



Research Activities

No. 264, August 2002

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ECG-based diagnostic tools speed treatment of suspected heart attack victims and substantially reduce malpractice suits

When doctors in the emergency department (ED) miss a diagnosis of heart attack (acute myocardial infarction, AMI) or unstable angina, they put the patient at risk and open the door to a possible malpractice suit. Physician use of an electrocardiograph-based ED risk management tool, which predicts the probability of acute ischemia (AMI or unstable angina), substantially reduces malpractice costs, according to a study supported by the Agency for Healthcare Research and Quality (HS07360). A second AHRQ-supported study (HS08212) shows that a suspected heart attack patient who is identified in the ED is more likely to receive potentially lifesaving thrombolytic (clot dissolving) therapy or angioplasty when another ECG-based predictive instrument indicates the benefits of thrombolytic therapy for the patient at the time of the ECG. Both studies, which were led by Harry P. Selker, M.D., M.S.P.H., of Tufts-New England Medical Center, are summarized here.

Selker, H.P., Beshansky, J.R., Pozen, J.D., and others. (2002, winter). "An electrocardiograph-based emergency department risk management tool based on the acute cardiac ischemia time-insensitive predictive instrument (ACI-TIPI): Potential impact on care and on the occurrence and outcomes of malpractice claims." *Journal of Healthcare Risk Management* pp. 11-18.

An ED risk management form automatically generated by electrocardiographs that include an ECG-based acute cardiac ischemia time-insensitive predictive instrument (ACI-TIPI) could reduce malpractice costs nationally by \$1.2 billion a year, concludes this study. The ACI-TIPI generates a 0-100 percent probability that the ED patient has acute cardiac ischemia and may prompt doctors to consider and document key clinical factors for each ED patient with chest pain or related symptoms. It reduces the likelihood of malpractice suits because it helps ED doctors appreciate the importance of ECG abnormalities, the need to hospitalize certain

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ECG-based diagnostic tools

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patients, and the need to document appropriate care, suggest the researchers.

For 20 closed cases of malpractice litigation for missed AMI, six expert reviewers determined the likely impact of the ACI-TIPI if filled out by the physician during patient ED evaluations and if automatically generated with the initial electrocardiogram, on the case's likelihood of litigation and the outcome of litigation, if litigated. Both the manually completed and electrocardiograph-generated forms were judged to reduce the likelihood of litigation, respectively, for 65 percent and 83 percent of cases, including 38 percent judged "very much less likely" and 61 percent judged "almost certain not" to come to litigation.

Assuming that the cases were litigated, reviewers determined that there would have been a different litigation outcome supporting the physician's care for 62 percent of

cases had the physician-completed form been used and for 80 percent of cases had the electrocardiograph-generated version been used. Review of cases with complete financial data projected a mean savings per case for physician-generated forms of \$356,052, compared with \$470,288 for the electrocardiograph-generated forms. This would translate into annual savings in the United States of \$1.2 billion.

Selker, H.P., Beshansky, J.R., and Griffith, J.L. (2002, July 16). "Use of the electrocardiograph-based thrombolytic predictive instrument (TPI) to assist thrombolytic and reperfusion therapy for acute myocardial infarction: A multicenter randomized clinical effectiveness trial." *Annals of Internal Medicine* 137(2), pp. 87-95.

As electrocardiograph-based decision support to help ED physicians recognize the need for thrombolytic (clot dissolving) therapy for suspected heart attack patients, the Thrombolytic

Predictive Instrument (TPI), incorporated into conventional computerized electrocardiographs, provides patient-specific predictions of the benefit of thrombolytic therapy for individual patients. When this prediction was printed on the text header of the ED electrocardiograph, the percentage of patients treated with thrombolytic therapy over a

22-month period increased at the EDs of 28 urban, suburban, and rural hospitals.

The researchers randomly assigned 1,197 ED patients with ST elevations on the ECG to either the control (587 patients) or intervention group (610 patients). If assigned to the intervention group, the ECG automatically prompted the user to enter information needed to compute the TPI predictions: age, sex, history of hypertension or diabetes, blood pressure, and time since ischemic symptom onset. The remaining variables, based on measurements of ECG waveforms, were automatically acquired by the electrocardiograph. Then the ECG was printed with the TPI prediction on its header. For patients assigned to the control group, the ECG was automatically printed with the standard header text used in that ED.

The ECG-TIPI increased use of thrombolytic therapy for patients with ECG detection of ST elevation characteristic of AMI, as well as use within 1 hour when it is most beneficial for preventing heart damage. The ECG-TIPI also increased overall reperfusion therapy (by thrombolytics or angioplasty) by 11-12 percent for inferior AMI (which is less classically targeted for reperfusion therapy and more likely to be missed than anterior AMI). It also increased overall reperfusion therapy by 18-22 percent for women (who are less likely to have classic signs of heart attack than men), by 30-34 percent when consultation with an off-site physician was required, and by 44-53 percent for patients who were seen at hospitals with no on-site ED physician. Thus, its impact was greatest for those patients in settings less likely to receive needed reperfusion therapy. The next area of application for this technology could be in ambulances. ■

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AHRQ
Office of Health Care Information
2101 East Jefferson Street, Suite 501
Rockville, MD 20852
(301) 594-1364

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

ER doctors often overestimate the need for critical care for patients with acute congestive heart failure

Congestive heart failure (CHF) is a leading cause of hospitalization for elderly patients. In the absence of specific guidelines for triaging CHF patients, up to 47 percent of hospitalized patients with CHF go to intensive care units (ICUs). However, doctors tend to drastically overestimate the need for ICU care for these patients, according to a study that was supported in part by the Agency for Healthcare Research and Quality (HS06274).

Researchers led by Wally R. Smith, M.D., of Virginia Commonwealth University, prospectively studied triage decisions of emergency department (ED) doctors caring for ED patients with acute CHF at an urban university hospital, a community hospital, and a VA hospital. They reviewed the medical charts of these patients to determine whether each patient died or developed severe complications within 4 days of ED triage and asked physicians about the probability of this outcome.

Overall, 4.2 percent of triaged CHF patients died or developed severe complications. A calibration curve that stratified doctors'

judgments by deciles of the highest probability of death or serious complications showed that they consistently overestimated this probability. For example, of the 74 patients whom ED doctors judged to have the highest probability of these problems, only 14 patients (19 percent) actually died or developed serious complications. Of the 19 patients that doctors judged to be in the next highest probability decile (81 to 90 percent), only two patients (11 percent) died or experienced severe complications.

Thus, doctors were only moderately proficient at discriminating which CHF patients would die or experience severe complications. This probably led to overuse of scarce ICU resources, since the higher a doctor's prediction of death or severe complications, the more likely the doctor was to send that patient to a more intense care setting. Patients admitted to an ICU received the highest average predicted probability (56 percent), followed by those admitted to a telemetry unit (34 percent), a regular hospital ward (30 percent), or sent home (18 percent).

More details are in "Prognostic judgments and triage decisions for patients with acute congestive heart failure," by Dr. Smith, Roy M. Poses, M.D., Donna K. McClish, Ph.D., and others, in the May 2002 *CHEST* 121, pp. 1610-1617. ■

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Most patients with coronary artery disease take aspirin to prevent strokes and heart attacks, but some do not

Use of aspirin by patients with coronary artery disease (CAD) reduces heart attacks, strokes, and CAD-related death. Aspirin and other antiplatelet agents sufficiently thin the blood to prevent clot

formation leading to these problems.

A new study shows that 85 percent of CAD patients referred to a major medical center for a cardiovascular procedure were taking aspirin after discharge. This

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Coronary artery disease

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is a higher rate than reported in previous studies, which is good news. Nevertheless, an estimated 6 percent of CAD patients who had no contraindications for taking aspirin or another antiplatelet agent (for example, allergy, stomach ulcer, or use of other blood thinning medications) were not using either agent. The study was supported in part by the Agency for Healthcare Research and Quality (HS10548) and conducted by researchers at the Duke CERTs (Centers for Education and Research on Therapeutics) at the Duke Clinical Research Institute in Durham, NC.

Increasing use of aspirin or another antiplatelet agent among these eligible patients could further reduce the number of CAD-related events in the over 12 million patients with CAD in the United States, according to the researchers. They analyzed survey responses from a subgroup of 1,626 CAD patients identified from a clinical database at Duke University Medical Center who had undergone a cardiac procedure at the Center since 1969. The survey examined aspirin use and factors associated with its use or nonuse. Responses were extrapolated to the large database (16,174 patients) of CAD patients.

Overall, 58 percent of survey respondents reported taking aspirin (extrapolated to 85 percent of CAD

patients in the database), and 42 percent reported no aspirin use. Of the 948 patients who used aspirin, 85 percent said they took it every day, and 7 percent took it only as needed. The most frequent aspirin dose (60 percent of respondents) was 325 mg. Twenty-two percent reported a dose of 81 mg (the dose of a children's aspirin). Most patients (87 percent) said that their doctors were the ones who convinced them to take aspirin.

See "Patient-reported frequency of taking aspirin in a population with coronary artery disease," by Nancy M. Allen LaPointe, Pharm.D., Judith M. Kramer, M.D., M.S., Elizabeth R. DeLong, Ph.D., and others, in the *American Journal of Cardiology* 89, pp. 1042-1046, 2002. ■

Implantable defibrillators reduce cardiac deaths and are as cost effective as many generally accepted therapies

An estimated 1,000 people suffer from cardiac arrest each day in the United States, and 220,000 Americans die from it each year. Fortunately, implantable cardioverter defibrillators, which can sense abnormal heart rhythms and deliver a shock to restore a normal heartbeat, improve the survival of patients at risk for cardiac arrest. These devices are also as cost effective as some, but not all, generally accepted therapies, according to a study supported by the Agency for Healthcare Research and Quality (HS08362).

Mark A. Hlatky, M.D., of Stanford University School of Medicine, and his colleagues identified 7,612 matched pairs of elderly Medicare patients from a nationwide sample of patients discharged between 1987 and 1995. These patients had been hospitalized for ventricular tachycardia (abnormally fast heartbeat) or ventricular fibrillation (irregular heartbeat).

The investigators compared mortality and care costs for the patients in the matched pairs who received a

defibrillator with the patients who were treated medically (but had similar severity of illness and prognosis) during 8 years of followup. Overall, defibrillator patients had 34 percent fewer deaths. Significantly fewer of those who received a defibrillator had died at 1 year (11 vs. 19 percent), 2 years (20 vs. 30 percent) and 3 years (28 vs. 39 percent). By 8 years, fewer patients who received defibrillators had died compared with those who did not receive defibrillators, but the advantage of the defibrillator decreased over time. Median survival for the defibrillator group also was longer (5.7 vs. 4.6 years).

Health care expenditures among patients who received a defibrillator were consistently higher than among medically treated patients (\$48,700 vs. \$17,000 during the first year). This is not surprising, since the device costs more than \$20,000, and there are

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Implantable defibrillators

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additional costs for implantation. Over the 8-year period, the difference grew to \$78,700 for defibrillator patients versus \$37,200 for medically treated patients, with a cost-effectiveness ratio of \$78,400 per life-year gained. Although above a common benchmark of \$50,000 per life-year saved, it is comparable to several other commonly accepted medical interventions.

See “Effectiveness and cost-effectiveness of implantable cardioverter defibrillators in the treatment of ventricular arrhythmias among Medicare beneficiaries,” by J. Peter Weiss, M.D., Olga Saynina, M.A., M.B.A., Kathryn M. McDonald, M.M., and others, in the May 2002 *American Journal of Medicine* 112, pp. 519-527. ■

Use of cholesterol-lowering drugs by elderly heart attack survivors has increased substantially since the mid-1990s

Use of statin and other drugs to lower cholesterol levels among heart attack patients has been shown to improve their survival and reduce the risk of further heart problems. The good news is that in 1999 and 2000, nearly 60 percent of elderly heart attack survivors in three different areas of the United States were using cholesterol-lowering drugs 5 years after having a heart attack. This is far more than the 12 to 29 percent of elderly heart attack survivors shown to be taking these medications in previous studies during the mid 1990s. This finding suggests the positive impact of acute myocardial infarction (AMI, heart attack) care guidelines and educational campaigns on the benefit of these drugs among elderly heart attack survivors.

On the other hand, only one-third of these elderly patients knew

their cholesterol level, and many were unaware of the potential adverse effects of cholesterol-lowering medications. Clearly, elderly heart attack survivors could benefit from increased education about cholesterol testing and treatment, concludes John Z. Ayanian, M.D., M.P.P., of Brigham and Women’s Hospital and Harvard Medical School. In a study that was supported in part by the Agency for Healthcare Research and Quality (HS08071), Dr. Ayanian and his colleagues conducted a telephone survey of 815 elderly Medicare patients in 1999 and 2000. The patients had been hospitalized for heart attacks 5 years earlier.

Nearly 60 percent of respondents said they were taking cholesterol-lowering drugs. However, only 24 percent were aware that cholesterol-lowering drugs can cause hepatitis, and only

4 percent were aware those drugs can cause muscle damage. Women, those aged 65 to 69 years, and those who said a cardiologist was mainly responsible for their cholesterol management were more likely to be taking cholesterol-lowering drugs. Although 77 percent of respondents said that lowering their cholesterol level was very important after AMI to prevent another AMI, only 33 percent knew the results of their own cholesterol test conducted within the previous 2 years.

See “Use of cholesterol-lowering therapy by elderly adults after myocardial infarction,” by Dr. Ayanian, Mary Beth Landrum, Ph.D., and Barbara J. McNeil, M.D., Ph.D., in the May 13, 2002 *Archives of Internal Medicine* 162, pp. 1013-1019. ■

Areas with higher cardiac procedure rates for patients with coronary artery disease do not overuse the procedures

Areas with high rates of cardiac procedures for patients hospitalized with coronary artery disease (CAD) seem to have a pool of patients with more need for the procedures and are not inappropriately overusing them. In fact, more extensive disease instead of physician practice style may be at the root of area practice variations in use of cardiac catheterization and revascularization for CAD

patients, concludes Joseph D. Restuccia, Dr.P.H., of Boston University.

In a study supported by the Agency for Healthcare Research and Quality (HS06048), Dr. Restuccia and his colleagues created 70 small geographic areas based on hospital use patterns in Massachusetts in 1990. Using data from the early 1990s, they examined the

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Cardiac procedure rates

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appropriate use of cardiac catheterization among patients hospitalized primarily for CAD and of revascularization (bypass surgery or coronary angiography) among hospitalized CAD patients who underwent cardiac catheterization.

The researchers ranked areas from highest to lowest based on hospitalization rates for each procedure; 1,704 cases from 43 hospitals were sampled, about half each from high and low use. They examined medical records to determine whether each procedure was appropriate or, in the case of patients who did not have a procedure, would have been appropriate based on clinical criteria. The use rate for cardiac catheterization per 1,000 CAD patients in the highest rate group was 62 percent greater than in the lowest rate group. The use rate for revascularization per 1,000

CAD patients who had a cardiac catheterization in the highest rate group was 34 percent greater than in the lowest rate group.

Appropriateness rates were similar in the high and low use areas for either cardiac catheterization (82 vs. 84 percent) or revascularization (93 vs. 90 percent). However, among candidates for cardiac catheterization or revascularization who did not have the procedure, appropriateness for performing the procedure was greater in high-rate areas (41 vs. 32 percent for catheterization and 71 vs. 57 percent for revascularization).

See “Does more ‘appropriateness’ explain higher rates of cardiac procedures among patients hospitalized with coronary heart disease?” by Dr. Restuccia, Michael Shwartz, Ph.D., Bernard E. Kreger, M.D., M.P.H., and others, in the June 2002 *Medical Care* 40(6), pp. 500-509. ■

Internal thoracic artery grafting can improve survival in elderly patients undergoing coronary bypass surgery

Among the most powerful technical improvements in coronary artery bypass graft (CABG) surgery has been the grafting of the left internal thoracic artery (ITA), instead of the saphenous vein (which doesn't stay open as long), to the left anterior descending coronary artery (LAD). In fact, use of ITA grafting has become a marker of quality CABG surgery. Doctors have been reluctant to use this approach in CABG surgery for the elderly due to their elevated surgical risks and shorter life expectancy. However, a new study demonstrating improved survival of elderly patients with use of ITA grafting may prompt them to reconsider this option.

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS10403), T. Bruce Ferguson, Jr., M.D., of the LSU Health Sciences

Center and the Society of Thoracic Surgeons, and colleagues used data from a national cardiac database of over 500,000 patients who underwent non-emergency CABG surgery between 1996 and 1999. They analyzed the use of and complications associated with ITA grafting. Only 77 percent of patients aged 75 to 84 years received an ITA graft compared with nearly 94 percent of those aged 55 or younger. Yet this elderly ITA group had 27 percent less risk of dying within 30 days than a matched elderly non-ITA group.

In addition, the elderly ITA group did not have significantly higher likelihood of reoperation, stroke, and renal failure. Deep sternal infections were higher among the ITA versus non-ITA group, but the incidence was small (0.66 vs. 0.52 percent). When patients were divided into five

groups based on their preoperative risk scores, mortality rates for those receiving an ITA were lower than the rates for those not receiving an ITA in each of the five predicted risk groups. However, the acute survival benefits of an ITA graft appeared to diminish in those aged 85 years or older. The impact of ITA use on long-term mortality among the elderly remains unclear, according to Dr. Ferguson.

See “Internal thoracic artery grafting in the elderly patient undergoing coronary artery bypass grafting: Room for process improvement?” by Dr. Ferguson, Laura P. Coombs, Ph.D., and Eric D. Peterson, M.D., M.P.H., in the May 2002 *Journal of Thoracic and Cardiovascular Surgery* 123(5), pp. 869-880. ■

Educating neurologists about coagulation tests could improve their use of such tests in stroke patients

Blood coagulation disorders (coagulopathies) are a rare but recognized cause of stroke. There currently are no guidelines for when to order specialized coagulation tests to prevent further strokes in stroke patients. However, a new study suggests that neurologists could improve their use of these tests.

Educating neurologists to optimize diagnostic testing for coagulopathies in stroke patients will most likely require reminder systems, educational outreach, and other strategies, says Cheryl D. Bushnell, M.D., M.H.S., and Larry B. Goldstein, M.D., of Duke University Medical Center. Their work was supported by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00079).

The researchers surveyed 79 academic and community-based neurologists about their use of specialized coagulation tests and the rationale for using them in their practice and in the case of three hypothetical patients. The 59 completed surveys showed that neurologists were more likely to use these

tests for young patients (76 percent), those with a history of thrombosis (46 percent) or miscarriages (36 percent), and those with few traditional stroke risk factors (35 percent)—that is, patients who are more likely to have strokes due to coagulation disorders. Only 14 percent would order tests for a hypothetical patient with traditional stroke risk factors.

Nevertheless, 46 percent of those surveyed could not identify the coagulopathy most prevalent in patients with ischemic stroke. Also, there were important discrepancies between knowledge and observed practice. For example, despite neurologists' apparent awareness of the low prevalence of hereditary coagulopathies (identified by protein C or S deficiencies) in the survey, protein C and protein S were two of the most commonly ordered specialized coagulopathy tests.

More details are in "Physician knowledge and practices in the evaluation of coagulopathies in stroke patients," by Drs. Bushnell and Goldstein, in the April 2002 *Stroke* 33, pp. 948-953. ■

Preventive Services

Value of prostate cancer screening may lie in the reassurance it can provide

Prostate cancer is the second leading cause of cancer deaths among men in the United States. In 1999 alone, nearly 180,000 men were diagnosed with the disease, and another 37,000 died of it.

Prostate screening tests such as the digital rectal examination (DRE) and prostate-specific antigen (PSA) test are currently used to identify the early stages of prostate cancer, but the benefits of such tests remain unclear. No clinical trial has yet linked prostate cancer screening results with men's survival or quality of life. Nevertheless, men do gain reassurance from prostate cancer

screening, concludes a study supported by the Agency for Healthcare Research and Quality (HS08992).

Researchers led by Robert J. Volk, Ph.D., of Baylor College of Medicine, examined the responses of 168 men (aged 45-70 years) to a hypothetical screening scenario after the men were educated about prostate cancer, screening and diagnostic tests, and possible adverse effects of cancer treatment. During interviews, the researchers asked the men to assume they did not have prostate cancer and to rank three predefined screening states with regard to reassurance value: A, no screening; B, normal

by screening (a PSA and DRE); and C, normal by biopsy (abnormal PSA and DRE results, but a negative ultrasound-guided prostate biopsy).

Nearly 97 percent of the men associated some reassurance value with screening, with 87 percent considering health state A, no screening, to be the worst possible health state. Preference for screening state C was associated with a family history of prostate cancer and perceived greater risk for prostate cancer compared with other men. More than half (57 percent) of the men thought

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Prostate cancer screening

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screening state B to be the best state (only 2 percent considered it to be the worst), and 39 percent

considered screening state C to be the best (11 percent considered it to be the worst). Age, ethnicity, education, and income were not significantly related to a preference for screening state C over state B.

See "Psychological benefits of prostate cancer screening: The role of reassurance," by Scott B. Cantor, Ph.D., Dr. Volk, Alvah R. Cass, M.D., S.M., and others, in *Health Expectations* 5, pp. 104-113, 2002. ■

U.S. Preventive Services Task Force issues recommendation on colorectal cancer screening and other new information

The U.S. Preventive Services Task Force (USPSTF), in its strongest ever recommendation for colorectal cancer screening, is urging that all adults age 50 and over get screened for the disease, the Nation's second leading cause of cancer deaths. Various screening tests are available, making it possible for patients and their clinicians to decide which test is most appropriate for each individual. The Task Force is an independent panel of experts that is sponsored by the Agency for Healthcare Research and Quality.

An estimated 143,300 U.S. adults will be diagnosed with colorectal cancer in 2002, and nearly 57,000 will die from it. Of cancer deaths, only lung cancer kills more Americans. Currently, less than half of all Americans over the age of 50 are being screened for colorectal cancer.

This recommendation strengthens the Task Force's previous position in 1996 when it simply "recommended" screening. It now "strongly recommends" screening for colorectal cancer because new studies show even more clearly that various screening methods are effective in diagnosing cancer and preventing deaths.

Although several screening tests are effective in diagnosing colorectal cancer at an early stage when it is treatable, the Task Force noted that current information is

insufficient to recommend one method over another. Options include at-home fecal occult blood test (FOBT); flexible sigmoidoscopy; a combination of home FOBT and flexible sigmoidoscopy; colonoscopy; and double-contrast barium enema. Screening also can lead to early detection of adenomatous polyps, which are precancerous growths that can be removed to prevent them from progressing to cancer.

The Task Force found good evidence that annual FOBT reduces deaths from colorectal cancer and fair evidence that sigmoidoscopy alone or in combination with FOBT reduces deaths. They noted that colonoscopy or barium enema also are likely to be effective screening tools, although they did not find direct evidence that colonoscopy or barium enema are effective in reducing colorectal cancer deaths. The Task Force could not determine whether the increased accuracy of colonoscopy, which allows doctors to examine the entire colon, offsets the procedure's inconvenience, costs, and potential complications, such as a small risk for bleeding and perforation of the colon.

There is no single best test for all patients and clinical practice settings, since each test has advantages and disadvantages, according to Alfred O. Berg, M.D., M.P.H., Chair of the Task Force. Clinicians should talk to patients

about the benefits and potential harms with each option. The decision to screen should be based on patient preferences and available resources for testing and followup.

Most cases of colorectal cancer occur in people at average risk for the disease, a category that includes people 50 and over. About 20 percent of colorectal cancers occur in those at high risk for the disease, including people with a personal history of ulcerative colitis or a family history of colorectal cancer in a first-degree relative; that is, a mother, father, sister, or brother who received a diagnosis before age 60. For those at high risk, the Task Force suggested that screening could begin at a younger age.

The Task Force, a leading independent panel of private-sector experts in prevention and primary care, conducts rigorous, impartial assessments of all the scientific evidence for a broad range of preventive services. Its recommendations are considered the "gold standard" for clinical preventive services. The Task Force based its conclusion on a report prepared by a research team led by Michael Pignone, M.D., M.P.H., at AHRQ's Evidence-based Practice Center at RTI International-University of North Carolina.

For more information, see the following articles in the July 16, 2002 *Annals of Internal Medicine* 137(2): "Screening for colorectal

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cancer: Recommendation and rationale,” by the U.S. Preventive Services Task Force, pp. 129-131; “Cost-effectiveness analyses of colorectal cancer screening: A systematic review for the U.S. Preventive Services Task Force,” by Dr. Pignone, Somnath Saha, M.D., M.P.H., Tom Hoerger, Ph.D., and Jeanne Mandelblatt, M.D., M.P.H., pp. 96-104; and “Screening for colorectal cancer in adults at average risk: A summary of the evidence for the U.S. Preventive Services Task Force,” by Dr. Pignone, Melissa Rich, M.D., Steven M. Teutsch, M.D., M.P.H., and others, pp. 132-141. See also “Recent developments in colorectal cancer screening and prevention,” by Dr. Pignone, and Bernard Levin, M.D., in the July 15, 2002 *American Family Physician* 66(2), pp. 297-302. The colorectal cancer recommendation and materials for clinicians are available on the AHRQ Web site at <http://www.ahrq.gov/clinic/3rduspstf/colorectal/>.

Behavioral Counseling to Promote Physical Activity. The USPSTF also has issued a recommendation on behavioral counseling for physical activity. Although the Task Force affirmed the well-established benefits and importance of physical activity to

improve health and prevent disease, they found insufficient evidence to recommend for or against behavioral counseling by primary care physicians to promote physical activity among adults. In issuing their findings, the Task Force called for more research on the role of clinician counseling on levels of physical activity for adults, children, and adolescents.

The Task Force noted the abundant evidence regarding the importance of physical activity as a means to staying healthy. However, there is mixed or inconclusive evidence regarding the role of primary care providers in motivating adult patients to be physically active. There are a few multicomponent interventions that the Task Force feels are promising approaches to encouraging adults to exercise, including patient goal setting, written exercise prescriptions, individually tailored physical activity regimens, and telephone followup. In addition, the Task Force noted that linking primary care patients to community programs and targeting groups rather than individuals could be an effective approach to encourage physical activity among adults.

For more information, see the August 6, 2002 *Annals of Internal Medicine* 137(3): “Behavioral counseling in primary care to promote physical activity: Recommendation and rationale,” by the U.S. Preventive Services Task

Force, pp. 205-207; and “Does counseling by clinicians improve physical activity? A summary of the evidence for the U.S. Preventive Services Task Force,” by Karen B. Eden, Ph.D., Tracy Orleans, Ph.D., Cynthia D. Mulrow, M.D., M.Sc., and others, pp. 208-215.

Hormone Replacement Therapy. Two new systematic reviews of a broad spectrum of research on hormone replacement therapy (HRT) to prevent cardiovascular disease and other long-term health problems support the findings of a recently halted clinical trial in the Women’s Health Initiative (WHI). These reviews were developed for the U.S. Preventive Services Task Force as background for new recommendations on HRT use that will be published in the fall for clinicians and patients.

The two reviews found that harms could exceed benefits for women taking HRT for 5 years or longer to prevent chronic conditions. The authors of the reviews were not able to determine whether the harms or benefits depended on the type of hormones used. Although one study of estrogen and progestin in the WHI was stopped after 5 years because harms exceeded benefits, a second study of estrogen alone for women who have had a hysterectomy is continuing because the balance of benefits and harms is not yet clear.

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USPSTF recommendations

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The authors did not examine the use of HRT to treat menopausal symptoms or specific conditions such as osteoporosis.

The authors confirm the benefits of HRT to prevent bone fractures and probably colorectal cancer, but they found that the effects of HRT on dementia were uncertain. Harms include an increased risk of blood clots and stroke, an increase in breast cancer with 5 or more years of use, and a probable increase in gallbladder disease. New evidence suggests that HRT does not reduce the risk of heart disease and may modestly increase risk.

HRT, in the form of estrogen alone or combined with progestin, is taken by 14 million U.S. women. It is used by women to reduce acute symptoms of menopause such as hot flashes, and physicians

have prescribed it to prevent chronic conditions such as heart disease. Heart disease is the leading cause of death among women in the United States.

The reviews were prepared for the U.S. Preventive Services Task Force by a team of researchers at AHRQ's Evidence-based Practice Center at Oregon Health & Science University. Data from the WHI trial were incorporated into the articles in an effort to integrate those results with systematic reviews of thousands of studies published on HRT since 1996. The Task Force will be reviewing these new systematic reviews in the next few months to update its 1996 recommendations on HRT.

For more information see "Postmenopausal hormone replacement therapy and the primary prevention of cardiovascular disease," by Linda L. Humphrey, M.D., M.P.H., Benjamin K.S. Chan, M.S., and

Harold C. Sox, M.D., in the August 20, 2002 *Annals of Internal Medicine* 137(4), pp. 273-284; and "Postmenopausal hormone replacement therapy: Scientific review," by Heidi D. Nelson, M.D., M.P.H., Linda L. Humphrey, M.D., M.P.H., Peggy Nygren, M.A., and others, in the August 21, 2002 *Journal of the American Medical Association* 288(7), pp. 872-881.

More information on the USPSTF. Previous Task Force recommendations, summaries of the evidence, easy-to-read fact sheets explaining the recommendations, and related materials are available from the AHRQ Publications Clearinghouse. See the back cover of *Research Activities* for ordering information.*

Clinical information also is available from the National Guideline Clearinghouse™ at <http://www.guideline.gov>. ■

Hospitalization and Hospital Care

Fewer registered nurses in hospitals linked to more cases of postoperative pneumonia

A new study of a national sample of over 500 hospitals suggests that concern about nurse staffing may be warranted. The study demonstrated a connection between fewer RN hours per patient day and more cases of postoperative pneumonia among patients undergoing major surgery.

Chunliu Zhan, M.D., Ph.D., Peter J. Gergen, M.D., M.P.H., and Jayasree Basu, Ph.D., of the Agency for Healthcare Research and Quality, and their colleagues linked discharge data from hospitals in 13 States from 1990 to 1996 with American Hospital Association data on hospital characteristics and nurse staffing. They used these data to examine the impact of nurse staffing on four postsurgical complications: venous thrombosis/pulmonary embolism, pulmonary compromise, urinary tract infection (UTI), and pneumonia, among patients undergoing major surgery.

After controlling for other factors—such as patient case mix and hospital characteristics—fewer RN hours per patient day were found to be significantly associated with more postsurgical pneumonia. Contrary to anecdotal reports of declining RN staffing levels, this study found slightly increased RN hours per patient day, as well as steady increases in physician and resident/intern hours per patient day during the study period.

This study, which used different data and different methods, reached the same conclusions as another recent AHRQ-funded study by Jack Needleman, Ph.D., of the Harvard School of Public Health, and Peter Buerhaus, Ph.D., R.N., of the Vanderbilt University School of Nursing. Their findings were published in

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RN staffing levels

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the May 30, 2002 issue of the *New England Journal of Medicine* 346(22), pp. 1715-1722.

For more information on the current study, see “Nurse staffing and postsurgical adverse events: An analysis of administrative data from a sample of U.S.

hospitals, 1990-1996,” by Christine Kovner, Ph.D., R.N., Cheryl Jones, R.N., Ph.D., Dr. Zhan, and others, in the June 2002 *Health Services Research* 37(3), pp. 611-629. Reprints (AHRQ Publication No. 02-R079) are available from AHRQ.**

Editor’s note: See the June 2002 issue of *Research Activities*, pages 1-2, for a summary of the article by Drs. Needleman and Buerhaus. ■

Newer antidepressant drugs are prescribed more often than other medications for patients hospitalized for depression

The newer antidepressant drugs, selective serotonin reuptake inhibitors (SSRIs), are used more often than older tricyclic antidepressants (TCAs), atypical antidepressants, and other medications to treat patients hospitalized for depression. SSRIs also have the highest medication charges, according to a study supported by the Agency for Healthcare Research and Quality (HS09551).

TCAs have greater potential toxicity than SSRIs and require far more medical tests and monitoring. Atypical antidepressants are usually reserved for patients who have not responded to conventional antidepressants. They are often treated with electroconvulsive therapy (ECT) and have longer hospital stays, which contribute to their higher overall charges.

Researchers led by Deborah L. Ackerman, M.S., Ph.D., of the

University of California, Los Angeles (UCLA) School of Public Health, reviewed billing data of the UCLA Neuropsychiatric Hospital from 1994 to 1997 for all 1,698 hospitalizations for mood disorders (manic depression, major depression, and depressive disorder). Overall, only 0.5 percent of total inpatient charges for these patients were for antidepressants. SSRIs such as fluoxetine and paroxetine were the most commonly prescribed medications (47 percent) followed by the atypicals such as trazodone and bupropion (12 percent), the tricyclics such as amitriptyline and doxepine (7 percent), venlafaxine (7 percent), and the monoamine oxidase inhibitors (MAOIs, less than 1 percent).

After controlling for hospital length of stay, patient age and sex, and coexisting illnesses, the atypicals were associated with the

highest total inpatient charges: \$2,000 more than MAOIs, \$600 more than SSRIs, and \$600 more than venlafaxine. Patients who received multiple drugs or atypicals had the highest inpatient charges (mean of \$21,204 and \$20,344, respectively) and longest stays (16 and 15 days, respectively, vs. 10 days for SSRIs). When charges for rooms were subtracted from total charges, length of stay accounted for 43 percent and drug class accounted for 4 percent of the variation in total charges.

More details are in “Inpatient treatment of depression and associated hospital charges,” by Dr. Ackerman, Jurgen Unutzer, M.D., M.P.H., Sander Greenland, M.S., Dr.P.H., and Michael Gitlin, M.D., in the April/May 2002 *Pharmacoepidemiology and Drug Safety* 11(3), pp. 219-227. ■

Outcomes/Effectiveness Research

Degree of disability at surgery may explain differences between men and women in outcomes of hip replacement surgery

Elderly women suffer longer than men from the pain and disability of arthritis of the hip before they opt for surgery. They are in worse shape than men by the time they have total hip arthroplasty (THA, surgical reconstruction or replacement of the degenerated joint), and their delay in undergoing surgery may explain why they are not doing as well as

men 1 year after the procedure, according to a study supported by the Agency for Healthcare Research and Quality (HS09735).

University of Minnesota researchers led by Jeremy Holtzman, M.D., M.S., examined differences in

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Hip replacement surgery

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functional status and pain at the time of THA and 1 year later in 1,120 elderly Medicare HMO beneficiaries (432 men and 688 women) in 12 States. At the time of THA, women were more likely than men to report severe pain with walking (67 vs. 58 percent) and need for assistance with walking (56 vs. 45 percent), housework (49 vs. 30 percent), and grocery shopping (51 vs. 31 percent). Men could also walk greater distances than women prior to THA. These differences between men and women persisted, even after adjustments were made for ages and coexisting medical problems. One year following THA, women were more likely than men to report needing help with walking (30 vs. 21 percent), housework (29 vs. 23 percent), and grocery shopping

(27 vs. 19 percent), and they were able to walk shorter distances than men.

Operating on women with less disability should improve their outcomes, suggest the researchers. They point out, however, that women's worse outcomes may have been due to unmeasured coexisting conditions among women, their more sedentary lifestyle, or true inferiority of outcomes (perhaps poorer rehabilitation of women following surgery). On the other hand, women may not be referred to orthopedic surgeons until they have a greater degree of disability, or they may have different desires than men regarding referral and surgery.

See "Gender differences in functional status and pain in a Medicare population undergoing elective total hip arthroplasty," by Dr. Holtzman, Khal Saleh, M.D., and Robert Kane, M.D., in *Medical Care* 40(6), pp. 461-470. ■

Both hospital characteristics and board certification of anesthesiologists affect patient outcomes

Patients undergoing surgery aided by experienced anesthesiologists who are not board certified suffer more deaths or failure to rescue (rate of death after complications) than patients of midcareer board-certified anesthesiologists. However, the poor outcomes associated with noncertified anesthesiologists may be a result of the hospitals at which they practice and not necessarily their manner of practice, according to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS06560 and HS09469).

The researchers found that noncertified anesthesiologists were more likely than those with board certification to practice at hospitals with fewer characteristics associated with quality care. Such factors include hospital size, nurse-to-bed ratio, percentage of board-certified surgical staff, presence of a trauma center, and others. These hospital factors play an important

role in determining patient outcomes, explains Jeffrey H. Silber, M.D., Ph.D., of the University of Pennsylvania School of Medicine.

Dr. Silber and his colleagues analyzed Medicare claims records for nearly 145,000 elderly Pennsylvania patients who underwent general surgical or orthopedic procedures between 1991 and 1994. They compared the outcomes of 8,894 patients who had midcareer anesthesiologists (11-25 years after medical school graduation) who lacked board certification with all other cases.

After adjusting for other factors affecting patient risk of death, the odds of death and failure to rescue were both 13 percent greater when care was delivered by noncertified midcareer anesthesiologists. This corresponded to 3.8 excess deaths and 9.2 excess deaths following complications (failure to rescue) per 1,000 patients. Adjusting for international medical school

graduates did not change these results. In addition, hospital characteristics often associated with improved quality were consistently less evident in the noncertified group.

In summary, the researchers note that the current study provides strong evidence that anesthesiologist board certification status is an important factor associated with surgical outcomes, but it must not be used in isolation. They conclude that midcareer anesthesiologists who lack board certification and the hospitals in which they are employed appear to be associated with worse outcomes for surgical patients.

See "Anesthesiologist board certification and patient outcomes," by Dr. Silber, Sean K. Kennedy, M.D., Orit Even-Shoshan, M.S., and others, in the May 2002 *Anesthesiology* 96(5), pp. 1044-1052. ■

Cancer outcomes research is moving toward consensus on the most appropriate outcomes to be studied

Health services research on cancer encompasses the entire continuum of cancer care, from prevention and early detection to diagnosis and treatment to survivorship and end-of-life care. Carolyn M. Clancy, M.D., Acting Director of the Agency for Healthcare Research and Quality, and William Lawrence, M.D., M.S., of AHRQ's Center for Outcomes and Effectiveness Research, discuss some lessons learned from cancer outcomes research in a recent article.

Outcomes researchers have developed practical approaches for assessing the impact of alternative treatments, including no treatment, and methods for soliciting patient

judgments regarding the value of those outcomes. Work is in progress to develop consensus within the research community regarding which cancer outcome measures are most appropriate as required elements in future clinical trials. Unfortunately, interventions that have demonstrated effectiveness in a clinical trial do not always translate automatically into clinical practice. For example, despite the demonstrated effectiveness of colorectal cancer screening, only 44 percent of adults are screened according to the recommended timetable.

If definitive clinical trials are used to evaluate the relation between clinical process and health-related quality of life, the

probability that they will be used in practice could increase dramatically, note the researchers. The cooperative Clinical Oncology Groups have long established relationships with community practices, primarily to increase enrollment of patients in clinical trials. These practices offer a fertile opportunity for identifying clinical questions relevant to practicing oncologists, conclude Drs. Clancy and Lawrence.

More details are in "Is outcomes research on cancer ready for prime time?" by Drs. Clancy and Lawrence, in *Medical Care* 40(6, suppl), pp. 92-100. Reprints (AHRQ Publication No. 02-R075) are available from AHRQ.** ■

Health Care Costs and Financing

Health care costs for children with attention deficit/hyperactivity disorder are comparable to costs for asthma care

Attention deficit/hyperactivity disorder (ADHD) and asthma are the most common chronic health problems among children. Children with ADHD—a behavioral disorder defined by ease of distraction, hyperactivity, and impulsiveness—are more likely than other children to have difficulties in school, with family relationships, and delinquency. They also are at increased risk for injury (often due to impulsive behavior), depression, and substance abuse.

A new study shows that the cost of care for both asthma and ADHD are similar, exceeding by \$400 to \$500 a year the health care costs of the general population of children. However, the types of care differ, with children who have ADHD using more outpatient visits and mental health services.

Conditions such as ADHD have not received the widespread public attention that classic medical conditions such as asthma have. Yet the burden of illness and associated costs of ADHD deserve public health efforts to enhance child health, according to

Chunliu Zhan, M.D., Ph.D., of the Agency for Healthcare Research and Quality. Dr. Zhan and his colleagues at Boston Children's Hospital used data from the 1996 Medical Expenditure Panel Survey, a nationally representative household survey, to compare the health care use and costs of children with asthma or ADHD with those of children without either condition.

After adjusting for the effects of sex, race, poverty status, insurance type, and other factors affecting health care costs, children with ADHD spent \$479 more on health care and children with asthma spent \$437 more than children in the general population.

More details are in "Health care use and costs for children with attention-deficit/hyperactivity disorder," by Eugenia Chan, M.D., M.P.H., Dr. Zhan, and Charles J. Homer, M.D., M.P.H., in the May 2002 *Archives of Pediatric and Adolescent Medicine* 156, pp. 504-511. Reprints (AHRQ Publication No. 02-R074) are available from AHRQ.** ■

Researchers examine regionalization and use of expensive health technologies in neonatal intensive care

The rapid rise in use of neonatal intensive care (NIC) in the 1990s was accompanied by concerns about the cost-effectiveness of high technology neonatal intensive care units (NICUs) as well as reassuring indications that neonates fared better when treated in NICUs with high patient volume and sophisticated capabilities.

Although managed care plans have attempted to constrain the high costs typically associated with NICUs, a new study by researchers at the Agency for Healthcare Research and Quality suggests that they have not been any more effective than other payers in restraining the rise of NICUs and consequent use of expensive services. This finding is consistent with the hypothesis that younger married couples are attractive to an HMO and therefore the HMO must cater to their preference for hospitals with a NICU.

A second AHRQ-supported study found merit in the regionalization of NICUs. These researchers showed that the risk of neonatal death is reduced when hospitals with no NICUs or intermediate NICUs transfer high-risk mothers to hospitals that have a regional NICU where many such babies are treated. High-risk mothers are defined as those who are expected to deliver babies weighing less than 4.2 pounds. Both studies are summarized here.

Friedman, B., Dever, K., Steiner, C., and Fox, S. (2002, June). "The use of expensive health technologies in the era of managed care: The remarkable case of neonatal intensive care." *Journal of Health Politics, Policy and Law* 27(3), pp. 441-464.

This snapshot study of hospital market areas in New Jersey in 1994 reveals that neither the market penetration of managed care plans nor the concentration of managed care enrollment (proportion of the population enrolled in managed care plans) was associated with the offering of NIC by hospitals. Restraining access to high-cost NICUs with narrow panels of preferred physicians and hospitals might discourage enrollment by young families who usually are healthier. Managed care plans may consider that profits lost by reduced enrollment of these families might outweigh any gains achieved by reducing the cost of NICU care for a very small proportion of births, suggest the researchers.

They used NICU days and charges from discharge abstracts from short-term, non-Federal hospitals in New Jersey in 1994, American Hospital Association annual survey estimates of NICU beds at each hospital, and State data on HMO enrollment by county to examine how strongly a hospital's decision to offer NIC in 1994 was associated with teaching status and several market characteristics. Market factors ranged from the proportion of births covered by managed care plans, concentration of managed care enrollment, and proportion of higher risk and self-pay patients to market share of births going to the particular hospital and concentration index among major competing hospitals.

A higher concentration of births among the major competitors in a hospital's market area was associated with a lower probability that the hospital would offer NIC, although this result was limited by

the relatively small number of hospitals. A high hospital market share of births was not associated with a higher likelihood of offering NIC, yet effect of market share was confounded with hospital teaching status. Finally, insurance status did not seem to influence the admission of individual patients to an NICU. Admission to an NICU was highly related to the presence of NIC at the hospital of birth, controlling for risk factors. However, Medicaid patients had somewhat higher adjusted charges and longer lengths of stay than other patients. Reprints (AHRQ Publication No. 02-R078) are available from AHRQ.*

Cifuentes, J., Bronstein, J., Phibbs, C.S., and others. (2002, May). "Mortality in low birth weight infants according to level of neonatal care at hospital of birth." (contract 290-92-0055) *Pediatrics* 109(5), pp. 745-751.

Neonates weighing less than about 4.2 pounds, who are born at hospitals with no NICUs or intermediate NICUs, have about twice the risk of dying of babies born at hospitals with regional NICUs that treat many such babies, concludes this study. The researchers linked the birth certificates of 16,732 infants who weighed less than 4.2 pounds when born in California hospitals in 1992 and 1993 with hospital discharge abstracts and death certificates. They classified the hospitals by level of NICU: no NICU (cared for only healthy neonates); intermediate NICU (cared for moderately sick infants, but did not regularly provide assisted ventilation for more than 4 hours);

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Neonatal intensive care

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community NICU (provided long-term ventilatory support but no other specialized services typical of regional NICUs); and regional NICU (provided full range of specialized neonatal intensive care). They estimated death within the first 28 days of life, after controlling for demographic risks, diagnoses, transfer to an NICU, average NICU census, and NICU level.

Low-birthweight (LBW) infants had over twice the risk of death if born in a hospital with no NICU

compared with those born in a hospital with a regional NICU; they had nearly twice the risk of death if born in a hospital with an intermediate NICU or a small (average census less than 15) community NICU. The risk of dying for LBW infants born in hospitals with a large community NICU (average census 15 or more) was not much different from those born in a regional NICU, but these data were not conclusive.

The diffusion of new technologies and trained neonatologists into lower level NICUs has certainly enhanced the ability of more hospitals to care for

high-risk neonates. However, this study suggests that birth in a regional NICU offers them the best chance to survive. What's more, this study found that the level of care available at the hospital of birth is much more important for survival than is the level of care that the LBW newborn ultimately receives (for example, with transfer to a regional NICU). This strongly supports the recommendations that whenever possible, a woman with early preterm labor should be moved to the regional NICU rather than be transferred there later with her infant. ■

Grandparents raising adolescent grandchildren often have trouble providing them with health insurance

The number of children living in households headed by a grandparent nearly doubled from 1970 to 1997 (from 2.2 to 3.9 million). In at least one-third of these households, neither parent was present. It is in these so-called skipped-generation families that grandparents are particularly hard-pressed to provide health insurance for their adolescent grandchildren compared with other types of families, according to James B. Kirby, Ph.D., of the Agency for Healthcare Research and Quality, and Toshiko Kaneda, Ph.D., of the Population Council.

In a recent study, they analyzed data collected in 1995 on the health insurance status of a large, nationally representative sample of 17,670 middle and high school students. They compared the health insurance status of adolescents in skipped-generation families with that of adolescents in two-parent families, single-mother families, and step-families (mother and stepfather). The researchers found that the heavy reliance of grandparents on public insurance over private insurance apparently was not due to their

lack of work-related insurance because of retirement or more limited income than other family types.

Even after adjusting for work status, income, education, race/ethnicity, and sex, adolescents of skipped-generation families had a much greater mean predicted probability of having public insurance (.197) than adolescents of two-parent families, single-mother families, and step-families (.020, .061, and .041, respectively) and a lower mean predicted probability of being privately insured (.682 vs. .912, .842, and .858, respectively). All of the adolescents who lived outside of two-parent families were significantly more likely to have been uninsured than adolescents in two-parent families, with adolescents in skipped-generation families most likely to be uninsured.

More details are in "Health insurance and family structure: The case of adolescents in skipped-generation families," by Drs. Kirby and Kaneda, in the June 2002 *Medical Care Research and Review* 59(2), pp. 146-165. Reprints (AHRQ Publication No. 02-R073) are available from AHRQ.** ■

Researchers examine U.S. dental care expenditures

Despite a greater number of dental cavities, poor and minority children in the United States typically visit the dentist less often than other children. Three recent studies by Richard J. Manski, D.D.S., M.B.A., Ph.D., Senior Scholar at the Agency for Healthcare Research and Quality, and his colleagues examined the costs of dental care and the sources of payment for children and adults.

The first study finds that dental care for children accounts for about one-fourth of U.S. dental spending, with poor and minority children spending far less than higher income children. The second study reveals a shrinking disparity in dental care expenses between poor and higher income children and among minority and white children from 1987 to 1996. The third study shows a narrowing of the gap in dental expenditures between white and black adults from 1987 to 1996 and overall reduced dental expenditures among all adults.

Edelstein, B.L., Manski, R.J., and Moeller, J.F. (2002). "Child dental expenditures: 1996." *Pediatric Dentistry* 24(2), pp. 11-17.

About one-fourth of 1996 dental expenditures in the United States were for dental care for children. However, actual dental expenditures were 5.3 times as high for middle- and high-income children as for poor and near-poor children (\$10.1 vs. \$1.9 billion), despite Medicaid coverage for poor children. In fact, the high levels of reported out-of-pocket costs for Medicaid-eligible children suggest that Medicaid fails to meet families' needs for obtaining dental care, according to this study. The researchers used data from AHRQ's

1996 Medical Expenditure Panel Survey (MEPS), which included 6,595 children representing over 75 million noninstitutionalized U.S. children.

Results showed that disproportionately greater expenditures are made for white and higher income children than for minority and lower income children, despite the fact that white children have less dental disease. Expenditures for children's dental care totaled nearly \$12 billion in 1996, for an average of \$375 per child who obtained care. This is similar to the amount spent to treat childhood injuries or respiratory problems (including asthma).

Overall sources of payment for dental care were 47 percent out of pocket, 45 percent insurance, and 8 percent "other" (primarily Medicaid). Mean expenditures for poor and near-poor children were less than half of mean expenditures for higher income children. Poorer respondents reported lower mean out-of-pocket and private insurance payments for dental services than respondents from middle- and high-income families.

Actual dental expenditures for racial subgroups of children differed markedly from the proportion these subgroups represent in the U.S. child population. White children make up 66 percent of the child population, but they incurred 86 percent of actual expenditures. Black and Hispanic children each make up 17 percent of the population, but they consumed only about 6 percent and 8 percent of actual dental expenditures, respectively. Poor children (from families with gross annual 1996 incomes of less than \$16,036 for a family of four) and "near-poor"

children (\$16,036 to \$32,071 1996 income) each accounted for about 8 percent of dental care expenditures (\$940-\$980 million). Children from middle-income (\$32,071-\$48,108) and high-income (\$48,108 or more) families accounted for 43 percent (\$5.2 billion) and 41 percent (\$4.9 billion) of 1996 dental care expenditures.

Reprints (AHRQ Publication No. 02-R062) are available from AHRQ.**

Wall, T.P., Brown, J., and Manski, R.J. (2002, April). "The funding of dental services among U.S. children 2 to 17 years old." *Journal of the American Dental Association* 133, pp. 474-482.

Based on a comparison of data from the 1987 National Medical Expenditure Survey (NMES) with data from the 1996 MEPS, these researchers found that overall dental expenditures among children 2 to 17 years of age fell nearly 14 percent from \$578 in 1987 to \$499 in 1996. Racial and ethnic disparities in dental expenditures were dramatically reduced during this time period. The absolute difference between white and black children fell from \$315 in 1987 to \$158 in 1996 and for non-Hispanic and Hispanic children from \$245 to \$72. Real dental expenditures tended to increase with the child's level of household income in both 1987 and 1996. However, the absolute difference between the highest and lowest income levels fell from \$556 in 1987 to \$230 in 1996.

Nevertheless, dental expenditures increased for poor children and decreased for higher

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Dental care expenditures

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income children (mostly due to a decrease in out-of-pocket payments). For example, in 1996, children below the Federal poverty level (FPL) who visited a dentist reported higher expenditures on average than children in the 100 to 200 percent of FPL income category (\$404 vs. \$276).

Overall out-of-pocket payments fell from 52 percent of the total payments for pediatric dental care to 38 percent. Contributions from private insurance and public funding held steady at 37 percent and 5 percent of the total, respectively, while the nonreimbursed category grew from 5 percent to 19 percent of the total.

Children in the two highest income levels received about 81 percent of the total dental care provided in 1996. Children in the lowest income group received 11 percent, but they received 24 percent of the unreimbursed care. Middle-class children did not need much restorative dentistry, mainly routine diagnostic and preventive services, and did not increase their expenditures between 1987 and 1996. Lower income children also showed a marked decrease in untreated dental caries, but they still needed more restorative care, even after the decrease. Children below the FPL were still less likely to visit a dentist in 1996 than upper income children.

Reprints (AHRQ Publication No. 02-R069) are available from AHRQ.**

Brown, L.J., Wall, T.P., and Manski, R.J. (2002, May). "The funding of dental services among U.S. adults aged 18 years and older." *Journal of the American Dental Association* 133, pp. 627-635.

Dental expenditures among adults 18 years and older fell from \$530 in 1987 to \$467 in 1996, a decrease that may be related to a shift from restorative to diagnostic and preventive services. Disparities based on income, race, ethnicity, and sex, which were not large in 1987, were further reduced in 1996, according to this study comparing dental care expenditures detailed in the 1987 NMES and the 1996 MEPS. The study revealed a decrease in real dental expenditures during that time among whites from \$538 to \$467, which resulted in a narrowing of the gap between whites and blacks from \$88 in 1987 to \$30 in 1996. Hispanics reported a drop of \$148 (25 percent) in real expenditures in 1996. In 1987, Hispanics reported higher average dental care expenditures than non-Hispanics, but in 1996, Hispanics reported lower expenditures.

Although expenditures tended to increase with the level of income in both survey years, the gap between the highest income group and the lowest decreased from \$109 in 1987 to \$56 in 1996.

For all adults, out-of-pocket payments decreased by 28 percent, from \$301 in 1987 to \$218 in 1996. This decrease was most pronounced in the below the FPL group, in which out-of-pocket payments decreased from \$265 in

1987 to \$157 in 1996. Out-of-pocket payments made up one-half of the total for those in the 100 to 200 percent of the FPL group, about 47 percent in the upper-income groups, and 36 percent in those below the FPL.

Private insurance accounted for 18 percent of total dental care expenditures for people with incomes below the FPL and rose to 41 percent among those in the highest income category. Public funding accounted for 21 percent of the total among those with incomes below the FPL and dropped to 4 percent of the total or less among those in high income categories.

Nonreimbursed care rose in every income category. It accounted for 24 percent of the total among those below the FPL, 16 percent among those with incomes 100 to 200 percent of the FPL, and 12 percent and 11 percent, respectively, among those in the middle- and upper-income categories. For those with an income below the FPL, nonreimbursed care amounted to \$101 per patient and 24 percent of the total in 1996.

Reprints (AHRQ Publication No. 02-R068) are available from AHRQ.** ■

Parental pressure for antibiotics can influence pediatricians' treatment decisions

When parents pressure pediatricians to prescribe antibiotics for their children, it can influence pediatricians' treatment decisions, according to a study supported by the Agency for Healthcare Research and Quality (HS10577). After using audiotapes and videotapes of 295 acute care visits to analyze the conversations of nine pediatricians and parents of pediatric patients, Tanya Stivers, Ph.D., of the University of California, Los Angeles, found that parents often pressured pediatricians to prescribe antibiotics for their children. What's more, this pressure prompted negotiation of antibiotic prescribing between parent and doctor. Doctors prescribed antibiotics for nearly half of all cases involving some form of overt pressure for antibiotics (15 out of 31 cases).

In six cases, a doctor who appeared to be on a clear path towards a viral diagnosis and no antibiotics, which are ineffective in treating viral infections, ended up prescribing antibiotics in the face of overt parental pressure. Parents used several approaches to pressure the pediatrician to defend his or her position not to prescribe antibiotics: directly expressing a preference

for antibiotics, asking whether antibiotics should be considered in this case, citing circumstances such as need for the sick child to be well for an upcoming birthday party, or stating how antibiotics were prescribed for this condition before.

In response, pediatricians often found themselves explaining why antibiotics would not be appropriate, for example, for a simple cold or a case of influenza. However, in some cases, the parent refused to accept the doctor's perception of the case or diagnosis and persisted in wanting antibiotics. For example, one parent stated that the child's cold might actually be bronchitis, because the cough was so "congested." In some cases, the pediatrician finally acquiesced. For example, one doctor changed a child's diagnosis from a "cold" to sinusitis, for which antibiotics are more appropriate, even though he didn't fully endorse use of antibiotics in this case.

More details are in "Participating in decisions about treatment: Overt parent pressure for antibiotic medication in pediatric encounters," by Dr. Stivers, in the April 2002 *Social Science & Medicine* 54(7), pp. 1111-1130. ■

Use of three factors at car crash sites can help EMTs quickly triage seriously injured children

If emergency medical technicians (EMTs) on the scene of a motor vehicle crash (MVC) simply evaluate a child's degree of consciousness (coma score), extent of passenger space intrusion from the other car or object, and appropriate use of seatbelt or other restraint, they can identify seriously injured children and properly triage them to pediatric trauma centers. This triage approach could potentially prevent 80 fatalities per year in children younger than 16 years involved in MVCs, concludes the largest pediatric MVC trauma triage study to date. The study was

supported in part by the Agency for Healthcare Research and Quality (National Research Service Award fellowship F32 HS00148).

Craig D. Newgard, M.D., M.P.H., of the Harbor-University of California, Los Angeles Medical Center, and his colleagues analyzed a national database produced from crash team investigators to study 8,394 children up to 15 years of age who were involved in MVCs from 1993 through 1999. They selected 12 out-of-hospital factors, which were both available in the database and easily obtained by on-scene EMTs, to analyze as potential predictors of severity of

injury: age, sex, weight, Glasgow Coma Scale (GCS) score (a cumulative measure of level of consciousness and degree of dysfunction reflected in eye opening, verbal response, and motor response), primary point of vehicular impact, rollover, magnitude of passenger space intrusion (PSI), intrusion location, restraint use, seat location, entrapment, and air bag deployment.

The researchers found that a GCS score less than 15 (15 is no impairment, 7 indicates coma, and

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Car crash victims

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3 brain death), PSI of 6 inches or more, and lack of appropriate restraint use predicted severe injury in children (Injury Severity Score of 16 or more) with a sensitivity of 92 percent and specificity of 73 percent. Of children with a GCS score less

than 15, 62 percent were seriously injured. A PSI of 6 inches or more identified an additional 23 seriously injured children. Finally, in children with a normal GCS score and minimal (less than 6 inches) or no PSI, lack of appropriate restraint use suggested a higher probability of severe injury.

For details, see "Use of out-of-hospital variables to predict severity of injury in pediatric patients involved in motor vehicle crashes," by Dr. Newgard, Roger J. Lewis, M.D., Ph.D., and B. Tilman Jolly, M.D., in the May 2002 *Annals of Emergency Medicine* 39(1), pp. 481-491. ■

Palliative care services for children with chronic illnesses need to be at least partially hospital-based

A study of 60 children's hospitals located throughout the United States reveals that children with complex chronic conditions (CCCs) such as cancer, congenital heart disease, or cystic fibrosis, are in the hospital longer and spend longer periods on mechanical ventilation before dying in the hospital than other children. This finding suggests that palliative care services for chronically ill children need to be at least partially hospital-based.

Services for children with CCCs should be integrated with community-based services to cover the inpatient and outpatient components of care as much as possible, and they should facilitate, if the family desires, the occurrence of death at home, suggests Chris Feudtner, M.D., Ph.D., M.P.H., of the University of Washington. This research was supported in part by the Agency for Healthcare Research and Quality (K08 HS00002).

Dr. Feudtner and his colleagues used discharge data from 60 hospitals to identify all deaths of patients 0 to 24 years of age during 1991, 1994, and 1997. They classified discharge diagnoses into nine major categories of CCCs: cardiovascular, neuromuscular, malignancy, respiratory, renal, metabolic, gastrointestinal, hematologic/immunologic, and other

congenital/genetic. Patients with CCCs were more likely than non-CCC patients to have been mechanically ventilated (52 vs. 46 percent) and to have been ventilated longer (mean of 12 vs. 5 days).

After adjustment for age, sex, year, and principal payer, patients with one or more CCCs had 40 to 50 percent less chance of dying soon after hospital admission than patients with no CCC diagnosis. Perhaps it is more difficult to foresee what is likely to happen to gravely ill children with CCCs than other children, and this uncertainty leads to prolonged courses of intensive therapy before care is limited or withdrawn. On the other hand, children with CCCs who die in the hospital may have had several other nearly fatal episodes. This may prompt family and care providers to more persistently pursue aggressive therapy such as mechanical ventilation for prolonged periods of time in the hope of yet another astonishing recovery, explain the researchers.

See "Characteristics of deaths occurring in children's hospitals: Implications for supportive care services," by Dr. Feudtner, Dimitri A. Christakis, M.D., M.P.H., Frederick J. Zimmerman, Ph.D., and others, in the May 2002 *Pediatrics* 109(5), pp. 887-893. ■

Improving medication use may be the key to reducing racial disparities in children's asthma problems

Black and Hispanic children with asthma end up hospitalized or in the emergency department due to poorly controlled asthma far more often than white children with the condition. Researchers have been

trying to sort out whether these racial/ethnic disparities are due to differences in asthma care, insurance status, or sociodemographic factors.

A recent study shows that the disparity may simply

reflect a difference in use of preventive medications for asthma. Despite having worse asthma than white children (based on number of symptom days, school days missed, and health status scores), black and

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Children's asthma problems

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Hispanic children with similar insurance and sociodemographic characteristics were 31 percent and 42 percent less likely, respectively, to be using inhaled antiinflammatory medication (including inhaled steroids) to prevent the beginning or worsening of an asthma episode.

This suggests that nonfinancial barriers—such as differences in health beliefs and concepts of disease, fears about steroids, or communication barriers (including language) between doctors and

patients—may play an important role in suboptimal medication use. Most other asthma care processes, including specialist use, preventive visits, and home management practices (for example, no pets or smoking at home), were equal or better for minority children studied.

Increasing the use of preventive medications would be a natural focus for reducing racial disparities in asthma burden, concludes Tracy A. Lieu, M.D., M.P.H., of Harvard Medical School.

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS09935), Dr. Lieu and her

colleagues analyzed data on Medicaid-insured children with asthma in five managed care organizations in California, Washington, and Massachusetts. They also interviewed the parents to gauge children's asthma status to evaluate racial/ethnic variations in processes of asthma care.

See "Racial/ethnic variation in asthma status and management practices among children in managed Medicaid," by Dr. Lieu, Paula Lozano, M.D., M.P.H., Jonathan A. Finkelstein, M.D., M.P.H., and others, in the May 2002 *Pediatrics* 109(5), pp. 857-865. ■

New approaches are needed to encourage parents of children with asthma to reduce their exposure to household allergens

Asthma rates have increased in the past two decades and are highest among poor, urban, and minority populations. National asthma care guidelines highlight the importance of reducing indoor allergens and irritants that worsen childhood asthma. Unfortunately, exposure to household asthma triggers continues to be a significant problem, with few parents adopting environmental control measures to reduce allergen exposure, concludes a new study.

In a study of 638 children (ages 3 to 15 years) with asthma, 30 percent lived in households that included a smoker, 18 percent had household pests (cockroaches or mice), and 59 percent had furry pets. Other exposures included bedroom carpeting (78 percent), which increases exposure to dust mites. Most children did not have appropriate mattress covers (65 percent) or pillow covers (84 percent) to reduce exposure to dust mites.

Further discouraging news is that 45 percent of parents had received written instructions about avoiding asthma triggers—11 percent had received the instructions in the past year—and 42 percent had discussed household asthma triggers with a clinician in the past 6 months. Receipt of instructions about how to reduce environmental triggers was not associated with efforts to do so.

Some household asthma triggers closely linked to housing problems (for example, cockroaches and mold

due to unrepaired leaks) may be difficult for families living in multi-unit buildings to change. Nevertheless, new methods for educating parents to reduce household exposure to asthma allergens and triggers should be sought and evaluated, concludes Kevin B. Weiss, M.D., M.P.H., of Northwestern University Medical School. Dr. Weiss is principal investigator of the Pediatric Asthma Care Patient Outcomes Research Team (PORT), which is supported in part by the Agency for Healthcare Research and Quality (HS08368).

In a recent study funded by AHRQ and the National Heart, Lung, and Blood Institute, Dr. Weiss and his colleagues assessed the prevalence of potential environmental triggers in the households of 638 children with asthma in three managed care practices, and they looked at whether prior parental education about trigger avoidance was associated with fewer such exposures.

See "Parent-reported environmental exposures and environmental control measures for children with asthma," by Jonathan A. Finkelstein, M.D., M.P.H., Anne Fuhlbrigge, M.D., M.S., Paula Lozano, M.D., M.P.H., and others, in the March 2002 *Archives of Pediatric and Adolescent Medicine* 156, pp. 258-264. ■

National experts outline a plan of action to improve asthma outcomes among U.S. children

Despite significant advances in the treatment of childhood asthma, it has reached epidemic proportions in the United States. The number of asthma cases in children under 5 years of age increased over 160 percent between 1980 and 1994 and 74 percent among children ages 5 through 14 years.

A committee of nationally recognized experts and leaders in childhood asthma recently outlined policy recommendations to improve childhood asthma outcomes. The recommendations appear in an article by Marielena Lara, M.D., M.P.H., of the University of California, Los Angeles, and other committee members. Dr. Lara's work was supported in part by the Agency for Healthcare Research and Quality (K08 HS00008).

The overall goals of the recommendations are to promote asthma-friendly communities nationwide in which children with

asthma are quickly diagnosed and receive appropriate and ongoing treatment; health care, school, and social agencies are prepared to meet the needs of children with asthma and their families; and children are safe from environmental risks that worsen asthma. To achieve these goals, the committee recommends enhancing access to and quality of health care services for asthma, enhancing knowledge about asthma among affected individuals and the general public, and ensuring asthma-safe schools. They also recommend promoting asthma-safe home environments (absence of asthma-provoking allergens and irritants such as smoke, dust, mold, pet dander, and cockroaches), encouraging innovation in asthma prevention and management (for example, environmental modification, immunologic intervention, and lifestyle changes for preventing and managing symptoms), and reducing

socioeconomic disparities in childhood asthma outcomes.

To improve asthma health care delivery and financing, the experts suggest developing and implementing quality of care standards in primary care, self-management education, and case management interventions, as well as expanding insurance coverage and benefit design to include essential pediatric asthma services. They also support a stronger public health infrastructure that includes public funding of asthma services, a national asthma public education campaign, a national asthma surveillance system, and a national agenda for asthma prevention research.

See "Improving childhood asthma outcomes in the United States: A blueprint for policy action," by Dr. Lara, Sara Rosenbaum, J.D., Gary Rachelefsky, M.D., and others, in the May 2002 *Pediatrics* 109(5), pp. 919-930. ■

Women's Health

Providing homeless women with health insurance and a regular source of care may greatly improve their access to care

Homeless women, who made up 42 percent of the homeless population in 1999, are a vulnerable group plagued by mental illness and a history of physical, sexual, and substance abuse. Not only do they have poorer health and less insurance than other women, but they also have far less access to all types of medical care, finds a study supported in part by the Agency for Healthcare Research and Quality (HS08323). Providing these women with health insurance, clinics that they can visit regularly, and outreach programs for homeless women living on the streets should improve these women's access to care, concludes Lillian Gelberg, M.D., M.S.P.H., of the University of California, Los Angeles.

Dr. Gelberg and her UCLA colleagues interviewed 974 homeless women in Los Angeles County, who were recruited from homeless shelters and soup lines, about their number of hospitalizations, outpatient visits, and preventive health screens in the past year. Only 61 percent of homeless women overall had a regular source of care, and 47 percent had no health insurance, yet one-third reported that they were in poor or fair health. Homeless women were 33 percent more likely to use outpatient care if they had a regular source of care, especially a particular provider that they saw.

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Homeless women

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Having health insurance nearly tripled their likelihood of being hospitalized.

Homeless women living on the streets were less likely than women who stayed in shelters and traditional housing to have been hospitalized (21 vs. 28 and 38 percent, respectively) or to have had outpatient visits (3.7 vs. 7.2 and 7.4 visits) or health screens in the past year (2.9 vs. 3.6 and 3.6 out of 4

screens). These women also were significantly more likely to report poor or fair health (61 percent) than homeless women who stayed in shelters and traditional housing (31 and 37 percent, respectively). Finally, women who spent most of their time on the streets had less social contacts and were only one-third as likely to have health insurance as other homeless women.

See "How accessible is medical care for homeless women?" by Yee Wei Lim, M.B.B.S., Ronald Andersen, Ph.D., Barbara Leake, Ph.D., and others, in the June 2002 *Medical Care* 40(6), pp. 510-520. ■

Women with stressful life events are more likely to be physically abused during pregnancy, usually by their partners

An estimated 4 to 8 percent of women are physically abused when they are pregnant. Women who experience several stressful life events, for example, financial hardship, a partner with an alcohol or drug problem, or separation or divorce, are more likely than other women to be physically abused before or during pregnancy, according to a study supported by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00032).

Doctors should ask pregnant women about stress and abuse in their lives and make appropriate referrals, for example, to domestic violence programs for abused women. That's the suggestion of the University of North Carolina, Chapel Hill, researchers who conducted the study. They analyzed data from a North Carolina

Statewide representative survey of over 2,600 postpartum women (most of whom were married, white, high school graduates, and aged 20 or older; only 12 percent were poor). Based on survey responses, the researchers examined the link between women's sociodemographic characteristics, experience of 13 stressful life events during the year before childbirth, and experience of physical abuse. Overall, 14 percent of the women had suffered through five or more stressful events (high stress level), and almost 9 percent were physically abused during the year before pregnancy and/or during pregnancy (usually by their husbands/partners).

A high level of stress was 12 times as likely among women who had been abused both before and during pregnancy and 14 times as likely among women abused before but not during pregnancy. Physical

abuse was positively associated with 5 of 13 stressors studied. Women who had been abused at some point in their lives were more likely than those who had never been abused to have argued more often with their partners in the past year (74 vs. 26 percent), been involved in physical fights (49 vs. 2 percent), had a loved one with an alcohol or drug problem (46 vs. 15 percent), recently separated or divorced (36 vs. 9 percent), and endured financial problems (49 vs. 24 percent).

See "Stressful life events and physical abuse among pregnant women in North Carolina," by Sandra L. Martin, Ph.D., Jeffrey M. Griffin, M.S., Lawrence L. Kupper, Ph.D., and others, in the September 2001 *Maternal and Child Health Journal* 5(3), pp. 145-152. ■

HIV/AIDS Research

Researchers examine use of highly active HIV medications and their effects on costs and access to care

Highly active antiretroviral therapy (HAART) has improved immune system functioning (evidenced by increased CD4 cell count) and survival in patients infected with the human

immunodeficiency virus (HIV) that causes AIDS. HAART also reduces by nearly 2 months the time that HIV-positive patients spend in the hospital, according to a recent study of a nationwide network of HIV

clinics. A second study found that differences in the use of HAART based on insurance status have narrowed since 1996.

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HIV medications

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Both studies were supported in part by the Agency for Healthcare Research and Quality (HS07809). The studies, which are summarized here, were led by Richard D. Moore, M.D., M.H.Sc., of Johns Hopkins University School of Medicine.

HIV Research Network. (2002, May). "Hospital and outpatient health services utilization among HIV-infected patients in care in 1999." *Journal of Acquired Immunodeficiency Syndromes* 30(1), pp. 21-26.

This study involved data on 5,255 patients who were treated at nine U.S. HIV primary and specialty care clinics during 1999. For patients who received HAART, hospital time averaged 265 days per 100 patients compared with 320 days per 100 patients who did not receive this type of combination drug therapy. In contrast, HAART patients made more clinic visits for outpatient care than non-HAART patients. Thus, HAART not only improves patient health, but also reduces HIV-related health care costs, since hospital care is more expensive than outpatient care.

Seventeen percent of the patients were hospitalized sometime during the year, with hospital time even more strongly affected by CD4 cell count than HAART. Hospital days averaged 165 per 100 patients with

a CD4 cell count of more than 500 cells/mm³ compared with 840 days per 100 patients with CD4 count of less than 50/mm³ (very advanced HIV disease). Clinic visits also increased at lower CD4 counts. Both hospital days and clinic visits increased with higher HIV RNA level (number of copies of HIV in the blood), an indicator of the severity of HIV infection.

Mean monthly health care spending per patient averaged \$423 for hospital care and \$168 for outpatient care. Compared with previous studies, these figures suggest that the costs of HIV care may have leveled off since the advent of HAART in the late 1990s. However, the authors note that data from the past few years will be needed to confirm this conclusion.

Keruly, J.C., Conviser, R., Moore, R.D. (2002, May). "Association of medical insurance and other factors with receipt of antiretroviral therapy." *American Journal of Public Health* 92(5), pp. 852-857.

Patients infected with HIV who were uninsured or insured by State Medicaid programs were less likely than those with private insurance to receive HAART in early 1997. However, insurance-related differences in receipt of HAART narrowed significantly by 1999, according to this study. Thus, it appears that effective but expensive medical care can be made available to all patients if socioeconomic

barriers are removed, suggests Dr. Moore.

The researchers assessed the associations of sociodemographic factors and medical insurance with receipt of HAART in two periods (April 1996 through March 1997, and April 1997 through March 1999) using data on 959 patients enrolled in the Johns Hopkins HIV clinic after April 1, 1996. Most of the patients were male (70 percent), black (78 percent), and had intravenous drug use as the major risk behavior for HIV transmission (47 percent). In period 1, HAART was more likely to be used in patients who were commercially insured than in other payer groups. However, differences between payers narrowed in period 2.

After January 1, 1998, use of HAART significantly increased for Medicaid and uninsured patients compared with commercially/privately insured patients, and it increased nonsignificantly for people who had partial coverage. Although whites were more likely than minority patients to receive HAART in period 1, these differences narrowed in period 2. However, substance abusers and those who missed scheduled visits were still less likely to receive HAART in period 2. Care providers may have viewed these patients as unable to adhere to the rigorous medication schedule and followup visits needed to monitor HAART. ■

Oral health is strongly associated with physical and mental health of HIV-positive patients

People who have HIV can suffer from up to 16 oral conditions that can cause pain and worry or affect their appearance and functioning (for example, ability to speak, eat, or swallow). Side effects of HIV medications such as dry mouth,

sore throat, and loss of appetite may compound the problem. Yet most measures of health-related quality of life (HRQOL) and stage of disease for people with HIV do not include indicators of oral functioning and well-being. Oral health is strongly associated with

physical and mental health among HIV-positive patients and should be considered when assessing HRQOL, concludes a study supported in part by the Agency for

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Oral health in HIV patients

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Healthcare Research and Quality (HS08578).

Researchers from the University of California, Los Angeles, RAND, and the Doris Duke Foundation used data from the HIV Cost and Services Utilization Study (HCSUS)—a national probability sample of adults with HIV—to assess physical and mental HRQOL (measured on a 0 - 100 range). They also used seven indicators of specifically oral-related HRQOL: pain and discomfort, worry, appearance, and function. The number of oral symptoms was strongly associated

with a decrease in oral HRQOL. A one point increase in oral HRQOL was associated with a 0.10 increase in mental HRQOL and 0.07 increase in physical HRQOL.

In multivariate analyses, higher oral HRQOL was related to oral symptoms, general physical functioning, HIV-related symptoms, and emotional well-being. HIV exposure via intravenous drug use was related to lower oral HRQOL compared with exposure via male-to-male sex. Age younger than 35, HIV exposure via male-to-male sex versus heterosexual activities, being male, and prior measures of physical functioning and emotional well-being were associated with better physical HRQOL. HIV-related

symptoms and oral symptoms were associated with worse physical HRQOL. Finally, HIV exposure via sex rather than intravenous drug use, black race, private insurance versus Medicaid, and oral HRQOL were associated with better mental HRQOL, as were low levels of oral symptoms and HIV-related symptoms.

For more information, see “Associations of self-reported oral health with physical and mental health in a nationally representative sample of HIV persons receiving medical care,” by Ian D. Coulter, Ph.D., Kevin C. Heslin, Marvin Marcus, D.D.S., M.P.H., and others, in *Quality of Life Research* 11, pp. 57-70, 2002. ■

Routine voluntary HIV testing of all hospital patients could identify a substantial number of patients with undiagnosed HIV

Testing only high-risk or symptomatic patients for the human immunodeficiency virus (HIV) that causes AIDS is inadequate to identify the one-third of HIV-positive people in the United States (300,000) who are unaware of their HIV infection, according to the results of a new pilot study. Researchers implemented the Think HIV program and found that use of routine, voluntary HIV testing in all patients admitted to Boston Medical Center—which has a 1 percent prevalence of HIV infection among its patients—tripled the likelihood that patients would undergo HIV testing compared with patients admitted prior to the Think HIV program.

Using this testing approach in 72 hospitals nationwide that have patient demographics similar to Boston Medical Center (and assuming a similar HIV prevalence at these hospitals) would identify an additional 8,000 to 31,800 HIV-infected patients per year compared with current strategies to test only high-risk or symptomatic patients, according to the researchers who conducted the study. In the routine Think HIV program, 6.4 percent of admitted patients underwent testing and counseling for HIV. The

program detected about two new diagnoses of HIV infection per month compared with one per month during the 15 months prior to the program.

Patients who underwent testing during the program, who had an estimated prevalence of HIV infection of 3.8 percent, were informed about their infection, counseled, and linked to care and treatment. The researchers estimated that, with about 500 medical admissions at the hospital per month, voluntary testing of all inpatients might detect 19 patients with previously undiagnosed HIV per month compared with the 1.3 patients per month identified by results of targeted testing. Their study was supported in part by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00020).

More details are in “Identifying undiagnosed human immunodeficiency virus: The yield of routine, voluntary inpatient testing,” by Rochelle P. Walensky, M.D., M.P.H., Elena Losina, Ph.D., Kathleen A. Steger-Craven, R.N., M.P.H., and Kenneth A. Freedberg, M.D., M.Sc., in the April 22, 2002 *Archives of Internal Medicine* 162, pp. 887-892. ■

Researchers examine the role of informatics in responding to bioterrorism, mass disasters, and war

Three major health issues have become urgent in the wake of recent terrorist attacks against the United States: bioterrorism, the threat of widespread delivery of agents of illness; mass disasters, local events that produce many casualties and overwhelm the usual capacity of health care delivery systems; and the delivery of optimal health care to remote military field sites. Each of these health issues carries large demands for the collection, analysis, coordination, and distribution of health information.

Informatics can help this effort, according to three recent studies supported by the Agency for Healthcare Research and Quality. The first study discusses the ongoing informatics work in each of these areas. The second study examines information system-based surveillance described during a roundtable discussion on bioterrorism detection. The third study details unique biomedical informatics tools at the local and regional levels that can be immediately pressed into service for the protection of U.S. groups from bioterrorism attacks.

Teich, J.M., Wagner, M.M., Mackenzie, C.F., and Schafer, K.O. (2002, March). "The informatics response in disaster, terrorism, and war." (contract 290-00-0009). *Journal of the American Medical Informatics Association* 9(2), pp. 97-104.

Several policy changes are needed to better coordinate information among local, regional, and national agencies to prevent and manage terrorist attacks, according to these authors. Some

regions are testing integrated regional data systems that provide biological exposure data from different parts of a region. One such system makes use of real-time data feeds from 17 hospitals. Also, emergency department (ED) computerized registration data can be used to track clusters of viral symptoms, respiratory symptoms, diarrhea, rash, and encephalitis that may indicate bioterrorism. Some newer detection techniques, such as polymerase chain reaction (PCR) and, eventually, biochips, which can detect the DNA sequences of a number of biological agents, need further investigation and testing.

Increasing efficiency in disaster response requires coordination of information from the field to the hospital. One example is Maryland's communication network (known as the Trauma Line), which enables pre-hospital field care providers to communicate directly with physicians in trauma centers and other referral centers. Information on patient vital signs, estimated time of arrival and means of transport, mechanism of injury, level of consciousness, and priority status is put on a fax notepad linked to a cell phone in the ambulance for transmission to the hospital trauma team.

Another project known as "MobiDoc" makes use of next-generation wireless technology to create an entirely mobile telecommunications system. This communication kit, which is the size of a briefcase, contains eight cell phones and wireless data-acquisition devices that are connected to the cell phones. A field team can perform charting,

monitor vital signs, collect images, and carry out other data acquisition tasks for multiple patients. The data are sent to the hospital's Intranet or disaster control center, where they can be viewed on a Web browser by control personnel. Finally, through telemedicine technologies, expert assistance (for example, for trauma evaluation and management, including surgery) can be provided to remote medical caregivers in military operations.

Lober, W.B., Karras, B.T., Wagner, M.M., and others. (2002, March). "Roundtable on bioterrorism detection: Information system-based surveillance." (contract 290-00-0009). *Journal of the American Medical Informatics Association* 9(2), pp. 105-115.

A roundtable on bioterrorism detection was hosted during the 2001 American Medical Informatics Association annual symposium, during which several researchers discussed public health surveillance systems designed to enhance early detection of bioterrorism events. This article combines case reports of six existing systems described at the roundtable. Systems ranged from a geographic scope of 13 counties and 14 hospitals to 14 countries and 395 military installations. Some used data only from EDs, while others used data from EDs, hospitals, and military treatment facilities.

The systems were developed independently but converged on similar solutions to the problem of early detection using similar types

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Role of informatics

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of data and relying on the Internet for connecting institutions. All the sites indicated concerns about maintaining security and confidentiality. Most systems used encryption for the transmission of data; those not capable of encryption accepted automated e-mail of de-identified data.

Several systems used clustering of diagnostic (ICD-9) codes to define disease symptoms of interest in bioterrorism detection. By clustering codes in prodromal groups, researchers hope to include all codings that might conceivably be applied to a patient with relatively early symptoms of an infectious or toxic syndrome. Clustering schemes have been proposed by AHRQ and the U.S. Department of Defense but have not yet been universally adopted. Most systems are using visit data for certain diagnoses or syndrome clusters combined with ED volume data (for example, ED visits per day for gastrointestinal complaints).

Kohane, I.S. (2002, March). "The contributions of biomedical informatics to the fight against bioterrorism." (contract 290-00-0020). *Journal of the American*

***Medical Informatics Association* 9(2), pp. 116-119.**

Experts in biomedical informatics have developed and implemented architectures, methodologies, and tools at the local and regional levels that can be immediately pressed into service for the protection of U.S. populations from bioterrorist attacks. Fortunately, the National Library of Medicine and other organizations have already created the Unified Medical Language system to share descriptions across vocabularies and even link a new bioterrorism monitoring vocabulary to other terminologies. For example, standardized models for describing clinical events in general and ED information in particular have been developed.

The synergy between standardized clinical data models and electronic medical record systems has allowed investigators to use the Internet to rapidly implement large-scale, multi-institutional clinical data gathering and integration. Once raw clinical data are acquired, the detection of signatures of bioterrorism requires sophisticated and prompt interpretation of monitored health care data across time and geography. Usually, this has to be

done in the context of many diseases with early clinical presentations overlapping those of the bioterrorism-related infectious agents (for example, influenza). The uncertainty associated with this overlap and the variation in degree of overlap require probabilistic inference techniques that have been developed to distinguish subtle signals of diseases from the background of findings.

Sensitivity and specificity are critical, since the costs of missing the detection of a bioterrorism incident are great, as are the costs and risks of misdiagnosing and treating thousands of unaffected individuals. Even when correct treatments, isolation methods, and testing protocols are known by experts, implementation of the normative, prescribed responses to exposure and disease from bioterrorism events are uneven at best. Clinicians throughout the country have only partial and often out-of-date knowledge of appropriate procedures. Clinicians must be trained to deliver state-of-the-art diagnostic work-ups and treatments to potential and actual victims of bioterrorism. ■

Conference attendees review the state of the art in telemedicine and telehealth

A symposium entitled "State-of-the-Art Telemedicine/ Telehealth: An International Perspective," was convened in August 2001 with support from the Agency for Healthcare Research and Quality (HS10936) and many other government and nongovernment sponsors. Invited participants represented private, public, and military sectors of telemedicine, as well as diverse international interests. The purpose of the symposium was to assess the state of the art in telemedicine and to develop recommendations and action plans to advance telemedicine at the regional, national, and international levels.

A recently published symposium report covers topics ranging from an assessment of clinical telemedicine applications and the role of telemedicine in public health and medical education, to development of telemedicine network models and the diffusion of telemedicine. In an introductory chapter, Rashid L. Bashshur, Ph.D., of the University of Michigan Health System, discusses the promise of the federally sponsored Next Generation Internet (NGI) or Internet 2 (I2), Department of Defense Intelligent Integration of Information (I*3) system, and the

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European Community's Intelligent Information Interfaces (i3). These systems either expand the storage for large data sets needed for certain diagnostic and clinical applications; speed information transfer, acquisition, and integration; and/or develop interactive capabilities and embed computing power into everyday objects to develop vertically and laterally "connected communities."

Despite these innovations, problems related to access, quality of service, and security remain. Many projects have been funded only for the short-term. The lack of mature telemedicine programs prevents adequate and definitive cost-benefit analysis. Also,

with certain exceptions, such as teleradiology and telepathology, health providers and health administrators have not embraced telemedicine enthusiastically. The success and progress of telemedicine are being met, in the United States at least, by State-based protectionism and inconsistent Federal policies and financing regulations. Internationally, legal, ethical, economic, cultural, and logistical challenges have yet to be overcome.

More details, including a brief review of contents addressed in the symposium report, are in "State-of-the-art telemedicine/telehealth: An international perspective," by Dr. Bashshur, Salah H. Mandil, Ph.D., and Gary W. Shannon, and "Telemedicine and health care," by Dr. Bashshur, in the *Telemedicine Journal and e-health* 8(1), pp. 3-4 and 5-12, 2002. ■

Agency News and Notes

AHRQ's proposed FY 2003 budget

President Bush has proposed a fiscal year 2003 budget of \$251.7 million for the Agency for Healthcare Research and Quality, which is currently under review in Congress. This proposal represents a 16.2 percent decrease from the Agency's FY 02 budget level of \$300 million. The proposed budget earmarks new and continued funding for five critical AHRQ programs: \$5 million for the Secretarial Initiative to Improve Patient Safety research; \$53.3 million (an increase of \$4.8 million) for the Medical Expenditure Panel Survey (MEPS); \$4.1 million for the Healthcare Cost and Utilization Project (HCUP); \$7 million for Translating Research into Practice (TRIP); and \$2.5 million for the Consumer Assessment of Health Plans Study (CAHPS®).

The magnitude of the budget reduction, coupled with earmarked funds for these programs, could

dramatically affect how AHRQ does business every day. Existing grants would be cut by 46 percent, and existing contracts would be cut by 31 percent. If this happens, AHRQ will solicit input from the research community and other stakeholders to help decide how to apportion the cuts and identify potential funding partners to continue important projects.

The five AHRQ programs that have been earmarked for continued and/or increased funding in FY 03 have had an impact American health care because they have done more than just produce findings. These programs have produced tools that can be used to improve the quality of health care services, enhance patient outcomes, increase access to care, and/or reduce health care costs. To continue to make the case for the importance of health services research, investigators must make sure their research is relevant and that it will have a

measurable impact. It is especially important for researchers to tell AHRQ when their findings have made a difference.

The budget process is ongoing and the Agency is continuing to accept applications. For more information on the budget process, go to the AHRQ Web site at: www.ahrq.gov/about/cj2003/cjweb03.htm.

See "AHRQ's fiscal year 2003 budget proposal," in the June 2002 *Health Services Research* 37(3), pp. xiii-xviii. Reprints (AHRQ Publication No. 02-R080) are available from AHRQ.**

Editor's note: As this issue of *Research Activities* goes to press, the Senate Appropriations Committee approved a FY 2003 budget for AHRQ of \$308 million. This recommendation still needs to be considered by the full Senate. The House Appropriations Committee has not yet made its funding recommendation. ■

AHRQ plays an important role in health technology assessment

The historical role of the Agency for Healthcare Research and Quality in health technology assessment (HTA) is outlined in a recent article by the late John M. Eisenberg, M.D., M.B.A., AHRQ's former director, and Deborah A. Zarin, M.D., who directs AHRQ's HTA program. They chronicle the Federal Government's HTA activities, beginning with the creation of the Congressional Office of Technology Assessment (OTA) in 1972, followed by the National Center for Health Care Technology and the Office of Health Technology Assessment (OHTA). OHTA was a component of the National Center for Health Services Research and Health Care Technology Assessment (NCHSR). NCHSR later became the Agency for Health Care Policy and Research (AHCPR), AHRQ's predecessor.

OHTA's role was to advise the Healthcare Financing Administration (HCFA, now the Centers for Medicare & Medicaid Services, CMS) on coverage decisions for new medical technologies under the Medicare program. The Agency continues its role as science advisor to CMS by providing health technology assessments to the Coverage and Analysis Group at CMS, whose coverage decisions are often followed by private health insurers. These technology assessments are conducted internally by AHRQ staff or through contract and collaboration with one of the Agency's 13 Evidence-based Practice Centers.

AHRQ also convenes interagency committees and task forces of independent experts engaged in performing health technology assessment, such as the Quality Interagency Coordination Task Force and the U.S. Preventive

Services Task Force. Drs. Eisenberg and Zarin discuss the effects of economic globalization and cooperative agreements—which affect markets for drugs and medical devices—on the creation of new opportunities for international cooperation in health technology assessment.

See “Health technology assessment in the United States: Past, present, and future,” by Drs. Eisenberg and Zarin, in the *International Journal of Technology Assessment in Health Care* 18(2), pp. 192-198, 2002. Reprints (AHRQ Publication No. 02-R072) are available from AHRQ.** ■

Position Available

The Agency for Healthcare Research and Quality has an opening for a senior biomedical research service position in clinical informatics. This person will direct the program in clinical informatics located within AHRQ's Center for Primary Care Research. He or she will plan, organize, direct, and evaluate the Agency's programmatic initiatives in clinical informatics, including development of AHRQ's extramural and intramural research agenda in clinical informatics. AHRQ is seeking applicants who possess extensive experience and training in clinical informatics and in research methods (e.g., epidemiology, health services research, or statistical research). Candidates must have professional training in clinical informatics. The Agency for Healthcare Research and Quality is located in Rockville, MD, a suburb of Washington, DC.

For more information, go to www.ahrq.gov to view specific employment opportunities. Full text vacancy announcements specify qualification requirements for individual positions, desirable qualifications that must be addressed individually through a personal narrative, as well as other administrative requirements. Questions about this opening may be directed to Helen Burstin, M.D., Director of AHRQ's Center for Primary Care Research, via e-mail to hburstin@ahrq.gov. ■

Correction

An article on emergency department triage of chest pain patients appeared on pages 5-6 of the July 2002 issue of *Research Activities*. An incorrect affiliation was given for Harry Selker, M.D., AHRQ's principal investigator, who led the development and testing of the two electrocardiograph-based triage tools. Dr. Selker is with Tufts-New England Medical Center. In addition, results from recent clinical trials of the two instruments have been published, as follows:

Selker, H.P., Beshansky, J.R., Griffith, J.L., and others. The use of the Acute Cardiac Ischemia Time-Insensitive Predictive Instrument (ACI-TIPI) to assist emergency department triage of patients with chest pain or other symptoms suggestive of acute cardiac ischemia: A multicenter controlled clinical trial. *Annals of Internal Medicine* 129(11):845-855, 1998.

Selker, H.P., Beshansky, J.R., and Griffith, J.L., for the TPI Trial Investigators. Use of the electrocardiograph-based

thrombolytic predictive instrument to assist thrombolytic and reperfusion therapy for acute myocardial infarction: A multicenter randomized controlled clinical effectiveness trial. *Annals of Internal Medicine* 137(2):87-95, 2002.

We apologize for any inconvenience these errors may have caused.

Research Briefs

Balk, E.M., Bonis, P.A., Moskowitz, H., and others. (2002, June). "Correlation of quality measures with estimates of treatment effect in meta-analyses of randomized controlled trials." (AHRQ contract 290-97-0019). *Journal of the American Medical Association* 287(22), pp. 2973-2982.

Specific features of clinical trial quality, such as caregiver blinding and handling of dropouts, may be associated with exaggeration or shrinking of the observed treatment effect. Therefore, assessment of trial quality is often used in meta-analysis of multiple trials. However, the degree to which specific quality measures are associated with treatment effects has not been well established across a broad range of clinical areas. These researchers evaluated 24 quality measures from published quality assessment scales in 276 randomized controlled trials included in 26 meta-analyses from four medical areas. None of the individual quality measures was reliably associated with the strength of treatment effect across studies and medical areas. The researchers

conclude that association of specific quality measures with treatment effect cannot be generalized to all clinical areas or meta-analyses.

Coulter, I.D., Favreau, J.T., Hardy, M.L., and others. (2002, June). "Biofeedback interventions for gastrointestinal conditions: A systematic review." (AHRQ contract 290-97-0001). *Alternative Therapies* 8(3), pp. 76-83.

Four common gastrointestinal (GI) conditions have proven difficult to treat with conventional therapy: irritable bowel syndrome (IBS, stress-related lower abdominal pain and diarrhea/constipation), adult constipation, adult fecal incontinence, and constipation with fecal incontinence in children. According to the results of a review of studies on the topic, biofeedback is not an effective alternative for treating these conditions. Biofeedback is a method that provides information to a patient about a targeted physiologic process that enables the individual to control that process through mental activity. Medicare currently covers

biofeedback for several conditions, including fecal and urinary incontinence. Researchers at the Southern California Evidence-based Practice Center found 16 controlled trials of biofeedback for GI problems out of a review of over 4,000 articles and abstracts. The identified studies had significant methodological flaws, and the researchers determined that the evidence was insufficient to support the efficacy of biofeedback for these GI conditions.

Covinsky, K.E., Covinsky, K.H., Palmer, R.M., and Sehgal, A.R. (2002). "Serum albumin concentration and clinical assessments of nutritional status in hospitalized older people: Different sides of different coins?" (AHRQ grant K02 HS00006). *Journal of the American Geriatrics Society* 50(4), pp. 631-637.

Malnutrition is common in older hospitalized medical patients, often goes unrecognized, and is strongly associated with complications and

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death. As a result, some have recommended routine nutritional screening. These researchers compared two potential methods of assessing nutritional status in 311 hospitalized patients aged 70 and older: serum albumin, and the subjective global assessment (SGA), which classified patients as well nourished, moderately malnourished (5 percent weight loss with mild examination findings), or severely malnourished (more than 10 percent weight loss with marked findings) based on a history and examination. Discordance between albumin and the SGA was common. In fact, the ability of either measure to predict the other measure was only marginally better than chance. The authors conclude that they may each reflect fundamentally different clinical processes.

Fuhrer, R., and Stansfeld, S.A. (2002). "How gender affects patterns of social relations and their impact on health: A comparison of one or multiple sources of support from close persons." (AHRQ grant HS06516). *Social Science & Medicine* 54, pp. 811-825.

British men tend to receive most of their practical emotional support from their wives, whereas women obtain more support from female friends than their husbands. Yet both men and women have the same proportion of women among their closest friends. Previous studies have examined a person's social support only from the "closest person." Expanding the field up to four people provides a more accurate picture, and differences between men and women are weakened, if not eliminated, when this approach is used to predict physical and

psychological health. The researchers asked British civil servants (aged 35-55 years) to complete questionnaires about social networks and social support up to a maximum of four nominated people they "felt very close to." Over 92 percent of the married/cohabiting men nominated their wives as the closest person in contrast to 80 percent of married women who nominated their partners. When nomination of a spouse was excluded, 64 percent of men and 59 percent of women nominated a woman as their closest person. About 9 percent of the men and 4 percent of women nominated only one close person, while 65 percent of men and 75 percent of women nominated four close people. Being in the group with the least cumulative emotional support increased the risk of ill physical and mental health for both men and women.

Macek, M.D., Manski, R.J., Vargas, C.M., and Moeller, J.F. (2002, April). "Comparing oral health care utilization estimates in the United States across three nationally representative surveys." *Health Services Research* 37(2), pp. 499-521.

There are three main sources of nationally representative dental visit data in the United States: the National Health Interview Survey (NHIS, which has long been the standard data source), the National Health and Nutrition Examination Survey (NHANES), and three health expenditure surveys from AHRQ: the 1977 National Medical Care Expenditure Survey (NMCES), the 1987 National Medical Expenditure Survey (NMES), and the 1996 Medical Expenditure Panel Survey (MEPS). These researchers compared dental visit estimates derived from the standard NHIS with estimates derived from NHANES and the

health expenditure surveys to assess differences across surveys and stratum-specific trends within surveys. Sociodemographic, stratum-specific trends were generally consistent across surveys, but overall estimates differed. The researchers suggest that a validation study be conducted to establish true utilization estimates. Reprints (AHRQ Publication No. 02-R071) are available from AHRQ.*

Reuben, D.B. (2002). "Organizational interventions to improve health outcomes of older persons." (Presented at AHRQ-supported conference). *Medical Care* 40(5), pp. 416-428.

This author points out that a variety of organizational interventions have been implemented to improve the health outcomes of older people. These range from comprehensive geriatric assessment and management of elderly patients to dedicated acute care hospital units. However, the evidence supporting the effectiveness of these interventions is inconsistent, they rarely reduce health care costs, and there have been formidable barriers to implementing successful interventions into practice. The researcher suggests several ways to overcome these barriers. First, the costs and benefits of such interventions must be clearly articulated so that health care systems will have better-informed decisionmaking. Second, Federal and national accrediting efforts to measure quality of care should be continued, but the measures need to be further tested and refined. Third, fee-for-service Medicare must provide incentives for improving the efficiency of health care delivery for the elderly.

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Sohn, M-W. (2002, April). "A relational approach to measuring competition among hospitals." (AHRQ grant HS08002). *Health Services Research* 37(2), pp. 457-482.

This author presents a new relational approach to measuring competition in hospital markets and compares this approach with alternative methods of measuring competition. The author used patient discharge abstracts and financial disclosure files for 1991 from the California Office of Statewide Health Planning and Development to derive patient flows. The patient flows were combined to calculate the extent of overlap in patient pools for each pair of hospitals, producing a cross-sectional measure of market competition among hospitals. This relational approach produced measures of competition between each and every pair of hospitals in the study sample, which allowed examination of a much more local effect of competition. Preliminary analyses found that hospital markets were smaller than thought, for-profit hospitals received considerably more competition from their neighbors than either nonprofit or government hospitals, and hospital size did not matter in

the amount of competition received.

Wolf, L.E., Croughan, M., and Lo, B. (2002). "The challenges of IRB review and human subjects protections in practice-based research." (AHRQ/NIMH MH42459). *Medical Care* 40(6), pp. 521-529.

This paper analyzes three challenges of Institutional Review Board (IRB) review and human subjects protections faced by practice-based research networks (PBRNs): IRB review for clinician investigators who are not affiliated with the institution that has an IRB; multiple IRB reviews; and required training of key personnel in human subjects protection. The authors make several recommendations. Investigators should ensure that appropriate IRB review is obtained for all performance sites and plan for review for unaffiliated investigators. PBRN investigators and professional societies should educate IRB members and policymakers and publish articles about how IRBs might best address human subjects concerns in PBRNs. Finally, PBRN investigators need to ensure that their clinician investigators receive appropriate training in human subjects protection.

Zuvekas, S.H., and Cohen, J.W. (2002, Spring). "A guide to comparing health care expenditures in the 1996 MEPS to the 1987 NMES." *Inquiry* 39, pp. 76-86.

Substantial changes in the organization, delivery, and financing of health care during the past decade, combined with data collection and methodological improvement in the 1996 Medical Expenditure Panel Survey (MEPS), pose special challenges in comparing expenditure estimates in MEPS with those in the 1987 National Medical Expenditure Survey (NMES). The 1987 NMES used charges as its fundamental expenditure concept, whereas the 1996 MEPS used actual payments as its expenditure measure. In spite of these differences, researchers and policymakers want to be able to analyze trends in health care expenditures using these two surveys. Toward this end, the researchers present a simple, straightforward adjustment method that can be applied to the 1987 NMES public use expenditure data to improve comparability with the MEPS data. They provide several examples that illustrate the importance of the adjustments when analyzing trends in health care spending. Reprints (AHRQ Publication No. 02-R076) are available from AHRQ.** ■

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