) rated the importance of hepatitis B vaccine as high, 7 percent rated it as unimportant, and 15 percent gave it an intermediate rating. Eighty-five percent of pediatricians, 70 percent of general practitioners and 65 percent of family physicians gave high ratings for the vaccine’s importance. Zimmerman and Mieczkowski, J Fam Pract 47(5):370-374, 1998 (AHRQ grant HS08068).

AHRQ-supported research finds that some preventive services are not delivered to the extent they should be.

- Substantial variability seen in delivery of smoking cessation screening and counseling of adolescents.

This study describes the delivery of smoking prevention and cessation screening and counseling practices to adolescents, based on a self-reported survey of 564 pediatricians and family physicians. According to the authors, familiarity with smoking cessation guidelines, physician specialty and practice style with adolescents are associated with better delivery of tobacco cessation counseling. They recommend dissemination of preventive service recommendations through physician specialty organizations. Klein, Levine, and Allan, Arch Pediatr Adolesc Med 155:597-602, 2001 (AHRQ grant H S08192).

- Disparities in immunization of disadvantaged children found.

Researchers calculated immunization rates of rural and urban 2-year-old boys and girls. They found no significant differences in immunization rates between urban and rural children. However, low income, low family education, black or other minority race, unemployment, and female sex were associated with under-immunization. The under-immunization figures do not change even for children residing in States that purchase and distribute vaccines for all children to reduce cost and improve access to immunization. Lowery, Belansky, Siegel, et al., J Fam Pract 47(3):221-225, 1998 (AHRQ contract 290-93-0039).

- Most clinicians do not counsel parents about drowning prevention.

According to an analysis of 325 responses from pediatricians, family physicians, and pediatric nurse practitioners who serve families with young children, only one-third counseled parents about drowning prevention. The remaining two-thirds did not know that deaths due to drowning are more common than those due to poisoning and firearm injuries. Barkin and Gelberg, Pediatrics 104(5):1217-1219, 1999 (AHRQ grant H S00046).
AHRQ-supported investigators examine factors that affect delivery of preventive services to children.

- Investigators uncover predictors of reproductive health screening and counseling.

To determine the familiarity of family physicians with reproductive health clinical guidelines for adolescent patients, investigators surveyed a random sample of 354 physicians. Findings show that female physicians, younger physicians, physicians who regularly discuss confidentiality, and physicians who have a more positive attitude toward and familiarity with preventive care guidelines are more likely to provide reproductive health screening and counseling during adolescent visits. Kelts, Allan, and Klein, Fam Med 33(5):376-381, 2001 (AHRQ grant HS08192).

- Providers' attitudes predict injury prevention counseling.

A survey of 465 pediatric primary care providers reveals that providers' attitudes about injuries, not their knowledge about prevalence, affect which counseling topics they address. Results show that providers counseled parents of children age 5 and younger about prevention of car-crash related injury (66 percent); ingestion of poison (62 percent); drowning (32 percent); and firearm injury (16 percent). Barkin, Fink, and Gelberg, Arch Pediatr Adolesc Med 153:1226-1231, 1999 (AHRQ grant HS00046).

Several AHRQ-funded projects find positive effects of interventions to reduce teens' and preteens' risk behaviors.

- Interactive video game increases preadolescents' resolve not to smoke.

Children aged 10-11 who played the smoking prevention video game ARex Ronan™ at home for 1 week gained a better understanding of the physiological effects of smoking and strengthened their resolve not to smoke. The game is intended to strengthen antismoking attitudes and intentions not to begin smoking in children aged 10-12. Lieberman, J Ambulatory Care Manage 24:26-38, 2001 (AHRQ contract 213-92-0051).

- Computer game encourages adolescents to delay parenthood.

Study findings show that an interactive computer program can encourage adolescents to delay parenthood. During the 2-year study period, 250 adolescents participated. Teenagers who used the program knew more about the costs of having a child and were significantly more apt to value contraception, view a child as adding problems to a teen's life, and want to delay parenthood. Brown-Peterside and Laraque, Am J Pub Health 87(9):1563-1564, 1997 (AHRQ grant HS07399).

- Access to condoms in high schools increases safe-sex practices, but not teen sex.

Researchers evaluated a high school program where plastic packets containing two condoms, an instruction sheet, and a warning card were placed in baskets in four classrooms and outside the nurse's office. Results show the proportion of males who reported using condoms every time they engaged in vaginal intercourse increased from 37 to 50 percent. Also, the number of males who reported condom use at recently initiated first vaginal intercourse increased from 65 to 80 percent. The overall level of sexual activity did not increase, however. Schuster, Bell, Berry, et al., Fam Plann Perspect 30(2):67-72, 88, 1998 (AHRQ grant HS08055).
Prevention programs affect some risky behaviors in disadvantaged youth.

Disadvantaged, urban, black youths who participated in a community-based risk behavior-reduction program were more apt to postpone or stop risky behaviors. Stanton, Fang, Xiaoming, et al., Arch Pediatr Adolesc Med 151:398-406, 1997 (AHRQ grant H 07392).

Researchers make advances in prevention research methods.

In a study on the validity of 354 adolescents’ self-reported receipt of preventive services, results show they are aware of and can describe the preventive services they receive. Parental reports, medical charts, and physicians self-report were found to be less accurate. Klein, Craff, and Santelli, Health Serv Res 34(1):391-404, 1999 (AHRQ grant HS 08192).

Prevention Tools

- AHRQ’s Medical Expenditure Panel Survey (MEPS) to monitor child preventive services.

Beginning in 2001, the Child Health Supplement to the MEPS will ask parents whether their children received the following evidence-based clinical preventive services:
  - Measurement of height and weight
  - Blood pressure reading
  - Vision screening
  - Regular dental care
  - Healthy eating
  - Exercise
  - Use of automobile safety devices
  - Use of bicycle and motorcycle helmets
  - The harmful effects of smoking indoors.

Parents will also be asked whether their adolescent children were asked if they wanted to spend time alone with the health care provider at their last visit. Research strongly suggests that such private time is essential if adolescents and health care professionals are to have frank discussions about risky behaviors.

- AHRQ releases quality indicators (QIs) related to clinical preventive care for children.

Beginning fall 2001, AHRQ will make available enhanced and expanded quality indicator software for use with hospital administrative data sets. These AHRQ Quality Indicators (QIs) are expected to comprise separate software modules for prevention, inpatient quality, and patient safety. The first module/the Prevention Quality Indicators includes 16 indicators that represent ambulatory care sensitive conditions—conditions for which hospitalization might be avoided through high-quality primary care. Three of the prevention area-level indicators relate to care for children:
  - Low birth weight—Number of low birth weight infants per 100 births
  - Pediatric asthma—Number of admissions for pediatric asthma per 100,000 population
  - Pediatric gastroenteritis—Number of admissions for pediatric gastroenteritis per 100,000 population.

These indicators can be used by public health agencies, health care systems, and others interested in improving primary care for children as a “screening tool” to help flag potential problem areas in their communities. When available, the Prevention Quality Indicators (as well as the other AHRQ QIs) can be downloaded without charge from the AHRQ Web site.
Research Translation and Dissemination

Studies consistently show that it can take almost two decades before research published in academic journals is actually used in clinical practice or in policymaking. AHRQ has several efforts under way to get research findings on clinical preventive services for children into the hands of those who need the information.

U.S. Preventive Services Task Force

AHRQ convenes and provides technical support for the U.S. Preventive Services Task Force (USPSTF), an independent panel of experts established in 1984. The USPSTF evaluates the scientific evidence on the effectiveness of clinical preventive services; evaluates the benefits of individual services; creates recommendations about which services should be included in periodic health examinations; and identifies a research agenda for clinical preventive care.

The USPSTF recommendations have formed the basis of clinical guidelines developed by professional societies, have helped guide coverage policies of health plans and insurers, and have figured prominently in health care quality measures and national health objectives. Furthermore, by documenting the evidence supporting effective preventive services, the USPSTF helps boost awareness, delivery, and coverage of preventive care as an integral part of quality primary health care for children. The USPSTF continues to educate a diverse audience with timely and targeted information about prevention services, to update its evaluations and recommendations, and to assess new topics in prevention.

The second USPSTF published a comprehensive report in 1996, and the third USPSTF is now updating information in that report. Individual chapters are being released online and in print.

The third USPSTF has recommended that primary care clinicians conduct chlamydia screening on all sexually active females ages 25 and younger (as well as on older women with new or multiple sexual partners). In addition, the USPSTF has determined that the evidence on routine newborn hearing screening is inconclusive.

The third USPSTF will continue to work on topics relevant to children and adolescents, including:

- Screening for visual impairment
- Screening for developmental delay
- Prevention of unintended pregnancy
- Counseling to promote breast feeding


To receive a semiannual update of USPSTF chapters and recommendations, contact the AHRQ Publications Clearinghouse at 1-800-358-9295.

To order the 1996 Guide to Clinical Preventive Services, 2nd Edition, (Publication Number OM 97-0001; $20), contact the AHRQ Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907 (1-800-358-9295) or search the AHRQ Web site (http://www.ahrq.gov/clinic/ppipix.htm).
Put Prevention into Practice

AHRQ oversees the Put Prevention into Practice (PPIP) initiative. Established as the vehicle for implementing USPSTF recommendations and overcoming barriers to the delivery of preventive care, PPIP has become a national, research-based, public-private campaign. Chief among its tasks is educating clinicians and health systems, office and clinic staffs, and consumers with tailored materials that promote a team approach for delivering preventive care. Since 1994, private companies, medical societies, academia, and government agencies have incorporated PPIP materials into their clinical and educational activities.

- Pocket guides advise parents to put prevention into practice.

Published in both English and Spanish, the Child Health Guide helps parents become active members of their children’s health care team. The 40-page booklet provides records for keeping track of immunizations, tests, and exams; reminders and recommendations; and resources for helping children stay healthy. To obtain a free pocket Child Health Guide (AHRQ Publication No. APPIP98-0026) or La Guia de Salud Infantil (AHRQ Publication No. APPIP99-0013), contact the AHRQ Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907 (1-800-358-9295) or search the AHRQ Web site (http://www.ahrq.gov/clinic/ppipix.htm).

Other tools include a PPIP Waiting Room Poster (APPIP98-0024); PPIP Child Preventive Care Timeline Poster (APPIP01-0002); and downloadable tracking/prompting flow sheets and patient reminder postcards. In addition, AHRQ has recently released A Step-by-Step Guide to Delivering Clinical Preventive Services: A Systems Approach. The Guide presents practical instructions for incorporating prevention into office and clinic routines for children and adults; a sample audit tool; and links to flowcharts, reminders, prompts, and patient materials. To order or download child-related PPIP tools, contact the AHRQ Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907 (1-800-358-9295) or search the AHRQ Web site.

More Information

An information packet offers a comprehensive view of AHRQ’s partnerships and efforts to disseminate information on prevention. The packet includes the English and Spanish consumer child health guides, prevention program fact sheets, and ordering information. To order What’s New in Clinical Prevention: Information From the Third U.S. Preventive Service Task Force and Put Prevention Into Practice (AHRQ Publication No. APPIP-0009), contact the AHRQ Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907 (1-800-358-9295).

AHRQ makes it easy to receive information on the breadth of AHRQ’s activities in child and adolescent health, and on its prevention activities.

- To receive information on child and adolescent health, send an e-mail message to listserv@list.ahrq.gov. In the message box type: subscribe AHRQkid-L Your Full Name.

- To receive notice of USPSTF recommendations and new PPIP resources, send an e-mail message to listserv@list.ahrq.gov. In the subject line type: Subscribe. In the body of the message type: SUBSCRIBE AHRQ_PREVENTION_PROGRAM_UPDATES Your Name.

For more information on AHRQ’s initiatives in children’s health, visit the AHRQ Web site at http://www.ahrq.gov/ and select Child Health, or contact:

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Items marked with an asterisk (*) may be obtained from the AHRQ Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907. Call 1-800-358-9295 for more information.