



RESEARCH ACTIVITIES

U.S. Department of Health and Human Services • No. 355, March 2010

Highlights

Departments

Child/Adolescent Health 2

Patient Safety and Quality . . 3

Chronic Disease 4

Pharmaceutical Research . . . 6

Disparities/Minority Health . . 7

Elderly/Long-Term Care . . . 11

Health Care Workforce 12

**Health Information
Technology 12**

Regular Features

Agency News and Notes . . . 13

Announcements 16

Research Briefs 17

Poverty, race, and gender are all factors in the epidemic of severely obese children

Children whose body mass indexes (BMIs) are in the 99th percentile for their age and gender are considered severely obese, which can lead to chronic health conditions, including diabetes and cardiovascular disease. A new study finds that an estimated 2.7 million U.S. children are severely obese. This number jumped more than 300 percent since 1976 and 70 percent since 1994.

Researchers examined data representing 71 million U.S. children from the National Health and Nutrition Examination Survey and found that black and Mexican American boys aged 12 to 19 are most likely to be severely obese. Poverty is also a risk factor. This may be explained in part because of the availability of cheap junk food and the dearth of affordable fresh produce in inner city areas, note the researchers.

More than a third of severely obese children face significant health risks and meet criteria of the adult metabolic syndrome: large waistlines, high triglyceride

levels, high cholesterol, high blood pressure, and high blood sugar levels. Further, more than 400,000 adolescents may meet criteria to have bariatric surgery; that is, their BMIs classify them as morbidly obese.

Unfortunately, many severely obese children will carry their weight problems into adulthood, because clinical and behavioral programs to combat obesity may not be covered by insurance. What's more, physicians who provide these services may not be reimbursed; thus, there is little incentive to provide them in combating the current obesity crisis in children. This study was funded in part by the Agency for Healthcare Research and Quality (HS13901).

See "Prevalence and trends of severe obesity among U.S. children and adolescents," by Joseph A. Skelton, M.D., Stephen R. Cook, M.D., M.P.H., Peggy Auinger, M.S., and others in *Academic Pediatrics* 9(5), pp. 322-329, 2009.

■ KFM

Venous thromboembolism is rare in young trauma patients, but a better understanding of its risk factors is needed

Venous thromboembolism (VTE), a complication of major trauma, is rarer among young trauma patients than among adults who suffer severe trauma. VTE is an obstruction of a deep vein by a blood clot (deep venous thromboembolism), which can travel to the lungs (pulmonary embolism) or elsewhere. It can lengthen hospital stays as well as costs, independent of how severe the injury is, according to a new study. Therefore, it is important to identify patients most at risk for VTE, who would benefit from low doses of anticoagulating medications to prevent VTE.

In a weighted sample of 240,387 hospital stays related to trauma in patients less than 20 years of age from the 2003 Healthcare Cost and Utilization Project (HCUP) Kids' Inpatient Database, the researchers identified 648 patients (2.7 per 1,000 hospital discharges) with a

diagnosis of VTE. Of the young trauma patients with VTE, 22.6 percent had only a pulmonary embolism and 72.8 percent had only deep venous thromboembolism. An additional 4.6 percent had both types of thromboembolism. Patients with VTE were older (mean age of 16.6 years vs. 12.2 years) than trauma patients without VTE and had nearly double the injury severity score (ISS = 20.7 vs. 10.5). Mean total costs and length of stay for VTE patients (\$68,865 and 22.6 days, respectively) were substantially greater than for pediatric trauma patients as a whole (\$10,843 and 4.2 days, respectively). The researchers found that critically injured patients were 3.5 times more likely to have VTE than patients with minor injuries. For example, children with severe and critical injuries, who were likely to be admitted to the ICU,

made up less than 15 percent of the total trauma group, but nearly 50 percent of the trauma and VTE group. Because the rate of VTE among young trauma patients is low, and anticoagulating therapy has its own risks, there is a need to determine the factors that make a pediatric trauma patient at high risk of developing VTE, the researchers conclude. The study was funded in part by the Agency for Healthcare Research and Quality (HS17344).

More details are in "Effect of injury severity on the incidence and utilization-related outcomes of venous thromboembolism in pediatric trauma inpatients," by Sean D. Candrilli, Ph.D., Rajesh Balkrishnan, Ph.D., and Sarah H. O'Brien, M.D., M.Sc., in the September 2009 *Pediatric Critical Care Medicine* 10(5), pp. 554-557.

■ DL

Research Activities is a digest of research findings that have been produced with support from the Agency for Healthcare Research and Quality. *Research Activities* is published by AHRQ's Office of Communications and Knowledge Transfer. The information in *Research Activities* is intended to contribute to the policymaking process, not to make policy. The views expressed herein do not necessarily represent the views or policies of the Agency for Healthcare Research and Quality, the Public Health Service, or the Department of Health and Human Services. For further information, contact:

AHRQ
Office of Communications
and Knowledge Transfer
540 Gaither Road
Rockville, MD 20850
(301) 427-1360

Gail Makulowich
Managing Editor

David I. Lewin, Karen Fleming-Michael,
Mark W. Stanton, Kevin Blanchet
Contributing Editors

Joel Boches
Design and Production

Karen Migdail
Media Inquiries

Also in this issue:

Impact of physical therapy on multiple sclerosis, see page 4

Underuse of beta blockers, see page 6

Neighborhood demographics and access to care, see page 9

Why nurses quit their jobs, see page 12

Number of hospital outpatient procedures, see page 14

Simulation training in the operating room improves competency for the entire operating room team

Hospital operating rooms (ORs) are highly intense work environments that require the OR team to function as a well-honed unit under stressful conditions. Ongoing training opportunities are critical to improving the competency and cooperation of these OR teams. Training on patient simulators of various OR crisis scenarios improves OR team-based competencies such as communication, role clarity, and mutual support, concludes a new study.

For the study, patient simulators were set up in ORs at a 157-bed hospital. Seven crisis scenarios were duplicated, including cardiac arrhythmia, shock, and problems with anesthesia. OR personnel participated in two separate training sessions lasting up to 3 hours. Following each training session, participants were asked about their experience and how it affected team-related competency. A total of 45 team members participated, representing surgical residents, nurse anesthetists, circulating nurses, and surgical technicians.

Post-training scores improved significantly compared with pretraining scores. The scores increased from 4 out

of 15 items related to teamwork competencies after the first training (Module 1) to 9 out of 15 items after the second training (Module 2). Competency areas that showed improvement after completion of the two trainings included role clarity, team orientation, open communication, and mutual support and backup behavior. Observers who were placed in the OR during the high-fidelity simulations witnessed distinct improvements in teamwork abilities from one module to the next. The researchers conclude that such competency improvements can then be adopted in actual clinical practice in the OR. The study was supported in part by the Agency for Healthcare Research and Quality (HS16680).

See “Attitudinal changes resulting from repetitive training of operating room personnel using high-fidelity simulation at the point of care,” by John T. Paige, M.D., Valeriy Kozmenko, M.D., Tong Yang, M.D., M.S., and others, in *The American Surgeon* 75(7), pp. 584-591, 2009. ■ KB

One patient safety indicator may offer a glimpse at a hospital's overall safety record

The Patient Safety Indicators (PSIs) from the Agency for Healthcare Research and Quality (AHRQ) let health system leaders identify potential adverse events that can occur during hospitalization. Researchers from the RAND Corporation analyzed 19 PSIs to determine if any of them could act as “canary measures” to serve as barometers of broad safety trends. (The term “canary measure” comes from coal miners’ use of canaries, whose sudden silences warned miners that deadly gases were present.)

The researchers found that PSI #7, selected infections due to

medical care, was the best canary of the PSIs. It was correlated with 10 of the 18 other PSIs and was associated with common risk factors at the institutional level. Conversely, PSI #1, complications of anesthesia, and PSI #17, birth trauma—injury to neonate, were the least correlated with other PSIs.

The researchers suggest that PSI #7 may offer a way for hospital staff to detect general trends in safety by examining fewer safety measures. Because most of the correlations between PSIs were driven by hospital-level factors, the authors recommend that future interventions focus on reducing

risks that occur across all hospitals. This study, which used the Nationwide Inpatient Sample from AHRQ’s Healthcare Cost and Utilization Project, was funded in part by AHRQ (Contract No. 290-02-0010).

See “‘Canary measures’ among the AHRQ patient safety indicators,” by Hao Yu, Ph.D., Michael D. Greenberg, J.D., Ph.D., Amelia M. Haviland, Ph.D., and Donna O. Farley, Ph.D., in the November/December 2009 *American Journal of Medical Quality* 24(6), pp. 465-473. ■ KFM

Pain management in emergency departments has improved but can still be better

Emergency departments (EDs) are doing a better job of helping older adults manage their pain, but room for improvement exists, according to findings from the University of Iowa. Marita Titler, Ph.D., R.N., F.A.A.N., now with the University of Michigan School of Nursing, and Keela Herr, Ph.D., R.N., A.G.S.F., F.A.A.N., reviewed medical records of 1,454 older patients who ended up in EDs with broken hips in the 33 months after the Joint Commission issued new pain assessment and management standards in 2000. Over the study period, an average of 96 percent of patients with broken hips had pain documented in their medical records. Use of a standard numeric rating scale (NRS) that lets patients report pain on a scale of 0 to 10 rose from 16.5 to 54.4 percent. This signaled an improvement in ED pain assessment practices, but also indicated that more could be done.

At the end of the study, almost a quarter of older patients with hip fractures still received no pain medicine in the ED. The authors suggest this may be particularly harmful because undertreating pain can affect outcomes. Further, while physician orders for morphine rose over the 18 months, the amount of the drug actually administered to patients did not match

the orders. This indicates that either the patient refused to receive the drug or the nursing staff did not deliver it.

On a positive note, intramuscular injections to deliver pain medicines declined from 38 to 24 percent. These injections are not recommended for older adults because older adults may have wasting muscles or lack fatty tissue, potentially slowing drug absorption. Additionally, researchers noted decreased use of meperidine, a drug that can cause neurologic toxicity in seniors.

The authors recommend several strategies for improving adoption of evidence-based pain management strategies. These include improving communication between doctors and nurses, appointing an ED nurse as a pain management champion, and using patient education materials that address pain assessment and treatment. This study was funded in part by the Agency for Healthcare Research and Quality (HS10482).

See “Acute pain assessment and pharmacological management practices for the older adult with a hip fracture: Review of ED trends,” by Drs. Herr and Titler in the July 2009 *Journal of Emergency Nursing*, 35(4), pp. 312-320. ■ KFM

Chronic Disease

Wellness education and physical therapy improve health and functioning of persons with multiple sclerosis

Multiple sclerosis (MS) causes the immune system to attack nerve cells causing muscle weakness, fatigue, and other symptoms. Although there is no cure for MS, regular physical activity can help patients slow down the decline. A new study comparing physical rehabilitation to a group wellness program shows that both approaches improve physical activity and reduce fatigue in patients with MS. Each approach, however, may have unique benefits.

Researchers randomly placed 50 individuals with MS into one of two groups. The physical rehabilitation group received four physical therapy sessions and three phone calls between sessions to encourage therapy adherence. The wellness group met 2 hours each week for 7 weeks. Participants in both groups received a home exercise program and questionnaires before and after the interventions to assess their level of functioning.

Both groups reaped a variety of health benefits, such as better physical activity, a lower resting heart rate, less fatigue, and improvements in percent of body fat, waist circumference, and strength. While both interventions produced similar results, the individualized physical rehabilitation may have had a greater effect in slowing the decline of perceived physical health. The group wellness intervention, on the other hand, may have improved an

continued on page 5

Multiple sclerosis

continued from page 4

individual's mental health better.

According to the researchers, a new intervention that incorporates group education with therapeutic exercise tailored to the specific patient

should be designed and tested for improvements in patients' physical and mental health. Their study was supported in part by the Agency for Healthcare Research and Quality (HS15554 and T32 HS00011).

See "Comparing individualized rehabilitation to a group wellness

intervention for persons with multiple sclerosis," by Matthew A. Plow, Ph.D., Virgil Mathiowetz, Ph.D., O.T.R./L., and Dawn A. Lowe, Ph.D., in the September/October 2009 *American Journal of Health Promotion* 24(1), pp. 23-26.

■ KB

Primary care organizational characteristics are linked to the self-management behaviors of patients with diabetes

Patients with type 2 diabetes need to engage in certain self-management behaviors to control their blood glucose level. For example, they must regularly check their blood glucose level, follow a diabetes diet, consistently exercise, and take prescribed diabetes medications. In a study of how primary care organizational aspects of the Chronic Care Model (CCM) affect the self-management behaviors of patients with type 2 diabetes, Amer A. Kaissi, Ph.D., of Trinity University, and Michael Parchman, M.D., M.P.H., of the University of Texas, found mixed results.

The Chronic Care Model delineates six important organizational aspects of primary care necessary for optimizing outcomes from chronic disease care. These are: organizational support (commitment to patient self-management); community linkages, for example, to diabetes specialists and educators; decision support systems; self-management support (assessment of patients' needs and activities); delivery system design; and clinical information systems, such as diabetes registries, provider reminders, and feedback to the care team.

Nearly 26 percent of patients reported maintaining all four self-management behaviors in the last 6 months. Less than half reported adhering to diet (46 percent) and exercise (45 percent), 61 percent reported adhering to self-monitoring of blood glucose, and 85

percent reported adhering to their medications. Some primary care organizational features had a positive impact and others had a negative impact on patient self-management behaviors. For example, self-management support was positively associated, but community linkages were negatively associated with medication adherence. In addition, decision support systems were positively associated with exercise and all four self-management behaviors, but clinical information systems were negatively associated with diet and all four self-management behaviors. Due to the small size of the clinics studied, physicians may have been preoccupied with the diagnosis and management of diabetes and its associated disorders, and may not have had sufficient time to educate their patients, suggest the study authors. They studied 617 patients with type 2 diabetes in 20 South Texas primary care clinics that ranged from solo physician clinics to county/city health clinics with 12 physicians. The study was supported by the Agency for Healthcare Research and Quality (HS13008).

See "Organizational factors associated with self-management behaviors in diabetes primary care clinics," by Drs. Kaissi and Parchman, in the September/October 2009 *Diabetes Educator* 35(5), pp. 843-850. ■ MWS

Visit the AHRQ Patient Safety Network Web Site

AHRQ's national Web site—the AHRQ Patient Safety Network, or AHRQ PSNet—continues to be a valuable gateway to resources for improving patient safety and preventing medical errors and is the first comprehensive effort to help health care providers, administrators, and consumers learn about all aspects of patient safety. The Web site includes summaries of tools and findings related to patient safety research, information on upcoming meetings and conferences, and annotated links to articles, books, and reports. Readers can customize the site around their unique interests and needs through the Web site's unique "My PSNet" feature. To visit the AHRQ PSNet Web site, go to psnet.ahrq.gov.

Clinicians should be cautious when prescribing one class of diabetes drugs for patients at high risk for heart attack

Rosiglitazone and pioglitazone are thiazolidinediones, a class of drugs commonly used to treat patients with type 2 diabetes. The U.S. Food and Drug Administration has issued black-box warnings on these medications' drug labels stating they may increase the rate of heart attack. A new study finds that starting therapy with drugs from this class is not associated with suffering a heart attack. However, the researchers caution that the data did not exclude the possibility of elevated risk of heart attack immediately after beginning therapy. They recommend that clinicians exercise caution when starting patients who are considered

at high risk for heart attack on thiazolidinediones.

The researchers looked at Medicaid claims data from five States during 2001 and 2002. They reviewed patient demographic and clinical information and documented the start of thiazolidinedione therapy within 180 days prior to when the heart attack occurred. They identified a total of 2,316 cases with a primary discharge diagnosis of heart attack. These patients were matched with up to 5 age- and state-of-residence-matched controls each, for a total of 9,700 control patients.

Starting a thiazolidinedione anytime within the 180 days before the date of a heart attack was not

associated with an increased rate of heart attack. A small increase in the rate of heart attack was found shortly after starting these drugs (within 90 days before a heart attack), especially for rosiglitazone, although the researchers could not draw definitive conclusions about this. The study was supported in part by the Agency for Healthcare Research and Quality (T32 HS00011).

See "Association between extent of thiazolidinedione exposure and risk of acute myocardial infarction," by David D. Dore, Pharm.D., Amal N. Trivedi, M.D., M.P.H., Vincent Mor, Ph.D., and Kate L. Lapane, Ph.D., in *Pharmacotherapy* 29, pp. 775-783, 2009. ■ KB

Beta blockers are underused in patients receiving implantable cardioverter defibrillators

Impantable cardioverter defibrillators (ICDs) are most commonly used in patients who also have conditions for which beta blockers are recommended. In fact, ICDs are only supposed to be used for primary prevention of sudden cardiac arrest (SCA) in patients who have had their beta blocker therapy optimized. However, only 68 percent of patients received a beta blocker during the hospitalization in which their ICD was implanted and only 72 percent received a beta blocker in the 2 years after their ICD implant, according to Nancy M. Allen LaPointe, Pharm.D., and colleagues at Duke University. They examined beta blocker use among 652 patients who received ICDs for secondary prevention of SCA and 152 patients who received ICDs for primary prevention of SCA between July 1999 and July 2004 at Duke Hospital. The median age of the patients was 65 years and 75 percent were men.

An ICD is recommended for patients with cardiac arrest or ventricular tachycardia/fibrillation for secondary prevention of SCA and in patients with left ventricular systolic dysfunction with or without

ischemic heart disease (IHD) for primary prevention of SCA. Beta blockers are recommended in patients with IHD, heart failure, and many different types of ventricular arrhythmias—many of whom also have an indication for an ICD.

The researchers found less than optimal use of beta blockers for these patients, with 69 percent of the secondary prevention group receiving beta blockers and 60 percent of the primary prevention group receiving the medication. They concluded that there appears to be a substantial lack of compliance with evidence-based recommendations for beta blocker use among ICD recipients, which may result in poorer clinical outcomes. The study was supported in part by the Agency for Healthcare Research and Quality (HS10548).

See "Use of beta-blocker in patients with an implantable cardioverter defibrillator," by Dr. LaPointe, Judith A. Stafford, M.S., Paul A. Pappas, M.S., and others in *The Annals of Pharmacotherapy* 43, pp. 1189-1196, 2009. ■ MWS

Antidepressants may help some HIV patients stick to their complex medication regimens

Patients with HIV often suffer from depression, which can cause them to not stick to their often demanding highly active antiretroviral therapy (HAART) medication schedules. However, when these individuals also take antidepressants, the rates of adhering to HAART increase, even when the medication regimens are very complex. That's the finding of a new study from Agency for Healthcare Research and Quality researcher William Encinosa, Ph.D., and Virender Kumar, Ph.D., M.P.H., M.B.A., of Westat.

Of the 1,192 individuals surveyed, 58 percent reported complete adherence to their HAART, 15 percent reported taking

their medications 6 of 7 days, and 12 percent took them less than 5 days a week. As the complexity of the medication regimen increased, the odds of adherence decreased.

However, antidepressant use appears to have countered lack of adherence in some cases. For instance, individuals who were depressed but took antidepressants had adherence odds that were 9 percent higher than those who were not depressed or who were depressed but did not take antidepressants. As the complexity of the HAART medication schedule increased, the individuals who took antidepressants had adherence odds that were 12 percent higher than those who were depressed but

didn't take antidepressants. Given these findings, the authors suggest that previous studies may have overstated the claim that antidepressant therapy negatively affects HAART adherence. In fact, antidepressants may be able to overcome depression as a risk factor for not adhering to HAART.

See "Effects of antidepressant therapy on antiretroviral regimen adherence among depressed HIV-infected patients," by Drs. Kumar and Encinosa in the September 2009 *Psychiatric Quarterly* 80(3), pp. 131-141. Reprints (AHRQ Publication No. 10-R013) are available from AHRQ.* ■ *KFM*

Disparities/Minority Health

Lower socioeconomic status in childhood linked to racial differences in disability during adulthood

Older adults may experience disabilities in activities of daily living (ADL), such as bathing and eating, and in instrumental activities of daily living (IADL), such as managing money and shopping for groceries. A new study finds that childhood socioeconomic status (SES) may affect these disabilities later in life and explain some of the racial differences observed among older blacks and whites. Wayne State researcher Mary Elizabeth Bowen, Ph.D., analyzed data from the U.S. Health and Retirement Study 1998-2006, a national sample of community-dwelling blacks and whites. She looked at individuals' ages (starting at age 65), adult SES, health conditions and behaviors, and disability at baseline in 1998. Every 2 years, she looked at these same characteristics again.

Compared with white parents, black parents of study participants had fewer years of education. Black fathers were less likely to work in certain occupations, such as professional and sales jobs. They were also more likely to be absent or deceased when black participants were growing up. As adults, black participants had lower educational levels, income, and wealth compared with whites. Education was found to have the strongest correlation with childhood SES.

Over the course of the survey, blacks reported more ADL and IADL disability than whites. The risk for ADL disability increased with age and grew over time. Blacks reported more ADL disability than whites. This increased over time for older blacks. When parental

continued on page 8

Note: Only items marked with a single (*) asterisk are available from the AHRQ Clearinghouse. Items with a double asterisk (**) are available from the National Technical Information Service. See the back cover of *Research Activities* for ordering information. Consult a reference librarian for information on obtaining copies of articles not marked with an asterisk.

Disabilities

continued from page 7

education of the participants was taken into consideration, racial differences in ADL disability were reduced. This suggests that parental education may account for some of the racial differences observed in ADL disability. The occupation of an individual's father was also associated with a reduction in racial differences of ADL. The risk for IADL disability increased with age and grew over time. Blacks reported more IADL disability than whites. As with ADL

disability, IADL disability increased over time for older blacks. Racial differences in IADL disability were also reduced when parental education was taken into account. The study was supported in part by the Agency for Healthcare Research and Quality (HS13819).

See "Childhood socioeconomic status and racial differences in disability: Evidence from the Health and Retirement Study (1998-2006)," by Dr. Bowen in *Social Science & Medicine* 69, pp. 433-441. ■ KB

Creating networks to provide social support for the homeless may improve health outcomes

Informal networks of social support serve as an important resource for homeless adults that may lead to improved health, according to a new study. The researchers studied 544 homeless adults from 50 shelters and 18 meal programs in Toronto, Canada. These adults perceived that they had moderately high access to financial, emotional, and instrumental social supports (such as a ride). These perceived social supports were related to better physical and mental health status and a lower likelihood of victimization.

The vast majority (89 percent) of men and women were living in shelters, with the remaining 11 percent living in a public place, vehicle, abandoned building, or in someone else's place. The study

participants answered questions on social support, filled out a standardized questionnaire on health status, and answered a question on whether they had been "physically assaulted or beat up in the past 12 months."

Two-thirds (67 percent) of this homeless group suffered from one or more chronic health conditions, and their scores on the health status questionnaire indicated poorer physical and mental health than the general population. Nearly 30 percent of the sample had been physically assaulted in the past 12 months. Through their social network, 62 percent of the group perceived access to financial support in the form of a short-term loan, 51 percent perceived access to instrumental support in the form of a ride, and 60 percent perceived

access to emotional support during crises. Perceived financial support was related to better physical health status, perceived emotional support was related to better mental health status, and perceived instrumental support was associated with lower likelihood of victimization. The study was funded in part by the Agency for Healthcare Research and Quality (HS14129).

More details are in "Multidimensional social support and the health of homeless individuals," by Stephen H. Hwang, M.D., M.P.H., Maritt J. Kirst, Ph.D., Shirley Chiu, M.A., and others, in the September 2009 *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 86(5), pp. 791-803. ■ DIL

Inner-city minority adults with chronic asthma are more likely to take inhaled medicine if they believe in its benefits

Daily use of inhaled corticosteroids (ICS), even when patients have no asthma symptoms, is the cornerstone of managing persistent asthma. However, patients do not always adhere to such therapy. This is particularly true for minority patients living in inner cities, even when they have regular access to medical care and insurance. However, adult inner-city minorities with positive beliefs about ICS are more likely to adhere to the daily regimen, concludes a new study. Juan P. Wisnivesky, M.D., M.P.H., of Mount

Sinai School of Medicine, and colleagues analyzed data on 261 patients with asthma from general internal medicine clinics in inner-city neighborhoods, who were prescribed daily ICS. Patients reported adherence to ICS using the Medication Adherence Reporting Scale at baseline and then again at 1 and 3 months. Patients were also asked questions related to the necessity of ICS therapy and concerns about side effects.

continued on page 9

Chronic asthma

continued from page 8

Seventy percent of patients reported using ICS all or most of the time when they had no asthma symptoms. The belief that it was important to use ICS, even when no symptoms were present, was the single most important predictor of adherence. Patients holding this conviction quadrupled their odds of being adherent to ICS. Adherence odds were also doubled in patients who were confident in their ability to properly use ICS. However, patients who were worried about ICS side effects or said they found the regimen hard to follow were about half as likely to adhere to the drug regimen.

Since high-risk, inner-city patients have the most problems and mortality from asthma, it is important to target these negative beliefs with educational messages. This, in turn, may improve adherence and patient outcomes, suggest the researchers. Their study was supported in part by the Agency for Healthcare Research and Quality (HS13312).

See “Impact of positive and negative beliefs about inhaled corticosteroids on adherence in inner-city asthmatic patients,” by Diego Ponieman, M.D., Dr. Wisnivesky, Howard Leventhal, Ph.D., and others in the *Annals of Allergy, Asthma & Immunology* 103, pp. 38-42, 2009. ■ KB

Increasing the number of coronary angiography facilities led to a reduction in racial disparities in New Jersey

To contain health care costs and promote high quality care, States often require health care facilities to obtain approval before offering certain new or expanded services, such as coronary angiography facilities. When New Jersey eased these restrictions, access to angiography (an imaging technique used to diagnose heart problems) increased and eliminated a longstanding racial disparity, a new study finds. Joel C. Cantor, Sc.D., of Rutgers University, and colleagues examined the effect of regulatory reforms between 1996 and 2003 and found that a doubling of angiography facilities closed the gap in blacks’ and whites’ access to these services. Reducing this disparity was imperative because blacks are at higher risk for heart

disease and have higher cardiac death rates than whites.

Interestingly, established centers saw the majority of new patients. For instance, the annual average number of black patients seen at these facilities rose by 817, while new facilities saw an average of fewer than 500 black patients each year. Additionally, the average number of angiography procedures for blacks rose 46 percent for all New Jersey hospitals between the mid-1990s and 2001, with urban hospitals seeing the biggest influx of black patients. Annual utilization among whites rose a more modest 15 percent over the same period, closing the black-white gap in procedure rates.

New Jersey’s reforms mandated that new facilities create plans to reach out to patients and linked

licensing of other profitable cardiac services to improving access. New Jersey’s example shows that it is possible to simultaneously regulate health care offerings and reduce disparities, the authors suggest. Further, lawmakers should use caution when they create policies that limit hospitals from offering profitable services because they may inadvertently create disparities. This study was funded in part by the Agency for Healthcare Research and Quality (HS14191).

See “Reducing racial disparities in coronary angiography,” by Dr. Cantor, Derek DeLia, Ph.D., Amy Tiedemann, Ph.D., and others in the September/October 2009 *Health Affairs* 28(5), pp. 1521-1531. ■ KFM

Neighborhood demographics play a role in access to health care for immigrant and U.S.-born Mexican Americans

Foreign-born Mexican Americans, particularly those who have lived in the United States for a short time, have more limited access to care than U.S.-born Mexican Americans, even after controlling for differences in the sociodemographic characteristics and insurance coverage between the two groups. However, for both native-born and immigrant

Hispanics, the type of neighborhood in which they live plays an important role in their access to health care, according to a new study. José J. Escarce, M.D., Ph.D., of the University of California, Los Angeles, and colleagues studied patterns of health care use care among 8,371 Mexican Americans living in urban areas.

continued on page 10

Mexican Americans

continued from page 9

They found that for Mexican American immigrants, and in particular for recent immigrants, those living in predominantly Spanish-speaking areas have better access to health care services compared with immigrants living in other areas. For example, among insured immigrants, those living in an area with a relatively large Spanish-speaking population are more likely to fill a prescription, have a usual source of care, or visit a doctor's office compared with immigrants living in other areas.

However, for U.S.-born Mexican Americans, living in an area that is predominantly Spanish speaking is not associated with better access to care and, in fact, for the uninsured, is associated with worse access to care. Uninsured native-born Mexican Americans in areas with a predominantly Spanish-speaking or foreign-born and Spanish-speaking population are less likely to visit a doctor's office or have any medical expenditures.

The authors suggest that immigrant Hispanics who live in areas more heavily populated by Spanish speakers or Spanish-speaking immigrants may form social networks that enable them to better navigate the U.S. health care system. These areas also are more likely to have local organizations dedicated to helping immigrants and physicians who are Hispanic or speak Spanish. Policymakers should be aware of how a lack of social networks may serve as a barrier for immigrants in accessing health care, the authors suggest. Their study, which used 1996 to 2002 Medical Expenditure Panel Survey data from the Agency for Healthcare Research and Quality (AHRQ), was funded in part by AHRQ (HS10770).

See "Community demographics and access to health care among U.S. Hispanics," by Carole Roan Gresenz, Ph.D., Jeannette Rogowski, Ph.D., and Dr. Escarce in the October 2009 *Health Services Research* 44(5), pp. 1542-1562. ■ *KFM*

Advantage of high survival rates among low-weight black infants has waned over time

Black infants who are born with very low birth weights have puzzled researchers for some time because these children have lower mortality rates in their first month of life than white infants born at the same low weights. However, a new study finds that, over time, this reported advantage has actually shifted into a disparity for black infants in California.

Using State birth-weight data from 1989 to 2004 for black and white infants who weighed 3.3 pounds or less at birth, researchers found that about a quarter of all babies born with very low birth weights did not survive a month after birth. Although black babies had lower mortality rates in 1989 and 1990, this advantage

disappeared after 1991. In fact, beginning in 2002 the mortality rate rose for black babies born with very low birth weights, but it decreased for white babies born at similarly low weights.

The authors suggest that the advantage black infants once had may have been eliminated once better access to high-quality prenatal care and therapeutic innovations, such as surfactant therapy to treat respiratory distress, became prevalent—technologies they may have less access to. This new disparity may also be a result of more black than white infants being born with extremely low birth weights (1.1 pounds or higher) or the economic downturn in California that resulted in high rates of

uninsurance, which may have limited black mothers' access to prenatal care. The authors note that it is important to determine if this trend has continued since 2004. This study was funded in part by the Agency for Healthcare Research and Quality (T32 HS00086).

See "From paradox to disparity: Trends in neonatal death in very low birth weight non-Hispanic black and white infants, 1989-2004," by Tim A. Bruckner, Ph.D., M.P.H., Katherine B. Saxton, M.P.H., Elizabeth Anderson, M.P.H., and others in the October 2009 *The Journal of Pediatrics* 155(4), pp. 482-487. ■ *KFM*

Octogenarians fare well after aortic valve replacements

Severe aortic stenosis occurs when the heart's aortic valve narrows and obstructs blood flow, causing the heart to work harder to pump blood. This extra work weakens the heart, further limiting the amount of blood it can pump. Fortunately, a surgery that replaces the aortic valve can extend the lives of those who suffer from aortic stenosis. Even people in their 80s who undergo aortic valve replacement (AVR) surgery have life expectancies similar to their elderly counterparts, according to a new study.

Donald S. Likosky, Ph.D., of Dartmouth-Hitchcock Medical Center, and colleagues studied 7,584 patients who had AVRs from 1987 to 2006. They found that more than half of the patients were alive 6 years after the surgery, mirroring the life expectancy of the general population. In fact, survival rates were 6.8 years for patients who were 80 to 84 and 6.2 years for patients who were 85 and older.

Octogenarians who had both AVR and coronary artery bypass graft (CABG) surgeries had similar long-

term survival rates, with patients aged 80 to 84 living an additional 6.8 years and patients older than 85 living an average of 7.1 years. However, patients who underwent AVR and CABG had higher 30-day mortality rates than patients who had AVR only (6.2 vs. 3.7 percent for patients younger than 80, 9.4 vs. 6.7 percent for patients aged 80 to 84, but 8.5 vs. 11.7 percent for patients 85 and older).

As the number of octogenarians in the United States grows, so will the number of AVRs for elderly patients. These findings demonstrate that AVRs are an effective way to safely extend these patients' lives. This study was funded in part by the Agency for Healthcare Research and Quality (HS15663).

See "Long-term survival of the very elderly undergoing aortic valve surgery," Dr. Likosky, Meredith J. Sorensen, M.D., Lawrence J. Dacey, M.D., and others in the September 15, 2009 *Circulation* 120(Suppl. 1), pp. S127-S133. ■ *KFM*

Nursing home studies focus on the costs of staff turnover rates and selective admission of patients

The oft-lamented high staff turnover rates in nursing homes, linked to poor quality of care, actually net cost savings for these homes, according to a new study. A second study found little evidence that nursing homes selectively admit healthier patients in order to improve their national quality report card standings. The first study was led by William D. Spector, Ph.D., of the Agency for Healthcare Research and Quality (AHRQ), and the second study was led by Dr. Spector and AHRQ colleague Rhona Limcangco, Ph.D. Reprints of the first (Publication No. 10-R002) and second (Publication No. 10-R004) studies are available from AHRQ.* Both studies are briefly discussed here.

Mukamel, D. B., Spector W. D., Limcangco, R., and others. (2009, October). "The costs of turnover in nursing homes." *Medical Care* 47(10), pp. 1039-1045.

In this study, the researchers estimated the net costs associated with staff turnover in 902 California nursing homes during 2005. The turnover rate of direct care staff averaged 62 percent. A calculation was made for the marginal cost of turnover. According to the researchers, an increase in turnover of just 10 percent results in \$170,000 for an average nursing home—a 2.9 percent cost savings. A nursing home choosing between operating at the 25th percentile versus the 75th percentile of turnover, i.e., between 38 percent and 78 percent,

would experience cost savings of \$668,252, assuming all other factors are held constant.

The net cost savings associated with nursing home staff turnover may explain its persistence over the past decade, despite the many policy initiatives to reduce it, note the study authors. They point out that future policy efforts need to recognize the complex relations between staff turnover and costs.

Mukamel D. B., Ladd, H., Weimer, D. L., and others. (2009, December). "Is there evidence of cream skimming among nursing homes following the publication of the nursing home compare report card?" *The Gerontologist* 49(6), pp. 793-802.

continued on page 12

Nursing home studies

continued from page 11

The authors of this study investigated the practice of “cream skimming,” also known as “cherry picking” in nursing homes. In this practice, patients are admitted who are less frail and sickly—individuals less likely to experience poor outcomes and negatively

impact published nursing home care quality scores. During 2001 to 2005, the investigators looked at all non-Medicare patients admitted to 16,745 nursing homes across the country. They analyzed various patient characteristics, including pain at time of admission, memory limitations, diabetes, and pressure ulcers.

They found little evidence of cream skimming among the nursing homes studied. Even when evidence was found for not selecting patients with pain and memory limitations, the effect was not large. Although anticipated by the researchers, there was no evidence of cream skimming among high-occupancy facilities.

■ KB

Health Care Workforce

Job, family, and other factors play a role in nurses quitting their jobs and how much they work

Nurses who are satisfied with their current position and whose organization supports them in a variety of ways are more likely to want to stay in their jobs. Desire to quit a job is also positively linked to higher levels of education, working in smaller metropolitan areas, ease of finding another job, and work-family conflict, according to a new study. Nursing researchers sent out 4,000 surveys to nurses randomly selected in 29 States and the District of Columbia. All of the nurses were female, under 65 years of age, and worked in nonrural areas. A total of 1,907 nurses responded to the first survey in 2003, with 1,348 nurses also responding to the shorter survey in 2004.

Nurses with young children had less likelihood of working at the same job a year later. They were also less likely to be working full-time. However, nurses

educated outside the U.S. had an increased likelihood of working at the same job a year later.

This was also true for nurses with a higher predicted wage. For every unit increase in the market wage, the probability that the nurse would remain working at the same job increased 23 percent. Finally, having paid time off and medical insurance increased the probability that a nurse would work full-time. The study was supported in part by the Agency for Healthcare Research and Quality (HS11320).

See “Predictors of RNs’ intent to work and work decisions 1 year later in a U.S. national sample,” by Carol S. Brewer, Ph.D., R.N., Christine T. Kovner, Ph.D., R.N., William Greene, Ph.D., and Ying Cheng, M.A., in the *International Journal of Nursing Studies* 46, pp. 940-856, 2009. ■ KB

Health Information Technology

Hospital discharge software slightly boosts patient and outpatient physician satisfaction

In the transition from inpatient to outpatient care, when patients are vulnerable to adverse events, it is important to have good discharge communication. However, a recent trial of discharge software with computerized physician order entry found only small improvements in discharge

perceptions by patients and their outpatient physicians, according to James F. Graumlich, M.D., of the University of Illinois College of Medicine, and colleagues.

They surveyed perceptions of discharge preparedness among 631 inpatients from an Illinois teaching hospital who were discharged home

with a high risk of readmission, as well as their internal medicine hospital physicians and outpatient physicians. They then compared patients assigned to the discharge software group with those who were not. The discharge software

continued on page 13

Discharge software

continued from page 12

produced concise reports and outlined a brief postdischarge care plan. The discharge summary included discharge diagnoses, key findings, test results, followup appointments, pending diagnostic tests, documentation of patient education, a reconciled medication list, and contact information for the hospital physician.

Patients' perceptions of their discharge preparedness were slightly higher for those in the software group (mean of 17.7 vs. 17.2), but their scores for satisfaction with medication

information were unchanged (12.3 vs. 12.1). Outpatient physicians of patients in the software group perceived only slightly higher quality discharge than those in the nonsoftware group (17.2 vs. 16.5). This may have been because discharge plans and prescriptions were transmitted mostly by fax, since most of the community physicians had no access to interoperable medical records, secure messaging, or electronic transmittal of prescriptions. Hospital physicians reported significantly more effort involved in using the discharge software than the effort for usual care (6.5 vs. 7.9). This may have been because

the software application was not integrated with the hospital electronic medical record (EMR) and hospital physicians had to reenter patient data already in EMR, suggest the researchers. Their study was supported by the Agency for Healthcare Research and Quality (HS15084).

See "Patient and physician perceptions after software-assisted hospital discharge: Cluster randomized trial," by Dr. Graumlich, Nancy L. Novotny, Ph.D., G. Stephen Nace, M.D., and Jean C. Aldag, Ph.D., in the *Journal of Hospital Medicine* 4(6), pp. 356-363, 2009. ■ MWS

Agency News and Notes

Task force recommends screening children and adolescents for obesity

Based on new evidence that children and adolescents can be effectively treated for obesity, the U.S. Preventive Services Task Force now recommends that clinicians screen children ages 6 to 18 years for obesity and refer them to programs to improve their weight status. Comprehensive programs include three components: counseling for weight loss or healthy diet; counseling for physical activity or a physical activity program; and behavioral management techniques such as goal setting and self monitoring. Moderate- to high-intensity programs involve more than 25 hours of contact with the child and/or the family over a 6-month period. Families who seek treatment for obesity should look for comprehensive programs that

address weight control through healthy food choices, physical activity, and behavioral skill-building.

The recommendation was published in the February issue of *Pediatrics* and is also available on the Agency for Healthcare Research and Quality (AHRQ) Web site at www.ahrq.gov/clinic/uspstf/uspshobes.htm.

The U.S. Preventive Services Task Force is the leading independent panel of experts in prevention and primary care. The Task Force, which is supported by AHRQ, conducts rigorous, impartial assessments of the scientific evidence for the effectiveness of a broad range of clinical preventive services, including screening, counseling, and preventive medications. Its recommendations are considered the gold standard for clinical preventive services. ■

Colorectal cancer screening still underused

Despite national recommendations supporting screening for colorectal cancer (CRC)—a disease that kills an estimated 50,000 Americans a year—screening is

still underused. Screening is particularly underused by low-income people, the uninsured, Asians and Hispanics, foreign-born people, and/or those with limited English-language skills, according

to a new Agency for Healthcare Research and Quality (AHRQ) evidence report. After reviewing evidence on CRC screening, researchers at the RTI-University of

continued on page 14

Colorectal cancer

continued from page 13

North Carolina Evidence-Based Practice Center found some increase in screening using colonoscopy, but decreasing rates of screening by sigmoidoscopy and fecal occult blood testing. The reviewers also looked for evidence on strategies for encouraging CRC

screening. They found that some, such as contacting people to remind them to get screened, boosted screening rates. Other strategies, including using printed matter and video messages, either did not increase rates or produced mixed results. However, it is not clear that any specific set of interventions will increase screening rates

nationally. The reviewers found no studies of how CRC screening has been effectively monitored, nor did they find any that systematically measured its quality. For details, see *Enhancing the Use and Quality of Colorectal Cancer Screening* at www.ahrq.gov/downloads/pub/evidence/pdf/crcuse/crcuse.pdf. ■

More than half of all hospital procedures are outpatient

Nearly 58 percent of the surgeries performed in hospitals were done as outpatient procedures, according to the latest data from the Agency for Healthcare Research and Quality (AHRQ). In outpatient surgery, also called ambulatory or same-day surgery, patients normally require hospital care for less than 24 hours. These operations are being used more often because advances in surgical technology and anesthesia enable surgeons to perform many operations formerly limited to inpatient care.

AHRQ's analysis of data available from 28 States also found that in 2007:

- Charges for outpatient procedures were seven times lower than for inpatient ones. The average hospital charge for an outpatient procedure was \$6,100 in 2007 compared with \$39,900 for an inpatient procedure.
- Outpatient surgery charges for hospitals totaled \$55.6 billion compared with \$259 billion for inpatient surgeries.

- Colonoscopies and resulting biopsies were the most frequently performed outpatient procedure (18 percent of all ambulatory procedures), followed by upper gastrointestinal endoscopies and related biopsies (11 percent), lens and cataract procedures (5.5 percent), and diagnostic cardiac catheterization (4 percent).

These data come from the report *Hospital-Based Ambulatory Surgery, 2007*. The report uses statistics from 28 States that provide data to the Healthcare Cost and Utilization Project State Ambulatory Surgery Databases and their corresponding State Inpatient Databases. These databases provide information on hospital-based ambulatory and inpatient surgeries performed in short-term, acute care hospitals. The report is available at www.hcup-us.ahrq.gov/reports/statbriefs/sb86.jspport. ■

Prescription drug purchases increase for digestive problems

The number of Americans buying prescription drugs to treat digestive conditions climbed over 50 percent between 1997 and 2007, rising from 18.1 million to 29 million people, according to the latest data from the Agency for Healthcare Research and Quality (AHRQ). Total annual spending for these drugs rose during the 10 years from \$7 billion to nearly \$19 billion (in 2007 dollars).

AHRQ's analysis also found that:

- The proportion of children ages 17 and younger who had at least one prescription drug purchase for a digestive condition rose from 1.5 percent to 2.5

percent. This trend held true for seniors—increasing from 18.6 percent to 26.6 percent—and for 18 to 64 year olds—rising from 6.4 percent to 8.9 percent.

- The total number of prescription drug purchases for digestive conditions more than doubled—rising from 77.8 million to 158.4 million.
- The average expense per digestive prescription drug purchase increased 33 percent—from \$90 to \$120.

The estimates do not include over-the-counter drugs and prescription drugs administered in inpatient, physician's office, or clinic settings. These data were

continued on page 15

Digestive problems

continued from page 14

taken from the Medical Expenditure Panel Survey (MEPS), a detailed source of information on the health services used by Americans, the frequency with which they are used, their cost, and how they are paid for. For

more information, see *Trends in Outpatient Prescription Gastrointestinal Agent Purchases and Expenditures for the Civilian Noninstitutionalized Population, 1997 and 2007*, at www.meps.ahrq.gov/mepsweb/data_files/publications/st277/stat277.pdf. ■

Medicare pays for nearly half of rural hospital stays

Medicare patients accounted for nearly half (45 percent) of all stays at rural hospitals in 2007, while the percentage of Medicare beneficiaries who were admitted to urban hospitals was considerably lower (35 percent), according to the latest data from the Agency for Healthcare Research and Quality. The Agency's analysis also found that in 2007:

- About 25 percent of rural hospital patients were covered by private health insurance vs. 36 percent of urban hospital patients. One-fifth of patients in both rural and urban hospitals had Medicaid and about 5 percent were uninsured.
- Half of the nation's 2,000 rural hospitals had fewer than 50 beds compared with only one-fifth of urban hospitals.
- The top five illnesses among the two-thirds of rural residents who were hospitalized in rural facilities were pneumonia (267,000 stays); congestive heart failure (166,000 stays); chronic obstructive lung disease (146,000 stays); chest pain (110,000); and fluid and electrolyte disorders, primarily dehydration and fluid overload (106,000 stays).
- The top five illnesses among the one-third of rural residents who were admitted to urban hospitals were hardening of the arteries (108,000 stays); osteoarthritis (79,000 stays); back disorders (75,000 stays); medical device, implant, or graft complications (61,000 stays); and heart attack (61,000 stays).

These data come from the report, *Inpatient Stays in Rural Hospitals, 2007*. The report uses statistics from the 2007 Nationwide Inpatient Sample, a database of hospital inpatient stays that is nationally representative of inpatient stays in all short-term, non-Federal hospitals. The data are drawn from hospitals that comprise 90 percent of all discharges in the United States and include all patients, regardless of insurance type, as well as the uninsured. The report is available at www.hcup-us.ahrq.gov/reports/statbriefs/sb85.pdf. ■

Two-thirds of State and local government workers get their health plans from their employers

About 66 percent of the nearly 20 million State and local government employees were enrolled in employer-sponsored health plans in 2008 compared with 54 percent of private-sector workers, according to the latest data from the Agency for Healthcare Research and Quality (AHRQ).

The Agency's analysis of State and local government employee health plan data, broken down by the nine Census divisions, found that:

- The highest average annual total premiums (\$6,631) for plans that only covered the employee (single-coverage) were in the New England division of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, while they were the lowest (\$4,560) in the West South Central division – Arkansas, Louisiana, Oklahoma, and Texas.
- New England employees also had the highest average annual total premium (\$16,965) for plans that covered families, with the lowest premium (\$12,068) in the South Atlantic division of Delaware, the District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia.
- Workers in New England with single-coverage plans contributed more (\$1,097) on average to the cost of that premium than workers in the neighboring Middle Atlantic division – New Jersey, New York, and Pennsylvania (\$291).
- In contrast, State and local government workers in the West South Central division (\$4,048) contributed the most on average to the family plan premium and

continued on page 16

Government workers

continued from page 15

those in the Middle Atlantic division contributed the least (\$957).

These data are taken from the Medical Expenditure Panel Survey (MEPS), a detailed source of information

on the health services used by Americans, the frequency with which they are used, the cost of those services, and how they are paid for. For more information, see Employer-Sponsored Health Insurance for Employees of State and Local Governments by Census division, 2008 at www.meps.ahrq.gov/mepsweb/data_files/publications/st273/stat273.pdf. ■

Announcements

AHRQ releases 2007 hospital emergency department data

The Agency for Healthcare Research and Quality (AHRQ) has released 2007 data for its Nationwide Emergency Department Sample (NEDS), the largest emergency department (ED) database in the United States. It can be used for many purposes. For example, it can be used to generate statistics on hospital ED visits by patients with various types of coverage as well as the uninsured. The data can help researchers and others find

answers to questions about access to and use of hospital EDs by Americans as a whole and policy-relevant groups like the low-income and uninsured, the quality and effectiveness of care, ED charges, and the impact of policy changes.

For example, the data show that in 2007, the uninsured accounted for nearly one-fifth of the 122 million ED visits, Medicaid and Medicare each accounted for about a fifth, and the remaining

visits were made by privately insured patients. However, Medicare patients accounted for half of all cases severe enough to require hospital admission. NEDS is part of AHRQ's Healthcare Cost and Utilization Project (HCUP), a Federal-State-industry partnership for building a standardized, multistate health data system. For more information about NEDS, go to www.hcup-us.ahrq.gov/nedsoverview.jsp. ■

AHRQ and the American College of Cardiology collaborate on study of implantable cardioverter defibrillators

A \$3.5 million research project that will study the long-term benefits and risks of implantable cardioverter defibrillators (ICDs) in patients at risk of death from ventricular fibrillation will be supported by the Agency for Healthcare Research and Quality and the American College of Cardiology. The project is being conducted in cooperation with the National Heart, Lung, and Blood Institute, part of the National Institutes of Health.

Ventricular fibrillation is a dangerous type of abnormal heart rhythm that causes cardiac muscles in the ventricles in the heart to tremble rather than contract properly. The condition requires prompt attention. If the abnormal rhythm continues for more than a few seconds, blood circulation will cease, and sudden cardiac death may occur in minutes.

Patients at risk for ventricular fibrillation sometimes have ICDs implanted in their chests. These battery-

powered devices, which are typically about 3 inches high and 2 inches wide, monitor the heart for abnormal heartbeats. If they detect potentially life-threatening rhythms, they deliver an electric shock to restore normal rhythm.

The new 3.5-year study will be conducted by members of the AHRQ-supported HMO Research Network, a consortium of 15 health care delivery systems that conduct research on various topics, including medical effectiveness and safety. The systems are also part of the National Heart, Lung, and Blood Institute's Cardiovascular Research Network. The results will also be helpful to the Centers for Medicare & Medicaid Services, which has covered ICDs for certain patients since 2005 and has required that certain Medicare patients receiving the devices be enrolled in a national registry.

continued on page 17

Cardioverter defibrillators

continued from page 16

The study will follow 3,500 patients with ICDs from the Cardiovascular Research Network to determine how often the devices deliver shocks, whether the shocks are appropriate, and to identify those patients who are most

likely to require ICD shocks. AHRQ is providing \$2.1 million to construct the study sample and collect ICD shock data within the first 2 years of the study. The American College of Cardiology Foundation is providing \$1.4 million to collect and analyze shock data during the remainder of the study. ■

AHRQ introduces new online technical tutorial series with first module on HCUP sample design

AHRQ is offering a new online training course on Healthcare Cost and Utilization Project (HCUP) Sample Design as the first technical course in a new HCUP Online Tutorial Series (www.hcup-us.ahrq.gov/tech_assist/tutorials.jsp). The sampling course assists users in understanding the sampling strategy of the three HCUP nationwide databases: the Nationwide Inpatient Sample, the Kids' Inpatient Database, and the Nationwide Emergency Department Sample.

The HCUP Online Tutorial Series provides HCUP data users with information about HCUP data and tools and training on technical methods for conducting research with HCUP data. The courses are designed to answer technical questions related to HCUP data and programs, such as:

- How do I load HCUP data onto my computer and check that it has loaded correctly?
- How were the HCUP samples designed?

- How do I use HCUP data to produce national or regional estimates?

Modules on loading and checking HCUP data and producing national and regional estimates will be released later this year. For new HCUP users, the HCUP Overview Course (www.hcup-us.ahrq.gov/overviewcourse.jsp) is very helpful. For more information, contact HCUP User Support at hcup@ahrq.gov. ■

Research Briefs

Alexander, G. L. and Madsen, R. (2009). "IT sophistication and quality measures in nursing homes." (AHRQ grant HS16862). *Journal of Gerontological Nursing* 35(7), pp. 22–27.

The relationship between the degree of information technology (IT) sophistication and quality measures of care at nursing homes is strongest when IT is used to manage resident care and clinical support, found this study of 210 nursing homes in Missouri. The researchers reported comparable IT sophistication scores in 3 domains (resident care management, clinical support, and administrative processes) for 95 nursing homes

that made quality measure data available to the researchers and 115 that did not. Among the nursing homes providing quality measure data, the most commonly occurring quality measure issue was incontinence (mean of 39.4 percent of residents), followed by a decline in activities of daily living, or ADLs, (mean of 13.4 percent), and worsening locomotion (mean of 10.6 percent). The researchers found weak but significant correlations between the use of IT for resident care management and reduction in ADL decline.

Alper, S. J. and Karsh B.-T. (2009). "A systematic review of

safety violations in industry." (AHRQ grant HS13610). *Accident Analysis and Prevention* 41(4), pp. 739–754.

Instead of blaming workers for violating safety rules, managers should try to understand the factors in the work environment that precipitate these violations, note the authors of this review of the literature. They identified 13 studies that discussed intentional violations of safety procedures and norms without a desire to cause harm (termed "nonmalevolent violations"). Of these studies, five were concerned with health care; the other fields reported on were

continued on page 18

Research briefs

continued from page 17

commercial driving, aviation, aviation maintenance, mining, railroad transportation, and construction. The studies tested 57 different variables to determine their association with violations. The researchers grouped these variables into six categories (individual characteristics, information/education/training, design to support worker needs, safety climate, competing goals, and problems with rules). In some cases, violation of poorly designed rules was found to be necessary to increase safety.

Butt, A. A., Tsevat, J., Leonard, A., and others. (2009). “Effect of race and HIV co-infection upon treatment prescription for hepatitis C virus.” (AHRQ grant HS13220). *International Journal of Infectious Diseases* 13, pp. 449-455.

These researchers compared treatment of 241 patients with hepatitis C virus (HCV) infection and 158 patients with HCV and HIV co-infection from 3 academic medical centers. They found that HIV co-infection was an independent predictor of not receiving treatment for HCV. This result persisted even after researchers controlled for such factors as patient age, minority race, and coexisting medical conditions. The researchers offer several explanations. First, HCV/HIV co-infected patients have lower response rates to HCV medications compared with patients with just HCV infection. Co-infected patients receiving treatment for HIV are also at risk for a number of drug interactions with ribavirin, a common therapy for HCV. Blacks were less likely to receive treatment for HCV compared with whites. The

researchers attribute the treatment disparities for blacks with HCV to their reduced likelihood of achieving good treatment responses to HCV medications compared with whites.

Castle, N. G., Hanlon, J. T., and Handler, S. M. (2009). “Results of a longitudinal analysis of national data to examine relationships between organizational and market characteristics and changes in antipsychotic prescribing in U.S. nursing homes from 1996-2006.” (AHRQ grant HS16547). *The American Journal of Geriatric Pharmacotherapy* 7, pp. 143-150.

In order to help patients who are agitated or behave aggressively, nursing homes use antipsychotic medications. Currently, between 24.8 percent and 27.6 percent of patients in nursing homes receive these drugs. In some cases, nursing home caregivers may use these drugs inappropriately in an attempt to keep patients quiet and less troublesome to staff. The researchers tracked the use of these drugs between 1996 and 2006 with data from the Medicare and Medicaid programs. Factors such as nursing home for-profit status, chain membership, competition levels, and Medicaid reimbursement were included in the analysis. Overall, the use of antipsychotics in the facilities studied increased by almost 60 percent during the time period. Theresearchers also found that for-profit nursing homes used more antipsychotic drugs than others. Factors resulting in a lower rate of antipsychotic use included chain membership, increased Medicaid reimbursement, and increased market competition.

Chung, J. W. and Meltzer, D. O. (2009, November). “Estimate of the carbon footprint of the US

health care sector.” (AHRQ grant HS16967). *Journal of the American Medical Association* 302(18), pp. 1970-1972.

To quantify the environmental impact of health care—its carbon footprint, these researchers estimated total greenhouse gas (GHG) emissions for the U.S. health care sector. They accounted for carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. They estimated GHG emissions using 2007 data on health expenditures by the National Health Accounts Team and the Environmental Input-Output Life-Cycle Assessment Model developed by Carnegie Mellon University. Both the direct effects of health care activities and indirect effects that included upstream supply-chain effects were measured. In 2007, the health care sector accounted for 16 percent of the U.S. gross domestic product. The total effects of health care activities contributed 8 percent of total U.S. GHG and 7 percent of U.S. total carbon dioxide emissions as measured in millions of metric tons of carbon dioxide equivalent.

Clancy, C. M. (2009, November.) “The canary’s warning: Why infections matter.” *American Journal of Medical Quality* 24(6), pp. 462-464. Reprints (AHRQ Publication No. 10-R018) are available from AHRQ.*

Health care organizations that desire a brief but accurate view of their patient safety performance can use the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicator (PSI) #7 “Selected Infections Due to Medical Care” as a simple barometer, suggests the Director of AHRQ in this paper. Constructing national trends of safety outcomes is difficult because of data

continued on page 19

Research briefs

continued from page 18

limitations. The AHRQ PSI #7 is useful as a canary measure because the data that can be collected for it are significant, and its results strongly correlate with health care organization performance on other PSIs. Also, the PSI #7 is useful because of the nature of health care-related infections, which have become the most common complication of hospital care, notes the author.

Clancy, C. M. (2009, November). “Ten years after To Err is Human.” *American Journal of Medical Quality* 24(6), pp. 525-528. Reprints (AHRQ Publication No. 10-R019) are available from AHRQ.*

A decade ago, the discovery of the large numbers of people who die each year from medical errors in U.S. hospitals came as a surprise, even to experts in health care quality and patient safety. Since that time, the Agency for Healthcare Research and Quality (AHRQ), as the lead Federal agency in supporting Federal research on efforts to reduce patient harms, has built a wider and deeper evidence base about the root causes of errors. AHRQ has also created patient safety tools that providers have begun using to address medical errors in a systematic way. For example, AHRQ’s suite of patient safety culture surveys help hospitals, nursing homes, and medical offices to assess, improve, and monitor their patient safety performance. Other areas of AHRQ involvement include reducing health care-associated infections, reducing hospital readmission rates, and understanding the relationship between medical resident fatigue and medical errors.

DeFrank, J. T., Rimer, B. K., Gierisch, J. M., and others. (2009). “Impact of mailed and automated telephone reminders on receipt of repeat mammograms.” (AHRQ grant T32 HS00079). *American Journal of Preventive Medicine* 36(6), pp. 459-467.

Only two-thirds of U.S. women over 40 years and under 74 years old report having had mammograms within the past 1–2 years. To see if they could increase the proportion of women with recent mammograms, the researchers tested the effectiveness of automated telephone reminders (ATRs), enhanced reminder letters, and standard letters on the likelihood of repeat mammograms. The study included 3,547 adult women who were randomly assigned to 3 different groups. The researchers found that ATRs (76 percent) were more effective in ensuring repeat mammography than either standard (74 percent) or enhanced reminder letters (72 percent), even though the information contained in the ATR and the standard letter was the same. The telephone reminders were also the least costly of the three interventions. Overall, 74 percent of the women in the study had a repeat mammogram within 10–14 months after the previous mammogram compared with 57 percent before the reminders.

Gallagher, P., Ding, L., Ham, H. P., and others. (2009, November). “Development of a new patient-based measure of pediatric ambulatory care.” (AHRQ grant HS09205). *Pediatrics* 124(5), pp. 1348-1354.

There are validated versions of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey for assessing pediatric care. However, many in the

field thought that the pediatric CAHPS would be improved by including questions about developmental and preventive care. In this study, the researchers developed and tested two new pediatric CAHPS multi-item scales (composites) of developmental surveillance and preventive care that met high standards of reliability and validity. As part of this process, they conducted two focus groups and nine cognitive interviews. The multi-item scales were then tested on a group of 670 parents. The researchers found that reliable care assessments at the physician level can be obtained for both composites with as few as 50 patients. The CAHPS Consortium approved the new instrument, CAHPS-CG Child Primary Care, which incorporates the two composites, for assessing ambulatory pediatric care by clinicians and groups.

Henderson, M. J. (2009). “Synthesis of ‘statistical innovations for cost effectiveness analysis.’ *Translating Research into Policy and Practice (TRIPP)*,” in: Hofmann, B. R., ed. *Health Care Costs: Causes, Effects and Control*. Hauppauge, NY: Nova Science Publishers, 2009, pp. 121-151. (Reprints (AHRQ Publication No. 10-RG001) are available from AHRQ.*

This article pulls together the findings of a 6-year study of new statistical models and methods for improving cost-effectiveness analysis (CEA) in health services research. CEA is seen as a useful tool for setting priorities in expenditures for health care programs, allowing comparison in costs and benefits between alternative interventions to improve health. The methods developed by the study allow analysts to express

continued on page 20

Research briefs

continued from page 19

and quantify the degree of uncertainty in estimates of cost and benefit. Applications of the new models and methods include calculating the cost-effectiveness of the implantable cardioverter defibrillator and technologically improved versions of the device. The author of the article suggests that these methods may prove useful in evaluating the Medicare Part D prescription drug benefit.

Henriksen, K., Joseph, A., and Zayas-Cabán, T. (2009, December). “The human factors model of home health care: A conceptual model for examining safety and quality concerns.” *Journal of Patient Safety* 5(4), pp. 229-236. Reprints (AHRQ Publication No. 10-R020) are available from AHRQ.*

As the U.S. population ages, the rise in multiple chronic and acute care needs among individual patients is placing new demands on home health care. Patients can be discharged from the hospital while not fully recovered. At the same time, within the past decade, a growing number of sophisticated medical devices and equipment originally designed for use by trained personnel in hospitals and clinics are now used at home. The authors examine the human factors challenges associated with these converging trends in the home health care sector. Based on an analysis of literature related to home health care, they present a sociotechnical systems conceptual model in order to explore safety and quality concerns. The model consists of five tiers: the external environment, the physical and social/community environments together with medical devices and technology, the nature of home health care tasks, provider

characteristics, and patient characteristics.

Lopez, L., Weissman, J.S., Schneider, E.C., and others. (2009, November). “Disclosure of hospital adverse events and its association with patients’ ratings of the quality of care.” (AHRQ grant HS11928). *Archives of Internal Medicine* 169(20), pp. 1888-1894.

To discover the relationship between the disclosure of hospital adverse events and patients’ ratings of the quality of care, the researchers surveyed a random sample of 603 medical and surgical acute care adults patients in Massachusetts hospitals in 2003. Adverse events (AEs) are injuries caused by medical management rather than an underlying condition of the patient. Overall, the 603 patients reported 845 AEs. Forty percent of the AEs were disclosed to the patients by someone from the hospital, who explained why the negative effects occurred. Patients who reported an AE that had been disclosed to them gave a higher rating of the quality of care than patients who reported an AE that was not disclosed. Clinicians were less likely to disclose an AE that was associated with a more prolonged impact on the patient. The researchers suggest that a disclosure gap remains, even though patients rate their care favorably when AEs are disclosed.

McAuley, W. J., Spector, W., and Van Nostrand, J. (2009). “Formal home care utilization patterns by rural-urban community residence.” *Journal of Gerontology: Social Sciences* 64(2), pp. 258-268. Reprints (AHRQ Publication No. 10-R003) are available from AHRQ.*

The researchers used data taken from the Medical Expenditure Panel Survey for 2002 and 2003 to look at

home care utilization patterns in various residential areas. These areas included large metropolitan counties, micropolitan counties with towns of 10,000 to 50,000 residents, and remote counties with towns of less than 2,500 residents. Residents of micro counties were nearly twice as likely as metro residents to use home care and residents of remote counties had a three times greater likelihood of using home care. More home care provider days were received by users residing in counties adjacent to micro counties compared with those living in nonmetro counties next to metro counties and those residing in remote counties. Factors associated with a greater use of formal home care included increasing age, being white, having Medicaid, and being a nonsenior with Medicare.

Malat, J., van Ryan, M., and Purcell, D. (2009). “Blacks’ and whites’ attitudes toward race and nativity concordance with doctors.” (AHRQ grant HS13280). *Journal of the National Medical Association* 101(8), pp. 800-807.

Very little is known about patients’ general attitudes toward doctors’ race and nativity. In addition, there is little research on how American-born patients evaluate care from foreign-born doctors. In order to explore these questions, the researchers decided to focus on how patients felt about the two dimensions of technical competence and interpersonal skills. Using a telephone survey conducted in the spring of 2004, the researchers queried 695 whites and 510 blacks in Hamilton County, Ohio. They found that black patients were more likely to believe that same-race doctors better understand their health problems (27 percent vs. 12 percent) and

continued on page 21

Research briefs

continued from page 20

expected to be more at ease with same-race doctors than white patients (27 percent vs. 20 percent). Blacks were also more likely than whites to believe that U.S.-born doctors better understood their health problems and expected to be more at ease with U.S.-born doctors.

Manwell, L. B., Williams, E. S., Babbott, S., and others. (2009, May). “Physician perspectives on quality and error in the outpatient setting.” (AHRQ grant HS11955). *Wisconsin Medical Journal* 108(3), pp. 139-144.

In this study, 32 primary care physicians participated in 9 focus groups in 5 cities to identify workplace factors that were related to greater or reduced safety and error. Participant comments were sorted into three major areas (factors affecting quality, factors affecting errors, and cross-cutting factors that affected both quality and errors). Many participants attributed limitations on quality of care to differences in basic values between staff physicians and practice leadership, to the availability of resources (supplies, medications, and referrals), and to lack of job control and inability to participate in decisionmaking. Factors influencing errors included the lack of formal error reporting systems and a focus on individuals rather than systems in preventing errors. Patient advocates and on-site pharmacists were noted as resources to help reduce mistakes by patients and clinicians. Cross-cutting factors included increased complexity of needs for aging patients, and lack of attention to special issues for women and minority physicians and patients.

Margolis, P. and Halfon, N. (2009). “Innovation networks: A strategy to transform primary health care.” (AHRQ grant HS16957). *Journal of the American Medical Association* 302(13), pp. 1461-1462.

Collaborative networks of primary care practices can enhance the capability of individual practices, as well as the capacity of local primary care systems, to improve health outcomes. However, most primary care practices are outside of large health care systems. Therefore, providing policy and practice supports to them poses an enormous challenge. One way to meet this challenge is through user-led innovation networks, suggest the authors. These networks, linked by technology and common purpose, are becoming a widespread means of sharing the work of innovation while improving large complex systems. Operational components of the networks include ongoing dialogue to achieve common understanding and interchange of widely varying perspectives, a platform for experimenting and testing ideas, and a means to execute and implement ideas. One innovation network, called Improving Performance in Practice, currently operates in seven States, and serves as a prototype of a primary health care innovation network.

Olfson, M., Crystal, S., Gerhard, T., and others. (2009). “Mental health treatment received by youths in the year before and after a new diagnosis of bipolar disorder.” (AHRQ grant HS16097). *Psychiatric Services* 60, pp. 1098-1106.

A recent sharp increase in the number of youths diagnosed as having bipolar disorder has focused attention on community practice

patterns. Concern exists that this diagnosis may be excessively used by health care professionals who treat children and adolescents, but little is known about the circumstances under which clinicians diagnose young people as having bipolar disorders. The researchers examined service patterns and pharmacy claims surrounding new clinical diagnoses of bipolar disorder among 1,274,726 privately insured youths (17 and younger) during a 1-year period. The rate of new diagnoses was 0.23 percent (2,900 youths). Most of these youths had already been diagnosed as having other mental disorders, usually depressive (46.5 percent) or disruptive (36.7 percent) behavior disorders and they were already being treated with psychotropic medications. In the year after the new diagnosis, more than half had three or fewer additional claims for bipolar disorder. This service pattern suggests that the diagnostic label often does not persist as new symptom patterns emerge or resolve.

Rodriguez, M., Shoultz, J., and Richardson, E. (2009). “Intimate partner violence screening and pregnant Latinas.” (AHRQ grant HS11104). *Violence and Victims* 24(4), pp. 520-532.

The American College of Obstetrics and Gynecology recommends that pregnant women be routinely screened for intimate partner violence (IPV). IPV has a high prevalence and is associated with adverse health consequences. The researchers decided to explore whether pregnant Latina women were being screened in accordance with the recommendation. In their survey of 210 pregnant Latina women in the Los Angeles area, they found that almost two-thirds

continued on page 22

Research briefs

continued from page 21

had never been asked about being abused. Nearly 83 percent of women who were asked about abuse received care at provider practices that had systems in place to prompt routine screening for abuse. Health care providers who possess good listening skills and are able to explain information in a way women can understand were also likely to ask women about abuse. The researchers suggest that training care providers to ask women about potential abuse may increase clinicians' confidence and boost the number of women whose abuse is detected.

Schiff, G.D., Hasan, O., Kim, S., and others. (2009, November). "Diagnostic error in medicine." (AHRQ grant HS11552). *Archives of Internal Medicine* 169(20), pp. 1881-1887.

Errors related to delayed or missed diagnoses are a frequent and underappreciated cause of patient injury. Despite the fact that such errors are the leading cause of malpractice litigation, few studies have examined diagnostic errors in detail. The researchers surveyed 310 clinicians from 22 institutions about diagnostic errors which they personally committed or observed. Of the 583 cases examined, 162 (28 percent) were considered major, 241 (41 percent) moderate, and 180 (31 percent) minor. The largest proportion of errors (44 percent) took place during laboratory and radiology testing (including test ordering, performance, and clinician processing), followed by clinician assessment (32 percent) (including hypothesis generation, weighing or prioritizing, and recognizing urgency or complications). Pulmonary embolism and drug reactions (including overdose and poisoning)

were the two most commonly missed diagnoses (4.5 percent each), followed closely by lung cancer (3.9 percent) and colorectal cancer (3.3 percent).

Sharma, M., Ansari, M.T., Abou-Setta, A.M., and others. (2009). "Systematic review: Comparative effectiveness and harms of combination therapy and monotherapy for dyslipidemia." (AHRQ Contract No. 290-02-0021). *Annals of Internal Medicine* 151, pp.622-630.

Patients who need an intensive lowering of cholesterol levels may take an increased dose of a statin alone or use a statin in combination with other lipid-lowering agents of another class, such as ezetimibe, niacin, or bile-acid sequestrants. The researchers undertook a comparative effectiveness review to evaluate which of these strategies is superior with respect to clinical outcomes. In their review of 102 studies, they found no evidence of combination therapy being superior to high-dose statin monotherapy in terms of mortality, heart attack, stroke, and revascularization procedures in patients requiring intensive lipid-lowering therapy. There was limited evidence for a greater reduction in LDL cholesterol levels with any combination compared with high-dose statin monotherapy in patients requiring intensive lipid-lowering therapy. However, few studies examined treatment combinations other than statin-ezetimibe.

West, S. L., Blake, C., Liu, Z., and others (2009). "Reflections on the use of electronic health record data for clinical research." (AHRQ Contract No. 290-05-0040). *Health Informatics Journal* 15(2), pp. 108-121.

To gain insight into the usefulness and limitations of electronic health records (EHRs)

for clinical research, the authors of this paper focused on a Web-based EHR system at a major academic medical center. The goal of the clinical research case study was to assess medication patterns in patients with newly diagnosed type 2 diabetes. The researchers discuss the problems in extracting deidentified data from the EHR databases. From 12,424 records of patients with HbA1c measurements (a measure of blood sugar control), 1,664 met their criteria for "newly diagnosed diabetics." The researchers found they needed to use a variety of methods to screen out patients, including text mining of transcribed notes of the patient visits. They found that fragmentation of care at the practice or provider level made it difficult to determine when a patient was newly diagnosed with diabetes and how well they were being treated for this condition.

White, R. H., Sadeghi, B., Tancredi, D. J., and others. (2009, December). "How valid is the ICD-9-CM based AHRQ patient safety indicator for postoperative venous thromboembolism?" (AHRQ Contract No. 290-04-0020). *Medical Care* 47(12), pp. 1237-1243.

Patient Safety Indicators (PSIs) are a set of indicators providing information on potential in-hospital complications and adverse events following surgeries and procedures. One PSI, PSI-12, focuses on postoperative venous thromboembolism (VTE), either pulmonary embolism (PE) or deep-vein thrombosis (DVT). However, current PSI 12 criteria do not accurately identify patients with acute postoperative lower extremity DVT or PE, found this study. Like all PSIs, it relies on ICD-9-CM diagnostic coding of hospital

continued on page 23

Research briefs

continued from page 22

records. However, the coding process for VTE is particularly prone to inaccuracy. Patients from 80 hospitals were divided into two groups. In the combined group, 451

of 573 VTE flag-positive cases identified using PSI-12 had any acute documented VTE at any time during hospitalization. However, the positive predictive value for acute lower extremity DVT or PE diagnosed after an operation was 44

percent in one group and 48 percent in the second group. Modification of the ICD-9-CM codes and implementation of “present on admission” flags should improve the predictive value for clinically important VTE events. ■



Healthcare 411

Are you looking for health-related news you can listen to at your convenience at home or on the go?

AHRQ's Healthcare 411 is your reliable audio news program, based on the latest research and available when and where you need it!

Listen to:

- 60-second radiocasts with tips for health care consumers
- 10-minute audio podcasts featuring longer, more in-depth interviews with experts who provide evidence-based information on today's critical health care topics

Log on and listen at www.healthcare411.ahrq.gov. Or subscribe and we'll send stories directly to your computer or personal media player.

Get your medical information—when and where you're ready to hear it—on-demand with Healthcare 411.

Subscribe to AHRQ's Electronic Newsletter

AHRQ's free notification service brings news and information to your e-mail inbox! This service allows subscribers to receive automatic e-mail updates about AHRQ's research, data, publications, events and meetings, and many other announcements.

You also can **customize your subscription** and receive other AHRQ topics of interest.

To subscribe:

1. Go to www.ahrq.gov and select “E-mail Updates” next to the red envelope icon.
2. Enter your email address.
3. On the “Quick Subscribe” page, select *AHRQ Electronic Newsletter* under the “AHRQ News and Information” heading.

Questions? Please send an e-mail to Nancy.Comfort@ahrq.hhs.gov.



**U.S. Department of
Health and Human Services**

Agency for Healthcare Research and Quality
P.O. Box 8547
Silver Spring, MD 20907-8547

Official Business
Penalty for Private Use \$300



AHRQ Pub. No. 10-RA006
March 2010

ISSN 1537-0224

Ordering Information

Most AHRQ documents are available free of charge and may be ordered online or through the Agency's Clearinghouse. Other documents are available from the National Technical Information Service (NTIS). To order AHRQ documents:

**(* Available from the AHRQ
Clearinghouse:**

Call or write:

AHRQ Publications Clearinghouse

Attn: (publication number)

P.O. Box 8547

Silver Spring, MD 20907

800-358-9295

703-437-2078 (callers outside the

United States only)

888-586-6340 (toll-free TDD service;

hearing impaired only)

To order online, send an e-mail to:

ahrqpubs@ahrq.hhs.gov

() Available from NTIS:**

Some documents can be downloaded from the NTIS Web site free or for a nominal charge. Go to www.ntis.gov for more information.

To purchase documents from NTIS, call or write:

National Technical Information Service
(NTIS)

Springfield, VA 22161

703-605-6000, local calls

800-553-6847

**Note: Please use publication numbers
when ordering**

To subscribe to *Research Activities*:

Send an e-mail to ahrqpubs@ahrq.hhs.gov with "Subscribe to *Research Activities*" in the subject line. Be sure to include your mailing address in the body of the e-mail.

**Access *Research Activities* online at
www.ahrq.gov/research/resact.htm**