



# Research Activities



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## Certain medications that can increase the risk of cardiac arrest and arrhythmias are often prescribed together

**C**ertain cardiac and noncardiac drugs induce QT prolongation (prolonged recovery after contraction of the heart muscle) and increase the risk of torsade de pointes, a type of ventricular tachycardia (abnormally fast heartbeat) that may progress to ventricular fibrillation (rapid, irregular heartbeat that can quickly lead to death).

Unfortunately, drugs with the potential for QT prolongation, particularly some antibiotics and a wide variety of other drugs, or drugs that inhibit their removal from the body are prescribed frequently in outpatient settings and often together. Combined prescribing of these drugs may increase the risk for cardiac arrest or arrhythmias, suggests a study that was supported in part by the Agency for Healthcare Research and Quality (HS10385).

Researchers at the Centers for Education and Research on Therapeutics (CERTs) at the

**Attention researchers:** See page 24 to learn about a new AHRQ funding opportunity.

University of Arizona Health Sciences Center and Duke University Medical Center used the administrative claims database of a national pharmaceutical benefit manager to measure the frequency of overlapping prescriptions for adults for 50 drugs with QT-prolonging potential and 26 drugs that inhibit their metabolic clearance in the outpatient setting in 1999. Nearly 1.1 million individuals filled 4.4 million prescriptions for QT-prolonging drugs. Of these, 9.4 percent filled overlapping prescriptions for two or more QT-prolonging drugs or drugs that inhibit their clearance.

Twenty-two percent of those who filled overlapping prescriptions were elderly, and 74 percent were women; both of these groups are more susceptible than younger people to drug-induced arrhythmias.

Antidepressants were involved in nearly 50 percent of cases. For the five most commonly prescribed QT-prolonging drugs in this study, serious cardiac

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## Medication interactions

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problems (atrial fibrillation, cardiac arrest, and ventricular arrhythmia) were rare (less than 1 in 1,000 patients). The additive effects of taking two QT-

prolonging drugs might result in 2 in 1,000 patients suffering a serious cardiac problem. Synergistic effects of both drugs would affect considerably more patients.

See "Prescription of QT-prolonging drugs in a cohort of

about 5 million outpatients," by Lesley H. Curtis, Ph.D., Truls Ostbye, M.D., Ph.D., Veronica Sendersky, Pharm.D., and others, in the February 1, 2003 *American Journal of Medicine* 114, pp. 135-141. ■

## Pharmaceutical Research

### Doctors are prescribing fewer and safer antiarrhythmic drugs than in the 1980s

Doctors now prescribe antiarrhythmic drugs less often than they did in the 1980s. They are also prescribing fewer class I agents (for example, quinidine, procainamide and mexiletine) in favor of class III agents (for example, amiodarone and sotalol), which are less risky for people who have had heart attacks. However, the change was slow, according to a study by the Duke Center for Education and Research on Therapeutics, which is supported by the Agency for Healthcare Research and Quality (HS10548). Sana M. Al-Khatib, M.D., M.H.S., and fellow researchers used pharmaceutical marketing research data to review outpatient antiarrhythmic drug prescriptions in the United States from 1995 through the third quarter of

2000 to characterize drug prescribing patterns based on diagnosis and physician specialty.

Their review revealed a noticeable decline in the number of class I antiarrhythmic prescriptions (5.5 million in 1995 vs. 2.4 million in 2000). However, until 2000, class I antiarrhythmic drugs remained the most commonly prescribed antiarrhythmic agents (3.6 million class I prescriptions vs. new 3.2 million class III prescriptions in 1999). There was a doubling in the number of class III antiarrhythmic prescriptions in 2000 (2.7 million vs. 1.2 million in 1995), largely due to the increase in amiodarone prescriptions.

Doctors most commonly prescribe antiarrhythmic drugs for atrial fibrillation, a type of irregular and often rapid heartbeat. However, this study revealed that they may also be prescribing these drugs for ischemic and hypertensive heart diseases, a practice not based on evidence derived from clinical trials. Internists and family practitioners prescribed more class I antiarrhythmic drugs than did cardiologists, perhaps because cardiologists are more aware of evidence from clinical trials showing problems with class I antiarrhythmic drugs. On the other hand, general physicians are more likely to see patients without cardiac disease, whose survival has not been shown to be adversely affected by class I antiarrhythmic drugs.

See "Outpatient prescribing of antiarrhythmic drugs from 1995 to 2000," by Dr. Al-Khatib, Nancy M. Allen LaPointe, Pharm.D., Leslie H. Curtis, Ph.D., and others, in the January 1, 2003 *American Journal of Cardiology* 91, pp. 91-94. ■

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## Clinicians can maintain the same warfarin dose in asymptomatic patients with an INR of 3.3 or less without risk of hemorrhage

The anticoagulant warfarin is often used to prevent blood clots in people with a history of thromboembolism. However, the dosage must be monitored closely, often through use of an anticoagulation service (ACS), so that the medication keeps the blood thin enough to prevent clots but not so thin as to cause hemorrhaging.

Because the risk of hemorrhage rises exponentially with rising values of the international normalized ratio (INR), experts agree that the dose of warfarin sodium should be decreased when the INR exceeds 4 but disagree on how to treat an isolated INR of 3-4. According to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS10133), clinicians can maintain the same warfarin dose in asymptomatic patients with an INR of 3.3 or less (target INR is 2.5) and reduce the dose by 1-20 percent for slightly higher INRs.

Researchers from the Washington University School of Medicine in St. Louis, MO, identified 231 HMO outpatients who were receiving warfarin (half of them for atrial fibrillation, others for venous thromboembolism or other

problems) with an INR between 3.2 and 3.4 and no signs of bleeding. Their ACS monitored 103 of the patients; primary care physicians (PCPs) monitored the remaining 128 patients. Except for one patient who developed a nosebleed, none of the 103 ACS patients suffered a major bleed in the 30 days after their mildly elevated INR.

Compared with PCPs, the ACS clinicians were less likely to decrease the dose (22 vs. 47 percent), and when there was a decrease, the ACS clinicians recommended smaller dose reductions. After their elevated INRs, ACS patients had a therapeutic INR sooner than PCP patients (32 vs. 49 days), and ACS patients also had a followup INR test sooner. The median followup INR was 2.7 in 148 patients who maintained their warfarin dose, 2.5 in 77 patients who decreased their dose by 1 to 20 percent, but only 1.7 in 6 patients who decreased their dose by 21 to 43 percent.

For more details, see "Warfarin dose reduction vs. watchful waiting for mild elevations in the international normalized ratio," by Gerald A. Banet, R.N., M.P.H., Amy D. Waterman, Ph.D., Paul E. Milligan, R.Ph., Susan K. Gatchel,

C.C.R.C., and Brian F. Gage, M.D., M.Sc., in the February 2003 *CHEST* 123(2), pp. 499-503. ■

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## Pharmacist care and telephone peak flow monitoring can improve peak flow rates among patients with asthma and COPD

People who have asthma or chronic obstructive pulmonary disease (COPD) can prevent breathing crises by appropriate drug therapy. However, patients often find it difficult to follow prescribed drug regimens. A pharmacist care program in which the pharmacist

monitors symptoms, provides medication counseling, helps resolve drug-related problems, and facilitates communication with the patient's doctors, may be able to enhance patients' adherence to therapy and outcomes.

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## Pharmacist care

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A new study found that compared with usual care, pharmaceutical care significantly increased patients' peak expiratory flow rates (PEFRs), an indicator of breathing capacity, but such care provided little benefit over monthly calls for peak flow monitoring alone. However, implementation of the pharmacy care program was poor, perhaps due to pharmacists' limited time or lack of incentives. Pharmacists viewed patients' filled prescriptions by computer only half the time and documented their actions only 50 percent of the time they viewed those data, notes Morris Weinberger, Ph.D., of Indiana University.

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS09083), Dr. Weinberger and his colleagues provided participating pharmacists with weekly faxed reports of recent clinical data on 447 patients (PEFRs, emergency department visits, hospitalizations, and medication compliance), training, customized patient educational materials, and other resources. The PEFR monitoring control group (363 patients) received a peak flow meter, instructions about its use, and monthly calls to elicit PEFRs; but PEFR data were not provided to the pharmacists. The 303 patients in the usual care group received neither peak flow meters nor

instructions in their use, and were not asked about PEFR rates. At 12 months, pharmaceutical care patients had significantly higher peak flow rates than the usual care group but not higher than PEFR monitoring controls. There were no significant between-group differences in medication compliance or health-related quality of life.

See "Effectiveness of pharmacist care for patients with reactive airways disease," by Dr. Weinberger, Michael D. Murray, Pharm.D., David G. Marrero, Ph.D., and others, in the October 2, 2002 *Journal of the American Medical Association* 288(13), pp. 1594-1602. ■

## Collaborative program can reduce potential medication problems among elderly home health care patients

Nearly one-third of older home health care patients are taking medications that put their health at risk. Such patients usually are frail and have multiple care providers, making them particularly vulnerable to problems with medication use. They may benefit from a team approach to their care. For example, collaboration between an agency's visiting home health nurse and the patient's pharmacist can identify duplicate medications or dangerous combinations of medications. Once such problems are identified, the home health nurse can contact the patient's doctor for reassessment and possible medication change.

This approach can improve medication use among these vulnerable patients without increasing home health visits or duration of home health care, according

to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS10384). However, the improvement is modest and varies substantially according to the particular medication problem, cautions Wayne A. Ray, Ph.D., of the Center for Education and Research on Therapeutics (CERT) at Vanderbilt University.

Dr. Ray and his colleagues used routine screening to identify 1,463 patients enrolled in one of two large U.S. home health agencies who had one of four common medication problems. These included: unnecessary therapeutic duplication (16 percent of study patients), cardiovascular medication problems (14 percent), use of psychotropic drugs in patients

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## Medication problems

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with possible adverse psychomotor or adrenergic effects (40 percent), and use of nonsteroidal antiinflammatory drugs (NSAIDs) in patients at high risk of peptic ulcer complications (35 percent).

The researchers randomized 317 patients—160 to the medication improvement program and 157 to the control group. Overall, there was improvement in medication use for 50 percent of program patients and 38 percent of control patients. At followup, more program than control patients had duplicate medications dropped (71 vs. 24 percent) and were

taking more appropriate cardiovascular medications (55 vs. 18 percent). However, there were no significant improvements in patients with psychotropic medication problems (reducing the dose or switching to a preferred agent) or with NSAID medication problems.

See “Improving medication use in newly admitted home healthcare patients: A randomized controlled trial,” by Sarah Meredith, M.B.B.S., M.Sc., Penny Feldman, Ph.D., Dennee Frey, Pharm.D., and others, in the September 2002 *Journal of the American Geriatrics Society* 50, pp. 1484-1491. ■

## AHRQ-funded Centers for Education and Research on Therapeutics examine the safety and effectiveness of several popular medications

The Centers for Education and Research on Therapeutics (CERTs) demonstration program consists of seven centers and a coordinating center. The CERTs conduct research and provide education that advances the optimal use of therapeutics (that is, drugs, medical devices, and biological products). The goal is to increase awareness of both the use and risks of new therapeutics and ways to improve their safe and effective use; provide clinical information to patients, providers, insurers, health care administrators, and government agencies; and improve quality while reducing costs by focusing on the appropriate use of therapeutics.

The CERTs program is a national initiative that is administered as a cooperative agreement by the Agency for Healthcare Research and Quality in consultation with the Food and Drug Administration. The seven

CERTs centers are: Duke University, the HMO Research Network, the University of Alabama, Birmingham, the University of Arizona, the University of North Carolina, the University of Pennsylvania, and Vanderbilt University.

Researchers at the Vanderbilt CERT (HS10384), which is led by Wayne A. Ray, Ph.D., focus on prescription drug use among Medicaid enrollees. They recently published three articles, which are summarized here.

**Hartert, T.V., Speroff, T., Togias, A., and others. (2002, November). “Risk factors for recurrent asthma hospital visits and death among a population of indigent older adults with asthma.” *Annals of Allergy, Asthma, & Immunology* 89, pp. 467-473.**

Asthma is a common cause of hospitalization among the elderly, particularly women and indigent

patients. Regular use of inhaled corticosteroids (CCS) protects individuals from acute worsening of asthma that can lead to hospitalization and death. According to this study, inhaled CCS are underprescribed for elderly asthma patients who are poor. Only 10 percent of indigent elderly asthma patients in this study were current users of inhaled CCS, whereas 31 percent had required rescue with systemic CCS in the year before their initial hospitalization. Furthermore, the hospital visit for asthma did not prompt more appropriate prescribing of asthma medication.

The researchers studied 510 Medicaid-insured elderly patients who survived a single hospital visit for asthma in 1992. They examined recurrent hospital visits for asthma and death from all causes during the year after the initial hospital

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**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.

## CERTS research

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visit. Overall, 10 percent of the study patients were on inhaled CCS at admission and only 11 percent at discharge. Also, 23 percent of the patients had recurrent asthma hospital visits, and 12 percent died during the 1-year followup.

Asthma severity was the strongest independent risk factor for both a recurrent hospital visit and death. Moderate to severe asthma nearly doubled the relative risk (RR) of recurrent hospital visit (RR 1.92) and tripled the risk of death (RR 2.99). Near-fatal asthma more than doubled the risk of recurrent hospital visit (RR 2.28) and quadrupled the risk of death (RR 4.44). Among those with near-fatal asthma, only 39 percent had filled a prescription for oral CCS at hospital discharge, and only 20 percent had inhaled CCS prescribed and filled.

**Ray, W.A., Stein, M., Daugherty, J.R., and others. (2002, October). "COX-2 selective non-steroidal anti-inflammatory drugs and risk of serious coronary heart disease." *Lancet* 360, pp. 1071-1073.**

People typically take nonsteroidal antiinflammatory drugs (NSAIDs) to alleviate the pain and inflammation associated with conditions such as rheumatoid arthritis. Premarketing and postmarketing trials have raised doubts about the cardiovascular safety of the NSAID rofecoxib, especially at doses greater than 25 mg. The study from the Vanderbilt CERT shows there is reason for concern. The researchers found that adults who use high-dose (more than 25 mg) rofecoxib are nearly twice as likely to be hospitalized with a heart attack or die from

serious coronary heart disease (CHD) than users of other NSAIDs, such as ibuprofen, naproxen, or celecoxib. However, those who use rofecoxib at a dose of 25 mg or less have no greater risk of serious CHD than other NSAID users.

Since there is no evidence of greater long-term (more than 5 days) efficacy for the higher doses, long-term use of high-dose rofecoxib should be avoided, suggest the researchers. They retrospectively examined the occurrence of serious CHD in 202,916 non-users of NSAIDs, 24,132 users of rofecoxib, and 151,728 users of other NSAIDs among individuals enrolled in the Tennessee Medicaid program (TennCare). These adults (aged 50 to 84 years) lived in the community and did not have life-threatening non-cardiovascular illness.

Users of high-dose rofecoxib were 1.70 times as likely as non-users to have CHD; among new users this rate increased to 1.93. Thus, risk of serious CHD increased by 70 percent relative to non-users of NSAIDs, and new users had a nearly doubled risk. By contrast, there was no evidence of elevated risk of CHD among users of rofecoxib at doses of 25 mg or less or among users of other NSAIDs.

**Ray, W.A., Daugherty, J.R., and Griffin, M.R. (2002). "Lipid-lowering agents and the risk of hip fracture in a Medicaid population." *Injury Prevention* 8, pp. 276-279.**

According to several recent studies, patients taking the widely used and well-tolerated lipid-lowering statin drugs have half the rate of osteoporotic fractures of people taking no lipid-lowering drugs. These reports led many to

wonder about the bone-sparing potential of statins. However, these researchers caution that it is premature to use statins to prevent osteoporotic fractures. Other factors may be the source of fewer fractures among users of statins and other lipid-lowering medications. For example, these patients tend to have higher body mass index, since overweight people are more likely to have high lipid levels, and higher body mass usually correlates with stronger bones.

The researchers compared hip fracture rates among Tennessee Medicaid patients who were new users of statins with new users of other lipid-lowering drugs, primarily gemfibrozil. They used Medicaid data from 1989 through 1998 to identify all new users of lipid-lowering drugs and randomly selected non-user controls. None of those selected (50 years of age and older) had been diagnosed with osteoporosis or had a life-threatening illness.

Overall, there were 12,505 new users of statins, 4,798 new users of other lipid-lowering drugs, and 17,380 non-user controls. Among the study group, there were 186 hip fractures (2.8 per 1,000). Statin users had a 38 percent lower rate of hip fracture, and users of other lipid-lowering medications had a 56 percent lower rate of hip fracture, compared with non-users of lipid-lowering medications. The difference between statins and other lipid-lowering medications was not significant. Larger observational studies or meta-analysis may be needed to quantify differences in fracture rates between specific types of lipid-lowering agents. ■

## Two-thirds of children with persistent asthma symptoms seen in primary care have uncontrolled asthma

Daily use of inhaled antiinflammatory medications such as corticosteroids (controllers) reduces airway obstruction and symptoms, such as labored breathing and coughing, among people who have persistent asthma. Inhaled beta agonists, so-called relievers, are adrenalin-like drugs that ideally are supposed to be used to quickly open up the airways to "rescue" a person during an asthma episode that occurs when symptoms break through despite use of controller medications.

Unfortunately, inappropriate reliance on relievers and nonadherence to controllers are common among children with persistent asthma who are seen by primary care doctors, according to a recent study from the Pediatric Asthma Care Patient Outcomes Research Team (PORT), which is supported in part by the Agency for Healthcare Research and Quality (HS08368). The PORT is led by Kevin B. Weiss, M.D., M.P.H., of Hines VA Hospital and Northwestern University's Feinberg School of Medicine.

The researchers used a face-to-face questionnaire to interview the parents of 638 children (ages 3 to 15) with asthma, who were cared for at one of 42 primary managed care practices in three U.S. regions. Symptoms included cough, wheeze, or limitation in

activity. Overall, 64 percent of children with persistent asthma were inadequately controlled (excess symptoms or reliever use), including both children who used controllers less than recommended or who received no controller medication at all.

One-third of children had excessive symptoms, that is, 5 to 14 symptoms days in the preceding 2 weeks. One-third of children using relievers had high levels of use (inhaler use 3-4 days per week, five or more puffs per day, or inhaler or nebulizer use 5 or more days per week). One-third of children using controller medications used them only 4 or fewer days per week (underdosing).

Older age, minority race, and household poverty were significantly associated with inadequate control. Having seen an asthma specialist in the previous 6 months was significantly associated with a lower likelihood of inadequate asthma control.

See "Asthma medication use and disease burden in children in a primary care population," by Paula Lozano, M.D., M.P.H., Jonathan A. Finkelstein, M.D., M.P.H., Julia Hecht, Ph.D., and others, in the January 2003 *Archives of Pediatric and Adolescent Medicine* 157, pp. 81-88. ■

## Respiratory viruses may be the culprit in sparking seasonal peaks in children's asthma problems

A new study confirms the pattern of fall/winter worsening of asthma symptoms and related medical visits and summer improvement. Surprisingly, seasonal variation in environmental allergens is not the source of this difference. A more likely cause could be increased viral respiratory infections during fall and winter months, according to Peter J. Gergen, M.D., M.P.H., formerly of the Agency for Healthcare Research and Quality and now with the National Institute on Allergy and Infectious Diseases.

Dr. Gergen and his colleagues tracked children ages 4 to 12 who were participating in the National Cooperative Inner-City Asthma Study (NCICAS) for about 4 years after allergen skin testing and determination of exposure to environmental tobacco smoke. They also obtained air pollution data from EPA monitoring sites in the NCICAS cities.

Analysis of the data on 1,641 children revealed that all three measures of asthma-related illness (wheeze, unscheduled medical visits, and hospitalizations) started

to peak in September and reached their highest levels in winter. These same measures reached their lowest levels in the summer months of June through August. Seasonal patterns were similar among children with no allergen skin test reactivity; those reactive only to indoor allergens such as dust mites, cockroaches, and animal dander; and those who were reactive to outdoor allergens such as trees or ragweed.

The mean days of wheeze averaged over the full time period

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## Respiratory viruses

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were similar for the three groups: no skin test reactivity, 6.9 days/month; indoor reactors, 7.3 days/month; and outdoor reactors, 7.1 days/month. Environmental tobacco smoke was not related to observed seasonal patterns. Among four air pollutants evaluated (sulphur dioxide, nitrogen dioxide, particulates, and ozone), only sulfur dioxide coincided with

worsening of asthma symptoms, but its impact on those symptoms was questionable. The increase of indoor allergen exposure in fall and winter may not be enough to influence the activity of the disease, suggest the researchers. The yearly cycle of asthma attacks may be driven primarily by viral infections. Future vaccines against these infections may reduce these seasonal fluctuations.

See "Understanding the seasonal pattern of childhood asthma: Results from the National Cooperative Inner-City Asthma Study (NCICAS)," by Dr. Gergen, Herman Mitchell, Ph.D., and Henry Lynn, Ph.D., in the November 2002 *Journal of Pediatrics* 141, pp. 631-636. Reprints (AHRQ Publication No. 03-R017) are available from AHRQ.\*\* ■

## Hospitalization of children for respiratory illness presents an opportunity to counsel their parents about smoking

Children who are exposed to environmental tobacco smoke (ETS), usually through parental smoking, are at greater risk than other children for asthma and respiratory infections. When the children of parents who smoke are hospitalized for respiratory illness, it is an opportunity to counsel the parents about quitting smoking.

In a recent study supported by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00063), Jonathan P. Winickoff, M.D., M.P.H., of Massachusetts General Hospital, and his colleagues offered the Stop Tobacco Outreach Program to 71 parents who smoked and whose children were hospitalized in the facility for asthma, pneumonia, or other respiratory illness. The program includes an initial 20 minute face-to-face motivational interview and two followup telephone calls for counseling 5 and 10 days later, written materials, nicotine replacement therapy (NRT, gum or patch), and a note faxed to the parent's primary care provider to schedule an appointment to discuss their smoking.

Overall, 80 percent of parents completed all counseling sessions, and 56 percent accepted free NRT at the time of study enrollment. At the 2-month

followup, 49 percent of parents had a stop-smoking attempt that lasted at least 24 hours, 21 percent had not smoked a cigarette in the last 7 days (more than the quit rate of U.S. smokers of 2 to 3 percent per year), 27 percent had used NRT, and 38 percent had visited their primary care doctor to discuss quitting smoking. Also, far more parents said they prohibited smoking in the house after vs. before the program (71 versus 29 percent).

Parents rated the overall usefulness of the smoking intervention program at 4.3 on a 5 point scale, with 5 being greatly useful. One-third of the parents who were offered the program said they were ready to consider quitting smoking, a higher rate than found in the general smoking population (20 percent). Their greater readiness was probably due to concern that their smoking was having a negative effect on their child's health.

For more details, see "A smoking cessation intervention for parents of children who are hospitalized for respiratory illness: The Stop Tobacco Outreach Program," by Dr. Winickoff, Valerie J. Hillis, Judith S. Palfrey, M.D., and others, in the January 2003 *Pediatrics* 111(1), pp. 140-145. ■

## Improvements are needed in meeting the spiritual care needs of hospitalized children and their families

Hospital chaplains and other pastoral care providers estimate that 34 percent of the children they visit are chronically ill, and 21 percent are terminally ill. Half or more of these hospitalized

children are fearful or anxious, must cope with pain or other symptoms, and are concerned about their relationship with their parents or between their parents. In turn, 60 to 80 percent of their parents are

fearful or anxious, find it difficult to cope with their child's pain or other symptoms, wonder about the meaning of their child's suffering,

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## Spiritual care

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and feel guilty. Unfortunately, health care providers are not trained to detect the spiritual needs of these families, there are few available hospital pastoral care providers, and they are often called in too late to be of much help to the children or their parents, according to a survey supported in part by the Agency for Healthcare Research and Quality (K08 HS00002).

Chris Feudtner, M.D., Ph.D., M.P.H., of the University of Pennsylvania, and colleagues mailed a survey to pastoral care

providers at major children's hospitals throughout the United States. The survey asked about their perceptions of the spiritual care needs of hospitalized children and their parents, barriers to better care, and overall assessment of the current quality of spiritual care in children's hospitals. Pastoral care providers from 115 hospitals in 42 States responded.

The majority of those surveyed strongly agreed that the following methods of providing spiritual care were very effective: empathetic listening, praying with children and families, touch or other forms of silent communication, and

performing religious rituals or rites. Most pastoral care providers estimated that their hospitals were providing 60 percent of what they deemed to be ideal spiritual care for these families, which have diverse and substantial needs.

See "Spiritual care needs of hospitalized children and their families: A national survey of pastoral care providers' perceptions," by Dr. Feudtner, Jeff Haney, B.S., and Martha A. Dimmers, M.Div., M.S.W., in the January 2003 *Pediatrics* 111(1), online at <http://www.pediatrics.org/cgi/content/full/111/1/e67>. ■

## Diabetes Research

### Researchers focus on diabetes prevalence and control among urban black adults and diabetes understanding by the undereducated

Type 2 diabetes, which used to affect only adults, has increased alarmingly among adolescents and is reaching epidemic proportions in the United States. In 1994, 12 percent of adults aged 40 to 74 years were affected by diabetes. Type 2 diabetes affects more minorities than whites, with incidence nearly tripling among blacks in the past 30 years. High levels of blood sugar (hyperglycemia) and longer duration of the disease increase the risk of serious complications ranging from blindness to kidney failure.

A study supported in part by the Agency for Healthcare Research and Quality (HS09722) and led by Lawrence S. Phillips, M.D., of Emory University, found a high prevalence of obesity and poor blood sugar (glycemic) control among young urban blacks with

diabetes. A second study by the same group is testing whether endocrinologist-supported primary care strategies can improve glycemic control among black adults who have diabetes. A third AHRQ-supported study (HS10281 and HS10856) led by A. Eugene Washington, M.D., of the University of California, San Francisco, and John Piette, Ph.D., of the University of Michigan Medical School, revealed that primary care doctors rarely check whether their diabetic patients understand instructions that often are critical to managing their disease. The three studies are described here.

**El-Kebbi, I.M., Cook, C.B., Ziemer, D.C., and others. (2003, January). "Association of younger age with poor glycemic control and obesity in urban**

**African Americans with type 2 diabetes." *Archives of Internal Medicine* 163, pp. 69-75.**

Younger black adults with type 2 diabetes are more obese and have worse glycemic control than their older counterparts, despite a higher prevalence of insulin use, according to this study. Since younger study patients were more obese than older patients, they would be expected to be more insulin-resistant and possibly require more aggressive therapy to achieve glycemic control, explain the investigators.

They retrospectively studied 2,539 predominantly black patients with type 2 diabetes, who were seen at a hospital-based outpatient diabetes clinic between 1991 and 1998. They examined the contribution of age to glucose control (measured by hemoglobin

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## Diabetes prevalence

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A<sub>1c</sub> or HbA<sub>1c</sub>) at the initial visit and after an average of 8 months of care by a multidisciplinary team that emphasized lifestyle modifications and self-management skills. The researchers also analyzed the HbA<sub>1c</sub> data of 597 people with diabetes treated at a neighborhood primary care clinic in 1999.

The researchers divided patients into four age groups in each clinic: less than 30 years, 30 to 49 years, 50 to 69 years, and more than 69 years old. Despite the provision of intensive dietary education, there was no clinically significant change in body mass index (BMI, calculated as weight in kilograms divided by the square of height in meters) in any age group. Younger age, longer duration of diabetes, higher BMI, less frequent clinic visits, and treatment with oral medication or insulin were associated with higher HbA<sub>1c</sub> level (worse glucose control) at followup at both clinics.

Of the four hospital-based clinic groups ranked in order of increasing age, 77 percent (under 30), 63 percent (30 to 49), 53 percent (50 to 69), and 40 percent (70 or older) were obese, with a BMI of 30 or more and little change over time. At baseline, 19 to 23 percent of patients had an HbA<sub>1c</sub> level less than 7 percent (considered controlled and the target HbA<sub>1c</sub>), increasing to 33 to 41 percent at 8 months, with no significant difference between age groups. However, the prevalence of having an HbA<sub>1c</sub> level greater than 8 percent (which should prompt intensification of therapy) at baseline increased from 54 to 75 percent with decreasing age. The researchers recommend more effective measures for weight

reduction, use of aggressive medication therapy, and more frequent clinic visits to improve diabetes control.

**Phillips, L.S., Hertzberg, V.S., Cook, C.B., and others. (2002). "The Improving Primary Care of African Americans with Diabetes (IPCAAD) project: Rationale and design." *Controlled Clinical Trials* 23, pp. 554-569.**

Although blacks with diabetes typically have poorer glycemic control and more serious diabetes complications than others, they are not often treated in specialty clinics, where patients are instructed in home blood glucose monitoring and diet (avoidance of refined sugars and saturated fats) and are advised to exercise. Instead, most blacks with diabetes are managed in a primary care setting where measurement of HbA<sub>1c</sub>, dilated eye exams, and foot exams are infrequent, and hypertension is treated less aggressively than recommended.

These researchers have developed a program of endocrinologist-supported strategies focused on primary care providers to improve diabetes management in primary care sites. In their Improving Primary Care of African Americans with Diabetes (IPCAAD) project, they randomized over 2,000 black patients with type 2 diabetes being seen at hospital-based medical clinics to receive one of four types of care for their diabetes.

These included: usual care (usual diabetes education); endocrinologist-supported interventions of computerized reminders that recommend individualized changes in therapy; endocrinologist discussions providing performance feedback on patient management (for example, whether the primary care doctors are achieving target glucose levels

[below 7 percent] in their patients, intensifying therapy when glucose levels are above that, and how their achievements compare with clinic peers); and computerized reminders and endocrinologist discussion. The IPCAAD project is the first comprehensive intervention aimed at sustained improvement in diabetes management of urban blacks in the primary care setting.

The researchers have established that this approach works in the specialty diabetes clinic and are hoping it can be successfully transferred to primary care clinics. In the project, ongoing through 2003, they will assess patient outcomes related to both microvascular disease (HbA<sub>1c</sub>, which reflects average glucose levels over a 2-month period) and macrovascular disease (blood pressure and lipids), as well as provider performance. The IPCAAD project is a joint effort of endocrinologists, primary care doctors, and social scientists.

**Schillinger, D., Piette, J., Grumbach, K., and others. (2003). "Closing the loop: Physician communication with diabetic patients who have low health literacy." *Archives of Internal Medicine* 163, pp. 83-90.**

This study found that ethnically diverse diabetes patients, whose doctors asked them during their visit if they understood new instructions about medication or other disease management issues, were nearly nine times more likely to have reasonable glucose control (HbA<sub>1c</sub> of 8.6 percent or less) than patients whose doctors did not assess their understanding. The primary care doctors caring for patients with type 2 diabetes and low functional health literacy (FHL, corresponding to a 4th to

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## Diabetes prevalence

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6th grade level) checked to see if these patients understood them in only one out of five visits, even though asking such questions did not make visits significantly longer than those in which the doctors did not confirm patient understanding (20.3 vs. 22.1 minutes).

Patients with low FHL levels are especially likely to have difficulty recalling and understanding medical information. They typically have problems reading medication labels, interpreting blood glucose values or dosing schedules, and

conceptualizing risk. The low FHL among minorities, coupled with their greater burden of diabetes, suggests that problems with health communication may contribute to disparities in diabetes care for minorities, note the researchers. They analyzed audiotapes of visits between 38 physicians and 74 English-speaking patients with type 2 diabetes and low FHL (functional health literacy was assessed by an initial questionnaire) at two primary care clinics of a public hospital.

Doctors conveyed at least one new concept in 61 (82 percent) of

74 visits. Among these 61 visits, doctors conveyed a mean of two new concepts, more than half of which involved a medication change. Physicians assessed recall or comprehension at least once in 20 percent of these 61 visits. When asked by physicians to restate or interpret new concepts, patients responded incorrectly 47 percent of the time (7 of 15 new concepts). In all seven instances, the physician provided further tailored information but then did not assess whether the patient fully understood it. ■

## Studies focus on depression, disease self-management, and vaccination status among people with diabetes

About 6 percent of the U.S. population, 17 million people, have diabetes, and 1 million new cases are identified each year. People who have diabetes are twice as likely as other individuals to become depressed. Diabetes is also twice as prevalent among blacks as whites, with 13 percent of U.S. blacks having the disease. People with diabetes are susceptible to influenza and pneumonia and are more likely to die during flu epidemics than people without diabetes.

Three recent studies supported by the Agency for Healthcare Research and Quality (HS11418) and led by Leonard E. Egede, M.D., M.S., of the Medical University of South Carolina, examined these issues. The studies are summarized here.

**Egede, L.E., and Zheng, D. (2003, January). "Independent factors associated with major depressive disorder in a national sample of individuals with diabetes." *Diabetes Care* 26(1), pp. 104-111.**

The psychosocial burden of diabetes, especially the perception that it negatively affects overall health, may be the reason why depression is more prevalent among people who have the disease, according to this study. The researchers found that perceived worsening of health status among people with diabetes, along with other factors, was independently associated with major depressive disorder among those surveyed. The researchers analyzed data on 1,810 adults with diabetes from the 1999 National Health Interview Survey. They used a short-form interview to identify individuals with major depressive disorder and analyzed whether perceived poor physical health, duration of diabetes, and smoking were associated with major depressive disorder. They also examined factors such as age and education.

Overall, 9.3 percent of 10.4 million adults with diabetes in the United States in 1999 had major depressive disorder compared with 6.1 percent of those who did not

have diabetes. Among people with diabetes, worsening health status was associated with nearly six times the likelihood of developing a major depressive disorder. Diabetics who were younger than age 65 were nearly three times as likely as those who did not have diabetes to develop a major depressive disorder, and females were nearly twice as likely. Major depressive disorder was nearly twice as likely among diabetics who smoked and three times as likely among those who had an income less than 124 percent of the Federal poverty level, compared with people who did not have diabetes. Also, the presence of depression increased primary care and emergency department visits and expenditures for people with diabetes.

This study strengthens the results of several earlier studies on the relationship between diabetes and depression. However, it did not find a relationship between depression and the presence of multiple diabetes complications,

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## Diabetes studies

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unemployment, marital status, type of treatment, lower levels of education, or duration of diabetes found in other studies. The researchers caution that this study did not differentiate type 1 from type 2 diabetes and was limited by the absence of data on blood sugar control.

**Egede, L.E., and Bonadonna, R.J. (2003, January). "Diabetes self-management in African Americans: An exploration of the role of fatalism." *Diabetes Educator* 29(1), pp. 1-26.**

Twice as many blacks suffer from diabetes as whites in the United States. Blacks who have diabetes also experience higher complication rates, greater complication-related disability, and 27 percent higher death rates than whites who have the disease. Effective self-management of diabetes is the key to achieving optimal control of blood glucose and decreasing the complications and premature death associated with diabetes. Patients ideally should watch their diet, exercise, measure their blood-sugar levels regularly, take insulin or other medications as directed, and get regular checkups to prevent the development or progression of eye, kidney, and other complications.

Unfortunately, due to a fatalistic view of their disease, blacks who have diabetes are less likely to manage their diabetes, conclude these researchers. They conducted seven focus groups in 2001 with 39 black patients (22 men and 17 women) with type 2 (adult-onset) diabetes. Most participants had less than a high school education and an annual household income less than \$25,000; diabetes duration was a mean of 13 years for the

group. Perceptions of hopelessness, meaninglessness, powerlessness, and social despair were expressed by focus group participants. Most of the participants felt that they had no control over their diabetes, that it was inherited, and that it would result inevitably in death, regardless of what they did.

Individuals who had diabetes longer, had friends or relatives with diabetes, were disabled from diabetes, or had poor social support appeared to be the most fatalistic. Despite experiences such as dialysis, amputations, and diabetes-related deaths of family members, many said they were unwilling to make the lifestyle modifications needed to avert complications associated with the disease. Individuals with negative coping responses appeared to have a fatalistic attitude toward diabetes outcomes and ineffective diabetes self-management behavior. In contrast, individuals with positive coping responses, such as hope for a cure, were less fatalistic in their outlook. People with strong religious or spiritual beliefs appeared to have more positive coping responses despite being more fatalistic.

**Egede, L.E., and Zheng, D. (2003, February). "Racial/ethnic differences in adult vaccination among individuals with diabetes." *American Journal of Public Health* 93(2), pp. 324-329.**

Current guidelines recommend influenza and pneumococcal vaccination for people with diabetes, who are more likely to contract these illnesses and to die from influenza. However, this study found that among people with diabetes, blacks and Hispanics had lower vaccination rates than whites, even after adjustment for socioeconomic status (SES), insurance coverage, and other

factors influencing access to care. The researchers analyzed data on 1,906 individuals from the 1998 National Health Interview Survey to calculate national vaccination estimates, which they adjusted for race/ethnicity, age, access to care, health insurance, and SES.

Overall, 51 percent of adults with diabetes received influenza vaccine, and 33 percent received pneumococcal vaccine. However, more whites (55 percent) than blacks (39 percent) or Hispanics (42 percent) received influenza vaccinations. Similarly, 38 percent of whites compared with 22 percent of blacks and 17 percent of Hispanics received pneumococcal vaccinations. Vaccination rates were also higher in individuals older than age 65, those with household incomes under \$20,000, and those who were employed. People born in the United States also had higher influenza and pneumonia vaccination rates, as did those with health insurance, access to a primary care provider, or other medical problems in addition to diabetes.

However, race/ethnicity was an important predictor of both pneumonia and influenza vaccination independent of access to care, health coverage, and SES. This suggests that cultural values may influence the differential acceptance of vaccination by patients or that physicians may recommend vaccination for minorities differently from whites. Clearly there were missed opportunities for vaccination of people, and particularly minorities, with diabetes seen in primary care settings (only 54 percent of diabetics who had contact with a primary care doctor received the influenza vaccine). ■



### Use of an ECG-based diagnostic tool in the ER can help predict cardiac arrest in heart attack patients

**E**mergency department (ED) physicians can use a simple ECG printout to help predict which patients are at highest risk of cardiac arrest, which is associated with increased mortality. That's the finding of a recent study supported by the Agency for Healthcare Research and Quality (HS06208) and led by Harry P. Selker, M.D., M.S.P.H., of the Tufts-New England Medical Center.

In an earlier Thrombolytic Predictive Instrument (TPI) Study (see August 2002 *Research Activities*, page 1), Dr. Selker and his colleagues used clinical, laboratory, and electrocardiographic (ECG) data available when patients arrive at the ED to develop an ECG-based model to predict the likelihood of cardiac arrest in ED patients with symptoms of heart attack (acute myocardial infarction, AMI).

In the present study, they investigated the clinical implications of the time-dependent predictive features of cardiac arrest in the TPI cardiac arrest model based on a case-control study of ED patients with AMI: 65 cases with sudden cardiac arrest and 258 without cardiac arrest. Within the first hour of AMI symptom onset, increased risk of cardiac arrest was associated with ECG prolonged QTc interval and a greater sum of ST-segment elevation, after adjustment for age,

systolic blood pressure, serum potassium, and infarct size.

However, after 1 hour, the effect of ST-segment elevation was much reduced, and prolonged QTc appeared protective. For patients arriving at the ED 30 minutes after chest pain onset, the risk for cardiac arrest for patients with a prolonged QTc (0.50) was more than double (odds ratio, OR 2.20) that of patients with a QTc of 0.44, whereas for those arriving at the ED 1.5 hours after chest pain onset, the risk was 79 percent lower (OR 0.21). Patients presenting to the ED 30 minutes after chest pain onset with a sum of ST elevation of 20 mm had a three-fold higher risk of cardiac arrest than patients with a sum of ST elevation of 5 mm (OR 3.37). However, for those arriving 1.5 hours after chest pain onset, the risk was barely elevated (OR 1.18). These relationships, which were not previously appreciated, provide an example of how multivariable modeling in a health services research project can lead to new pathophysiologic knowledge of a disease, concludes Dr. Selker.

See "Time-dependent predictors of primary cardiac arrest in patients with acute myocardial infarction," by Dr. Selker, Merritt H. Raitt, M.D., Christopher H. Schmid, Ph.D., and others, in the February 1, 2003 *American Journal of Cardiology* 91, pp. 280-286. ■

### Chest x-ray is appropriate to confirm suspected pneumonia in most patients

**P**rompt diagnosis of community-acquired pneumonia (CAP) is important to determine the need for antibiotic therapy, and prognosis (risk of death) is important for deciding whether or not to hospitalize the patient. Only 5 percent of patients suspected of having CAP actually do, and findings from the medical history (for example, a cough) and physical examination rarely distinguish CAP from other types of respiratory infections.

Thus, a chest x-ray is needed to confirm the diagnosis in most patients treated for CAP, according to a study performed by Joshua P. Metlay, M.D., Ph.D., of the University of Pennsylvania School of Medicine and VA Philadelphia Medical Center, and Michael J. Fine, M.D., M.Sc., of the University of Pittsburgh and the VA Pittsburgh Healthcare System. This work is an extension of the Pneumonia Patient Outcomes Research Team (PORT), which was supported by the Agency for Healthcare Research and Quality (HS06468).

Normal vital signs such as heart rate, temperature, and respiratory rate significantly reduce the likelihood of CAP. If the patient has only mildly severe illness and no clinical or pharmacologic factors that would modify the presence of abnormalities in vital signs, CAP may be excluded without chest x-ray. Patients with moderate to severe illness and no findings on initial chest x-ray may benefit from antibiotic therapy and

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## Chest x-ray to confirm pneumonia

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repeated chest x-ray after several days to confirm or rule out the diagnosis of CAP.

Overall, individual clinical and laboratory abnormalities are associated with only moderate increases in the odds of death. Thus, a combination of medical history, physical exam, and laboratory tests is needed to accurately assess short-

term risk of death and guide decisions about hospital versus home care. This involves identifying absolute contraindications to home care, including deficient arterial oxygen and social and psychological problems, conclude Drs. Metlay and Fine.

The researchers updated two previous literature reviews on the diagnosis and prognosis of CAP by reviewing additional studies conducted from January 1996

through December 2000. They performed a meta-analysis of studies on the ability of the medical history, physical examination, and laboratory findings to diagnose CAP and predict short-term risk of death.

More details are in "Testing strategies in the initial management of patients with community-acquired pneumonia," by Drs. Metlay and Fine, in the January 21, 2003 *Annals of Internal Medicine* 138(2), pp. 109-118. ■

## Use of intensive care for patients with severe pneumonia is common and expensive, but hospital ICU admission rates vary

**P**atients with community-acquired pneumonia (CAP) who are admitted to the intensive care unit (ICU) tend to be sicker, have poorer outcomes, and use more medical resources than CAP patients treated on regular hospital floors. Although use of intensive care for patients with severe pneumonia is common, hospital ICUs vary in their ICU admission rates. Also, no current diagnostic criteria adequately predict which CAP patients need ICU care, according to a study that was supported in part by the Agency for Healthcare Research and Quality (HS06468, Patient Outcomes Research Team [PORT] on Community-Acquired Pneumonia).

The researchers prospectively compared the characteristics, course, and outcomes of 170 patients who were admitted to the ICU and 1,169 patients who did not receive ICU care during a hospital stay at one Canadian and four U.S. medical centers. Overall, 13 percent of CAP patients were admitted to the ICU, with ICU admission rates ranging from 9 to 26 percent.

Reasons for ICU admission included respiratory failure (57 percent), need to monitor blood circulation (32 percent), and shock (16 percent). ICU patients had longer hospital stays (23 vs. 9 days), higher hospital

costs (\$21,144 vs. \$5,785), more nonpulmonary organ dysfunction, and higher hospital mortality (18 vs. 5 percent) than non-ICU patients.

However, there were no differences in the total number or severity of symptoms between the two groups. In addition, although ICU patients were sicker, 27 percent were considered to be at low risk of dying. Four clinical prediction rules for severe CAP (original and revised American Thoracic Society criteria, the British Thoracic Society criteria, and the Pneumonia Severity Index) were not good predictors of subsequent care decisions (ICU admission and mechanical ventilation) and outcomes (medical complications and death). Three-quarters of the patients who met any of the criteria were never admitted to the ICU. The researchers conclude that clinical prediction rules for severe CAP are not robust enough to guide clinical care at the current time.

See "Severe community-acquired pneumonia," by Derek C. Angus, M.D., M.P.H., Thomas J. Marrie, M.D., D. Scott Obrosky M.S., and others, in the September 2002 *American Journal of Respiratory and Critical Care Medicine* 166, pp. 717-723. ■

## CT scans can help physicians determine which artery is bleeding in patients with traumatic pelvic fractures

**P**elvic fractures account for about 5 percent of all trauma admissions, with 5 to 15 percent of these patients dying. Hemorrhage is frequently the primary cause of death, usually

within 24 hours of injury. Pelvic computerized tomography (CT) can quickly predict the source of arterial hemorrhage in these patients, according to the findings of a study supported in part by the

Agency for Healthcare Research and Quality (K08 HS11291). Identifying the source of hemorrhage is the first step in

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## Traumatic pelvic fractures

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stopping the life-threatening bleed, notes C. Craig Blackmore, M.D., Ph.D.

Dr. Blackmore and colleagues from the University of Washington digitized CT scans of 104 patients with traumatic pelvic fractures who had undergone emergency pelvic angiography (x-ray visualization of the blood vessels following injection of a contrast dye). They compared clots that measured more than 10 cm<sup>2</sup> (substantial clots) on

the scan with specific arterial injuries found on angiography.

Overall, 58 percent of the patients had arterial bleeding at angiography. The presence of a clot greater than 10 cm<sup>2</sup> was a frequent indicator of injury to an artery passing through the region. For example, a patient with a substantial clot in the left pelvic sidewall region at the level of the sciatic notch had nearly triple the risk of injury to the left superior gluteal artery as patients who did not have a clot at this location.

A clot greater than 10 cm<sup>2</sup> in the rectus sheath region at the top of the iliac crest, areas of the pelvic

sidewall, and certain gluteal regions was a significant indicator of unspecific arterial bleeding. The pre-sacral region was not significant at any level, indicating that blood in the presacral area is just as likely to be venous (much less serious) as arterial.

See "Can CT predict the source of arterial hemorrhage in patients with pelvic fractures?" by Meghan K. Sheridan, Dr. Blackmore, Ken F. Linnau, and others, in the October-November 2002 *Emergency Radiology* 9, pp. 188-194. ■

## Clinical screening criteria can identify virtually all blunt trauma patients with acute thoracolumbar spine injuries

**T**horacolumbar (TL) spine injuries (affecting the middle or lower back) are more common than cervical spine (affecting the neck and upper back) injuries after blunt trauma. Patients are considered at very low risk for TL spine injury if none of the following criteria are present: complaints of TL spine pain, TL spine tenderness on midline palpation, decreased level of consciousness, abnormal peripheral neurologic examination, distracting painful injury, or evidence of intoxication with ethanol or drugs.

All patients with TL spine injuries have at least one of the high-risk criteria. This suggests that use of all six screening criteria can identify virtually all blunt trauma patients with acute TL spine injuries, concludes William R. Mower, M.D., Ph.D., of the University of California, Los Angeles School of Medicine.

With support from the Agency for Healthcare Research and Quality (HS08239), Dr. Mower and his colleagues studied patients who underwent TL spine x-rays following blunt trauma. They determined injury status by the final faculty radiologist interpretation of all x-rays for a total of 2,404 patients. Radiologists identified TL spine injuries in 152 patients; all 152 patients were considered high-risk for TL spine injury

because they met at least one of the high-risk criteria. Patients who exhibited none of the criteria were considered to have low risk for TL spine injury.

Overall, the criteria had a specificity of 3.9 percent and a positive predictive value of 6.6 percent. They did, however, have sensitive and negative predictive values of 100 percent, meaning that the criteria could reliably identify a subset of patients who did not have acute TL spine injury and for whom an x-ray would be unnecessary. Although these criteria identified all patients with TL injury, the positive predictive value and specificity of the criteria were disappointingly low, according to Dr. Mower. He concludes that further research is needed to identify criteria that maintain sensitivity but have improved specificity. Such criteria could then be employed in development of clinical guidelines for use of x-rays in blunt trauma patients suspected of TL spinal injury to avoid unnecessary spine imaging.

See "Prospective evaluation of criteria for obtaining thoracolumbar radiographs in trauma patients," by James F. Holmes, M.D., Edward A. Pancek, M.D., Paul Q. Miller, B.Sc.H., and others, in the *Journal of Emergency Medicine* 24(1), pp. 1-7, 2003. ■

## Physicians are more likely to use specialty society guidelines that are evidence-based and recently revised

A credible source of a clinical guideline, even a doctor's own specialty society, and familiarity with the guideline do not ensure that physicians will follow it. Physicians are more likely to adhere to guidelines whose recommendations are supported by evidence from randomized clinical trials. Indeed, advances in practice, as in use of coronary angioplasty, may precede changes in guidelines, say Lucian L. Leape, M.D., and Arnold M. Epstein, M.D., M.A., of Harvard Medical School, and their colleagues.

In a study supported by the Agency for Healthcare Research and Quality (HS07098), the researchers found that cardiologists were more likely to follow guidelines developed by the American College of Cardiology/American Heart Association (ACC/AHA) for coronary artery bypass graft

surgery (CABG) than angioplasty. The 1990 ACC/AHA CABG guideline was based on a large number of randomized clinical trials. However, the 1988 ACC/AHA guideline on percutaneous coronary angioplasty (PTCA) was based almost entirely on expert opinion.

The researchers used computer programs to classify the appropriateness of PTCA and CABG based on ACC/AHA PTCA (1988 and 1993) and CABG (1990) guidelines and 1990 RAND PTCA and CABG guidelines among randomly sampled Medicare patients who underwent 543 angioplasties and 676 CABGs in five states in 1991 and 1992. Based on the RAND guidelines, 12 percent of PTCA and 9 percent of CABG procedures were classified as inappropriate.

Only 1.5 percent of CABG procedures were inappropriate based on ACC/AHA guidelines.

However, based on the 1988 ACC/AHA guidelines, 30 percent of PTCAs were rated inappropriate, whereas 24 percent were rated inappropriate based on the 1993 guidelines. Apparently, practicing cardiologists decided before the 1993 guidelines that an earlier trial of thrombolytic therapy (suggested in the 1988 guidelines) was not needed before trying angioplasty, something the expert panel decided to add to its 1993 guideline. The researchers conclude that to remain useful and credible, guidelines should be revised frequently when practice is advancing rapidly, as in the case of angioplasty.

More details are in "Adherence to practice guidelines: The role of specialty society guidelines," by Dr. Leape, Joel S. Weissman, Ph.D., Eric C. Schneider, M.D., M.Sc., and others, in the January 2003 *American Heart Journal* 145, pp. 19-26. ■

### Quality/Patient Safety

## Certain factors increase the likelihood that sponges or instruments will be left inside a surgical patient

Leaving sponges or medical instruments inside surgical patients can lead to serious problems ranging from bowel perforation and blood infection to death. A new study estimates that 1,500 such cases occur each year in the United States, about one or more cases each year for a typical large hospital. The study reveals for the first time that instruments and sponges associated with surgery are more likely to be left behind in cases involving emergency surgery, obese patients, or unplanned changes in the surgical procedure.

In the study supported by the Agency for Healthcare Research and Quality (HS11886 and K02 HS11285), David M. Studdert, L.L.B., Sc.D., M.P.H., of Harvard University, and his colleagues reviewed medical

records associated with all claims or incident reports of a retained surgical sponge or instrument filed between 1985 and 2001 with a large malpractice insurer in Massachusetts. For each case, they identified an average of four randomly selected control patients who underwent the same type of operation during the same 6-month period.

Overall, the study included 54 patients with a total of 61 retained sponges or instruments and 235 control patients. Over half (54 percent) of the foreign bodies were left in the abdomen or pelvis, 22 percent were left in the vagina, 7.4 percent were left in the thorax, and 17 percent were left elsewhere in the body. Over two-thirds (69 percent) of the patients with retained

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## Retained instruments and sponges

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sponges or instruments required reoperation, and one died. These patients were more likely than controls to have had emergency surgery (33 vs. 7 percent) or an unexpected change in surgical procedure (34 vs. 9 percent). They also had a higher mean body mass index and were less likely to have had sponges and instruments counted, which is recommended for all open cavity surgeries (followed by x-ray or manual

reexploration if not all materials are accounted for). Given the cost of more than \$50,000 per case for malpractice claim expenses alone, a \$100 plain x-ray following high-risk categories of operations could prove a cost-effective intervention, suggest the researchers.

See "Risk factors for retained instruments and sponges after surgery," by Atul A. Gawande, M.D., M.P.H., Dr. Studdert, E. John Orav, Ph.D., and others, in the January 16, 2003 *New England Journal of Medicine* 348, pp. 229-235. ■

## Interpretation errors are common during medical encounters with people who have limited English proficiency

About 45 million people in the United States speak a language other than English at home, and about 19 million people are limited in English proficiency (LEP). When these individuals see a doctor or arrive at the hospital, errors in interpretation of what the doctor or patient says are alarmingly common, averaging 31 errors per clinical encounter. Furthermore, many of these errors have potential clinical consequences, such as omitting questions about drug allergies, which can be disastrous. Errors committed by ad hoc interpreters are significantly more likely to have potential clinical consequences than those committed by hospital interpreters (77 vs. 53 percent), according to study supported in part by the Agency for Healthcare Research and Quality (K02 HS11305).

Third-party reimbursement for trained interpreter services should be considered for patients with limited English proficiency, suggests Glenn Flores, M.D., of the Medical College of Wisconsin. Dr. Flores and his colleagues audiotaped and transcribed pediatric encounters in a hospital outpatient clinic in which a Spanish interpreter was used. For each transcript, they categorized each error in medical interpretation and determined whether errors had a potential clinical consequence. Professional hospital interpreters were present for six encounters; ad hoc interpreters included nurses, social workers, and an 11-year-old sibling. The researchers calculated 396 interpreter errors, with a mean of 31 per encounter.

Nearly two-thirds (63 percent) of all errors had potential clinical consequences, with a mean of 19

per encounter. Half of even hospital interpreter errors had potential clinical consequences. Examples included omitting instructions on the dose, frequency, and duration of antibiotics and rehydration fluids; adding that hydrocortisone cream must be applied to an infant's entire body, instead of only the facial rash; and instructing a mother to put amoxicillin in both ears for an ear infection. These findings suggest that hospital interpreters need more adequate training.

See "Errors in medical interpretation and their potential clinical consequences in pediatric encounters," by Dr. Flores, M. Barton Laws, Ph.D., Sandra J. Mayo, Ed.M., and others, in the January 2003 *Pediatrics* 111(1), pp. 6-14. ■

## Adequate nurse staffing and managerial support foster better patient care and reduce nurse dissatisfaction and burnout

Nearly one-fifth (18 percent) of patients in the United States and England and more than one-fourth (27 percent) of patients in Canada rated their last hospital stay as fair or poor. Physicians in these countries agree that hospital quality of care is threatened by shortages of nurses. Yet nurse burnout, dissatisfaction, and shortages in the countries studied

are at an all time high, and prospects of recruiting more nurses are dim.

Adequate nurse staffing and organizational/managerial support for nursing are keys to decreasing nurse job dissatisfaction and burnout and ultimately to

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## Nurse staffing

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retaining more hospital nurses and improving the quality of patient care. That's the conclusion of Linda H. Aiken, Ph.D., R.N., of the University of Pennsylvania School of Nursing, and other members of the International Hospital Outcomes Research Consortium, which is supported in part by the Agency for Healthcare Research and Quality in collaboration with the National Institute of Nursing Research (NR04513).

Dr. Aiken and her colleagues surveyed 10,319 nurses in 303 hospitals in five sites (United States, Pennsylvania; Canada, Ontario and British Columbia; England; and Scotland) to examine the effects of nurse staffing and organizational support for nursing care on nurses' dissatisfaction with their jobs, nurse burnout, and nurse reports of care quality. Dissatisfaction, burnout, and concerns about care quality were common among hospital nurses in all five sites.

The percent of nurses with burnout scores above published norms for medical personnel varied from 54 percent of nurse respondents in Pennsylvania to 34 percent in Scotland. Nurse reports of low quality of care (in their units and on their last shift) were three times as likely in hospitals with low staffing and support for nurses as in hospitals with high staffing and support. Also, nurses working in hospitals with weak organizational support for nursing care were twice as likely to report dissatisfaction with their jobs and to have burnout scores above published norms for medical personnel.

See "Hospital staffing, organization, and quality of care: Cross-national findings," by Dr. Aiken, Sean P. Clarke, R.N., Ph.D., and Douglas M. Sloane, Ph.D., in the September 2002 *Nursing Outlook* 50(5), pp. 187-194.

**Editor's note:** This study appeared originally in the January 2002 issue of the *International Journal for Quality in Health Care* 14(1), pp. 5-13. ■

## Health Care Marketplace

### Local preferences and factors other than market structure influence county differences in hospice use

Use of hospice care, which provides dying patients with relief of pain and other symptoms either at home or in a hospice center, varied more than 11-fold across U.S. metropolitan statistical areas in 1996. This variation was not explained by differences in the major components of the health care infrastructure—such as the availability of hospital, nursing home, or skilled nursing facilities—or by the availability of HMOs, doctors, or generalists. Rather, the difference seems to be due to important local factors such as local preferences, differences in the particular mix of services provided by local hospices, or even differences in community leadership on end-of-life issues, according to a recent study that was

supported in part by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00084).

Virginia W. Chang, M.D., M.A., of the University of Chicago, and her colleagues examined Medicare claims data for a group of elderly patients newly diagnosed with lung cancer, colon cancer, stroke, or heart attack in 1993, and followed them for up to 5 years. They linked data on use of hospice care by those who died to Census and Area Resource File data on county-level variables (for example, number of hospital beds) to determine the power of market-level structure and local demographics to explain variation between 1,530 counties in rates of hospice use.

Local demographics explained 2.5 percent and market factors

explained 0.7 percent of the between-county variation. Three demographic factors were significant. Individuals living in counties with more white collar employees, people living in the least densely populated counties, and those living in counties with relatively more cancer deaths were more likely to use hospice care. None of the county-level health care market factors were significantly associated with differences in use of hospice care.

More details are in "The lack of effect of market structure on hospice use," by Theodore J. Iwashyna, M.D., Ph.D., Dr. Chang, James X. Zhang, Ph.D., M.S., and Nicholas A. Christakis, M.D., Ph.D., M.P.H., in the December 2002 *Health Services Research* 37(6), pp. 1531-1551. ■

## More people receive oral surgery from a general dentist than an oral surgeon, especially low-income and minority individuals

**D**uring 1996, slightly more than 14 million Americans made almost 20 million visits to dentists nationwide for oral surgery. Almost three times as many people had a general dentist perform the surgery as an oral and maxillofacial surgeon (oral surgeon). This difference held for each socioeconomic and demographic category.

These findings suggest that dentists other than oral surgeons feel adequately trained or prepared to provide oral surgery and do so. Although the numbers tend to indicate that patients seem comfortable with this, some of them may not have a choice. Some patients may have far fewer oral surgeons than general dentists in their area, or their dental insurance plan may require the use of a generalist or pretreatment referral to an oral surgeon, explain Richard Manski, D.D.S., M.B.A., Ph.D., and John F. Moeller, Ph.D., of the Agency for Healthcare Research and Quality, and James Hupp, D.M.D., M.D., of the School of Dentistry, University of Mississippi.

Nevertheless, minorities, people with less education, and low-income individuals were more likely to receive surgery from a general dentist than an oral surgeon than

whites and people with higher incomes and more education. About 29 percent of whites versus 18 percent of minorities received surgery from an oral surgeon, while 75 percent of whites and 86 percent of minorities received surgery from a general dentist.

Low-income people also were more likely than those with higher incomes to receive surgery from a general dentist (81 vs. 73 percent), as were those with some or no school versus college graduates (80 vs. 70 percent). People who were 18 years and older were more likely to receive surgical procedures from an oral surgeon than younger people (28 vs. 20 percent). These findings were based on an analysis of oral surgical dental visits by members of 10,500 U.S. households that participated in the 1996 Medical Expenditure Panel Survey.

See "An analysis of oral surgical dental visits by provider type, 1996," by Drs. Manski and Moeller, and James R. Hupp, D.M.D., M.D., J.D., M.B.A., in the December 2002 *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics* 94, pp. 687-691. Reprints (AHRQ Publication No. 03-R024) are available from AHRQ.\*\* ■

## Health Care Costs and Financing

### Individuals who have lapses in insurance coverage are less likely to use preventive services than those with continuous coverage

**P**eople who lose health insurance coverage for any period are less likely than those who are continuously insured to use preventive care services such as cholesterol screening and mammograms, according to a study supported in part by the Agency for Healthcare Research and Quality (HS10283). Policy initiatives are needed to promote stability in insurance coverage, suggest Joseph J. Sudano, Jr., Ph.D., of Case Western Reserve University Medical School, and David W. Baker, M.D., M.P.H., of Northwestern University. They used

data from the 1992, 1994, and 1996 national Health and Retirement Study to focus on how insurance status in 1994 and 1996 and episodes of noncoverage during 1992 through 1996 predicted use of preventive services among 7,300 older adults.

More than 15 percent of participants were uninsured at the baseline interview in 1992. However, insurance status at one point in time clearly does not tell the whole story. Between 1994 and 1996, 3.4 percent of those interviewed lost coverage, and 4.9 percent obtained coverage. Overall,

21.2 percent reported having at least one episode of noncoverage between 1992 and 1996. Thus, the pool of individuals who were continuously or intermittently uninsured was about 40 percent greater than that estimated from 1992 insurance status alone.

Over three-fourths (77 percent) of those who were continuously insured during the 4-year period received a mammogram compared with 62 percent who had one uninsured period and 53 percent who had two uncovered periods. Also, 74 percent of people who

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## Insurance coverage

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were continuously insured had a cholesterol test versus 64 percent of those with one uncovered period and 54 percent with two uncovered periods. Finally, 41 percent of the continuously insured received

influenza vaccinations versus 34 percent of those with one uncovered period and 29 percent with two uncovered periods. In addition, people who obtained insurance coverage during the study period did not rapidly “catch up” with their already-insured peers in use of preventive services.

More details are in “Intermittent lack of health insurance coverage and use of preventive services,” by Drs. Sudano and Baker, in the January 2003 *American Journal of Public Health* 93(1), pp. 130-137. ■

## Despite new critical care technologies, the proportion of Medicare spending on end-of-life care is not increasing

**A**lthough health services delivered near the end of life will continue to consume large portions of medical dollars, the proportion of Medicare spending for end-of-life care is not increasing. Thus, efforts to contain Medicare expenditures should not focus on those near the end of life, conclude the researchers involved in the first nationwide study of both Medicare and non-Medicare expenditures for the last year of life. Their work was supported in part by the Agency for Healthcare Research and Quality (HS09566 and HS11825).

Researchers led by Stephen Crystal, Ph.D., of Rutgers University, analyzed the 1992-1996 Medicare Current Beneficiary Survey, which contains yearly health care use and cost data for about 10,000 elderly men and women. The mean annual medical expenditures (1996 dollars) for the elderly from 1992 to 1996 were \$37,581 during the last year of life versus \$7,365 for other years. The estimated 1992-1996 mean Medicare expenses during the last year of life were \$22,967. However, the portion of Medicare expenses spent on the last year of life in 1992-1996

was 26 percent, similar to that spent on the last year of life between 1976 and 1988.

In addition, last-year-of-life expenses constituted 22 percent of all medical, 26 percent of Medicare, 25 percent of Medicaid, and 18 percent of all non-Medicare expenditures. Additional non-Medicare expenditures near the end of life are directed toward facility-based management of chronic conditions preceding death rather than to acute terminal conditions per se. As the elderly population ages, average total end-of-life medical expenses (adjusted for inflation) will probably change little, but the portion paid by non-Medicare sources supporting chronic and custodial care will likely rise, conclude the researchers.

More details are in “Medical expenditures during the last year of life: Findings from the 1992-1996 Medicare current beneficiary survey,” by Donald R. Hoover, Ph.D., M.P.H., Dr. Crystal, Rizie Kumar, M.S., and others, in the December 2002 *Health Services Research* 37(6), pp. 1625-1642. ■

## Most appeals to managed care health plans dispute provider choice and contractual coverage, not medical necessity

**T**he first recourse for most health insurance plan members who are denied coverage for a medical procedure is an appeal to the health plan itself. In fact, HMOs adjudicate more than 250,000 such appeals each year for their privately insured enrollees alone. A new study reveals that most preservice appeals dispute choice of provider or contractual coverage issues,

rather than medical necessity. Medical necessity disputes proliferate not around life-saving treatments, but in areas of societal uncertainty about the legitimate boundaries of insurance coverage, according to David M. Studdert, L.L.B., Sc.D., M.P.H., of the Harvard School of Public Health, and Carole Roan Gresenz, Ph.D., of RAND.

They suggest that greater clarity about the coverage status of specific services, through more precise contractual language and consumer education about benefits limitations, may help to avoid a large proportion of disputes in managed care. In the study, which was supported in part by the Agency for Healthcare Research

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## Health plan disputes

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and Quality (HS11285), they reviewed the administrative files associated with 3,519 appeals lodged by privately insured enrollees at two large HMOs to understand the sources of conflict between patients and managed care organizations.

Just over one-third (37 percent) of preservice appeals involved medical necessity determinations, another one-third (37 percent) centered on the scope of

contractually covered benefits—for example, dental care, alternative medicine, and experimental treatments—and most of the remainder (20 percent) involved disputes over use of out-of-network providers. Enrollees won half of medical necessity appeals (52 percent), 35 percent of out-of-network appeals, and 33 percent of contractual coverage appeals. Appeals covered relatively few services and focused mostly on therapies that are generally regarded as nonessential, for

example, surgical treatments for obesity, breast alteration, and varicose vein removal.

More details are in “Enrollee appeals of preservice coverage denials at 2 health maintenance organizations,” by Drs. Studdert and Gresenz, in the February 19, 2003 *Journal of the American Medical Association* 289, pp. 864-870. ■

## Malpractice pressure prompts unnecessary treatments and care costs without improving patient outcomes

**B**y prompting doctors to practice “defensive” medicine, the medical malpractice liability system can reduce medical productivity. Fearing legal liability, doctors order more tests and treatments. This approach results in greater expenditures without important consequences for patient outcomes, according to Daniel P. Kessler, J.D., Ph.D., and Mark B. McClellan, M.D., Ph.D., of Stanford University.

In a study supported in part by the Agency for Healthcare Research and Quality (HS08804), they used physician-level data on the frequency of malpractice claims and claim-level data on claim costs and outcomes to identify four dimensions of malpractice pressure. These included the frequency of malpractice claims, the likelihood of prolonged duration of claims resolution, administrative and legal expenses incurred in defending against a claim, and the amount of any settlement or award to the plaintiff. The investigators then estimated the impact of State liability law reforms on the effects of malpractice pressure on three major categories of medical treatment decisions for elderly heart disease patients

and the consequences of these practice changes for total hospital expenditures and patient outcomes.

The researchers estimated, for example, that for elderly heart disease patients, an untried reform that reduced the legal defense burden on physicians and hospitals by one-fourth could be expected to reduce medical treatment intensity by about 6.2 percent without increasing the incidence of adverse health outcomes. In the same population, a policy that expedited claim resolution by 6 months across-the-board could be expected to reduce hospital treatment costs by 2.8 percent without greater adverse patient outcomes.

Their estimates also suggested a savings of \$4.76 in hospital expenditures on elderly patients with cardiac illness for each \$1 reduction in the litigation costs incurred by the malpractice insurer in connection with claim defense per physician per year.

More details are in “How liability law affects medical productivity,” by Drs. Kessler and McClellan, in the *Journal of Health Economics* 21, pp. 931-955, 2002. ■

## New AHRQ Web-based tool offers hospitals quick checkup on patient safety

The Agency for Healthcare Research and Quality has developed a new Web-based tool that can help hospitals enhance their patient safety performance by quickly detecting potential medical errors in patients who have received medical or surgical care in the hospital. Hospitals then investigate to determine whether the problems detected were caused by potentially preventable medical errors or have some other explanation. Health and Human Services Secretary Tommy G. Thompson announced the AHRQ Patient Safety Indicators on March 13, at the National Patient Safety Foundation 5th Annual Congress in Washington, DC.

The Patient Safety Indicators at [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov) are part of a major AHRQ program to improve the safety of patients in hospitals, outpatient care, and other medical settings. The program also includes research to develop ways to prevent medical errors and a Web-based medical journal that showcases patient safety lessons drawn from actual cases of medical errors.

The Patient Safety Indicators tool contains a set of measures that

use secondary diagnosis codes to detect 26 types of adverse events, such as complications of anesthesia, blood clots in the legs or lungs following surgery, fracture following surgery, and four types of birth-related injuries.

Six of these indicators can be calculated as either a hospital-level or an area-level indicator. Area-level indicators use principal and secondary diagnosis codes to capture all cases of potentially preventable complications that occur within a specific geographic area and include foreign bodies left during a procedure, hospital-acquired pneumonia, infection from medical care, technical difficulty with a procedure, and reaction to blood transfusion. Evaluating these indicators by geographic region can help policymakers and providers identify differences in the occurrence of health care complications by individual counties or Metropolitan Statistical Areas.

Although the indicators were developed primarily for hospitals to use in their quality improvement programs, other kinds of organizations will find this Web-

based tool to be useful. For example, hospital associations can show member hospitals how they perform for each indicator when compared with their peer group, the State as a whole, or other comparable States.

The Patient Safety Indicators were developed and validated by the AHRQ-funded UCSF-Stanford Evidence-based Practice Center with the help of eight panels of clinicians nominated by 21 professional societies, including the American College of Physicians-American Society of Internal Medicine, American College of Surgeons, American College of Cardiology, and the American College of Obstetricians and Gynecologists.

The tool can be downloaded free of charge from AHRQ's Web site, but it requires the use of SAS or SPSS software, which are commercially available statistical programs. Please contact AHRQ via e-mail to [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov) for technical questions on the content and use of the Patient Safety Indicators. ■

## AHRQ names new senior scholar in residence in primary care

In March, the Agency for Healthcare Research and Quality welcomed Henry Barry, M.D., M.S., as the 2003 American Academy of Family Physicians (AAFP) Senior Scholar in Residence. Dr. Barry, who is working full time at AHRQ over the next 6 months, is based in the agency's Center for Primary Care Research. His primary area of study is the effect of information technology systems on patient outcomes.

Dr. Barry is the Senior Associate Chair and Associate Professor of Family Practice at the College of Human Medicine, Michigan State University, East Lansing. He is also codirector of the Great Lakes Research Into Practice Network, which is affiliated with the Michigan Consortium for Family Practice Research (one of three centers funded under the AAFP plan to enhance family practice research). ■

## New AHRQ evidence reports focus on allergic rhinitis among U.S. workers and jaundice in newborns

The Agency for Healthcare Research and Quality recently released two new evidence reports, one on allergic rhinitis in the U.S. working population, prepared by the Duke Evidence-based Practice Center (EPC), and the other on managing jaundice in newborn infants, prepared by the Tufts-New England Medical Center EPC. 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. EPC reports and summaries are published by AHRQ and are available online and through the AHRQ clearinghouse. Visit the AHRQ Web site at [www.ahrq.gov](http://www.ahrq.gov) or see the back cover of *Research Activities* for ordering information.

**Allergic rhinitis.** Although no studies have found effective treatments for allergic rhinitis, common allergies that affect more than 19 million U.S. workers each year, a review of the scientific literature confirms that some patients can take steps to relieve symptoms, according to this AHRQ evidence report. Direct medical costs for common allergies—which often are caused by pollen, dust mites and pet dander—can range from \$1.2 billion to \$4.5 billion annually, with an additional \$3.2 billion in indirect costs, including the cost of lost work productivity.

The EPC researchers who developed the report, which focuses specifically on

management of allergic rhinitis in working adults, did not find much evidence of a direct association between allergic rhinitis and work performance. However, they noted that the physical symptoms of allergies—such as sneezing, nasal congestion, headache, poor concentration, and fatigue—may cause problems on the job for workers affected by the condition. The report, which was requested by the American Association of Health Plans, concludes that treatments that improve symptoms and have minimal side effects will likely improve work performance.

The EPC researchers found evidence that some patients may attain relief with simple steps. For example, those allergic to dust mites can reduce their symptoms by using bedding specifically designed to keep out the mites or by cleaning their homes more often. The evidence report also notes that injections to build immunity can help reduce or eliminate symptoms for both seasonal causes, such as trees and pollen, and year-round causes, such as dust mites and cat dander. In addition, combination treatments such as antihistamines plus decongestants or antihistamines plus steroid nasal sprays work better than using any of these medications alone. The researchers did not find strong evidence that air filtration systems decrease symptoms.

The evidence report outlines potential areas for future research, including identifying which patients are most likely to benefit from injection therapy, studying the effectiveness of longer duration combination treatments for both seasonal and year-round allergic rhinitis, and more thoroughly

measuring the effectiveness of environmental controls on the reduction of symptoms. The researchers also call for future studies to include more complete descriptions of the patients being studied that might identify racial or ethnic differences in the use and outcomes of treatment options.

A summary of the report, *Allergic Rhinitis in the Working-Age Population*, Evidence Report/Technology Assessment No. 67 (AHRQ Publication No. 03-E006) is available from AHRQ.\*\* The full report (AHRQ Publication No. 03-E015) is in press. The summary can be found online at <http://www.ahrq.gov/clinic/epcsums/rhinworksum.htm> and also from the National Guideline Clearinghouse at <http://www.guideline.gov> (Select NGC Resources).

**Neonatal jaundice.** More research is needed to determine whether using standardized data charts used to plot results from bilirubin measurements based on hours since birth can help clinicians do a better job of predicting potentially serious cases of jaundice in newborns, according to this AHRQ evidence report. Although the EPC researchers who prepared the report did not directly address the appropriateness of universal screening for hyperbilirubinemia, a condition caused by excessive concentrations of bilirubin in the blood, they did examine the various strategies for identifying the condition.

High bilirubin levels cause jaundice and are a major reason for readmission of newborns to the hospital in the first 2 weeks of life. Jaundice, usually indicated by yellow-colored skin and eyes,

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## New evidence reports

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affects over half of the infants born in the United States each year, but it generally is a temporary condition that clears up without any clinical intervention. However, in rare instances, some babies with high bilirubin levels could develop a potentially fatal disorder known as kernicterus. Kernicterus has a death rate of at least 10 percent and causes brain damage and other serious long-term complications in at least 70 percent of newborns who have it.

This evidence report is based on a review of almost 5,000 abstracts and articles, including a summary of 123 cases of kernicterus in term/near-term infants that spanned more than 30 years. The report was requested by the American Academy of Pediatrics, which last published guidelines on managing hyperbilirubinemia in 1994.

The current practice for diagnosing and treating significant hyperbilirubinemia begins with a visual assessment of the infant for jaundice. If significant hyperbilirubinemia is suspected, a blood test is done to determine the

level of bilirubin. Phototherapy (light therapy) is then performed in babies with high bilirubin levels.

Researchers reviewed the literature to determine whether measurements by noninvasive instruments are reliable in identifying babies who need blood tests to confirm high bilirubin levels. They found that measurements by several noninvasive devices traditionally used to examine the pigment of a baby's skin correlated well with bilirubin levels directly measured from blood. They concluded that use of these devices could serve as reliable screening tools to determine which infants should have blood tests performed and, if necessary, be treated with phototherapy. This approach could lead to earlier detection of potentially serious cases of hyperbilirubinemia and may decrease the need for invasive blood tests in those infants found to be at lower risk.

Researchers also suggested that future research is needed to validate newer noninvasive measurement devices and to address issues of cost-effectiveness

and reproducibility in clinical practice. In addition, future research should be conducted to validate an hourly age-specific data chart (nomogram) for bilirubin blood levels in healthy full-term infants. An important part of this validation should be an evaluation of potential differences by sex, race, and ethnicity, as well as prenatal, natal, and postnatal factors. Finally, future research in kernicterus would benefit from a uniform definition of the disease, they said.

A summary of the report, *Management of Neonatal Hyperbilirubinemia*, Evidence Report/Technology Assessment No. 65 (AHRQ Publication No. 03-E005)\*\* and the full report (AHRQ Publication No. 03-E011)\* are available in print form from AHRQ. See the back cover of *Research Activities* for ordering information. The summary can be found online at <http://www.ahrq.gov/clinic/epcsums/neonatalsum.htm> and also from the National Guideline Clearinghouse at <http://www.guideline.gov> (select "NGC Resources"). ■

## Announcements

### AHRQ issues RFA for challenge grants on safe practices

The Agency for Healthcare Research and Quality is seeking applications from for-profit and non-profit organizations—including universities, clinics, hospitals, faith-based organizations, and State and local government agencies—to fund five to ten safe practices implementation challenge grants. The grants are intended to assess safety risks to patients and devise ways to prevent them and to implement safe practices that show evidence of eliminating or reducing known hazards to patient safety when providing care.

These grants build on AHRQ's portfolio of patient safety research and dissemination, which represents an investment of \$165 million since fiscal year 2001. The

projects funded under this Request for Applications (RFA) will help health care institutions assess risks and implement patient safety practices, including research findings and tools developed through the Agency's patient safety research.

The Agency expects to award up to \$3 million to support the two types of projects, with approximately half the grant awards to be funded in each category. The Agency will provide up to 50 percent of the total cost of the projects under these cooperative agreements.

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## RFA for challenge grants

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Grant recipients will be required to provide a minimum of 50 percent of the total costs.

The Agency is interested in risk-assessment applications from organizations that are in the process of identifying risk areas. Grants in this area can be for up to \$200,000 for as long as 12 months. Grants for safe practice implementation projects from organizations that have identified a risk to be addressed by the safe practice, developed an implementation plan, and provided an evaluation plan to determine whether the safe practice was successful, can be for up to \$500,000 per year for as long as 24 months.

The Agency has announced this cooperative agreement in collaboration with the Patient Safety

Task Force established by the Secretary of the Department of Health and Human Services in 2001 to coordinate research efforts across the Department. The Task Force comprises AHRQ, the Centers for Disease Control and Prevention, the Centers for Medicare & Medicaid Services, and the Food and Drug Administration.

Letters of intent are due June 16, 2003; applications are due July 15, 2003. For more information on this RFA, go to the April 4, 2003, *NIH Guide to Grants and Contracts* at <http://grants.nih.gov/grants/guide/rfa-files/RFA-HS-03-005.htm>. In addition, a special technical assistance workshop and conference call is scheduled for June 12, 2003, at AHRQ's offices; call James Battles in the Center for Quality Improvement and Patient Safety at 301-594-9892 or e-mail him at [jbattles@ahrq.gov](mailto:jbattles@ahrq.gov) for details. ■

## AHRQ announces availability of the HCUP 2000 Kids' Inpatient Database

AHRQ has announced the availability of year 2000 data for the agency's Kids' Inpatient Database (KID), a unique and powerful database that researchers, policymakers, and others can use to identify, track, and analyze national trends in children's health care use, access, charges, quality of care, and outcomes. The 2000 KID contains data from approximately 1.9 million hospital discharges of children 20 years of age and younger in 27 states.

Go to [www.ahrq.gov/data/hcup/hcupkid.htm](http://www.ahrq.gov/data/hcup/hcupkid.htm) for examples of the types of analyses suited for KID, users who could benefit, technical details, and purchasing information. The KID is part of the Healthcare Cost and Utilization Project's Federal-State-industry partnership, which includes data organizations and participating States. ■

## International child health research meeting scheduled

A 1-day meeting, "International Child Health Services Research: Advancing Knowledge, Informing Action, Improving Child Health Care," will be held September 20, 2003, in Washington, DC, as an affiliate meeting of the 5th International Conference on the Scientific Basis of Health Services. The child health meeting is being cosponsored by the Agency for Healthcare Research and Quality and AcademyHealth.

This will be the first ever affiliate meeting focused on child health services research. The goal is to advance children's health care and health through the establishment of a strategic focus for international child health services research activities. The meeting will bring together leaders from diverse countries to address the current under-emphasis on children in the international dialogue on health care quality and improvement.

For more information, go to [www.icsbhs.org/affiliate.htm](http://www.icsbhs.org/affiliate.htm) or contact Lisa Simpson, Planning Committee Chair, ACH Guild Endowed Chair for Child Health Policy, [lsimpson@hsc.usf.edu](mailto:lsimpson@hsc.usf.edu) or Denise Dougherty, Senior Advisor for Child Health at AHRQ, [ddougher@ahrq.gov](mailto:ddougher@ahrq.gov). ■

## Mark your calendars now for TRIP 2003 meeting

The Agency for Healthcare Research and Quality is sponsoring the upcoming meeting, “Translating Research Into Practice (TRIP 2003): What’s Working? What’s Missing? What’s Next?” to be held July 22-24, 2003, at the Omni Shoreham Hotel in Washington, DC. Attendees will include health services researchers, clinicians, health care managers, payers, patient and consumer representatives, industry representatives, and policymakers.

From prevention to medication safety to surgical technique and more, evidence-based research findings must be translated into health care practices, protocols, policies, and systems that achieve needed and

measurable improvements in health care quality, patient safety, outcomes, and cost, use, and access.

Conference participants will examine successes and challenges in implementing research findings faced by patients, communities, physicians, practices, health care organizations, national and local governments, payers, educators, and the media.

Conference registration is \$400. Go to <http://www.blsmmeetings.net/TRIP> to register, or go to the AHRQ Web site at <http://www.ahrq.gov/research/trip03conf.htm> for more information on discussion topics and confirmed speakers. ■

## New publications now available from AHRQ

The following program note, methodology report, and research syntheses were published recently by the Agency for Healthcare Research and Quality. Go to the agency’s Web site at [www.ahrq.gov](http://www.ahrq.gov) to access the documents or see the back cover of *Research Activities* for ordering information.

### ***Compendium of AHRQ Research Related to Mental Health. Program Note 6 (AHRQ Publication No. 03-0001).***

AHRQ has a broad portfolio of mental health research and other related activities, ranging from intramural studies to grants, contracts, and workshops. This compendium provides an overview of the research and activities carried out or sponsored by AHRQ from 1989 to the present. The research projects and other activities are organized into broad sections such as extramural research grants/contracts, intramural research, and meetings sponsored by AHRQ. These broader sections are categorized into subject-matter areas:

extramural research is grouped by type of disorder or problem (such as depression) or a cross-cutting topic (such as pharmaceuticals); intramural research is grouped by health services research topics (such as access). Many of the entries include the information needed to access the research. Some research results are available in print as journal articles or AHRQ reports, and some are available on the Web or as audiotapes. Brief descriptions of findings are included when available.\*

### ***Sommers JP. Estimation of Expenditures and Enrollments for Employer-Sponsored Health Insurance. MEPS Methodology Report No. 14 (AHRQ Publication No. 03-0009).***

AHRQ conducts the Medical Expenditure Panel Survey (MEPS), a survey of health care use and spending. The MEPS Insurance Component (IC) is a survey of business establishments and governments in the United States. It is focused on employer-sponsored health insurance—by far

the largest source of health insurance in the United States. This report gives details of the enrollment and expenditure estimation process in the IC. Parts of this process use very standard statistical estimates. Where the estimation process deviates from standard methods, more detail is provided. The report also discusses changes in the data collected and the estimators used that have taken place since the first IC survey year.\*

**Research syntheses.** AHRQ’s research translation team produces the Research in Action series of publications, which synthesize AHRQ research findings on a particular topic, as well as related research from the field. Six syntheses have been published recently and are available from AHRQ.\*

- ***Using Informatics for Better and Safer Health Care. Research in Action No. 6 (AHRQ publication No. 02-0031).*** Medical informatics

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## New publications

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deals with all aspects of understanding and promoting the effective organization, analysis, management, and use of information in health care. This synthesis describes AHRQ-supported research into computer systems and software programs designed for use by clinicians to improve the quality of care, help with medication management, reduce costs, enhance patient self-management of chronic diseases, and help protect against bioterrorism and detect disease agents. Topics covered include the electronic medical record system, access to current information, clinical reminders, clinical decision support, electronic communication, and patient education.

- ***Prescription Drug Therapies: Reducing Costs and Improving Outcomes. Research in Action No. 8 (AHRQ Publication No. 02-0045).*** Prescription drug spending doubled from \$60.8 billion in 1995 to \$121.8 billion in 2000. This publication describes AHRQ-supported research on the cost-effective use of prescription drugs. This research helps to identify drug therapies that can lower health care costs while maintaining quality of care.
- ***Reducing Costs in the Health Care System: Learning from What Has Been Done. Research in Action No. 9 (AHRQ Publication No. 02-0046).*** Today's policymakers are searching for ways to decrease health care cost

inflation without reducing access to needed health care services or creating undue burdens for providers. This synthesis describes research conducted and funded by AHRQ that focuses on the dynamic or interactive effects of cost-containment strategies, estimating the likely effects of efforts in one sector on the rest of the system.

- ***AHRQ Tools and Resources for Better Health Care. Research in Action No. 10 (AHRQ Publication No. 03-0008).*** This report describes the tools and resources that AHRQ makes available to health care policymakers, administrators, employers and other purchasers of health insurance, clinicians, and consumers. These include data resources and tools such as the Medical Expenditure Panel Survey (MEPS), the Healthcare Cost and Utilization Project (HCUP), HIVnet, CAHPS® (formerly known as the Consumer Assessment of Health Plans Study), the Hospital Bioterrorism Preparedness Tool, and Put Prevention into Practice (PIIP). Online resources available from AHRQ include the National Guideline Clearinghouse, the Child Health Toolbox, and AHRQ's Qualify Indicators.
- ***AHRQ Tools for Managed Care. Research in Action No. 11 (AHRQ Publication No. 03-0016).*** Managed care organizations need ready access to a comprehensive array of evidence-based clinical information and other clinical performance measures to enable them to evaluate their providers' performance and identify areas where

improvement is needed. AHRQ has funded research to compile a database of evidence-based clinical guidelines and to develop clinical performance measures, member satisfaction surveys, and preventive care recommendations. This synthesis describes these tools and how they have been used and provides information on sources of additional information.

- ***Advance Care Planning: Preferences for Care at the End of Life. Research in Action No. 12 (AHRQ Publication No. 03-0018).*** The aging of the population has given new importance to the need for end-of-life discussions and advance directives. Although research funded by AHRQ indicates that advance directives are underused, it also shows that most patients are willing to discuss end-of-life options with their doctors. Research also shows that while such discussions are usually reserved for the terminally ill, advance care planning is also a good idea for people suffering from chronic illnesses. This synthesis of findings from AHRQ-funded studies shows that fewer than half of severely or terminally ill patients have an advance directive in their medical record. Only 12 percent of patients who have advance directives had help from physicians in developing them. Between 65 and 76 percent of physicians were unaware of the existence of an advance directive. ■

## Grant final reports now available from NTIS

The following grant final reports are now available for purchase from the National Technical Information Service. Each listing identifies the project's principal investigator (PI), his or her affiliation, grant number, and project period and provides a brief description of the project. See the back cover of *Research Activities* for ordering information.\*\*\*

Records of all 750,000 documents archived at the National Technical Information Service—including many AHRQ documents and final reports from all completed AHRQ-supported grants—can now be searched on the new NTIS Web site. Also, all items in the database from 1997 to the present now can be downloaded from the NTIS Web site. Documents from 1-20 pages are free; documents 21 pages and over are \$8.95 per download. Go to [www.ntis.gov](http://www.ntis.gov) for more information.

**Editor's note:** In addition to these final reports, you can access information about these projects from several other sources. Most of these researchers have published interim findings in the professional literature, and many have been summarized in *Research Activities* during the course of the project.

To find information presented in back issues (1995-present) of *Research Activities*, go the AHRQ Web site at [www.ahrq.gov](http://www.ahrq.gov) and click on "Research Activities: Online Newsletter" and then "Search Research Activities." To search for information, enter either the grant/contract number or principal investigator's name in the query line. A reference librarian can help you find related journal articles through the National Library of Medicine's Pub Med.

***Closing the Gap: Applying Injury Prevention Science to Patient***

***Safety.* Stephen W. Hargarten, M.D., M.P.H., Medical College of Wisconsin, Milwaukee. AHRQ grant HS10111, project period 8/15/00-8/14/01.**

Thirty-two injury prevention scientists and patient safety experts met from around the country to discuss the applicability of injury prevention principles to patient safety and to develop a research agenda using injury control and public health approaches to enhance current efforts to increase patient safety. Participants discussed the utility of the phase factor matrix for both analysis of causal relationships and identification of intervention strategies. Recommendations for better, more informative data were made, and several specific research projects highlighting the utility of the injury prevention approach were presented. Participants made several specific recommendations for increased data, conceptualization of definitions, and specific research areas that should be pursued. This report summarizes the conference. (Abstract and executive summary, NTIS accession no. PB2003-101394; 34 pp, \$25.50 paper, \$12.00 microfiche)\*\*\*

***Determinants of Nursing Home Residents' Hospital Use.* Orna Intrator, Ph.D., Brown University, Providence, RI. AHRQ grant HS09723, project period 7/1/98-6/30/01.**

Previous research has shown that many hospitalizations from nursing homes are avoidable. This study of facility characteristics that influence hospitalizations of long-stay nursing home residents found that, on average, 14 percent of long stayers in urban facilities were hospitalized in a 6-month period, and 3 percent of these residents were hospitalized with dehydration.

Hospitalization rates varied among facilities from 0 to 45 percent. Facilities that operated with more physicians and physician extenders and those that conducted on-site training and evaluations of nurse aides were less likely to hospitalize their residents. States with higher Medicaid payment rates and case-mix reimbursement methods had reduced hospitalization rates. These findings need to be re-examined in more States and post-Prospective Payment System (PPS). Findings from this study could be used to guide facilities and policymakers in organizing and regulating medical and nursing care for patients. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101393; 100 pp, \$29.50 paper, \$17.00 microfiche)\*\*\*

***Does Primary Care Access Decrease Respiratory Emergency Department Visits?* Robert A. Lowe, M.D., M.P.H., University of Pennsylvania, Philadelphia. AHRQ grant HS09261, project period 6/1/98-5/31/02.**

The objective of this project was to determine the association between primary care practice (PCP) site characteristics and emergency department (ED) use among members of a Medicaid managed care organization, after adjusting for patient characteristics. Study personnel visited PCPs affiliated with a Medicaid HMO to ascertain characteristics of the practices. Administrative data from the HMO were used to determine rates of ED use for the patients assigned to the practices and to determine patient demographics and chronic medical conditions. Overall ED use rates were studied, along with several subsets of ED visits, to determine the independent association between PCP site

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characteristics and ED use. The researchers studied 57,850 HMO enrollees at 353 primary care practice sites. The overall ED use rate was 0.80 ED visits per member-year. Several practice site characteristics, including evening hours, proportion of patients covered by Medicaid in the practice, active patients per clinician-hour, and availability of peak flow meters and nebulizers, were significantly associated with use of EDs by Medicaid patients assigned to those practices.

(Abstract, executive summary, and final report, NTIS accession no. PB2003-101415; 48 pp, \$25.50 paper, \$12.00 microfiche)\*\*\*

### ***Expert System Diagnosis of Depression and Dementia.***

**Roderick K. Mahurin, Ph.D., Battelle Memorial Institute, Seattle, WA. AHRQ grant HS09828, project period 9/30/98-9/29/99.**

This project involved development of a computer-based expert system to assist mental health practitioners in differentiating depression and dementia. These two disorders are present with high frequency in primary care settings, yet they often are difficult to differentiate. The decision rules used by the system were derived from published lists of clinical features that distinguish depression from dementia, as well as specific suggestions from experienced medical and mental health practitioners. A clinician interacts with the system through a straightforward question and answer format or alternatively by submitting prepared tables of clinical data. One of the following four outcome classifications is presented for consideration by the

clinician, along with reasoning behind the decision: depression, dementia, dementia with depression, or other disorder. Clinical and test data from 1,858 cases seen by a neuropsychology service at a major medical center were entered into the system. The system correctly classified 92 percent of these cases. With increased acceptance, such expert systems have the potential to provide diagnostic and treatment recommendations in medical settings without ready access to clinical specialists, such as in rural health care settings and underserved urban areas. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101521; 24 pp, \$23.00 paper, \$12.00 microfiche)\*\*\*

***Nephrologist Care and Outcomes in Renal Insufficiency.*** Jerome L. Avorn, M.D., Brigham & Women's Hospital, Boston, MA. AHRQ grant HS09398, project period 9/30/98-9/29/99.

The researchers found that patients with chronic kidney disease who see a nephrologist excessively late during the course of their disease are at risk of experiencing several detrimental outcomes: inadequate preparation of vascular access for hemodialysis, higher mortality once on renal replacement therapy, and lower access to renal transplantation. Patients who are most likely to experience delayed referral to a nephrologist are of low socioeconomic status and minority race. All of these outcomes are costly to society by way of loss of life, higher health care costs, and also by means of creating inequalities or enhancing those that already exist. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101420; 14 pp, \$23.00 paper, \$12.00 microfiche)\*\*\*

***Organizational Infrastructure for Patient Safety.*** Robert L. Wears, M.D., M.S., University of Florida, Gainesville. AHRQ grant HS10952, project period 3/1/01-2/28/02.

Safety efforts in health care have focused primarily on the "lower level" factors such as workers, their tools, the work team, and the environment. Factors considered basic to safety in other industries, e.g., institutional culture and the social-regulatory-economic environment, have not yet received much attention. This 2-day conference brought together 34 experts from organizational behavior, health care management, and health systems research to begin focusing on these higher level factors. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101412; 50 pp, \$25.50 paper, \$12.00 microfiche)\*\*\*

***Pediatric Emergency Care: Severity and Quality.*** Murray M. Pollack, M.D., Children's Research Institute, Washington, DC. AHRQ grant HS10238, project period 9/30/99-9/30/02.

The goals of this project were to investigate emergency department (ED) factors associated with quality of pediatric care using a nationally applicable model to control for severity of illness in the ED. Institutional care factors chosen for investigation included patient volume (high/low), presence or absence of pediatric emergency medicine specialists, and presence or absence of residents. EDs were randomly selected from all U.S. hospitals with pediatric ICU capabilities, using a stratified design to provide equal representation of hospitals with and without the three care factors. Logistic regression and generalized

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estimating equations (GEE), to account for patient clustering effects, were used to model the outcome of mandatory admission. Admission errors and discharge errors were calculated by comparing observed to expected based on the GEE model. Hospitals submitted records for 729 patients each, for a total sample of 11,664 patients. A severity model was developed which performed well. Total errors (admission plus discharge) were strongly associated with residents; there was no association with other care factors. After controlling for severity of illness and patient clustering among institutions, the presence of

residents was associated with admission decisionmaking errors in the ED. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101524; 36 pp, \$25.50 paper, \$12.00 microfiche)\*\*\*

### ***Uniting Practice and Research in Long-Term Care.* Larry W. Lawhorne, M.D., AMDA Foundation, Columbia, MD. AHRQ grant HS10967, project period 9/30/01-9/29/02.**

The AMDA Foundation Research Network held its first annual meeting in Dallas, TX, November 3-4, 2001. The chief goal was to develop ideas for research that will provide a systematic base of evidence for providing health care in a long-

term care (LTC) setting. A major goal is the development of an LTC practice-based research network. Timely questions currently facing the field include the effectiveness of clinical practice guidelines in improving care: how disease management programs work in LTC, and how physicians can help create evidence-based practices for LTC. Over the course of this day-and-a-half meeting, participants generated topics for possible research projects, crafted a research agenda for the future, and developed five network research projects. (Abstract, executive summary, and final report, NTIS accession no. PB2003-101414; 18 pp, \$23.00 paper, \$12.00 microfiche)\*\*\* ■

**Correction:** The Research Briefs section of the December issue of *Research Activities* (page 29) presented a summary of a recent article by Steven Hill and colleagues. The summary contained a misstatement with regard to underfunding of Medicaid managed care programs for SSI beneficiaries. A revised summary of Dr. Hill's article appears this month in the Research Briefs section (page 31). ■

## Research Briefs

**Ambler, G., Royston, P., and Head, J. (2003).** "Non-linear models for the relation between cardiovascular risk factors and intake of wine, beer and spirits." *Statistics in Medicine* 22, pp. 363-383.

Substantial evidence suggests that moderate consumption of alcohol is associated with reduced risk of coronary heart disease (CHD). However, it is not clear whether this benefit is derived by consuming a particular type of alcoholic drink, for example, wine. These authors propose two types of models designed to detect differential effects of beverage type on known CHD risk factors, such as cholesterol and blood pressure,

using data from a large longitudinal study of British civil servants. The results suggest that gram for gram of alcohol, the effect of wine differs from that of beer and spirits, particularly for systolic blood pressure. In particular, increasing wine consumption was associated with slightly more favorable levels of all three risk factors studied: high density lipoprotein cholesterol, fibrinogen, and systolic blood pressure in men (only systolic blood pressure for women). Nevertheless, these findings are tentative, and the apparent benefit of consuming wine instead of other alcoholic beverages may be relatively small.

**Cho, S-H. (2003, January).** "Using multilevel analysis in patient and organizational outcomes research." *Nursing Research* 52(1), pp. 61-65.

A traditional approach to analyzing multilevel data has been to aggregate individual-level variables at the institutional level. However, multilevel modeling allows researchers to examine simultaneously the effect of individual-level as well as group-level predictors on the variable of interest. These researchers present a two-level model employing multilevel logistic regression analysis to examine the relationship between nurse staffing and the

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probability of pneumonia developing in patients after surgery. The level 1 model compared patients with pneumonia who were discharged from the same hospital. The level 2 model took into account the differences between hospitals and explained those differences in terms of hospital characteristics. Model 3 (the combined model) indicated that patient characteristics had strong relationships with risk for developing pneumonia. Contrary to previous studies, the combined model, which accounted for both individual and hospital differences, did not suggest that greater nurse staffing would reduce postsurgical pneumonia.

**Farley, D.O., Elliott, M.N., Short, P.F., and others. (2002, September). "Effect of CAHPS performance information on health plan choices by Iowa Medicaid beneficiaries." *Medical Care Research and Review* 59(3), pp. 319-336.**

This study examined whether Consumer Assessment of Health Plans Study (CAHPS®) information on health plan performance affected health plan choices by new beneficiaries in Iowa Medicaid. The investigators randomly assigned new cases entering Medicaid in selected counties during February through May 2000 to experimental or control groups. The control group received standard Medicaid enrollment materials, and the experimental group received these materials plus a CAHPS report. The CAHPS information did not affect health

plan choices by Iowa Medicaid beneficiaries, similar to its impact on New Jersey Medicaid beneficiaries. However, CAHPS information did affect plan choice in an earlier laboratory experiment. The value of this information may be limited to receptive consumers who actively study the information received, and even then, only when ratings of available plans differ greatly, ratings differ from prior beliefs about plan quality, and reports are easy to understand.

**Hill, S.C., Thornton, C., Trenholm, C., and Woolridge. (2002, summer). "Risk selection among SSI enrollees in TennCare." *Inquiry* 39, pp. 152-167.**

The issue of risk selection is especially important for States that enroll blind and disabled beneficiaries of Supplemental Security Income (SSI) in Medicaid managed care. SSI beneficiaries have persistent needs for care, have a wide variety of chronic conditions, and often need atypical and complex services. Risk selection occurs when the health care needs of beneficiaries enrolled in a specific plan differ systematically from the needs of the overall beneficiary population, and payments do not reflect those needs. These authors assess the extent of risk selection among managed care plans for SSI beneficiaries over the first 3 years of Tennessee's Medicaid managed care program, TennCare. Using claims data containing fee-for-service expenditures prior to enrollment in managed care, they found substantial evidence of persistent risk selection among

plans. Results are robust to most alternative measures of risk selection for most plans. Reprints (AHRQ Publication No. 02-R092) are available from AHRQ.\*\*

**Jensvold, N.G., Lieu, T.A., Chi, F.W., and others. (2003). "Strategies for surveying families of Medicaid-insured children by telephone." *Journal of Health Care for the Poor and Underserved* 14(1), pp. 17-22.**

The growing use of managed care for impoverished Medicaid populations has raised concerns that quality of care will suffer due to cost-containment efforts. It is difficult to collect data from Medicaid-insured individuals about their quality of care, since they are very unresponsive to surveys. However, telephone interviewing can complete an acceptable rate of interviews with this group at a reasonable cost, concludes this study. The authors describe strategies used for locating families and completing telephone and mail surveys with parents of Medicaid-insured children in five health plans in a study of the quality of pediatric asthma care. They analyzed the proportion of completed interviews contributed by each strategy, stratified by health plan. Completed interviews required a median of five calls, using as many as seven different telephone numbers in some cases. Nevertheless, the researchers completed 1,889 interviews using 3,611 interviewer hours for a total interviewing cost of \$67,792 and an average cost of \$36 per completed interview. ■

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