



Research Activities



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Longer anti-clotting treatment appears to lower the risk of death or a heart attack in patients with drug-eluting stents

Patients who receive drug-coated stents to open heart arteries may lower their risks of heart attack or death by taking an anti-platelet medication longer than current recommendations, according to a study supported by the Agency for Healthcare Research and Quality (AHRQ).

The drug, clopidogrel, is an anti-clotting medication currently recommended for 3 to 6 months after placement of “drug-eluting” stents, but the new observational study by AHRQ’s DEcIDE Research Center at Duke University suggests the drug reduces risks of heart attack or death for at least 2 years in some patients.

How long clopidogrel may be needed, however, remains uncertain. The drug, which minimizes clotting by stopping blood platelets from sticking together, is currently recommended by the Food and Drug Administration for 3 or 6 months for drug-eluting stents, depending on the stent manufacturer.

The Duke study included 4,666 patients who received drug-eluting

stents or bare metal stents during a 5-year period. Of those, 3,609 were defined as “event free,” meaning they had not died, had heart attacks, or undergone additional procedures to open coronary arteries for at least 6 months since stent placement. Researchers then checked those patients’ use of clopidogrel and their health status through September 2006. The study concluded:

- Among drug-eluting stent patients who were event free at 6 months, those who reported clopidogrel use were significantly less likely to die during the next 18 months than those who did not use the drug (a 2 percent death rate vs. a 5.3 percent death rate). These patients were also less likely to either die or have a heart attack (3.1 percent vs. 7.2 percent).
- Among patients who had been event free for a full year, those who reported clopidogrel use at 12 months were similarly

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Anti-clotting treatment

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less likely than those not taking clopidogrel to die during the next 12 months (0 percent vs. 3.5 percent), and less likely to either die or have a heart attack (0 percent vs. 4.5 percent).

While the Duke study strongly suggests that patients with drug-eluting stents should take clopidogrel longer than current recommendations, a randomized controlled trial is needed to confirm these results, researchers said. In addition, further research is needed to assess the relationship between

long-term clopidogrel therapy and its risks for serious adverse effects such as bleeding.

See “Clopidogrel use and long-term clinical outcomes after drug-eluting stent implantation,” by Eric L. Eisenstein, D.B.A., Kevin J. Anstrom, Ph.D, David F. Kong, M.D., and others, in the December 5, 2006 online issue of *JAMA* 297, pp. E1-E10.

Editor’s note: The Duke study was funded by AHRQ’s Effective Health Care (EHC) program (contract 290-05-0032). Authorized by the Medicare Prescription Drug, Improvement, and Modernization Act, the EHC program develops

unbiased scientific evidence on the effectiveness of medical interventions. The Duke researchers are 1 of 13 teams nationwide that are part of AHRQ’s DEcIDE (Developing Evidence to Inform Decisions about Effectiveness) network, which is part of the EHC. The network conducts new research to help patients, health care providers, and others make decisions about the effectiveness and safety of treatment options. For more information about DEcIDE and the EHC program, go to www.effectivehealthcare.ahrq.gov. ■

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Disparities/Minority Health

Older American Indians often have a poorer view of their own health than their doctors

Older American Indians, whose health is generally worse than non-Indians in the United States, often view their health as worse than their doctors do. This is particularly true if they only weakly identify with the white-American culture of their doctors, according to a new study. Investigators surveyed 115 patients 50 years and older who sought care at a Cherokee Nation clinic, and their 7 health care providers. Both providers and patients completed American-Indian identity and white-American identity indexes. All but one provider identified strongly as a white American.

In 40 percent of medical visits, providers and patients rated the patient’s health differently. In 68 percent of these cases, providers rated patients healthier than the patients rated themselves. Provider-patient differences were larger for the Cherokee patients who identified weakly with white culture than those who felt stronger affiliation. This finding is consistent with research suggesting that providers may overlook illness among patients who are racially or culturally different.

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American Indians

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Discordant perceptions between providers and patients about the patient's health are associated with inadequate and unnecessary treatment, poor adherence to treatment advice, dissatisfaction with care, diminished symptom resolution, and mismatching of care services to needs. Discordant perceptions of health status pose special concerns for chronically ill patients, who must carefully follow providers' advice to maintain their health, and for older patients, who are often unassertive with providers and unlikely to

challenge their perceptions. The researchers note that future studies should investigate the reasons for the differences in perceived health status between culturally diverse patients and their providers. The study was supported in part by the Agency for Healthcare Research and Quality (HS10854).

See "Cultural identities and perceptions of health among health care providers and older American Indians," by Eva Marie Garrouette, Ph.D., Natalia Sarkisian, Ph.D., Lester Arguelles, Ph.D., and others, in the February 2006 *Journal of General Internal Medicine* 21, pp. 111-116. ■

Patient Safety and Quality

Both hospitals and Medicare would gain financially by improving patient safety

Medicare spends more than \$300 million extra per year for additional care needed due to medical error or adverse events, such as care for a bed sore or postoperative blood infection (sepsis). Yet these extra Medicare payments cover less than a third of the extra costs incurred by hospitals in treating adverse events. Both Medicare and hospitals would gain financially by improving patient safety, according to a new study by Agency for Healthcare Research and Quality (AHRQ) researchers Chunliu Zhan, M.D., Ph.D., and Bernard Friedman, Ph.D., and colleagues.

The researchers used data from the AHRQ 2002 Healthcare Cost and Utilization Project Nationwide Inpatient Sample to examine the cost impact of five patient safety problems. Five AHRQ Patient Safety Indicators (PSIs) were used to identify adverse events during hospitalization: decubitus ulcer (DU) or bed sore, iatrogenic (hospital-caused) pneumothorax (IP), postoperative hematoma or hemorrhage (PH/H), postoperative pulmonary embolism or deep vein thrombosis (PE/DVT), and

postoperative sepsis (PS). The rates varied from 1 case of IP to 34 cases of DU per 1,000 discharges of patients who were at risk for these problems. The Medicare payment for these adverse events under the Prospective Payment System (PPS) ranged from \$735 per case of DU to \$8,881 per case of PS, and an estimated national total of \$313 million a year for the five types of adverse events studied.

Nevertheless, hospitals absorbed most of the costs of treating adverse events under the Medicare PPS. For example, hospitals received no additional payment from the Medicare PPS in 48 percent of postoperative sepsis events or in 80 percent of DU events. These extra charges were estimated per case as follows: \$10,845 for DU; \$17,312 for IP; \$21,431 for PH/H; \$21,709 for postoperative PE/DVT; and \$57,727 for PS.

See "Medicare payment for selected adverse events: Building the business case for investing in patient safety," by Dr. Zhan, Dr. Friedman, Andrew Mosso, M.S., and Peter Pronovost, M.D., Ph.D.,

in the September 2006 *Health Affairs* 25(5), pp. 1386-1393. Reprints (AHRQ Publication No. 07-R008) are available from AHRQ.* ■

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Functional outcomes may be good markers of quality of care for hip fracture surgery patients

Functional outcomes among hip fracture surgery patients could indicate important differences in the processes of care related to improved patient functioning, suggests a new study. Researchers found that functional outcomes of patients who underwent surgery for hip fracture were more sensitive markers of improved process of care than 6-month mortality rates. Improving functional outcomes is critical, since only 60 percent of surviving older hip fracture patients eventually return to their prefracture level of walking.

It is important to attend to all steps in the care of hip fracture patients. For example, the benefit from early surgery may be short-lived if it is not followed up by timely mobilization, early initiation of rehabilitation, and attention to postoperative care. Researchers examined the relationship between functional outcome and 9 processes of care related to mobilization for 554 patients who underwent surgery for hip fracture at 4 hospitals. They used information from medical records, interviews, and bedside observations. They also used the Functional

Independence Measure (FIM), survival, and hospital readmission to assess patient outcomes 6 months later.

The nine-item mobility process of care measure was associated with improved locomotion, self-care, and transferring (for example, from bed to chair) at 2 months. The predicted value for the FIM locomotion measure (range 2-14) at 2 months was 5.9 for patients at the 10th percentile of performance on these care processes compared with 7.1 at the 90th percentile. However, the benefits were smaller and not significant by 6 months. These care processes were not associated with mortality. Individual processes of care were generally not associated with outcomes, which suggests that any single process may be dependent on other care processes. The study was supported in part by the Agency for Healthcare Research and Quality (HS09459 and HS09973).

See "Effect of inpatient quality of care on functional outcomes in patients with hip fracture," by Albert L. Siu, M.D., M.S.P.H., Kenneth S. Boockvar, M.D., M.S., Joan D. Penrod, Ph.D., and others, in the September 2006 *Medical Care* 44(9), pp. 862-869. ■

Health Information Technology

Journal supplement reviews evidence for the efficacy of telemedicine and telecare

Despite the growth of computer networks and the Internet, telemedicine continues to fall short of its potential. One reason is the lack of high-quality evidence to convince clinicians, policymakers, and others that this technique deserves more widespread use in health care. Research on telemedicine and

telecare is conducted at the Evidence-based Practice Center of the Oregon Health and Science University, which is supported by the Agency for Healthcare Research and Quality (AHRQ) (contract 290-02-0024).

A March 2005 workshop based on this research was sponsored by AHRQ and the Centers for

Medicare and Medicaid Services. Papers commissioned for the workshop were published in Volume 12, Supplement 2, 2006, of the *Journal of Telemedicine and Telecare*. The papers discuss the poor and uneven evidence base for telemedicine, what telemedicine

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Telemedicine

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services are covered by insurance, lessons learned from other countries, use of telemedicine addressing problems of access and specialty shortages, and its role in the national information technology strategic framework. The papers are briefly summarized here. Single reprint copies (Publication No. OM07-0004) are available from AHRQ.*

Hersh, W.R., Hickam, D.H., and Erlichman, M., “The evidence base of telemedicine: Overview of the supplement,” pp. 1-2.

In this overview, the authors summarize the general themes of the journal supplement. The main theme is that telemedicine has unfulfilled potential for delivery of health care. While the rationale for its use is still strong, and studies do not show any harm, the lack of a substantial evidence base makes its benefits unrealized. There is a need for robust clinical trials to test its efficacy in its most promising clinical domains, such as dermatology, psychiatry, and home health care. Growth of the evidence base may be aided by the increased use of electronic health records to facilitate systematic data collection and growth in use of health information technology in general.

Hersh, W.R., Hickam, D.H., Severance, S.M., and others, “Diagnosis, access and outcomes: Update of a systematic review of telemedicine services,” pp. 2-31.

This update of a systematic review originally published in 2001 concludes that the quality of evidence for telemedicine continues to be uneven and, for the most part, poor. The authors reviewed the literature for three types of telemedicine services that substitute for face-to-face medical diagnosis and treatment. The

evidence of efficacy for store-and-forward services, most commonly studied in dermatology, has been mixed. Several limited studies showed the benefits of home-based telemedicine interventions in chronic diseases. Studies of office/hospital-based telemedicine suggest that telemedicine is most effective for verbal interactions such as videoconferences for diagnosis and treatment in specialties like neurology and psychiatry.

Brown, N.A., “State Medicaid and private payer reimbursement for telemedicine: An overview,” pp. 32-39.

This paper reviews what telemedicine services are being covered by U.S. States and their rationale for coverage. Since 1998, when States were given the option of paying for telemedicine services with Medicaid, 34 States have added coverage of telemedicine services to their Medicaid programs. However, a survey showed wide variations in service coverage, payment policies, and geographical and other restrictions. Another survey showed that over half of the 72 telemedicine programs in 25 States were reimbursed by private insurance companies. In 1999, 43 percent of responding telemedicine networks saw reimbursement as a barrier to long-term sustainability, while in 2004 only 22 percent did so. Thus, it appears that some progress has been made in Medicaid and private payer reimbursement for telemedicine.

Ohinmaa, A., “What lessons can be learned from telemedicine programmes in other countries?,” pp. 40-44.

Some telemedicine programs in other countries may be applicable to implementation of telemedicine in the United States, asserts the

author of this paper. He queried eight international experts in telemedicine and reviewed a few key publications in the field to identify examples of successful telemedicine programs that had the potential to be successfully implemented in the United States. He concluded that international telemedicine applications in some specific areas would be suitable for implementation in the United States. These areas included teleradiology, telementalhealth, telegeriatric applications, e-referrals and discharge letters, and integration of health care organizations with telemedicine networks.

Rheuban, K.S., “The role of telemedicine in fostering health care innovations to address problems of access, specialty shortages and changing patient care needs,” pp. 44-50.

This paper assesses telemedicine studies from the standpoint of fostering innovation in addressing specific health care challenges. The author focuses in particular on access to care, specialty shortages, and changing patient care needs. She asserts that, by incorporating advanced technologies, clinicians will be able to manage the growing volumes of medical information, research, and decision support analytical tools. Also, the deployment of advanced technologies will minimize the barriers of distance and geography to enhance access to care and facilitate the delivery of integrated health care. This is particularly important for rural areas, where there are few local specialists, and for marginalized populations such as prisoners. Telemedicine also improves the opportunity to reach the elderly at home and in nursing homes.

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Dimmick, S.L., and Ignatova, K.D., “The diffusion of a medical innovation: Where teleradiology is and where it is going,” pp. 51-58.

Teleradiology is one of the more successful applications of telemedicine, note the authors of this paper. A persistent shortage of radiologists combined with the ease of transmitting radiology images led to the rapid adoption of teleradiology. For example, teleradiology had become part of the practices of two-thirds of radiologists who responded to the 1999 American College of Radiology survey. Telecardiology may be the next successfully diffused form of telemedicine. However, the authors caution that one potential problem is the political pressure to avoid outsourcing to foreign countries, particularly those to which U.S. information technology jobs have already been transferred. How the outsourcing issue is resolved will have a significant effect on teleradiology specifically and, perhaps, telemedicine generally.

Speedie, S.M., and Davies, D., “Telehealth and the national health information technology strategic framework,” pp. 59-64.

These authors point out that telemedicine does not exist in an information technology vacuum. It may well provide synergistic benefit in concert with electronic health records and the National Health Information Infrastructure. The authors note that goals of telehealth and the national plan are complementary. One focuses on improving access to high quality health care services and the other on the information systems to support those services. Telehealth also needs the fully realized

electronic health record to provide the best possible care when patients are geographically and chronologically separated from their providers. The experiences of telehealth in organizing large networks of heterogeneous health care groups can provide useful lessons as the process of implementing health information technology moves forward.

Whitten, P., “Will we see data repositories for telehealth activity in the near future?,” pp. 65-71.

This paper addresses the issue of what sources of clinical/patient data exist, either in telemedicine-specific registries or in general electronic health record systems, which would allow investigators to analyze it for research on the efficacy of telemedicine interventions. A number of different organizations operate registries, but there do not appear to be any true telehealth registries. One reason is that Federal requirements through such policies as the Health Insurance Portability and Accountability Act have led to heightened fear of inadvertently releasing confidential or unauthorized information. Also, it would be more efficient if patient data were captured electronically at the local level, ideally through electronic medical records, and then transferred electronically to registries. However, the diffusion of EMRs at the local level is in its infancy, making a telehealth data repository unlikely to be soon.

Yellowlees, P., and Harry, D., “Standards for data collection and monitoring in a telemedicine research network,” pp. 72-76.

Although a networked, nationwide health information system is financially and logistically impractical, the development of independent,

regional systems is realistic and feasible, assert these authors. A Telemedicine Research Network (TRN) could connect a number of geographically disparate health systems. This would require the reconciliation of policies and practices in five principal areas: partner agreement on project scope; privacy, security and confidentiality; technical standards; telecommunications and computer infrastructure; and change management practices and training. Establishing a first-stage TRN would require very little technical development and would, instead, rely on trust among the partners. The development of standards-based TRNs will greatly increase the quality and quantity of telemedicine research.

Grigsby, J., and Bennett, R.E., “Alternatives to randomized controlled trials in telemedicine,” pp. 77-84.

The authors of this paper assess the usefulness of study designs other than randomized controlled trials for the evaluation of telemedicine. Potential methods include those that do not rely on randomization and tight control of the intervention and include analysis of existing administrative and clinical databases. Quasi-experimental designs may also be useful, especially when conducted in association with careful statistical methods, which allow the investigator to control for certain differences between groups. Databases, such as those maintained by the Centers for Medicare & Medicaid Services, contain information on both outcomes and claims, as well as disease/procedure registries. Such databases may be a potential tool for understanding the effect of telemedicine on access to care in conjunction with costs and quality.

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Telemedicine

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Shea, S., "Health delivery system changes required when integrating telemedicine into existing treatment flows of information and patients," pp. 85-90.

The technical issues involved in using telemedicine to improve chronic disease management are

numerous, daunting, and complex, note the authors of this paper. However, they assert that many can be addressed using the resources and infrastructure available in large, well-integrated clinical information systems. The cost-benefit balance will change when it becomes possible to use devices that are owned by patients for everyday use, rather than installing special-

purpose devices for telemedicine. Provider-side telemedicine capabilities, specifically for upload, storage, and display of medical data, will improve as technology develops. How clinicians will process the large amount of data made available by telemedicine is a clinical issue, but it is likely that software will emerge to aid in this task. ■

Women's Health

Racial differences in religiosity and religious coping styles are linked to use of health care services by low-income older women

Asking older women about their religiosity and religious coping style during health assessments could help nurses set goals to improve the health of minority and other older women. It could also give them clues about potential church-related support, especially for low-income black women, for whom the church typically plays a large social role. In a study, supported in part by the Agency for Healthcare Research and Quality (HS1164), researchers used several questionnaires to examine the religiosity, religious coping style, and use of health care services among 274 black women and white women aged 55 years and older living in subsidized high-rise housing in Nashville, Tennessee.

Older black women perceived themselves to be more religious than white women. Black women also reported more organizational religious behaviors (attendance at church or at church-sponsored events) and non-organizational religious behaviors (such as praying, reading religious material, listening to gospel music, and reading the Bible). The self-directing religious coping style (relying on oneself rather than on God to cope with stressors) was associated with more physician visits for white women, who may assert control over their health with regular visits. However, this style was associated with fewer

physician visits for black women, who may prefer to keep control in their own hands and minimize the extent of contact with the health care system, explains Pamela D. Ark, Ph.D., R.N., of the University of Central Florida.

The deferring coping style (one gives responsibility for coping with stressors over to God) was associated with more physician visits in the past 6 months and more hospital days in the past year among white women, but with fewer hospital days among black women. Deferring white women may put off seeking care, develop more severe symptoms, and eventually require longer hospital stays. Deferring black women may try to minimize their hospital stays, for example, by asking to be discharged as soon as possible. The collaborative coping style (people may pray to God, but also seeks their own solutions) was associated with a high number of hospital days among black women, but had no significant effect on health care use patterns for white women.

More details are in "Religiosity, religious coping styles, and health service use," by Dr. Ark, Pamela C. Hull, Ph.D., Baqar A. Husaini, Ph.D., and Clinton Craun, M.A., in the August 2006 *Journal of Gerontological Nursing*, pp. 20-29. ■

Note: Only items marked with a single (*) asterisk are available from the AHRQ Clearinghouse. Items with a double asterisk (**) are available from the National Technical Information Service. See the back cover of *Research Activities* for ordering information. Consult a reference librarian for information on obtaining copies of articles not marked with an asterisk.

The decision to hospitalize nursing home residents is driven primarily by residents' preference and quality of life

Moving nursing home residents to a hospital can seriously affect their health. For instance, their often frail conditions make them vulnerable to complications when they are hospitalized. Also, the switch from the nursing home to hospital setting can be disruptive and lead to confusion, disorientation, and further decline. The decision to hospitalize a nursing home resident is driven primarily by the resident's preference, according to a survey of medical directors and directors of nursing (DONs) from 420 (mostly nonprofit) nursing homes in 25 States. The survey was supported by the Agency for Healthcare Research and Quality (HS10645).

Nearly half of medical directors and DONs (46 and 42 percent,

respectively) cited resident preference as the most important factor in the hospitalization, followed by residents' quality of life (30 percent and 26 percent), and the amount of discomfort from acute illness (9 and 13 percent). At the time of the hospitalization decision, the most important considerations were resident quality of life, relative effectiveness of treatment options, and family wishes.

The medical directors surveyed cited a lack of information and support to residents and their families regarding end-of-life care as the main factor causing overhospitalization. A secondary factor was covering doctors' lack of familiarity with residents. DONs agreed, but reversed the order. Medical directors and DONs did not attribute overhospitalization to

lack of quick access to doctors; however, they ranked on-site doctor/nurse practitioner evaluation within 4 hours as the least accessible resource. The next least available resource that could prevent hospitalization was electrocardiogram tracing and interpretation, followed in order by radiology results in less than 4 hours, laboratory results in less than 4 hours, intravenous therapy, and oxygen monitoring and therapy.

See "Nursing home capabilities and decisions to hospitalize: A survey of medical directors and directors of nursing," by Joan L. Buchanan, Ph.D., Rachel L. Murkofsky, M.D., M.P.H., Alistair James O'Malley, Ph.D., and others in the March 2006 *Journal of the American Geriatric Society* 54(3), pp. 458-465. ■

A pain medication appropriateness scale reveals that many nursing home residents suffer from poorly controlled pain

An assessment using the Pain Medication Appropriateness Scale (PMAS) indicates that only one-third of nursing home residents have an excellent match between their reported pain severity and the medication prescribed to control their pain, which means that two-thirds of residents have suboptimal pain management. The PMAS lists the appropriate medication for the type of pain; appropriate dose interval (depending on whether the pain is persistent, predictably recurrent, or breakthrough pain); and appropriate titration of medication to severity of pain. The scale also lists the degree of pain relief from medication, appropriate prevention of constipation from opioids, and appropriate exclusion of drugs considered high-risk for the geriatric population. The scale is designed as a screening tool to assess overall pain management

strategies in a nursing home or group of homes, and is not meant to be used to evaluate individual care plans.

In this study, supported by the Agency for Healthcare Research and Quality (HS11093), researchers used the PMAS to assess pain medication prescribing during a study of a multifaceted intervention to improve pain management in six rural and six urban nursing homes in one State. The mean total PMAS was 64 percent of optimal, an indication of generally poor management of pain in nursing homes. Fewer than half of residents with predictably recurrent pain were prescribed scheduled pain medication. Also, 23 percent of residents received at least one high-risk medication.

PMAS scores were better for residents not in pain (68 vs. 60 percent) and in homes where the nurses'

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Pain medication

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knowledge of pain assessment and management improved or stayed the same during the intervention (69 vs. 61 percent). Appropriate prescribing for mild episodic pain and constipation prevention for as-needed opioids was excellent (84 and 79 percent compliance, respectively). However, prescribing was adequate for

only 40 percent of the residents who had neuropathic pain.

More details are in “Assessing the appropriateness of pain medication prescribing practices in nursing homes,” by Evelyn Hutt, M.D., Ginette A. Pepper, R.N., Ph.D., F.A.A.N., Carol Vojir, Ph.D., and others, in the February 2006 *Journal of the American Geriatric Society* 54, pp. 231-239. ■

Pharmaceutical Research

Direct-to-consumer drug advertising on television may have led to increased prescribing of Vioxx® and Celebrex®

The cyclooxygenase-2 (COX-2) inhibitor Vioxx® was one of the most heavily advertised prescription drugs in recent years. According to a new study, direct-to-consumer (DTC) drug advertising on television may have led to an increase in doctor's visits by osteoarthritis patients and an increase in prescriptions for Merck's Vioxx® and Pfizer's Celebrex® prior to the 2004 removal of Vioxx® from the market because of evidence it increased the risk of heart attack and stroke.

W. David Bradford, Ph.D., of the Medical University of South Carolina, and colleagues matched monthly clinical information from 57 primary care practices in 2000-2002 to monthly brand-specific drug advertising data for local and network television. The researchers estimated that a 100 percent increase in local and national Vioxx® ads would, on average, have increased the number of visits by osteoarthritis patients per month by 0.8 percent and 7.4 percent, respectively. They estimated that a 100 percent increase in DTC national advertising of Celebrex® would have led to a 2 percent increase in monthly visits. Local Celebrex® advertising did not influence office visit rates.

DTC advertising of Vioxx® increased the likelihood that patients would be prescribed both Vioxx® and Celebrex® during these office visits; however, Celebrex® ads only affected Vioxx® use. For example, a tenfold increase in local Vioxx® DTC spots would have generated about a 0.5 percent increase in the rate of Vioxx® prescribing each month. A 50 percent increase in monthly national Celebrex® ads would have led to an increase of about 0.5 percent in Vioxx® prescribing. This may have been because in 2000 Merck invested in nearly twice as many DTC ads for Vioxx® as Pfizer did for Celebrex®. Pfizer concentrated on direct-to-physician marketing of Celebrex® via office visits by pharmaceutical representatives. The study was supported in part by the Agency for Healthcare Research and Quality (HS11326).

See “How direct-to-consumer television advertising for osteoarthritis drugs affects physicians' prescribing behavior,” by Dr. Bradford, Andrew N. Kleit, Ph.D., Paul J. Neitert, Ph.D., and others, in the September 2006 *Health Affairs* 25(5), pp. 1371-1377. ■

Outcomes/Effectiveness Research

Studies examine factors influencing postoperative complications and functioning among patients undergoing hip fracture repair

Older patients hospitalized for hip fracture repair surgery can suffer numerous postoperative complications, but they also must become mobile as soon as possible after surgery to improve their

functioning. Two studies supported by the Agency for Healthcare Research and Quality examined these issues. The first study (HS09459) found that one-fifth of hip fracture patients are admitted to the hospital with a major clinical

abnormality that can dramatically increase their risk for postoperative complications if not corrected prior to surgery. The second study (HS09459 and HS09973) revealed that delay in getting older hip

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Hip fracture repair

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fracture patients out of bed after surgery is associated with poor functioning and survival. Both studies are discussed here.

McLaughlin, M.A., Orosz, G.M., Magaziner, J., and others. (2006, March). "Preoperative status and risk of complications in patients with hip fracture." *Journal of General Internal Medicine* 21, pp. 219-225.

Researchers found that one-fifth of patients with hip fractures are admitted to the hospital with a major clinical abnormality, such as serious electrolyte disturbances, heart failure, or respiratory failure. The presence of more than one major abnormality before surgery increased the risk of postoperative complications nearly tenfold. The presence of major abnormalities on hospital admission that were not corrected or stabilized prior to surgery increased the risk of postoperative complications nearly threefold. Minor abnormalities (for example, mildly abnormal electrolyte, blood pressure, or glucose levels, or mild anemia), while warranting correction, did not increase the risk of postoperative complications.

Most minor abnormalities among patients were corrected before surgery, but 15 percent of patients with major clinical abnormalities underwent hip surgery without correction of the abnormalities. Although the prolonged immobility associated with delaying surgery can create its own problems, major abnormalities should be corrected or stabilized prior to hip fracture repair surgery. However, the researchers suggest that patients with minor

abnormalities could have surgery with attention to these medical problems afterwards.

The researchers correlated 11 categories of physical and laboratory findings (presurgical risk factors) classified as mild and severe abnormalities with in-hospital complications among 554 adults (mean age of 83 years) who underwent hip repair surgery at 4 hospitals. Having a minor abnormality on admission (34.3 percent) was more common than having a major abnormality (22.6 percent).

Seven percent of patients suffered complications. The most frequent type of postoperative complication was cardiopulmonary (5.8 percent of the complications) followed by thromboembolic (1.8 percent), infection (1.6 percent), miscellaneous (1.2 percent), and hematologic (0.4 percent).

Siu, A.L., Penrod, J.D., Boockvar, K.S., and others. (2006, April). "Early ambulation after hip fracture: Effects on function and mortality." *Archives of Internal Medicine* 166, pp. 766-771.

Older patients with hip fractures are immobilized an average of 5.2 days during their hospital stay for hip repair surgery. Longer immobility is associated with higher mortality at 6 months and poorer function at 2 months, according to this study. Patients who were immobile for 8 days had 5.4 percent lower 6-month mortality and 1 point higher FIM (Functional Independence Measure) locomotion score than those who were immobile for 2 days. This 1-point FIM difference is the difference between needing minimal personal assistance or just needing personal supervision with no assistance in walking 150 feet or

transferring, for example, from a bed to a chair. It can make the difference between being able to go home or not, depending on the availability of an able-bodied caregiver to provide the needed assistance, explain the authors of the study.

Patients who were immobile the least amount of time reported less pain (5.9 percent compared with 40 percent who reported having more than 3 days of moderate or severe pain), were less likely to receive general anesthesia (22.6 vs. 51 percent), and were less likely to have had postoperative transfusions (37.7 vs. 72 percent) or prolonged urinary catheterization (9.4 vs. 54.9 percent). However, functional differences related to time spent immobile abated by 6 months as patients recovered function. Immobility had the most severe impact on patients who already needed help with walking when they were admitted to the hospital (usually older patients with more coexisting medical conditions).

These findings indicate that immobility should be minimized in patients undergoing repair of hip fracture. This can be achieved, in part, by early surgery for patients with stable medical problems and timely efforts to stabilize other patients for surgery, suggest the researchers. They also recommend improved pain management, local instead of general anesthesia when possible, early removal of indwelling catheters, and minimizing the immobilizing effects of postoperative transfusions (for example, by use of heparin locks). These findings were based on analysis of functioning and survival of 532 patients 50 years and older 6 months after hip repair surgery at 4 New York hospitals. ■

Study raises doubts about the usefulness of emergency department diagnosis as a criteria for medically unnecessary EMS transports

Emergency medical services (EMS) systems respond to thousands of calls for help each day to transport people to a hospital emergency department (ED). Yet, the patient's condition (ED diagnosis), a marker used to determine the medical necessity of transport, did not warrant ambulance transport in 13 percent of transports that occurred in 2002. ED diagnosis is one criterion (along with signs and symptoms such as heart rate and chest pain) that EMS and ED staff use when reviewing transport decisions and when constructing new decision protocols. However, a new study raises considerable doubts about the usefulness of ED diagnosis as a criterion for determining medically unnecessary EMS transports.

Overall, researchers found only fair agreement among physicians about which diagnoses constituted unnecessary EMS transport. Three emergency physicians and two family medicine physicians evaluated 913 diagnostic codes, and rated each code as either medically necessary, uncertain, or medically unnecessary. The percentage of codes classified as medically unnecessary varied across physicians and ranged from a low of 25 percent to a high of 65

percent. Ranges for the uncertain and medically necessary categories ranged from 18 to 46 percent and 14 to 48 percent, respectively.

Family medicine-trained physicians agreed more with one another than did emergency physicians. Agreement was observably better among physicians with more experience.

Among family medicine physicians, agreement ranged from poor for diagnoses associated with conditions of the perinatal period to substantial for diagnoses associated with the digestive system. Among emergency physicians, agreement ranged from poor for neoplasm-related diagnoses to fair for diseases of the circulatory system. The study authors, who were supported in part by the Agency for Healthcare Research and Quality (T32 HS00032), call for more research with a larger sample of physicians.

See "Use of ED diagnosis to determine medical necessity of EMS transports," by P. Daniel Patterson, Ph.D., M.P.H., E.M.T.-B., Charity G. Moore, Ph.D., M.S.P.H., Jane H. Brice, M.D., M.P.H., and Elizabeth G. Baxley, M.D., in the October/December 2006 *Prehospital Emergency Care* 10, pp. 488-493. ■

Access to Care

People with low incomes are more likely to obtain dental care outside of private dental practices than those with higher incomes

In recent years, many States have tightened eligibility criteria and restricted and/or eliminated adult dental benefits in their Medicaid programs. A new study found that people with low incomes are more likely than higher income individuals to use physicians' offices or hospital emergency rooms (ERs) instead of private dental practices to treat their dental problems.

During 2001, about 3 percent of the U.S. population had at least one dental problem taken care of outside of the traditional office-based dental system. Of these, 2.7 percent received care in a hospital ER and 7 percent received care in other medical settings, note Leonard A. Cohen, D.D.S., M.P.H., M.S., of the University of Maryland Dental School, and Richard J. Manski, D.D.S., M.B.A., Ph.D., of the Agency for Healthcare Research

and Quality. A majority (68 percent) had contact with the formal health care system via a prescription associated with their dental problem. About 1 in 5 people did not seek any formal treatment for their problem. Low-income individuals were more likely not to seek formal dental care than were middle/high-income individuals (32.5 vs. 19.7 percent). Those experiencing dental problems were

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Dental care

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most likely to be in the 19 to 64 and 65 and over age categories.

Individuals with no dental visits during the year were more likely to have received no formal care than those who had at least one dental visit during the year (56.4 vs. 16.2

percent). Twenty percent of all individuals who had a dental problem outside the normal dental office system missed at least one day of school, stayed home from work, or stayed in bed as a result of their dental problem. The findings were based on analysis of 2001 data from the Household Component of the Medical Expenditure Panel

Survey, a nationally representative health survey of the U.S. community-based population.

See "Visits to non-dentist health care providers for dental problems," by Drs. Cohen and Manski, in the September 2006 *Family Medicine* 38(8), pp. 556-564. Reprints (AHRQ Publication No. 07-R007) are available from AHRQ.* ■

Lack of health care options in rural communities poses substantial barriers to care for rural disabled adults

Many rural communities are designated "health professional shortage areas." They typically suffer from clinician shortages, few specialists, and fragile financial footing for existing providers. Also, many rural hospitals lack the professional and financial resources to care effectively for people with complex disabilities. The lack of health care options in rural communities poses substantial barriers to care for rural disabled adults, concludes a new study. A team led by Lisa I. Iezzoni, M.D., M.Sc., of Beth Israel Deaconess Medical Center, analyzed transcripts of focus groups in rural areas of Massachusetts and Virginia that included 35 disabled adults. These adults had sensory, physical, or psychiatric disabilities that ranged from blindness, limb

amputation, and spinal cord injury to stroke, extreme obesity, and bipolar disorder.

Participants perceived rural areas to be generally less sensitive to disability access issues than urban areas. For example, they had substantial difficulties finding physicians who understood their disabilities. They also felt that they had to teach their local doctors about their underlying conditions. In addition, physicians' offices were sometimes located in old buildings that did not have wheelchair ramps, automatic doors, or other accessible equipment.

Many focus group participants said they needed to travel periodically to large medical centers to obtain necessary specialty care. However, many participants could not drive and rural public

transportation was often inaccessible and unreliable. Participants were generally poor and either lacked health insurance or had Medicaid coverage, which complicated their search for primary care doctors willing to treat them. The study concludes that interventions addressing transportation and physical access are required to serve this population's health care needs. The study was supported by the Agency for Healthcare Research and Quality (HS10223).

See "Rural residents with disabilities confront substantial barriers to obtaining care," by Dr. Iezzoni, Mary B. Killeen, M.A., and Bonnie L. O'Day, Ph.D., in the August 2006 *HSR: Health Services Research* 41(4), pp. 1258-1275. ■

Health Care Costs and Financing

Tax subsidies for employer-sponsored health insurance will exceed \$200 billion in 2006

Total Federal and State tax subsidies for employer-sponsored health care coverage for active workers will exceed \$200 billion in 2006, an inflation-adjusted increase of more than 150 percent since 1987, according to a new study sponsored by the Agency for Healthcare Research and Quality (AHRQ).

The health insurance premiums that employers contribute to, as well as an increasing share of workers' premium contributions, are exempt from Federal and State income taxes, as well as from taxes for Medicare and Social Security. The goal of these

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Tax subsidies

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subsidies is to make job-related health insurance more available to workers.

AHRQ researcher Thomas M. Selden, Ph.D., and Bradley M. Gray, Ph.D., of the CNA Corporation, estimate that in 2006, the Federal and Social Security payroll tax components of the overall employment health insurance subsidy will total \$111.9 billion and \$73.3 billion, respectively, while the exemption from State income taxation will total \$23.4 billion. The authors further estimate that nearly 80 percent of the overall tax subsidy will go to private establishments and their workers, 17 percent will be for State and local public establishments, and the remaining 3 percent will be for coverage provided to Federal employees.

The authors also project that in 2006:

- The average tax subsidy for each worker who is covered by employer-sponsored health insurance, regardless of type of employer, will be \$2,778.
- The average tax subsidy per worker enrolled in a single-coverage plan will be \$1,573, compared with \$3,825 for a family-coverage plan.
- The average subsidy per covered Federal worker will be \$608 more than average, primarily because Federal employees are more likely than workers in general to select family coverage.
- The average subsidy per worker in companies with 1,000 or more employees will be \$1,886, compared with \$770 per worker in firms with fewer than 10 employees.
- The average subsidy per covered worker in establishments where more than half the employees

earn more than \$23.07 per hour will be \$3,283, compared with \$2,268 per covered worker in establishments in which the majority of employees earn less than \$10.43 per hour.

- The industries with the lowest per-worker subsidies include agriculture, fisheries, forestry, retail trade, and construction (from \$781 to \$1,189), while those with the highest average subsidy (\$1,751 to \$2,289) include financial services, utilities and transportation, real estate, and mining and manufacturing.
- The States with the highest average per-worker subsidies tend to be located in the Northeast, East North Central, South Atlantic, and East South Central divisions of the country, while those with the lowest are found mostly in West South Central, Mountain, and Pacific Coast divisions.

The researchers based their projections on data from AHRQ's Medical Expenditure Panel Survey (MEPS), the nation's most complete survey of how Americans use and pay for health care, including their health insurance coverage. The MEPS Insurance Component surveys employers annually to collect data on the number and types of private health insurance plans offered, benefits associated with these plans, premiums, contributions by employers and employees, eligibility requirements, and employer characteristics.

For more details, see "Tax subsidies for employment-related health insurance: Simulation results for 2006 from the Medical Expenditure Panel Survey," by Drs. Selden and Gray in the November-December 2006 issue of *Health Affairs*, 25(6), pp. 1568-1579. Reprints (AHRQ publication no. 07-R014) are available from AHRQ.* ■

Acute Care/Hospitalization

Medical injuries among children result in longer hospital stays and higher charges

According to a new study, researchers from the Medical College of Wisconsin identified that 3.4 percent of children hospitalized in Wisconsin between 2000 and 2002 suffered a medical injury. These injuries were due to problems with medications (1.5 percent), procedures (1.3 percent), and medical devices (0.9

percent). Injured children had a half day (12 percent) longer hospital stay and \$1,614 (26 percent) higher charges than children without medical injuries. Hospitals and pediatricians should focus on medications, procedures, and devices most associated with pediatric medical injuries to

improve patient safety, suggest the authors of the study.

Investigators used Wisconsin Medical Injury Prevention Program (WMIPP) screening criteria to identify medical injuries among 318,785 children admitted to one of 134 Wisconsin hospitals between 2000 and 2002. The WMIPP differs

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Medical injuries

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from the Patient Safety Indicators (PSIs) developed by the Agency for Healthcare Research and Quality (AHRQ) in that it identifies injuries that occur in the hospital. It also identifies those that occur in the outpatient, community, and home settings that can lead to the child's hospitalization, such as an acetaminophen overdose at home.

The results were generally consistent with previous PSI findings up to 2000. Analysis of hospital discharge records showed that excess length of stay and charges were greatest for injuries due to genitourinary devices/implants, vascular devices, and infections/inflammation after procedures. Public health leaders can use this information to prioritize areas for outpatient or community interventions. Since the WMIPP data are based on hospital discharge data,

they cannot include great clinical detail. This approach is also limited by variability among states in coding of external cause of injury in hospital discharge data. The study was supported in part by AHRQ (HS11893).

More details are in "Medical injuries among hospitalized children," by John R. Meurer, M.D., M.B.A., Hongyan Yang, Ph.D., Clare E. Guse, M.S., and others in the June 2006 *Quality and Safety in Health Care* 15, pp. 202-207. ■

Clinician communication through multidisciplinary rounds may improve with well-designed information tools

Communication among hospital staff is a key to patient safety. Multidisciplinary rounds (MDR) have become an important vehicle for communication and coordination of care among hospital clinicians. During rounds, care providers from different specialties meet to communicate, coordinate patient care, make joint decisions, and manage responsibilities. A new study suggests that communication through MDR may be improved by process-oriented information tools that aid information organization, communication, and work management. This could be achieved through automatic extraction of patient data from clinical information systems, displays and printouts in condensed forms, at-a-glance representations of the care unit, and temporary storing of work-process information, note the University of Maryland School of Medicine study authors.

Ayse P. Gurses, Ph.D., and Yan Xiao, Ph.D., reviewed research studies published from 1990 to 2005 about MDR on information needs, information tools used, impact of information tools, and evaluation measures. A total of 51 studies revealed that patient-centric tools (for example, medical charts, nursing

flow sheets, and bedside patient monitoring devices), decision-support tools (for example, clinical pathways), and process-oriented tools (for example, a rounding list and daily goals form) helped with information organization and communication.

A rounding list is used for a summary view of up-to-date lists of patients and their active diagnoses, test results, and care plans; it is also used for note taking. A daily goals form is used to remind providers to define patient goals explicitly. It includes a to-do list for discharge, safety risks, ventilator management, scheduled laboratory tests, removal of catheters, and family issues. Information tools were also shown to improve the situation awareness of multidisciplinary care providers and efficiency of MDR and to reduce patient hospital stay. The study was supported in part by the Agency for Healthcare Research and Quality (HS11562).

More details are in "A systematic review of the literature on multidisciplinary rounds to design information technology," by Drs. Gurses and Xiao, in the May 2006 *Journal of the American Medical Informatics Association* 13(3), pp. 267-276. ■

Agency News and Notes

Injuries cost hospitals \$20 billion annually

U.S. hospitals spend roughly \$20 billion each year to treat the nearly 2 million Americans injured seriously enough to require inpatient care, according to a new report by the

Agency for Healthcare Research and Quality.

Medicare and Medicaid are billed for almost half of all injury cases, and more than 12 percent of hospital stays of injured patients

are uninsured. The Federal report also found:

- Broken bones (fractures of the hip, leg, spine, rib and pelvis, arm, and skull) are the number

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Injury costs

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one type of injury hospitalizations. They account for nearly 1 million admissions a year.

- Poisonings (overdosing on medications or substances or being given or taking the wrong drug) are the second most common cause of injury hospitalizations. They account for roughly one-quarter of a million cases.
- Brain injury is the most deadly. Each year, 186,000 patients are

admitted and 1 in 10 dies in the hospital. Other deadly injuries, measured by their in-hospital death rates, are spinal cord injury (5.7 percent), burns, and crushing or internal injury (about 4 percent each), and hip fracture (2.9 percent).

- The most frequent cause of injury was falls (38 percent of injury hospital stays). Falls cause nearly 475,000 admissions and account for 68 percent of all injury hospitalizations in patients age 65 and older.

- Other leading causes of injury hospitalizations include motor vehicle crashes, head or body blows, cutting or piercing wounds, other transportation crashes (such as those involving off-road vehicles, horseback riding, and boats), and gunshots.

For more information, see *Frequency and Costs of Hospital Admissions for Injury, 2004, HCUP Statistical Brief #18* and *Common Injuries that Result in Hospitalizations 2004, HCUP Statistical Brief #19* at www.hcup-us.ahrq.gov/reports/statbriefs.jsp. ■

The cost of treating diabetes surges

The cost of caring for U.S. adults with diabetes rose sharply between 1996 and 2003, a period in which the number of patients soared from 9.9 million to 13.7 million and the average annual inflation-adjusted treatment costs rose from \$1,299 to \$1,714, according to reports released by the Agency for Healthcare Research and Quality (AHRQ). The rising costs of prescription drugs accounted for much of the cost increase. For an adult with diabetes, the average annual spending for prescription medicines jumped nearly 86 percent during the time period, from \$476 to \$883. Patients aged 45 to 64, for whom drug costs doubled, were the age group most dramatically affected. The Federal reports also found:

- Overall, hospitals spent \$58 billion in 2004 on the 6 million stays of patients diagnosed with diabetes. This represents 20 percent of the total amount spent by hospitals on the 38.6 million patient stays that year.

- Patients with diabetes tended to be hospitalized longer than other patients. Uninsured diabetes patients with less access to care were more likely to be admitted principally to have their diabetes treated than insured patients.
- The number of foot or lower leg amputations per 1,000 hospital stays of patients with diabetes was twice as high for the uninsured and more than twice as high for men as it was for women.
- Overall care for patients with diabetes—including treatment in all settings and for other illnesses such as congestive heart failure—averaged more than \$10,000 annually.

For more information, see *Proportion and Medical Expenditures of Adults Being Treated for Diabetes, 1996 and 2003, MEPS Statistical Brief #146*, online at www.meps.ahrq.gov/mepsweb and *Hospital Stays Among Patients with Diabetes, 2004, HCUP Statistical Brief #17* at www.ahrq.gov/data/hcup. ■

Hospitalization of obese patients more than doubles

Hospital stays of obese patients increased by 112 percent between 1996 and 2004, rising from 797,000 to 1.7 million, according to a new report by the Agency for Healthcare Research and Quality. The Federal study looked at the hospital stays of patients who were admitted for their

obesity and the stays of obese patients hospitalized for other diseases. The findings relating to patients admitted to the hospital for treatment of obesity include the following:

These patients had 126,000 hospital stays and most were admitted for gastric bypass or other

weight loss surgery, and more than half were 18 to 44 years old. The remaining patients were primarily ages 45 to 64. Women accounted for about 82 percent of all patients admitted for treatment of their obesity.

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Obese patients

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Almost all the patients hospitalized for treatment of obesity were morbidly obese, meaning they weighed at least two times more than their ideal weight. Hospital costs for patients admitted for obesity treatment were an average of \$11,700 per stay.

Obese patients who were admitted to the hospital for other

treatments accounted for the 1.6 million other hospital stays. The greatest proportion – 7 percent – were hospitalized for hardening of the arteries. Other leading conditions included congestive heart failure, osteoarthritis, skin infections, depression, diabetes, and chronic obstructive pulmonary disorder. Obese patients had higher rates of these conditions than non-obese patients.

Nearly three-quarters of patients admitted for other treatments were over 45 years of age, 64 percent were women, and about one-third were morbidly obese. Treating these patients cost hospitals an average of \$8,800 per stay.

For more information, see *Obese Patients in U.S. Hospitals, 2004*, HCUP Statistical Brief # 20 at www.hcup-us.ahrq.gov/reports/statbriefs.jsp. ■

New report offers first look at sickle cell disease hospitalizations in 10 years

The first Federal analysis in a decade of sickle cell disease hospitalizations shows that admissions of adults remained stable from 1997 to 2004. In 2004, approximately 83,000 hospital stays were for adults and 30,000 were for children. Of the latter, 2,000 stays were for infants, according to a new report issued by the Agency for Healthcare Research and Quality.

Sickle cell disease, an inherited blood disease mostly affecting African Americans, causes red blood cells to lose their shape, block circulation, and cause organ damage. The illness has no common cure and patients with periodic pain are often treated with pain medications.

The study found:

- Patients spent about 5 days in the hospital, which cost facilities an average of \$6,223 per stay. Total hospital costs were nearly \$500 million overall in 2004.

- Medicaid paid for 65 percent of the stays for patients hospitalized primarily for sickle cell disease, Medicare paid 13 percent, private insurers were responsible for 15 percent, and 4 percent were uninsured.
- The number of people with sickle cell disease who died while hospitalized in 2004 was relatively low — 699 adults and 47 children. In-hospital deaths for children remained low and constant from 1994 to 2004.

For more information, see *Sickle Cell Disease Patients in U.S. Hospitals, 2004*, HCUP Statistical Brief # 21 at www.hcup-us.ahrq.gov/reports/statbriefs.jsp. The report uses statistics from the Nationwide Inpatient Sample, a database of hospital inpatient stays that is nationally representative of all short-term, non-Federal hospitals. The data are drawn from hospitals that comprise 90 percent of all discharges in the United States and include all patients, regardless of insurance type as well as the uninsured. ■

New disaster planning guide offers valuable mass casualty care information

The Agency for Healthcare Research and Quality (AHRQ) has released *Providing Mass Medical Care With Scarce Resources: A Community Planning Guide*, which provides community planners, as well as planners at the institutional, State, and Federal levels, with valuable information to help plan for and respond to a mass casualty event (MCE). An MCE is a catastrophic public health or terrorism-related event, such as an influenza pandemic, in which the needs of tens of thousands of patients or victims could overwhelm the community's healthcare system.

This planning guide examines MCE response and preparedness challenges across a wide range of health care settings and provides recommendations for planners in specific areas. It also discusses:

- Ethical and legal considerations related to MCE planning in prehospital, hospital, acute care, and alternative care sites.
- Planning for palliative care, or the aggressive management of symptoms and relief of suffering, that must be integrated into the planning for, and response to, an MCE.
- Situations that communities could face as a result of an MCE.
- Key constructs, principles, and structures that should be incorporated into the advanced planning.
- Approaches and strategies that could be used to provide the most appropriate standards of care possible under the circumstances.
- Examples of tools and resources that are available to help States and communities in their planning process.
- Illustrative examples of how health systems, communities, and States have approached certain issues as part of their MCE-related planning efforts.

Providing Mass Medical Care With Scarce Resources: A Community Planning Guide is the product of a collaborative effort between AHRQ and the Department of Health and Human Service's Office of Public Health Emergency Preparedness and can be found online at www.ahrq.gov/research/mce. Print copies (AHRQ publication no. 07-0001) are also available from AHRQ.* ■

Research Briefs

Bell, C.M., Urbach, D.R., Ray, J.G., and others. (2006, February). "Bias in published cost effectiveness studies: Systematic review." (AHRQ grant HS10919). *British Medical Journal* 332, pp. 699-703.

Many insurers now require some form of cost effectiveness analysis before covering health interventions. This study found that most published analyses reported favorable incremental cost effectiveness ratios, with medical interventions costing below \$20,000, \$50,000, and \$100,000 per quality adjusted life year (QALY) gained. Studies by

industry were more likely to report ratios below the three thresholds. Studies of higher methodological quality and those conducted in Europe and the United States rather than elsewhere were less likely to report ratios below \$20,000/QALY. These findings were based on a review of 494 studies measuring health effects in QALYs published up to December 2001.

Blake, S.C., Kohler, S., Rask, K., and others. (2006, September). "Facilitators and barriers to 10 National Quality Forum safe practices." (AHRQ contract 290-

00-0011). *American Journal of Medical Quality* 21, pp. 323-334.

The National Quality Forum (NQF) has listed 30 safe practices for hospitals to adopt to improve health care. Implementing safety practices can be a difficult process, replete with organizational, financial, and professional barriers. Interviews with Georgia hospital administrators identified several key factors that resulted in the adoption and/or nonadoption of 10 NQF safe practices in 2 areas: medication safety and the culture of safety. Medication safety practices ranged from pharmacist

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consultation with prescribers and review of medication orders to recording of verbal medication orders, use of standardized abbreviations and dosage designations, implementation of a computerized order entry system, and identification of all high-alert drugs. Culture of safety practices ranged from a blame-free, user-friendly, and confidential error-reporting system to safe staffing ratios, positive feedback from hospital supervisors/managers, teamwork within hospital units, and smooth transfer and handoff of patients within and among hospital units.

Brauer, C.A., Rosen, A.B., Greenberg, D., and Neumann, P.J. (2006, July). "Trends in the measurement of health utilities in published cost-utility analyses." (AHRQ grant HS10919). *Value In Health* 9(4), pp. 213-218.

Many experts and consensus groups have recommended cost-utility analysis (CUA) as the gold standard for conducting economic evaluations of medical interventions. Increasingly, analysts conducting CUAs are using generic, preference-weighted instruments, and relying on community-based preferences. The catalog of utility weights developed by these authors provides a useful reference tool for producers and consumers of CUAs. The catalog also highlights the continued need for improvement in methods and transparency, note the authors. This paper presents an update, through 2001, to their current registry of utility weights, and documents recent changes in methods used for utility weight calculation.

Clancy, C.M. (2006). "Enhancing quality improvement." *Healthcare Papers* 6(3), pp. 46-50.

In this commentary, the Director of the Agency for Healthcare Research and Quality notes that a substantial gap exists between the best possible care and the care that is routinely delivered in most developed nations. Numerous research studies and reports from authoritative organizations such as the U.S. Institute of Medicine have provided compelling evidence that care is not consistently safe, timely, effective, equitable, efficient, or patient-centered. In fact, a landmark study published in 2003 reported that Americans receive recommended care only 55 percent of the time. A recent survey of sicker adults conducted by the Commonwealth Fund in six developed countries underscores the pervasive challenges of providing high-quality care. There is room for significant improvement in all developing nations, concludes the author. Reprints (AHRQ Publication No. 07-R005) are available from AHRQ.*

Clancy, C. (2006, September). "The intensive care unit, patient safety, and the Agency for Healthcare Research and Quality." *American Journal of Medical Quality* 21(5), pp. 348-351.

There are about 6,000 intensive care units (ICUs) in the United States, caring for about 55,000 patients each day. Some estimates indicate that about 85,000 medical errors occur each day in American ICUs, of which 24,650 are potentially life-threatening. In a commentary, the Director of the Agency for Healthcare Research and Quality (AHRQ) highlights some of the major issues in ICU safety and describes ICU patient

safety studies and activities that AHRQ supports. Study topics have ranged from the impact of sleep deprivation on staff performance to incident reporting and staffing with intensivists (physicians specialized in intensive care). A group of AHRQ-supported researchers has developed an ICU Safety Reporting System, a Web-based incident reporting system that collects information about adverse events and near misses reported by clinical staff in ICUs. Another project, the Keystone ICU Patient Safety Project, designed and implemented unit-based safety programs and daily goals sheets to help eliminate bloodstream infections and eradicate ventilator-associated pneumonia. Finally, AHRQ's 2001 report *Making Health Care Safer*, included a chapter on the importance of using intensivists in hospital ICUs, an approach later studies have shown improves ICU patient health and care costs. Reprints (AHRQ Publication No. 07-R001) are available from AHRQ.*

Clancy, C.M., McNeill, D., Moy, E., and Dayton, E. (2006, June). "Agency for Healthcare Research and Quality's National Quality and Disparities Reports emphasize patient safety." *Journal of Patient Safety* 2(2), pp. 70-71.

This commentary reviews the implications for patient safety of the Agency for Healthcare Research and Quality's two Congressionally mandated reports, the *National Healthcare Quality Report (NHQR)* and the *National Healthcare Disparities Report (NHDR)*. Even in the relatively brief span of 2 years, these annual reports showed improvements in patient safety. For example, the *NHQR*'s five core measures of patient safety increased at an

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annual median rate of improvement of 10.2 percent. Similarly, this year's third edition of the *NHDR* indicates that ethnic/racial disparities in patient safety are less substantial than disparities in quality. Overall, minority hospital inpatients tended to have more nosocomial infections, potentially avoidable deaths, and complications of care compared with whites. On the other hand, minority patients tended to have fewer hospital injuries, adverse events related to technical errors, and birth-related traumas. Reprints (AHRQ Publication No. 07-R013) are available from AHRQ.*

Coben, J.H., Steiner, C.A., Barrett, M., and others. (2006). "Completeness of cause of injury coding in healthcare administrative databases in the United States." *Injury Prevention* 12, pp. 199-201.

External cause of injury codes (E-codes) describe the mechanism and intent of an injury. E-code reporting in administrative databases is relatively complete, but there is significant variation in completeness in State databases. This study found that States with mandates for the collection of E-codes and with a mechanism to enforce those mandates had the highest rates of E-code reporting. Nine Statewide emergency department (ED) data systems showed consistently high E-coding completeness. The findings were based on analysis of the 2001 Healthcare Cost and Utilization Project State Inpatient Databases, a Nationwide Inpatient Sample, and nine State ED databases. Reprints (AHRQ Publication No. 07-R009) are available from AHRQ.

Fongwa, M.N., Cunningham, W., Weech-Maldonado, R., and others. (2006, October). "Comparison of data quality for reports and ratings of ambulatory care by African American and white Medicare managed care enrollees." (AHRQ grant HS09204). *Journal of Aging and Health* 18(5), pp. 707-721.

More data is missing for elderly black than white Medicare managed care enrollees on all items of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey of health plans. Higher missing data rates and lower plan-level reliability estimates for black Medicare managed care enrollees suggest caution in making race/ethnicity comparisons across health plan evaluations. Future efforts are needed to enhance the quality of data collected from older blacks, conclude the researchers. They analyzed CAHPS health plan survey data collected from 109,980 Medicare managed care enrollees in 321 health plans to compare missing data and reliability of health care evaluations.

Gorelick, M.H. (2006). "Bias arising from missing data in predictive models." (AHRQ grant HS11395). *Journal of Clinical Epidemiology* 59, pp. 1115-1123.

This author examined the effect of three common approaches to handling missing data on the results of a predictive model of hospital admission. The study used logistic regression analysis of complete data to predict hospital admission based on white blood cell count (WBC), presence of fever, or procedures performed (PROC). The author performed a series of simulations in which WBC data were deleted for varying proportions (15 to 85 percent) of patients under various patterns of missingness. Three approaches to

handling missing data on the results of the predictive model were used: analysis restricted to cases with complete data, missing data assumed to be normal, and use of imputed values. Results showed that all three methods of handling large amounts of missing data can lead to biased estimates of the odds ratio for WBC, fever, and PROC, and overall predictive model performance.

Gupta, D., Potthoff, S., Blowers, D., and Corlett, J. (2006, July). "Performance metrics for advanced access." (AHRQ grant HS13023). *Journal of Healthcare Management* 51(4), pp. 246-258.

This article proposes several performance measures that can help clinic directors monitor and evaluate their advanced access implementation. Advanced access is an outpatient scheduling technique that aims to provide same-day appointment access. It is designed to reduce the time patients must wait for a scheduled appointment and to improve continuity of care by matching daily appointment supply and demand. Factors that make it difficult to sustain initial success in achieving supply-demand balance include different practice styles of doctors, differences in panel compositions and patient preferences, and time-varying demand patterns.

Henriksen, K., Keyes, M.A., Stevens, D.M., and Clancy, C.M. (2006, March). "Initiating transformational change to enhance patient safety." *Journal of Patient Safety* 2(1), pp. 20-24.

Transformational change is a daunting undertaking, but one that is needed in health care. This paper explores what transformational change means with respect to

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patient safety and quality initiatives. It draws on the transformational change literature to help identify the distinguishing features of successful transformations, and provides emerging findings and examples in health care that illustrate transformational concepts in practice. For example, introducing new information technology prompts changes in work procedures, work flow, communication networks, performance standards, needed subject matter expertise, personnel decisions, and other activities. Reprints (AHRQ Publication No. 07-R003) are available from AHRQ.*

Hubbard, H.B. (2006, September). “**Interdisciplinary research: The role of nursing education.**” *Journal of Professional Nursing* 22(5), pp. 266-269.

Because of health care’s increased complexity and subsequent reliance on interdisciplinary collaboration, nursing faculty have the opportunity to encourage emerging nurse scientists to be part of multidisciplinary teams that address a variety of healthcare issues, notes the author. She details the educational requirements necessary for an emerging nurse scientist, as well as the requirements that nurse investigators will encounter from funding agencies along the research trajectory. Through this dual lens, she defines health services research, which by its nature is interdisciplinary and multidisciplinary, examines its importance, and integrates its application with nursing education. Reprints (AHRQ Publication No. 07-R006) are available from AHRQ.*

Indik, J.H., Pearson, E.C., Fried, K., and Woosley, R.L. (2006, September). “**Bazett and Fridericia QT correction formulas interfere with measurement of drug-induced changes in QT interval.** (AHRQ grant HS10385). *Heart Rhythm* 3(9), pp. 1003-1007.

The QT interval on the electrocardiogram is prolonged by more than 50 marketed drugs, an effect that has been associated with sudden cardiac death due to arrhythmia. Because changes in heart rate also change the QT interval, it has become standard practice to use a correction formula, such as the Bazett formula, to normalize the QT interval to a heart rate of 60 beats per minute. This study shows how the Bazett formula and three other formulas influenced assessment of the QT-prolonging effect of the potassium channel-blocking drug ibutilide. The researchers used a standard physical activity protocol to assess the QT interval over a broad range of heart rates before and after an infusion of ibutilide that produced a stable 15- to 20-ms QT prolongation in consenting normal subjects. At heart rates from 60 to 120 beats per minute, the Bazett and Fridericia correction formulas overestimated the change in QT in both men and women. However, the Framingham and Hodges formulas did not alter the accuracy of the assessment of QT interval change.

Localio, A.R., Berlin, J.A., and Have, T.R. (2006). “**Longitudinal and repeated cross-sectional cluster-randomization designs using mixed effects regression for binary outcomes: Bias and coverage of frequentist and Bayesian methods.**” (AHRQ grant HS11481). *Statistics in Medicine* 25, p. 2720-2736.

This study examined two distinct cluster randomization designs, in which a treated group and a control

group are followed over time. These designs can be a powerful tool to measure the effect of medical interventions that must be applied to all individuals in the cluster. In a repeated cross-sectional design, patients who are naturally grouped within clusters or centers are recruited at baseline, but they cannot be followed individually. Rather, different patients within the same center are measured at each subsequent time period. In a second longitudinal design, individual patients are followed longitudinally within clusters, while the treatment is allocated to all patients in the centers. The authors concluded that the performance of common statistical tools for the analysis of cluster randomization designs depends heavily on the precise design, the number of clusters, and the variability of baseline outcomes and treatment effects across centers.

Max, M.B., Wu, T., Atlas, S.J., and others. (2006, April). “**A clinical genetic method to identify mechanisms by which pain causes depression and anxiety.**” (AHRQ grants HS06344, HS08194, and HS09804). *Molecular Pain* 2(4), pp. 14-25.

Pain patients are often depressed and anxious, and benefit less from psychotropic drugs than pain-free patients. These authors propose a method to prioritize molecular targets by studying polymorphic genes in patients undergoing lumbar spine surgical procedures associated with a variable pain relief response. Their goal was to identify molecules through which pain alters mood during the first postoperative year. In patients whose pain was reduced by over 25 percent by surgery, symptoms of depression and anxiety improved briskly at the first postoperative measurement. In patients with little or no surgical

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pain reduction, mood scores stayed about the same on average.

Polymorphisms in three pre-specified pain-mood candidate genes were not associated with postoperative mood or with a pain-gene interaction on mood.

However, an exploratory survey of 25 other genes illustrates pain-gene interactions on postoperative mood - the mu opioid receptor for short-term effects of acute sciatica on mood, and the galanin-2 receptor for effects of unrelieved post-discectomy pain on mood 1 year after surgery.

Parzen, M., Lipsitz, S.R., Fitzmaurice, G.M., and others. (2006). "Pseudo-likelihood methods for longitudinal binary data with non-ignorable missing responses and covariates." (AHRQ grant HS10871). *Statistics in Medicine* 25, pp. 2784-2796.

In longitudinal studies, it is common for outcomes and any time-varying covariates to be missing due to missed study visits, resulting in nonmonotone patterns of missingness. Furthermore, the reasons for missed visits may be related to the specific values of the response and/or covariates that should have been obtained. In other words, missingness is nonignorable. With nonmonotone, nonignorable missing response and covariate data, a full likelihood approach is quite complicated. Also, maximum likelihood estimation can be computationally prohibitive when there are many occasions of followup. Furthermore, the full likelihood must be correctly specified to obtain consistent parameter estimates. These authors propose a pseudo-likelihood method for jointly estimating the covariate

effects on the marginal probabilities of the outcomes and the parameters of the missing data mechanism.

Serwint, J.R., Thomas, K.A., Dabrow, S.M., and others. (2006, September). "Comparing patients seen in pediatric resident continuity clinics and national ambulatory medical care survey practices: A study from the continuity research network." (AHRQ grant HS13582). *Pediatrics* 118(3), pp. e849-e857.

This study found that residents in Continuity Research Network (CRN) practices provide care to more underserved patients than pediatric practices that participate in the National Ambulatory Medical Care Survey (NAMCS). However, the Network practices evaluate problems that are similar to those observed in NAMCS office practices. Thus, CRN practices provide important training experiences for residents, who will serve both minority and nonminority children, concludes this study. The researchers compared data for CRN practice visits during a 1-week period in 2002 with data from the 2000 NAMCS.

Talcott, J.A., Clark, J.A., Manola, J., and Mitchell, S.P. (2006, October). "Bringing prostate cancer quality of life research back to the bedside: Translating numbers into a format that patients can understand." (AHRQ grant HS08208). *The Journal of Urology* 176, pp. 1558-1564.

Most treatments of clinically localized prostate cancer cause some degree of permanent erectile dysfunction and, less often, urinary or bowel symptoms. Understanding the likely effects of their treatment options is often a crucial step for

men toward making a difficult decision with lasting consequences. Sophisticated quality-of-life measures produce purely numerical results that patients find difficult to understand. The authors of this paper present an approach that preserves the methodological strengths of validated multi-item measures, but provides more accessible information for clinical use. They use symptom indexes to define levels of function to produce a quality-of-life metric that is valid, defines quantitative intervals, is transparent, and may be more useful to patients attempting to choose a prostate cancer treatment.

Welch, W.P., Rudolph, B.A. Blewett, L.A., and others. (2006). "Management tools for Medicaid and State Children's Health Insurance Program (SCHIP)." *Journal of Ambulatory Care Management*, 29(4), pp. 272-282.

State Medicaid health insurance programs for low-income families and the State Children's Health Insurance Program (SCHIP) need analytic tools to manage their programs. Drawing upon extensive discussions with experts in various States, this article describes the state of the art in use of analytic tools to manage health insurance programs, and makes several observations. First, several States have linked Medicaid/SCHIP administrative data to other data, such as birth and death records, to measure access to care. Second, several States use managed care encounter data to set payments. Third, the analysis of pharmacy claims data appears widespread. The authors also describe "lessons learned" regarding building capacity and improving data to support the implementation of management tools. ■

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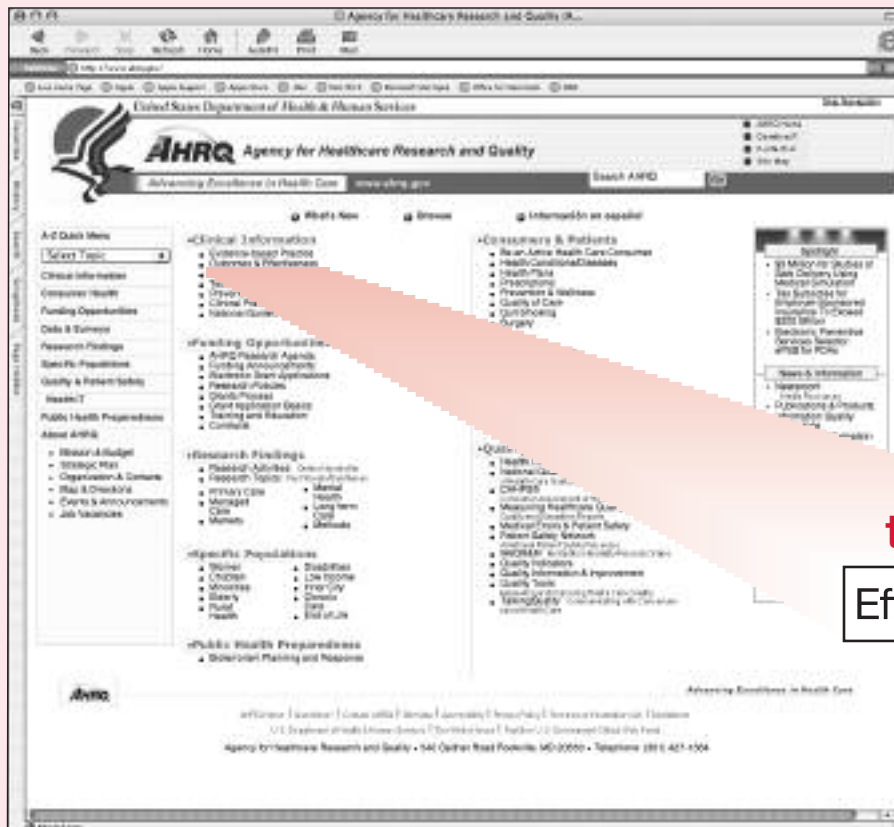
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