# Research Activities

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Agency for Healthcare Research and Quality


## Highlights

### Departments



### Regular Features



### Indexes



## Medical interns who work extended-duration shifts double their risk of car crashes when driving home from the hospital

Drowsy driving is a well-known hazard that causes more than 100,000 motor vehicle crashes on the Nation's highways every year. According to a recent study, first-year doctors in training, or medical interns, who work shifts of longer than 24 hours are more than twice as likely to have a car crash leaving the hospital and five times as likely to have a "near miss" incident on the road as medical interns who work shorter shifts. The study was supported by the Agency for Healthcare Research and Quality (HS12032 and F32 HS14130) and the National Institute for Occupational Safety and Health (NIOSH) in the Centers for Disease Control and Prevention.

Details of the study were published in an article that appeared in the January 13, 2005, issue of the *New England Journal of Medicine*. The article is the third in a series of studies cofunded by AHRQ and NIOSH on the impact of extended work hours and fatigue on interns conducted by the Divisions of Sleep Medicine at the Brigham and Women's Hospital and the Harvard Medical School in Boston. The first two studies were published in the October 28, 2004, issue of the same journal. Charles A. Czeisler, Ph.D., M.D., leads the Harvard Work Hours, Health, and Safety Group, the team that conducted all three studies. Dr. Czeisler is Baldino Professor of Sleep Medicine and Director of the Division of Sleep Medicine at Harvard Medical School.

For this study, Laura K. Barger, Ph.D., research associate in medicine at the Brigham and Women's Hospital and Harvard Medical School, and her colleagues recruited 2,737 interns from medical institutions around the country to fill out detailed monthly surveys recording their work hours, frequency of shifts of more than 24 hours, and driving safety records, including car accidents, near-miss incidents in which property damage was narrowly avoided, and incidents

*continued on page 2*

## Medical interns

*continued from page 1*

in which they had fallen asleep while driving or while stopped in traffic. More than 17,000 surveys were collected between April 2002 and May 2003. Researchers also randomly selected 7 percent of study participants to keep daily work diaries that were verified through direct observation.

The researchers found that the majority of interns routinely worked more than 30 consecutive hours, and the interns reported that on average, they were awake 96 percent of the time they were in the hospital. Also, during the 12-month study period, interns reported working an average of 80 hours or more during 46 percent of work weeks and 100 hours or more per week during 11 percent of work weeks.

Study participants reported a total of 320 accidents during the 12-month study period, including 133 that resulted in treatment in the emergency room, property damage of more than $1,000, or the filing of a police report. Slightly more than 40 percent of the 320 crashes occurred on the commute from work. Every extended shift that was scheduled per month increased the monthly rate of accidents on the commute from work by 16 percent and the monthly rate of any car accident by 9 percent. Interns also were more than twice as likely to fall asleep while driving and more than three times as likely to fall asleep while stopped in traffic in months during which they worked five or more extended shifts.

For more information, see "Extended work shifts and the risk of motor vehicle crashes among interns," by Dr. Barger, Brian E. Cade, M.S., Najib T. Ayas, M.D., M.P.H., and others, in the January 13, 2005 *New England Journal of Medicine* 352, pp. 125-134. ■

*Safety/Quality*

# Almost 90 percent of American adults wear seat belts regularly, but young men are least likely to wear them

Men between the ages of 19 and 29 are the group least likely to wear a seat belt while driving or riding in a car, and they are three times as likely not to use their seat belt as women of the same age, according to a new data analysis from the Agency for Healthcare Research and Quality.

The data, from AHRQ's 2002 Medical Expenditure Panel Survey, show that 88 percent of people between 16 and 64 years of age were reported to always or nearly always use seat belts. This number is close to the goal set by the National Highway Traffic Safety Administration to increase national seat belt use to 90 percent by the year 2005. Healthy People 2010 set a goal of 92 percent use of seat belts by 2010. However, a little more than 5 percent of people ages 16 to 64 never or seldom use their seat belts, and another 7 percent use their seat belts only sometimes.

Other data about the people who never or seldom use their seat belts include:

- Young people ages 19-21 who are not students are four times as likely not to use their seat belts as students of the same age (12 percent compared with 3 percent).
- People who have only a high school education are twice as likely not to wear their seat belts as those with some additional education (almost 8 percent compared with almost 4 percent).
- People living in non-metropolitan areas are more than twice as likely not to wear their seat belts as

***continued on page 3***

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## Use of seat belts

*continued from page 2*

people living in large metropolitan areas (about 9 percent versus 4 percent).

In addition, of all people ages 16 to 64, those ages 16 to 18 were the group least likely to drive or ride in a car without their seat belts. Only about 3 percent of girls and 4 percent of boys were reported to have never used their seat belt.

Details are available online in Statistical Brief No. 62: *Characteristics of Persons Who Seldom or Never Wear Seat Belts, 2002.* Go to www.meps.ahrq.gov to access the brief.

MEPS collects information each year from a nationally representative sample of U.S. households about health care use, expenses, access, health status, and quality. MEPS is a unique government survey because of the degree of detail in its data, as well as the capability of users to link data on health services spending and health insurance to demographic, employment, economic, health status, and other characteristics of individuals and families. General information about MEPS is available at www.meps.ahrq.gov. ■

# Multifaceted QI program greatly improves use of prophylactic surfactant for high-risk preterm infants

Preterm infants often don't have sufficient pulmonary surfactant, a lipid/protein compound that aids the transition from the fluid-filled lungs of the fetus to the air-filled lungs of the newborn. When this transition does not occur, the infant develops respiratory distress syndrome. (RDS). Prophylactic surfactant therapy immediately after birth is recommended for preterm infants to prevent RDS and other respiratory problems.

Although surfactant treatment reduces the risk of death and pneumothorax by 40 percent, few preterm infants routinely receive it, and many infants receive delayed treatment. This situation can be improved with a multifaceted quality improvement (QI) program, according to a study supported by the Agency for Healthcare Research and Quality (HS10528).

Preterm infants born at hospitals that participated in the QI program were significantly more likely than infants born at control hospitals to receive surfactant in the delivery room (55 percent vs. 18 percent) and to receive it much sooner after birth (median of 21 minutes vs. 78 minutes). Jeffrey D. Horbar, M.D., and colleagues at the Vermont Oxford Network examined use of surfactant therapy by 114 neonatal intensive care units (NICUs), which treated 6,029 infants of 23-29 weeks gestation born in 2001.

Dr. Horbar and his colleagues randomly assigned 57 NICUs to a collaborative QI program, which included audit and feedback (that compared their administration and timing of surfactant and delivery room practice with peers), reviews of surfactant evidence, an interactive training workshop, and collaborative ongoing faculty support via conference calls and an e-mail discussion list. The other 57 control NICUs received center-specific confidential reports routinely prepared for members of the Vermont Oxford Network.

For more information, see "Collaborative quality improvement to promote evidence based surfactant for preterm infants: A cluster randomized trial," by Dr. Horbar, Joseph H. Carpenter, M.S., Jeffrey Buzas, Ph.D., and others, in the October 2004 *British Medical Journal* 329, pp. 1004-1010. ■

### Also in this issue:

## Improving access to coronary angioplasty in hospitals without CABG surgery programs is risky

The decreased risk of complications following percutaneous coronary interventions (PCIs)—which include coronary angioplasty and other techniques for relieving coronary artery narrowing—has rekindled a decade-long debate on the safety of performing PCIs in hospitals without onsite coronary artery bypass graft (CABG) surgery programs, given that emergency CABG surgery may be needed following PCI. A recent study of Medicare beneficiaries suggests that PCI in the absence of on-site CABG surgery capability is associated with a higher risk of adverse outcomes.

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS10141), David E. Wennberg, M.D., M.P.H., of the Center for Outcomes Research and Evaluation, Maine Medical Center, and his colleagues compared in-hospital and 30-day deaths following PCI for 625,854 Medicare patients aged 65 and older at acute care facilities between 1999 and 2001. They identified hospitals with and without onsite CABG surgery based on Medicare claims data.

PCIs were performed by 178 hospitals without onsite CABG and 943 hospitals with onsite CABG. Patients at both types of hospitals had similar characteristics. Overall, combined in-hospital and 30-day post-procedure mortality was nearly twice as high in hospitals without onsite CABG surgery as those with it (6 percent vs. 3.3 percent). Those undergoing PCIs in hospitals with onsite CABG surgery were more likely to have a primary/rescue PCI (22 vs 5.6 percent), that is, same-day surgery for heart attack.

After accounting for baseline differences, mortality for patients with primary/rescue PCI was similar for both types of hospitals. However, for patients undergoing non-primary/rescue PCI, mortality was 38 percent higher in hospitals without onsite CABG surgery. This increase in mortality was primarily confined to hospitals performing a low volume of PCIs (50 or less a year) for Medicare patients.

For more information, see "Outcomes of percutaneous coronary interventions performed at centers without and with onsite coronary artery bypass graft surgery," by Dr. Wennberg, F. Lee Lucas, Ph.D., Andrea E. Siewers, M.P.H., and others in the October 27, 2004 *Journal of the American Medical Association* 292, pp. 1961-1968. ■

## Use of a multidisciplinary team can reduce hospital stays and costs without adverse effects on readmissions or outcomes

Compared with usual care, a multidisciplinary team of hospitalist/attending physicians and advance practice nurses coupled with daily instead of weekly multidisciplinary rounds improved the management of general medicine patients in a large medical center during hospital stays and for 30 days after discharge. This team approach reduced length of hospital stay and costs without affecting hospital readmissions, mortality, or compromising quality of life and patient satisfaction, according to a recent study supported by the Agency for Healthcare Research and Quality (HS10734).

Marie J. Cowan, Ph.D., of the University of California, Los Angeles School of Nursing, and her colleagues examined the impact of the Multidisciplinary, Doctor, Nurse Practitioner (MDNP) intervention on length of stay, hospital costs, resource use for 4 months after discharge,

*continued on page 5*

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## Multidisciplinary teams

*continued from page 4*

readmissions, and other outcomes. They assigned 581 general medical patients to the experimental (E) group and 626 similar patients to the control (usual care, C) group.

The primary duties of the nurse practitioners (NPs) in the E group were case management, facilitation of communication and collaboration with physicians and nurses, leading and implementing timely processes of care after the daily multidisciplinary rounds, surveillance of cost-effective measures, and facilitation of continuity of care between inpatient and outpatient management and for 30 days after discharge.

A hospitalist was medical director of the E group, and attending physicians randomized to the E group were instructed personally by the hospitalist medical director to perform their duties as would a hospitalist. Their duties included daily multidisciplinary rounds, twice-daily assessment of patients' clinical status, use of clinical pathways, and other duties. The hospitalist medical director wrote disease-specific pathways for various conditions, met with NPs weekly, and was always available to them by phone.

Patients in the E group had significantly shorter hospital stays than those in the C group. After adjustment for the cost of the team intervention (mostly for NP salaries), a significant net cost savings per patient was associated with the intervention. There were no significant differences in readmission rates or mortality between the two groups. Because health outcomes and patient satisfaction were comparable for the two groups, the intervention was considered cost effective.

See "Hallmarks of quality: Generating and using knowledge," by Dr. Cowan, in *Communicating Nursing Research* 37(1), pp. 3-12, 2004. ■

## Use of a comprehensive QI program in primary care can improve delivery of preventive services for heart disease and stroke

A quality improvement (QI) program in which primary care practices hosted quarterly site visits, participated in two QI network meetings, and received copies of practice guidelines and quarterly performance reports improved the proportion of practice patients whose LDL cholesterol and blood pressure were controlled. In a study led by Steven Ornstein, M.D., of the Medical University of South Carolina, researchers examined the impact of the QI program for improving adherence to 21 quality indicators for primary and secondary prevention of cardiovascular disease and stroke.

The study, which was supported by the Agency for Healthcare Research and Quality (HS11132), involved 20 community-based family and general internal medicine practices in 14 States, all of which used the same electronic medical record. Control practices received only the guidelines and performance reports. QI practices improved 22.4 percentage points (from 11.3 to 33.7 percent) in the percentage of indicators at or above the target compared with the 16.4 percentage points of control practices (from 6.3 to 22.7 percent), a nonsignificant difference. However, patients with hypertension in the QI practices had a 15.7 percentage point greater improvement in diagnoses of hypertension and an 8 percentage point greater improvement in blood pressure control than those in control practices.

On the basis of published estimates of the effect of blood pressure lowering, these improvements, if maintained for 10 years, might prevent 302 cardiovascular disease events (such as stroke and heart attack) and 209 deaths in the QI group and 224 cardiovascular disease events and 154 deaths in the control group. Clinicians cited use of multiple-agent hypertensive therapy, recommended in recent practice guidelines, as an explanation for better blood pressure control. The authors caution that the study involved only a small number of practices, limiting their ability to detect between-group differences, and it lacked a pure control group.

Details are in "A multimethod quality improvement intervention to improve preventive cardiovascular care," by Dr. Ornstein, Ruth G. Jenkins, M.S., Paul J. Nietert, Ph.D, and others, in the October 2004 *Annals of Internal Medicine* 141, pp. 523-532. ■

## Study finds declining quality of primary care for elderly Medicare patients

Many elderly adults have multiple chronic medical conditions that must be monitored on a regular basis. For these patients, receipt of high-quality primary care is critical. Yet, findings from a recent study show that the quality of seniors' interactions with their primary care physicians declined significantly from 1998 to 2000. In 2000, Medicare-insured seniors reported less thorough discussions about their problems and symptoms, greater difficulty reaching their doctor, and interpersonal treatment that they felt was less caring and more rushed (despite similar length of office visits).

Seniors' financial access to primary care, continuity of care, and integration of care also declined during this period, according to the study, which was supported by the Agency for Healthcare Research and Quality (HS09622) and the National Institute on Aging and carried out by researchers from Tufts-New England Medical Center and Tufts University School of Medicine in Boston.

Specifically, Medicare patients reported paying more for doctor's visits, medication, and other treatments in 2000 than in 1998. The largest declines occurred in the quality of physician-patient interactions. For example, patients said they were less likely to be able to see their regular doctor when they were sick, their doctor often did not help them understand what specialists said about them, and the quality of specialists they were referred to declined over the 2-year period. Patients also reported that they had less access to their doctor when they were sick, called for an appointment, or wanted advice by phone. With the exception of financial access, the observed changes did not differ by system (fee-for-service [FFS] or HMO Medicare).

The declines in financial access and interpersonal quality of care seen in this study are in sharp contrast to changes in technical quality of care that occurred during the same time period. These technical improvements were likely the result of routine monitoring and reporting on measures of technical quality of care using the Health Employer Data and Information Set (HEDIS) and other measures. Thus, the technical aspects of care were getting attention from organizations and individual clinicians leading to steady improvement (i.e., "What gets measured gets attention"). In conclusion, the authors note that similar attention to the interpersonal aspects of quality of care is part of what is needed to correct the observed downward trajectory seen in this study.

The researchers based these findings on analysis of data from the Primary Care Assessment Survey completed by Medicare FFS and HMO beneficiaries in 13 States. Using these data, the investigators evaluated changes from 1998 to 2000 in nine measures covering two broad areas of primary care: quality of physician-patient interactions (five measures) and structural/organizational features of care (four measures).

Details are in "Primary care experiences of Medicare beneficiaries, 1998-2000," by Jana E. Montgomery, Sc.M., Julie T. Irish, Ph.D., Ira B. Wilson, M.D., M.S., and others, in the October 2004 *Journal of General Internal Medicine* 19, pp. 991-998. ■

## Researchers find potentially inappropriate drug use in nursing homes associated with deaths of elderly residents

Elderly nursing home residents given potentially inappropriate drugs intermittently over a 3-month period had an almost 90 percent greater likelihood of dying during the last month of that period than similar residents who were not administered the possibly inappropriate medications, according to a recent study conducted by researchers at the Agency for Healthcare Research and Quality.

Older people metabolize drugs differently than younger people, and they usually have a greater number of health problems than the general population. Thus, nursing home residents who usually are elderly, are of special concern, according to Denys T. Lau, Ph.D., formerly of AHRQ and now with the University of Michigan School of Public Health, and D.E.B. Potter, M.S., of AHRQ's Center for Financing, Access, and Cost Trends, and their colleagues.

In a separate analysis, the researchers found that over a 2-month period, residents who took potentially inappropriate medications during the last month of that

*continued on page 7*

## Medication use in nursing homes

*continued from page 6*

period had a substantially higher chance of being hospitalized the following month than residents not exposed to the medications. The study is the first known analysis of the effects of potentially inappropriate medication prescribing in nursing homes based on nationally representative survey data. The researchers used the latest available data (1996) on nursing homes from AHRQ's Medical Expenditure Panel Survey Nursing Home Component (MEPS-NHC).

For more information, see "Hospitalization and death associated with potentially inappropriate medication prescriptions among elderly nursing home residents," by Dr. Lau, Judith D. Kasper, Ph.D., Ms. Potter, and others, in the January 2005 *Archives of Internal Medicine* 165, pp. 68-74. Reprints (AHRQ Publication No. 05-R024) are available from AHRQ.**

In an earlier study, these AHRQ researchers found that, at a minimum, half of all people aged 65 and older who stayed in a nursing home for 3 months or longer in 1996 were given at least one potentially inappropriate medication. The most common drugs involved were propoxyphene (narcotic painkiller); amitriptyline (antidepressant); diphenhydramine and cyproheptadine (antihistamine with strong anticholinergic effects); hydroxyzine (anti-anxiety drug); oxybutynin (bladder muscle relaxant); ranitidine (antacid); and iron supplements.

The residents who were more likely to be given these drugs included those covered by Medicaid, individuals who were not high school graduates, and those who had mental disorders but not dementia. The study also found higher use of potentially inappropriate drugs in nursing homes with large numbers of beds and lower registered nurse-to-resident ratios.

Details are in "Potentially inappropriate medication prescriptions among elderly nursing home residents: Their scope and associated resident and facility characteristics," by Drs. Lau and Kasper, Ms. Potter, and Alan Lyles, Sc.D., in the October 2004 *Health Services Research*. 39(5), pp. 1257-1276. Reprints (AHRQ Publication No. 05-R022) are available from AHRQ.* ■

## Voluntary primary care safety reporting system includes errors due to communication, diagnostic tests, and medication

Most efforts to improve patient safety have focused on reducing hospital errors. However, errors in primary care also may have serious consequences. A recently implemented primary care safety reporting system (Applied Strategies for Improving Patient Safety, ASIPS)—which encourages clinicians and staff to report errors or near misses either anonymously or confidentially—helps to pinpoint some major causes of errors.

During the first 2 years of the project, more than 700 error reports were submitted. Problems in communication (71 percent), diagnostic tests (47 percent), medications (35 percent), and both diagnostic tests and medications (14 percent) made up most error reports to the system.

Compared with anonymous reports, confidential reports to the system yielded richer information on which to base safety improvements. In the confidential reports, the reporters identified themselves and were interviewed, but all contact information was automatically expunged from the database within 10 days after report submission.

Researchers from the University of Colorado Health Sciences Center and the CNA Corporation, Alexandria, VA, examined the types of medical error reports submitted to the system from clinicians and staff in two practice-based research networks: The Colorado Research Network (CaReNet) and the High Plains Research Network (HPRN). The study was supported by the Agency for Healthcare Research and Quality (HS11878).

Participants were asked to report "any event you don't wish to have happen again that might represent a threat to patient safety" (including near misses where no patient harm actually occurred). During the first

***continued on page 8***

**Note:** Only items marked with a single (*) or double (**) asterisk are available from AHRQ. Items marked with a single asterisk (*) are available from AHRQ's clearinghouse. Items with a double asterisk (**) are also available through AHRQ InstantFAX. Three asterisks (***) indicate NTIS availability. 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.

## Primary care safety reporting system

*continued from page 7*

2 years of the project, 33 practices with a total of 475 clinicians and staff participated in ASIPS. Participants submitted 708 reports during this time, with two-thirds of participants using the confidential reporting form. The researchers followed up on 84 percent of the confidential reports within the allotted 10-day time frame and ended up with 608 relevant, codable reports.

See "Event reporting to a primary care patient safety reporting system: A report from the ASIPS collaborative," by Douglas H. Fernald, M.D., Wilson D. Pace, M.D., Daniel M. Harris, Ph.D., and others, in the July 2004 *Annals of Family Medicine* 2(4), pp. 327-332. ■

## Clinicians value medication safety alerts and welcome small-group training to make better use of them

Busy clinicians generally find computerized safety alerts helpful for providing prescribing and preventive health information. However, the alerts need to be concise and relevant, have clear action steps, and provide options for users with different experience levels and work styles, according to a recent study. The study was supported by the Agency for Healthcare Research and Quality through the Centers for Education and Research on Therapeutics (CERTs) cooperative agreement (HS11843).

Members of the HMO Research Network CERT conducted interviews with 20 primary care providers at a large group-model HMO where prescribers have used computerized order entry since 1996. They asked clinicians about their emotional response to sample alerts, level of attention (ignore or read), perceived barriers to use, and usual clinical response.

More than half of those interviewed felt that it would be unwise to let clinicians control or avoid safety alerts. On the other hand, many interviewees said they were often frustrated due to delays caused by an alert, difficulty interpreting an alert, and receiving the same alert repeatedly. Alerts that intruded on their workflow were particularly annoying and subject to override. These included health maintenance alerts such as overdue tobacco cessation counseling or the need to schedule a screening exam, which popped up when they opened a patient's chart.

Clinicians considered alerts received during the medication prescribing process to be more helpful than alerts received at other times. They particularly welcomed alerts pertaining to agents with which they were less familiar, drug interactions, drugs to which the patient had an allergy, and appropriate dosing. They preferred alerts that were clearly written, provided options for alternative medications, or offered a single "button" solution to the clinical issue. Most preferred small-group educational sessions tied to existing meetings over e-mail for advance notice of new alerts, especially for new and complex areas, and preferred training by local physicians with clinical and electronic medical record expertise rather than outside experts.

See "How to design computerized alerts to ensure safe prescribing practices," by Adrianne Feldstein, M.D., M.S., Steven R. Simon, M.D., Jennifer Schneider, M.P.H., and others, in the November 2004 *Joint Commission Journal on Quality and Safety* 30(11), pp. 602-613. ■

## Community pharmacists receive many computer-generated alerts about drug-drug interactions, most of which they override

An important part of the daily job of community pharmacists is evaluating the clinical significance of drug-drug interactions (DDIs) and responding to computer-generated DDI alerts. However, a panel of nine pharmacists from one community pharmacy chain deemed most (81 percent) of these DDI alerts insignificant. Either the patient was no longer taking the medication with which the new prescription interacted, or the prescription was being refilled and the interaction had already been evaluated. The pharmacists generally had no reason to take any action other than to override the alert.

Although pharmacists did not spend much time attending to these alerts, they still had to divert attention from other tasks that might benefit the patient, notes John E. Murphy, Pharm.D., of the University of Arizona. Dr. Murphy and his colleagues recommend that

***continued on page 9***

## Community pharmacists

*continued from page 8*

online prospective drug-use review (OPDUR) systems and internal pharmacy alert systems be redesigned to make them more useful to pharmacists.

In a study that was supported in part by the Agency for Healthcare Research and Quality (HS10385), the researchers had pharmacy students observe daily pharmacy practice and collect data on DDI alerts. They also surveyed the panel of pharmacists about how much time they spent dealing with DDIs and the types of alerts overridden. The pharmacists all used OPDUR systems commonly used in pharmacies and the same internal pharmacy system software.

The pharmacists overrode all 51 DDI alerts generated by the computer. Drug interactions for which there were repeated alerts involved antibiotics, diuretics, angiotensin-converting-enzyme inhibitors, beta-blockers, and potassium replacement products. Most pharmacists spent from less than a half hour to an hour of an 8-hour shift overriding interactions they deemed not clinically significant. A mean of 74 percent of the alerts were overridden with no further action taken. The patient was warned and the medication accepted in 19 percent of cases, the physician consulted and the drug left unchanged in 4 percent of cases, and the physician consulted and drug changed in 3 percent of cases.

See "Community pharmacists' responses to drug-drug interaction alerts," by Dr. Murphy, Ryan A. Forrey, Pharm.D., and Usha Desiraju, Pharm.D., in the July 15, 2004 *American Journal of Health-System Pharmacy* 61(14), pp. 1484-1487. ■

## Involving all staff members in guideline-recommended care can improve oversight and coordination of patient care

Involving all primary care staff members in practice activities and assuring that they all become familiar with clinical practice guidelines can improve oversight, coordination of patient care, and outcomes. A quality improvement model to accomplish this was developed during a Practice Partner Research Network (PPRNet) Translating Research into Practice (TRIP) project, supported by the Agency for Healthcare Research and Quality (HS11132). The goal was to help practices improve primary and secondary prevention of cardiovascular disease and stroke from 2000 to 20003.

The model consisted of five categories of improvement strategies. First, prioritize performance, for example, accept a clinical practice guideline, establish project leaders, and use PPRNet practice reports to guide improvement. Second, involve all staff, for example, train staff on guidelines and practice improvement objectives, arrange clinical information loops to doctors from staff, extend staff roles in care delivery, and minimize staff turnover. Third, redesign delivery systems, for example, schedule lab work before office visits, use point-of-care tests, and assign routine monitoring to nursing staff. Fourth, activate patients via office posters and practice newsletters and provide incentives to meet guidelines such as discounted screening.

Finally, the model involved use of electronic medical record tools such as internal messaging or flags for team coordination, queries to flag charts for patients needing specific care, and queries and automated letter generation for outreach. The project's 10 intervention practices used more of the model items than the 9 control practices (69 vs. 48 percent), as did high-performing practices versus mid-range or low performers (81 vs. 39 vs. 46 percent). Chris Feifer, Dr.P.H., of the University of Southern California, and Steven Ornstein, M.D., of the Medical University of South Carolina, conclude that the PPRNet-TRIP Improvement Model might help small practices translate research into practice and improve care outcomes.

See "Strategies for increasing adherence to clinical guidelines and improving patient outcomes in small primary care practices," by Drs. Feifer and Ornstein, in the August 2004 *Joint Commission Journal on Quality and Safety* 30(8), pp. 431-441. ■

## Internal medicine residents and interns prefer inpatient rotations that are supervised by hospitalists

Residents, interns, and medical students consider internal medicine rotations supervised by hospitalists to be more effective and satisfying than those supervised by traditional attending physicians, according to a study supported by the Agency for Healthcare Research and Quality (HS11416). Hospitalists, who in the study spent substantially more time in the hospital compared with traditional attending physicians, may have more specific inpatient knowledge and teaching skills that distinguish them from non-hospitalists, suggest the researchers who conducted the study.

For the study, the researchers analyzed data from a Web-based evaluation system containing all house staff and student evaluations of their attending physicians and internal medicine ward rotations at two university-affiliated teaching hospitals over a 2-year period (1999-2001). A total of 1,587 trainees working with 17 hospitalists and 52 traditional attending physicians completed the evaluation. Trainees reported significantly more overall satisfaction with hospitalists than with traditional attendings (8.3 vs. 8.0 on a 9-point scale), and they rated hospitalists' overall teaching effectiveness as superior (4.8 vs. 4.5 on a 5-point scale). The trainees also rated the overall educational value of rotations higher with hospitalists (3.9 vs. 3.7 on a 5-point scale).

Trainees rated hospitalists' knowledge of relevant subject matter, discussion of pathophysiology, teaching effectiveness, emphasis on cost-effectiveness, and provision of appropriate and effective feedback as superior to that of traditional attendings. The items for which hospitalists received higher ratings describe a specific skill set that they either brought to their position or developed via frequent ward duty and do not reflect a difference in commitment toward or enjoyment of teaching, note the researchers.

Details are in "Effects of hospitalist attending physicians on trainee satisfaction with teaching and with internal medicine rotations," by Karen E. Hauer, M.D., Robert M. Wachter, M.D., Charles E. McCulloch, Ph.D., and others, in the September 27, 2004 *Archives of Internal Medicine* 164, pp. 1866-1871.

**Editor's note:** Another AHRQ-supported study on a related topic focuses on professional liability issues pertinent to resident physicians, attending physicians, and graduate medical education institutions. For instance, attending physicians overseeing resident physicians face personal malpractice risk for the care they personally deliver as well as the care they direct (that is completed by residents they supervise) and for improper supervision that leads to mistakes. See Kachalia, A., and Studdert, D.M. (2004, September). "Professional liability issues in graduate medical education." (AHRQ grant HS11285). *Journal of the American Medical Association* 292(9), pp. 1051-1056. ■

## *Pharmaceutical Research*

## Marketing and prescribing of hormone replacement therapy declined substantially following reports of harm

By the end of the 1990s, almost half of postmenopausal women in the United States were being treated with long-term hormone therapy, which was also among the most heavily promoted medications. In July 2002, the Women's Health Initiative Estrogen Plus Progestin Trial (WHI E+P) report demonstrated that standard-dose Prempro produced significant harm (for example, increased risk for cardiovascular disease and breast cancer) and lacked net benefits.

U.S. prescriptions for postmenopausal hormone therapy declined 43 percent during the 18 months after these results were published. Promotional spending for hormone therapy, particularly for the agents most directly implicated in the trial, also declined substantially, according to a study conducted by researchers at the University of Alberta and Stanford University School of Medicine. The study was supported in part by the Agency for Healthcare Research and Quality (HS13405).

Interrelated with the trial results themselves and the ensuing media coverage, reduced promotion may have contributed to a substantial decline in hormone

*continued on page 11*

## Hormone replacement therapy

*continued from page 10*

therapy prescriptions, according to the researchers. They examined nationally representative data on hormone prescribing and promotion from January 2001 through December 2003 from *IMS Health and Consumer Media Reports*. In addition, they analyzed promotional expenditures for hormone therapy before and after July 2002.

In the quarter before release of the trial results (April-June 2002), 22.4 million prescriptions for hormone therapy were dispensed, and $71 million was spent on promotion ($350 per year per U.S. physician). Within 9 months of the report's publication (first quarter of 2003), there was a 32 percent decrease in hormone therapy prescriptions and a 37 percent decline in promotional spending from pre-trial result levels. The greatest declines in promotion occurred for standard-dose Prempro (61 percent decrease), the agent implicated by the WHI E+P report.

See "Promotion and prescribing of hormone therapy after report of harm by the Women's Health Initiative," by Sumit R. Majumdar, M.D., M.P.H., Elizabeth A. Almasi, and Randsall S. Stafford, M.D., Ph.D., in the October 27, 2004 *Journal of the American Medical Association* 292(16), pp. 1983-1988. ■

## Study suggests that use of lifesaving beta-blockers for heart attack patients is increasing at community hospitals

Heart attack patients who take recommended beta-blockers are less likely to die or have another heart attack than patients who do not take them. A new study of five community hospitals in Michigan shows that more heart attack patients may be receiving these lifesaving drugs. The study, which was supported in part by the Agency for Healthcare Research and Quality (HS10531), found that beta-blocker use for heart attack patients at these hospitals improved dramatically between 1994 and 1995. However, 13 percent of patients given beta-blockers while in the hospital were not prescribed them at discharge. Also, nonelderly patients were twice as likely as elderly patients to receive a beta-blocker prescription when they were discharged from the hospital.

More effort is needed to improve the use of beta-blockers in heart attack patients after hospital discharge, particularly in elderly patients, according to researchers participating in the Michigan State University Inter-Institutional Collaborative Health (MICH) Study. They examined changes in the rate of beta-blocker use among heart attack patients at admission, in the hospital, and at discharge between 1994 and 1995 (MICH I, 287 patients) and 1997 (MICH II, 121 patients) at the five hospitals. In 1994 and 1995, physicians underprescribed beta-blockers for heart attack patients who had no contraindication (such as congestive heart failure or pulmonary edema) to their use.

Use improved by 23.5 percent in 1997 for patients with a previous history of heart attack on arrival at the hospital (36 vs. 12.5 percent), 29 percent for those in the hospital (76 vs. 47 percent), and 28 percent at discharge (62 vs. 34 percent). Neither race nor sex predicted beta-blocker use. This increase in prescription of beta-blockers most likely resulted from many quality improvements made between the study periods, most notably clinician feedback, as well as 1996 guidelines recommending increased beta-blocker use.

See "Changes in rates of beta-blocker use in community hospital patients with acute myocardial infarction," by Adesuwa B. Olomu, M.D., Ralph E. Watson, M.D., Azfar-e-Alam Siddiqi, M.D., and others, in the October 2004 *Journal of General Internal Medicine* 19, pp. 999-1004.

**Editor's note:** Another AHRQ-supported study on a related topic shows that mailing treatment recommendations to primary care doctors caring for newly discharged patients with heart attack or heart failure did not improve their quality of care. For more details, see Guadagnoli, E., Normand, S-L., DiSalvo, T.G., and others. (2004, September). "Effects of treatment recommendations and specialist intervention on care provided by primary care physicians to patients with myocardial infarction or heart failure." (AHRQ grant HS09487). *American Journal of Medicine* 117, pp. 371-379. ■

## Women who have given birth only via cesarean are less likely than those with vaginal deliveries to report stress incontinence

Women with a history of only cesarean delivery are 40 percent less likely to suffer from stress incontinence later in life than women who delivered their children vaginally, according to a recent study supported by the Agency for Healthcare Research and Quality (HS06865). There has been increased interest in recent years in elective cesarean delivery to reduce the long-term maternal risk of pelvic floor disorders such as incontinence, but more studies are needed to clarify the long-term risks, benefits, and costs of cesarean delivery, according to researchers from Johns Hopkins University.

For the study, the researchers surveyed 1,299 women scheduled for elective hysterectomy about the number of children they had borne (parity), route of delivery, other factors (such as obesity and uterine fibroids), and bladder symptoms to investigate the association between reproductive factors and bladder symptoms. They found that both stress incontinence (leaking of urine due to laughing or other activities that increase abdominal pressure) and urinary urgency (sudden urge to urinate) increased nearly two-fold after a single delivery. The prevalence of stress incontinence was further increased with more births, most notably among women who had four or more deliveries. However, after controlling for parity and other characteristics, women who had a history of cesarean delivery were 40 percent less likely to report stress incontinence than women with a history of vaginal delivery.

The diagnosis of uterine prolapse was associated with both stress incontinence and urinary urgency, independent of parity and route of delivery. Uterine fibroids were not associated with stress incontinence but were significantly associated with urinary urgency. Obesity emerged as an important risk factor for both stress incontinence and urinary urgency in this group.

More details are in "Parity and route of delivery: Does cesarean delivery reduce bladder symptoms later in life?" by Victoria L. Handa, M.D., Lynn Harvey, B.S., Harold E. Fox, M.D., and Kristen H. Kjerulff, Ph.D., in the *American Journal of Obstetrics and Gynecology* 191, pp. 463-469, 2004. ■

## Disparities in heart disease among British civil servants are not due to cardiac care differences

Low social position and South Asian ethnicity are both associated with increased risk of dying from coronary heart disease. Such potential health care disparities have stimulated calls in both the United States and the United Kingdom for remedial action. However, a recent study did not find a connection between either socioeconomic position or ethnicity with receipt of cardiac procedures or drugs. The study was supported in part by the Agency for Healthcare Research and Quality (HS06516).

Michael Marmot, M.B.B.S., M.P.H., Ph.D., and colleagues at the University College London Medical School prospectively studied 10,308 British civil servants (by employment grade), aged 35-55 at baseline (1985-1988) for over 15 years in the Whitehall II study. They compared the subjects' need for cardiac care (presence of angina, heart attack, and coronary risk factors) with receipt of care: exercise electrocardiography, coronary angiography, coronary revascularization procedures, and cardiac preventive medications (aspirin, beta-blockers, lipid lowering agents, or angiotensin converting enzyme inhibitors).

The researchers found no evidence that low social position (defined by employment grade) or South Asian ethnicity was associated with lower use of cardiac procedures or drugs, independently of clinical need. After adjustment for age, men in low employment grades had 66 percent higher incidence of angina and heart attack than men in high employment grades, and South Asian men (who were also less likely to be in a high employment grade) had a 95 percent higher incidence than white men. However, after adjustment for clinical need, social position showed no association with the use of cardiac procedures or secondary prevention drugs.

South Asian subjects were more likely than white participants to undergo cardiac procedures and to be taking more secondary

*continued on page 13*

## Disparities in heart disease

*continued from page 12*

prevention drugs, even after adjustment for clinical need. It may be that South Asian patients and their doctors are responding to widely held perceptions that these patients have an increased risk of heart disease with corresponding lower thresholds of action.

For details, see "Does access to cardiac investigation and treatment contribute to social and ethnic differences in coronary heart disease? Whitehall II prospective cohort study," by Annie Britton, Martin Shipley, Dr. Marmot, and Harry Hemingway, in the July 2004 *British Medical Journal* 329, pp. 318-323. ■

## Substantial barriers prevent cancer patients from obtaining optimal care at the end of life

Despite many recent advances in cancer detection and treatment, more than half a million U.S. cancer patients die from their disease each year. Unfortunately, substantial societal, health care system, provider, and patient barriers prevent these individuals from obtaining optimal end-of-life care, according to a literature review supported in part by the Agency for Healthcare Research and Quality (HS08395). K. Robin Yabroff, Ph.D., M.B.A., Jeanne S. Mandelblatt, M.D., M.P.H., and Jane Ingham, of the Lombardi Cancer Center at Georgetown University identified and reviewed the barriers to optimal end-of-life care for cancer patients.

The researchers found that societal attitudes towards cancer and death and the medicalization of end-of-life care impede optimal end-of-life care for cancer patients. System barriers range from cost-containment efforts and fragmented coverage of end-of-life care by insurers to increased reliance on informal caregiving by family and friends, regulatory restrictions on pain management, and lack of coordinated end-of-life services. Provider barriers include poor provider-patient communication, delayed referrals to specialists or hospice care, limited ability to recognize and treat common symptoms of advanced cancer, and lack of training in palliative care.

Key patient-level barriers include the patients' inability to confront death, reluctance to accept the sick role, fear of side effects or becoming addicted to pain medications, and the lack of health insurance or inadequate coverage. The researchers stress how important it is for physicians to communicate with patients and their families about prognosis and the risks and benefits of treatment, to develop clear and informed treatment goals that are consistent with patient and family goals of care, and to deliver services that are consistent with treatment goals and quality of life.

See "The quality of medical care at the end-of-life in the USA: Existing barriers and examples of process and outcome measures," by Dr. Yabroff, Ph.D., M.B.A., Dr. Mandelblatt, and Jane Ingham, M.B.B.S., in the April 2004 *Palliative Medicine* 18, pp. 202-216.

**Editor's note:** Another AHRQ-supported study on a related topic found that mailing health care proxy and living will forms and literature to patients before an appointment at which their physicians received a reminder about advance directives yielded a small but significant improvement in completion of these documents. See Heiman, H., Bates, D.W., Fairchild, D., and others. (2004, September). "Improving completion of advance directives in the primary care setting: A randomized controlled trial." (AHRQ grant HS11046). *American Journal of Medicine* 117, pp. 318-324. ■

# *Clinical Decisionmaking*

## Appropriately targeting thrombolytic therapy for heart attack patients has the potential to save both lives and money

Tissue plasminogen activator (t-PA) has overtaken streptokinase as the preferred clot-busting (thrombolytic) agent for heart attack patients in the United States. However, a new community-based study suggests that while t-PA is clearly cost effective for some patients, it is not for others and thus should be targeted to heart attack patients most likely to benefit. The study was supported in part by the Agency for Healthcare Research and Quality (HS08212 and T32 HS00060).

Researchers from Tufts-New England Medical Center and the University of Michigan Medical

***continued on page 14***

## Thrombolytic therapy for heart attack patients

*continued from page 13*

Center calculated that targeting t-PA to the half of heart attack patients most likely to benefit from it could save 247 lives and $174 million nationally per year. According to their model, patients most likely to benefit were those at higher risk, where risk was defined by a multivariable model including age, the presence of diabetes, prior myocardial infarction (heart attack), and the size and location of the anterior wall myocardia infarction. Based on t-PA benefits found in the GUSTO (Global Utilization of Streptokinase and t-PA for Occluded Coronary Arteries) study and differences in patient characteristics between the GUSTO population and this study sample, the researchers generated predictions of the effectiveness and cost-effectiveness of t-PA compared with streptokinase in 921 patients who received thrombolytic therapy for heart attack.

When patients were grouped into quartiles based on their expected mortality benefit, 61 percent of the incremental mortality benefit from t-PA accrued to the top 25 percent of patients; 85 percent was accounted for by half of the patients, and only 4 percent accrued to patients in the lowest quartile. For the quartile of patients most likely to benefit, t-PA was very cost effective ($15,396 per life-year saved). However, t-Pa was not cost effective (more than $100,000 per life-year saved) for 37 percent of treated patients. Those in the lowest quartile were slightly more likely to be harmed (for example, by thrombolytic-related intracranial hemorrhage) than to benefit from t-PA.

See "Tissue plasminogen activator was cost-effective compared to streptokinase in only selected patients with acute myocardial infarction," by David M. Kent, M.D., Sandeep Vijan, M.D., Rodney A. Hayward, M.D., and others, in the *Journal of Clinical Epidemiology* 57, pp. 843-852, 2004. ■

## Many kidney dialysis patients are not properly treated for high cholesterol

The risk of atherosclerotic cardiovascular disease (ASCVD) in patients with end-stage renal disease (ESRD or kidney failure) on dialysis is 10 to 20 times higher than in the general population and 5 to 10 times higher than in patients with diabetes. Application of national guidelines to reduce cardiovascular disease in kidney dialysis patients is complicated by the conflicting observations that dialysis patients have a high risk of ASCVD, but those dialysis patients who have higher serum cholesterol have lower mortality rates. This conflict may explain the results of a recent study which found that many ESRD dialysis patients in the United States are not treated for high cholesterol. The study was supported in part by the Agency for Healthcare Research and Quality (HS08365).

Whether improved cholesterol treatment rates will result in decreased cardiovascular disease events such as heart attacks among ESRD dialysis patients needs to be tested in randomized clinical trials, suggests Neil R. Powe, M.D., M.P.H., M.B.A., of Johns Hopkins University. Dr. Powe and his colleagues assessed the prevalence, treatment, and control of hyperlipidemia (elevated levels of blood lipids such as cholesterol) in 812 ESRD patients undergoing hemodialysis (HD) or peritoneal dialysis (PD) at dialysis clinics in 19 States from 1995 to 1998.

About 40 percent of HD and 62 percent of PD patients had hyperlipidemia. Among those with hyperlipidemia, 67 percent of HD and 63 percent of PD patients were not treated for it, and only 22 percent of HD and 14 percent of PD patients were treated and controlled. Those who entered the study in 1997 or 1998, those with diabetes, males, and white patients were more likely to be treated and controlled, whereas those on PD and those with ASCVD were less likely to be treated and controlled.

See "Undertreatment of hyperlipidemia in a cohort of United States kidney dialysis patients," by Caroline S. Fox, M.D., M.P.H., J. Craig Longenecker, M.D., Ph.D., Dr. Powe, and others, in the May 2004 *Clinical Nephrology* 61(5), pp. 299-307. ■

## Early referral of patients with chronic kidney disease reduces complications and mortality

End-stage renal disease (ESRD) is preceded in most cases by a long and progressive decline in kidney function. Optimal management of patients with chronic kidney disease (CKD) usually requires the involvement of a nephrology specialist to address the complex issues that may arise, especially at the later stages of CKD.

Late referral of CKD patients to a nephrologist has been associated with adverse outcomes among ESRD patients. A recent study that was supported in part by the Agency for Healthcare Research and Quality (F32 HS00143) confirmed an association between late nephrologist referral (less than 4 months before starting dialysis) and a higher risk of death 1 year after initiation of dialysis.

Waqar H. Kazmi, M.D., of Tufts-New England Medical Center, and colleagues analyzed data from the Dialysis Morbidity and Mortality Study - Wave II to examine the impact of timing of nephrology care prior to dialysis on death within a year of starting dialysis. Of the 2,195 ESRD patients studied, 33 percent were referred late. Compared with patients in the late referral group, those in the early referral group (first nephrology visit 4 or more months prior to staring dialysis) were more likely to be white, have private or health maintenance organization insurance, be employed, married, and college graduates, and have diabetes as the cause of ESRD.

A hazards analysis demonstrated that compared with early referral patients, late referral patients had a 44 percent higher risk of death within a year after beginning dialysis. This higher risk remained significant after adjusting for other factors affecting risk of death such as age, race, coexisting conditions, and cause of CKD.

See "Late nephrology referral and mortality among patients with end-stage renal disease: A propensity score analysis," by Dr. Kazmi, Gregorio T. Obrador, Samina S. Khan, M.D., and others, in *Nephrology Dialysis Transplantation* 19, pp. 1808-1814, 2004. ■

## Many people still misunderstand "brain death" and its relation to organ donation

In the United States, brain death is clinically defined as irreversible loss of all brain functions in patients whose hearts continue to beat and who are maintained on mechanical ventilators in the intensive care unit. No one correctly diagnosed as brain dead has ever regained consciousness or independent functioning. Brain death and the dead donor rule (patients may not be killed through organ retrieval) are clinically and legally accepted in the United States as prerequisites for organ removal. Yet, many adults are unaware of, misinformed about, or hold beliefs that are not congruent with current definitions of brain death, according to a recent study that was supported by the Agency for Healthcare Research and Quality (HS10047).

This highlights the need for more public dialogue and education about brain death and organ donation, notes lead investigator Laura A. Siminoff, Ph.D., of Case Western Reserve University. Dr. Siminoff and her colleagues conducted a telephone survey of 1,351 adult residents of Ohio. Participants were asked to assess whether the patient in each one of three hypothetical scenarios (brain dead, in a coma, in a persistent vegetative state [PVS]) was dead and whether they would be willing to donate that patient's organs.

Only one-third (34 percent) of respondents knew that someone who was brain dead was legally dead in Ohio. Also, 28 percent mistakenly believed that brain-dead patients can still hear, and nearly 60 percent mistakenly thought that the respirator is stopped before, rather than after, organs are taken. The majority (86 percent) identified the brain dead patient in the first scenario as dead, 57 percent identified the patient in a coma as dead, and 34 percent identified the patient in a PVS as dead. Most who said that the patient was alive were not willing to donate that patient's organs. Yet, 34 percent were willing to donate the organs of patients they classified as alive for at least one scenario, in seeming violation of the dead donor rule.

See "Death and organ procurement: Public beliefs and attitudes," by Dr. Siminoff, Christopher Burant, and Stuart J. Youngner, M.D., in *Social Science and Medicine* 59, pp. 2325-2334, 2004. ■

## Controlling diet and physical activity can help obese and overweight children lose weight

About 15 percent of American children aged 6 to 19 years are overweight, and the percentage of black and Hispanic children who are overweight is even higher. Excess weight in children is due primarily to poor eating habits and inactivity, according to Jennifer Greaser, R.N., M.S.N., of the Centers for Disease Control and Prevention, and John J. Whyte, M.D., M.P.H., of the Agency for Healthcare Research and Quality. In a recent article, they recommend that children eat at least five servings of fruits and vegetables a day, engage in moderate physical activity for at least 60 minutes on most days of the week, and limit their TV viewing and computer activities to no more than 2 hours a day.

Because children are still growing, weight loss is usually not recommended, and clinicians and parents should first strive to maintain a child's baseline weight. Weight loss of no more than 1 pound per month is recommended in children aged 2 to 7 years who have a secondary weight-related complication such as high cholesterol or high blood pressure. Weight loss should be considered for children aged 7 years and older if the child's body mass index (BMI, ratio of weight to height) for age is 95 percent or greater or if the child is at risk for becoming overweight (BMI-for-age of 85 to 95 percent) and has secondary complications.

Several barriers prevent children from eating a healthy diet and exercising regularly. These include unsafe neighborhoods that relegate children to inside TV viewing and video games; time spent alone after school, during which children tend to engage in sedentary activities while eating foods high in fat and sugar; and low socioeconomic status that makes it harder for families to provide nutritious foods and pay for sports activities. Finally, children who eat excessively or when they are not hungry may be suffering from an eating disorder, which is often related to depression or stress.

See "Childhood obesity: Is there effective treatment?" by Ms. Greaser and Dr. Whyte, in the September 1, 2004 *Consultant,* pp. 1349-1353. Reprints (AHRQ Publication No. 05-R011) are available from AHRQ.** ■

## First-week followup of newborns afer hospital discharge is critical to prevent severe jaundice and other problems

Severe jaundice (hyperbilirubinemia) among newborns is becoming more prevalent, which some attribute to earlier discharge of newborns and lack of early discharge followup by a physician or home health nurse. The July 2004 American Academy of Pediatrics guideline on managing newborn jaundice recommends that all infants be examined in the first few days after discharge (when bilirubin levels peak and jaundice can be diagnosed). Unfortunately, many barriers prevent timely newborn followup, notes R. Heather Palmer, M.B., B.Ch., S.M., of the Harvard School of Public Health.

In a study that was supported by the Agency for Healthcare Research and Quality (HS09782), Dr. Palmer and her colleagues identified three major barriers to early newborn followup and strategies for overcoming them from focus group discussions among physicians and nurses and among parents in 2001. All groups noted barriers in communication and information, systems and processes of care, and parental knowledge and education. For instance, conflicting information was often given to the mother by pediatricians and obstetricians about infant readiness for discharge, communication gaps occurred during "hand-offs" between hospital and community-based providers, and outpatient bilirubin testing and reporting were often delayed.

Home care nurses often had trouble reaching the responsible clinician, and community-based providers often didn't have key information needed to evaluate newborns after discharge, such as exact time of birth, gestational age, and hospital test results. Doctors and nurses recommended using e-mail to notify community-based providers that the baby was born

*continued on page 17*

## Severe jaundice in newborns

*continued from page 16*

and to provide them with quick access to lab results. They also suggested encouraging parents to choose a pediatrician prior to discharge, giving parents a list of "early warning signs" to report, providing a call-in number for questions, and initiating followup calls from the nursery to the mother.

See "Barriers to first-week follow-up of newborns: Findings from parent and clinician focus groups," by Susanne Salem-Schatz, Sc.D., Laura E. Peterson, B.S.N., S.M., Dr. Palmer, and others, in the November 2004 *Joint Commission Journal on Quality and Safety* 30(11), pp. 593-601. ■

## Children with special needs often don't receive the health care services and assistive devices they need

Only a small proportion of children with special health care needs (CSHCN) receive needed therapy, assistive devices such as wheelchairs, hearing aids, or glasses, and related services, according to a recent study by researchers at the University of North Carolina, Chapel Hill. In addition, children who are more severely impaired and impoverished are even less likely to receive the care or assistive devices they need. Uncorrected hearing, mobility, and communication deficits slow children's academic progress and development and may contribute to behavior problems, according to Stacey C. Dusing, P.T., M.S., and colleagues.

Using data from the National Survey of Children with Special Health Care Needs, the researchers calculated the first national estimate of the prevalence of unmet needs for therapy services, vision care or glasses, hearing care or hearing aids, mobility aids, and communication aids for CSHCN, as well as the demographic characteristics associated with these unmet needs. They found that 6 percent of CSHCN who needed vision care or glasses did not get them, and 25 percent of those who needed communication aids such as hearing aids did not receive them. CHSCN who were insured were substantially more likely than those who were uninsured to receive needed therapy, vision care, glasses, or mobility aids.

Impoverished children (at or below 100 percent of the Federal poverty level) were much less likely to have their needs met for vision care or glasses and hearing aids or hearing care than children living in households with incomes more than 200 percent of the poverty level. Eleven percent of children who needed physical, occupational, or speech therapy did not receive the needed service. For each of the services studied, more severely limited children were significantly less likely to receive what they needed. CSHCN insured by Medicaid had better access to vison care or glasses than other CSHCN. These findings demonstrate that Medicaid's comprehensive coverage of assistive devices increases access to these services, conclude the researchers.

See "Unmet need for therapy services, assistive devices, and related services: Data from the National Survey of Children with Special Health Care Needs," by Stacey C. Dusing, P.T., M.S., Asheley C. Skinner, B.A., and Michelle L. Mayer, PhD., M.P.H., R.N., in the September-October 2004 *Ambulatory Pediatrics* 4, pp. 448-454. ■

## Many chronic diseases and mental disorders that affect adults have their roots in childhood

Better health during childhood has increased life expectancy and diminished disability among U.S. elders. At the same time, the burden of chronic and mental disorders among older Americans has increased dramatically, note Christopher B. Forrest, M.D., Ph.D., and Anne W. Riley, Ph.D., of the Johns Hopkins Bloomberg School of Public Health. In a recent article, they describe the life-course model of health. It focuses on preventing the precursors of future disorders such as childhood obesity and adolescent smoking.

The model suggests that health is produced across the life span, but that childhood is a critical period. For example, sexual abuse of children greatly increases their risk of major depressive disorder, anxiety, and substance abuse as adults. Abuse appears to alter the structures and functions of a child's brain and the

***continued on page 18***

## Preventing chronic diseases

*continued from page 17*

body's reactivity to stress. Preventing these and other toxic environmental exposures such as tobacco smoke, as well as curtailing risky behaviors, are important for preventing adult problems. The model emphasizes the importance of early identification and treatment of childhood high blood pressure, overweight/obesity, high cholesterol, glucose intolerance, and other health conditions that place individuals at risk for health problems in later life.

Fully 15 percent of young people are overweight by the time they reach adulthood, a rate that has increased by 50 percent since 1990 and is associated with increasing blood pressure in U.S. children. Many child health policies, like addressing obesity, must be crafted at multiple levels: family, school, and community, even though child care practitioners cannot bill for their work with communities to promote healthier home and school environments. This study was supported in part by the Agency for Healthcare Research and Quality (K02 HS00003).

See "Childhood origins of adult health: A basis for life-course health policy," by Drs. Forrest and Riley, in the September 2004 *Health Affairs* 23(5), pp. 155-164.

**Editor's note:** A second article by Dr. Forrest proposes priorities for research studies focused on child health care outcomes based on special characteristics of childhood: developmental change, dependency on adults, differences in disease epidemiology from adults, and unique demographic characteristics. For more details, see Forrest, C.B. (2004, April). "Outcomes research on children, adolescents, and their families: Directions for future inquiry." (AHRQ grant K02 HS00003). *Medical Care* 42(4Suppl), pp. III-19-III-23. ■

## *Primary Care Research*

# Patients are more trusting of doctors who spend more time with them and discuss the impact of their illness

Patients' trust in their physicians has been linked to patient satisfaction, adherence to treatment, continuity of care with the same physician, and improved health. A recent study supported by the Agency for Healthcare Research and Quality (HS10610) is the first to link trust to specific observable physician behaviors. It showed that exploring patients' experiences with their disease or illness and spending more time with patients during office visits increases patients' trust in their physicians.

Kevin Fiscella, M.D., M.P.H., of the University of Rochester School of Medicine and Dentistry, and his colleagues assessed physician behavior and length of office visits. They used audiotapes of visits of two unannounced standardized patients (SPs)—SPS are actors portraying patients with certain conditions—with 100 community-based primary care physicians participating in a large managed care organization. The researchers used three components of the Measure of Patient-Centered Communication (MPCC) scale to assess physician behavior during the taped SP visits. The Primary Care Assessment Survey (PCAS) trust subscale was also administered to 50 patients from each physician's practice and to the SPs.

Component 1 of the MPCC, doctors exploration of patients' experience of the disease and illness, was independently associated with patients' ratings of trust in their physicians. A 1 standard deviation (SD) increase in this score was associated with a 0.08 SD increase in trust. Each additional minute spent in SP visits was also independently associated with 0.01 SD increase in patient trust. Surprisingly, component 2, asking about a patient's family, job, etc., and component 3, explaining and involving the patient in discussion of the problem and management plan, did not affect trust.

See "Patient trust: Is it related to patient-centered behavior of primary care physicians?" by Kevin Fiscella, M.D., M.P.H., Sean Meldrum, M.S., Peter Franks, M.D., and others, in the November 2004 *Medical Care* 42(11), pp. 1049-1055. ■

## Centers specializing in primary care for women consistently deliver preventive services and have high patient satisfaction

A 2002 evaluation of the 15 National Centers of Excellence in Women's Health (CoE) found that women received better quality primary health care at CoEs than in other settings. Female physicians, who typically provide more preventive care and counseling than male physicians, tend to predominate the staff of CoEs. However, the better care women received at CoEs was not due to the greater number of female physicians, but rather to the focus on coordinated and comprehensive health care for women, according to a study supported in part by the Agency for Healthcare Research and Quality (HS10237).

Researchers led by Jillian T. Henderson, Ph.D., M.P.H., of the University of California, San Francisco, examined the CoE effect on quality of care while controlling for physician sex to determine the extent to which the physician's sex contributed to CoE quality of care. They compared quality of care (receipt of age-appropriate clinical preventive services and women's ratings of satisfaction with care) of women seen in three CoE clinics with that of women seen in other settings in the same communities who had a female primary care doctor.

Women seen in CoEs were nearly three times as likely to receive physical breast examinations and nearly four times as likely to receive mammograms (for those 50 years and older) as women seen in other settings. They also were much more likely to be counseled on domestic violence, sexually transmitted diseases, family or relationship concerns, and sexual functions or concerns, and they were nearly three times as likely to report high satisfaction with care as women with female primary care doctors in other settings.

See "The role of physician gender in the evaluation of the National Centers of Excellence in Women's Health: Test of an alternate hypothesis," by Dr. Henderson, Sarah Hudson Scholle, Dr.P.H., Carol S. Weisman, Ph.D., and Roger T. Anderson, Ph.D., in the July-August 2004 *Women's Health Issues* 14, pp. 130-139. ■

## Shortages of rural generalist physicians may be due to poor recruitment rather than retention problems

Scarcity of physicians continues to threaten health care delivery in many rural communities in the United States. The general feeling has been that underserved rural areas (Health Professional Shortage Areas, HPSAs) generally suffer from an inability to recruit a sufficient number of physicians and to retain those that they have. However, according to the authors of a recent study, recruitment, not retention, is the problem.

Previous studies of retention in underserved areas have been limited to assessments of physicians working under service obligations and in other unique situations. The new study focuses on physicians working without obligations. The researchers examined how long these physicians, who constitute the majority of practitioners in rural underserved areas, are retained within the full range of practice settings. The study was supported in part by the Agency for Healthcare Research and Quality (HS10654).

Donald E. Pathman, M.D., M.P.H., of the University of North Carolina, and his colleauges surveyed nationally representative samples of primary care physicians in 1991. The physicians had recently moved to rural HPSAs and non-HPSAs and did not have service obligations. The researchers surveyed the same physicians again in 1996 and 1997 to learn of any job changes.

The average retention duration for generalist physicians in rural HPSAs was identical to or just slightly shorter than it was for similar physicians in rural non-HPSAs. Coupled with findings of earlier studies that fewer physicians move into shortage areas, the researchers conclude that the principal dynamic leading to rural shortage areas is inadequate recruitment of physicians. This often occurs when local amenities, economies, and practice situations are unattractive. Physician retention, by contrast, appears unrelated to the amenities communities offer but instead is related to physicians' work and family situations, their satisfaction, and their relationships to their communities.

See "Retention of primary care physicians in rural health professional shortage areas," by Dr. Pathman, Thomas R. Konrad, Ph.D., Rebekkah Dann, M.S., and Gary Koch, Ph.D., in the October 2004 *American Journal of Public Health* 94(10), pp. 1723-1729. ■

## Primary care doctors demonstrated restraint in prescribing antibiotics following the 2001 anthrax attacks

Despite widespread alarm in response to the October 2001 anthrax attacks, only one in five patients who initiated discussion about anthrax or smallpox with doctors at a New York internal medicine practice either requested antibiotics or received them. This is particularly significant, since the practice was near media and health care facilities where cutaneous and inhalational anthrax cases occurred. These findings do not suggest widespread antibiotic abuse in the aftermath of the 2001 terrorist attacks, notes Nathaniel Hupert, M.D., M.P.H., of the Weill Medical College of Cornell University. His work is supported by the Agency for Healthcare Research and Quality (contract 290-00-0013).

Prescription of antibiotics appropriate for anthrax prophylaxis (that is, ciprofloxacin, doxycycline, or amoxicillin) was most highly associated with patient requests, followed by report of potential exposure and abnormal findings on physical examination. The study included a large number of postal workers and office workers from midtown Manhattan, both populations in which inhalational and cutaneous anthrax cases had been diagnosed by mid-October. Agreeing with requests by these patients for prophylactic antibiotics may have appeared to be a low-risk strategy with high potential benefit, especially if there was report of potential exposure.

In light of changing guidelines for screening and uncertainty about the clinical presentation or appropriate management of anthrax exposure during this time, the clinicians studied showed notable therapeutic restraint (for example, 28 percent of telephone requests for antibiotics were denied). The lower rate of prescribing for symptomatic patients suggests that physicians may have used clinical judgment in making treatment decisions in this setting. These results highlight the importance of including primary care physicians in community-wide bioterrorism response planning, notes Dr. Hupert.

See "Antibiotics for anthrax: Patient requests and physician prescribing practices during the 2001 New York City attacks," by Dr. Hupert, Wairimu Chege, M.D., M.P.H., Gonzalo M.L. Bearman, M.D., M.P.H., and Fred N. Pelzman, M.D., in the October 11, 2004 *Archives of Internal Medicine* 164, pp. 2012-2016. ■

### *Elderly/Long-Term Care*

## Elderly people who lack prescription drug coverage may not get needed medications for chronic conditions

Elderly Medicare patients who have prescription drug coverage are much more likely than those who don't to obtain needed medications for serious chronic conditions, according to a recent study supported in part by the Agency for Healthcare Research and Quality (HS10318). Also, people in this study who lacked drug coverage acquired fewer medications if they felt well than if they felt ill, whereas people with drug coverage acquired similar amounts of medications regardless of their perceived health status. This is important, because people who have significant chronic conditions need medications to prevent end-organ damage regardless of how they feel.

These findings raise questions about the recently enacted Medicare legislation, since the legislated drug benefit requires patients to make substantial out-of-pocket contributions to pay for medications, notes Barry G. Saver, M.D., M.P.H., of the University of Washington. Seniors who feel healthy, even those with serious, chronic conditions, may acquire fewer needed medications under the new legislation, according to Dr. Saver and his colleagues.

They tracked medication purchases, complete with the timing and duration of each prescription, among 3,073 elderly men and women enrolled in a Medicare+Choice program (a group-model HMO) in Washington State for at least 2 years. Study participants had been diagnosed with one or more chronic conditions (hypertension, diabetes, congestive heart failure, and/or coronary artery disease). Unlike studies that have adjusted only for income, this study also adjusted for wealth (home ownership and non-home assets), which can influence a senior's ability to purchase medications.

See "Prescription drug coverage, health, and medication acquisition among seniors with one or more chronic conditions," by J. Elizabeth Jackson, M.A., Mark P. Doescher, M.D., M.S.P.H., Dr. Saver, and Paul Fishman, Ph.D., in the November 2004 *Medical Care* 42(11), pp. 1056-1065. ■

## Nursing homes that employ physician extenders and provide training for nurses' aides have fewer hospitalizations

Provision of high quality care hinges on the ability of nursing homes to manage the increasing clinical complexity of the residents they serve and to prevent the acute worsening of chronic conditions that trigger hospitalizations. These ambulatory care-sensitive (ACS) conditions range from asthma and congestive heart failure to hypertension, diabetes, pneumonia, and urinary tract infections. Nursing homes that employ a physician extender (nurse practitioner or physician assistant), provide intravenous therapy, and operate a certified nurses' aide training program appear to have fewer ACS hospitalizations, according to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS09723).

Orna Intrator, Ph.D., of Brown University, and her colleagues used data from assessments of nursing home residents' health (Minimum Data Set, MDS), Medicare and Medicaid inpatient claims and eligibility records, On-line Survey Certification Automated Records (OSCAR), and the Area Resource File to examine the association between nursing home characteristics and the rate of potentially preventable/avoidable hospitalizations of non-HMO long-stay (160 days or more) residents of 663 nursing homes in 1997.

Nursing homes with physician extenders (23 percent) were associated with 17 percent lower hospitalization rates for ACS conditions but not with other hospitalizations. Facilities that had more physicians (i.e., more than one half full-time equivalent hours of physicians' time, not including the medical director; 26 percent of facilities) appeared to have higher odds of both ACS and non-ACS hospitalizations. Facilities providing intravenous therapy (23 percent) and those that operated a training program for nurses' aides (36 percent) were associated with fewer hospitalizations of both types.

See "Nursing home characteristics and potentially preventable hospitalizations of long-stay residents," by Dr. Intrator, Jacqueline Zinn, Ph.D., and Vincent Mor, Ph.D., in the October 2004 *Journal of the American Geriatrics Society* 52, pp. 1730-1736. ■

## Medicaid may be an important key to linking older individuals in rural areas with formal home health care

Medicaid may be an important mechanism for linking older rural residents with formal home care, especially Medicare home health care, according to a study by researchers at the Agency for Healthcare Research and Quality. They used combined data from the 1998 Medical Expenditure Panel Survey-Household Component with data from the Area Resource File to examine the impact of rural-urban residence on use of formal home care (reimbursed by Medicare or any source) among older people and to determine whether and how Medicaid coverage influenced this association.

After adjusting for other factors affecting use of home care, results pointed to an interplay between residential status and Medicaid coverage with regard to formal home care use. Compared with metropolitan residents covered by Medicaid, the likelihood of any formal home care use was significantly higher for Medicaid enrollees residing in non-metropolitan counties having no town of 10,000 or more people. Use of Medicare home health care was significantly greater for residents of the most rural counties, irrespective of their Medicaid coverage.

Within these very rural counties, Medicare home care may substitute for other forms of health and long-term care that would normally be reimbursed thorough Medicare but that are less available, such as hospitals or advanced medical services. The results suggest that for older people in rural counties, Medicaid coverage may facilitate access to acute and chronic care services (perhaps through primary care case management programs that link elders to formal home care or other services), especially Medicare home health services.

Details are in "The influence of rural location on utilization of formal home care: The role of Medicaid," by William J. McAuley, Ph.D., William D. Spector, Ph.D., Joan Van Nostrand, D.P.A., and Tom Shaffer, M.H.S., in the *Gerontologist* 44(5), pp. 655-664, 2004. Reprints (AHRQ Publication No. 05-R010) are available from AHRQ.** ■

## Medicare managed care enrollees make significant use of home health benefits, but low education limits use of medical equipment

Home health care services play a critical role in both the long-term and acute care of older Americans covered by Medicare. Low-income Medicare beneficiaries enrolled in managed care plans do not appear to have reduced access to home health visits. However, those with less than a high school education are much less likely than high school graduates to receive durable medical equipment (DME, for example, wheelchairs and walkers) for home use, according to a study supported by the Agency for Healthcare Research and Quality (HS09630).

Given the cost-effectiveness and better outcomes of DME for Medicare patients, physicians and therapists should actively target DME prescriptions to the educationally disadvantaged, suggests Vicki A. Freedman, Ph.D., of the Madlyn and Leonard Abramson Center for Jewish Life. In 2000, Dr. Freedman and her colleagues conducted a telephone survey of 4,613 Medicare managed care enrollees. The researchers collected information about participants' sociodemographic characteristics (including educational attainment, household income, and household wealth), health status, family and household structure, and lifetime experiences with health insurance and health care. They linked the survey data to administrative claims data from two Medicare managed care plans for a subsequent 12-month period to determine which socioeconomic factors were related to home health visits and the use of DME for this group.

After controlling for health status and demographic differences, Medicare managed care enrollees in the lowest one-third for liquid (nonhousing) assets had 50 percent greater odds than those in the highest one-third of having one or more home health visits. Minimal copays of Medicare managed care plans may minimize access difficulties of poor enrollees to home health care. On the other hand, those who are wealthier may choose alternatives options such as assisted living or hiring private assistance outside of the Medicare benefits.

All else being equal, those with less than a high school education had 30 percent lower odds of using DME than those who had graduated from high school. Either DME is less likely to be prescribed for these individuals, or they are less likely to purchase equipment due to perceived stigma of device use, not being aware of services, or other reasons.

See "Socioeconomic disparities in the use of home health services in a Medicare managed care population," by Vicki A. Freedman, Ph.D., Jeannette Rogowski, Ph.D., Steven L. Wickstrom, M.S., and others, in the October 2004 *Health Services Research* 39(5), pp. 1277-1297. ■

## *Health Care Costs and Financing*

## During the mid-1990s, Medicare HMOs in California reduced inpatient use beyond that attributable to favorable selection

Lower costs in Medicare HMOs have been attributed primarily to favorable selection, that is, the enrollment of healthier individuals who tend to use fewer health care services than those who are less healthy and don't enroll. Yet, through the mid-1990s, Medicare HMOs in California were able to reduce use of inpatient care beyond that attributable to the high level of favorable selection, found a study supported in part by the Agency for Healthcare Research and Quality (HS10256). The reduction in inpatient days was due entirely to reduced length of stay.

The RAND and University of Southern California researchers who conducted the study linked Medicare records with California hospital discharge data over 5 years (1991-1995) in order to examine the extent of favorable selection and the impact of joining an HMO on inpatient use. The sample included 124,111 Medicare beneficiaries who switched from fee-for-service (FFS) to HMO plans in 1992 and 1993 and random samples of 108,966 Medicare beneficiaries with continuous FFS enrollment and 18,276 with continuous HMO enrollment.

*continued on page 23*

## Medicare HMOs

*continued from page 22*

When beneficiaries joined a group/staff or independent practice association (IPA) HMO, their total hospital days per year were 18 percent and 11 percent lower, respectively, than if they had remained in an FFS plan. In 1995, Medicare group/staff and IPA-model HMO enrollees used roughly 60 percent of the inpatient days used by FFS beneficiaries (976 and 928 vs. 1,679 days per thousand, respectively). In the group/staff model HMOs, favorable selection accounted for 70 percent of this difference and managed care practices 30 percent. In IPA HMOs, favorable selection accounted for 85 percent of the difference, and managed care practices 15 percent.

See "The effect of HMOs on the inpatient utilization of Medicare beneficiaries," by Nasreen Dhanani, Ph.D., June F. O'Leary, Ph.D., Emmett Keeler, Ph.D., and others, in the October 2004 *Health Services Research* 39(5), pp. 1607-1627. ■

## *Agency News and Notes*

# AHRQ's evidence-based health care programs focus on improving practice and policy

Many programs and patients benefit from the Agency for Healthcare Research and Quality's evidence-based health care programs, according to a recent article by the Agency's Director, Carolyn M. Clancy, M.D., and her AHRQ colleagues Jean R. Slutsky, P.A., M.S.P.H., and Larry Patton. For example, the National Asthma Education and Prevention Program used AHRQ's evidence report, *Management of Chronic Asthma*, to update its asthma guidelines.

The Centers for Medicare & Medicaid Services used an AHRQ technology assessment in its decision to cover pneumatic compression therapy for certain patients with chronic venous insufficiency. As a result of AHRQ-funded research that demonstrated the benefits of using clinical pharmacists to work with a group of physicians to help control drug costs, one group was able to save over $5 million in pharmacy costs.

Dr. Clancy and her colleagues describe several essential programs, including AHRQ's 13 Evidence-based Practice Centers (EPCs). The EPCs review relevant scientific literature on clinical and behavioral topics, as well as the organization and financing of health care, to produce evidence reports and technology assessments. These reports provide the evidence needed to formulate clinical practice guidelines, practice policies, quality of care measures, and policy decisions, such as whether or not Medicare will cover a particular treatment or procedure.

Other relevant AHRQ programs include the National Guideline Clearinghouse™ (NGC) and the Centers for Education and Research on Therapeutics (CERTs). The NGC is a unique database of evidence-based clinical practice guidelines and related documents that are available at wwww.guideline.gov. The CERTs increase awareness of the uses and risks of drugs and drug combinations, biological products, and devices, as well as mechanisms to improve their safe and appropriate use.

The U.S. Preventive Services Task Force is a panel of private-sector experts in primary care and prevention sponsored by AHRQ. The Task Force reviews the evidence of effectiveness of clinical preventive services such as screening tests, counseling, and immunizations. Finally, AHRQ's recent investments in health information technology will support the effective use of HIT to accelerate the use of evidence-based information to improve the quality, safety and value of health care.

For more information, see "Evidence-based health care 2004: AHRQ moves research to translation and implementation," by Dr. Clancy, Ms. Slutsky, and Mr. Patton, in the October 2004 *Health Services Research* 39(5), pp. xv-xxxiii. Reprints (AHRQ Publication No. 05-R005) are available from AHRQ.** ■

# AHRQ publishes evidence reports on the safety and effectiveness of melatonin supplements and other topics

A new evidence review by the University of Alberta Evidence-based Practice Center (EPC), which is supported by the Agency for Healthcare Research and Quality (290-02-0023), focuses on the use of melatonin supplements for the treatment of a variety of sleep disorders. According to the EPC researchers who conducted the review, melatonin supplements appear to be safe when used over a period of days or weeks at relatively high doses and in various formulations. However, the safety of melatonin supplements used over months or even years is unclear.

Although there is some evidence for the benefits of melatonin supplements, for most sleep disorders the authors found evidence suggesting limited or no benefits. But, according to the authors, firm conclusions cannot be drawn until more research is conducted. The report was requested and funded by the National Center for Complementary and Alternative Medicine, a component of the National Institutes of Health.

The researchers reviewed the scientific evidence to date for the benefits of melatonin supplements used for disorders due to sleep schedule alterations and primary and secondary sleep disorders. Disorders due to sleep schedule alterations can stem from flying across time zones or working night shifts. Primary sleep disorders, which include insomnia, can be caused by factors such as stress or drinking too much caffeinated coffee. Secondary sleep disorders also may include insomnia, but patients in this category also have underlying mental disorders, such as psychoses or mood and anxiety disorders, neurological conditions such as dementia or Parkinson's disease, or chronic pulmonary disease.

In its natural form, melatonin is produced by the brain's pineal gland to regulate the sleep cycle. In the evening, the level of the hormone in the bloodstream rises sharply, reducing alertness and inviting sleep; in the morning, it falls back, encouraging wakefulness.

Among those problems for which melatonin supplements appear to provide little benefit are jet lag—a problem that often affects coast-to-coast travelers and those who fly through other time zones—as well as sleep problems that affect people who work night shifts.

In contrast, the authors found evidence to suggest that melatonin supplements may be effective when used in the short term to treat delayed sleep phase syndrome in people who have primary sleep disorders. In delayed sleep phase syndrome, a person's internal biological clock becomes "out of sync," making it difficult for the person to fall asleep until very late at night or to wake up early the next morning. But melatonin supplements may decrease sleep onset latency—that is, the time it takes to fall asleep after going to bed—in people with primary sleep disorders such as insomnia, although the magnitude of the effect appears to be limited.

Melatonin supplements do not appear to have an effect on sleep efficiency in people who have primary sleep disorders, and the effects of the hormone do not seem to vary by the individual's age, type of primary sleep disorder, dose taken, or length of treatment. Sleep efficiency refers to the percent of time a person is asleep after going to bed. Furthermore, melatonin supplements do not appear to affect sleep quality, wakefulness after sleep onset, total sleep time, or percent of time spent in rapid eye movement (REM) sleep. This most important phase of sleep is characterized by extensive physiological changes, such as accelerated breathing, increased brain activity, REM, and muscle relaxation.

In people with secondary sleep disorders, melatonin supplements do not appear to have an impact on sleep latency in either adults or children, regardless of dose or duration of treatment. On the other hand, the hormone does appear to modestly increase sleep efficiency, but it is not enough to be considered clinically significant. Melatonin supplements were not found to have an effect on wakefulness after sleep onset or the percent of time spent in REM sleep, but they do appear to increase total sleep time.

Estimates show that at least 40 million Americans each year suffer from chronic sleep disorders, and an additional 20 million people experience occasional sleep problems. Insomnia, the most common sleep disorder, affects 6 percent to 12 percent of adults, while 15 percent to 25 percent of children have difficulty initiating or maintaining sleep.

***continued on page 25***

## Evidence reports

*continued from page 24*

Sleep disorders cost an estimated $16 billion in medical costs alone each year. Indirect costs due to lost or substandard work productivity, accidents, resulting litigation, and other factors may increase total costs many times over. The National Highway Traffic Safety Administration, for example, estimates that 100,000 motor vehicle accidents a year are caused by driver fatigue from sleep deprivation—which is one result of some sleep disorders—and that more than 1,500 people are killed and another 71,000 injured annually as a result.

Copies of *Melatonin for Treatment of Sleep Disorders*, Evidence Report/Technology Assessment No. 108, are available from AHRQ (AHRQ Publication Nos. 05-E002-1, summary** and 05-E002-2, full report*). In addition, the summary is available online at www.ahrq.gov/clinic/epcsums/melatsum.htm. To download the full report, go to www.ahrq.gov/clinic/evrptpdfs.htm#melatonin.

In addition to the melatonin report, AHRQ has several other newly published evidence reports that were developed by AHRQ-supported EPCs. There are 13 AHRQ-supported EPCs. They systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

The goal is to inform health plans, providers, purchasers, and the health care system as a whole by providing essential information to improve health care quality. All of AHRQ's EPC reports, as well as several technical reviews, that have been published to date are available online and through the AHRQ clearinghouse. Visit the AHRQ Web site at www.ahrq.gov and click on "Clinical Information" or see the back cover of *Research Activities* for ordering information.

- ***Cardiac Resynchronization Therapy for Congestive Heart Failure.*** Evidence Report/Technology Assessment No. 106 (AHRQ Publication Nos. 05-E001-1, summary** and 05-E001-2, full report*).
- ***Sexuality and Reproductive Health Following Spinal Cord Injury.*** Evidence Report/Technology Assessment No. 109 (AHRQ Publication Nos. 05-E003-1, summary** and 05-E003-2, full report*).
- ***End-of-Life Care and Outcomes.*** Evidence Report/Technology Assessment No. 10. AHRQ Publication Nos. 05-E004-1, summary* and 05-E004-2, full report*). ■

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**Bundorf, M.K., Singer, S.J., Wagner, T.H., and Baker, L., (2004, September). "Consumers' use of the Internet for health insurance." (AHRQ grant HS11668).** ***American Journal of Managed Care*** **10(9), pp. 609-616.**

The Internet is an important source of health insurance information, according to this survey of 4,500 adults. The survey asked adults about their use of the Internet to search for information about health insurance plans and manage health benefits in three health insurance markets: Medicare, individual or nongroup, and employer-sponsored group. The Internet seemed to be a more important information source for those purchasing coverage individually in the nongroup and Medicare markets than those obtaining coverage from an employer. Although many individuals were unaware of whether their employer or health plan maintained a Web site to manage health benefits, those who used the sites gave them a favorable evaluation.

**Carey, E.C., Walter, L.C., Lindquist, K., and Covinsky, K.E. (2004, October). "Development and validation of a functional morbidity index to predict mortality in community-dwelling elders." (AHRQ grant HS00006).** ***Journal of General Internal Medicine*** **19, pp. 1027-1033.**

These researchers developed and validated a prognostic index for 2-year mortality for community-dwelling elders based solely on self-reported functional status, age, and sex. The researchers developed the index in 4,516 participants (mean age 78 years) and validated it in 2,877 different same-aged participants. They calculated risk scores with male sex, 2 points; age (76 to 80, 1 point; greater than 80, 2 points); dependence in bathing, 1 point; dependence in shopping, 2 points; difficulty walking several blocks, 2 points; and difficulty pulling or pushing heavy objects, 1 point. In the development and validation groups respectively, 2-year mortality was 3 percent and 5 percent in the lowest risk group (0 to 2 points); 11 percent and 12 percent in the middle risk group (3 to 6 points); and 34 percent and 36 percent in the highest risk group (more than 7 points).

**Godder, K., Eapen, M., Laver, J.H., and others. (2004, September). "Autologous hematopoietic stem-cell transplantation for children with acute myeloid leukemia in first or second complete remission: A prognostic factor analysis." (Cosponsored by AHRQ, NCI, NIAID, and NHLBI).** ***Journal of Clinical Oncology*** **22(18), pp. 3798-3804.**

Among children with acute myeloid leukemia (AML), leukemia relapse is common, whether treatment is with intensive chemotherapy alone or in combination with allogeneic (from a genetically matched relative or unrelated person) or autologous (from the patient) hematopoietic stem-cell transplantation (HSCT). This study found that a substantial proportion of children who underwent transplantation in second complete remission (CR) achieved long-term leukemia-free survival (LFS), especially those who were experiencing relapse after a long first CR. Patients in second CR after a short first CR were more likely to experience relapse and had higher treatment failure and mortality. Results in children who experience treatment failure with conventional chemotherapy support the use of autologous transplantation as salvage therapy if such patients achieve a subsequent CR, conclude the researchers. They correlated prognostic factors with outcomes among 219 children who received autologous HSCT for AML in first CR and 73 children in second CR.

**Kane, R.L., Johnson, P.E., Town, R.J., and Butler, M. (2004). "A structured review of the effect of economic incentives on consumers' preventive behavior." (AHRQ contract 290-02-0009).** ***American Journal of Preventive Medicine*** **27(4), pp. 327-352.**

These researchers reviewed 47 trials to assess the effects of economic incentives on consumers' preventive health behaviors. They classified a study as complex preventive health if a sustained behavior change was required of the consumer; if it could be accomplished directly (for example, immunizations), it was considered simple. Economic incentives worked 73 percent of the time, but rates varied by the goal of the incentive. Incentives that increased the ability to purchase the preventive service worked better than more diffuse incentives, but the type mattered less than the nature of the incentive. Economic incentives were effective in the short run for simple preventive care and distinct, well-defined behavioral goals. The authors conclude that small incentives can produce finite changes, but it is not clear what size of incentive is needed to yield a major sustained effect.

*continued on page 27*

## Research briefs

*continued from page 26*

**Kaplan, R.M., Ries, A.L., Reilly, J., and others. (2004, September). "Measurement of health-related quality of life in the National Emphysema Treatment Trial." (Cosponsored by AHRQ, NHLBI, and CMS). *Chest* 126(3), pp. 781-789.**

This study evaluated two generic and two disease-specific measures of health-related quality of life (QOL) using data from the National Emphysema Treatment Trial (NETT). Patients completed evaluations before and after completion of the prerandomization phase of the NETT pulmonary rehabilitation program. The researchers evaluated QOL measures against physiologic criteria that included measures of emphysema severity (for example, FEV1, volume of gas expired after one second) and functional criteria, (the 6-minute walk distance [6MWD], maximum work, and hospitalizations in the prior 3 months). Compared with normative samples, scores on general QOL measures were low, suggesting that the NETT participants were quite ill. All QOL measures were modestly but significantly correlated with FEV1, maximum work, and 6MWD. There were significant improvements for all QOL measures following the rehabilitation program, and improvements in QOL were correlated with improvements in 6MWD.

**Plunkett, B.A. and Grobman, W.A. (2004, September). "Elective cesarean delivery to prevent perinatal transmission of hepatitis C virus: A cost-effectiveness analysis." (AHRQ grant T32 HS00078). *American Journal of Obstetrics and Gynecology* 191, pp. 998-1003.**

The goal of this study was to determine the cost-effectiveness of elective cesarean delivery to avert perinatal hepatitis C virus (HCV) transmission. The researchers compared two approaches in terms of the lifetime cost and quality-adjusted life years (QALYs) for neonates: one, offering elective cesarean delivery to pregnant women infected with HCV, and two, performing a cesarean delivery only for obstetric indications (emergent cesarean delivery). The researchers calculated that when elective cesarean delivery prevented all perinatal HCV transmission, 18 elective cesareans were necessary to avert one neonatal infection with a cost-effectiveness ratio of $34,812 per QALY. This is similar or less than other accepted therapies considered to be cost effective. If rates of perinatal transmission with emergent cesarean or vaginal delivery were relative low (6 percent or less), elective cesarean was not cost effective even if it prevented all perinatal HCV transmission. If HCV transmission rates were high (12 percent) with emergent cesarean and vaginal delivery, elective cesarean delivery became cost effective when transmission rates were reduced by only 50 percent. The researchers conclude that cesarean delivery is cost effective only if it substantially reduces the risk of perinatal HCV transmission. ■

## *Research Activities* - 2004 Author Index

The following is an alphabetical listing of the first authors of journal articles, book chapters, and reports summarized in *Research Activities* during 2004. Month and page number(s) are given.



***continued on page 28***

# 2004 Author Index

*continued from page 27*



***continued on page 29***

# 2004 Author Index

*continued from page 28*



***continued on page 30***

# 2004 Author Index

*continued from page 29*



***continued on page 31***

## 2004 Author Index

*continued from page 30*



## *Research Activities* - 2004 Subject Index

The following is an alphabetical listing of research topics featured in *Research Activities* in 2004. Month of publication and page number(s) are given.



***continued on page 32***

# 2004 Subject Index

*continued from page 31*



***continued on page 33***

# 2004 Subject Index

*continued from page 32*



***continued on page 34***

# 2004 Subject Index

*continued from page 33*



***continued on page 35***

# 2004 Subject Index

*continued from page 34*

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