



Research Activities



U.S. Department of Health and Human Services • No. 311, July 2006

Agency for Healthcare Research and Quality

Highlights

Departments

- 2 Patient Safety and Quality
- 7 Disparities/Minority Health
- 8 Child/Adolescent Health
- 10 Health Information Technology
- 11 Men's Health
- 12 Elderly/Long-Term Care
- 13 Primary Care Research
- 15 Emergency Medicine
- 16 Access to Care
- 17 Health Care Costs and Financing
- 19 Acute Care/Hospitalization

Regular Features

- 19 Agency News and Notes
- 20 Announcements
- 21 Research Briefs

NICU babies are frequently at risk for misidentification

Neonatal Intensive Care Unit (NICU) babies often share similar or similar-sounding last names or similar medical record numbers (MRNs) with other babies receiving care in the same NICU on the same day. The potential confusion created by these similarities contributes significantly to the risk of patient identification errors in the NICU. An infant could be given a medication, procedure, or mother's expressed breast milk intended for another infant, perhaps with adverse consequences. A study supported in part by the Agency for Healthcare Research and Quality (HS11583) found that during one calendar year, there was not a single day without at least one pair of patients at risk for misidentification. On average, 26 percent of NICU babies were at risk for being mistaken for another baby on any given day.

Researchers measured the potential for misidentification among NICU infants resulting from patient name and MRN similarities based on a listing of infants who received care in one NICU during 1 year. A patient

was considered at risk for misidentification when the index infant shared a surname, similar-sounding surname, or similar MRN with another infant who was cared for in the NICU on that day.

The mean number of patients who were at risk on any given day was 17, representing just over 50 percent of the average daily census (33.4 babies). During the entire year, the risk of misidentification ranged from 20.6 percent to a high of 72.9 percent of the average daily census. The most common causes of misidentification risk were similar appearing MRNs (44 percent of patient days), identical surnames (34 percent), and similar-sounding names (9.7 percent).

These findings underscore the need to reconsider the methods used for NICU patient identification, assert the researchers. Since the physical appearance of NICU infants isn't as helpful as in older patients, NICU clinicians must rely on standardized patient wristbands

continued on page 2

NICU babies

continued from page 1

for identification purposes. Errors in wristband content or use are frequent, and missing wristbands are common.

More details are in “Patient misidentification in the neonatal intensive care unit: Quantification of risk,” by James E. Gray, M.D., Gautham Suresh, M.D., Robert Ursprung, M.D., and others, in the January 2006 *Pediatrics* 117(1), pp. 43-47. ■

Patient Safety and Quality

Work hour limits improve residents' quality of life, but not their satisfaction with their medical education

Mandatory work-hour limitations were imposed in 2003 for medical residents, limiting duty hours to 80 hours per week, 1 day off per week, and no more than 30 consecutive work hours. The work-hour limitations were meant to improve residents' ability to learn and reduce burnout and fatigue that can lead to medical errors. While work-hour limitations do improve residents' quality of life, they do not improve educational satisfaction,

according to the University of California, San Francisco (UCSF) researchers who conducted the study.

After system changes were introduced to implement work-hour limitations, researchers, supported by the Agency for Healthcare Research and Quality (HS11416), analyzed survey responses from 125 internal medicine residents at 3 clinical training sites affiliated with UCSF.

The vast majority (78 percent) of residents said reduced work hours had a positive impact on quality of life and hours worked (82 percent). However, 28 percent reported a negative impact on their medical education. Also, 72 percent reported that the amount of time spent doing non-medical-oriented tasks was unchanged. They considered paperwork, answering pages, and scheduling tasks to be the major hindrance to engaging in educational activities.

Residents rated the educational activities—morning report and teaching others—most highly, followed by attending rounds, reading medical literature, and the daily noon conference. After work hour duties were reduced, about two-thirds of residents spent the same time or less time in highly rated educational activities such as teaching others and in conferences. About one-third spent more time reading and teaching others. Educational satisfaction may be more related to the type of workload rather than the number of hours worked, suggest the researchers.

See “Impact of reduced duty hours on residents' educational satisfaction at the University of California, San Francisco,” by Arpana R. Vidyarthi, M.D., Patricia P. Katz, Ph.D., Susan D. Wall, M.D., and others in the January 2006 *Academic Medicine* 81(1), pp. 76-81. ■

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

Barbara L. Kass, MPH, CHES,
Managing Editor
Gail Makulowich, Contributing Editor
Joel Boches, Design and Production
Karen Migdail, Media Inquiries

Surgeons vary widely in their approaches to disclosing medical errors to their patients

Surgeons are encouraged to fully disclose medical errors they make during the care of patients, yet few receive training on the best way to talk to patients about errors. Surgeons are also often reluctant to do so because of possible malpractice suits, discomfort in facing angry patients, and concern about potential damage to their reputation. A study, supported in part by the Agency for Healthcare Research and Quality (HS11898 and HS14012), analyzed how surgeons talk with patients about medical errors and found that the surgeons' approaches to these discussions varied widely.

Researchers randomly assigned 30 surgeons to meet with standardized patients (SPs), who portrayed patients in 3 different hypothetical error scenarios. The scenarios included a wrong-side lumpectomy related to a surgeon's error in labeling breast biopsy

specimens, a retained surgical sponge after a splenectomy, and life-threatening hyperkalemia-induced cardiac arrhythmia related to the surgeon forgetting to check laboratory test results. The SPs, who had experience in assessing physicians' communication skills, rated each encounter based on five communication elements of effective error disclosure.

The surgeons were rated highest on their ability to explain the medical facts about the errors (average scores for the three scenarios ranged from 3.93 to 4.20 out of a maximum score of 5). However, surgeons used the word "error" or "mistake" in only 57 percent of disclosure conversations. In 27 percent of cases, surgeons used the words "complication" or "problem" to describe the error.

The average scores for surgeons when rated for honesty and truthfulness ranged from 3.58 to

4.13. For empathy, surgeons averaged scores ranging from 3.58 to 3.83. Surgeons scored the lowest on prevention of future errors: 1.75 to 2.40.

Surgeons admitted full responsibility for the error in 65 percent of cases, verbally apologized in 47 percent, and acknowledged or validated the patient's emotions in 55 percent. Eight percent of surgeons discussed how similar errors would be prevented in the future, and 20 percent offered to refer the patient to another doctor for a second opinion or transfer of care.

See "How surgeons disclose medical errors to patients: A study using standardized patients," by David K. Chan, M.D., Thomas H. Gallagher, M.D., Richard Reznick, M.D., and Wendy Levinson, M.D., in the November 2005 *Surgery* 138, pp. 851-858. ■

Doctors often fail to order laboratory monitoring when elderly HMO outpatients begin cardiovascular medications

Laboratory monitoring tests are often required when people begin taking a medication that has the potential to damage organs such as the liver or kidneys. Yet physicians often fail to order recommended laboratory monitoring tests in outpatient elderly HMO members who begin therapy with high-risk cardiovascular medications, concludes a study supported by the Agency for Healthcare Research and Quality (HS11832). The researchers examined use of certain laboratory tests for seven medications commonly used to prevent or treat cardiovascular

disease in older people: angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), amiodarone, digoxin, diuretics, potassium supplements, and statins.

They investigated whether nearly 200,000 elderly members of 10 HMOs, who received 1 of these high-risk cardiovascular medications as outpatients, had the recommended baseline laboratory monitoring performed during the 180 days before or 14 days after the drug was initially dispensed. Lack of laboratory monitoring

continued on page 4

Also in this issue:

Use of anticoagulants after surgery, see page 5

Treatment for adults with diabetes and depression, see page 7

State Children's Health Insurance Program and Latino children, see page 9

Computerized prescriber order entry and medication errors, see page 11

Improving care of patients with type 2 diabetes, see page 13

Emergency medical services in rural areas, see page 15

Physicians and dissatisfaction with medical practice, see page 17

Laboratory monitoring tests

continued from page 3

varied by medication class. For example, 23 percent of patients who were prescribed potassium supplements did not receive serum potassium and serum creatinine monitoring; 58 percent of patients prescribed amiodarone did not have recommended monitoring for thyroid or liver function.

Recommended laboratory tests were most likely to be omitted in

the youngest elderly for ACE inhibitors, ARBs, digoxin, diuretics, and potassium supplementation. However, in patients receiving amiodarone and statins, recommended laboratory tests were most often omitted in the oldest elderly. Laboratory tests were also more likely to be omitted in patients with fewer coexisting medical problems. Average error rates (recommended laboratory tests not performed) ranged from 23 to 43 percent at various sites. The study did not examine the

association between laboratory monitoring errors and adverse clinical outcomes.

See “Baseline laboratory monitoring of cardiovascular medications in elderly health maintenance organization enrollees,” by Steven R. Simon, M.D., M.P.H., Susan E. Andrade, Sc.D., Jennifer L. Ellis, M.S.P.H., and others, in the December 2005 *Journal of the American Geriatrics Society* 53(12), pp. 2165-2169. ■

High-quality/low-cost hospital performance is linked to organizational characteristics and market forces

A new study indicates that there is substantial variation in hospital quality and cost performance. Researchers H. Joanna Jiang, Ph.D., and Bernard Friedman, Ph.D., of the Agency for Healthcare Research and Quality, and James W. Begun, Ph.D., of the University of Minnesota, found that high-performing hospitals average 50 to 60 percent lower risk-adjusted mortality rates and costs than low-performing hospitals. Additionally, certain organizational and market characteristics are significantly associated with better hospital performance. For example, hospitals that are investor-owned or part of a hospital system are more likely to have high performance in both quality and cost. Hospitals in a highly competitive market, or in a market with a large number of HMOs, are more likely to achieve better quality and lower cost.

The researchers analyzed data from the Healthcare Cost and Utilization Project State Inpatient Databases for 10 States in 1997 and 2001. After controlling for

patient risk factors and hospital share of uninsured and Medicaid patients, they explored organizational and market characteristics associated with a hospital's likelihood of being in the lowest quartiles for both mortality and cost. They also examined the interaction of hospital and market characteristics. The differences between nonprofit and for-profit hospitals diminished in markets with high HMO penetration. The competitive pressure generated over time by HMOs' selective contracting may have motivated nonprofit hospitals to achieve higher performance in competing with their for-profit counterparts, suggest the researchers. They conclude that the presence of managed care organizations in local markets does not necessarily diminish care quality.

See “Factors associated with high-quality/low-cost hospital performance,” by Drs. Jiang, Friedman, and Begun, in the Spring 2006 *Journal of Health Care Finance* 32(3), pp. 39-52. Reprints (AHRQ Publication No. 06-R054) are available from AHRQ.* ■

Free and fast—Subscribe to AHRQ's Electronic Newsletter!

If you want the latest information from AHRQ on new RFAs, research findings, conferences, and more, just subscribe to AHRQ's Electronic Newsletter. All you need is a computer and an e-mail address. Here's how:

1. Send an e-mail message to: listserv@list.ahrq.hhs.gov
2. In the subject line type: Subscribe
3. In the body of the message type: sub public_list-L your full name
4. That's it. You will receive an e-mail confirmation.

Questions? Please send an e-mail to Nancy Comfort in AHRQ's public affairs office at nancy.comfort@ahrq.hhs.gov

Medications to prevent blood clots after major orthopedic surgery are underused, especially in Japanese patients

Patients undergoing major orthopedic surgery such as hip fracture repair, hip replacement, or knee replacement are at the highest risk for developing a blood clot in the veins of the legs or pelvis (deep vein thrombosis, DVT). These clots can break off and travel elsewhere to block an artery (thromboembolism), which can be life-threatening. Practice guidelines recommend prophylactic use of anticoagulants such as heparin or warfarin after major orthopedic surgery to decrease the risk of DVT. Despite these recommendations, use of preventive anticoagulants after major orthopedic surgery is low, especially among Japanese patients.

Researchers, supported by the Agency for Healthcare Research and Quality (HS11627), conducted a retrospective study of 1,811 adults who underwent hip

replacement, hip fracture surgery, or total knee replacement at a hospital in Hawaii. They found that only half of patients studied received anticoagulants to prevent thromboembolism following major orthopedic surgery. Japanese patients were 30 percent less likely to receive prophylactic therapy, after adjustment for patient age, sex, thromboembolism and bleeding risk factors, type of surgery, and anesthesia. The reason for the treatment differences was not clear. However, some studies have suggested there is a lower risk of venous thromboembolism among Asians and Pacific Islanders, and doctors may be aware of this. It also remains unclear if lower prophylaxis translated into higher rates of postoperative venous thromboembolism in this group.

Other ethnic groups were treated similarly to whites.

Compared with patients undergoing hip replacement, those with hip fracture surgery (who are perceived to be at higher bleeding risk) were 60 percent less likely and those undergoing total knee replacement were over 4 times more likely to receive appropriate prophylaxis. The low overall rates of venous thromboembolism prophylaxis suggest that doctors may be unaware of the guidelines for or the efficacy of prophylaxis, note the researchers.

More details are in "Patient ethnicity and use of venous thromboembolism prophylaxis," by Rebecca P. Gelber, M.D., M.P.H., and Todd B. Seto, M.D., in the *International Journal of Equality in Health Care* 18(1), pp. 23-29, 2006. ■

Physicians appear to be driven more by professional standards of quality than financial incentives

In recent years, a growing number of U.S. health plans and employer groups have established pay-for-performance programs (P4P). These programs offer health care providers financial incentives to achieve quality of care targets such as regular eye exams for patients with diabetes. However, physicians appear to be motivated more by professional standards of quality than financial incentives. Also, many physician organizations do not share the financial rewards with individual physicians.

Researchers, supported in part by the Agency for Healthcare Research and Quality (HS13591), interviewed 28 practice executives from 25 physician organizations in Massachusetts, where health plans have implemented a variety of P4P programs. Overall, the practice executives felt that quality incentives were better than utilization incentives (for example, financial rewards to perform fewer tests, get the patient out of the hospital faster, or use less expensive medication). They noted that physicians view quality

incentives as more aligned with their natural tendency to provide good quality of care, even though they often feel they cannot control whether targets are achieved due to patients' lack of adherence to their treatment or advice. In contrast, physicians often view utilization incentives as barriers to quality care. In addition, while some practice executives viewed the incentives as agents for change, others emphasized that the incentives were just rewards for good quality of care already being provided, thus calling into question the effectiveness of incentives to change practice.

The interviews also revealed that physician organizations differ in how they distribute financial rewards. For example, some distribute them equally to primary care providers regardless of attainment of quality targets, while others distribute them based on performance. Some organizations retain the financial rewards and don't distribute them to physicians. The

continued on page 6

Professional incentives

continued from page 5

researchers suggest that health plans should better educate practice executives about the relative power of the incentives they propose. They should also advise physicians how implementation may alter the power of that incentive to improve quality of care.

See “Incentive implementation in physician practices: A qualitative study of practice executive perspectives on pay for performance,” by Barbara G. Bokhour, Ph.D., James F. Burgess Jr., Ph.D., Julie M. Hook, and others, in the February 2006 *Medical Care Research and Review* 63(1S), pp. 73S-95S. ■

Researchers compare two widely used data sources to examine hospital nurse staffing

With increasing concerns on about the adequacy of hospital nurse staffing and the implications for patient safety, it is important to examine the consistency of nurse staffing measures from different data sets. Specifically, to what extent does nurse staffing appear differently as measured by different data sources? Do the nurse staffing measures derived from different data sources show similar relationships with patient outcomes? To answer these questions, researchers at the Agency for Healthcare Research and Quality compared the American Hospital Association (AHA) annual survey with the California Office for Statewide Health Planning and Development (OSHPD) data on nurse staffing for 372 non-Federal, acute care hospitals in California. The OSHPD data appeared to be more complete, to include data on unlicensed nursing staff such as nurse aides (which comprised an average of 26 percent of nursing

personnel), and to be more closely associated with patient outcomes.

Both databases showed that hospitals with higher registered nurse (RN) hours per adjusted patient day had significantly lower risk-adjusted rates for decubitus ulcers (bed sores) and mortality. However, the RN measures derived from OSHPD had greater effects on these outcomes than did the measures based on the AHA survey. No significant relationship was found between RN hours and rates of failure-to-rescue (patients who die after a complication). The data from both sources matched closely on overall average licensed nurse staffing level (total RNs and licensed practical nurses) and skill mix. Yet, staffing level data varied substantially by hospital characteristics. The AHA data more closely matched the OSHPD data for teaching, urban, large, or nonprofit hospitals (average relative difference ranged from less than 1 percent to 15 percent). However, AHA data showed an average of 16 to 49 percent higher

staffing level than the OSHPD data for rural or small hospitals, whose resources might be too constrained to report annual data to the AHA.

The findings suggest that refining the AHA annual survey as a national database for nurse staffing could significantly enhance the capacity to monitor the nurse workforce and its effect on quality of care. Particularly, improvements are needed in data on unlicensed staff such as nurse aides, measuring nurse staff by nursing unit, type of nursing activity (for example, direct care vs. management), educational level, national origin, and productive hours (absent hours for vacation, sick leave, etc.).

See “Disparities between two common data sources on hospital nurse staffing,” by H. Joanna Jiang, Ph.D., Carol Stocks, R.N., M.H.S.A., and Cindy J. Wong, M.S., M.A., in the *Journal of Nursing Scholarship* 38(2), pp. 187-193, 2006. Reprints (AHRQ Publication No. 06-R055) are available from AHRQ.* ■

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.

Blacks and Hispanics receive worse care than whites, yet rate their interactions with health care providers more positively

Blacks and Hispanics receive significantly worse medical care than whites in the United States, yet they rate their interactions with health care providers more positively than whites, according to a new study by researchers at the Agency for Healthcare Research and Quality. Elizabeth Dayton, M.A., and colleagues examined findings from the *National Healthcare Disparities Report* released by AHRQ in February 2005.

The study reveals that blacks received significantly worse care than whites did in 68 percent of clinical quality measures and 35 percent of care access measures, while receiving better care for none of the quality measures and 10 percent of access measures. Hispanics received significantly poorer care than whites did for 50 percent of quality measures and 90 percent of access measures, while receiving better care for 11 percent of quality measures and 3 percent of access measures.

Yet across the board, blacks and Hispanics were more likely than whites to assess their care experiences positively. They reported that their providers always listened carefully, explained things in a way they could understand, and showed respect for what they had to say.

Several factors could explain these seemingly contradictory findings. Responses by black and Hispanic patients may reflect different understandings of survey items or different response tendencies (for example, to pick “always” or “never” responses instead of more moderate responses such as “usually”) rather than actual disparities in experience. Second, the varied beliefs, attitudes, and experiences that are shared by some racial/ethnic groups likely shape their expectations and resulting assessments of care. Finally, race/ethnicity often serves as a proxy for interrelated social, economic, and cultural characteristics. Future studies of racial/ethnic disparities in care should account for these factors in order to minimize sources of bias, caution the researchers.

More details are in “Racial and ethnic differences in patient assessments of interactions with providers: Disparities or measurement biases?” by Ms. Dayton, Chunliu Zhan, M.D., Ph.D., Judith Sangl, Sc.D., and others, in the March 2006 *American Journal of Medical Quality* 21(2), pp. 109-114. Reprints (AHRQ Publication No. 06-R049) are available at AHRQ.* ■

Treatment of black adults with diabetes and depression insured through Medicaid raises quality concerns

Adults with diabetes are more likely to suffer from major depression than adults without the disease. Treating depression has been shown to improve mood as well as outcomes in people with diabetes. However, in a study of four State Medicaid programs, blacks who suffered from both diabetes and depression were less likely to be treated for depression than whites (68 vs. 75 percent). Also, if treated, they were more likely than whites with depression and diabetes to receive older tricyclic antidepressants (TCAs) instead of newer selective serotonin reuptake inhibitors

(SSRIs) (27 vs. 23 percent). TCAs may adversely alter blood sugar (glycemic) control, whereas SSRIs are less likely to do so.

In this study, supported in part by the Agency for Healthcare Research and Quality (HS11825 and HS09566), one-fourth of all Medicaid adult beneficiaries with depression and diabetes received TCAs in 1995, a time period when TCAs were already known to be less preferred than SSRIs for patients with diabetes. These findings raise concern about timely and equitable diffusion of newer treatment technologies, and the consequences of these lags for

glycemic control as well as racial differences in the quality of mental health care. Researchers analyzed 1995 Medicaid claims data from Alabama, Georgia, New Jersey, and Wisconsin to investigate whether there were sociodemographic or insurance differences in the rates of depression diagnosis and treatment among nonelderly adults with diabetes.

Overall, 5 percent of the population studied was diagnosed with diabetes during 1995. Adults with diabetes had higher rates of depression than those without

continued on page 8

Diabetes and depression

continued from page 7

diabetes (10 vs. 7 percent). Among those diagnosed with depression, antidepressant treatment rates were higher in those with diabetes than those without diabetes (78 vs. 69

percent). This may be because adults with diabetes have more severe depression or they may have more frequent contact with health professionals, who are likely to prescribe antidepressants.

See “Diabetes and depression care among Medicaid

beneficiaries,” by Usha Sambamoorthi, Ph.D., Mark Olfson, M.D., Wenhui Wei, Ph.D., and Stephen Crystal, Ph.D., in the February 2006 *Journal of Health Care for the Poor and Underserved* 17, pp. 141-161. ■

Child/Adolescent Health

A pediatric oncology model can help guide decisionmaking relationships between clinicians, parents, and children

Pediatric oncology is fraught with difficult and emotionally troubling decisions for physicians and families—from the time a child is first diagnosed, during treatment, if the child relapses, and if death is inevitable. Although there is no ethical consensus about how physicians and families should collaborate in this process, popular ethical theories argue that the family should make the decisions. However, this theory does not always reflect clinical reality, explains Simon N. Whitney, M.D., J.D., of the Baylor College of Medicine, in a recent paper.

Dr. Whitney and colleagues describe an ethically justified, clinically applicable approach to decisionmaking in pediatric oncology. They distinguish decision priority from decision authority. The person (parent, child, or clinician) who first identifies a preferred choice exercises decisional priority. In contrast, decisional authority is a parental right and duty, in which a mature child may join. Because cure of a disease is the ultimate goal, the physician is in a better position to assume decisional

priority when a child can probably be cured. Clinicians sometimes justifiably assume decisional priority when there is one best medical choice.

However, they should encourage parents (and children, when appropriate) to assume decisional priority when there are two or more clinically reasonable choices. In this circumstance, the family, with its deeper understanding of the child’s nature and preferences, is better positioned to take the lead. This model integrates ethical theory with the concrete realities of clinical medicine as the family and clinician struggle to find the right choice for the child. The study was supported in part by the Agency for Healthcare Research and Quality (HS11289).

See “Decision making in pediatric oncology: Who should take the lead? The decisional priority in pediatric oncology model,” by Dr. Whitney, Angela M. Ethier, M.S.N., R.N., Ernest Fruge, Ph.D., and others, in the January 1, 2006 *Journal of Clinical Oncology* 24(1), pp. 160-165. ■

Puerto Rican children are diagnosed with asthma more often than other children

Puerto Rican children, particularly those born in Puerto Rico, bear a much higher burden of asthma than other children in the United States, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS00008).

Over one-fourth (26 percent) of Puerto Rican children studied were diagnosed with asthma at some point compared with 16 percent of black children, 13 percent of white children, and 10 percent of Mexican children. Similarly, 12 percent of Puerto Rican children

had suffered a recent asthma attack compared with 7 percent of black children, 6 percent of white children, and 4 percent of Mexican children in the United States.

Among children born in the United States whose parents were also born in the United States,

continued on page 9

Puerto Rican children

continued from page 8

Puerto Rican children were nearly twice as likely as either Mexican children or white children to be diagnosed with asthma at some point. Yet island-born Puerto Rican children were 2.5 times more likely and Mexico-born Mexican children were 57 percent less likely to be diagnosed with asthma at some point than U.S.-born white children with U.S.-born parents, after adjusting for other factors affecting risk of asthma. All of these patterns were similar for recent asthma attacks.

The higher asthma morbidity rates among Puerto Rican children were not explained by sociodemographic and other asthma risk factors (such as household smoking) measured in the National Health Interview Survey (NHIS). An ethnic group-specific genetic predisposition among Puerto Rican children that interacts with early life physical and social environmental exposures (for example, molds and family psychosocial stressors) may contribute to their higher prevalence of asthma, notes Marielena Lara, M.D., M.P.H., of the University of California, Los

Angeles. These findings were based on analysis of 1997-2001 NHIS data on the prevalence of asthma diagnosis and asthma attacks in a sample of 46,511 children (ages 2 to 17 years) living in the 50 States and Washington, D.C.

See “Heterogeneity of childhood asthma among Hispanic children: Puerto Rican children bear a disproportionate burden,” by Dr. Lara, Lara Akinbami, M.D., Glenn Flores, M.D., and Hal Morgenstern, Ph.D., in the January 2006 *Pediatrics* 117(1), pp. 43-53. ■

Aggressive Medicaid and SCHIP outreach programs are needed to enroll Latino children

Despite State Medicaid health insurance programs for the poor and the State Children’s Health Insurance Program (SCHIP) enacted in 1997, 8.5 million U.S. children remain uninsured. The situation is worst for Latino children, with 24 percent (3 million) of them uninsured. Even in Massachusetts, a State where all low-income children are eligible for health insurance, current SCHIP and Medicaid outreach and enrollment efforts are not reaching many uninsured Latino children, according to a study supported in part by the Agency for Healthcare Research and Quality (HS11305).

Latino parents need better information about the programs, eligibility, and the application process, as well as a more efficient, user-friendly system, notes Glenn Flores, M.D. Dr. Flores and colleagues conducted bilingual focus groups with 30 parents of uninsured Latino children from Boston communities with the highest proportion of uninsured Latino children. Two-thirds of the parents never graduated high school, only one-third were U.S. citizens, and their average annual income was \$9,120.

Parents reported 52 barriers to insuring their children. Major obstacles included lack of knowledge about the application process and eligibility (especially

misconceptions about work, welfare, and immigration), language barriers, hassles with paperwork, family mobility, misinformation from insurance representatives (being told insurance is too expensive and the parent must work to qualify), and system problems (including lost applications, discrimination, and excessive waits). The Massachusetts Medicaid Program requires that the child must be a U.S. citizen, green card holder, refugee, or asylee, and family income must be less than \$35,920. However, receipt of welfare assistance, parental employment, and the child being in school are not an issue. Similarly, for the Children’s Medical Security Program, family income had to be less than \$35,920, but no other restrictions applied, such as U.S. citizenship for the child, parental employment, or welfare assistance.

See “How Medicaid and the State Children’s Health Insurance Program can do a better job of insuring uninsured children: The perspectives of parents of uninsured Latino children,” by Dr. Flores, Milagros Abreu, M.D., Vanessa Brown, B.A., and Sandra C. Tomany-Korman M.S., in the November 2005 *Ambulatory Pediatrics* 5(6), pp. 332-340. ■

Enrollment in New York's State Children's Health Insurance Program improves asthma care quality and access

Low-income and minority children suffer the greatest burden of childhood asthma. They are also less likely to receive asthma care that prevents asthma episodes from leading to emergency department visits and hospitalizations. Enrollment of these children in New York's State Children's Health Insurance Program (SCHIP) was associated with improvements in access to asthma care, the quality of asthma care, and asthma-specific outcomes.

The SCHIP provides health insurance coverage to low-income children who are neither eligible for Medicaid nor covered by private health insurance. In this study, supported in part by the Agency for Healthcare Research and Quality (HS10450), 14 percent of 2,644 children had asthma when their

parents were interviewed by telephone shortly after SCHIP enrollment, and 16 percent of 2,310 children had asthma at the follow-up interview a year later. After enrollment in SCHIP, the number of children lacking a usual source of care (USC) decreased from 5 to 1 percent, unmet health needs decreased from 48 to 21 percent, and problems getting to the USC for asthma dropped from 13 to 4 percent. Also, children had fewer asthma-related attacks (a decline from an average of 9.5 to 3.8), medical visits (3.0 to 1.5), and hospitalizations (11 to 3 percent).

Finally, the quality of asthma care improved for general measures. The number of children who made most or all of their visits to their USC rose from 53 to 94 percent and the average rating of the provider

rose from 7.9 to 8.8. Quality of care for asthma-specific measures improved as well. Problems getting to the USC for asthma care when the child was well declined from 13 to 1 percent. At followup interviews, more than two-thirds of parents reported that both quality of asthma care and asthma severity were "better or much better" than at baseline. They attributed this to SCHIP insurance coverage or lower costs of medications and medical care.

More details are in "Improved asthma care after enrollment in the state children's health insurance program in New York," by Peter G. Szilagy, M.D., M.P.H., Andrew W. Dick, Ph.D., Jonathan D. Klein, M.D., M.P.H., and others in the February 2006 *Pediatrics* 117(2), pp. 486-496. ■

Health Information Technology

Parental use of a kiosk in the emergency department has the potential to improve asthma care

Using a computerized kiosk in the emergency department (ED), parents of children with asthma can enter their child's symptoms, current medications, and unmet care needs. The computer kiosk prints out a tailored plan of recommended care based on the input, which parents can share with ED clinicians. So far, however, the kiosk has had a small and variable impact on asthma care quality. Physicians' limited use of kiosk-generated asthma care recommendations may explain the limited impact of the kiosk on asthma care, explains Stephen C. Porter, M.D., M.P.H., of Children's Hospital Boston.

In a study supported in part by the Agency for Healthcare Research and Quality (HS11660), Dr. Porter and colleagues asked parents to use the asthma ED kiosk for their children, who were 1 to 12 years of age and had a respiratory complaint and history of asthma. During the initial 2-month baseline period, no output from the kiosk was shared with physicians, and usual care proceeded. During the 3-month intervention

that followed, parents shared the output (which targeted prescription of the inhaled steroid, fluticasone) with ED clinicians. Parents completed a telephone follow-up interview 1 week after their child's discharge.

A total of 131 parents enrolled during baseline, 13 during a 1-week test phase, and 142 during the intervention. The total number of prescribed inhaled corticosteroids did not vary significantly between baseline and intervention. At baseline, physicians prescribed inhaled corticosteroids to 4 of 43 children whose symptoms warranted further investigation, compared with 9 of 50 children during the intervention among the similar groups of children. Providers did prescribe inhaled fluticasone to eligible patients more often during the intervention than baseline (9 of 50 vs. 2 of 43). The average number of parent-clinician partnership problems increased from 1.5 at baseline to 1.9 during the intervention. However,

continued on page 11

Computerized kiosk

continued from page 10

when ED clinicians acted on kiosk data, information problems were fewer (0.6) than when no action was taken (1.1). A mismatch between an activated parent and a less-than-proactive provider may have widened a gap in partnership that the kiosk was meant to narrow.

See “Impact of patient-centered decision support on quality of asthma care in the emergency department,” by Dr. Porter, Peter Forbes, M.A., Henry A. Feldman, Ph.D., and Donald A. Goldmann, M.D., in the January 2006 *Pediatrics* 117(1), pp. e33-e42. ■

Computerized prescribing may reduce some harmful medication errors, but can introduce new errors

Facilities that use computerized prescriber order entry (CPOE) reported fewer inpatient medication errors but more outpatient medication errors that reached or harmed patients than facilities without CPOE; however, the statistical significance of these differences could not be determined. Chunliu Zhan, M.D., Ph.D., of the Agency for Healthcare Research and Quality, and colleagues used a national, voluntary medication error reporting database, Medmarx, to assess the extent to which CPOE prevents medication errors. They found substantial variation across facilities in the frequency and patterns of medication errors reported and concluded that voluntary data cannot be used to compare rates of errors between providers or to determine the effectiveness of a CPOE system in reducing medication errors.

This study also examined the medication errors reportedly caused by CPOE, and analyzed the text descriptions of these errors. Facilities using Medmarx reported more than 7,000 CPOE-related medication errors over 7 months in 2003; 0.1 percent of them

resulted in patient harm or adverse events. The most common CPOE errors were dosing errors (that is, wrong dose, wrong dosage form, or extra dose).

Analysis indicated that CPOE could lead to some medication errors because of faulty computer interface, miscommunication with other systems, and lack of adequate decision support. CPOE could also lead to medication errors because of common human errors such as inadequate knowledge, distractions, inexperience, and typing errors. The researchers suggest that CPOE systems should include not only optimal system design, but also features that prevent common human errors.

See “Potential benefits and problems with computerized prescriber order entry: Analysis of a voluntary medication error-reporting database,” by Dr. Zhan, Rodney W. Hicks, M.S.N., M.P.A., Christopher M. Blanchette, M.A., and others, in the February 15, 2006 *American Journal of Health-System Pharmacy* 63, pp. 353-358. Reprints (AHRQ Publication No. 06-R056) are available from AHRQ.* ■

Men's Health

Androgen deprivation therapy for prostate cancer causes only modest depression and other side effects

Nearly half of all men with prostate cancer receive androgen deprivation therapy at some point in their course of treatment, since prostate cancer growth is fueled by androgen hormones (especially testosterone). Sexual dysfunction is a well-documented adverse effect

of the therapy. Some have also termed the depression, anxiety, malaise, fatigue, and memory difficulties associated with the therapy as “androgen deprivation syndrome.” A new study, supported in part by the Agency for Healthcare Research and Quality (HS11618), shows that depression

and a range of other cognitive and physical problems affected at least 30 percent of men receiving the therapy over a 5-year period. However, these problems appeared to be primarily due to the older age, greater number of coexisting medical conditions, and more

continued on page 12

Androgen deprivation therapy

continued from page 11

advanced cancers among men receiving androgen deprivation therapy.

The risks of depression and other problems directly attributed to the therapy are at best modest. Thus, they should not preclude its use in men for whom the benefits are clear, conclude the researchers at the University of Texas Medical Branch, Galveston. The researchers analyzed data from the SEER-Medicare database of population-

based tumor registries in selected geographic areas. Using a sample of 50,613 men who were diagnosed with prostate cancer from 1992 through 1997, they calculated the risk of physician diagnoses of depression, anxiety, cognitive impairment, or physical symptoms following androgen deprivation.

Of men surviving at least 5 years after prostate cancer diagnosis, 31.3 percent of those receiving androgen deprivation therapy developed at least one depressive, cognitive, or physical diagnosis compared with 23.7 percent of those who did not receive the

therapy. Yet, after controlling for tumor characteristics, patient age, and other factors, the risk of developing these problems among the men receiving the therapy was substantially reduced or abolished.

See "Risk of 'androgen deprivation syndrome' in men receiving androgen deprivation for prostate cancer," by Vahakn B. Shahinian, M.D., M.S., Yong-Fang Kuo, Ph.D., Jean L. Freeman, Ph.D., and James S. Goodwin, M.D., in the February 27, 2006 *Archives of Internal Medicine* 166, pp. 465-471. ■

Elderly/Long-Term Care

Greater use of agency nurses in nursing homes may lead to poorer quality of care

Nursing homes often find it difficult to attract licensed nurses, due to lower salaries, greater administrative duties, and general lack of prestige. That, combined with the current nursing shortage, has prompted a growing number of nursing homes to use contract registered nurses (RNs) and licensed practical nurses (LPNs), commonly known as agency nurses. However, agency staffing is costly, disrupts continuity of care, and may contribute to poor quality of patient care, concludes a nursing home survey supported in part by the Agency for Healthcare Research and Quality (T32 HS00011).

Researchers found that use of agency nurses was associated with more nursing home deficiency

citations, characteristics of poorer quality facilities, and tight labor markets. Twice as many nursing homes surveyed in 2002 used agency nurses than in 1992 (10 vs. 5 percent for RNs and 14 vs. 6 percent for LPNs). Nursing homes that heavily used agency nurses (5 percent or more of total full-time equivalent nurses) had the most health deficiency citations (indicating poor quality of care). Facilities that were for-profit without chain members were more likely to use 5 percent or more agency RNs or LPNs. Larger nursing homes in more competitive markets, rural facilities, and those with low occupancy rates and fewer private-pay residents also relied heavily on agency nurses.

These findings were based on analysis of 1992 through 2002 data from the On-line Survey Certification and Reporting System of resident data collected from 18,544 freestanding and hospital-based nursing facilities. These data are collected as part of the Federally required annual nursing home licensure and certification process. The researchers linked these data to provider records over time for each facility.

See "The use of contract licensed nursing staff in U.S. nursing homes," by Meg Bourbonniere, Ph.D., R.N., Zhanlian Feng, Ph.D., Orna Intrator, Ph.D., and others, in the February 2006 *Medical Care Research and Review* 63(1), pp. 88-109. ■

Patients with the poorest functioning after a stroke benefit the most from followup therapy

Nearly 5 million Americans are living with the effects of a stroke. These effects range from weakness on one side of the body and inability to walk to problems with memory, learning, and awareness. Inpatient rehabilitation programs can improve motor and cognitive function after a stroke. However, these programs have been shortened because the length of a hospital stay for stroke has decreased, prompting the need for followup therapy. Stroke victims who seem to benefit most from followup therapy are those discharged from the hospital with the poorest functioning, according to a study supported in part by the Agency for Healthcare Research and Quality (HS11618).

Researchers analyzed data from the Uniform Data System for Medical Rehabilitation (UDSMR), a large national registry of information on U.S. medical

rehabilitation inpatients. They combined followup data with the UDSMR inpatient record from 1994 to 2001 for 45,164 patients who received inpatient medical rehabilitation after a stroke (mean age 69.5 years). UDSMR data includes ratings on standardized measures of basic daily living skills, the FIM™ instrument, demographics, length of hospital stay, and other information. The FIM™ instrument includes 18 items on functioning, with each rated from 1 (complete dependence) to 7 (complete independence), with total possible ratings ranging from 18 to 126.

The six function domains are self-care, sphincter control, transfers, locomotion, communication, and social cognition. The patients who made the highest gain in functioning (based on FIM™ instrument ratings) due to followup therapy were those with a low discharge FIM™ rating

of 65 or less (average gain of 19.4 points between discharge and followup assessment compared with 15.1 points for persons in this range who did not receive followup therapy). In contrast, followup therapy did not affect the functioning of patients discharged with FIM™ ratings over 75, who may have had only mild or moderate functional limitations at discharge, and home and community activities alone may have been sufficient to improve their functioning. These findings may assist clinicians in discharge planning for stroke victims.

See “Examination of follow-up therapy in patients with stroke,” by Yong-Fang Kuo, Ph.D., Glenn V. Ostir, Carl V. Granger, and Kenneth J. Ottenbacher, Ph.D., O.T.R., in the March 2006 *American Journal of Physical Medicine and Rehabilitation* 85(3), pp. 192-200. ■

Primary Care Research

Primary care of patients with type 2 diabetes can be improved

People with type 2 diabetes (previously called adult-onset diabetes) either do not produce enough insulin to metabolize glucose, or their bodies do not use the insulin they make. More than 80 percent of U.S. patients with type 2 diabetes are cared for by primary care clinicians, yet studies continue to document gaps in the quality of primary care for type 2 diabetes. A new study supported by the Agency for Healthcare Research and Quality (HS13008) found that recommended diabetes services were performed in only one-third

of primary care visits with patients who had type 2 diabetes. A second AHRQ-supported study (HS11182 and HS11187) revealed that only modest numbers of primary care patients with type 2 diabetes achieved established targets of diabetes control, despite intensive treatment. Both studies are summarized here.

Parchman, M.L., Romero, R.L., and Pugh, J.A. (2006, January). “Encounters by patients with type 2 diabetes—complex and demanding: An observational

study.” *Annals of Family Medicine* 4(1), pp. 40-45.

More innovative approaches and new care models are needed to improve the quality of primary care for diabetes, conclude the researchers. They directly observed the content of the physician-patient encounter in 20 primary care clinics for 211 patients with type 2 diabetes. They measured the quality of diabetes care based on the delivery of five services during the encounter: foot examination, referral for an eye examination, a blood-sugar (glycosylated

continued on page 14

Type 2 diabetes

continued from page 13

hemoglobin, HbA1c) measurement, a lipid panel, and a urine microalbumin test (indicative of kidney function).

These recommended services were performed in only one-third of visits for patients with type 2 diabetes. Doctors most often ordered an HbA1c measurement and least often referred patients for an eye examination. Compared with visits for an acute illness, patients visiting for chronic disease followup were 4.8 times more likely to receive 100 percent of diabetes care services. The percentage of diabetes services delivered increased with longer clinical visits. Also, followup visits were scheduled sooner if fewer of the indicated diabetes services were delivered, suggesting a desire by physicians to complete these services.

Clinical visits during which 100 percent of all indicated services were delivered lasted an average of nearly 20 minutes. This may explain why almost one-half of U.S. physicians report not having enough time with patients as a major problem. The brief-visit model of outpatient care is no longer

consistent with the tasks facing family physicians, note the researchers. They suggest use of disease-specific group clinics for diabetics as one option of a new model of care.

Spann, S.J., Nutting, P.A., Galliher, J.M., and others. (2006, January). "Management of type 2 diabetes in the primary care setting: A practice-based research network study." *Annals of Family Medicine* 4(1), pp. 23-31.

This study found that only modest numbers of primary care patients with type 2 diabetes achieved established targets of diabetes control, despite intensive treatment by experienced clinicians. The researchers surveyed 95 primary care clinicians and 822 of their established patients with type 2 diabetes from 4 practice-based primary care research networks. The clinicians answered a survey about their training and practice, and patients completed a self-administered questionnaire about their care. The researchers reviewed patients' medical records for diabetes-related complications, treatment, and diabetes-control indicators.

Participating clinicians saw an average of 33 adults with diabetes per month. The average time since diabetes onset was 9 years, and 34 percent had the disease more than 10 years. Nearly one-half (47.5 percent) of the patients had a least one diabetes-related complication and 60.8 percent were obese (body mass index over 30).

The patients were being treated with glucose-lowering medications, antihypertensives, and lipid-lowering agents by experienced primary care clinicians, who also used dietitians, diabetes educators, and other health professionals to help manage their patients. Despite the intensity of diabetes care being provided, less than half of patients (40.5 percent) actually achieved the established target for glycemic control (an HbA1c level of less than 7 percent). Only 35.3 percent of patients achieved adequate blood pressure control (less than 130/85 mm Hg), and 43.7 percent achieved low-density lipoprotein cholesterol target levels (less than 100 mg/dL). These findings underscore the need to improve systems that support the care of patients with chronic disease, including use of disease registries for tracking patients. ■

Subscribe now to AHRQ's Patient Safety E-newsletter

The Agency for Healthcare Research and Quality publishes the Patient Safety E-Newsletter to make available important patient safety news and information. Issued monthly, the E-newsletter features concise descriptions of recent findings from AHRQ-supported research and information about new initiatives, upcoming meetings, and other important patient safety activities. Web links will be provided for those who want to followup or get more detailed information. All you need to sign up for this free service is a computer and an e-mail address. To subscribe, follow these simple steps:

1. Send an e-mail message to: listserv@list.ahrq.hhs.gov
2. In the subject line type: Subscribe
3. In the body of the message type: sub patientsafetynewsletter and your full name

To receive the e-newsletter in text-only format:

1. Follow steps 1 and 2 above. In the body of the message type: sub patientsafetynewslettertext and your full name

You will receive an e-mail confirmation of your subscription. For questions, e-mail Salina Prasad in AHRQ's public affairs office at salina.prasad@ahrq.hhs.gov. ■

Paramedic errors in lifesaving endotracheal intubation may be a symptom of larger emergency medical system problems

Paramedics must be able to perform endotracheal intubation (ETI), the insertion of a breathing tube into the trachea (windpipe) of critically ill patients, to maintain the flow of oxygen to the brain and other vital organs. An improperly placed tube (for example, in the esophagus) can deprive the patient of oxygen and rapidly lead to death. Yet, paramedic intubation errors occur in 22 percent of intubation attempts, according to a study supported in part by the Agency for Healthcare Research and Quality (HS13628).

ETI is a complex procedure that requires considerable skill to maneuver the breathing tube into the correct position. However, paramedics undergo only a fraction of the training in this procedure that physicians do. In addition, paramedics perform ETI in uncontrolled, stressful, and chaotic out-of-hospital settings, such as the floor of a cramped bathroom or in a mangled car after an automobile crash. Also, prehospital patients are often critically ill and injured, and it is often impossible to identify basic airway structures. Finally, most paramedics do not perform this procedure frequently. Given these factors, there is great potential for adverse outcomes and errors during ETI, explains Henry E. Wang, M.D., of the University of Pittsburgh School of Medicine.

Dr. Wang and colleagues analyzed data collected from forms prepared by rescuers in 42 advanced life support emergency medical services in Pennsylvania on 1,953 patient encounters involving ETI. The researchers identified ETI errors such as breathing tube misplacement or dislodgment from the trachea, multiple attempts to perform ETI (four or more efforts to expose the vocal cords), or failed ETI. Overall, errors occurred in 22 percent of intubation attempts and up to 40 percent of the time in selected ambulance systems. ETI errors were not associated with system configuration (ground vs. air medical), personnel patterns (all career vs. mixed career/volunteer), the number of paramedic-level rescuers, mean response or transport times, or population characteristics. The researchers suggest that these errors may be a symptom of larger problems with delivery of out-of-hospital emergency medical care, which has not changed since its conception over 25 years ago.

More details are in "Paramedic intubation errors: Isolated events or symptoms of larger problems?" by Dr. Wang, Judith R. Lave, Ph.D., Carl A. Sirio, M.D., and Donald M. Yealy, M.D., in the March 2006 *Health Affairs* 25(2), pp. 501-509. ■

Studies examine Federal support and ways to measure available resources for emergency medical services in rural areas

Emergency medical services (EMS) systems provide emergency health care, rescue and safety services, and public health prevention activities to many communities. Several recently released reports have created a debate about the oversight and funding for EMS nationally. A recent commentary by P. Daniel Patterson, Ph.D., M.P.H., E.M.T.-B, of the University of North Carolina at Chapel Hill, examines how this debate affects the rural health community. A study by Dr. Patterson's group proposes a way to measure availability of EMS resources to identify under-resourced

areas. Both were supported by the Agency for Healthcare Research and Quality (T32 HS00032) and are summarized here.

Patterson, P.D. (2006, Spring). "Emergency medical services and the Federal government's evolving role: What rural and frontier emergency medical services advocates should know." *The Journal of Rural Health* 22(2), pp. 97-101.

Federal support for the two main components of EMS, medical care and transportation, is currently spread across multiple agencies with diverse missions, agendas, and EMS

budget commitments. A growing number of reports call for a greater Federal Government role in overseeing and funding EMS. The issue is being hotly debated among EMS, fire, rural health, and policy communities. Some EMS and fire service advocates feel Federal-level involvement should remain limited but be better coordinated, for example, by having Congress recreate the Federal Interagency Committee on EMS (FICEMS).

On the other side of the debate, different EMS constituents call upon Congress to create a U.S. Emergency

continued on page 16

Emergency medical services

continued from page 15

Medical Services Administration (USEMSA). Advocates for a USEMSA argue that although EMS is equal in numbers to fire and police personnel nationwide, EMS has received very little support from agencies like the Department of Homeland Security. They point out that EMS lacks data collection programs and national training academies similar to its counterparts in public safety, and lacks a nationwide EMS needs assessment.

Policymakers have listened to the coalition supporting FICEMS, which includes rural EMS advocates, and support many of their recommendations. Bills have been introduced in both the Senate and House of Representatives that support a newly created FICEMS. It is unlikely that policymakers will support creating a USEMSA, asserts the author of this commentary. Factors like history, fragmentation of EMS, and current political philosophies suggest that the status quo in Federal-EMS relations is acceptable. Nevertheless, forward progress on FICEMS legislation

holds promise for improving Federal programs and funding for EMS.

Patterson, P.D., Probst, J.C., and Moore, C.G. (2006, Spring). "Expected annual emergency miles per ambulance: An indicator for measuring availability of emergency medical services resources." *The Journal of Rural Health* 22(2), pp. 102-111.

This paper proposes a county-level indicator of EMS resource availability that estimates the minimum annual number of emergency miles placed on each ambulance in a county. The EXAMB (EXpected annual emergency miles per AMBulance) takes into consideration existing EMS resources (ambulances), population health and demographics, and geographic factors (land area). As such, it provides a basis for comparing ambulance availability across counties within States.

The researchers estimated ambulance demand using a rule of thumb that projected demand at 1 transport per 10,000 people per day, which many EMS systems still use as a rough estimate of future demand. To test the feasibility of the EXAMB

indicator, they used county-level EMS data from five States in 2003. The EXAMB indicator was negatively correlated with ambulance availability per 100,000 population in 4 of the 5 States. The indicator was positively correlated with rurality in three States. In Mississippi, South Carolina, and Wyoming, whole-county health professional shortage areas had median EXAMB values 45-81 percent higher than those of counties without health professional shortages.

Although the EXAMB indicator was positively associated with rural status in three of the five States, it is possible for urban counties to have high EXAMB values if they have few ambulances, low physician-to-population ratios, high poverty rates, and high mortality rates. Given the reasons for high EXAMB values in various counties, local officials would have to decide the best response to them. This could range from policies that would reduce vehicular crash death rates to the purchase of new ambulances and programs to reduce poverty. The researchers suggest that the EXAMB indicator should be applied to more States. ■

Access to Care

Reductions in primary and preventive care use under Medicaid primary care case management are more dramatic for minority children

Primarily care case management (PCCM) programs pay providers on a fee-for-service (FFS) basis. However, they assign Medicaid patients to gatekeeper providers who must make specific referrals for specialty, emergency, and inpatient care. These programs are designed to increase patients' use of primary and preventive care in doctors' offices, while decreasing use of specialty and urgent care. However, the disruptions in established patterns of care use required by PCCM in Alabama and Georgia had an unexpected negative effect on children, especially

minority children, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS10435).

Implementation of PCCM in these two southern States reduced primary care visits for children, both through the direct effect of the gatekeeper role and through changes related to the availability of participating providers. Accounting for provider supply, PCCM was associated with lower use of

continued on page 17

Primary care case management

continued from page 16

primary care for all children except white children in urban Georgia. PCCM reduced preventive care for white and black children in urban Alabama and for black children in urban Georgia. In rural Georgia, however, PCCM was associated with increased preventive care among all children.

The negative effect of PCCM was further compounded by negative effects of reduced provider availability. Reductions in office-based Medicaid providers affected Alabama children more often, while reductions in hospital-based Medicaid physicians had a

negative effect for Georgia children. Implementation of PCCM without fee increases may affect decisions of providers to participate in Medicaid which, in turn, may have had unexpected negative effects that differentially affected minority children, conclude the researchers. Their findings were based on analysis of Medicaid claims data for children from 1994 through 1997 in Georgia and 1996 through 1999 in Alabama.

See “Effects of primary care case management (PCCM) on Medicaid children in Alabama and Georgia: Provider availability and race/ethnicity,” by E. Kathleen Adams, Ph.D., Janet M. Bronstein, Ph.D., and Curtis S. Florence, Ph.D., in the February 2006 *Medical Care Research & Review* 63(1), pp. 58-87. ■

Physicians who are dissatisfied with their profession are two to three times more likely to leave medicine than satisfied doctors

Amidst decreasing reimbursement and rising practice costs, physicians are under growing pressure to see more patients and keep up with an ever-expanding list of recommended treatments. Career satisfaction remains a source of ongoing concern in the physician community. A new study, supported in part by the Agency for Healthcare Research and Quality (HS10803), shows that very dissatisfied physicians are over twice as likely to retire and over 3 times more likely to cut back on their hours than satisfied physicians. Very dissatisfied physicians retired 2 years earlier than very satisfied physicians. Physicians’ ratings of their professional autonomy, which

other studies have judged to be important to their satisfaction, and their ability to obtain needed inpatient and outpatient services, were minimally related to subsequent retirement or reduced work hours.

The researchers analyzed data from the 1996 and 1998 rounds of the Community Tracking Study Physician Survey, a series of nationally representative telephone surveys of physicians. Of 16,681 physicians interviewed in 1996 or 1998, 2.8 percent had retired 2 years later and 3 percent had reduced time spent in patient care to less than 20 hours per week.

Full- or part-time owners of practices were both less likely to retire and to cut back on hours.

Internal medicine specialists and psychiatrists were less likely to retire, whereas surgical specialists were more likely to retire. These findings have implications for physician manpower projections and quality of care. Replacing physicians who leave practice is costly, leads to discontinuity of care, and requires additional investments of time by new physicians and patients to become acquainted.

More details are in “Leaving medicine: The consequences of physician dissatisfaction,” by Bruce E. Landon, M.D., M.B.A., James D. Reschovsky, Ph.D., Hoangmai H. Pham, M.D., M.P.H., and David Blumenthal, M.D., M.P.P., in the March 2006 *Medical Care* 44(3), pp. 234-242. ■

Health Care Costs and Financing

Some adults with diabetes face high health care expenditures

When people with diabetes cannot afford medications or supplies (for example, syringes and blood glucose meters), they are less likely to adhere to treatment that can reduce diabetes-related complications and hospitalizations. The financial burden of care among adults with

diabetes is substantial, concludes the first nationally representative study of the topic by Didem M. Bernard, Ph.D., Jessica S. Banthin, Ph.D., and William E. Encinosa, Ph.D., of the Agency for Healthcare

continued on page 18

Diabetes

continued from page 17

Research and Quality. For instance, over one-fifth of nonelderly adults with diabetes who are uninsured or have public coverage spend more than half of their disposable income on health care. The financial burden is particularly heavy for women, the poor, and those with coexisting medical conditions.

Prescription medications and diabetes supplies accounted for 63 to 70 percent of out-of-pocket expenditures among nonelderly adults and 62 to 69 percent among the elderly with diabetes. Medications accounted for a larger share of out-of-pocket health care expenses among adults with diabetes (65 percent) compared with adults with heart disease (57 percent), cancer (46 percent), and hypertension (59 percent). Among the elderly with diabetes, those with private non-employment-related insurance were most likely to suffer a high financial burden followed by those insured by Medicare only, those with private employment-related coverage, and those insured by Medicaid.

Greater financial burden was linked to barriers to care and poorer treatment compliance. For example, 5.7 percent of families whose out-of-pocket health-related expenses were less than 10 percent of disposable income had a member who went without needed treatment to pay for food, shelter, and clothing. This is in contrast to 9.2 percent of families whose out-of-pocket costs exceeded 20 percent of disposable income. Redesigning drug benefit coverage to acknowledge the importance of preventive diabetes medications may reduce out-of-pocket burdens, improve treatment adherence, and prevent costly future complications, suggest the researchers. Their findings were based on analysis of 2001 data from the National Medical Expenditure Panel Survey of a representative sample of U.S. households.

See "Health care expenditure burdens among adults with diabetes in 2001," by Drs. Bernard, Banthin, and Encinosa, in the March 2006 *Medical Care* 44(3), pp. 210-215. Reprints (AHRQ Publication No. 06-R052) are available from AHRQ.* ■

Workers who have health insurance are less likely to miss work than uninsured workers

Workers who have health insurance at some point during the course of a year are significantly less likely to miss work than uninsured workers, concludes a study supported by the Agency for Healthcare Research and Quality (HS00005). This suggests that there are potential financial benefits to employers who provide health coverage to employees, note Jennifer H. Lofland, Pharm.D., M.P.H., Ph.D., of Thomas Jefferson University, and Kevin D. Frick, Ph.D., of the Johns Hopkins Bloomberg School of Public Health. Of a national sample of 25,676 individuals, about half (54 percent) reported missing work during the previous year. The average annual number of missed

workdays among those who missed work was a little more than four, which is consistent with other studies.

After controlling for other factors, workers with health insurance were 12 percent less likely to miss days from work. Those with insurance who missed work missed 0.017 fewer days than the uninsured. Greater access to health care (for example, ease of appointment booking and contacting the usual source of care) was associated with 0.0047 more missed workdays. Health care use was significantly associated with increased likelihood of and greater number of missed work days. However, health care use may have confounded the effects of health

insurance and missed work, note the researchers.

By ensuring that all employees have health insurance coverage, employers may begin to see decreased absenteeism rates among their employees, which may have a positive impact on the firm's bottom line. These findings were based on retrospective study of data from the 1996-1999 Medical Expenditure Panel Survey of U.S. employees.

See "Effect of health insurance on workplace absenteeism in the U.S. workforce," by Drs. Lofland and Frick, in the January 2006 *Journal of Occupational and Environmental Medicine* 48(1), pp. 13-21. ■

Collaboration of hospitalists/attending physicians and nurse practitioners can reduce hospital stays and increase profit

A multidisciplinary team of hospitalist/nonhospitalist attending physicians and nurse practitioners (NPs) can reduce hospital length of stay (LOS) and increase hospital profits when compared with usual care only. This approach reduced the average LOS from 6 to 5 days. By reducing the number of hospital days after the first 4 days, which are the most profitable ones, hospital profits increased by \$1,591 per day for each patient without increasing hospital readmission or mortality rates.

Previous studies have demonstrated reduced hospital costs and LOS with use of hospitalists. However, in many places, it is not feasible to have full-time hospitalists at the bedside and nonhospitalist attending physicians in academic medical centers do not spend as much time as hospitalists in inpatient care. In a study supported by the Agency for Healthcare Research and Quality (HS10734), Marie J. Cowan, Ph.D., R.N., F.A.A.N., and colleagues used NPs to supplement physicians' efforts to ensure continuity of care. They compared this approach for managing 581 general

medicine patients in 1 unit of a large academic medical center during hospitalization and for 30 days after discharge with usual care for 626 patients in another general medicine unit.

The hospitalist medical director educated attending physicians about hospitalist duties and in-serviced and guided NPs on the experimental unit. The director also wrote protocols for specific diseases and care processes for the NPs to follow. The usual care unit had multidisciplinary rounds for 90 minutes once a week compared with daily rounds for the experimental unit, which also included post-discharge home visits and/or phone calls by the NPs. The researchers caution that the impact of the daily (vs. weekly) multidisciplinary rounds on the outcomes of the study cannot be discounted.

More details are in "The effect of a multidisciplinary hospitalist/physician and advanced practice nurse collaboration on hospital costs," by Dr. Cowan, Martin Shapiro, Ph.D., M.D., Ron D. Hays, Ph.D., and others, in the February 2006 *Journal of Nursing Administration* 36(2), pp. 79-85. ■

Agency News and Notes

Hospital copayments are required of more workers

The percentage of workers enrolled in health plans sponsored by private-sector employers that obligated them to pay a share of their hospital bill increased by more than 60 percent between 1999 and 2003—from 33.8 percent to 54.7 percent—according to data from AHRQ's Medical Expenditure Panel Survey (MEPS). The percentage of enrolled workers whose plans did not require hospital copayments fell by nearly a third between 1999 and 2003—from 66.3 percent to 45.3 percent. The percentage whose plans required copayments ranging from \$150 to \$400 for hospital care doubled from

10.5 percent to 21 percent during the same period, as did the percentage of those required to pay more than \$400 (from 6.4 percent to 13.1 percent).

MEPS data also showed that the proportion of enrolled workers required to make a copayment when they visited the doctor increased only slightly—from 92.4 percent to 95.3 percent—but there were more dramatic shifts in the amounts they had to pay. The percentage that had to pay more than \$0 but less than \$10 per physician visit shrank from 57 percent to 23.5 percent and the proportion that had to pay more than \$10 but less than \$20 per

physician visit almost doubled, rising from 33.4 percent to 60.8 percent between 1999 and 2003. The 2 percent of enrolled workers who had to pay more than \$20 per visit ballooned to 11 percent in 2003.

For further details see *Changes in Co-pays for Employer-Sponsored Health Insurance Plans, 1999-2003* at www.meps.ahrq.gov/papers/st127/stat127.pdf. For a related MEPS statistical brief, see *Changes in Out-of-Pocket Maximum Limits for Employer-Sponsored Health Insurance Plans, 1999-2003* www.meps.ahrq.gov/papers/st128/st128.pdf. ■

Where Americans work affects the cost of their health insurance plan

A new analysis using data from AHRQ's Medical Expenditure Panel Survey (MEPS) revealed that workers in North Dakota with family coverage spent on average nearly \$3,000 less on premiums for employer-sponsored health insurance plans than workers in the District of Columbia, just one example of how the economics of health insurance vary widely between States. In 2003, the national average for family coverage premiums of employer-sponsored health insurance plans was \$9,249. The average premium for family coverage for workers in North Dakota was only \$7,866—the lowest in the United States—while workers in the District of Columbia had the highest average premium at \$10,748. Other findings were:

- The national average for single coverage premiums for employer-offered health insurance was \$3,481.
- MEPS also looked at State differences in what workers paid out of pocket for their health insurance premiums. The data show that workers in Nebraska made the highest contributions for

single coverage (\$875), while those in Hawaii made the lowest (\$251). Thirty-six States had average employee single-coverage contributions that did not differ from the national average of \$606.

- Of all employees in small firms, those working in Louisiana contributed the most to family coverage (\$3,713), while those working in West Virginia contributed the least (\$1,153).
- For large firms, employees in Maine contributed the most (\$2,853) and those in West Virginia contributed the least (\$1,630).
- In every State, more than 90 percent of employees in large firms worked where health insurance was offered. There was much more variation by State in small-firm offers.

For further findings, see *State Differences in Employer-Sponsored Health Insurance, 2003, MEPS Chartbook No. 15* at http://www.meps.ahrq.gov/Papers/cb15_06-0030/cb15.pdf. ■

Announcements

New asthma care resource guide offers help to States

The Agency for Healthcare Research and Quality, in partnership with the Council of State Governments, has released *Asthma Care Quality Improvement: A Resource Guide for State Action* and its companion *Workbook*. The *Resource Guide* and *Workbook* are designed to help State leaders identify measures of asthma care quality, assemble data on asthma care, assess areas of care most in need of improvement, learn what other States have done to improve asthma care, and develop a plan for improving the quality of care for their States.

The *Resource Guide* uses data from AHRQ's *National Healthcare Quality Report* and *National Healthcare Disparities Report* and Web-based State Snapshots to help inform the Nation and States about the quality of asthma care. The *Workbook* is designed for State policymakers, including officials in State

health departments, asthma prevention and control programs, and Medicaid offices. It includes five modules, some of which are targeted to senior leaders responsible for making the case for asthma care quality improvement and taking action. Other modules provide the information necessary for program staff to develop and implement a quality improvement strategy. The goal is for all groups involved in asthma care to work together as a team to improve the quality of asthma care.

Asthma Care Quality Improvement: A Resource Guide for State Action and its companion *Workbook* can be found online at <http://www.ahrq.gov/qual/asthmaqual.htm>. Printed copies (AHRQ Publication Nos. 06-0012-1 and 06-0012-2) are also available from AHRQ.* ■

Braithwaite, R.S., Fridsma, D., and Roberts, M.S. (2006, March). “The cost-effectiveness of strategies to reduce mortality from an intentional release of aerosolized anthrax spores.” (AHRQ Contract No. 290-00-0009). *Medical Decision Making* 26, pp. 182-193.

Strategies to reduce deaths from anthrax attacks are cost-effective only if large exposures are certain. Also, a faster response is more beneficial than enhanced surveillance. The investigators used computer simulation of a 100,000-person single-site exposure (worst case scenario) and a 100-person multiple-site exposure (resembling a recent U.S. attack). For each scenario, they compared universal vaccination and an emergency surveillance and response (ESR) system with a default strategy that assumed eventual discovery of the exposure to aerosolized anthrax spores. They concluded that, if an exposure was unlikely to occur or was small in scale, neither vaccination nor an ESR system was cost-effective. If an exposure was certain and large in scale, an ESR system was more cost-effective than vaccination (\$73 vs. \$29,600 per life-year saved), and that a rapid response saved more lives than improved surveillance.

Darby, C., Crofton, C., and Clancy, C.M. (2006, March/April). “Consumer assessment of health providers and systems (CAHPS): Evolving to meet stakeholder needs.” *American Journal of Medical Quality* 21(2), pp. 144-147.

This paper describes how the Consumer Assessment of Health Providers and Systems (CAHPS) surveys have evolved over time to meet stakeholder needs. The first

survey assessed how members of health plans evaluated their quality of care and their health plans. The surveys were eventually expanded to include other stakeholders beyond health care consumers. The 30 surveys developed or in development target stakeholders including health care accrediting organizations, individual providers, providers in group practice, and different patient groups, such as children with special health care needs or people with mobility impairments.

CAHPS II provides reporting guidance to stakeholders through its TalkingQuality Web site (www.TalkingQuality.gov). It offers research findings, real-world examples, and innovative strategies for communicating complex health quality information to consumers. Reprints (AHRQ Publication No. 06-R047) are available from AHRQ.*

Feifer, C., Ornstein, S.M., Jenkins, R.G., and others. (2006, March). “The logic behind a multimethod intervention to improve adherence to clinical practice guidelines in a nationwide network of primary care practices.” (AHRQ grants HS11132 and HS13716). *Evaluation & The Health Professions* 29(1), pp. 65-88.

Guidelines are more likely to be implemented if interventions address clinical practice motivations and clinicians’ abilities to focus on new tasks in an already busy workday, note the authors of this paper. They describe the logic behind a multimethod intervention to increase adherence to clinical guidelines among practices in a nationwide network of primary care practices. The network specializes in quality improvement

research and uses a common electronic medical record. Practice performance reports, site visits, and network meetings are a few intervention methods designed to stimulate improvement in practices by addressing personal and organizational factors. The researchers describe theories and evidence supporting these interventions, which they believe could prove useful to others trying to translate medical research into practice.

Fischer, I.D., Krauss, M.J., Dunagan, W.C., and others. (2005, October). “Patterns and predictors of inpatient falls and fall-related injuries in a large academic hospital.” (AHRQ Grant HS11898). *Infection Control and Hospital Epidemiology* 26, pp. 822-827, 2005.

Fall frequency and rates of fall-related injury vary substantially by hospital department. Researchers found that the median age of patients who fell at an urban hospital was 62 years and half of those who fell were women and 20 percent were confused. The overall hospital fall rate was 3.1 falls per 1,000 patient days, which varied by service from 0.86 (women and infants) to 6.36 (oncology) per 1,000 patient days. About 6 percent of the falls resulted in serious injury, ranging by service from 3.1 percent (women and infants) to 10.9 percent (psychiatry). The most common serious fall-related injuries were bleeding or laceration (53.6 percent), fracture or dislocation (15.9 percent), and hematoma or contusion (13 percent).

continued on page 22

Research briefs

continued from page 21

After adjusting for other factors that might affect falls, patients 75 years or older were over 3 times more likely to sustain serious fall-related injuries than other patients and those on the geriatric psychiatry floor were nearly 3 times more likely. Advanced age may serve as a marker for conditions that increase the risk of falls and related injuries. Also, health conditions common to geriatric psychiatry patients, such as Parkinson's disease and Alzheimer's disease, may contribute to falls. The findings were based on a retrospective analysis of 1,235 inpatient falls, which were documented in an online adverse event reporting database at an urban hospital in 2001 and 2002.

Gross, R., and Harrison, M.I. (2006). "Responses of Israeli HMOs to environmental change following the national health insurance law: Opening the black box." *Health Policy* 76, pp. 213-232.

The National Health Insurance (NHI) Law of 1995 introduced managed competition into the Israeli health care system by radically transforming HMO regulatory and competitive environments. This study analyzed the strategies developed by two Israeli HMOs in response to this change. The two HMOs developed comparable strategies, but diverged from one another in important ways, which the authors describe. Their analysis highlights how the interaction among organizational history, managerial choice, and environmental constraints created divergence in organizational responses to national policy initiatives. They suggest involving provider organizations in

structuring of reform or simulating their response in advance, based on expert knowledge of their strategic repertoires. They also recommend including mechanisms for obtaining feedback on organizational responses when implementing reforms. Reprints (AHRQ Publication No. 06-R041) are available from AHRQ.*

McNamara, P. (2006, February). "Foreword: Payment matters? The next chapter." *Medical Care Research and Review* 63(1S), pp. 5S-10S.

The Agency for Healthcare Research and Quality joined with the journal *Medical Care Research and Review* and a team of guest editors in an experiment to expedite the transfer of research on quality-based payment to public and private purchasers. The effort involved aggressive, systematic outreach to research teams across the country in an attempt to identify early findings, some based on partial data, appropriate for peer review and translation. This paper is the foreword to the journal supplement featuring the findings contributed by five research teams. The supplement also includes commentaries from employers, providers, and policymakers. The commentators were asked to interpret the new findings from their particular perspective and, more broadly, share their views on the advantages and disadvantages of this particular research-to-practice experiment of identifying, distilling, and packaging early findings. Reprints (AHRQ Publication No. 06-R050) are available from AHRQ.*

McNeill, D., Moy, E., and Clancy, C.M. (2006, May). "The Agency for Healthcare Research and Quality's National Healthcare Quality and Disparities Reports:

Action agendas for the nation." *American Journal of Medical Quality* 21(3), pp. 206-209.

This paper highlights trends documented in the 2005 *National Healthcare Quality Report (NHQR)* and the *National Healthcare Disparities Report (NHDR)*. The *NHQR* reveals that care quality continues to improve at a modest pace of 2.8 percent. Care quality is most improved (median of 10 percent) for diabetes, heart disease, respiratory conditions, nursing home care, and maternal and child health care. It is least improved for HIV/AIDS, cancer, end-stage renal disease, mental health, substance abuse, and home health care (median 0.3 percent). According to the *NHDR*, health care disparities related to race, ethnicity, and socioeconomic status still pervade the American health care system. For example, blacks received poorer quality of care than whites did in 43 percent of core measures and American Indians and Alaska Natives received poorer quality care than whites did in 38 percent of measures. While these disparities are narrowing for many minority Americans, they are widening for Hispanics and care access disparities are growing as well. Reprints (AHRQ Publication No. 06-R048) are available from AHRQ.*

Nast, P.A., Avidan, M., Harris, C.B., and others. (2005, October). "Reporting and classification of patient safety events in a cardiothoracic intensive care unit and cardiothoracic postoperative care unit." (AHRQ grant 11898). *Journal of Thoracic and Cardiovascular Surgery* 130(4), pp. 1137-1143.

A study of the Intensive Care Unit Safety Reporting System (ICUSRS) at a cardiothoracic intensive care unit (ICU) and

continued on page 23

Research briefs

continued from page 22

postoperative care unit in 1 hospital resulted in a total of 163 reports describing 157 patient safety events over a 6-month period. This included 121 events reported from the ICU (25.3 reported events per 1,000 patient-days)—a 3-fold increase in reported safety events over the hospital's preexisting online safety reporting system. A total of 113 reports (69 percent) came from nurses, 31 from physicians (19 percent), and 10 from other staff (6 percent). A majority of events (54 percent) reached the patient, but caused no harm. Health care workers identified multiple causes for the majority of events. The most frequent causes were related to human factors (48 percent) and organizational factors (34 percent).

The ICUSRS differed from the hospital's preexisting Risk Management Online Event/Incident Entry system in several ways. All health care workers had easy access to the ICUSRS, reporting forms could be carried easily and completed quickly in any location, reporting was completely voluntary, and reports could be submitted anonymously.

Weiner, R.J., Alexander, J.A., Baker, L.C., and others. (2006, February). "Quality improvement implementation and hospital

performance on patient safety indicators." (AHRQ grant HS11317). *Medical Care Research and Review* 63(1), pp. 29-57.

This study assessed the association between the scope of hospital involvement in hospital quality improvement (QI) activity and four hospital-level indicators of patient safety (postoperative complications, technical adverse events, technical difficulty with procedures, and failure to rescue). Involvement by multiple hospital units in the QI effort was associated with lower values on all four patient safety indicators. Percentages of hospital staff and senior managers participating in QI teams showed no significant association with any patient safety indicators. However, the percentage of physicians participating in QI teams was associated with higher values on two patient safety indicators. These findings were based on a 1997 quality improvement survey of 1,784 community hospitals, as well as other surveys and databases.

Zinn, J., Spector, W., Hsieh, L., and Mukamel, D. (2005, December). "Do trends in the reporting of quality measures on the Nursing Home Compare web site differ by nursing home characteristics?" *Gerontologist* 45(6), pp. 720-730.

A new study by William Spector, Ph.D., of the Agency for Healthcare

Research and Quality, and colleagues found a clear downward trend of quality measures in nursing homes for pain, physical restraints, and delirium. The researchers used information obtained from the Centers for Medicare & Medicaid Services (CMS) Nursing Home Compare Web site (www.medicare.gov/NHCompare). The site includes quality-deficiency citations issued by State inspectors, staffing levels, a set of care quality measures (QM), and basic facility characteristics. Researchers compared the relationship between an initial set of 10 QMs for both post-acute, short-stay residents and long-term care residents and for 5 nursing home structural characteristics: ownership, chain affiliation, size, occupancy, and hospital-based versus freestanding status.

Declines between the first QM reporting period (April to June 2002) and the fifth period (April to June 2003) ranged from 12.7 percent to 46 percent. For-profit and chain-affiliated facilities appeared to do better on QMs for short-stay postacute residents. Small, independent, nonprofit, high-occupancy facilities performed better on QMs for long-term residents. Reprints (AHRQ Publication No. 06-R019) are available from AHRQ.* ■

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.

U.S. Department of Health and Human Services

Public Health Service
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. 06-0066
July 2006

ISSN 1537-0224