Research Activities

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Highlights

Departments

Regular Features

Patients cared for by both a cardiologist and a primary care doctor after heart attack have a lower risk of death

Many Americans survive a heart attack only to die soon after leaving the hospital from a second heart attack or other medical problem. But a new study sponsored by the Agency for Healthcare Research and Quality suggests that heart attack patients fare better if they are treated by a cardiologist and better still if they are treated by a cardiologist and a family physician or internist rather than by a primary care physician alone after they go home from the hospital.

The researchers found that patients cared for by cardiologists on an outpatient basis following a heart attack have a lower risk of dying within 2 years than patients seen only by primary care physicians (14.6 percent vs. 18.3 percent). Also, patients cared for by both a cardiologist and a primary care physician have an even lower risk of dying within 2 years than those treated solely by a cardiologist (11.1 percent vs. 12.1 percent). In these two comparisons, patients in each group were similar in age, sex, race, and clinical characteristics, and those in the first comparison were relatively sicker with a higher risk of dying.

According to Harvard Medical School researcher John Ayanian, M.D., who led the study, the tests and procedures that cardiologists can provide their patients—such as exercise testing, angiograms, heart bypass surgery, and cardiac rehabilitation—together with the experience that primary care physicians have in managing common chronic illnesses, may explain the success of this combination.

However, the researchers did not find that the cardiologists' patients used effective cardiac drugs to any significantly greater extent than other patients. In fact, regardless of which type of physician the heart attack survivors used for followup care, many were not prescribed drugs that have been proven effective, such as beta-blockers and cholesterol-lowering medications. On the other hand, the cardiologists' patients were more likely to undergo major diagnostic and treatment procedures such as angiograms and heart bypass

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surgery, which may have contributed to their better outcomes.

The study also found that the patients who were less likely to see a cardiologist for followup care were those who had major chronic illnesses such as congestive heart failure, diabetes, or lung disease, and those who were black, female, or very elderly. Patients who underwent major cardiac procedures while hospitalized, such as heart bypass surgery, were more likely to receive followup from a cardiologist after leaving the hospital.

The researchers examined 1994 and 1995 data on the medical care of more than 35,000 elderly heart attack survivors for 3 months after hospital discharge—the normal timeframe for such patients to begin seeing physicians for followup. The patients, who were insured through Medicare's fee-for-service program, lived in California, Florida, Massachusetts, New York, Ohio, Pennsylvania, and Texas.

Details are in "Specialty of ambulatory care physicians and mortality among elderly patients after myocardial infarction," in the November 21, 2002 *New England Journal of Medicine* 347(321), pp. 1678-1686. ■

Heart Disease

Researchers examine the risk factors for sudden cardiac death and management of at-risk patients

Despite advances in the prevention and treatment of heart disease, sudden cardiac death (SCD)—usually caused by ventricular arrhythmias (irregular heart beats)—accounts for one-fourth of all deaths in the United States. SCD occurs most often in patients diagnosed with heart disease, especially those who have suffered a heart attack or congestive heart failure.

Seven studies were published recently that focus on risk factors for SCD and management of patients at high risk for SCD. The studies are from the Sudden Cardiac Death Patient Outcomes Research Team (PORT), led by Mark Hlatky, M.D., principal investigator, and Kathryn McDonald, M.M., project director, of Stanford University. The studies, which were supported in part by the Agency for Healthcare Research and Quality (HS07373 and HS08362), are described here.

Every, N., Hallstrom, A., McDonald, K.M., and others. (2002). "Risk of sudden versus nonsudden cardiac death in patients with coronary artery disease." ***American Heart Journal*** **144, pp. 390-396.**

Patients at high risk of sudden cardiac death (SCD), yet at low risk of nonsudden cardiac death (non-SCD, for example, heart failure), benefit most from antiarrhythmic drugs such as amiodarone or devices like the implantable cardioverter-defibrillator (ICD), which shocks the heart into a normal rhythm. Standard clinical evaluation is not very good at distinguishing patients at risk for SCD versus non-SCD, since these patients have similar clinical profiles, according to this study.

The researchers identified all cardiac deaths during a 3.3-year followup of 30,680 patients discharged alive after a stay in a cardiac care unit of a Seattle hospital. They reviewed the medical charts of 1,093 subsequent out-of-hospital SCDs, 973 non-

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SCDs, and 442 randomly selected control patients. Patients who died during followup, either suddenly or nonsuddenly, differed in numerous ways from the randomly selected control patients. For example, patients who died were significantly older, more likely to have had a prior heart attack or congestive heart failure, more likely to have diabetes, and less likely to have been discharged on beta-blockers or aspirin.

Yet very few factors distinguished patients with subsequent SCD from those who died not suddenly. Cardiac test results and discharge medications of patients who died suddenly were quite similar to those of patients who died nonsuddenly. Women, patients who had angioplasty or bypass surgery, and patients prescribed beta-blockers were 20 to 30 percent less likely to die suddenly than other patients. Those with heart failure, frequent ventricular ectopy, or a discharge diagnosis of heart attack were 20 to 30 percent more likely to die suddenly than other patients. However, a model containing all clinical variables had only a modest ability to predict mode of death.

Heidenreich, P.A., Keeffe, B., McDonald, K.M., and others. (2002). "Overview of randomized trials of antiarrhythmic drugs and devices for the prevention of sudden cardiac death." ***American Heart Journal*** **144, pp. 422-430.**

By preventing or terminating ventricular arrhythmias (irregular heart beats) in patients who have already suffered a heart attack, the type III antiarrhythmic agent amiodarone and the ICD substantially reduce SCD, according to this study. The investigators reviewed randomized trials and quantitative overviews of type I and type III antiarrhythmic drugs and randomized trials of ICDs and combined these outcomes in a quantitative overview. The Cardiac Arrhythmia Suppression Trial (CAST) and meta-analyses of other studies suggested that type I agents increased by 21 percent the mortality rate of heart attack patients who had no symptoms of irregular heart beat but were at risk of sudden death.

Randomized trials of amiodarone suggested a moderate 13 to 19 percent decrease in mortality rate relative to placebo, and sotalol, another type III agent, was effective in several small trials. Trials of pure type III agents, however, showed no reduced mortality.

An overview of ICD trials revealed a 24 percent reduction in mortality rate compared with amiodarone. The benefit of the device was greater in patients with an ejection fraction (a measure of cardiac output) of 35 percent or less. The evidence supporting the efficacy of the ICD was strongest in patients who had experienced an episode of sustained ventricular tachycardia (abnormally rapid heart beat) or ventricular fibrillation (irregular heart beat).

The researchers suggest that type I agents be reserved for patients with symptomatic atrial arrhythmias and, even in these patients, other therapies may be preferred when the ejection fraction is substantially reduced. They conclude that amiodarone remains an acceptable therapeutic option, particularly as preventive therapy, in patients at high risk of SCD who have not experienced an episode of sustained ventricular tachycardia or fibrillation. The ICD is effective in patients with prior episodes of sustained ventricular tachycardia or fibrillation.

Hlatky, M.A., Saynina, O., McDonald, K.M., and others. (2002). "Utilization and outcomes of the implantable cardioverter defibrillator, 1987-1995." ***American Heart Journal*** **144, pp. 397-403.**

Introduced into clinical use in 1980, the ICD has become smaller and simpler to implant, while

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providing better methods to detect and treat sustained ventricular tachyarrhythmias (rapid, irregular heart beat). This study found that ICD use expanded more than 10-fold in clinical practice from 1987 to 1995, with improved mortality rates but high medical expenditures and rates of surgical revision. The investigators identified ICD recipients by use of the hospital discharge databases of Medicare beneficiaries for 1987 through 1995 and of California residents for 1991 through 1995. They linked the initial hospital admission for each ICD patient to previous and subsequent admissions and to mortality files to determine the outcomes of ICD use.

During the study period, over 31,000 ICDs were implanted in Medicare patients, most of whom had been hospitalized for heart attack, congestive heart failure, or ventricular tachycardia at that time or during the previous year. Between 1987 and 1995, the number of hospitals performing the procedure increased from roughly 100 to 500, and the volume of ICD implantations per hospital also rose. Patients who died within 30 days of implantation decreased from 6 to 2 percent, and mortality rates within a year of implantation fell from 19 to 11 percent. Mortality rates at 3 years declined as well, but less sharply, from 38 percent in 1987 to 33 percent in 1992.

Subsequent hospitalizations for ICD complications or surgical replacement were very common and within the first year remained about 5 percent. However, the rate of revision/replacement at 3 years declined from 34 percent from 1987 to 1989 to 18 percent for devices implanted from 1990 to 1992, largely as a result of fewer generator replacements due to improvements in device and battery life. Medicare expenditures for these patients within 30 days of ICD implantation have remained close to $40,000 in 1993 dollars, and 3-year expenditures averaged almost $50,000.

McDonald, K.M., Hlatky, M.A., Saynina, O., and others. (2002). "Trends in hospital treatment of ventricular arrhythmias among Medicare beneficiaries, 1985-1995." ***American Heart Journal*** **144, pp. 413-421.**

Survival of patients who sustain a ventricular arrhythmia is poor but slowly improving due to in-hospital use of medications and ICDs. However, this more intensive hospital treatment has been accompanied by increased hospital expenditures, finds this study. The researchers analyzed Medicare databases from 1985 to 1995 to identify elderly patients hospitalized with ventricular arrhythmias (index admission). They created a longitudinal patient profile by linking the index hospital admission with all earlier and subsequent admissions and with death records.

During this time, about 85,000 elderly patients went to U.S. emergency departments (EDs) with ventricular arrhythmias each year. Only about 20,000 of these patients lived to be admitted to the hospital from the ED, and then about 14 percent died within the first day. From 1987 to 1995, the demographic and clinical characteristics of patients and the use of coronary angioplasty and bypass graft surgery for these patients were largely unchanged. However, the use of electrophysiology studies (EPS) grew from 3 to 22 percent and use of ICDs increased from 1 to 13 percent. A growing number of patients survived, particularly in the medium term, with 1-year survival rates increasing from 53 percent in 1987 to 58 percent in 1994, or half a percentage point each year.

At the same time, hospital expenditures rose 8 percent per year, primarily because of the increased use of EPS and ICD procedures. By 1993, Medicare was reimbursing hospitals an average of $15,627 for care for each patient during the year after admission for ventricular tachycardia/fibrillation. During the subsequent year, another $14,739 on average was spent for these patients. The increased intensity of care for these patients led to a rise in the average expenditure per patient of about $1,000 per year (in 1993 dollars) from 1987 to 1995.

Alexander, M., Baker, L., Clark, C., and others. (2002). "Management of ventricular arrhythmias in diverse populations in California." ***American Heart Journal*** **144, pp. 431-439.**

Several studies have shown lower use of cardiac procedures in racial/ethnic minorities, and this

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study is no exception. It found that in a large population of California patients hospitalized for life-threatening ventricular arrhythmia (LTVA), blacks received significantly fewer invasive electrophysiological studies (EPS) and ICD procedures than whites and had higher mortality rates a year later. The researchers analyzed discharge abstracts of patients admitted to non-Federal California hospitals for ventricular tachycardia or ventricular fibrillation (VT/F) between 1992 and 1994.

Among 8,713 patients admitted with VT/F, 29 percent had a subsequent EPS procedure, and 9 percent had an ICD implanted. After controlling for potential confounding factors, black patients were 28 percent less likely to undergo EPS and 61 percent less likely to have an ICD implanted than white patients. Within 1 week of admission for VT/F, 22 percent of blacks and 21 percent of Hispanics received EPS compared with 28 percent of Asians and 30 percent of whites, a similar pattern that also was observed within a year of the hospitalization. Within 1 week of hospital admission, 4 percent of blacks, 6 percent of Hispanics, and 7 percent of Asians had received an ICD compared with 10 percent of whites, with the same pattern evident 1 year later.

Even after controlling for multiple confounding risk factors, 20 percent of blacks discharged alive from the hospital died over the next year compared with 15 percent of Hispanics and whites and 13 percent of Asians. Black and Asian patients lived closer to hospitals with EPS/ICD capability than Hispanic or white patients, yet they were no more likely to be admitted to such hospitals. In the study period, implantation of an ICD was usually confined to patients who had undergone a prior EPS procedure. Yet in patients who had undergone an EPS procedure, black patients were still 55 percent less likely to have an ICD implanted than white patients. Use of EPS and ICD procedures was also lower among women, older patients, and Medicaid or uninsured patients.

Hsu, J., Uratsu, C., Truman, A., and others. (2002). "Life after a ventricular arrhythmia." ***American Heart Journal*** **144, pp. 404-412.**

A life-threatening ventricular arrhythmia (LTVA) can have a substantial negative effect on a person's quality of life (QOL). With therapy, most patients can improve their QOL and reduce symptoms, possibly more so after treatment with an ICD, according to this study. However, the costs of treating these patients are very high and include the cost of the ICD. The researchers investigated changes in QOL during the first 2 years after initial arrhythmia, as well as cost and resource use among patients discharged after a first episode of an LTVA between 1995 and 1998 in a managed care population of 2.4 million members.

The researchers evaluated QOL by use of the Duke Activity Status Index (DASI), Medical Outcomes Study SF-36 mental health and vitality scales, and the Cardiac Arrhythmia Suppression Trial (CAST) symptom scale via telephone interviews with patients at discharge and 6, 12, and 24 months later. They also reviewed patient charts at baseline and at 24 months to assess treatment, coexisting illness, and medication use, and they evaluated resource use and costs via health plan databases. The 264 patients with new cases of LTVA received either an ICD or antiarrhythmic medication such as amiodarone, depending on their doctor's recommendation.

Both functional status and symptoms (ranging from palpitations and fainting to joint pains and severe shortness of breath) improved significantly for these patients during the study period, particularly for ICD patients. Patients receiving an ICD

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had the greatest initial decrease in DASI functional status (16.4 units) but also had the greatest subsequent recovery of their functional status (8.2 units) compared with patients receiving amiodarone. The average symptom score decreased from 44.2 to 29.5 units in the original nine-item CAST instrument, and these improvements were greater in patients receiving an ICD than in patients receiving amiodarone. However, the direct cost of medical care for LTVA patients was very high, averaging $30,193 in 2 years (including the initial cost of an ICD unit for the 94 patients receiving this treatment in the LTVA cohort). These data suggest that most patients treated for newly developed LTVA achieve QOL scores that are similar to those of patients after coronary angioplasty or coronary artery bypass graft surgery.

Owens, D.K., Sanders, G.D., Heidenreich, P.A., and others. (2002). "Effect of risk stratification on cost-effectiveness of the implantable cardioverter defibrillator." ***American Heart Journal*** **144, pp. 440-448.**

Risk stratification based on patient risk of sudden cardiac death alone is not sufficient to predict the cost-effectiveness of the implantable cardioverter defibrillator (ICD) compared with the medication amiodarone. Risk stratification strategies must distinguish patients who die suddenly from those who die nonsuddenly, not just patients who die suddenly from those who live, if they are to successfully identify patients for whom use of the ICD is economically attractive, suggest these researchers.

They developed a mathematical model to evaluate the cost-effectiveness of ICD implantation compared with amiodarone treatment, which incorporated mortality rates from sudden and nonsudden cardiac death, noncardiac death, and costs for each treatment strategy. They found that if the annual total cardiac mortality rate is 12 percent, the cost-effectiveness of the ICD varies from $36,000 per quality-adjusted life year (QALY) gained when the ratio of sudden cardiac death to nonsudden cardiac death is 4 to $116,000 per QALY gained when the ratio is 0.25. ■

Researchers recount lessons learned from the past two decades of cardiovascular clinical research

Cardiovascular clinical trials conducted in the past two decades have revealed insights that can be put to use to improve future trials. These trials also have suggested guidelines for clinicians who care for patients with heart disease. These lessons and guidelines are detailed in four recently published articles by Robert Califf, M.D., of the Duke Center for Education and Research on Therapeutics, and his colleague David L. DeMets, Ph.D., of the University of Wisconsin. Their work was supported in part by the Agency for Healthcare Research and Quality (HS10548).

DeMets, D.L., and Califf, R.M. (2002). "Lessons learned from recent cardiovascular clinical trials: Part I." ***Circulation*** **106, pp. 746-751.**

These authors provide evidence that clinical trials should not rely on unproven surrogate outcome measures, such as improved cardiac output. They caution that subgroup findings should be regarded with suspicion unless they are independently confirmed or expected on the basis of prior findings.

In several trials, for example, improved cardiac function (as estimated by cardiac output) was named as a surrogate outcome in patients with chronic heart failure. Several drugs that improved various heart function measures, such as cardiac output, were later tested in a series of trials. Despite the demonstration that these drugs would improve cardiac output in the short term, many of them increased mortality. Thus, improved cardiac output was not a valid surrogate outcome for evaluating this new class of drugs. The researchers caution that relying on nonvalidated surrogates only encourages the use of ineffective therapies and may even promote the use of harmful treatments.

Researchers often evaluate treatment effect in subgroups of patients based on demographics or risk factors. However, when a trial demonstrates either a significant benefit or a harmful treatment effect, this effect is usually consistent within subgroups. For example, in studies of primary or secondary prevention of heart

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disease with aspirin, fewer women were randomized, and the results in women were not statistically significant. Interpretation of this subgroup analysis led to undertreatment of women for years, although we now know that aspirin is effective in women.

DeMets, D.L., and Califf, R.M. (2002). "Lessons learned from recent cardiovascular clinical trials: Part II." *Circulation* 106, pp. 880-886.

This paper examines several structural issues involved in administering multicenter clinical trials in cardiovascular disease, such as ways to minimize bias, roles and responsibilities for monitoring patient safety and evaluating evidence of efficacy, conflict of interest, managing trials with emerging negative trends, publication of negative trials, noninferiority trials (comparison of equally effective treatments to detect other clinically important differences), confirmation trials (trials conducted to confirm the results of an initial trial), and specification of primary and secondary end points. The article stresses the artificial nature of proactive checks and balances in the organization of clinical trials. It suggests that trials lacking these systems may not be as effective at producing balanced results in the public interest.

Califf, R.M., and DeMets, D.L. (2002). "Principles from clinical trials relevant to clinical practice: Part I." *Circulation* 106, pp. 880-886.

In this paper, the investigators cite six principles from clinical trials that are relevant to clinicians working with patients with cardiovascular disease. The trials show that the benefits of most cardiovascular therapies are modest. For example, risk is rarely reduced by more than 25 percent for patients who have suffered a heart attack. On the other hand, for epidemic diseases such as acute coronary syndromes, even small improvements can be clinically important.

Therapies shown to benefit patients with a given clinical condition can be applied systematically to all patients with that condition in clinical practice. Contrary to what clinicians intuit in their own patients, sicker and older patients usually benefit most.

Therapy is typically aimed at blocking or augmenting some aspect of a biological pathway, but it often affects additional unintended targets. Relying on clinical experience to decide which therapies to use is not adequate.

Clinical trials tend to assess one treatment at a time, yet most patients are treated with multiple therapies simultaneously, and interactions are often unpredictable. Assumptions by clinicians about untested combinations of potent therapies may not only be incorrect, but they also could lead to widespread patient problems. Long-term effects of therapies may differ from short-term effects and deserve evaluation.

The effect of drugs in the same class (that is, with the same biological target) can be uncertain. For example, in the treatment of heart failure, three beta-blockers reduced mortality, but a fourth failed in a major trial. Clinicians should consider uncertainty when substituting a less-expensive but unproven agent from the same class for a given condition.

Califf, R.M., and DeMets, D.L. (2002). "Principles from clinical trials relevant to clinical practice: Part II." *Circulation* 106, pp. 1172-1175.

The investigators discuss five principles derived from cardiovascular clinical trials to guide clinicians caring for patients with heart disease.

Most therapies produce a combination of helpful and harmful effects, and clinical characteristics can identify patients with greater expected benefit or risks.

Most beneficial therapies may not save money, but they are incrementally cost-effective. For example, using an accelerated infusion of alteplase (which costs $2,000 more than streptokinase) would reduce risk of death from blocked coronary arteries by 15 percent compared with a standard infusion of streptokinase. The cost would be $30,000 per year of life saved, well below the $70,000 spent to save a year of life with renal dialysis. Thus, the widespread belief that beneficial treatment saves money is inaccurate, but the benefits achieved are often worth the extra cost.

Systematically using therapies demonstrated to be effective in clinical trials leads to better patient outcomes.

Some areas of cardiovascular medicine are underserved. Fewer than 30 randomized clinical trials have been completed in pediatric cardiology; in contrast, more than 80 percent of children with cancer are enrolled in clinical trials, and tremendous gains in longevity for these children have occurred.

More practitioners and patients need to participate in clinical trials to optimize treatment of patients with heart disease. ■

High-risk cardiovascular procedures, but not cancer operations, are becoming safer

The well-publicized decline in postoperative deaths following cardiovascular surgery has led to a general perception that high-risk surgery is becoming safer over time. However, that is not the case for high-risk cancer operations, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS10141). Organized efforts aimed at measuring surgical mortality rates—like those widely implemented in cardiac surgery—may be the first step toward making high-risk cancer surgery safer, suggests principal investigator John D. Birkmeyer, M.D., of Dartmouth-Hitchcock Medical Center.

Dr. Birkmeyer and colleagues examined national trends between 1994 and 1999 in operative mortality for 14 high-risk cardiovascular and cancer procedures in a nationally representative group of elderly Medicare patients. Mortality rates varied widely across the 14 procedures, from 2 percent for carotid endarterectomy (removal of plaque from the carotid artery) to 16 percent for esophagectomy (removal of all or part of the esophagus). Over the 6-year study period, operative mortality declined significantly for three cardiovascular procedures: 15 percent for coronary artery bypass graft (CABG) surgery, 14 percent for carotid endarterectomy, and 11 percent for mitral valve replacement.

On the other hand, operative mortality did not decline significantly for seven of eight cancer procedures studied. In fact, mortality increased for colonectomy for colon cancer, after adjusting for other factors known to affect operative mortality, such as hospital procedure volume. Mortality rates remained higher than 10 percent throughout the study period for cancer surgeries such as pneumonectomy (removal of all or part of a lung), gastrectomy (removal of all or part of the stomach), and pancreatic resection and remained at least 15 percent for esophagectomy.

Registries tracking hospital- and surgeon-specific performance have been linked to substantial reductions in operative mortality with cardiac surgery. Although there are several large cancer registries, these tend to focus on disease epidemiology and prognosis. If expanded to allow tracking of provider-level performance, these registries might be very useful as platforms for improving surgical outcomes.

See "Is surgery getting safer? National trends in operative mortality," by Philip P. Goodney, M.D., Andrea E. Siewers, M.P.H., Therese A. Stukel, Ph.D., and others, in the August 2002 *Journal of the American College of Surgeons* 195, pp. 219-227. ■

Referring high-risk surgeries to high-volume hospitals may save lives but not money

Policies aimed at referring patients who need high-risk procedures such as coronary artery bypass graft (CABG) surgery to hospitals that conduct a high volume of such surgeries could save thousands of lives each year, according to some estimates. However, this approach may not necessarily reduce direct health care costs, finds a study led by John Birkmeyer, M.D., of Dartmouth-Hitchcock Medical Center. The research was supported in part by the Agency for Healthcare Research and Quality (HS10141).

Dr. Birkmeyer and his colleagues examined the economic impact of regionalization from the hospital, payer, and societal perspectives. From the hospital perspective, this strategy will primarily redistribute surgical profits from smaller to bigger centers. Using data from a cross-section of New England hospitals, they estimated average hospital profits for four surgical procedures. Based on average hospital profits for CABG, a hospital giving up 100 procedures a year to a higher volume hospital would experience a net financial loss of $684,000.

From the payer perspective, prices paid for procedures will likely increase in some geographic areas, according to Dr. Birkmeyer, as a result of decreased competition among providers.

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From society's perspective, it is uncertain how volume-based referral policies would affect the true cost of providing surgical care. Concentrating selected procedures in a smaller number of high-volume centers could create some financial efficiencies as well as savings associated with better quality of care.

However, there would also be new costs. Increasing procedure volume at high-volume centers would require adding capacity (operating rooms and beds) at some facilities. There would be new administrative costs associated with transferring medical information between referring and referral hospitals. Finally, volume-based referral strategies would concentrate more care at teaching hospitals, where care tends to be more expensive compared with smaller nonteaching hospitals.

Surgical costs could also increase to the extent that volume-based referral policies create incentives for hospitals to do more procedures. The risk that such policies could increase the use of surgery is highest with procedures performed for discretionary clinical conditions, notes Dr. Birkmeyer. For example, there is a considerable gray area as surgeons decide which patients should undergo CABG for lifestyle-limiting coronary artery disease.

For more details, see "Will volume-based referral strategies reduce costs or just save lives?" by Dr. Birkmeyer, Jonathan S. Skinner, Ph.D., and David E. Wennberg, M.D., M.P.H., in the September/October 2002 *Health Affairs* 21(5), pp. 234-241. ■

Endometrial ablation may not prevent hysterectomy for many women with benign uterine conditions

In 1980, endometrial ablation was introduced as an alternative to hysterectomy for abnormal uterine bleeding. Its aim is to alleviate excessive menstrual bleeding in premenopausal women by destroying or removing the endometrial lining while conserving the uterus. There is a group of women who will benefit from this typically 1-day outpatient procedure and avoid hysterectomy. However, this procedure seems to be used in addition to rather than instead of hysterectomy for benign uterine conditions such as abnormal uterine bleeding, according to a study by researchers at the Agency for Healthcare Research and Quality.

Cynthia M. Farquhar, M.D., Sandra Naoom, B.Psych., and Claudia A. Steiner, M.D., M.P.H., accessed data on women with benign uterine conditions who underwent either hysterectomy or endometrial ablation using the State Inpatient and Ambulatory Surgery Databases of the Healthcare Cost and Utilization Project for six States from 1990 to 1997. In the six States studied, endometrial ablation was used as an additive medical technology rather than as a substitute for hysterectomy.

The proportionate increases in endometrial ablation did not mirror proportionate decreases in hysterectomy in any of the six States studied. Hysterectomy rates either declined slightly or remained unchanged. Yet, the rate for endometrial ablation for women with benign uterine conditions for all States increased significantly. The analysis included women who may have had more than one procedure, with hysterectomies perhaps following failed ablations. The researchers suggest implementing strategies to reduce hysterectomy rates in favor of endometrial ablation as well as other nonsurgical interventions tried in other countries.

See "The impact of endometrial ablation on hysterectomy rates in women with benign uterine conditions in the United States," by Drs. Farquhar, Naoom, and Steiner, in the *International Journal of Technology Assessment in Health Care* 18(3), pp. 625-634, 2002. Reprints (AHRQ Publication No. 03-R004) are available from AHRQ.** ■

Most hip fracture patients do not have medical complications following surgery

Each year, more than 225,000 people aged 50 or older in the United States suffer a hip fracture. Most (81 percent) patients undergoing hip fracture repair surgery suffer no postoperative complications, according to a study supported in part by the Agency for Healthcare Research and Quality (HS07322).

The researchers retrospectively studied data on complications and deaths from the medical records of 8,930 patients 60 years of age or older who underwent hip fracture repair surgery in one of 20 academic, community, or Veterans Affairs hospitals. The study population was elderly (mean age 80 or older), primarily female (79 percent), white (87 percent), and living at home at the time of the fracture (73 percent).

Only 1,737 (19 percent) of patients undergoing hip fracture repair surgery had postoperative medical complications. Among this group, cardiac and pulmonary complications were most frequent (8 and 4 percent, respectively). Serious cardiac and pulmonary complications occurred with equal frequency (2 and 3 percent, respectively). Death rates within 30 days and 1 year of surgery were 22 percent and 36 percent, respectively, for cardiac complications and 17 percent and 44 percent for pulmonary complications. Complications and death occurred significantly earlier for serious cardiac than for serious pulmonary complications (1 vs. 4 days and 2 vs. 8 days, respectively), but length of hospital stay was similar for patients surviving these complications (13 and 12 days, respectively).

Other complications included gastrointestinal tract bleeding (2 percent), combined cardiopulmonary complications (1 percent), venous thromboembolism (1 percent), and transient ischemic attack or stroke (1 percent). Renal failure and septic shock were rare. Overall in-hospital death was 3.3 percent. Most patients had only one complication, but 12 percent had multiple complications. Patients with multiple complications and renal failure had the highest in-hospital mortality rates (29-38 percent). The researchers conclude that most elderly patients have an uncomplicated course after hip fracture repair.

See "Medical complications and outcomes after hip fracture repair," by Valerie A. Lawrence, M.D., Susan G. Hilsenbeck, Ph.D., Helaine Noveck, M.P.H., and others, in the October 14, 2002 *Archives of Internal Medicine* 162, pp. 2053-2057. ■

Cultural and language problems can lead to dire consequences during pediatric emergencies

Twenty-nine percent of the U.S. population and one out of every three children is a member of an ethnic or racial minority group. By 2025, almost 40 percent of Americans and about half of all U.S. children with be minorities. Thus, emergency room (ER) clinicians will often encounter children needing emergency care who come from families with cultural differences or who don't speak English at all or only haltingly.

Failure to appreciate the importance of culture and language in pediatric emergencies can be catastrophic. It can lead to problems in obtaining informed consent, inadequate understanding of diagnoses and treatment by families, unnecessary medical and social service evaluations, inadequate analgesia, and dissatisfaction with care, warn the authors of a study supported in part by the Agency for Healthcare Research and Quality (HS11305).

Glenn Flores, M.D., of Boston Medical Center, and his colleagues reviewed studies on culture and language in the emergency care of children that were published in English or Spanish from 1966 to 1999. A final database of 117 articles yielded numerous insights. For instance, parents and children with limited English proficiency often don't get the interpreters they need and have a poor understanding of their diagnosis and treatment. Also, certain ethnic-specific beliefs such as the Navajo hozhooji (the belief that negative thoughts and words can cause harm) can impede informed consent (for example, to surgery that a doctor acknowledges to have some risks).

Numerous folk illnesses, such as empacho among Latinos (term for chronic indigestion in children with diarrhea), can affect care because symptoms often overlap with potentially serious biomedical conditions such as intestinal blockage or appendicitis. The first clinical contact may be with folk healers, and certain folk remedies are harmful or even fatal (for example, use of lead powders for empacho). Use of cultural

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Pediatric emergencies

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code cards could help ER clinicians quickly identify and treat pediatric problems in ways acceptable to parents. Such cards would depict folk illnesses and symptoms of specific ethnic groups, folk remedies used to treat them, and related biomedical conditions, conclude the researchers.

See "The importance of cultural and linguistic issues in the emergency care of children," by Dr. Flores, Jennifer Rabke-Verani, B.A., Whitney Pine, B.A., and Ashu Sabharwal, B.A., in the August 2002 *Pediatric Emergency Care* 18(4), pp. 271-284. ■

Published reports of in-hospital deaths for certain conditions may not accurately portray outcomes of hospital care

In-hospital deaths from five major conditions declined once Cleveland hospitals and physicians began to publicly report in-hospital deaths from those conditions. However, deaths within 30 days of hospital discharge declined for only two of the conditions and increased significantly for another, according to a study supported by the Agency for Healthcare Research and Quality (HS09969). Using in-hospital mortality rates to monitor trends in outcomes for hospitalized patients may lead to misleading conclusions, according to David W. Baker, M.D., M.P.H., of Case Western Reserve University.

Dr. Baker and his colleagues examined mortality trends from 1991-1997 for Medicare patients hospitalized with acute myocardial infarction (AMI, heart attack), congestive heart failure (CHF), gastrointestinal hemorrhage (GIH), chronic obstructive pulmonary disease (COPD), pneumonia, or stroke during the Cleveland Health Quality Choice program. This program shared information on hospitals' mortality rates and length of stay (adjusted for level of patient risk) with coalition members (businesses, hospitals, and physicians) and published it in two data reports per year.

During the study period, risk-adjusted in-hospital mortality declined significantly for all conditions except stroke and GIH, with absolute declines ranging from -2.1 percent for COPD to -4.8 percent for pneumonia. However, mortality rates in the early postdischarge period rose significantly for all conditions except COPD, with increases ranging from 1.4 percent for GIH to 3.8 percent for stroke. As a result, 30-day mortality was fairly flat, and for stroke, the risk-adjusted 30-day mortality rate actually increased by 4.3 percent. The researchers conclude that use of published hospital report cards for hospital profiling remains an unproven strategy for improving outcomes of care for medical conditions.

See "Mortality trends during a program that publicly reported hospital performance," by Dr. Baker, Doug Einstadter, M.D., M.P.H., Charles L. Thomas, B.A., and others, in the October 2002 *Medical Care* 40(10), pp. 879-890. ■

Researchers assess optimal timing of surgery following one or more attacks of uncomplicated diverticulitis

Twenty-five to thirty percent of people who have an attack of diverticulitis will have another one within 5 years. These attacks, caused by inflammation of one or more diverticula (pouchlike herniations through the muscular layer of the colon), cause cramping pain over the colon and fever. Severe attacks can involve an abscess in the tissues surrounding the colon, which can become obstructed, requiring urgent surgery and sometimes colostomy (surgical creation of an opening between the colon and skin surface).

Most authorities recommend prophylactic bowel surgery of the affected areas after two established attacks in order to reduce the risk of further attacks. However, waiting to perform this surgery after a third uncomplicated attack is more cost-effective, concludes a study supported by the Agency for Healthcare Research and Quality (HS10827).

Robert J. Richards, M.D., M.S., of the University of Kansas Medical Center, and James K. Hammitt, Ph.D., of the Harvard School of Public Health, used a decision model to compare the costs and outcomes of performing surgery after one, two, or three uncomplicated diverticulitis attacks

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Uncomplicated diverticulitis

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(resolve with conservative treatment such as antibiotics, bed rest, and intravenous fluids) in a hypothetical group of 60-year-old men and women. They estimated costs from Medicare reimbursement rates and estimated a 5-year recurrence rate of 26 percent based on previous studies.

Surgery following a second attack of diverticulitis did not increase life expectancy or quality-adjusted life years (QALYs), but it did increase costs considerably. On average, waiting until after the third attack cost $2,500, yielding 14 years of life expectancy and 14 QALYs, which was far more cost-saving than the other two options. Only when the yearly risk of having an outpatient recurrence was 42 percent did prophylactic surgery after the first attack exceed option three in terms of life expectancy and QALYs. However, the incremental cost per QALY saved was $4,500,000. The model results did not change until the 5-year risk for the third attack equaled 61 percent. Only at this point, was option 2 (surgery following the second attack) the preferred strategy at a cost of $95,000 per additional QALY saved.

More details are in "Timing of prophylactic surgery in prevention of diverticulitis recurrence: A cost-effectiveness analysis," by Drs. Richards and Hammitt, in the September 2002 *Digestive Diseases and Sciences* 47(9), pp. 1903-1908. ■

Outcomes/Effectiveness Research

Researchers examine age and race differences in treatment of breast cancer

By the late 1990s, breast cancer mortality rates began to decline for the first time in several decades. However, rates failed to decline for older women (age 65 or older), and mortality rates actually increased for older black women. Two studies supported by the Agency for Healthcare Research and Quality (HS08395) and led by Jeanne S. Mandelblatt, M.D., M.P.H., of Georgetown University School of Medicine, recently examined age and race differences in the treatment of breast cancer.

The first study found that older black women are less likely than older white women with localized breast cancer to receive breast conserving surgery (BCS) plus radiation, currently the preferred treatment over mastectomy (complete breast removal). The second study shows that women with localized breast cancer who are older, not functioning as well at the time of surgery, and whose surgeons are cancer specialists are less likely to undergo lymph node biopsy after BCS.

Mandelblatt, J.S., Kerner, J.F., Hadley, J., and others. (2002, October). "Variations in breast carcinoma treatment in older Medicare beneficiaries." ***Cancer*** **95, pp. 1401-1414.**

Older black women are less likely than older white women to receive recommended treatment for local breast cancer, according to this study. The researchers analyzed data from 984 black and 849 white Medicare-insured women 67 years of age or older diagnosed with local breast cancer in 1994 and a subset of 732 surviving women who were interviewed 3 to 4 years after treatment. The researchers used these data to calculate odds of treatment, adjusting for age, other coexisting medical problems, attitudes, geographic region, and area measures of socioeconomic status (SES) and health care resources. Overall, 67 percent of women underwent mastectomy and 33 percent received BCS. Radiation was omitted in one-third of women after BCS.

Black women were older, sicker, diagnosed with stage 2 cancer (vs. stage 1) more often, and lived in areas where the elderly were more impoverished than their white counterparts. Elderly black women were 36 percent more likely than elderly white women to receive mastectomy versus BCS and radiation, even after taking into account poverty and other factors. Also, when they did receive BCS, black women were 48 percent more likely than white women to not have radiotherapy, a practice that would increase their risk of local cancer recurrence, although the absolute number of women affected was small.

The odds of mastectomy were nearly eight times as high and the odds of not having radiation after BCS were over five times as high for women living in areas with the highest quartile of elderly residents living below the poverty level

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Breast cancer treatments

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compared with areas with the lowest quartile of poverty, controlling for other factors. Higher levels of coexisting illness and greater distance from a cancer center increased the odds of having a mastectomy versus BCS plus radiation for blacks but not for whites. Older age was independently associated most strongly with omission of radiation after BCS. Black women interviewed perceived more discrimination based on age and race than white women, and higher perceived age-based discrimination was associated with greater odds of mastectomy and radiation omission after BCS.

Edge, S.B., Gold, K., Gerg, C.D., and others. (2002, May). "Patient and provider characteristics that affect the use of axillary dissection in older women with stage I-II breast carcinoma." ***Cancer*** **94, pp. 2534-2541.**

Surgical biopsy (dissection) of axillary lymph nodes (in the arm pit) is almost always done during mastectomy to rule out lymph node involvement for women with breast cancer. Lymph node biopsy after BCS requires an additional incision and general anesthesia compared with often-used local anesthesia for BCS. Women with local breast cancer who are older, not functioning as well at the time of surgery, and whose surgeons are cancer specialists are less likely to undergo axillary lymph node biopsy after BCS, according to this study.

The investigators examined patient, clinical, and surgeon characteristics associated with the non-use of axillary lymph node biopsy after BCS. They used medical record and survey data for 464 elderly women with stage 1-2 breast cancer who underwent BCS at hospitals in four U.S. regions, as well as survey data from their 158 surgeons.

Most (63 percent) women underwent axillary lymph node biopsy after BCS. Increasing age was strongly associated with decreasing odds of undergoing node biopsy, even after considering other factors. Independent of age and other factors, women in the lowest quartile of physical functioning were 37 percent less likely to undergo node dissection compared with women in the highest quartile. Women who were cared for by surgeons with subspecialty training in surgical oncology were 60 percent less likely to undergo node dissection than women who were cared for by other surgeons (52 vs. 87 percent). Other provider and institutional factors, including geographic location, were not significant.

Although axillary lymph node biopsy after BCS is a reasonable procedure, its omission may represent appropriate management since the procedure can cause substantial problems. For instance, other research has shown that one-third of women who undergo axillary dissection experience long-term burning or prickling sensations, limited range of motion, and permanent lymphedema (puffiness or swelling of the arms), which can interfere with tasks such as self-care, shopping, and cleaning. Recently introduced sentinel lymph node biopsy causes fewer problems than complete dissection. Nevertheless, until more data are available, physicians must help women balance the risks and potential benefits of axillary lymph node dissection in making treatment decisions, suggest the researchers. ■

Prenatal use of erythromycin does not appear to increase the risk of infantile hypertrophic pyloric stenosis

A woman's use of the antibiotic erythromycin during pregnancy does not appear to increase her infant's risk of developing infantile hypertrophic pyloric stenosis (IHPS), a condition that results in gastric outlet obstruction and requires surgery. Erythromycin is believed to interact with motilin receptors in the stomach, present in the fetus beginning at 32 weeks' gestation, inducing strong gastric and pyloric bulb contractions and resulting in an enlarged pylorus (pyloric hypertrophy). Symptoms of IHPS range from projectile vomiting and dehydration to weight loss and electrolyte abnormalities, explains Wayne A. Ray, Ph.D., of the Center for Education and Research in Therapeutics (CERT) at Vanderbilt University.

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS10384), Dr. Ray and his colleagues analyzed births among women enrolled in Tennessee's Medicaid/TennCare from 1985 to 1997 (260,799 mother/infant pairs) and prenatal prescriptions for erythromycin, nonerythromycin macrolides, and other antibiotics from pharmacy files linked with birth certificate files.

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Infantile hypertrophic pyloric stenosis

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A previous study by the same researchers (see October 2002 *Research Activities*, page 3) found an increased risk of IHPS among infants who received erythromycin before 2 weeks of age. The current study found no association with prenatal erythromycin prescriptions and IHPS either after 32 weeks' gestation or at any time during pregnancy. There was an association between maternal prescriptions for nonerythromycin macrolides and IHPS, but the evidence was limited by the small number of affected children. Also, more mothers taking these antibiotics were black and urban and had sexually transmitted diseases which, along with other unmeasured factors, may have affected development of IHPS, note the researchers.

More details are in "Prenatal prescription of macrolide antibiotics and infantile hypertrophic pyloric stenosis," by William O. Cooper, M.D., M.P.H., Dr. Ray, and Marie R. Griffin, M.D., M.P.H., in the July 2002 *Obstetrics & Gynecology* 100(1), pp. 101-106. ■

Task force finds evidence lacking on whether routine screening for prostate cancer improves health outcomes

Although screening for prostate cancer is a common part of a routine checkup for American men, a new finding issued recently by the U.S. Preventive Services Task Force concludes there is insufficient scientific evidence to promote routine screening for all men and inconclusive evidence that early detection improves health outcomes.

The Task Force, an independent panel of experts sponsored by the Agency for Healthcare Research and Quality, reviewed studies on the effect of screening for prostate cancer using prostate-specific antigen (PSA) tests and digital rectal exams to prevent death in men over the age of 40. The Task Force found that although the tests are effective for detecting disease, there is insufficient evidence that they improve long-term health outcomes.

Over their lifetime, 15 percent of U.S. men eventually will be diagnosed with prostate cancer, and three-fourths of these men will be diagnosed after age 65. A man in the United States has a 3 percent chance of dying from prostate cancer. Because prostate cancer usually grows slowly, many men diagnosed with the diseaser will die of other causes, especially men who are older than 65 when they are diagnosed.

If clinicians opt to perform prostate cancer screening for individual patients, the Task Force recommends that they first discuss the uncertain benefits and possible harms. Benefits of the tests may include early detection of cancer, but harms may include false-positive results and unnecessary anxiety, biopsies, and potential complications of treating some early cancers that may never have affected a patient's health or well being. Potential side effects of surgery and radiation treatment include erectile dysfunction, urinary incontinence, and bowel dysfunction.

One part of a National Cancer Institute randomized clinical trial of over 150,000 people—the Prostate, Colorectal, Lung, and Ovarian Screening Trial—is looking at whether screening men with digital rectal examinations plus a PSA test can reduce deaths from prostate cancer. Results from this large trial, which should be available later this decade, could help clarify the benefits of prostate cancer screening.

The Task Force, the 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 grades the strength of the evidence from "A" (strongly recommends) to "D" (recommends against) or "I" (insufficient evidence). The Task Force found insufficient evidence that clinicians should routinely provide prostate cancer screening to those men not at high risk for the disease. In 1996, the Task Force recommended against routine prostate cancer screening for men.

Go to www.ahrq.gov/clinic/3rduspstf/prostatescr/ to access the prostate cancer screening recommendation and materials for clinicians. Previous Task Force recommendations, summaries of the evidence, easy-to-read fact sheets explaining the recommendations, and related materials are available from AHRQ. See the back cover of *Research Activities* for ordering information.* Clinical information is also available from the National Guideline Clearinghouse™ at www.guideline.gov. ■

Researchers assess the performance of radiographic imaging of spinal injuries

Evaluation and treatment of patients with suspected cervical spine injury (CSI), often due to blunt trauma, usually involves radiologic imaging. Plain x-rays of the spine usually are the first step in screening such injuries, but they may miss from 20 to 40 percent of cervical spine fractures. Therefore, computed tomography (CT) or magnetic resonance imaging (MRI) are often used as well.

Three studies supported by the Agency for Healthcare Research and Quality (HS08239) and led by William R. Mower, M.D., Ph.D., of the University of California, Los Angeles School of Medicine, recently examined the use of imaging to diagnose CSI. The first study concluded that MRI is not as reliable as CT for excluding CSIs but is better than CT for identifying soft tissue injuries. The second study found that spinal cord injuries among blunt trauma victims that are not revealed on plain back x-rays are rare and occur predominantly among adults. The third study revealed that geriatric victims of blunt trauma are more likely to suffer CSI than younger victims, and that five clinical criteria can save some of them from unnecessary spinal imaging. All three studies are described here.

Holmes, J.F., Mirvis, S.E., Panacek, E.A., and others. (2002, September). "Variability in computed tomography and magnetic resonance imaging in patients with cervical spine injuries." ***Journal of Trauma*** **53, pp. 524-530.**

Although CT has been the radiographic study of choice after obtaining plain x-rays in CSI patients, some centers have begun using MRI more frequently. However, MRI is not reliable for excluding cervical spine injuries, and fractures in particular, according to this multicenter study. The researchers examined the overall clinical performance of CT and MRI (following simple x-ray of the cervical spine) of CSI patients seen at university- and community-based facilities, trauma and nontrauma centers, and in teaching and nonteaching environments. Overall, 688 patients with 1,302 separate CSIs were enrolled. Following plain cervical spine x-rays, two-thirds of these patients underwent CT and one-fifth had MRI, with few patients having both.

CT better identified bony injuries, but MRI better identified spinal cord and soft tissue injuries. For example, MRI and CT respectively identified the following injuries among 124 MRI and 419 CT patients: osseous fractures (55 vs. 97 percent); spinal cord injury (100 vs. 0 percent); vertebral subluxation/dislocation (86 vs. 86 percent); ligamentous injury (100 vs. 25 percent); and unilateral/bilateral locked facets (78 vs. 97 percent). MRI missed 45 percent of identified osseous fractures, which are clinically unstable, indicating a significant limitation of this imaging technique.

In contrast, all 69 patients identified with spinal cord injury had this injury identified by MRI. This is important in managing patients with CSI, and for this reason, MRI is now considered useful in evaluating select patients with neurologic deficits. Neither MRI or CT can be relied on as the sole test to identify vertebral body subluxation because each technique missed at least 18 percent of these injuries. The researchers suggest that CT be used in patients with cervical spine fractures to identify fractures not seen on plain x-rays and for patients whose plain x-rays are inconclusive or suggestive of bony fracture. The role of MRI is less clear, but it likely is best used in evaluating patients with neurologic deficits.

Hendley, G.W., Wolfson, A.B., Mower, W.R., and others. (2002, July). "Spinal cord injury without radiographic abnormality: Results of the National Emergency X-Radiography Utilization Study in blunt cervical trauma." ***Journal of Trauma Injury, Infection, and Critical Care*** **53, pp. 1-4.**

Spinal cord injuries among blunt trauma victims that are not revealed on plain back x-rays are rare and occur predominantly among adults, concludes this study. The researchers analyzed data from the large prospective National Emergency X-Radiography Utilization Study (NEXUS) of blunt cervical spinal trauma to better characterize spinal cord injury without radiographic abnormality (SCIWORA). The database included adults and children with cervical spine trauma who had received plain neck x-rays at the emergency departments at any of 21 U.S. medical centers. Treating physicians decided what type of imaging the patients received. Radiologists at each site interpreted all radiographic studies.

SCIWORA was defined as spinal cord injury demonstrated by MRI, when a complete, technically adequate plain x-ray series, including at least three views, revealed no injury. Of the 34,069 patients in the NEXUS database, 818 (2.4 percent) had CSI, including 27 (0.08 percent) patients with SCIWORA. Over 3,000 children were enrolled, including 30 with cervical spine injury, but none had SCIWORA. The most common MRI findings among SCIWORA patients were central disc herniation (41 percent), spinal stenosis (41

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Spinal injuries

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percent), and spinal cord edema or contusion (93 percent). Central cord syndrome was described in 10 cases.

The researchers conclude that SCIWORA is an uncommon injury pattern in general, occurring in only 0.08 percent of all patients enrolled. Pediatric cases of SCIWORA were conspicuously absent in this large series. The central cord syndrome was prospectively identified in one-third of SCIWORA patients. The NEXUS criteria for patients at low risk of CSI (had none of the following: altered level of alertness, intoxication, posterior midline cervical spine tenderness, distracting painful injury, or focal neurologic deficit) were highly sensitive in identifying that these high-risk patients required imaging.

Touger, M., Gennis, P., Nathanson, N., and others. (2002, September). "Validity of a decision rule to reduce cervical spine radiography in elderly patients with blunt trauma." ***Annals of Emergency Medicine*** **40(3), pp. 287-293.**

Elderly patients who suffer from blunt cervical trauma are more likely than younger patients to have cervical spine injury (CSI), perhaps due to osteopenia (reduced bone mass), physical disability, or other age-related conditions. Also, they are more likely to suffer CSI from minor falls. However, use of certain clinical criteria can help avoid unnecessary cervical spine imaging in this group, according to this study. The investigators analyzed the use of five clinical criteria (NEXUS decision instrument) to identify risk of CSI among 2,943 elderly blunt trauma victims (8.6 percent of the entire NEXUS sample of blunt trauma patients treated at 21 U.S. medical centers).

NEXUS defined as "low-risk" patients exhibiting none of the following five criteria: altered level of alertness, intoxication, posterior midline cervical spine tenderness, distracting painful injury, and focal neurologic deficit. The rate of CSI was twice as great among geriatric as nongeriatric patients (4.6 vs. 2.2 percent). Odontoid fractures (in the upper spine) were particularly common in geriatric patients, accounting for 20 percent of geriatric fractures compared with 5 percent of nongeriatric fractures.

NEXUS criteria classified 14 percent of geriatric patients and 12.5 percent of non-geriatric patients as low risk for CSI. CSI occurred in only two low-risk geriatric patients, and these patients' injuries met the definition of a clinically insignificant injury. Therefore, the sensitivity of the NEXUS decision instrument for clinically significant injury in the geriatric group was 100 percent. These findings suggest that use of the NEXUS criteria can substantially reduce unnecessary imaging among geriatric victims of blunt trauma. ■

Community radiologists vary widely in how they interpret the same screening mammograms

Community radiologists give widely different interpretations of the same mammogram, according to a study supported by the Agency for Healthcare Research and Quality (HS10591). In fact, younger, more recently trained radiologists had two to four times more false-positive readings (diagnosing possible cancer when there was none) than older radiologists. This finding from a real-world community setting bolsters similar evidence from earlier studies on radiologists' variability using test sets of mammograms.

In the current study, Joann G. Elmore, M.D., M.P.H., of the University of Washington School of Medicine, and her colleagues examined results from 24 community radiologists' interpretations of 8,734 screening mammograms from 2,169 women over an 8-1/2 year period. They found wide variation in how frequently different radiologists noted masses, calcifications, and other suspicious lesions. For instance, one radiologist did not observe any calcifications, while another radiologist noted calcifications in more than 20 percent of the films read.

The radiologists also varied widely in their diagnostic interpretations and recommendations for additional screens and biopsies. The rate of false-positive readings among the radiologists ranged from 2.6 percent to 15.9 percent. However, after adjustment for differences in patient, radiologist, and testing characteristics, the range of false-positive rates narrowed to 3.5 to 7.9 percent.

Women who were younger, were premenopausal, were using hormone replacement therapy at the time of the mammogram, had a family history of breast cancer, or had a previous biopsy were more likely to have a false-positive result. Also, more women who

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Interpreting mammograms

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had mammograms in the 1990s were likely to have a false-positive result than women who had mammograms in the 1980s, perhaps due to the growing fear of malpractice litigation for delayed detection of breast cancer.

More details are in "Screening mammograms by community radiologists: Variability in false-positive rates," by Dr. Elmore, Diana L. Miglioretti, Ph.D., Lisa M. Reisch, Ph.D., and others, in the September 18, 2002 *Journal of the National Cancer Institute* 94(18), pp. 1373-1380. ■

Back pain patients seen by chiropractors receive more information and advice than those seen by physicians

One-third as many patients with low back pain go to chiropractors for relief as to medical doctors, and studies suggest that they are more satisfied with chiropractic care. That's because chiropractors are more likely to explain their treatment for low back pain to their patients and to advise them about self-care once they get home, explains Hal Morgenstern, Ph.D., of the University of California, Los Angeles School of Public Health.

In the study, which was supported by the Agency for Healthcare Research and Quality (HS07755), Dr. Morgenstern and his colleagues randomized 672 patients in a managed care organization with low back pain (with or without leg pain) that had begun more than a year prior to the study, to receive either medical or chiropractic care.

Chiropractic patients reported receiving more self-care advice than did medical patients; they were more likely to receive an explanation of their treatment; and they visited their primary providers more often. The mean care satisfaction score (on a 10-50 scale, from least to most satisfied) after 4 weeks of followup for chiropractic patients was 5.5 points higher than the score for medical patients (36.1 vs. 30.6). Clinical improvement during the first 2 weeks of followup, more and longer visits to the provider, and initial confidence with the assigned treatment were associated with greater satisfaction at 4 weeks.

Receipt of self-care advice and explanation of treatment had strong estimated effects on patient satisfaction in this study. The difference in mean satisfaction scores between chiropractic and medical patients nearly disappeared (to 0.1) for patients who received an explanation of their treatment and at least four items of self-care advice (for example, advice on diet, weight loss, stress reduction, or specific ways to manage back pain such as moist heat or a back brace). These findings are consistent with previous studies that demonstrate associations between the amount of information patients receive and their degree of satisfaction, concludes Dr. Morgenstern.

See "Comparing the satisfaction of low back pain patients randomized to receive medical or chiropractic care: Results from the UCLA low-back pain study," by Ruth P. Hertzman-Miller, M.D., M.P.H., Dr. Morgenstern, Eric L. Hurwitz, D.C., Ph.D., and others, in the October 2002 *American Journal of Public Health* 92(10), pp. 1628-1633. ■

Studies show that early nephrologist referral and frequent visits improve survival among ESRD patients

The annual mortality rate for patients with end-stage renal disease (ESRD) is 20 percent, with a 5-year survival rate of about 29 percent for patients undergoing renal dialysis. The highest risk of dying occurs during the first year of renal dialysis. Although early nephrologist evaluation is associated with better patient outcomes, 25 percent of ESRD patients first see a nephrologist only a month before beginning dialysis.

ESRD patients who consult with a nephrologist more than 3 months before beginning dialysis, and who see that specialist more often, are less likely to die during the first year of dialysis, according to a study supported in part by the Agency for Healthcare Research and Quality (HS09398). A second AHRQ-supported study (HS08365) shows that late evaluation of ESRD patients by a nephrologist is

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ESRD patients

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associated with shorter survival time, as are coexisting disease, black ethnicity, and lack of health insurance. These two studies are described here.

Avorn, J., Bohn, R.L., Levy, E., and others. (2002, September). "Nephrologist care and mortality in patients with chronic renal insufficiency." Archives of *Internal Medicine* 162, pp. 2002-2006.

In this largest study to date of predialysis patients, the researchers identified all patients in the New Jersey Medicaid and Medicare programs who began maintenance dialysis during a 6-year period and had been diagnosed with renal disease more than 1 year prior to dialysis. They documented use of nephrologist services during the year prior to the start of dialysis, along with other clinical and sociodemographic variables and mortality during the first year of dialysis.

Patients who did not see a nephrologist until 90 days or less before they began dialysis (late referral) were 37 percent more likely to die in the first year of dialysis than patients referred to a nephrologist earlier. Similarly, those who visited a nephrologist fewer than five times in the year prior to dialysis were 15 percent more likely to die in the first year of dialysis compared with those who had five or more visits. Socioeconomic status did not appear to affect timing of nephrologist referral, since Medicaid and Medicare patients had no greater risk of death than more affluent patients, after adjusting for other factors.

However, use of nephrologists may correlate with other issues of access and quality of care, which themselves may play an important role in outcomes. For example, patients who are referred to a nephrologist may have a primary care physician who is also more conscientious about managing other aspects of their care, such as hypertension or nutrition. Alternatively, patients referred to nephrologists are more likely to be treated with erythropoietin for anemia, possibly lowering the risk of death, or to have a permanent vascular access created for maintenance dialysis, especially a primary fistula (opening surgically created from one's own skin). This, in turn, may reduce the risk of infections during renal replacement therapy and/or improve dialysis doses. The investigators suggest that these findings be confirmed in younger and less indigent patients.

Kinchen, K.S., Sadler, J., Fink, N., and others. (2002, September). "The timing of specialist evaluation in chronic kidney disease and mortality." *Annals of Internal Medicine* 137, pp. 479-486.

The later a patient with ESRD is evaluated by a nephrologist, the greater the risk of death, especially for black patients and those who have diabetes, conclude these researchers. They prospectively studied 828 patients with new-onset ESRD treated at 81 dialysis facilities throughout the United States and calculated time from first evaluation by a nephrologist to initiation of dialysis. They classified evaluations done less than 4 months prior to dialysis as late, 4 to 12 months prior to dialysis as intermediate, and over 12 months as early. They examined rate of death from initiation of dialysis to an average of 2.2 years later.

After adjustment for potential confounding factors, late evaluation was more common among black men than white men (45 vs. 25 percent), uninsured patients than insured patients (57 vs. 29 percent), and patients with severe rather than mild coexisting disease (35 vs. 23 percent). Compared with patients who were evaluated early, the risk for death was 30 percent and 80 percent greater, respectively, among patients with intermediate or late evaluation, after adjustment for dialysis method, demographic characteristics, and socioeconomic status. After further adjustment for factors such as the presence and severity of coexisting medical problems, patients with intermediate or late referral still had a higher risk of dying than patients referred early.

Late referral could be due to asymptomatic renal failure in ESRD, noncompliance with referrals, lack of access to any medical care, or attitudes of primary care doctors about referral of ESRD patients to specialists. Clinicians need a system to remind them to refer patients to nephrologists when they are at an early stage of chronic renal failure, especially black men, the uninsured, and patients with severe coexisting illness. New practice guidelines for the treatment of chronic kidney disease define at what glomerular filtration rate (an indicator of kidney functioning) a patient should be referred to a nephrologist. ■

Patient satisfaction seems to lead to higher quality of care for depression

In a recent study, depressed patients who reported greater satisfaction with care at 18 months were more likely to receive higher quality care at 24 months. However, the reverse was not true. Higher quality of care at 18 months did not predict higher satisfaction at 24 months, according to the study, which was supported in part by the Agency for Healthcare Research and Quality (HS08349). These findings persisted, even after controlling for patient case mix, recent use of mental health care services, and stability of the doctor-patient relationship.

It may be that satisfied patients receive better technical care 6 months later because they tend to take a more active role in their care and are therefore more likely to stay on medications, show up for therapy, or both. These patients may also feel more confidence and trust in their doctors and, as a result, may be more comfortable disclosing their symptoms and relating their experiences. This gives the doctor more opportunity to deliver good quality care, explain Maria Orlando, Ph.D., and Lisa S. Meredith, Ph.D., of RAND.

The researchers examined the impact of two measures of interpersonal quality of care—care satisfaction and the patient-provider relationship (PPR)—on technical quality of care for depression at 18 and 24 months among 697 adults enrolled in the Partners in Care study. Technical quality of care for depression was evaluated based on appropriate antidepressant medication for at least 2 of the past 6 months or at least eight sessions of depression counseling from a mental health specialist during the past year. Patients who reported having the same doctor as they did 6 months previously tended to rate both satisfaction with care and the PPR higher than those with a different doctor.

More details are in "Understanding the causal relationship between patient-reported interpersonal and technical quality of care for depression," by Drs. Orlando and Meredith, in *Medical Care* 40(8), pp. 696-704, 2002. ■

Primary Care

Many elderly people believe they are unlikely to get the flu and don't realize they need the pneumonia vaccine

Influenza and pneumonia together are the fifth leading cause of death among the U.S. elderly. Even with appropriate treatment, 30 to 40 percent of deaths among the elderly are due to pneumonia. Yet in 1999, only 67 percent of older people received flu shots, and only 54 percent received the one-time pneumococcal vaccine. Rates were even lower for older blacks and Hispanics. Most unvaccinated elderly adults don't know that they need the pneumonia vaccine and feel that they are not at risk for getting the flu, according to a study supported by the Agency for Healthcare Research and Quality (HS09874).

Educational campaigns to increase vaccination rates among the elderly should emphasize the risk and severity of these diseases for older people, vaccine safety, and the existence of a pneumococcal vaccine, suggests Richard K. Zimmerman, M.D., M.P.H., and Tammy A. Santibanez, Ph.D., of the University of Pittsburgh. In 2000, Drs. Zimmerman, Santibanez, and colleagues surveyed a broad spectrum of elderly patients at urban, rural, and suburban sites about their vaccination status and beliefs about vaccination.

Overall, 1,007 people were surveyed. Those who received flu shots were much more likely than those who did not to know the symptoms of the flu. Similarly, 41 percent of elderly people who had been vaccinated against pneumonia could describe at least one classic symptom of the disease, compared with 35 percent of those who had not been vaccinated. Those who thought they could do something to keep from contracting pneumonia were more likely to have been vaccinated against it than those who thought they could not prevent it (77 vs. 54 percent). Of those who did not get flu shots, 19 percent felt they were not likely to contract the

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Vaccination among the elderly

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flu, 14 percent thought it would cause influenza, and 13 percent had a prior adverse reaction to the flu shot. About 34 percent of those who had never received the pneumonia vaccine did not know they needed it, 22 percent believed they were not likely to contract pneumonia, and 18 percent said that their doctor had not recommended it.

See "Knowledge and beliefs about influenza, pneumococcal disease, and immunizations among older people," by Dr. Santibanez, M. Patricia Nowalk, Ph.D., Dr. Zimmerman, and others, in the October 2002 *Journal of the American Geriatrics Society* 50, pp. 1711-1716. ■

Rates of colon cancer screening remain low among patients seen in primary care practices

All men and women aged 50 years and older should be screened for colon cancer, which is the third most common form of cancer in the United States. Yet only about half of primary care patients are screened either with fecal occult blood testing (FOBT, to detect blood in stool) or colon examination by sigmoidoscopy/colonoscopy, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS07373). Researchers from the MEDTEP Research Center at the University of California, San Francisco, retrospectively reviewed the medical records from three primary care practices in an academic medical center to identify colon cancer screening among patients of all races aged 50 to 74 who had at least one visit between mid-1995 and mid-1997.

They defined screening most liberally as FOBT in the past 1 to 2 years, sigmoidoscopy in the previous 5 to 10 years, or colonoscopy in the past 10 years. Of the 6,039 patients who made medical visits during the study period, only 53 percent had undergone some type of colon cancer screening. About 47 percent had received FOBT in the past 2 years, about one-quarter had undergone sigmoidoscopy in either the past 5 or 10 years, and only 3 percent had undergone colonoscopy. Only 14 percent of patients had received FOBT in the past year as well as sigmoidoscopy in the past 5 years (as recommended in most current guidelines).

Women were less likely to be screened than men, and patients who were younger (aged 50 to 54), had been seen less frequently, were uninsured, or did not have managed care insurance were less likely to be screened than others. Patients who had been diagnosed with a gastrointestinal illness or had a family history of colon cancer were more likely to have been screened. However, only a third of high-risk patients with a family history of the disease had undergone any cancer screening. Patients of nurse practitioners were 22 percent less likely to receive FOBT than patients seen by physicians, and patients of residents were 21 percent less likely than those of faculty to have sigmoidoscopy.

More details are in "Colon cancer screening in the ambulatory setting," by Judith M. Walsh, M.D., M.P.H., Samuel F. Posner, Ph.D., and Eliseo J. Perez-Stable, M.D., in *Preventive Medicine* 35, pp. 209-218, 2002. ■

Preventive health care could be improved for patients with chronic kidney disease who are receiving renal dialysis

Patients with chronic kidney disease (CKD) do not have adequate preventive health care screenings prior to beginning renal dialysis. Screening becomes even less adequate after starting dialysis (renal replacement therapy), even though dialysis requires regular and frequent contact with health care professionals. As patients approach and undergo dialysis, the health care they receive revolves predominantly around preparation for and delivery of the dialysis (for example, prevention of anemia), and preventive health care may fall through the cracks.

To avoid this and improve the health of these vulnerable patients, the relationship between the nephrologist (or dialysis facility) and the primary care

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Chronic kidney disease

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provider needs to be highly functional, according to researchers at Brigham and Women's Hospital, Harvard Medical School, and Duke University Medical Center. Their research was supported in part by the Agency for Healthcare Research and Quality (HS09398). They examined the use of five preventive care screenings from 1990 to 1996 among 3,014 New Jersey Medicaid and Medicare patients with CKD at 1 year before and after beginning dialysis. The screening tests included mammography, Pap smears, prostate cancer screening, diabetic eye exams (since many long-term diabetics develop CKD), and glycosylated hemoglobin testing (to measure blood sugar levels among diabetics).

With the exception of diabetic eye exams, 40 percent or fewer patients received recommended preventive care screening. The mammography screening rate for women aged 52 to 69 years was 27 percent before dialysis and 26 percent during the first year of dialysis. For women aged 21 to 64 years, cervical cancer screening was 17 percent the year before dialysis and 21 percent during the first year of dialysis. Prostate cancer screening, diabetic eye exams, and glycosylated hemoglobin testing were performed less often after onset of dialysis compared with the year before (27 vs. 40 percent, 76 vs 81 percent, and 11 vs. 19 percent, respectively).

More details are in "Preventive health care measures before and after start of renal replacement therapy," by Wolfgang C. Winkelmayer, M.D., Sc.D., William Owen Jr., M.D., Robert J. Glynn, Sc.D., and others, in the August 2002 *Journal of General Internal Medicine* 17, pp. 588-595. ■

Practice-based research network for registered nurses provides a forum for studying nursing-related practice problems

Practice-based research networks (PBRNs) are groups of practices that primarily provide patient care but also are affiliated with each other to study the clinical problems and practice patterns within the group's practices. The number of PBRNs is growing in primary care, but these networks are governed by doctors who created them and address research questions that reflect doctors' practices and perspectives.

The establishment of the first PBRN for advanced practice registered nurses (APRNs), who routinely provide primary care for underserved and minority populations, provides a forum for studying practice problems and processes related to nursing care. The development of this PBRN, called APRNet, which is supported in part by the Agency for Healthcare Research and Quality (HS11196), is described in a recent article by Margaret Grey, Dr.P.H., F.A.A.N., C.P.N.P., and colleagues at the Yale University School of Nursing.

The APRNet includes nurse practitioners from five other university schools of nursing and is governed by a planning committee, a volunteer advisory board, and a community advisory board. The first APRN Advisory Board meeting was held in May 2001. APRNet's purpose is to conduct and facilitate practice-based research relevant to APRN primary care practice; develop culturally competent, evidence-based practice models for APRNs; and enhance the translation of research findings into primary care practice.

APRNet has initiated two studies: a modification of the National Ambulatory Medical Care Survey—which is fielded by the Centers for Disease Control and Prevention's National Center for Health Statistics—and a study of data privacy and confidentiality issues of APRNs and their patients. Other studies in the planning stages focus on depression in primary care settings, childhood asthma, and parenting of chronically ill children; each of these topics has clear implications for nursing practice. Ultimately, APRNet will link with other PBRNs to do comparative and collaborative studies.

See "Establishing a practice-based research network of advanced practice registered nurses in southern New England," by Terry Deshefy-Longhi, B.S.N., M.S., Martha K. Swartz, M.S., R.N.C.S., P.N.P., and Dr. Grey, in the May 2002 *Nursing Outlook* 50, pp. 127-132. ■

HIV studies examine impact of opportunistic infections, HIV load, and other factors on death and life quality

Both HIV load (amount of HIV RNA per unit of blood) and CD4 lymphocyte cell counts are important predictors of HIV disease progression and death. However, independent of these, opportunistic infections (infections that attack people with weakened immune systems) have a major impact on HIV-related deaths, according to a study supported by the Agency for Healthcare Research and Quality (HS07317). A second AHRQ-supported study (National Research Service Award training grant T32 HS00060) reveals that improving patients' CD4 counts is likely to improve their quality of life; lowering HIV load below detectable levels may improve physical functioning; and highly active antiretroviral therapy (HAART) negatively affects physical functioning. Both studies are summarized here.

Seage, GR., Losina, E., Goldie, S.J., and others. (2002, August). "The relationship of preventable opportunistic infections, HIV-1 RNA, and CD4 cell counts to chronic mortality." ***Journal of Acquired Immune Deficiency Syndromes*** **30, pp. 421-428.**

This study used data from the Multicenter AIDS Cohort Study (MACS), which contains interview and medical record data from 1984 through 1994, to determine the relationship between a history of preventable opportunistic infection (POI) and chronic mortality (death more than 30 days after acute infection). The researchers controlled for HIV-1 RNA, absolute CD4 cell counts, use of antiretroviral therapy, and age. The study sample consisted of 2,193 homosexual adult men from four U.S. cities who were HIV-infected but asymptomatic. They were followed for nearly 8 years. People with a history of POI (for example, *Pneumocystis carinii* pneumonia) were over 28 times more likely to die 30 days or more after the acute infection compared with those without such a history (mortality rate of 66.7 vs. 2.3 per 100 person-years).

After adjustment for CD4 count and maximum HIV viral load, people with a history of POI still had a risk of death that was seven times as high as those without such a history. CD4 count was also an independent risk factor for chronic mortality. In the absence of a history of POI, those with CD4 cell counts less than 50 had a risk of death that was nearly nine times as high as it was for those with CD4 counts higher than 200. Maximum HIV viral load had no independent effect on chronic mortality, but unlike CD4 counts, viral load was not measured every 6 months.

Older men had a 34 percent higher risk of death within 30 days, whereas the risk of death was 63 percent lower for those who used antiretroviral therapy. These results support the idea that HIV may cause mortality through a number of different pathways.

Gill, C.J., Griffith, JL, Jacobson, D., and others. (2002, August). "Relationship of HIV viral loads, CD4 counts, and HAART use to health-related quality of life." ***Journal of Acquired Immune Deficiency Syndromes*** **30, pp. 485-492.**

HIV viral load, CD4 count, and HAART have different effects on health-related quality of life (HRQL) among patients with HIV disease, finds this study. The investigators analyzed the independent effect of each of these three factors on HRQL for 513 HIV-infected people in four domains of HRQL: physical functioning (PF, ranging from rigorous activities like running to carrying groceries, and walking a block); role function (RF, whether health kept them from working at a job, going to school, or doing work around the house in the prior 4 weeks); energy level (EL, fatigue that kept them from doing things they wanted, for example); and health perceptions (HP) after adjustment for other factors affecting HRQL.

The mean age of study participants was 40 years, 26 percent were female, 38 percent were minority, 57 percent were gay or bisexual, 33 percent had used injectable drugs, and 44 percent were using HAART. Mean HRQL scores ranged from 55.5 for EL to 75.5 for RF out of 100 points. Compared with patients with CD4 counts over 500, patients with CD4 counts less than 200 had lower PF (-8.8 points), RF (-9.3 points), and HP (-7.8 points). Patients with detectable HIV loads had lower PF scores (-7.7 points) than those with undetectable viral load. A PF score difference of -7.7 and -8.8 is of slightly lower magnitude than the impact of having diarrhea and clinical depression simultaneously

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HIV studies

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(-11.1 points) but of larger magnitude than either disease alone.

After adjusting for viral load and CD4 counts, HAART use was associated with lower PF scores (-5.4 points), probably due to disagreeable side effects, which is comparable in impact to having either diarrhea or clinical depression. Efforts to improve patients' CD4 counts are likely to also improve HRQL. Lowering viral loads may improve physical functioning but only if viral loads are suppressed to undetectable levels. Finally, the adverse effects of HAART on PF are likely to be outweighed by its positive effects on lowering viral load and increasing CD4 counts, conclude the researchers. ■

Patient Safety/Quality of Care

Physicians' involvement in patient safety and quality of care may be pivotal to maintaining medicine's credibility

The involvement of physicians in efforts to improve patient safety and care quality is essential to assure success and to maintain medicine's credibility, according to participants at the September 2001 conference, "The Role and Responsibility of Physicians to Improve patient Safety." Unfortunately, many doctors have not yet embraced quality improvement efforts. Furthermore, some physicians resist being measured and may hide problems out of fear of litigation, explains Carolyn M. Clancy, M.D., Director of the Agency for Healthcare Research and Quality, in a recent article.

Dr. Clancy and her colleagues—including the late John M. Eisenberg, M.D., the former director of AHRQ–cite several opportunities to encourage doctors to take a leadership role in quality improvement and patient safety. These opportunities were identified during discussions at the conference, which was sponsored by AHRQ and the ABIM Foundation. Conference participants included a broad array of stakeholders in health care delivery. Examples identified during the conference include:

- Integrate assessments of doctors' clinical performance into the board certification and credentialing process.
- Identify which incentives would encourage doctors to improve patient safety.
- Identify safety standards in office settings, not just hospitals.
- Develop the business case for identifying which interventions in outpatient care are most effective and for which patients in order to make practical improvements in office-based practice.
- Identify and train physician leaders to influence best practices among other doctors.
- Involve local groups in measuring, monitoring, and improving quality by engaging the existing grassroots infrastructure.
- Develop a common language and measures for safety.
- Create safety-related awards for individuals, groups, and societies.
- Put patient safety information in the public domain without compromising privacy or promoting litigation.

The authors note that even modest change can lead to substantial improvement. They conclude, however, that much greater input is needed from medical societies and professional standard-setting bodies.

More details are in "When is 'good enough'? The role and responsibility of physicians to improve patient safety," by Leslie D. Goode, M.H.S., Dr. Clancy, Harry R. Kimball, M.D., and others, in the October 2002 *Academic Medicine* 77(10), pp. 947-952. Reprints (AHRQ Publication No. 03-R005) are available from AHRQ.** ■

Only one-fourth of family doctors believe they are prepared to respond to a bioterrorist attack

Primary care doctors will be among the first responders in the event of a bioterrorist attack involving agents such as anthrax, smallpox, or ebola virus. They must be able to diagnose bioterrorism-related infections, whose symptoms often mimic those of common conditions like the flu, and activate the public health system to respond to the attack. However, only one-fourth (26 percent) of family doctors report knowing what to do as a physician during a bioterrorist attack, according to an October 2001 national survey of 976 family doctors who were randomly selected from the American Academy of Family Physicians' membership directory.

Family doctors who had received bioterrorism preparedness training were nearly three times as likely as other doctors to know how to respond to a bioterrorist attack (55 vs. 20 percent), and 93 percent said they would like to have such training. Primary care doctors should seek training in this area, suggest researchers at the Center for Primary Care Research, Agency for Healthcare Research and Quality, Frederick M. Chen, M.D., M.P.H., Kenneth S. Fink, M.D., M.G.A., M.P.H., and Helen Burstin, M.D., M.P.H., and their colleagues at the American Academy of Family Physicians National Network for Family Practice and Primary Care Research (AHRQ grant HS11182).

Nearly all (95 percent) of the 614 doctors who responded to the survey agreed that a bioterrorist attack was a real threat within the United States. However, only 24 percent believed they could recognize signs and symptoms of a bioterrorism-related illness in their patients, and 38 percent rated their current knowledge of the diagnosis and management of bioterrorism-related illness as poor. Only 27 percent of doctors surveyed believed that the U.S. health care system could respond effectively to such an attack, and just 17 percent thought that their local hospitals and medical communities could respond effectively. About half (56 percent) knew how to get information if they suspected an attack in their community, which is the greatest predictor of being able to diagnose and report cases.

See "On the front lines: Family physicians' preparedness for bioterrorism," by Dr. Chen, John Hickner, M.D., M.S., Dr. Fink, and others, in the September 2002 *Journal of Family Practice* 51(9), pp. 745-750. Reprints (AHRQ Publication No. 02-R091) are available from AHRQ.** ■

Researchers calculate staff needed for antibiotic distribution centers after bioterrorism-related disease exposure

A large-scale aerosol release of a biological agent such as anthrax, plague, or Q-fever could infect more than 250,000 people downwind and would require immediate large-scale prophylaxis campaigns to prevent massive loss of life. States are now required to develop local mass prophylaxis plans to receive Federal funding for bioterrorism response, and little research has been done to assist local planners in these efforts.

A new computer model simulating such a bioterrorism event calculates that for an antibiotic distribution center in affected areas to process about 1,000 people per hour, it would require 93 staff for a low-prevalence scenario to 111 staff for a high–prevalence scenario. This staffing would avoid large lines at entry screening, triage, medical evaluation, and drug distribution stations, explains Nathaniel Hupert, M.D., M.P.H., of the Department of Public Health, Weill Medical College of Cornell University.

Dr. Hupert and his colleagues used discrete-event computer modeling to simulate time-dependent processes in which patients interact with resources such as beds or nurses in the distribution centers set up throughout affected communities. Process times were based on reports of mass prophylaxis and emergency medical care during real epidemics or simulated terrorist attacks. The researchers modeled low (1 percent), medium (10 percent), and high (20 percent) prevalence rates of attack-related illness. Based on evidence from

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Bioterrorism-related disease exposure

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prior anthrax cases, they assumed that 25 percent of symptomatic cases in each scenario would be critically ill on arrival to the distribution center, another 25 percent would be moderately ill, and the remaining 50 percent only mildly ill.

The researchers also assumed that 10 percent of the noninfected population would either be "worried well" or have non-bioterrorism-related illness warranting onsite evaluation. For the purposes of this model, they did not consider other critical logistical components of response plans such as drug re-supply, crowd control, or criminal investigation activity taking place inside the distribution center, important parts of the public health response to the 2001 anthrax attacks. Their research was supported in part by the Agency for Healthcare Research and Quality (contract 290-00-0013).

See "Modeling the public health response to bioterrorism: Using discrete event simulation to design antibiotic distribution centers," by Dr. Hupert, Alvin I. Mushlin, M.D., Sc.M., and Mark A. Callahan, M.D., in the September/October 2002 *Medical Decision Making* 22(Suppl.), pp. S17-S25. ■

Experts identify the challenges facing the health care community in becoming better prepared for biological terrorism

The health care community must take action along several fronts to become better prepared for biological terrorism from anthrax, smallpox, and other agents. Over time, the United States will move away from a HAZMAT/first responder model of bioterrorism to an emergency department/hospital provider model. There will be less emphasis on decontamination and more emphasis on diagnosis, according to Jessica Jones, M.D., of the University of Alabama at Birmingham.

In a recent article, Dr. Jones and her colleagues at UAB, The Southern Research Institute, and the U.S. Army Medical Research Institute of Infectious Diseases describe our current state of readiness for biological terrorism, as well as some of the challenges that lie ahead. Their work was supported by the Agency for Healthcare Research and Quality (contract 290-00-0022).

For instance, surveillance will be improved with development of nationally computerized databases such as LEADERS (Lightweight Epidemiological Advanced Detection Emergency Response System). LEADERS collects data via the Internet or a faxed sheet listing the types of syndromes seen in U.S. emergency departments (EDs). Results are compiled every 12 hours and distributed to ED workers and public health authorities who generate alerts when unusual patterns appear.

Handheld, lightweight, fully automated devices that can detect biological agents in the environment in less than half an hour are now in the final stages of development. However, the technical difficulty of environmental detection of biological agents makes early clinical recognition more effective at present. That will require savvy laboratory workers and clinicians, who are trained to recognize laboratory or clinical indications of bioterrorism-related illness.

A national Laboratory Response Network is being developed by the Centers for Disease Control and Prevention to provide reagents and training, along with a system of rapid regional laboratory referral of suspicious specimens. Various medical groups are developing programs to train physicians and emergency medical personnel for bioterrorism crises.

Also being studied are new classes of broad spectrum antibiotics to treat bioterrorism-related illness and ways to diagnose such infections before symptoms develop. For example, gene "chips" are being developed that might make it possible to conduct a broad range of diagnostic tests from a single blood sample. In 1999, $51 million was appropriated by Congress to the Department of Health and Human Services to develop vaccine and drug stockpiles.

For more information, see "Future challenges in preparing for and responding to bioterrorism events," by Dr. Jones, Thomas E. Terndrup, M.D., F.A.C.E.P., David R. Franz, D.V.M., Ph.D., and Edward M. Eitzen Jr., M.D., M.P.H., F.A.C.E.P., in the May 2002 *Emergency Medicine Clinics of North America* 20, pp. 501-524. ■

Managed care's selective contracting with physicians slowed growth in physician fees during the early 1990s

Between 1980 and 1990, during the fee-for-service (FFS) insurance era, physician fees rose 110 percent. One strategy that managed care organizations (MCOs) use to reduce the rate of growth in physician fees is selective contracting with a network of providers who agree to lower their prices in order to gain access to the potential revenue of people insured by the MCO. In turn, the MCOs provide their beneficiaries with financial incentives, such as decreased copayments, if they use network providers. This competitive pressure prompted physicians to reduce the fees they negotiated with MCOs during the 1990-1992 period, according to a study supported by the Agency for Healthcare Research and Quality (HS07068).

Although managed care was successful in providing some market discipline to physician pricing at the time, today several States require MCOs to include "any willing provider" in their provider network. This is likely to undermine the threat of network exclusion and associated loss of patients raised by selective contracting, notes study author, Jack Zwanziger, Ph.D., of the University of Illinois at Chicago. He analyzed several national data sets, including a survey of MCO fee schedules, to determine the impact of several market factors on negotiated physician fees during the 1990-1992 period.

The surveyed MCOs from diverse geographic areas did not abolish the historical pattern of physician fees, but they did modify relative fees to align them more closely with their relative resource use. The most influential factors in fee negotiations were physician supply and the proportion of the area's population enrolled in managed care plans. The larger the MCO presence in the area, the lower the physician fees were. Also, fees were lower in areas with more physicians per capita. The number of physicians in a plan's local provider network had almost no effect on fees.

More details are in "Physician fees and managed care plans," by Dr. Zwanziger, in the Summer 2002 *Inquiry* 39, pp. 184-193. ■

Provider-sponsored managed care organizations work best when community leaders and health professionals are involved

One little-studied form of managed care is provider-sponsored managed care organizations (PSOs). They can be fully owned and operated by hospital health maintenance organizations (HMOs), vertically integrated networks of both physicians and hospitals, or by a physician-only network. PSOs are thought to improve hospital finances by decreasing patient management and utilization costs. PSOs may also be able to restore the public's trust in managed care by responding to community health needs, depending on the makeup of the hospital board.

The likelihood of a hospital owning any form of managed care organization (MCO) increases with the number of community leaders and health professionals on its board. The number of business leaders on the board had no impact on the likelihood of such arrangements, according to a study supported by the Agency for Healthcare Research and Quality (HS08610).

Community leaders on the board are concerned primarily with ensuring accessible and high-quality care in the community. They place a lower priority on the financial effect of their decisions as long as the hospital remains solvent. Health professionals on hospital boards most likely are favorably inclined toward involvement with PSOs because they provide a more flexible working environment for health professionals than insurance-based MCOs. PSOs also allow local health professionals to benefit financially from any increased revenues resulting from improved hospital operations.

Hospital managers should consider their hospital board's composition and the interests of the populations they represent before actively pursuing a strategic action, suggests the study's lead author, Shadi S. Saleh, Ph.D., of the State University of New York at Albany. Dr. Saleh and colleagues examined the effect of the composition of rural hospital governing boards on hospitals' involvement in provider-sponsored MCOs by examining responses to a 1997 survey sent to chief executive officers of 140 rural hospitals in Iowa and Nebraska.

See "The effect of governing board composition on rural hospitals' involvement in provider-sponsored managed care organizations," by Dr. Saleh, Thomas Vaughn, Ph.D., and James E. Rohrer, Ph.D., in the September 2002 *Journal of Healthcare Management* 47(5), pp. 321-333. ■

Impact of health services research: Moving beyond serendipity

A major focus of health care research is understanding how research leads to improvements in health care delivery and health policy. A clear challenge for the field is identifying how research findings are used and implemented. Growing interest in the use of knowledge and knowledge transfer clearly underscores the importance of learning which strategies are most likely to lead to discernible impact.

The Impact Case Studies Program of the Agency for Healthcare Research and Quality, located within AHRQ's Office of Health Care Information (OHCI), systematically tracks, updates, documents, and explains how AHRQ-supported research affects health care. In a recent article, Carolyn M. Clancy, M.D., Acting Director of AHRQ, and Lisa Simpson, M.B., B.Ch., M.P.H., Deputy Director of AHRQ, describe the program.

Drs. Clancy and Simpson note that the challenge for health services researchers is to identify beforehand—when they are planning their research—who will use the findings, instead of waiting to see after the research is completed who is using it. They advise investigators to ask potential users what they want to know, partner with them during the research design phase, clearly communicate the findings, and let funders know who is using the research and how they are using it.

Drs. Clancy and Simpson encourage researchers to send impact case study leads to AHRQ's public affairs office at kmurray@ahrq.gov.

For more information, including several examples of AHRQ research in action, see "Looking forward to impact: Moving beyond serendipity," by Drs. Clancy and Simpson, in the August 2002 *Health Services Research* 37(4), pp. xiv-xxii. Reprints (AHRQ Publication No. 02-R093) are available from AHRQ.** ■

AHRQ encourages nurses to become involved in health services research

Despite nurses' strong presence in health care, there is very limited understanding of the impact of nursing on patient outcomes. The paucity of this research has propelled the Agency for Healthcare Research and Quality to increase its focus on nursing-related health services research and to maintain a strong nursing presence within the Agency. Several of AHRQ's priority areas—disease prevention, health promotion, primary care, quality of care, service delivery, and patient safety—are particularly relevant to nurse researchers. Nursing research is crucial to inform health care delivery and policy, according to Heddy Hubbard, M.P.H., R.N., AHRQ's Chief Nurse, Carolyn M. Clancy, M.D., Acting Director of AHRQ, and their colleagues in AHRQ's Center for Outcomes and Effectiveness Research.

The number of grants submitted to AHRQ by nurses increased from 51 in 1999 to 70 in 2001, and the Agency would like to continue to encourage nurse researchers to consider AHRQ as a future funding source. This will permit further development of a national foundation of expertise in nursing-related health services research. Nurses can submit applications for investigator-initiated awards, evidence-based practice center research, translating research into practice (TRIP) projects, small pilot grants, and other programs. AHRQ encourage nurses to visit the Agency's Web site at www.ahrq.gov for information on grant programs, funding opportunities, new initiatives, job vacancies, training opportunities, and the nursing page.

More details are in "Outcomes and effectiveness research: Capacity building for nurse researchers at the Agency for Healthcare Research and Quality," by Ms. Hubbard, Patricia Hinton Walker, Ph.D., R.N., F.A.A.N., Dr. Clancy, and Daniel Stryer, M.D., in *Outcomes Management* 6(4), pp. 146-151, 2002. Reprints (AHRQ Publication No. 03-R003) are available from AHRQ.** ■

Correction

The October 2002 issue of *Research Activities*, page 26, announced a number of grant final reports newly available from the National Technical Information Service. An incorrect NTIS accession number was given for one of those reports, and NTIS had an incorrect title in their database for the same report. The correct information is:

Health Values in Patients with Chronic Hepatitis C Infection. **Kenneth E. Sherman, Ph.D., University of Cincinnati, Cincinnati, OH. AHRQ grant HS10366, project period 9/30/99-3/31/01. (Abstract, executive summary, and final report, NTIS accession no. PB2002-107325; 14 pp, $23.00 paper, $12.00 microfiche)*****

See the back cover of *Research Activities* for ordering information. We apologize for any inconvenience this error may have caused you. ■

Research Briefs

Atkins, D. (2002). "Principles of preventive care." *Primary Care Clinical Office Practice* 29, pp. 475-486.

This review explores how clinicians can find recommendations on clinical preventive services that are up-to-date and evidence based, understand reasons for conflicting recommendations, and identify other issues that may affect the appropriateness of specific recommendations for their particular practice. The author, David Atkins, M.D., M.P.H., manages the activities of the U.S. Preventive Services Task force on behalf of the Agency for Healthcare Research and Quality. He suggests that clinicians identify a source of prevention recommendations that is evidence-based and has a perspective that agrees with their practice. They should periodically review current recommendations to keep up with changing science. When a new screening test is introduced, they should ask whether it has been proven to improve important health outcomes or simply been shown to detect more disease. Clinicians should acknowledge the role of the patient in decisions in areas of uncertainty, approach prevention as a package of important services, and examine how well they are delivering high priority services. Reprints (AHRQ Publication No. 03-R002) are available from AHRQ.**

Beckham, J.C., Calhoun, P.S., Glenn, D.M., and Barefoot, J.C. (2002). "Posttraumatic stress disorder, hostility, and health in women: A review of current research." (National Research Service Award training grant T32 HS00079). *Annals of Behavioral Medicine* 24(3), pp. 219-228.

There is increasing evidence that both posttraumatic stress disorder (PTSD) and hostility adversely affect health, but most of this research has been done on men. The impact of PTSD and hostility on the health of women is less clear. This study examines the current literature on PTSD, hostility, and health in women and discusses possible mechanisms underlying the relationship between PTSD and hostility on health outcomes in the context of a theoretical model. Hostile individuals tend to have greater levels of interpersonal conflict and lower levels of social support, more frequent and severe daily stressors, and greater levels of major negative life events. Studies show that among women, hostility is a risk factor for hypertension, coronary heart disease, and heart attack. However, the mechanisms responsible for this relationship are unclear. Similarly, the few studies of PTSD and health in women suggest that PTSD is associated with increased health problems, including arthritis, bronchitis, migraines, and gynecological complaints. However, more rigorous, focused research is lacking.

Bowers, M.R., and Kiefe, C.I. (2002, July). "Measuring health care quality: Comparing and contrasting the medical and marketing approaches." (AHRQ grants HS09446 and HS08843). *American Journal of Medical Quality* 17(4), pp. 136-144.

Clinicians typically measure care quality by medical outcomes such as improved patient mobility after surgery. Health care administrators often use managerial input measures such as the average number of nursing hours required for an outpatient surgery. Governments, insurers, and other payers may measure quality as the reduction of some disease in a given population. Patients tend to measure quality by personal outcomes or interactions with providers. These researchers summarized definitions and basic conceptual approaches to care quality in both health care administration and marketing research and then compared them on several attributes: basic goals, sources of measurement,

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role of patient perceptions, role of health care personnel, and need for risk adjustment. They developed a conceptual model combining the two approaches. They conclude that both clinicians and administrators could benefit from broader outcome measures. Patient satisfaction deserves more attention from medical researchers, whereas marketing approaches should go beyond patient satisfaction as the only outcome of interest.

Friedman, D.S., Tielsch, J.M., Vitale, S., and others. (2002). "VF-14 item specific responses in patients undergoing first eye cataract surgery: Can the length of the VF-14 be reduced?" (AHRQ grant HS06280). *British Journal of Ophthalmology* 86, pp. 885-891.

The 14-item Visual Function questionnaire (VF-14) is designed to measure the impact of impaired vision on a patient's ability to perform daily tasks such as sewing, reading, or watching television. These authors sought to determine whether the VF-14 could be reduced in length without compromising its ability to act as an index of cataract-related visual impairment. To do this, the researchers analyzed the item-specific responses to the VF-14 before (771 patients) and 4 months after (552 patients) cataract surgery in one eye among patients enrolled in the Cataract Patient Outcomes Research Team (PORT) study. They found that 10 items correlated moderately with change in vision trouble, and 11 correlated moderately with change in vision satisfaction at 4 months after cataract surgery. Three items (recognizing people, cooking, and reading large print) were less responsive to cataract extraction and were more strongly associated with other coexisting ocular problems. The limited time saved by the VF-11 does not justify altering the already validated VF-14, conclude the researchers.

Fuhrer, R., Shipley, J.J., Chastang, J.F., and others. (2002, August). "Socioeconomic position, health, and possible explanations: A tale of two cohorts." (AHRQ grant HS06516). *American Journal of Public Health* 92(8), pp. 1290-1294.

Some common susceptibility may underlie the social gradient in health and disease. This may explain why inequalities occur in cultures with different patterns of morbidity and mortality, concludes this study. The researchers examined whether the social gradient for measures of morbidity was comparable in English and French public employees and investigated risk factors that may explain this gradient. They studied 5,825 London civil servants and 6,818 French office-based employees using two health outcomes: long spells of sickness absence during a 4-year followup and self-reported health. Health behaviors showed different relations with socioeconomic position in the two groups. Psychosocial work characteristics showed strong gradients in both groups. In the presence of a similar social gradient in ill health in two culturally different groups, the different distributions of smoking, alcohol intake, and fruit and vegetable intake make it unlikely that these are major explanatory variables for the social gradient. On the contrary, the consistency of the gradient in early childhood environment factors and adult psychosocial work characteristics makes it plausible that these factors have universal importance in explaining social gradients in poor health.

Ginsburg, K.R., Forke, C.M., Cnaan, A., and Slab, G.B. (2002, August). "Important health provider characteristics: The perspective of urban ninth graders." (AHRQ grant HS07876). *Developmental and Behavioral Pediatrics* 23, pp. 237-243.

The researchers surveyed 2,602 urban, multiethnic 9th graders from 39 Philadelphia high schools and asked students to rate each of 36 provider characteristics on a 5-point scale ranging from 1 (not at all important to me) to 5 (extremely important to me). Four underlying factors accounted for 52 percent of the variance in item rating: interpersonal relationship, physical safety, emotional safety, and counseling ability. The interpersonal relationship factor included such descriptions as someone who is honest, trustworthy, and helpful; someone who understands teenagers and spends time with them; and someone who is friendly and nice. It was the strongest factor in the model, followed by physical safety and emotional safety. The fourth most important factor was the provider's counseling ability. The researchers conclude that communication with adolescent patients should be a standard component of health care training.

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

State Medicaid programs that enroll blind and disabled Supplemental Security Income (SSI) beneficiaries in Medicaid managed care (adverse risk selection) often need more money to pay for the high medical needs of these patients than current reimbursements provide. SSI beneficiaries typically have a wide variety of chronic conditions and often need ongoing management by specialists and long-term social support services to address functional limitations. These researchers assessed the extent of adverse risk selection among managed care plans for SSI beneficiaries over the first 3 years of Tennessee's Medicaid managed care program, TennCare. Using claims data containing fee-for-

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service expenditures prior to enrollment in managed care, they found substantial evidence of persistent adverse risk selection among plans. They conclude that States may need payment systems that match plan compensation with the expected needs of plan enrollees, so that plans have incentives to serve SSI enrollees who have greater needs. Reprints (AHRQ Publication No. 02-R092) are available from AHRQ.**

Kilbourne, A.M., Asch, S., Andersen, R.M., and others. (2002). "Development and application of a method to assess timeliness of medical care for HIV symptoms." (AHRQ grant HS08578). *Health Services & Outcomes Research Methodology* 2, pp. 101-115.

Standards of care are needed that identify inappropriate delays in receiving care for serious symptoms of infection with the human immunodeficiency virus (HIV). Toward that end, these researchers evaluated the reliability and construct validity of provider-based standards for timely care for HIV symptoms and applied these standards to data from the AHRQ-sponsored HIV Cost and Services Utilization Study (HCSUS), a national probability sample of HIV-infected people in care. HIV physicians estimated the appropriate time to care for headache, cough, diarrhea, or weight loss for patients with HIV disease. They defined timely care as receiving care by the mean provider-specified acceptable number of days to care by specific CD4 count, compared with receiving care after the mean days to care. Up to 70 percent of HIV-infected individuals from the HCSUS sample did not receive timely care for their most bothersome symptom. Even though physicians rated patients with lower CD4 counts (indicating weaker immune systems) as requiring care within a shorter period of time, they were no more likely or less likely to receive timely care than others.

LaPointe, N.M., Kramer, J.M., Weinfurt, K.P., and Califf, R.M. (2002). "Practitioner acceptance of the dofetilide risk-management program." (AHRQ grant HS10548). *Pharmacotherapy* 22(8), pp. 1041-1046.

Dofetilide was approved in the United States in October 1999 as an antiarrhythmic agent used to treat atrial fibrillation or heart flutter. However, it can cause a dose- and concentration-dependent increase in the QT interval that can lead to torsades de pointes, which is potentially fatal. The FDA requires practitioners to complete an education program before they prescribe dofetilide, in part because it found that post-marketing labeling changes and warning letters to health care practitioners were ineffective in changing prescribing patterns and reducing the risk of torsades de pointes. These researchers assessed the opinions and knowledge retention of 91 practitioners at a large academic medical center after participation in the risk management program. Practitioners agreed the program was necessary but were undecided about whether the prescribing guidelines were easily understood or implemented. Identification of seven drugs that should not be taken with dofetilide differed significantly across groups (mean accuracy score was 41 percent for nurses, 80 percent for pharmacists, and 86 percent for physicians).

Radwin, L. (2000). "Refining the quality health outcomes model: Relations among client characteristics and other components. (AHRQ grant K08 HS11625). *Nursing Outlook* 50, pp. 168-169.

The Quality Health Outcomes Model (QHOM) is a conceptual framework that was developed by the American Academy of Nursing Expert Panel on Quality Health Care to guide health services research. The model focuses on reciprocal relations among interventions, health care system characteristics, client characteristics, and outcomes. In the QHOM, interventions do not act directly on outcomes but rather are affected by and affect both client characteristics and health care system characteristics in producing client outcomes. However, the authors of this commentary propose that, although client state characteristics remain reciprocally related to the other QHOM components, client trait characteristics can only be unidirectionally related to those components. For example, the client's age will typically influence the selection of patient teaching strategies (interventions) or the unit to which the patient is assigned when admitted to a hospital (health care system characteristic). But, of course, neither teaching strategies nor unit assignment will affect the patient's age.

Riddle, D.L., Freburger, J.K., and the North American Orthopaedic Rehabilitation Research Network. (2002, August). "Evaluation of the presence of sacroiliac joint region dysfunction using a combination of tests: A multicenter intertester reliability study."(National Research Service Award training grant T32 HS00032). *Physical Therapy* 82(8), pp. 772-781.

These investigators examined the intertester reliability of assessments of sacroiliac joint (SIJ) region dysfunction (pain near the joint, presumably due to misalignment or abnormal joint movement) based on a composite of four tests of pelvic symmetry or SIJ movement, which are advocated for identifying people with this problem. They used the four tests on 65 patients with low back pain and unilateral buttock pain who were examined by one of 34 randomly assigned physical therapists. For the composite test results, percentages of agreement ranged from 60 to 69 percent. The

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researchers conclude that the reliability of measurements obtained with the four tests appears to be too low for clinical use. They suggest that the four tests not be used to examine patients suspected of having SIJ region dysfunction, although the role of therapist training in use of the procedures is unclear.

Salomon, J.A., Weinstein, M.C., Hammitt, J.K., and Goldie, S.J. (2002). "Empirically calibrated model of hepatitis C virus infection in the United States." (National Research Service Award training grant T32 HS00020). ***American Journal of Epidemiology*** **156(8), pp. 761-773.**

Hepatitis C virus (HCV) is the most common blood-borne infection in the United States. It is not clear what the risks are of HCV leading to advanced liver disease, and treatments are effective in only 30 to 60 percent of patients. These authors developed a comprehensive epidemiologic model of HCV infection in the United States in order to gain insights into key uncertainties around the natural history of HCV and to improve the basis for projecting the future course of the epidemic. They reviewed the published literature to define plausible ranges around model parameters and used goodness-of-fit criteria to identify the range of parameter values that were consistent with available epidemiologic data on infection prevalence and mortality from liver cancer. Results indicated that rates of HCV progression to advanced liver disease may be lower than previously assumed. The authors also found that a wide range of plausible assumptions about heterogeneity in these rates, beyond that explained by age and sex, was consistent with observed epidemiologic trends.

Schneeweiss, S., Maclure, M., Soumerai, S.B., and others. (2002). "Quasi-experimental longitudinal designs to evaluate drug benefit policy changes with low policy compliance." (AHRQ grants HS09855 and HS10881). ***Journal of Clinical Epidemiology*** **55, pp. 833-841.**

A causal relation between drug benefit policy change and an increase in adverse outcomes can be tested by comparing the experience of a group of patients affected by the policy versus the (counterfactual) experience of the same patients if the policy had not been implemented. Quasiexperimental longitudinal designs with repeated measures can provide valid observational estimates of the counterfactual outcomes by comparing extrapolated prepolicy outcome trends with the observed postpolicy outcomes. If compliance with a policy is low, results may be biased toward the null (no policy effect), but a subgroup analysis of those who comply may be biased by nonignorable treatment selection. Using the example of reference drug pricing in British Columbia, these authors discuss assumptions for causal interpretations of such analyses and provide supplementary analyses to assess and improve the validity of findings.

Subak, L.L., Caughey, A.B., and Washington, A.E. (2002). "Cost-effectiveness analyses in ***Obstetrics & Gynecology:*** **Evaluation of methodologic quality and trends." (AHRQ grant HS10856).** ***Journal of Reproductive Medicine*** **47, pp. 631-639.**

These authors used ten methodologic principles that should be incorporated in cost-effectiveness analyses (CEAs) to evaluate the methodologic quality and trends of CEAs included in studies published in the journal *Obstetrics & Gynecology* from 1966 through 1999. Thirty-four CEAs in the journal's studies met the inclusion criteria. Seven (20 percent) adhered to 10 of the principles, 5 (15 percent) to 9, and two (6 percent) to 8 of the 10 methodologic principles. The mean number of principles to which studies adhered was 5.7. Studies had high compliance (85 percent or more) with principles of research questions, probabilities, and effectiveness measures. They significantly improved over time in adherence to principles of time frame, perspective, costs, incremental analysis, sensitivity analysis, discounting, and total score. The investigators conclude that the CEAs evaluated adhered to only half the methodologic principles for performing CEAs but showed significant improvements in quality over time.

Zaslavsky, A.M., and Buntin, M.J. (2002, Summer). "Using survey measures to assess risk selection among Medicare managed care plans." (AHRQ grant HS10803). ***Inquiry*** **39, pp. 138-151.**

These authors quantify risk selection among competing Medicare managed care plans, using beneficiary survey data from the Consumer Assessments of Health Plans Study (CAHPS®). Selection, measured by variation in plan-level prevalence of health conditions and predicted costs, was substantial. A plan with moderate adverse selection would have predicted costs 11.6 percent above an average plan. Only a small part of this variation was explained by geographic differences in the prevalence of health conditions among or within metropolitan statistical areas, indicating that the selection was driven by plan attributes. Plans serving members with greater health needs have the potential to establish programs to serve these sick members well, yet this places plans at financial risk. Hence, improved risk adjustment for chronic conditions may be warranted. Moreover, survey measures have the potential to measure the prevalence of such conditions reliably and consistently across plans. ■

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