Research Activities

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Highlights

Departments

Regular Features

Relying on clinical guidelines to treat young infants with fevers may not improve outcomes

Experienced pediatricians who relied on their clinical judgment more than existing clinical guidelines were able to minimize hospitalizations and avoid unnecessary lab testing for infants with fevers without a negative impact on the outcomes of care, according to a recent study supported in part by the Agency for Healthcare Research and Quality (HS06485).

Underlying conditions associated with fever symptoms in infants are difficult to recognize and range from minor illnesses to those that are life threatening. Expensive strategies that include hospitalization, extensive laboratory testing, and intravenous antibiotics traditionally have been used for diagnosis and treatment of infants with fever to protect against bacterial meningitis and bacterial blood infections. Illnesses such as these affect approximately 2 percent to 3 percent of infants with fevers.

Researchers led by Robert H. Pantell, M.D., of the University of California, San Francisco, worked with more than 573 clinicians' offices in 44 States that were part of the American Academy of Pediatrics' Pediatric Research in Office Settings Network from 1995 to 1998. The more than 3,000 infants in the study were aged 3 months or younger, had a fever of at least 100.4°F, and had no other major health problems (such as congenital anomalies, extreme prematurity, or conditions associated with organ system failure). At the time of the study, clinical practice guidelines for treating infants with fevers recommended that all infants under 1 month of age be hospitalized and treated with antibiotics and that laboratory tests be routinely performed on all infants younger than 3 months. This remains the current standard of care.

The researchers found that clinicians followed clinical practice guidelines to treat infants with fevers 42 percent of the time. Clinicians performed

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Clinical guidelines

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lab tests in 75 percent of the infants and treated 57 percent with antibiotics. In the first month of life, 40 percent fewer infants were hospitalized when clinicians did not follow guidelines. Rather than hospitalization, the clinicians saw many infants in repeated office visits and had frequent telephone followup. The infants who were treated in the office and with followup visits experienced similar results compared with those who would have been treated following the guidelines.

For more information, see "Management and outcomes of care of fever in early infancy," by Dr. Pantell, Thomas B. Newman, M.D., M.P.H., Jane Bernzweig, Ph.D., and others, in the March 10, 2004 *Journal of the American Medical Association* 291(10), pp. 1203-1212. ■

Clinical Decisiomaking

Undiagnosed angina is common and is associated with a two-fold risk of death when ECGs are abnormal

Although most people with symptoms of heart attack seek medical care and obtain a diagnosis from a doctor, people with angina (crushing chest pain that usually occurs during exertion) do not necessarily seek medical care. In fact, an 11-year study of a large group of British civil servants in the 1990s found that over half of them had undiagnosed angina. Furthermore, those with undiagnosed angina and abnormal electrocardiograms (ECGs) at baseline had more than double the risk of death compared with individuals who did not have angina. This risk was similar to those with diagnosed angina and abnormal ECGs. Both groups also had a similar increased risk of non-fatal heart attack and impaired physical functioning.

Researchers who were supported in part by the Agency for Healthcare Research and Quality (HS06516) and led by Michael Marmot, Ph.D., M.P.H., of the University of Glasgow, examined recurrent angina, quality of life (physical functioning), and non-fatal heart attack among 10,308 British civil servants aged 35-55 years at the beginning of the 11-year study. They also examined death from any cause for 344 participants. Overall, 11.4 percent of the civil servants developed angina, and 74 percent had no evidence of a diagnosis by a doctor at the time of the initial report.

Of these, 65 percent reported angina again during followup and remained without a diagnosis. Among those with an abnormal ECG result, the absolute risk of non-fatal heart attack was similar in those without a diagnosis by a doctor (15 percent) and those with a diagnosis (16 percent). Also, compared with civil servants without angina, those with undiagnosed and diagnosed angina had 2.36 and 3.19 times greater risk, respectively, of impaired physical functioning. These findings underscore the importance of greater vigilance in diagnosing angina so that more patients can be treated.

More details are in "Prognosis of angina with and without a diagnosis: 11 year follow up in the Whitehall II prospective cohort study," by Harry Hemingway, M.D., M.P.H., Martin Shipley, M.Sc., Annie Britton, Ph.D., and others, in the October 18, 2003 *British Medical Journal*, pp. 1-5. ■

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

Mary L. Grady, Managing Editor
Gail Makulowich, Contributing Editor
Joel Boches, Design and Production
Karen Migdail, Media Inquiries

Patients with cardiac complications following noncardiac surgery are more likely to have other complications as well

Patients undergoing noncardiac surgery who experience a cardiac complication are more likely than other patients to develop another type of complication and to have a prolonged hospital stay, according to a recent study that was supported by the Agency for Healthcare Research and Quality (HS06573). The study was led by Lee Goldman, M.D., M.P.H., of the University of California, San Francisco.

The researchers collected data on 3,970 patients aged 50 years or older who were undergoing major noncardiac procedures at one hospital. They performed serial electrocardiograms and cardiac enzyme measurements during each patient's hospital stay and recorded cardiac and noncardiac complications and their effects on length of hospital stay.

Cardiac complications occurred in 2 percent of patients, and noncardiac complications developed in 13 percent. One percent of patients suffered from both types of complications. The most common cardiac complications were pulmonary edema (42 patients) and heart attack (41 patients). The most common noncardiac complications were wound infection, confusion, respiratory failure requiring intubation, deep venous thrombosis, and bacterial pneumonia.

Patients with cardiac complications were more than six times as likely as those without complications to suffer a noncardiac complication, even after adjustment for preoperative clinical factors. Compared with patients who suffered no complications, those who had cardiac or noncardiac complications stayed in the hospital a mean of 11 days longer, and those who had both types of complications stayed a mean of 15 days longer, even after adjustment for procedure type and clinical factors.

See "Association between cardiac and noncardiac complications in patients undergoing noncardiac surgery: Outcomes and effects of length of stay," by Kirsten E. Fleischmann, M.D., M.P.H., Dr. Goldman, Belinda Young, M.S., and Thomas H. Lee, M.D., S.M., in the November 2003 *American Journal of Medicine* 115, pp. 515-520. ■

Renal disease progression is not slower among women than men, and it may even be faster

End-stage renal disease is expected to affect more than 650,000 individuals in the United States by 2010. Contrary to earlier reports, a new study shows that renal disease progression is not slower in women than in men, and it may even be faster. Thus, doctors should not treat women with chronic renal disease less intensively than men, conclude Christopher H. Schmid, Ph.D., of New England Medical Center, and his colleagues.

In a study supported by the Agency for Healthcare Research and Quality (HS13328 and HS10064), the researchers analyzed a pooled database of patients with non-diabetic renal disease, who were enrolled in 11 randomized controlled trials evaluating the efficacy of angiotensin-converting enzyme (ACE) inhibitors for slowing renal disease progression. They defined renal disease progression as a

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doubling of serum creatinine (a protein end product of metabolism found in blood and muscle, which is thought to be produced in lower rates by women due to lower muscle mass and meat intake) or onset of end-stage renal disease (ESRD, kidney failure requiring dialysis).

The researchers examined the independent effect of sex on these end points, after adjusting for patient characteristics and changes from baseline to followup systolic blood pressure (SBP) and urine protein (UP) excretion, factors that also affect renal disease progression. The 645 women (most of whom were postmenopausal) and 1,215 men were followed for a mean of 2.2 years. Overall, nearly 17 percent of the patients had a doubling of baseline serum creatinine, and 9.5 percent developed ESRD. Women had a 32 to 36 percent higher risk than men of doubling baseline serum creatinine, after adjustment for other factors. Similar differences between women and men were found for development of ESRD. The researchers caution, however, that because most women in the database used for this study were of postmenopausal age, these findings may not extend to younger women.

See "The rate of progression of renal disease may not be slower in women compared with men: A patient-level meta-analysis," by Tazeen H. Jafar, M.D., M.P.H., Dr. Schmid, Paul C. Stark, Sc.D., and others, in *Nephrology, Dialysis, Transplantation* 18, pp. 2047-2053, 2003. ■

EXCEED projects focus on prevention and treatment of cardiovascular disease

Three recent studies conducted by the Medical University of South Carolina Excellence Center to Eliminate Ethnic and Racial Disparities (EXCEED) focused on ways to reduce and control cardiovascular disease. The studies, which are summarized here, were supported in part by the Agency for Healthcare Research and Quality (HS10871).

The first study demonstrates that controlling blood pressure in half of all hypertensive patients by 2010 is a formidable goal, but it could be achieved with a coordinated strategic plan. The second study focuses on the potential of primary care audit and feedback programs to better control patients' cardiovascular risk factors and identify group disparities in treatment and outcomes. The third study suggests that a diet high in fiber may reduce inflammation associated with cardiovascular disease.

Egan, B.M., and Basile, J.N. (2003, November). "Controlling blood pressure in 50 percent of all hypertensive patients: An achievable goal in the Healthy People 2010 report." ***Journal of Investigative Medicine*** **51(6), pp. 373-385.**

Treatment of hypertension dramatically reduces the occurrence of congestive heart failure, stroke, and coronary heart disease. However, only about 3 in 10 adult Americans with hypertension have blood pressure (BP) values that are controlled to the goal of less than 140/90 mm Hg. The Healthy People 2010 report has set a goal for Americans and their health care providers to raise BP control rates from the current 31 percent to 50 percent of all hypertensive patients. Despite formidable barriers to this goal, it may be achievable with a coordinated strategic plan, according to this study.

To control hypertension in half of all treated patients would require raising awareness of hypertension (at least or greater than 140 systolic and greater than 90 diastolic) to 80 percent of all hyptertensives (from the current 63 percent); ensuring

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EXCEED projects

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treatment of 90 percent (from the current 84 percent) of aware hypertensives; and controlling BP to less than 140/90 mm Hg in 70 percent (compared with the current 53 percent) of treated patients, explain the researchers. They briefly reviewed selected research studies to assess the cardiovascular benefits of controlling hypertension, focusing particularly on factors that affect hypertension awareness, treatment, and control.

Based on the review, they identified four barriers to optimizing BP control: systems, providers, patients, and treatment factors. For example, systems factors range from limited access to regular primary care and medication to lack of appointment reminders. Providers often are not aware of the BP control rate in patients or fail to adjust medications when BP is not controlled. Patients fail to seek or receive preventive care services or don't adhere to medication or lifestyle recommendations. Finally, lack of treatment efficacy is a major impediment to reaching the Healthy People 2010 goal.

Hendrix, K.H., Lackland, D.T., and Egan, B.M. (2003, November). "Cardiovascular risk factor control and treatment patterns in primary care." ***Managed Care Interface*** **16(11), pp. 21-26.**

The researchers worked collaboratively with 201 providers at 63 primary care sites in South Carolina to assess BP control rates, treatment patterns, and disparities among patients with hypertension, diabetes, and dyslipidemia (lipoprotein metabolism disorders such as high total cholesterol). They asked the providers to contribute medical record information regarding patient risk factor levels, medications, and coexisting illnesses to the Hypertension Initiative database, which was launched in January 2000.

Providers received quarterly reports summarizing the risk-group distribution and percentages of their patients who reached BP, cholesterol, and blood-sugar (glycosylated hemoglobin) goals. Providers also received a list detailing the medications used for patients in each risk group. Nearly half (49 percent) of patients with hypertension achieved a normal BP of less than 140/90 mm Hg. Also, 62 percent of hypertensive patients who also had dyslipidemia achieved a low-density lipoprotein cholesterol (so-called "bad" cholesterol) of less than 130 mg/dL, although fewer than one-third met the more stringent goal of less than 100 mg/dL.

In 49 percent of patients with hypertension and diabetes, glycosylated hemoglobin levels reached the target of less than 7 percent. However, control of more than one cardiovascular risk factor in an individual was low, especially among women and blacks. This suggests that more specifically tailored treatment guidelines are needed for these very high-risk groups.

King, D.E., Egan, B.M., and Geesey, M.E. (2003, December). "Relation of dietary fat and fiber to elevation of C-reactive protein." ***American Journal of Cardiology*** **92, pp. 1335-1339.**

Dietary fiber may reduce inflammation associated with cardiovascular disease, suggests this study. To investigate whether consumption of specific food components is associated with elevation of C-reactive protein (CRP), an indicator of inflammation that is thought to increase the risk of cardiovascular disease (CVD), the researchers examined the relation of dietary fiber, fat, and other dietary factors to CRP levels in 4,900 adults who participated in the 1999 to 2000 National Health and Nutrition Examination Survey (NHANES).

After controlling for demographic factors, body mass index, smoking, alcohol consumption, exercise, and total caloric intake, those in the third and fourth highest quartiles of fiber consumption had a 36 percent lower risk of elevated CRP (>3.0 mg/L)) compared with those in the lowest quartile. Each additional gram of fiber consumed per day was associated with a 2 percent lower risk of elevated CRP.

Saturated fat was modestly associated with elevated CRP. Individuals in the third and fourth highest quartile of consumption had 58 percent and 44 percent higher risk of elevated CRP, respectively. Consumption of other types of fat was not consistently related to greater risk of elevated CRP. Total calories, protein, carbohydrate, fish, and cholesterol consumption were not associated with the risk of elevated CRP. ■

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Studies show low physician adherence to clinical guidelines for managing pneumonia and heart disease

Electronic medical record systems and computer-based reminders have been cited as ways to improve physicians' compliance with evidence-based clinical practice guidelines. However, a new study supported by the Agency for Healthcare Research and Quality found that other factors, such as physician specialty and attitudes toward guidelines, also affect use of guidelines for managing pneumonia. Another AHRQ-supported study showed that computer-generated guidelines for managing heart disease failed to improve physicians' and pharmacists' adherence to the guidelines. The studies are discussed here.

Switzer, G.E., Halm, E.A., Chang, C., and others. (2003, October.) "Physician awareness and self-reported use of local and national guidelines for community-acquired pneumonia." (HS08282) ***Journal of General Internal Medicine*** **18, pp. 816-823.**

This survey of 352 physicians who managed patients with community-acquired pneumonia (CAP) at seven Pittsburgh hospitals revealed low levels of awareness and use of clinical guidelines for managing CAP. Overall, 48 percent of the doctors reported being influenced by American Thoracic Society (ATS) guidelines, but only 20 percent reported using these guidelines. Also, 48 percent of doctors were uncertain whether a local (hospital-developed) CAP guideline existed, and only 28 percent of physicians who knew a local guideline existed said that they frequently used the guideline.

Three variables were independently associated with use of ATS guidelines: practicing as a pulmonary or infectious disease specialist, spending more time on nonpatient-related activities such as teaching, and scoring higher on the personality trait "intellect." Use of local guidelines was negatively associated with practice as an infectious disease or pulmonary medicine specialist and positively associated with positive attitudes toward practice guidelines. The researchers conclude that more effective implementation strategies will be necessary to encourage compliance with practice guidelines for the management of CAP.

Tierney, W.M., Overhage, J.M., Murray, M.D., and others. (2003, December). "Effects of computerized guidelines for managing heart disease in primary care." (HS07763). ***Journal of General Internal Medicine*** **18, pp. 967-976.**

Although interventions such as computer reminders have increased adherence to preventive care guidelines, there is less experience with their use in managing chronic illnesses, and their effects have been inconsistent. For example, this study found that patient-specific care suggestions for managing heart disease in primary care, which were generated by a sophisticated electronic medical record system, failed to improve physicians' and pharmacists' adherence to accepted practice guidelines or outcomes of heart disease patients.

The researchers randomized physicians and pharmacists to either intervention or control groups. Using data from each patient's electronic medical record and data entered by the physicians (for example, vital signs and symptoms), the workstation generated patient-specific, guideline-based cardiac care suggestions for 706 patients (with heart failure and/or ischemic heart disease) of intervention physicians and pharmacists. For patients in the physician and pharmacist control group, these suggestions were withheld.

Patients were followed for 1 year, during which they made 3,419 primary care visits and were eligible for 2,609 separate cardiac care suggestions. The computer-generated guidelines had no significant effect on physicians' or pharmacists' adherence to the care suggestions or on any patient outcome. The physicians and pharmacists may have found the intervention intrusive and time consuming. On the other hand, the system may have been more powerful if it required physicians to either comply with each suggestion or document their reasons for not complying. ■

Women with estrogen-positive breast tumors should not increase their intake of soy or other phytoestrogens

Given the current data, women with a history of estrogen receptor-positive (ER+) tumors should not increase their intake of soy or other phytoestrogens, according to a review of studies on the topic. The review was supported in part by the Agency for Healthcare Research and Quality (T32 HS00011).

Chemotherapy for breast cancer may induce or accelerate ovarian failure, often causing severe menopausal symptoms. In addition, the drug tamoxifen, used as additional therapy to prevent breast cancer proliferation or recurrence, often causes hot flashes. Reducing menopausal symptoms with hormone replacement therapy is not an option for breast cancer survivors, since the hormone estrogen is linked to breast cancer development. Thus, some women (up to 12 percent in one study) increase soy in their diets to minimize these symptoms.

Soy contains plant-based phytoestrogens (weak estrogens), mainly isolavones, of which genistein is the most prevalent. For instance, there is some limited clinical evidence that genistein can stimulate breast cancer growth. In addition, in women with ER+ tumors who are likely to be taking tamoxifen, genistein may interfere with the drug's antitumor activity.

For women with tumors that are estrogen receptor-negative (ER-), genistein may inhibit breast cancer cell growth, and it may be reasonable for these women to safely consume soy and possibly other phytoestrogens. However, the optimal amount and source are unknown. In addition, ER status is not absolute, and patients who have ER- tumors may have some element of ER positives or could develop ER+ tumors. They should be informed of this possibility, according to the researchers who conducted the study. They reviewed the current clinical evidence on the relationship between phytoestrogens and breast cancer and its implications for phytoestrogen consumption by breast cancer survivors.

See "Phytoestrogens: Potential benefits and implications for breast cancer survivors," by Christine Duffy, M.D., M.P.H., and Michele Cyr, M.D., in the September 2003 *Journal of Women's Health* 12(7), pp. 617-631. ■

Patients who undergo surgery for gastroesophageal reflux disease use less care later than those who receive only medications

An estimated 7 percent of Americans suffer from daily heartburn, and 15 to 44 percent suffer from heartburn monthly. This is often due to gastroesophageal reflux disease (GERD), a condition of abnormal acid exposure in the esophagus that leads to symptoms such as heartburn and regurgitation.

For many patients, reflux disease is a chronic disorder requiring lifelong therapy and increasing the risk of other serious esophageal disease. Patients who undergo surgery for GERD will use fewer GERD-related medications and outpatient visits than those who are treated only with medication, according to a study supported in part by the Agency for Healthcare Research and Quality (HS10384) through the Centers for Education and Research on Therapeutics (CERTs) program.

Wayne A. Ray, Ph.D., principal investigator at the Vanderbilt University CERT, and his colleagues studied matched groups of Tennessee Medicaid patients diagnosed with GERD receiving either surgery or medical therapy from 1996 through 2000. The 200 patients in the medically treated group were randomly matched to the 111 patients in the surgical group by demographic characteristics and previous use of acid-suppressing drugs. In 1996, all patients in the surgical group underwent fundoplication (surgery that creates a one-way valve in the esophagus to allow food to pass into the stomach but prevent stomach acid from flowing back up into the esophagus, thus preventing GERD). Patients in the medical group were treated without fundoplication.

During the 4-year followup period, the surgical group had fewer GERD-related outpatient physician visits (5.5 vs. 6.7 visits). During each year of followup, the proportion of patients using GERD medications was lower in the surgical group than in the medication only group (0.67 vs. 0.93 in year 1; 0.67 vs. 0.91 in year 2; 0.72 vs. 0.85 in year 3; and 0.74 vs. 0.90 in year 4, respectively).

See "Health care utilization after medical and surgical therapy for gastroesophageal reflux disease," by Leena Khaitan, M.D., M.P.H., Dr. Ray, Michael D. Holzman, M.D., M.P.H., and Walter E. Smalley, M.D., M.P.H., in the December 2003 *Archives of Surgery* 138, pp. 1356-1361. ■

Researchers examine physician prescribing of closely controlled antiarrhythmic drugs dofetilide and Betapace AF

An estimated 2 million people in the United States suffer from atrial fibrillation or atrial flutter. In these conditions of rapid irregular heartbeat, the heart's upper two chambers or atria quiver rather than beat, so that blood pools and may clot in the chambers. The danger is that a piece of clot will break off and lodge in the brain, a common cause of stroke.

Both dofetilide and a brand of sotalol, Betapace AF, were approved specifically for treatment of atrial fibrillation or atrial flutter by the U.S. Food and Drug Administration (FDA) in 2000. However, since dose-dependent torsades de pointes, a potentially life-threatening cardiac arrhythmia, has been shown to occur with dofetilide and Betapace AF, detailed dosing and monitoring recommendations to minimize this risk are included in the product labeling for both drugs.

The FDA also required the manufacturer of dofetilide to develop a risk management program that requires prescribing physicians to complete a dofetilide education program and restricts availability to only those physicians who have completed the educational program. Because sotalol had already been marketed in the United States for ventricular arrhythmias since 1993, a risk-management program was not required for Betapace AF. The following two studies, which were supported in part by the Agency for Healthcare Research and Quality (HS10548) and conducted at the Duke Center for Education and Research on Therapeutics (CERT), examine the impact of these risk management strategies on physician prescribing practices.

LaPointe, N.M., Pamer, C.A., and Kramer, J.M. (2003). "New antiarrhythmic agents for atrial fibrillation and atrial flutter: United States drug market response as an indicator of acceptance." *Pharmacotherapy* 23(10), pp. 1316-1321.

The restricted distribution and required education program for dofetilide, as well as the availability of generic sotalol products, may have discouraged physicians from prescribing both dofetilide and Betapace AF during the 2 years following their introduction into the market, concludes this study. The investigators reviewed the number of new, refill, and total prescriptions of all antiarrhythmic agents in the United States from April 2000 to December 2001 to assess use of dofetilide and Betapace AF in the drug market.

Both medications were prescribed very infrequently throughout the study period, even though during that time, atrial fibrillation and atrial flutter were the most frequently reported arrhythmias treated with an antiarrhythmic agent. For many of their patients with atrial fibrillation or flutter, instead of using dofetilide or Betapace AF, which are FDA-approved only for these indications, physicians appear to be more commonly prescribing amiodarone and generic sotalol, which are not FDA-approved for these indications. This suggests poor acceptance of the new agents by prescribing physicians.

LaPointe, N.M., Chen, A., Hammill, B., and others. (2003). "Evaluation of the dofetilide risk-management program." *American Heart Journal* 146, pp. 894-901.

The mandated dofetilide risk management program improved adherence to dosing and monitoring recommendations for dofetilide as compared with sotalol. On the other hand, the comparatively smaller number of patients receiving dofetilide versus sotalol suggests that fewer physicians are willing to select dofetilide as opposed to sotalol because of the constraints of the risk-management program, conclude these investigators. They reviewed the medical charts of 47 patients taking dofetilide and 117 patients taking sotalol.

The recommended starting dose was prescribed more frequently in the dofetilide group than in the sotalol group (79 vs. 35 percent). A higher number of patients in the dofetilide group compared with the sotalol group received the recommended baseline tests for potassium (100 vs. 82 percent), magnesium (89 vs. 38 percent), serum creatinine (100 vs. 82 percent), and electrocardiography (94 vs. 67 percent). A significantly greater proportion of patients in the dofetilide versus sotalol group received recommended electrocardiograms (ECGs, to detect prolonged QT interval that can lead to torsades de pointes) obtained after the first dose (94 vs. 43 percent) and subsequent doses (80 vs. 3.5 percent).

Although no patient in either group had a fatal episode of torsades de pointes, labeled recommendations for handling QT prolongation, which differ for dofetilide and sotalol, were not

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Antiarrhythmic drugs

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followed as carefully in the dofetilide group. The researchers suggest that standardization in the labeled ECG criteria for determining safety might improve physician understanding and adherence to labeled dosing and monitoring recommendations.

Editor's note: Another study on QT prolongation conducted by researchers at the Georgetown University CERT shows that intravenous methadone, sometimes given for intractable pain in cancer patients, when combined with chlorobutanol, is associated with QT interval prolongation. For more details, see Kornick, C.A., Kilborn, M.J., Santiago-Palma, J., and others. (2003). "QTc interval prolongation associated with intravenous methadone." (AHRQ grant HS10385). *Pain* 105, pp. 499-506. ■

Certain oral blood-sugar-lowering drugs may increase the risk of heart failure in patients with type 2 diabetes

Thiazolidinediones (TZDs) are oral medications widely used to lower blood-sugar levels in diabetes patients. TZDs have been associated with weight gain, increased plasma volume, and edema. TZDs may also increase the risk of heart failure among patients with type 2 (adult onset) diabetes, according to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS09722).

The researchers who conducted the study used a health insurance claims database to retrospectively study a sample of patients with type 2 diabetes who received an oral antihyperglycemic agent between January 1995 and March 2001. Each of the 5,441 people with any claims for TZDs was compared with five randomly selected patients who had not taken TZDs (controls). The TZD patients had more medical problems and received more medications. However, even after adjusting for these differences in the two groups, TZD use was associated with a 60 percent relative increase in the risk of heart failure after 40 months of followup.

Adjusted incidence of heart failure at 40 months was 8.2 percent for TZD patients and 5.3 percent for controls. TZDs could increase the risk of heart failure via direct effects on the heart, the kidneys, and/or the vasculature or indirectly by facilitating the action of insulin to promote renal sodium retention.

These findings suggest that physicians should use TZDs with caution in patients with heart failure and those predisposed to the development of heart failure, such as the elderly and patients receiving insulin. Physicians also should remain vigilant for symptoms of heart failure, such as shortness of breath, in patients receiving TZDs and consider alternate therapies for patients who develop such symptoms.

See "Use of thiazolidinediones and risk of heart failure in people with type 2 diabetes," by Thomas E. Delea, M.B.A., John S. Edelsberg, M.D., M.P.H., May Hagiwara, Ph.D., and others in the November 2003 *Diabetes Care* 26(11), pp. 2983-2989. ■

Elderly Health/Long-Term Care

Screening relatively healthy elderly women for breast cancer every 2 years is cost effective

Current guidelines recommend that women over 40 have mammograms to screen for breast cancer every 1 to 2 years. For elderly women (65 and older) without significant health problems, breast cancer screening every 2 years reduces mortality at reasonable costs, according to a study conducted for the U.S. Preventive Services Task Force. The study was supported in part by the Agency for Healthcare Research and Quality (contracts 290-97-0018 and 290-97-0011).

The researchers reviewed articles published between January 1989 and March 2002 on the cost-effectiveness of screening elderly women for breast cancer. Of the 115 studies identified, 10 met inclusion criteria. Despite methodologic differences among the studies, the cost-effectiveness results were fairly consistent. On

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Breast cancer screening

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average, extending biennial screening to age 75 or 80 years was estimated to cost $34,000 to $88,000 dollars per life-year gained, compared with stopping screening at age 65 years. Two studies suggested that it was more cost effective to target healthy elderly women than those with illnesses that could decrease life expectancy and thus offset the survival benefits of early cancer detection. For example, if a woman has a small breast tumor detected at screening but dies of a heart attack within the next few years, screening had no benefit in extending life expectancy.

These findings are consistent with those of large population-based studies and recommendations of the Task Force. The review identified two areas where further research could help clarify cost-effectiveness: the natural history of breast cancer in older women and the impact of diagnosis and treatment on quality of life. If the preclinical detectable phase of breast cancer is longer in older women (the period when a cancer can be detected by mammography but is still curable), a screening interval longer than every 2 years may be even more cost effective.

More details are in "The cost-effectiveness of screening mammography beyond age 65 years: A systematic review for the U.S. Preventive Services Task Force," by Jeanne Mandelblatt, M.D., M.P.H., Somnath Saha, M.D., M.P.H., Steven Teutsch, M.D., M.P.H., and others in the November 18, 2003 *Annals of Internal Medicine* 139(10), pp. 835-842.

Editor's note: Another AHRQ-supported study on a related topic suggests that emotional and social consequences rather than the physical outcomes of positive test results may be more salient in women's decisions to undergo genetic testing for breast cancer risk. For more details, see: Vuckovic, N., Harris, E.L., Valanis, B., and Steward, B. (2003). "Consumer knowledge and opinions of genetic testing for breast cancer risk." (AHRQ grant T32 HS00069). *American Journal of Obstetrics & Gynecology* 189, pp. S48-S53. ■

Inconsistent use of medications by elderly Mexican Americans with diabetes may explain their greater risk of some complications

Several studies have documented higher rates of diabetic complications of the kidney, eye, and circulation (including nontraumatic limb amputations) among Mexican American diabetes patients compared with white patients. The inconsistent use of diabetic medications by elderly Mexican Americans may underlie their increased risk for some diabetes complications, suggests a study supported by the Agency for Healthcare Research and Quality (HS11618). The researchers found that over one-third (36 percent) of elderly Mexican Americans with diabetes inconsistently used their prescribed diabetic medications, and those who were inconsistent in their medication use were more likely to develop kidney problems or die over a 7-year period.

Researchers from the Medical Branch and the Health Science Center of the University of Texas analyzed data from the four waves of the Hispanic Established Population for the Epidemiology Study of the Elderly. In-home interviewers assessed consistency in use of diabetes medications among 908 elderly Mexican Americans who had diabetes. Over a period of 7 years, 148 of these individuals discontinued their diabetes medications, 16 had not used their diabetes medications in the 2 weeks prior to the interview, and 160 had no diabetic medications at home, despite their self-report of taking medicine for diabetes. The rates of inconsistent drug use for those on oral hypoglycemic drugs and those on insulin (with or without oral hypoglycemic drugs) were similar (34 and 38 percent, respectively).

Patients who did not have Medicaid or private/HMO health insurance and those who were age 75 or older were much more likely to be inconsistent with treatment. Patients with inconsistent use of medication were more likely than consistent users to report kidney problems at followup, after controlling for years of diabetes, insurance status, and other factors. Inconsistent use of medication also increased the risk of death from any cause by 43 percent and diabetes-related deaths by 66 percent over a period of 7 years.

See "Inconsistent use of diabetes medications, diabetes complications, and mortality in older Mexican Americans over a 7-year period," by Yong-Fang Kuo, Ph.D., Mukaila A. Raji, M.D., Kyriakos S. Markides, Ph.D., and others, in the November 2003 *Diabetes Care* 26(11), pp. 3054-3060.

Editor's note: Another AHRQ-supported study on diabetes shows that type 2 diabetes is associated with a reduction in work productivity. For details see Lavigne, J.E., Phelps, C.E., Mushlin, A, and Lednary, W.M. (2003). "Reductions in individual work productivity associated with type 2 diabetes mellitus." (AHRQ grant HS09891). *Pharmacoeconomics* 21(15), pp. 1123-1134. ■

Depression is common among people who are primary caregivers for patients with dementia

Family caregivers of patients with dementia are more likely to suffer from depression if care takes up more than 40 hours a week, if the patient is angry or aggressive, or if the caretaker has limited functioning, according to a study supported in part by the Agency for Healthcare Research and Quality (K02 HS00006). To determine the patient and caregiver characteristics associated with depression among caregivers of patients with dementia, Kenneth Covinsky, M.D., M.P.H., of the University of California, San Francisco, and his colleagues examined data on 5,627 patients with moderate to advanced dementia and their informal (unpaid) primary caregivers.

The researchers used a scale to measure caregiver depression, and they examined hours spent providing care, caregiver functional status, relation to the patient, and demographics. They also examined patient sociodemographic characteristics, activities of daily living (ADL) function (for example, eating, dressing, walking, or transferring from bed to chair), Mini-Mental Status Exam score, and behavioral problems.

Nearly one-third of caregivers (32 percent) reported six or more symptoms of depression and were classified as depressed. Whites and Hispanics were more likely than blacks to become depressed. Individuals caring for patients who were dependent for help with two or more ADLS or patients who were angry or aggressive were 55 percent and 47 percent, respectively, more likely to become depressed than caretakers whose patients didn't have these problems. Finally, caregivers who spent 40-79 hours a week caring for the patient or who themselves had some ADL dependencies were about twice as likely to become depressed as those who spent less than 40 hours per week providing care and did not have any ADL dependencies.

See "Patient and caregiver characteristics associated with depression in caregivers of patients with dementia," by Dr. Covinsky, Robert Newcomer, Ph.D., Patrick Fox, Ph.D., and others, in the December 2003 *Journal of General Internal Medicine* 18, pp. 1006-1014. ■

Only about half of stroke survivors living in nursing homes receive medicine to prevent another stroke

Only half of residents of nursing homes in five States who had suffered a stroke during the 1990s received any medication to prevent another stroke. Furthermore, minority residents were less likely than white residents to receive the anticoagulant warfarin to prevent further strokes, according to a study supported in part by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00011).

Jennifer B. Christian, Pharm.D., M.P.H., of Brown University, and her colleagues identified 19,051 nursing home residents who had been hospitalized for ischemic stroke in five States from 1992 to 1996. They compared use of aspirin, dipyridamole, ticlopidine, and warfarin alone or in combination to prevent a second stroke for each racial/ethnic group.

Overall, only half of elderly residents who had suffered a stroke within the past 6 months received medication to prevent a second stroke. Use of all four medications by members of ethnic/racial groups varied widely, with 58 percent of American Indians and 39 percent of Asian/Pacific Islanders receiving at least one of these medications. Most residents (68 to 77 percent) did not receive aspirin. Most residents (60 to 75 percent) who were eligible for anticoagulant therapy did not receive warfarin.

After controlling for confounding factors, Asian/Pacific Islander, black, and Hispanic nursing home residents eligible for anticoagulant therapy received warfarin less often than white residents. Use of warfarin requires frequent laboratory monitoring to assess efficacy and safety, which may discourage doctors from prescribing it. The low estimates of use of aspirin, an antiplatelet recommended for all patients who have experienced a noncardioembolic stroke or transient ischemic attack, is also a concern. Interventions designed to improve the pharmacological management of recurrent stroke regardless of race are needed in the nursing home setting, conclude the authors.

More details are in "Racial disparities in receipt of secondary stroke prevention agents among U.S. nursing home residents," by Dr. Christian, Kate L. Lapane, Ph.D., and Rebecca S. Toppa, Ph.D., in the November 2003 *Stroke* 34, pp. 2693-2697. ■

Hospital costs are higher for elderly Medicare patients with low functional status

Medicare's Prospective Payment System is designed to pay hospitals fairly and provide similar financial incentives for admitting different types of patients, so that no group of patients is systematically a financial winner or loser for the hospital. To accomplish this, Medicare bases its payments on the diagnosis-related group (DRG), which correlates to a patient's discharge diagnosis. However, a recent study at one teaching hospital in Cleveland, OH, found that hospital costs were 23 percent higher for elderly Medicare patients with low functional status, even after adjustment for DRG payments and patient characteristics.

If this finding holds true in other hospitals, DRG-based payments provide hospitals a financial incentive to avoid patients dependent in activities of daily living (ADLs, for example, dressing, bathing, or transferring from bed to chair). DRG-based payments also disadvantage hospitals with more ADL-dependent patients, whose care costs are higher than their diagnosis alone would indicate, concludes Kenneth E. Covinsky, M.D., M.P.H., of the University of California, San Francisco. In a study supported in part by the Agency for Healthcare Research and Quality (K02 HS00006), Dr. Covinsky and his colleagues used a cost management information system to determine the cost of hospital care for 1,612 patients aged 70 and older.

Hospital costs were higher in patients dependent in ADLs on admission than in patients independent in ADLS on admission ($5,300 vs. $4,060). Mean hospital costs remained higher in ADL-dependent patients than in ADL-independent patients in an analysis that adjusted for DRG ($5,240 vs. $4,140) and in multivariate analyses adjusting for age, race, sex, clinical factors, and admission from a nursing home, as well as for DRG ($5,200 vs. $4,220).

See "Diagnosis-related group-adjusted hospital costs are higher in older medical patients with lower functional status," by Kenneth H. Chuang, M.D., Dr. Covinsky, Laura P. Sands, Ph.D., and others, in the December 2003 *Journal of the American Geriatrics Society* 51, p. 1729-1734. ■

Hospitalizations for work-related injuries and illnesses declined from 1997-1999, but charges increased

Hospitalizations for job-related injuries and illnesses account for less than 1 percent of all hospital stays. Nevertheless, they represent over 200,000 hospitalizations per year, involve charges of about $3 billion annually, and account for nearly 20 percent of all medical expenditures for worker's compensation (WC) claims in the United States.

According to the first study to compile national data on inpatient hospital care for patients with work-related injuries and illnesses covered under WC, the number of WC hospitalizations fell by about 7 percent from 1997 to 1999, and the proportion of hospitalizations paid by WC declined by over 14 percent during that period. However, there was a sharp 16 percent rise in total charges per WC stay. The study was supported by the Agency for Healthcare Research and Quality (HS11497).

After adjusting for the type of diagnosis and other factors, WC hospital care was found to involve 13-24 percent more procedures, involve 4 percent longer hospital stays, and take 23-54 percent less time from admission to the principal procedure than inpatient care for comparable diagnoses paid by other sources. The most common conditions treated during WC hospitalizations were disc and spinal disorders (27.9 percent of all WC hospitalizations), which had charges 16 percent higher than hospitalizations for the same disorders paid by other sources. Higher WC charges for disc and spinal disorders may reflect several factors, explains the study's principal investigator Allard E. Dembe, Sc.D., of the University of Massachusetts Medical School. The higher charges may reflect greater severity of work-related injuries

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that require more extensive treatment; greater emphasis in WC medical care on the patient's functional recovery and return to work, and relatively broad coverage for physical therapy and other rehabilitation services provided under WC insurance. Or, the higher WC charges may be due to greater use of fee-for-service billing arrangements typically used in WC medical care.

These findings are based on analysis of 3 years of data (1997-1999) from the Nationwide Inpatient Sample, a component of AHRQ's Healthcare Cost and Utilization Project.

More details are in "Inpatient hospital care for work-related injuries and illnesses," by Dr. Dembe, Martha A. Mastroberti, M.S., Sharon Fox, Ph.D., and others, in the *American Journal of Industrial Medicine* 44, pp. 331-342, 2003. ■

Medicare's role in financing nursing home care has greatly expanded

Medicare's role in financing nursing home care greatly expanded in the 1990s compared with the 1980s, according to a study by Jeffrey A. Rhoades, Ph.D., and John P. Sommers, Ph.D., of the Agency for Healthcare Research and Quality. They examined data from the 1987 National Medical Expenditure Survey Institutional Population Component (IPC) and the 1996 Medical Expenditure Panel Survey (MEPS) Nursing Home Component (NHC). Both are nationally representative surveys that detail the characteristics of nursing homes and their residents, as well as use of and expenses for nursing home care.

Survey data showed that total annual expenses for nursing homes increased from $28 billion in 1987 to $70 billion in 1996, a 150 percent increase. Annual expenses per resident increased from $13,866 in 1987 to $22,561 in 1996, representing a 63 percent increase. Mean expenses per day increased from $56 in 1987 to $118 in 1996, an increase of 111 percent.

The major sources of payment for total annual nursing home expenses shifted from 1987 to 1996. Medicare payments represented the greatest change between the 2 years, going from 2 percent of all payments for nursing home care in 1987 to 19 percent in 1996. The total share of expenses paid by Medicaid was 49 percent in 1987 and 44 percent in 1996.

As Medicare's financing role increased, there was an accompanying decline in the proportion of expenses that residents paid out of pocket. In 1987, 45 percent was paid out of pocket versus 30 percent in 1996. Nursing home residents using Medicare most heavily as a source of payment tended to have very short stays (33 days on average), zero limitations in activities of daily living such as dressing or walking, and no mental conditions.

See "Trends in nursing home expenses, 1987 and 1996," by Drs. Rhoades and Sommers, in the Fall 2003 *Health Care Financing Review* 25(1), pp. 99-114. Reprints (AHRQ Publication No. 04-R023) are available from AHRQ.** ■

Many major teaching hospitals might not be able to offer adequate access to specialty care for uninsured patients

Initial treatment of poor and uninsured patients at major private and public U.S. teaching hospitals, which often serve as a health care safety net for these individuals, does not guarantee them access to specialty or other referral services, according to a new study. The capacity of safety-net institutions, including academic health centers (AHCs), to provide equitable care to all patients needs to be reexamined, according to Ernest Moy, M.D., M.P.H., of the Agency for Healthcare Research and Quality, and his colleagues from Harvard Medical School and the Institute for Health Policy at Massachusetts General Hospital.

In their survey of more than 2,000 medical school faculty involved in direct patient care, they found large gaps between nonpaying and paying patients in referrals to specialists, high-tech care, outpatient mental health and substance abuse treatment, and even routine inpatient care. Relative rates (uninsured versus privately insured) ranged from 2.1 for problems obtaining substance abuse services to 8.9 for referral to a specialist. Nearly one-fourth of clinical faculty reported that they were rarely or never able to obtain nonemergency hospital admissions for uninsured patients.

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Nearly one in five clinical faculty felt that they were discouraged by their group practice or hospital from seeing too many indigent patients, and more than one in ten reported that their group practice placed formal limits on the number of patients or the amount of care they could provide. At teaching hospitals, faculty practices must finance their charity care through revenues from paying patients. However, they do so without the subsidies from Medicare and Medicaid that are available to hospitals serving a disproportionate number of poor and uninsured patients. The second most common reason given for limiting care to the uninsured was inadequate reimbursement.

See "Limits to the safety net: Teaching hospital faculty report on their patients' access to care," by Joel S. Weissman, Ph.D., Dr. Moy, Eric G. Campbell, Ph.D., and others, in the November 2003 *Health Affairs* 22(6), pp. 156-166. Reprints (AHRQ Publication No. 04-R028) are available from AHRQ.** ■

Researchers find SCHIP and Medicaid networks compete for physicians in some markets

The State Children's Health Insurance Program (SCHIP) was enacted in 1997 to provide health insurance coverage to low-income, uninsured children who lack private insurance but are ineligible for Medicaid. A recent study that was supported in part by the Agency for Healthcare Research and Quality and conducted as part of the Child Health Insurance Research Initiative (CHIRI™) examined whether the introduction of SCHIP had an impact on provider participation in Medicaid and the extent of the participation.

Provider participation in Medicaid is impacted by many factors, including low reimbursement levels, demand for services from private-paying patients, and the geographic separation of physicians and Medicaid enrollees. Given that SCHIP and Medicaid serve a similar population of low-income uninsured children, SCHIP enrollment might affect provider participation in Medicaid. States were given broad flexibility in establishing the overall design, benefits, administrative features and provider networks for these programs. For this study, researchers took advantage of a natural experiment by comparing the impact of SCHIP enrollment on Alabama's separate freestanding SCHIP program, which uses the Blue Cross Blue Shield provider network and fee structure, with the impact of SCHIP enrollment on Georgia's Medicaid look-alike SCHIP program, which uses the same provider network and fee rates as Medicaid.

Researchers found that increases in SCHIP enrollment had little effect on Medicaid physician participation in Alabama. These findings are consistent with predictions that SCHIP enrollment would have little impact on provider participation in structures where different provider networks were used for SCHIP and Medicaid. In Georgia, however, where the same provider network services both Medicaid and SCHIP enrollees, increases in SCHIP enrollment were associated with a decline in office-based physician participation in Medicaid, primarily in urban areas.

Implementing Medicaid expansions and using similar administrative and provider structures for Medicaid and SCHIP may be an attractive option for States seeking to improve administrative efficiencies between the two programs. The authors conclude, however, that adding more children to a provider system that is static or declining in size can negatively impact children enrolled in Medicaid. They note that linkage of SCHIP and Medicaid programs through the use of the same provider network needs to be accompanied by market conditions that encourage the expansion of the network, if access to health care for Medicaid enrollees is to be maintained. In other words, extending public health insurance coverage to new segments of low-income children may expand coverage at the expense of eroding the supply of physicians available to children who already have public coverage.

See "The impact of SCHIP enrollment on physician participation in Medicaid in Alabama and Georgia" by Janet M. Bronstein, Ph.D., E. Kathleen Adams, Ph.D., and Curtis S. Florence, Ph.D., in the April 2004 *Health Services Research* 39(2), pp. 301-317.

Editor's note: CHIRI™ is co-sponsored by AHRQ, The David and Lucile Packard Foundation, and the Health Resources and Services Administration. CHIRI™ provides policymakers with information to help them improve access to and the quality of health care for low-income children. Additional CHIRI™ findings can be accessed on the CHIRI™ Web site at www.ahrq.gov/chiri/. ■

Researchers examine the management of chronic illness in managed care settings

A special section, "Managing Chronic Illness in Managed Care Settings," was included in the December 2003 issue of the journal *Health Services Research* 38(6), Part I. The section includes an introduction and six articles from projects funded under a manged care initiative by the Agency for Healthcare Research and Quality, the American Association of Health Plans Foundation (now called America's Health Insurance Plans), and the Health Resources and Services Administration. The projects examine the impact of various features of managed care on the management of chronic disease.

For example, researchers studied the impact on chronic disease management of specific payment arrangements for individual physicians; the breadth of the provider networks offered by plans; and managerial approaches used by the plans (or medical groups) to select clinicians, monitor or profile practice patterns, and encourage adherence to practice guidelines. An introduction to the section and the six papers are briefly summarized here.

Luft, H.S., and Dudley, R.A., "Measuring quality in modern managed care," pp. 1373-1383 (AHRQ grant HS10771).

In this introduction, the journal editors note that there is no single conceptually correct level to analyze the impact of managed care on chronic disease. In some instances, the variables and outcomes of interest are best conceptualized at the health plan level because they deal with issues of coverage or care coordination. In other instances, the clinic level may be most relevant, for example, when the goal is to identify care processes that could be improved.

The papers in this section address key methodological issues that must be addressed when attempting to measure and analyze performance in the complex managed care environment. These methodological insights are of interest not only to the study of managed care, but also to issues of quality measurement, patient and consumer surveys, and complex study design.

Keating, N.L., Landrum, M.B., Landon, B.E., and others, "Measuring the quality of diabetes care using administrative data: Is there bias?" pp. 1529-1545 (AHRQ grant HS09936).

Health care organizations often measure processes of care using only administrative data. However, when quality of care is measured using administrative data without patient medical record data, diabetes quality of care indicators (performance of certain tests, for example, for diabetic retinopathy and blood-sugar level) may be under-detected more frequently for elderly and black patients and the physicians, clinics, and health plans who care for them. In other words, administrative data suggest that blacks and elderly patients with diabetes receive fewer recommended tests than they actually do. This suggests that providers who care for such patients may be disproportionately affected by public release of such data or the use of these data to determine the magnitude of financial incentives. Thus, health care organizations should consider using standardized indicators collected from both administrative and medical record data, such as those developed by the Diabetes Quality Improvement Project.

Stuart, B., Singhal, P.K., Magder, L.S., and Zuckerman, I.H., "How robust are health plan quality indicators to data loss? A Monte Carlo simulation study of pediatric asthma treatment," pp. 1547-1561 (AHRQ grant HS09950).

Proportion-based quality indicators (QIs) have become benchmarks for evaluating health plan performance, for example, the percentage of plan members receiving an annual flu shot. This study examined a proportion-based QI of treatment for persistent asthma (the percent of asthma patients filling prescriptions for two or more rescue medications who also filled a controller medication) for a group of Medicaid children transitioning from fee-for-service (FFS) to managed care. The goal was to test the robustness of proportion-based QIs to loss of encounter data. The QI was based on FFS medical and prescription claims in the before-transfer period and encounter data in the followup period. The QI measure proved highly robust to most forms of encounter data loss tested. The measure declined by less than 2 percent in the presence of up to a 35 percent loss of data. The findings suggest that other proportion-based QIs are likely to reflect true levels of health plan quality in the face of incomplete data capture.

Lozano, P., Grothaus, L.C., Finkelstein, J.A., and others, "Variability in asthma care and services for low-income populations among practice sites in managed Medicaid systems,"

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pp. 1563-1578 (AHRQ grant HS09935).

Chronic asthma care for children in managed care Medicaid plans could be improved, particularly in the areas of self-management support and information systems, according to this study. The investigators surveyed 85 managed care Medicaid practice sites about processes of asthma care. They found substantial variation in reports of asthma processes of care, particularly in the areas of self-management and information systems. Practice sites also varied significantly in availability of services targeting low-income populations, specifically relating to cultural diversity, communication, and enrollee empowerment. Very little of the site-to-site variation was attributable to the managed care organization.

Kahn, K.L., Liu, H., Adams, J.L., and others, "Methodological challenges associated with patient responses to follow-up longitudinal surveys regarding quality of care," pp. 1579-1598 (AHRQ grant HS09951).

Certain methodological challenges are associated with patient responses to followup longitudinal surveys regarding quality of care, which are outlined in this study. The researchers surveyed 30,308 patients in 1996 and 13,438 patients in 1998 as part of a 2-year longitudinal study of quality of care and health status of patients receiving care delivered by 63 physician groups across three West Coast States. They also included a subset of patients with chronic disease. In 1998, response rates were 54 percent overall (46 percent nonresponders) and 63 percent for patients with chronic disease (37 percent nonresponders). Patient demographics, health status, use of services, and satisfaction with care in 1996 were all significant predictors of response in 1998. However, process of care scores weighted for nonresponse differed from unweighted scores. This highlights the importance of applying nonresponse weights to minimize bias in estimates of care and outcomes associated with longitudinal quality of care and health outcome analyses.

Shenkman, E., Wu, S.S., Nackashi, J., and Sherman, J., "Managed care organizational characteristics and health care use among children with special health care needs," pp. 1599-1624 (AHRQ grant HS09949).

It is not certain how well managed care organizations (MCOs) are able to establish provider networks that meet the needs of children with special health care needs (CSHCN) and how MCOs assist primary care physicians in coordinating care for these children. The purpose of this study was to examine the relationship between MCOs' provider network composition (number of pediatricians, family practitioners, and pediatric subspecialists), strategies to coordinate or facilitate care for CSHCN, and the effects of reimbursement practices on access to care for 2,223 CSHCN enrolled in one of eight Florida MCOs. Three MCO indexes—pediatrician focus index, specialist focus index, and fee-for-service index—were significantly associated with children's health care use patterns. These MCO indexes, not the child-level characteristics, explained most of the variation in outpatient use rates by CSHCN in the eight MCOs.

Adams, J.L., Wickstrom, S.L., Burgess, M.J., and others, "Sampling patients within physician practices and health plans: Multistage cluster samples in health services research," pp. 1625-1640 (AHRQ grant HS09942).

A common study design in health services research is the multistage cluster sample to abstract data from medical records. The simple two-stage problem is sampling patients in physician practices to estimate a population average (for example, mean blood pressure). However, multistage design is needed if there are two or more subpopulations (for example, men and women) for whom separate estimates are required. These authors developed a simulation-based approach for designing multistage samples. They constructed a sample frame from all diabetes patients in six health plans who had evidence of chronic eye disease (glaucoma and retinopathy). They found that simulations of different study designs can uncover efficiency gains as well as inform potential tradeoffs among study goals. One of several benefits to this approach is that it can be easily adapted to problems that arise in the field (for example, when cost overruns reduce sample size or practices or physicians refuse to participate). ■

State shifting of Medicaid home care costs to Medicare greatly increases Medicare expenditures for home care

Home care services funded by Medicare and Medicaid grew rapidly throughout most of the 1990s. In fact, Medicare home health expenditures were the fastest growing component of the Medicare program for most of the 1990s, growing from $5.4 billion in 1991 to $14.9 billion in 1998. A policy adopted by some States to shift home care costs of patients eligible for Medicaid and Medicare (dual eligibles) from Medicaid to Medicare may explain some of the increase in Medicare expenditures during this period, according to two studies supported by the Agency for Healthcare Research and Quality (HS11262 and T32 HS00032). In these cases, State Medicaid home care programs pay home care claims and then retrospectively pursue Medicare reimbursement.

These Medicare maximization billing practices for home care services may aid States in reducing Medicaid outlays and potentially help dual eligibles gain coverage for their home care claims. On the other hand, they increase Medicare expenditures for home care at a time of concern for the long-term financial viability of Medicare and illustrate the need for reforming the Nation's long-term care financing policy, according to Wayne L. Anderson, Ph.D., of the University of North Carolina at Chapel Hill.

Dr. Anderson and his colleagues collected data from all 49 States with Medicaid programs, case studies of three States with retrospective billing practices, and information from officials of the Centers for Medicare & Medicaid Services to determine which States used retrospective Medicare billing practices and the amounts recovered from Medicare. Their analysis indicated that seven States recovered as much as $265 million from Medicare in State and Federal dollars during the 1990s. The three case study States recovered expenditures five to seven times over the costs incurred for retrospective billing practices. The second study by Dr. Anderson's group analyzed data collected from 47 State Medicaid offices supplemented with Medicare Current Beneficiary Survey data from 1992-1997. They projected that State retrospective Medicare maximization billing practices would increase Medicare home health care expenditures by $73.8 million over 6 years, although this was not statistically significant.

In conclusion, the researchers note that as a result of retrospective billing practices, claims could be skipped over in the screening process that potentially might be reimbursable by Medicare. Most States' screening processes employ a dollar threshold below which no claim is submitted, or if a claim is submitted, it is not appealed if denied. It is not possible to measure the magnitude of these implicit costs or to tell whether they might make retrospective billing practices less attractive for States. A State's success with this innovation may vary depending on the net gains and efficiency realized with retrospective practices compared with its current prospective billing practices. Further, the authors note that the existence of retrospective billing practices attests to the need for a centralized payer policy in which social benefit can be determined without losses in efficiency to the Government agencies responsible for implementing the policy.

See "Adoption of retrospective Medicare maximization billing practices by State Medicaid home care programs," by Dr. Anderson, Genevieve S. Kenney, Ph.D., and Donna J. Rabiner in the October 2003 *Journal of Health Politics, Policy and Law* 28(5), pp. 859-881; and "Effects of State Medicaid home care Medicare maximization programs on Medicare expenditures," by Dr. Anderson, Edward C. Norton, Ph.D., and Dr. Kenney, in the *Home Health Services Quarterly* 22(3), pp. 19-40, 2003. ■

Both low- and high-risk patients benefit from undergoing coronary bypass surgery at high-volume hospitals

Evidence shows that individuals who undergo coronary artery bypass graft (CABG) surgery at hospitals that perform many such surgeries each year are less likely to die after the surgery than those who have the surgery done at low-volume hospitals. However, patient risk factors may influence the level of benefit gained from having the surgery done at high-volume centers, suggests a study supported by the Agency for Healthcare Research and Quality (HS11295).

The researchers found that patients at very low risk (less than 0.5 percent) of dying were 60 percent less likely and those at low risk (0.5-2 percent) were 25 percent less likely to die in the hospital after CABG surgery at high-volume centers (more than 500 cases/year) compared with low-volume centers.

Very high risk (greater than 10 percent) patients had only 13 percent less likelihood of dying at high- versus low-volume hospitals, while the highest risk patients (risk of dying greater than 24 percent) had better outcomes at high-volume centers. If this study of CABG patients in New York is validated by other studies, the practice of referring low-risk patients to community hospitals with low operative volumes and selectively referring only high-risk patients to high-volume, high-expertise centers may need to be reevaluated, suggests Laurent G. Glance, M.D., of the University of Rochester Medical Center. Dr. Glance cautions, however, that volume is an imperfect proxy for quality of care and should not be used as the sole basis for regionalizing care.

For this study, the researchers retrospectively analyzed data from the Cardiac Surgery Reporting System database on all patients undergoing CABG surgery in New York State who were discharged in 1996. They examined in-hospital mortality as a function of hospital procedure volume, after adjusting for severity of disease.

More details are in "Is the hospital volume-mortality relationship in coronary artery bypass surgery the same for low-risk versus high-risk patients?" by Dr. Glance, Andrew W. Dick, Ph.D., Dana B. Mukamel, Ph.D., and Turner M. Osler, M.D., F.A.C.S., in the *Annals of Thoracic Surgery* 76, pp. 1155-1162, 2003. ■

Higher RN staffing is associated with fewer deaths among elderly Medicare patients hospitalized for heart attack

Over the past decade, many U.S. hospitals reduced the number of registered nurses (RNs) and substituted licensed practical nurses (LPNs) for RNs to reduce costs. In response to these cost-containment measures, there has been a call for government regulation of minimum staffing levels to protect the quality of care received by hospitalized patients.

A new study supported by the Agency for Healthcare Research and Quality (HS08843 and HS09446) found that higher RN staffing levels were associated with fewer deaths among elderly Medicare patients hospitalized for first-time heart attack. The researchers suggest that more astute RN clinical assessments and early identification of heart attack complications by RNs, such as congestive heart failure or pulmonary edema, may explain the survival advantage of patients treated at hospitals with higher RN staffing.

For the study, researchers from the University of Alabama at Birmingham and the Birmingham Veterans Affairs Medical Center reviewed the medical records of 118,940 elderly, fee-for-service Medicare patients hospitalized for heart attack during 1994-1995 from nearly all U.S. acute care hospitals included in the Cooperative Cardiovascular Project. They linked these data with American Hospital Association data on participating hospitals and used Medicare data to determine patient deaths.

The survival advantage for the highest RN staffing levels was not large (on the order of 2 percent), but it persisted after adjusting for patient and hospital characteristics. From highest to lowest quartile of RN staffing, in-hospital mortality was 17.8 percent, 17.4

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percent, 18.5 percent, and 20.1 percent, respectively. Conversely, from the highest to lowest quartile of LPN staffing, mortality was 20.1 percent, 18.7 percent, 17.9 percent, and 17.2 percent, respectively. These findings suggest an important effect of nurse staffing on in-hospital mortality. The researchers call for further investigation of how nurse staffing affects patient outcomes.

More details are in "Nurse staffing and mortality for Medicare patients with acute myocardial infarction," by Sharina D. Person, Ph.D., Jeroan J. Allison, M.D., M.S., Catarina I. Kiefe, Ph.D., M.D., and others, in the January 2003 *Medical Care* 42(1), pp. 4-12. ■

Updated ICU information systems substantially free nurses from documentation, giving them more time for direct patient care

Implementation of a third-generation intensive care unit (ICU) information system at one medical center decreased the time spent on documentation by ICU nurses by over 30 percent, or about 1 hour of each 8-hour shift. Nurses, in turn, devoted this time to direct patient care tasks, such as taking vital signs, observing and checking equipment function, administering medications, and changing dressings, according to a study supported in part by the Agency for Healthcare Research and Quality (HS11375 and HS11521).

The Quantitative Sentinel (QS) information system examined in this study had electronic interfaces to the ICU physiologic bedside monitors and to the hospital's laboratory information system and patient tracking system. The researchers had a critical care-certified nurse observe 10 ICU nurses in a 10-bed surgical ICU at a Veterans Affairs hospital for 4 consecutive hours on two separate occasions. She observed the nurses once before and once after installation of the QS system. The nurse calculated ICU nurses' performance on 70 distinct tasks categorized into five areas: direct patient care, indirect patient care, documentation, administrative tasks, and housekeeping.

The percentage of time the ICU nurses spent doing documentation decreased from 35.1 to 24.2 percent after the ICU information system was installed. The percentage of time the ICU nurses spent doing direct patient care increased from 31.3 to 40.1 percent. This was particularly notable for patient assessment, which doubled to more than 9 percent of total time and accounted for almost half of the time saved on documentation after the ICU information system was installed.

See "Changes in intensive care unit nurse task activity after installation of a third-generation intensive care unit information system," by David H. Wong, Pharm.D., M.D., Yvonne Gallegos, R.N., M.S.N., Matthew B. Weinger, M.D., and others, in *Critical Care Medicine* 31(10), pp. 2488-2494, 2003.

Editor's note: Another AHRQ-supported study on a related topic reveals that most primary care physicians believe that clinical decision support systems could improve their ability to track abnormal test results. For more details, see: Murff, H.J., Gandhi, T.K., Karson, A.K., and others. (2003). "Primary care physician attitudes concerning follow-up of abnormal test results and ambulatory decision support systems." (AHRQ grant HS11046). *International Journal of Medical Informatics* 71, pp. 137-149. ■

Nurses' contributions to patient-centered care and care equity are important components of health care quality

In 2001, the Institute of Medicine defined patient-centered care as care that is "respectful of and responsive to individual patients' preferences, needs, and values and ensures that patient values guide all clinical decisions." Patients' reports are the usual approach for measuring patient-centered care, an important component of health care quality.

According to a recent study, hospitalization for cancer was negatively related to patients' perceptions of patient-centered nursing care. Hospitalized patients may experience a wider range of care quality than clinic patients, possibly accounting for the inverse relationship between hospitalization and patient centered care.

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Patient-centered care

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The study was conducted by Laurel E. Radwin, R.N., Ph.D., C.S., of the College of Nursing and Health Sciences at the University of Massachusetts Boston, and supported by the Agency for Healthcare Research and Quality (K08 HS11625). The purpose of the study was to examine whether patient-centered nursing care for cancer patients differed according to patients' demographic characteristics, including race, sex, age, education, income, and hospitalization for cancer.

For the study, Dr. Radwin analyzed data on 423 cancer patients aged 18 or older who were in active treatment for their disease at a New England tertiary care medical center. About two-thirds of the patients were women, most of the patients were white (more than 80 percent), and 70 percent had been hospitalized for cancer. All reported that they had received cancer nursing care in the clinic or hospital.

Dr. Radwin used the Oncology Patients' Perceptions of the Quality of Nursing Care Scale to measure the quality of four dimensions of patient-centered interpersonal nursing interventions. The four dimensions are defined as: responsiveness, the nurse meets the patient's needs in a caring, attentive manner; individualization, the nurse personalizes care according to the patient's feelings, preferences, and desired level of involvement; coordination, the nurse promotes communication among other nurses and the patient; and proficiency, the nurse provides knowledgeable, skillful care.

Hospitalization for cancer was an important factor for each dimension of patient-centered care and resulted in a negative relationship between hospitalization for cancer and patients' reports of patient-centered nursing care. However, this finding probably does not indicate a relationship between illness severity and care quality, according to Dr. Radwin. Rather, it may be explained in part by the fact that participants who were hospitalized had been exposed to nursing care 24 hours per day and likely experienced a larger quantity of nursing care and a wider range of care quality, compared with clinic patients.

There was no correlation between age or patient sex with any of the four types of patient-centered care. Education had different effects in different income groups in this study, as well as differences between men and women. Inferences about race could not be made because of the limited racial diversity of the study sample. Participants were mainly white, well-educated, and had higher incomes; also, all data were collected at one site.

Details are in "Cancer patients' demographic characteristics and ratings of patient-centered nursing care," by Dr. Radwin, in the *Journal of Nursing Scholarship* 35(4), pp. 365-370, 2003. ■

Physicians are much less likely to examine patients in contact isolation compared with nonisolated patients

Hospitalized patients who are infected with multidrug-resistant bacteria are usually placed in contact isolation, which requires hospital personnel to put on a gown and gloves before examining the patient. Contact isolation with active surveillance of bacterial culture appears to help prevent the spread of drug-resistant infections. However, contact isolation may discourage attending physicians from examining patients as a result of the additional effort and time required to gown and glove, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS11540).

During morning rounds, attending physicians at two hospitals were about half as likely to examine patients in contact isolation compared with patients not under contact precautions. This means that many patients in contact isolation will not be examined by their attending physicians, even though they usually are seriously ill and may have more complicated problems than patients not in contact isolation, explains University of Michigan researcher, Sanjay Saint, M.D., M.P.H. Dr. Saint and his colleagues compared examination of patients in contact isolation and not in contact isolation by second- and third-year medical residents and attending physicians during morning rounds from October 1999 to March 2000 at two university-affiliated medical centers.

Of the total 139 patients, 22 percent were in contact isolation. Senior medical residents examined 84 percent of patients in contact isolation versus 87 percent of those not in contact isolation. However, attending physicians examined only 35 percent of patients in contact isolation versus 73 percent of non-isolated patients. Thus, nearly two-thirds of patients in contact isolation were not examined during morning rounds by the attending physicians.

See "Do physicians examine patients in contact isolation less frequently? A brief report," by Dr. Saint, Leigh Ann Higgins, M.D., Brahmajee K. Nallamothu, M.D., M.P.H., and Carol Chenoweth, M.D., in the October 2003 *American Journal of Infection Control* 31, pp. 354-356. ■

Study shows the culture of medical group practice changes as practices become larger and more complex

The culture of medical group practice is considered one of the most important organizational factors influencing the costs and quality of health care. A recent study that was supported by the Agency for Healthcare Research and Quality (HS10055 and T32 HS13828) shows that practice culture changes as group practices become larger and more complex through diversification into multispecialty practices or as they become part of larger health care systems.

Ann Curoe, M.D., M.P.H., John Kralewski, Ph.D., and Amer Kaissi, M.P.H., of the University of Minnesota School of Public Health, sent a survey to 1,223 physicians in 191 clinics in the upper Midwest. Clinics ranged from 3 to over 21 physicians, from single to multispecialty, physician-owned to system-owned, and rural to urban. The survey addressed nine dimensions of medical group practice culture: collegiality, information emphasis, quality emphasis, organizational identity, cohesiveness, business emphasis, organizational trust, innovativeness, and autonomy.

Physician responses indicated that collegiality, quality emphasis, organizational identity, cohesiveness, and organizational trust all decreased as clinic size increased with system ownership and multi-specialty practices. All except quality emphasis decreased with system ownership. Cohesiveness decreased in rural clinics. Autonomy decreased with system ownership but was not affected by clinic size, location, or specialty.

There was no difference in information emphasis, business emphasis, and innovativeness due to clinic size, ownership, location, or specialty. However, these three cultural dimensions varied a great deal within the various organizational forms, indicating that there are important cultural differences among the group practices within each practice form. Thus, the culture of medical group practices varies both between and within organizational forms. The authors conclude that the culture survey instrument used in this study can be a useful tool in assessing group practice cultures and managing those cultures effectively.

More details are in "Assessing the cultures of medical group practices," by Drs. Curoe and Kralewski, and Amer Kaissi, M.P.H., in the September 2003 *Journal of the American Board of Family Practice* 16, pp. 394-398. ■

Organ Transplantation

Understanding the implications of brain death for a patient's recovery may help families decide about donating organs

The medical community generally defines death as brain death. A family's understanding of brain death affects their decision to donate the organs of hospitalized loved ones, finds a study supported by the Agency for Healthcare Research and Quality (HS08209). Families who accepted that their loved one was dead when informed the patient was brain dead were more likely to donate their loved one's organs than those who did not consider the patient dead until mechanical support was turned off and the heart stopped.

The study was undertaken to examine factors related to families' understanding of brain death and how those factors affect the families' decisions about organ donation. The study population consisted of 403 families of organ donor-eligible patients at nine trauma hospitals who reported that someone at the hospital told them the patient was brain dead. Laura A. Siminoff, Ph.D., of Case Western Reserve University, and her colleagues interviewed family decisionmakers and health care providers who spoke with the families about organ donation. The researchers asked family members about their awareness of brain-death testing procedures, their understanding of brain death, and their organ donation decisions.

Most families (96 percent) were told that their family member was brain dead, but only 28 percent were able to provide a completely correct definition of brain death. For example, many confused brain death with coma (a state from which a person could emerge). Overall, 63.5 percent of the families first considered the patient dead when they were told the patient was brain dead, whereas 21.8 percent first considered the patient dead when the machines were turned off and the heart

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Donating organs

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stopped. Nearly 60 percent of families made statements indicating that they thought the patient was still alive even after being told he or she was brain dead.

In conclusion, the researchers note that the concept of brain death is confusing both to health care professionals and the public. In this study, people were willing to donate organs despite neither understanding brain death nor equating brain death with absolute death. The researchers suggest that rather than educating families regarding brain death per se, it might be more useful to focus on the implications of the diagnosis for the patient's recovery.

See "Families' understanding of brain death," by Dr. Siminoff, Mary Beth Mercer, M.P.H., and Robert Arnold, M.D., in the September 2003 *Progress in Transplantation* 13, pp. 218-224. ■

Agency News and Notes

Treadmill testing, EKG, and CT scans not recommended for screening patients at low risk for heart disease

The U.S. Preventive Services Task Force does not recommend using treadmill exercise testing, resting electrocardiogram (EKG), or electron beam computerized tomography (EBCT) to screen for heart disease in low-risk adults who don't have any symptoms of heart disease. For adults at increased risk for heart disease, the Task Force found insufficient evidence for or against using these three tests for screening.

The recommendations and a related article have been published online in the *Annals of Internal Medicine* (www.annals.org), and further information about the three screening tests can be found on the AHRQ Web site. Go to www.ahrq.gov and click on "Preventive Services."

An estimated 22 million Americans have heart disease, and more than 700,000 die from it each year. Heart disease is the leading killer of both men and women and is estimated to cost more than $350 billion annually in medical care, time lost from work, and other expenses. Men under age 50 and women under age 60 who have normal blood pressure and cholesterol levels, do not smoke, and do not have diabetes are at low risk of heart disease.

The Task Force recommends screening for many of the risks for heart disease, such as high blood pressure, obesity, diabetes, and high cholesterol. The Task Force found that although treadmill testing, EKG, and EBCT could identify individuals at higher risk of heart disease, no studies to date have examined whether or not using these tests to screen adults improves health outcomes. Furthermore, the Task Force concluded that using these three technologies to screen for heart disease in low-risk adults could cause more harm than good because of the frequency of false-positive and false-negative results.

False-positive results, in addition to causing psychological stress and anxiety for the patient, often lead to invasive tests, such as coronary angiography or treatment with unnecessary medications. Although coronary angiography (a test in which a catheter is inserted into the patient and a dye is injected) is generally considered to be safe, complications—such as internal bleeding, stroke or infection, and even death—can occur. False-negative results can mislead those with heart disease and result in delayed treatment.

The Task Force also concluded that the evidence is inadequate to determine how test results would change the course of treating patients and noted concern that potential harms, such as false-positive findings, unnecessary invasive procedures, and over-treatment could outweigh any benefit of the tests in people at lower risk.

The Task Force, which is sponsored by the Agency for Healthcare Research and Quality, is the leading independent panel of private-sector experts in prevention and primary care. The Task Force conducts rigorous, impartial assessments of the scientific evidence for a broad range of preventive services. Task Force recommendations are considered the gold standard for clinical preventive services. The Task Force based its conclusions about screening for coronary heart disease on a report from a research team led by Michael Pignone, M.D., M.P.H., Assistant Professor of Medicine at the University of North Carolina-Chapel Hill School of Medicine and the RTI

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Task Force recommendations

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International-University of North Carolina Evidence-based Practice Center.

The Task Force grades the strength of the evidence as "A" (strongly recommends), "B" (recommends), "C" (no recommendation for or against), "D" (recommends against), or "I" (insufficient evidence to recommend for or against screening). The Task Force recommends against routine screening with resting electrocardiogram, exercise treadmill test, or electron beam computerized tomography scanning for coronary calcium, for either the presence of severe coronary artery stenosis or the prediction of coronary heart disease events in adults at low risk for CHD events ("D" recommendation). For adults at increased risk for CHD events, the Task Force found insufficient evidence to recommend for or against routine screening with EKG, treadmill testing, or EBCT scanning for coronary calcium for either the presence of severe coronary artery disease or the prediction of CHD events ("I" recommendation). ■

New AHRQ tool for PDAs helps clinicians treat community-acquired pneumonia

The Agency for Healthcare Research and Quality has announced its first clinical decision-support tool for personal digital assistants (PDAs) that is designed to help clinicians deliver evidence-based medicine at the point of care. AHRQ's new Pneumonia Severity Index Calculator (which is available for download from the AHRQ Web site at http://pda.ahrq.gov/), is an interactive application for PalmPilots® and other PDAs to help doctors quickly and easily determine whether patients with community-acquired pneumonia should be treated at home or in a hospital.

Community-acquired pneumonia contracted outside of a hospital or nursing home environment affects approximately 4 million Americans and costs approximately $10 billion to treat each year. More than 90 percent of these costs are spent on treating patients who are hospitalized for care.

Developed by MDpda Design, Inc., the Pneumonia Severity Index Calculator is based on a clinical algorithm produced in 1997 by the AHRQ-funded multidisciplinary research team called the Pneumonia Patient Outcomes Research Team or PORT. The Pneumonia PORT developed and tested the Pneumonia Severity Index clinical algorithm to aid clinicians in treatment decisions for patients with community-acquired pneumonia. The algorithm was validated in a broad, randomized controlled trial and was shown to be safe and cost effective and to improve satisfaction by enabling patients to be treated at home instead of in the hospital when appropriate. A sizable number of low-risk patients can be treated safely on an outpatient basis, but these patients must be accurately identified before such treatment is recommended, according to the AHRQ-sponsored research.

AHRQ PDA applications are available for download at http://pda.ahrq.gov/. The AHRQ Pneumonia Severity Index Calculator is available in Palm OS®, Pocket PC, and HTML formats. Additional AHRQ PDA applications are in development. ■

Register now for conference on quality-based health care purchasing

Health care purchasing and reimbursement arrangements can significantly influence the quality of care delivered to patients. However, structuring reimbursement to positively impact quality is a new concept to purchasers and a new field of research.

To disseminate current knowledge on quality-based purchasing and share preliminary insights from progressive pay-for-performance projects, the Agency for Healthcare Research and Quality has joined with the Alliance Health Foundation and the Employer Health Care Alliance Cooperative to cosponsor a 2-day symposium on the subject. The symposium, "Quality-Based Health Care Purchasing: Disseminating Knowledge & Gaining Insights into Progressive Projects," will be held May 5-6, 2004, in Madison, WI.

Among the invited attendees are representatives from the Centers for Medicare & Medicaid Services, the Leapfrog Group, the National Business Coalition on Health, the National Quality Forum, State Medicaid offices, quality improvement organizations, researchers, and others involved in the field.

The registration fee is $75, and the deadline for registration and fees is April 23. For questions about the symposium or to request registration information, contact John Bott at 608-210-6615 or via e-mail to jbott@alliancehealthcoop.com. ■

Research Briefs

American Burn Association. (2003, September). "Outcomes measurement in pediatric burn care: An agenda for research." (AHRQ grant HS10950). *Journal of Burn Care & Rehabilitation* 24, pp. 269-274.

Each year, over 250,000 U.S. children are burned seriously enough to require medical attention. Relatively little is known about access to care for pediatric burn victims, the cost and cost-effectiveness of various treatment strategies on outcomes, and the impact of burn injury and medical treatment on the lives of children and their families. In response to these concerns, the American Burn Association held a national conference, "Outcomes Measurement in Pediatric Burn Care: An Agenda for Research." This paper discusses the research agenda developed at the conference, which focuses on three areas: psychosocial factors of the child and family; financing and delivery of pediatric burn care; and pediatric burn treatment and interventions.

Brown, M.D., Lau, J., Nelson, R.D., and Kline, J.A. (2003, November). "Turbidimetric D-dimer test in the diagnosis of pulmonary embolism: A metaanalysis." (AHRQ grant HS13328). *Clinical Chemistry* 49, pp. 1846-1853.

These investigators conducted a meta-analysis of nine studies on use of the D-dimer test using latex turbidimetric methods in the diagnosis of pulmonary embolism (PE) in adult emergency department (ED) patients with suspected PE. Combining the studies yielded an overall sensitivity of 0.93 and an overall specificity of 0.51. Thus, the turbidimetric D-dimer test is sensitive but nonspecific for the detection of PE in the ED setting. D-Dimer tests using latex turbidimetric methods appear to have test characteristics comparable to those of ELISA methods.

Califf, R.M. (2004, January). "Defining the balance of risk and benefit in the era of genomics and proteomics." (AHRQ grant HS10548). *Health Affairs* 23(1), pp. 77-87.

The ability to measure the function of genes (genomics) and proteins (proteomics) has spawned the construct of personalized medicine in which patients' own risks and preferences are used to choose diagnostic and therapeutic strategies. However, the complexity of clinical data required to guide personalized medicine calls for improvements in the system of clinical research, according to this paper. The author outlines three areas that need improvement: overhauling the system to produce networks that can do adequate-size pragmatic trials; synchronization of regulatory and payment systems to encourage adequate studies; and an investment in educating providers and patients to improve their

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understanding of the probabilistic predictions forming the basis of personalized medicine.

Centor, R.M., Allison, J.J., Weissman, N.W., and others. (2003). "Diffusion of troponin testing in unstable angina patients: Adoption prior to guideline release." (AHRQ grant HS08843). ***Journal of Clinical Epidemiology*** **56, pp. 1236-1243.**

The American College of Cardiology/American Heart Association released guidelines in 2000 recommending measurement of troponin (a biomarker for cardiac ischemia) in all patients with acute coronary syndromes such as angina. These authors identified unstable angina admissions from Medicare files for 22 Alabama hospitals for two time periods: March 1997-February 1998 and January 1999-December 1999. In the earlier period, 21 percent of unstable angina patients had troponin measured compared with 70 percent in the later period. Patients with abnormal troponin levels more often received angiotensin-converting enzyme inhibitors, cardiac catheterization, and percutaneous coronary intervention. These findings suggest that sometimes guidelines codify currently accepted practice and do not always disseminate new knowledge.

Col, N.F., and Pauker, S.G. (2003, December). "The discrepancy between observational studies and randomized trials of menopausal hormone therapy: Did expectations shape experience?" (AHRQ grant HS13329). ***Annals of Internal Medicine*** **139, pp. 923-929.**

Unlike the randomized Women's Health Initiative (WHI) trial that showed no benefit of menopausal hormone therapy (HR) on coronary heart disease (CHD), observational studies like the Nurses' Health Study (NHS) found it to be protective. These differences have been attributed to the fact that women who choose to use HT tend to be healthier than those who do not. However, reporting biases of physicians and women who believe that HT reduces CHD risks (described in this paper) may have affected the ascertainment of CHD outcomes in observational studies. Combining these reporting biases with socioeconomic differences between users and nonusers could explain discrepancies between the observational and WHI trials.

Cook, A.F., Hoas, H., and Guttmannova, K. (2003). "Project seeks to assess and aid patient safety in rural areas." (AHRQ grant HS11930). ***Biomedical Instruments*****, pp. 128-130.**

Without attention to the human/technology interface, even well-intentioned interventions may be resisted or used inappropriately, note the authors of this commentary. They make these claims based on data stemming from nine studies conducted in rural communities in a 14-State area, as well as data from an ongoing patient safety research project. The studies suggest that the ability to recognize and respond to potentially unsafe situations may be compromised by factors that technology alone cannot solve, including staffing patterns, problems in workplace communication, and overall lack of resources and training.

Corser, W.D. (2004). "Postdischarge outcome rates influenced by comorbidity and interdisciplinary collaboration." (AHRQ grant HS10792). ***Outcomes Management*** **8(1), pp. 45-51.**

The way in which health care professionals engage in discharge planning collaboration (DPC) may indeed influence the rates of some patient outcomes after hospital discharge, suggests this study. The investigators examined the relationship between health care professionals' ratings of their DPC and other patient characteristics with rates of postdischarge outcomes experienced by a sample of elderly veterans. The significant influence of interdisciplinary discharge planning collaboration was demonstrated by fewer emergency room visits and postdischarge falls by elderly veterans.

Cosby, K.S. (2003, December). "A framework for classifying factors that contribute to error in the emergency department." (AHRQ grant HS11552). ***Annals of Emergency Medicine*** **42, pp. 815-823.**

This author provides a framework for classifying factors that contribute to error in the emergency department (ED). In its most basic form, the framework is a comprehensive checklist of all the sources of error uncovered in the course of investigating hundreds of cases referred to one hospital's emergency medicine quality assurance committee over the past decade. The author begins with a look at error in the ED and then moves ahead to examine error in the context of the wider health care system. The framework incorporates ideas from safety engineering, transportation safety, human factors engineering, and the author's own experiences in the ED of an urban, public, teaching hospital.

Eitel, D.R., Travers, D.A., Rosenau, A.M., and others. (2003, October). "The emergency severity index triage algorithm version 2 is reliable and valid." (AHRQ grant HS10381). ***Academic Emergency Medicine*** **10(10), pp. 1070-1080.**

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Emergency department (ED) triage separates patients into urgency categories to prioritize patients for evaluation and treatment. A new approach to ED triage, the Emergency Severity Index (ESI) asks not only, "Who should be seen first?" but also, "What does this patient need to reach a disposition?" The ESI is used to rate patients on arrival to the ED and ranges from level 1 (most sick) to level 5 (least resource-intensive). After pilot implementation and validation, the ESI was revised to include pediatric and updated vital signs criteria. These authors assessed ESI version 2 reliability and validity at seven EDs in three States. The ESI version 2 produced reliable, valid stratification of patients across seven EDs.

Glasgow, R.E., Davis, C.L., Funnell, M.M., and Beck, A. (2003, November). "Implementing practical interventions to support chronic illness self-management." (AHRQ grant HS10123). ***Joint Commission Journal on Quality and Safety*** **29(11), pp. 563-574.**

Self-management support (SMS) is the area of disease management least often implemented and most challenging to integrate into usual care. These authors outline a model of SMS applicable across different chronic illnesses and health care systems. They also present recommendations for assisting health care professionals and practice teams to make changes, and they provide tips and lessons learned. The authors note that successful SMS programs involve changes at multiple levels: patient-clinician interactions; office environment changes; and health system, policy, and environmental supports.

Murray, M.E., and Darmody, J.V. (2004). "Clinical and fiscal outcomes of utilization review." (AHRQ grant HS10667). ***Outcomes Management*** **8(1), pp. 19-25.**

U.S. health care expenditures are expected to rise to over $3 trillion by 2012, putting pressure on health care providers to cut costs. Concurrent utilization review (UR) is both a quality improvement tool and a cost-containment strategy used by managed care organizations. The UR process requires that hospital staff communicate clinical information about hospitalized patients to payers who evaluate the appropriateness and medical necessity of the planned care. Payers than make a decision whether to certify the care for reimbursement. This study provides data which suggest that denials of certification have little impact on clinical and fiscal outcomes of patient care.

Needleman, J., Buerhaus, P.I., Mattke, S., and others. (2003, December). "Measuring hospital quality: Can Medicare data substitute for all-payer data?" (AHRQ grant HS09958). ***Health Services Research*** **38 (6, Part I), pp. 1487-1508.**

The goal of this study was to assess whether adverse outcomes in Medicare patients can be used as a surrogate for measures from all patients in quality-of-care research using administrative datasets. The researchers used patient discharge abstracts from State data systems for 799 hospitals in 11 States, national MedPar discharge data for Medicare patients from 3,357 hospitals, State hospital staffing surveys or financial reports, and 1997-1998 data from the American Hospital Association Annual Survey. They calculated rates for 10 adverse patient outcomes, examined the correlation between all-patient and Medicare rates, and examined other variables to compare results using all-patient and Medicare patient data. They conclude that analyses of quality of care for medical patients using Medicare-only and all-patient data are likely to have similar findings.

Okada, P.J., Young, K.D., Baren, J.M., and others. (2003, October). "Neurologic outcome score for infants and children." (AHRQ grant F32 HS00091). ***Academic Emergency Medicine*** **10(10), pp. 1034-1039.**

Many approaches for improving the neurologic outcomes of children after brain injury are under investigation, including accurate triage to specialized centers, medical and surgical therapies, and rehabilitation. However, the efficacy of interventions cannot be evaluated unless neurologic outcome can be reliably measured. These investigators developed and tested a measure of neurologic outcome–the Neurologic Outcome Scale for Infants and Children (NOSIC)—in 100 children of varying ages with a wide range of levels of neurologic function. Results showed that the NOSIC is a practical, reliable, valid, instrument applicable to infants and children with a broad range of neurologic deficits.

Phillips, R.L., Phillips, K.A., Chen, F.M., and Melillo, A. (2003). "Exploring residency match violations in family practice." ***Family Medicine*** **35(10), pp. 717-720.**

The National Resident Matching Program (NRMP) is a venue for matching residency applicants' and programs' preferences for each other in a consistent way and with a uniform timetable. The study investigators asked 15 student applicants to family practice residency programs in 2002 whether they experienced NRMP violations and how they were affected by perceived violations. Only six of the

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students believed that they had experienced a violation. Only two students had experienced an actual Match guideline violation, and two more experienced potential violations. However, there was substantial confusion about what constituted a violation. There are opportunities to investigate violations and to train students to recognize and deal with violations, conclude the authors. Reprints (AHRQ Publication No. 04-R024) are available from AHRQ.**

Saint, S., Hofer, T.P., Rose, J.S., and others. (2003, November). "Use of critical pathways to improve efficiency: A cautionary tale." (AHRQ grant HS11540). *American Journal of Managed Care* 9, pp. 758-765.

Critical pathways are care strategies that specify patient goals and the sequence and timing of actions necessary to achieve these goals with optimal efficiency. More than 80 percent of U.S. hospitals use critical pathways for at least some of their patients. These researchers identified all critical pathways initiated in their medical center between 1993 and 1996 in which at least 50 adult patients would be evaluated in the year preceding and succeeding pathway implementation. The goal was to assess whether critical pathways successfully reduced length of hospital stay and resource use. Although some pathways did reduce length of stay, resource use, or both, most pathways reduced neither.

Sayre, M.R., White, L.J., Brown, L.H., and others. (2003, October). "National EMS research agenda: Proceedings of the implementation symposium." (AHRQ grant HS12086). *Academic Emergency Medicine* 10(10), pp. 1100-1108.

This paper summarizes the proceedings of a two-day symposium to discuss implementation of the National Emergency Medical Services (EMS) research agenda for improving the conduct of EMS research in the United States. The participants suggested improving training opportunities for EMS researchers, stimulating increases in available funding resources, facilitating the integration of research into practice, and crafting alterations within the regulatory environment. They felt that EMS must be more broadly integrated into the public health continuum. Finally they asked Federal agencies, States, local governments, charitable foundations, and corporations to increase opportunities for participation in EMS research programs.

Singh-Manoux, A., Richards, M., and Marmot, M. (2003). "Leisure activities and cognitive function in middle age: Evidence from the Whitehall II study." (AHRQ grant HS06516). *Journal of Epidemiology and Community Health* 57, pp. 907-913.

Adults who engage in leisure activity entailing high cognitive effort or social interaction are more likely to have better cognitive ability, according to this large study of British civil servants aged 35-55 years. This suggests that seeking mental stimulation may have a beneficial effect on cognition in middle age, note the study authors. They examined data from the fifth data wave of the Whitehall II study of British civil servants and studied the effects of each leisure activity—adjusted for age and socioeconomic status—on cognition. They then examined the effects of two categories of leisure activities: those entailing high or low cognitive effort and social or individual activities.

Watson, N.M., Brink, C.A., Zimmer, J.G., and Mayer, R.D. (2003). "Use of the Agency for Health Care Policy and Research urinary incontinence guideline in nursing homes." (AHRQ grant HS08491). *Journal of the American Geriatrics Society* 51, pp. 1779-1786.

This study examined use of the AHRQ guideline on urinary incontinence (UI) in 52 nursing homes in upstate New York. Results suggest that assessment and treatment of UI is manageable (a total of 4.2 cases per 100 beds per 12 weeks), but quality of care is not adequate. On average, only 20 percent of the applicable clinical practice standards were met, due primarily to lack of awareness of new UI in patients and lack of familiarity with the guideline. For example, 81 percent of patients had a reversible cause of UI at the time of onset, but only 34 percent had all related problems addressed.

Zhou, X-H., and Castelluccio, P. (2004). "Adjusting for non-ignorable verification bias in clinical studies for Alzheimer's disease." (AHRQ grant HS08559). *Statistics in Medicine* 23, pp. 221-230.

A common problem for comparing the relative accuracy of two screening tests for Alzheimer's disease (AD) in a two-stage design study is verification bias. If the verification bias can be assumed to be ignorable, some have proposed a maximum likelihood approach to compare the relative accuracy of screening tests in a two-stage design study. However, if the verification mechanism also depends on the unobserved disease status, the ignorable assumption does not hold. In this paper, the authors discuss how to use a profile likelihood approach to compare the relative accuracy of two screening tests for AD without assuming the ignorable verification bias mechanisms. ■

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