Research Activities

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Agency for Healthcare Research and Quality

Highlights

Departments

Regular Features

Preventing diabetes complications could save $2.5 billion annually

A new research synthesis from the Agency for Healthcare Research and Quality estimates that the Nation could save nearly $2.5 billion a year by preventing hospitalizations due to severe diabetes complications. Diabetes is an increasingly common chronic disease. Currently, diabetes affects 18 million Americans, or about 6 percent of the population.

Complications associated with diabetes that may require hospitalization include heart disease, stroke, kidney failure, and blindness, as well as nerve and blood circulation problems that can lead to lower limb amputations. Much of the time, complications can be prevented or delayed with good primary care and patient compliance with the advice from providers. According to the research synthesis:

- Reducing hospital admissions for diabetes complications could save the Medicare program $1.3 billion annually and Medicaid $386 million a year.
- Nearly one-third of patients with diabetes were hospitalized two or more times in 2001 for diabetes or related conditions, and their costs averaged three times as high as those for patients with single hospital stays – $23,100 versus $8,500.
- The risk of hospitalization for cardiovascular disease was two to four times as high in women with diabetes as in those who did not have diabetes.
- African-American, other minority, and poor patients regardless of race or ethnicity were more likely to be hospitalized multiple times for diabetes complications than non-Hispanic white and higher income patients.

Economic and Health Costs of Diabetes, HCUP Highlights Issue No. 1 (AHRQ Publication No. 05-0013) summarizes findings from studies that were based on 2001 data from AHRQ's Healthcare Cost and Utilization Project. To access a

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Diabetes complications

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copy online, go to www.ahrq.gov/data/hcup/highlight1/high1.htm. Print copies are available from AHRQ.* See the back cover of *Research Activities* for ordering information.

Editor's note: Another tool, *Diabetes Care Quality Improvement: A Resource Guide for State Action*, (AHRQ Publication No. 04-0072)* and its companion workbook (AHRQ Publication No. 04-0073), were published recently by AHRQ to help State legislators, health departments, diabetes prevention and control programs, and Medicaid officials assess the quality of care for diabetes at the primary care level and develop improvement strategies. The resources, which were developed in partnership with the Council of State Governments, can be found online at www.ahrq.gov/ qual/ diabqualoc.htm. Print copies are available from AHRQ.* ■

Patient Safety/Quality

New study on computerized order entry finds flaws that could lead to errors, but there are opportunities for improvement

Although computerized physician order entry (CPOE) is expected to significantly reduce medication errors, systems must be implemented thoughtfully to avoid facilitating certain types of errors, according to a recent study supported by the Agency for Healthcare Research and Quality (HS11530). For the study, researchers examined clinicians' experience in using one CPOE system at a major urban teaching hospital.

According to AHRQ Director Carolyn M. Clancy, M.D., the findings are typical for products early in their implementation, and new health care information technology products usually go through an ongoing process of refinement and improvement as health care workers identify problems. Ideally, principles of human factors research, usability testing, and workflow impact should all be considered before products are released into the workplace.

The researchers identified 22 situations in which the CPOE system increased the probability of medication errors. According to the researchers, these situations fell into two categories: information errors generated by fragmentation of data and hospitals' many information systems and interface problems between humans and machines, where the computers' requirements are different than the way clinical work is organized.

Some of the flaws identified by the study include:

- Medical staff may look to the CPOE system to determine minimal effective or usual dosage for infrequently used medications. However, the CPOE system may only reflect dosage sizes available at the pharmacy, which may differ from the minimal or usual dosage that should be prescribed. The flaw represents an inappropriate use of the data available on the CPOE system and could result in prescribing an incorrect dosage.
- Clinicians could select the wrong patient file because names and drugs can be hard to read, and patients' names do not appear on all screens.
- A patient's medication information is seldom synthesized on a single screen. Up to 20 screens might be needed to see all of a patient's medications, increasing the likelihood of selecting a wrong medication.

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Computerized order entry

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- Because of patient load and multiple tasks, nurses are often unable to enter timely information on the computer about the administration of drugs. The delayed information may affect later medication and clinical decisions.
- Computer downtime, whether for maintenance or in the event of "crashes," can result in delays in medications reaching patients.

The study was led by Ross Koppel, Ph.D., of the University of Pennsylvania. It is based on interviews with medical staff, focus groups, shadowing staff as they worked, and a survey of interns and residents at a major urban teaching hospital with a widely used CPOE system.

Although these findings are important, Dr. Clancy notes that the study focuses on the experience of one hospital and one product and may not be easily applied to industry at large. It means these products are in their early implementation period, and there will be a learning period to both improve these systems and make CPOE function at its best. Implementation problems would be minimized through testing before products are marketed and through adaptation to meet the needs of individual clinical settings.

For more information, see "Role of computerized physician order entry systems in facilitating medication errors," by Dr. Koppel, Joshua P. Metlay, M.D., Ph.D., Abigail Cohen, Ph.D., and others, in the March 9, 2005 *Journal of the American Medical Association* 293(10), pp. 1197-1203.

Editors note: AHRQ is funding more than $139 million in grants and contracts nationwide over 3 years to support planning, implementation, and evaluation of health information technologies, including CPOE. AHRQ is also funding studies of how information technologies affect clinical workflow. AHRQ-supported projects assess the benefits and also identify any problems in using health information technology.

In addition, AHRQ is working with an organization of leading employers who are major health benefits purchasers, the Leapfrog Group, to develop an evaluation tool to assess the effectiveness of CPOE and electronic prescribing in reducing medical errors. The development of this evaluation tool is being supported to encourage and enable ongoing evaluation of CPOE and other information technologies as they are considered for incorporation into clinical settings to improve the quality of health care. ■

Computerized standing orders can increase rates of flu and pneumonia vaccination of hospital patients

Computerized standing orders are more effective than computerized reminders for increasing both influenza and pneumococcal vaccine administration among hospitalized patients, concludes a study supported in part by the Agency for Healthcare Research and Quality (HS07719). The researchers randomized 3,777 general medicine patients discharged from one of six hospital wards during a 14-month period in 1998 and 1999. The study period included two overlapping influenza seasons.

The hospital's computerized physician order entry system identified inpatients eligible for influenza and pneumococcal vaccination. For patients with standing orders, the system automatically produced vaccine orders directed to nurses at the time of patient discharge. No physician signature was required. For patients with reminders, the computer system provided reminders to physicians that included vaccine orders during routine order entry sessions. The doctors still had to

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write the orders and have them carried out.

During the 6-month influenza season, 50 percent of all hospitalized patients were identified as eligible for influenza vaccination. During the entire 14-month study period, 22 percent of patients were found eligible for pneumococcal vaccination. Patients with standing orders received an influenza and pneumococcal vaccine significantly more often (42 and 51 percent, respectively) than patients with reminders (30 and 31 percent, respectively).

More details are in "Inpatient computer-based standing orders vs physician reminders to increase influenza and pneumococcal vaccination rates," by Paul R. Dexter, M.D., Susan M. Perkins, Ph.D., Kati S. Maharry, M.A.S., and others, in the November 17, 2004 *Journal of the American Medical Association* 292(19), pp. 2366-2371. ■

Skipping meals or breaks may contribute to nurse burnout and jeopardize nurses' health

A new study suggests that nurses are regularly sacrificing their breaks and meal periods to provide patient care. The researchers found that nurses took a break or ate a meal free of patient care responsibilities in less than half (47 percent) of the shifts they worked over a 1-month period. During the remaining shifts, they either worked nonstop throughout the entire shift (10 percent of shifts) or were able to sit down for only a short period, while remaining responsible for patient care activities during their breaks or meals (43 percent of shifts).

Nurses who were unable to take a break made no more errors than those who were able to take a break. However, staffing levels so low that nurses feel they must work nonstop to meet the needs of their patients may contribute to burnout and nurses leaving the profession, and it may jeopardize their health, says Ann E. Rogers, Ph.D., R.N., F.A.A.N., of the University of Pennsylvania. In a study that was supported by the Agency for Healthcare Research and Quality (HS11963), Dr. Rogers and her colleagues analyzed the breaks of 393 registered nurses (RNs) who worked full time as hospital staff nurses. The nurses completed logbooks for 28 days on their work hours, errors or near-errors, episodes of drowsiness and actual sleep on duty, duration of breaks taken during each shift, and whether they were relieved of patient care responsibilities during their meals and/or breaks.

Although nearly 40 percent of the shifts exceeded 12 hours, nurses working longer shifts were no more likely to be able to take a break than nurses working shorter shifts. There were 189 errors (most of them medication errors) reported by 30 percent of the nurses during the 28-day period. Although the absence of a break did not increase the risk of making an error, longer breaks appear to offer some protection against making errors. Breaks averaged 23.8 minutes on shifts without errors, whereas breaks averaged only 16.2 minutes on shifts when errors occurred. Also, nurses had 10 percent less risk of making at least one error when they had an additional 10 minutes for their breaks and meals.

See "The effects of work breaks on staff nurse performance," by Dr. Rogers, Wei-Ting Hwang, Ph.D., and Linda D. Scott, Ph.D., R.N., in the November 2004 *Journal of Nursing Administration* 34(11), pp. 512-519. ■

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Health plans take action to improve services for members with limited English proficiency

The quality of communication between patients and clinicians can have a significant impact on health outcomes, and limited English proficiency can interfere with effective communication. Over 10 million U.S. residents speak English poorly or not at all, constituting a language chasm in the health care system, according to researchers at the Agency for Healthcare Research and Quality.

A team of researchers led by Cindy Brach, in AHRQ's Center for Delivery, Organization, and Markets, reviewed the research literature and found that language barriers have a demonstrable negative impact on access, quality, patient satisfaction, and in some instances, cost. Furthermore, the research demonstrates that language assistance—bilingual clinicians and interpreter services—is effective in improving care. To determine how health plans actually implement language assistance programs, the researchers identified and interviewed representatives of 14 health plans that are trailblazers in the area of linguistic competence.

Although each of the plans operated in somewhat different ways, most performed four critical functions: collecting member language data, recruiting and identifying bilingual staff and physicians, organizing and financing interpreter services, and educating members and physicians about interpreter services. The data collected suggest six priority activities for plans seeking to improve their linguistic competence:

1. Develop a language assistance plan.
2. Collect and use language data.
3. Don't rely exclusively on physicians who historically have served populations with limited English proficiency.
4. Educate physicians and hold them accountable.
5. Recognize language assistance as an integral part of quality.
6. Negotiate with purchasers.

The authors also gleaned lessons for purchasers, such as paying for interpreter services, making expectations explicit, and requiring reporting on language assistance. Policymakers can also play a role in crossing the language chasm through activities such as encouraging and supporting collection of language data and developing national measures and standards. Finally, the authors note that there are many unanswered questions about the impact of cultural and linguistic competence on health care delivery and health outcomes. They refer readers to *Setting the Agenda for Research on Cultural Competence in Health Care*, which was published by the Office of Minority Health and AHRQ in 2004.

For more details, see "Crossing the language chasm," by Cindy Brach, Irene Fraser, and Kathy Paez, in the March/April 2005 *Health Affairs* 24(2), pp. 424-434. Reprints (AHRQ Publication No. 05-R038) are available from AHRQ.* See the back cover of *Research Activities* for ordering information. ■

Outcomes/Effectiveness Research

Increased use of early revascularization in heart attack patients with cardiogenic shock will save lives

Revascularization (coronary angioplasty or coronary artery bypass graft surgery) within 6 hours of a heart attack complicated by cardiogenic shock increases survival rates. Although rare, cardiogenic shock is a dangerous complication of heart attack in which the heart is so damaged that it cannot pump enough blood to the body. In New York City, only certain hospitals have the capacity to perform revascularization. The possibility of early revascularization depends on admission to a hospital that has the capacity to perform this service.

According to a recent study, the number of patients who had this complication and were admitted to New York City hospitals with the capacity to perform revascularization increased modestly from 2000 to 2002 compared with 1995 to 1999. This seemed to be an ongoing trend rather than a reaction to the 1999 recommendation of early revascularization of such patients by the American College of Cardiology/American Heart Association (ACC/AHA), according to Jing Fang, M.D., and Michael H. Alderman, M.D., of the Albert Einstein College of

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Medicine. Their work was supported by the Agency for Healthcare Research and Quality (HS11612).

The researchers examined New York hospital discharge records before and after publication of the ACC/AHA guidelines to determine whether the rates of revascularization increased after publication of the guidelines and, if an increase occurred, whether it was due to increasing admission to hospitals with this capacity, to increased use of the procedure among patients who had been admitted to such hospitals, or a combination of the two factors.

Over the years, 58 percent of patients who suffered cardiogenic shock died during hospitalization compared with 8 percent of those with heart attack but not shock. For hospitals with revascularization services, the rates of revascularization did not increase from 1995 to 1999 or from 2000 to 2002. However, admissions to these hospitals increased from 54 to 61 percent from 1995 to 1999. The researchers conclude that the modest increase in these procedures from 1995 to 1999 and from 2000 to 2002 reflected a trend already underway before the ACC/AHA recommendation. Ambulance delivery directly to revascularizing hospitals or wider distribution of those facilities and increased performance of these procedures in such hospitals may improve adherence to ACC/AHA guidelines, note the researchers.

See "Revascularization among patients with acute myocardial infarction complicated by cardiogenic shock and impact of American College of Cardiology/American Heart Association guidelines," by Drs. Fang and Alderman, in the November 15, 2004 *American Journal of Cardiology* 94, pp. 1281-1285. ■

Enhanced CT performs better than unenhanced CT in predicting extent of damaged brain tissue in acute stroke patients

By identifying brain tissue that has been damaged due to lack of blood supply (ischemia), computerized tomography (CT) helps confirm the diagnosis of acute stroke. However, because normal noncontrast CT (NCCT) scans are relatively common when the scans are performed very early after onset of stroke symptoms, they introduce diagnostic uncertainty for the stroke neurologist. CT angiography-source images (CTA-SI) ASPECTS (Alberta Stroke Program Early CT Score), or enhanced CT, has a greater sensitivity to ischemic changes and more accurately identifies the volume of tissue that will ultimately infarct (die) compared with NCCT (unenhanced CT) alone, according to a recent study supported in part by the Agency for Healthcare Research and Quality (HS11392). The study was conducted by researchers at the University of Calgary, Alberta, and Harvard Medical School.

In seven of ten study cases, the ischemia would have been totally missed by one of the expert raters with use of NCCT alone, according to the researchers. They used two expert raters to assign ASPECTS on the acute NCCT, CTA-SI, and followup imaging and then compared the mean baseline ASPECTS of acute NCCT and CTA-SI with the followup ASPECTS. Nearly two-thirds (62 percent) of the 39 patients studied had proximal occlusion (of the internal carotid artery or middle cerebral artery), 18 percent had M2 occlusion, and 20 percent had no occlusion. The median time between symptom onset and CT imaging was 1.9 hours.

There was a significantly larger difference of 1.4 between the mean baseline NCCT and CTA-SI ASPECTS in patients who had more ischemic changes (follow-up ASPECTS of 0 to 3) compared with a difference of 0.6 in patients who had near-to-normal CT scans (follow-up ASPECTS of 8 to 10). Twice as many patients with near-to-normal CT scans (52 percent) had favorable outcomes compared with those who had more ischemic changes (NCCT ASPECTS of 0 to 7) (25 percent). For patients with acute CTA-SI ASPECTS of 8 to 10, the rate of favorable outcome was 59 percent versus 32 percent for those with 0 to 7.

See "ASPECTS on CTA source images versus unenhanced CT: Added value in predicting final infarct extent and clinical outcome," by Shelagh B. Coutts, M.B., Ch.B., Michael H. Lev, M.D., Michael Eliasziw, Ph.D., and others, in the November 2004 *Stroke* 35, pp. 2472-2476. ■

Androgen-deprivation therapy for prostate cancer increases the risk of fracture among elderly men

The use of androgen-deprivation therapy for prostate cancer has increased substantially over the past 15 years. This therapy has been associated with a loss of bone mineral density. It also increases an elderly man's risk of bone fracture, according to a study supported in part by the Agency for Healthcare Research and Quality (HS11618). This finding underscores the need for caution in the use of these therapies in settings without clear evidence of benefit, notes Jean L. Freeman, Ph.D, of the University of Texas Medical Branch.

Dr. Freeman and her colleagues linked the database of the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program with Medicare files to assess the risk of fracture associated with androgen deprivation in the form of orchiectomy (surgical removal of one or both testicles) or treatment with gonadotropin-releasing hormone agonists. They studied two groups of men aged 66 and older who were diagnosed with prostate cancer from 1992 through 1997: an androgen-deprivation group and a control (non-treatment) group.

Among men who survived at least 5 years after diagnosis, 19.4 percent of those in the androgen-deprivation group had a fracture compared with 12.7 percent of those not receiving the treatment. Also, 5.2 percent of those treated with androgen-deprivation therapy were hospitalized with a fracture compared with 2.4 percent of those not treated.

The relative risk of any fracture and fractures requiring hospitalization was 1.45 and 1.66, respectively, among those receiving nine or more doses of gonadotropin-releasing hormone agonist in the first 12 months following diagnosis and 1.54 and 1.70, respectively, among those who underwent orchiectomy. The researchers calculated that about 3,000 excess fractures per year could be attributable to the use of gonadotropin-releasing hormone agonists, even after adjustment for known confounding factors and preexisting bone disease.

More details are in "Risk of fracture after androgen deprivation for prostate cancer," by Vahakn B. Shahinian M.D., Yong-Fang Kuo, Ph.D., Dr. Freeman, and James S. Goodwin, M.D., in the January 13, 2005 *New England Journal of Medicine* 352(2), pp. 154-164. ■

Pharmaceutical Research

Use of certain antidepressants may increase risk of hip fractures among older patients

Nearly one in six individuals aged 65 or older suffers from depression. They are treated primarily with antidepressants, which have been associated with an increased risk of hip fracture in studies using Medicare claims data. Although these claims data tend to overestimate the relationship between antidepressant use and hip fractures, there remains a significant association, according to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS10881).

Sebastian Schneeweiss, M.D., Sc.D., and Philip S. Wang, M.D., Dr.P.H., of Brigham and Women's Hospital and Harvard Medical School, used the Medicare Current Beneficiary Survey to determine the association between use of selective serotonin reuptake inhibitor (SSRI) antidepressants and five factors also known to affect hip fracture risk. These five confounding factors, which were not measured in the Medicare claims data, include body mass index (BMI, heavier weight tends to strengthen bones leading to lower risk of fracture), smoking

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Antidepressants

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(which increases fracture risk), activity of daily living (ADL) score (limited activity can weaken bones and instability can lead to falls), cognitive impairment (which can lead to falls), and physical impairment (impairment can lead to instability and falls).

Comparing SSRI users with nonusers, the researchers found considerable overestimation of an association between SSRI use and hip fractures. Unmeasured activities of daily living scores (+21.5 percent bias) and impairment scales (+10.6 percent bias) accounted for a moderate proportion (30 percent) of the apparent risk of hip fracture associated with SSRIs. After correction for this bias, SSRIs were associated with a relative risk of hip fracture of 1.8 (nearly a doubling of risk). This risk, which is still significant, was similar to the association found between SSRIs and risk of fracture in a recent clinical study of nursing home residents.

See "Association between SSRI use and hip fractures and the effect of residual confounding bias in claims database studies," by Drs. Schneeweiss and Wang, in the December 2004 *Journal of Clinical Psychopharmacology* 24(6), pp. 632-638. ■

Pharmacy data can help public health officials identify TB cases and assess their management by private-sector physicians

Tuberculosis (TB) surveillance relies heavily on laboratories and providers to report cases to local health departments. TB surveillance data can be compromised by underreporting, particularly by private-sector clinicians who treat TB infrequently. In a recent study, researchers assessed the usefulness of pharmacy data on anti-TB medications—which are rarely used to treat other conditions—for helping public health officials find TB cases and assess their management by private-sector clinicians. The study was supported in part by the Agency for Healthcare Research and Quality through a cooperative agreement (HS10391) with the HMO Research Network Center for Education and Research on Therapeutics (CERT).

The researchers evaluated the contribution of pharmacy data from three different health plans in Michigan, Missouri, and Tennessee to identification of TB cases. The pharmacy databases identified individuals with more than two anti-TB medications. The researchers confirmed active TB cases by using State TB registries, medical record review, or responses to questionnaires sent to prescribing physicians. Overall, they identified 207 active TB cases, including 13 (6 percent) that had been missed by traditional surveillance and thus had not been reported to State health departments. All except one involved people with active pulmonary disease.

Screening of medications dispensed by the pharmacies identified 80 percent of individuals with TB who had received their medications through health plan-reimbursed sources but missed those treated solely in public health clinics. Pharmacy data also provided useful information about physicians' management of TB and patients' adherence to prescribed therapy. For all 17 patients not treated in public health clinics, the final drug regimen described in the medical record was adequate with regard to medications used, doses prescribed, and intended duration of treatment.

More details are in "Pharmacy data for tuberculosis surveillance and assessment of patient management," by Deborah S. Yokoe, M.D., M.P.H., Steven W. Coon, M.P.H., Rachel Dokholyan, M.P.H., and others, in the August 2004 *Emerging Infectious Diseases* 10(8), pp. 1426-1431. ■

Pharmacogenomic drug development raises new challenges for drug regulatory agencies

In the future, instead of making an educated guess about what medication to prescribe for a patient, a doctor may use a genetic test to indicate which medication the patient would respond to best. Such tests could also be used to determine if a patient is among those who might suffer severe side effects from a certain drug. Pharmacogenomics, the study of how genetic variations affect the ways in which people respond to drugs, may make this possible.

In addition to potential future clinical benefits, such as reducing adverse drug reactions and optimizing medication efficacy, pharmacogenomic drug development poses new challenges to drug regulatory agencies, explains Amalia M. Issa, Ph.D., M.P.H., of the University of California, Los Angeles, School of Public Health. Her work is

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Pharmacogenomic drug development

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supported by the Agency for Healthcare Research and Quality (T32 HS00046).

In a recent article, Dr. Issa describes the impact of pharmacogenomic-guided drug development on the regulatory process in the United States. She also uses several hypothetical vignettes to illustrate a number of issues that might confront regulatory authorities like the U.S. Food and Drug Administration (FDA) as they begin to set policy to deal with pharmacogenomic-based drug development.

In one vignette, company A has developed a diagnostic genotyping kit. Company B has a drug that would be more clinically beneficial for a certain patient population if it were marketed in combination with company A's kit. However, company B may be concerned about the prospect of potential reductions to its market if the FDA requires the drug label to include information requiring or encouraging physicians to use the genotyping diagnostic kit that is sold by the rival commercial company.

See "The regulation of pharmacogenomic-based drugs and policy making," by Dr. Issa, in *Current Topics In Medicinal Chemistry* 4(13), pp. 1455-1460, 2004. ■

Studies of COX-2 inhibitors have ramifications for other drugs and pharmaceutical policies

In recent months, the safety of a class of nonsteroidal antiinflammatory drugs (NSAIDs), the COX-2 inhibitors (including Vioxx, Celebrex, and Bextra), has been called into question. Typically used for arthritis and other inflammatory diseases, the COX-2 inhibitors provide an alternative for patients who suffer gastrointestinal (GI) bleeding and other complications from older nonselective NSAIDs.

Results of three recent studies of COX-2 inhibitors supported by the Agency for Healthcare Research and Quality (HS10881) have ramifications for other drugs and pharmaceutical policies. They found that Medicaid prior-authorization plans may reduce unnecessary use of certain costly drugs, that newly marketed drugs may prompt physicians to enthusiastically prescribe them to a wider swath of patients, and that claims databases can be combined with survey data to decrease confounding in drug safety studies. The studies, led by Sebastian Schneeweiss, M.D., Michael Fischer, M.D., and Daniel Solomon, M.D., M.P.H., of Harvard Medical School and Brigham and Women's Hospital, are briefly summarized here.

Fischer, M.A., Schneeweiss, S., Avorn, J., and Solomon, D.H. (2004, November). "Medicaid prior-authorization programs and the use of cyclooxygenase-2 inhibitors." ***New England Journal of Medicine*** **352, pp. 2187-2194.**

The popularity and cost of selective COX-2 inhibitors have imposed financial stress on many prescription drug insurance programs, including State Medicaid programs, whose mandate is to cover the medical expenses of the poor. In an attempt to control medication costs, many States have implemented prior authorization requirements for COX-2 inhibitors, according to this study. The programs allow use of COX-2 inhibitors by patients who meet high-risk criteria (for example, GI bleeding from nonselective NSAIDs) while reducing use by others, thus targeting the use of these expensive agents to appropriate patients. The researchers' earlier work indicated substantial overuse of these medications among patients at low risk for complications from traditional NSAIDs.

In this study, the researchers used data from State Medicaid programs for 1999 through 2003 to calculate the proportion of NSAID use accounted for by COX-2 inhibitors, and they evaluated the effect of 22 State prior authorization programs on the use of these drugs (before Vioxx was withdrawn from the market). By 2001, COX-2 inhibitors accounted for half of all NSAID doses covered by State Medicaid programs. However, this proportion varied widely by 2003, from a low of 11 percent in some States to a high of 70 percent in others.

The implementation of prior authorization requirements for COX-2 inhibitors reduced the proportion of NSAID doses made up by COX-2 inhibitors by 15 percent. This corresponded to a decrease of $10.28 in spending per NSAID prescription. With nearly 18 million NSAID prescriptions covered by Medicaid in 2003, this decrease can be projected to an annual reduction in spending of $185 million. Determining whether these reductions are clinically appropriate will have important implications for the development of rational drug-reimbursement policies.

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COX-2 inhibitors

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Schneeweiss, S., Glynn, R.J., Avorn, J., and Solomon, D.H. (2005). "A Medicare database review found that physician preferences increasingly outweighed patient characteristics as determinants of first-time prescriptions for COX-2 inhibitors." ***Journal of Clinical Epidemiology*** **58, pp. 98-102.**

The rapid diffusion of COX-2 inhibitors led to prescribing of these drugs even to patients who lacked a clear indication for their use (GI bleeding from traditional NSAIDs), according to this study. First-time COX-2 inhibitor prescribing was somewhat dependent on patient factors in the first quarter of marketing. However, the proportional influence of physician preferences increased substantially over the following 2 years. Rapid adoption of new drugs after market introduction may prompt doctors to enthusiastically prescribe them even for patients without a clear indication, suggest the researchers.

They examined data on 37,957 Medicare beneficiaries who were enrolled in the Pharmaceutical Assistance Contract for the Elderly in Pennsylvania. All patients had started using nonselective NSAIDs or selective COX-2 inhibitors between January 1, 1999 and December 31, 2000, had no prior NSAID use, and had full prescription drug coverage. The researchers quantified the amount of variation in first-time COX-2 prescribing that could be explained by predictors of GI toxicity, other patient characteristics, or physician preferences.

COX-2 inhibitors were adopted as the preferred NSAID by 55 percent of physicians within 6 months after they were marketed. In new NSAID users, COX-2 prescribing was twice as dependent on physician prescribing preferences (60 percent) as on the combined predictors of GI toxicity (3 percent) and other patient factors (30 percent). The ratio of COX-2 prescribing explained by physician preferences over patient factors increased from 2 to more than 10 over a 24-month period.

Schneeweiss, S., Glynn, R.J., Tsai, E.H., and others. (2005, January). "Adjusting for unmeasured confounders in pharmacoepidemiologic claims data using external information: The example of COX-2 inhibitors and myocardial infarction." ***Epidemiology*** **16(1), pp. 17-24.**

Rare adverse drug effects usually show up only after a medication has been used widely. Large databases, such as Medicare claims data, which reflect routine practice for large and representative populations, are often the best source of data to analyze the incidence of such adverse effects. However, these datasets often don't measure such confounding factors as use of over-the-counter medications (for example, aspirin), body mass index, or smoking status. Not accounting for these factors could lead to underestimates of problems caused by certain medications, caution the investigators.

They used Medicare Current Beneficiary Survey data on 8,785 elderly men and women to assess the association between use of COX-2 inhibitors and five potential confounders not measured in Medicare claims data: body mass index, aspirin use, smoking, income, and educational attainment. Users of COX-2 inhibitors were less likely to be smokers than users of other NSAIDs (8 vs. 10 percent), while the prevalence of obesity was comparable (24 percent). Aspirin use was also balanced among all drug categories. Failure to adjust for these potential confounders (that are independently associated with heart attack) led to a small underestimation of the association between COX-2 inhibitors and heart attack. ■

Primary Care Research

Primary care providers miss opportunities during office visits for adult preventive care

Despite the success of vaccines in preventing certain infectious diseases, adult vaccination rates are well below national goals of 90 percent, and influenza and pneumonia continue to be the fifth leading cause of death among the elderly. A recent study confirmed that there are many missed opportunities to vaccinate elderly adults during primary care office visits. Only one-third of doctors discussed vaccination with patients during office visits, and many physicians did not take advantage of opportunities to vaccinate patients during acute visits or to schedule preventive care visits during which they could focus on immunization.

Researchers from the University of Pittsburgh Schools of Medicine and Public Health reviewed the

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Adult preventive care

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medical records of 810 elderly adults seen in diverse rural, inner city, and suburban practices. For each patient, they determined the number and type of outpatient visits, influenza vaccinations over three seasons, and pneumococcal and tetanus vaccinations over 5 years, as well as discussions about and patient refusals of vaccines. Based on these records, only 24 percent of patients who had an office visit had annual flu shots, 49 percent received pneumonia immunizations, and 29 percent received tetanus vaccine.

During the 27-month study period, patients averaged 1.3 acute visits, 6.9 chronic care visits, and less than 1 (.48) preventive visit. Missed opportunities to vaccinate against influenza occurred at 38 percent of visits and at 47 percent of visits for pneumococcal disease. There were missed opportunities to vaccinate against tetanus at nearly all visits (94 percent). Vaccination rates were higher if medical records included health maintenance flow sheets, which can serve as a prompt for providers.

All three vaccines were administered primarily during chronic care visits (49-57 percent). Influenza and pneumococcal vaccines were administered least frequently during acute care visits (4 percent), while tetanus was administered 20 percent of the time during acute visits. About 20 percent of vaccines were given during preventive visits and 13-17 percent of vaccines had been received elsewhere. The broader view of prevention as part of every day care seems to be lacking in some practices, conclude the researchers. This study was supported by the Agency for Healthcare Research and Quality (HS09874).

See "Missed opportunities for adult immunization in diverse primary care office settings," by Mary Patricia Nowalk, Ph.D., Richard K. Zimmerman, M.D., and Joyce Feghali, P.A., in the September 3, 2004 *Vaccine* 22, pp. 3457-3463. ■

Family doctors and patients tend to agree on what constitutes competent patient communication

Family doctors and patients tend to agree on what behaviors constitute a patient's communication competence during a medical interview, according to a study supported by the Agency for Healthcare Research and Quality (HS09520). From the physicians' perspective, competent patients are well prepared, give prior thought to medical concerns, and even educate themselves about their illness prior to the visit. They come to the appointment with an agenda and stay focused on it, while providing detailed information about their medical history, symptoms, and other relevant matters. At the same time, they seek needed information by asking questions about their diagnosis and treatment of their illness.

Similarly, patients view communication competence as providing information about their medical problem, being prepared with an agenda, and asking questions. On the other hand, patients' interviewing behaviors, such as asking questions and providing detailed information, may not necessarily be noted by physicians. In this study, there was no evidence that doctors and patients agreed on the occurrence of competent communication, nor was there a significant correlation between patients' perceptions of competence and patients' actual discourse.

Nevertheless, being prepared for the medical interview is highly valued by both patients and physicians. The study results suggest that programs designed to enhance patients' communication should pay more attention to developing skills in providing information. Research supports the importance of patient-provided information. For example, studies show that most of the diagnostic and treatment decisions that primary care physicians make are based on what information the patient provides about symptoms, previous treatments, and general medical history.

See "Physicians' and patients' perceptions of patients' communication competence in a primary care medical interview," by Donald J. Cegala, Ph.D., Carmin Gade, Ph.D., Stefne Lenzmeier Broz, Ph.D., and Leola McClure, Ph.D., in *Health Communication* 16(3), pp. 289-304, 2004. ■

Late bottle-weaning is associated with an increased risk of overweight

The American Academy of Pediatrics recommends introducing the cup to babies at 6 months and complete bottle weaning at 15 months of age. Yet 20 percent of 2 year olds and 9 percent of 3 years olds still use a bottle, according to a recent National Health Interview Survey-Childhood Supplement.

Prolonged bottle use in young children is associated with increased risk of overweight, according to a study supported by the Agency for Healthcare Research and Quality (HS10900). Infants who are overweight are more likely than those who are not to be overweight in the preschool years. Further, children who are overweight at 12 months and during the preschool years are at increased risk of obesity in later life, notes Karen Bonuck, Ph.D., of the Albert Einstein College of Medicine.

Dr. Bonuck and her colleagues examined the relationship between age at bottle-weaning and child body mass index (BMI, a ratio of weight to height) among a national probability sample of nearly 3,000 children aged 3 to 5 years reported in the National Health and Nutrition Examination Survey III (NHANES III). The mean age of bottle-weaning was 18.8 months. Slightly more than half of children in the sample (55 percent) had ever received breast milk. The mean age of first receiving cow's milk was 11.2 months and 5.8 months for solids (consistent with pediatric guidelines).

Children less than the 85th percentile BMI (normal weight) were weaned from a bottle, on average at 18 months, compared with 19 months for those in the 85th-95th percentile BMI (overweight) and over 22 months for children greater than the 95th percentile BMI (obese). After accounting for other factors affecting BMI such as mother's BMI and birth weight, bottle-weaning was significantly associated with a child's BMI level. Each additional month of bottle use corresponded to an approximate 3 percent increase in the odds of being in a higher BMI category.

See "Is late bottle-weaning associated with overweight in young children?" Analysis of NHANES III data," by Dr. Bonuck, Richard Kahn, M.S., R.D, and Clyde Schechter, M.D., M.A., in the July/August 2004 *Clinical Pediatrics* 43, pp. 535-540. ■

Significant exposure to tobacco smoke and underuse of controller medications exacerbate asthma symptoms among Head Start children

Preschool-aged children, particularly those who are poor and disadvantaged, are driving the rising rates of asthma-related emergency department (ED) visits and hospitalizations. A recent study of children in an Arkansas Head Start program for disadvantaged preschoolers identified the factors that led to uncontrolled asthma in this population.

The researchers found that four out of five children suffered from persistent asthma, but only one-third of the children received appropriate medication to control it. Many of the children were also exposed to asthma triggers such as cigarette smoke. Exposure to cigarette smoke was reported by 52 percent of the families. Cotinine/creatinine ratios exceeded 20 ng/mg in 27 percent of the sample. This high-risk group could benefit from an asthma case management program, suggest Perla A. Vargas, Ph.D., and her colleagues at the University of Arkansas for Medical Sciences and Arkansas Children's Hospital.

For the study, which was supported by the Agency for Healthcare Research and Quality (HS11062), the researchers recruited caregivers of 368 children aged 3 to 5 years with asthma who were enrolled in a local Head Start program. They collected data on demographics, health care use and access, medication use, asthma symptoms, and exposure to asthma triggers. Most families were black and impoverished. Because of the Head Start program support services for parents, most children were enrolled in the Medicaid program, which allowed them to complete well-child visits and

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Asthma symptons among children

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immunizations and obtain medications.

Overall, the children had poor asthma control. Nearly two-thirds (64 percent) of the children had more than one ED visit for asthma in their lifetime, and nearly one-third (31 percent) had more than one ED visit in the preceding 6 months. Caretakers reported smoking in 37 percent of households. Nearly 4 out of 5 children (79 percent) reported symptoms consistent with persistent asthma.

Seventy-one percent of the children had positive results to skin-prick tests for more than one allergen, and 42 percent had positive reactions for more than three allergens. Only 32 percent of children with persistent asthma were receiving appropriate treatment, that is, had both rescue and controller medications (antiinflammatory medications used to prevent asthma or worsening of asthma).

Details are in "Characteristics of children with asthma who are enrolled in a Head Start program," by Dr. Vargas, Pippa M. Simpson, Ph.D., J. Gary Wheeler, M.D., and others, in the September 2004 *Journal of Allergy and Clinical Immunology* 114, pp. 499-504. ■

Limited direct evidence supports the many recommendations for preventive care during well-child care visits

Well-child care visits, which account for one-third of visits to pediatricians, are intended to prevent disease or injury and to promote the health of children and adolescents. Professional organizations, government agencies, and other groups have made extensive and sometimes conflicting recommendations about what should be included in well-child visits. These recommendations should be based on the strongest possible evidence. Yet, there is limited direct evidence to support 42 commonly recommended preventive interventions, according to a study supported in part by the Agency for Healthcare Research and Quality (contract 02-R00012801D).

Virgina A. Moyer, M.D., M.P.H., and Margaret Butler, B.A., of the University of Texas-Houston Health Science Center, tabulated the well-child care recommendations of seven major North American organizations such as the U.S. Preventive Services Task Force and the American Academy of Pediatrics. They found a total of 42 preventive interventions that were recommended by two or more organizations. These fell into three categories: behavioral counseling to reduce risky behavior or increase healthy behavior, screening (for example, growth monitoring, routine blood pressure measurement, and scoliosis screening), and prophylaxis (such as vitamin supplementation). They did not consider immunizations, which have been reviewed elsewhere.

The researchers sought evidence of effectiveness for the recommendations based on systematic reviews of the research literature and clinical trials. Limited clinical trials showed that counseling can change some health risk behaviors (such as seat belt and car seat use and use of smoke alarms), and that repeated intensive counseling is most likely to be effective. Rigorous evidence in support of screening was very limited. Trials supported the use of folate to prevent neural tube defects, trials of iron supplementation did not address developmental outcomes, and none addressed other prophylactic approaches such as oral fluoride treatment.

More details are in "Gaps in the evidence for well-child care: A challenge to our profession," by Dr. Moyer and Ms. Butler, in the December 2004 *Pediatrics* 114(6), pp. 1511-1521. ■

Combined video and computer game use outpaces daily TV viewing among preadolescents

Children under 11 years of age currently spend more time watching videos and playing computer games than watching television, according to a study supported by the Agency for Healthcare Research and Quality (HS13302). Children this age spent a mean of 1.5 hours daily watching television, 1.1 hours watching videos, and .5 hours playing computer games. Also, 30 percent of parents reported that their child had eaten breakfast or dinner in front of the television in the past week, 26 percent said their child had a television in his or her bedroom, and 22 percent were concerned about the amount of television that their child watched.

Having a TV in a child's bedroom was associated with increased television viewing (0.25 hour), video viewing (0.31 hour), and use of computer games

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Video and computer games

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(0.21 hour). Eating breakfast or dinner in front of the television in the past week was associated with increased TV (0.38 hour) and video (0.19 hour) viewing. In general, higher parental education was associated with fewer hours of watching television and videos (but not computer games), not having a television in the child's bedroom, and more concern about the amount of TV the child viewed.

Television viewing has been associated with problems ranging from obesity and attentional problems to aggressive behavior. Video viewing has been associated with increased body mass index, and computer games have been linked to aggressive behavior.

Strategies to reduce these sedentary behaviors in children should target parents of lower education. Parents could also benefit from tools and strategies that would help them exert more control over their children's television habits, suggest Dimitri A. Christakis, M.D., M.P.H., and colleagues at the University of Washington. Their findings were based on a telephone survey of parents whose children visited one of several university-associated primary care clinics in diverse neighborhoods during the period 2000 to 2003.

See "Television, video, and computer game usage in children under 11 years of age," by Dr. Christakis, Beth E. Ebel, M.D., M.Sc., M.P.H., Frederick P. Rivara, M.D., M.P.H., and Frederick J. Zimmerman, Ph.D., in the November 2004 *Journal of Pediatrics* 145, pp. 652-656. ■

Women's Health

Women 65 and older used more medications and spent more for them than same-age men during the period 1999 to 2001

Because women 65 and older used more prescription drugs than men of the same age, their medication expenditures were about 17 percent higher from 1999 to 2001, according to a study by researchers at the Agency for Healthcare Research and Quality. Rosaly Correa-de-Araujo, M.D., M.Sc., Ph.D., G. Edward Miller, Ph.D., and Jessica S. Banthin, Ph.D., examined differences between men and women in use of and expenditures for prescription drugs among Medicare and privately insured adults aged 65 and older. They used data on a nationally representative sample of prescription drug purchases collected for the Medical Expenditure Panel Survey Household Component in 1999, 2000, and 2001.

Overall, elderly women spent an average of $1,178 per year, about 17 percent more than the $1,009 spent by elderly men. The higher drug expenditures among women were due to higher rates of drug use rather than higher prices paid for drugs. Women were somewhat more likely than men (92 vs. 88 percent) to use prescription drugs, with women purchasing almost 20 percent more prescriptions on average than men (25 vs. 21). Women were more likely than men to use analgesics, hormones, psychotherapeutic agents, thyroid drugs, COX-2 inhibitors, and antidepressants, and they had more prescriptions per user for hormones, psychotherapeutic agents, analgesics, diabetes-related drugs, and beta-blockers.

However, the findings for the privately insured population of older adults found no difference between women and men in the probability that they would use several antihypertensives, even though women constitute 61 percent of those with hypertension in the Medicare population. Unfortunately, about 30 percent of the elderly with diabetes, hypertension, or heart failure who do not have prescription drug coverage skip medication doses that are critical for controlling such conditions. The expanded drug coverage available under the new Medicare Modernization Act may boost their compliance with drug regimens, note the authors.

See "Gender differences in drug use and expenditures in a privately insured population of older adults," by Drs. Correa-de-Araujo, Miller, and Banthin, and Yen Trinh, in the *Journal of Women's Health* 14(1), pp. 73-81, 2005. Reprints (AHRQ Publication No. 05-R019) are available from AHRQ.** ■

Ethnic differences in willingness to undergo knee replacement may explain disparities in receipt of this procedure

Disparities in receipt of medical procedures by minorities are not entirely explained by financial or other barriers to care. Ethnic differences in willingness to undergo certain procedures may also play a role, suggests a study supported in part by the Agency for Healthcare Research and Quality (HS10876). For example, blacks are less likely than whites to undergo total knee arthroplasty (TKA, knee joint replacement) to relieve the pain and dysfunction of knee osteoarthritis (OA). However, the researchers also found that blacks are significantly less willing than whites to undergo TKA to relieve the problem.

The researchers surveyed 193 black, white, and Hispanic adults about how much money they were willing to pay to rid themselves of two hypothetical conditions: mild OA, which involved some problems with walking, work, or leisure activities, along with moderate pain and discomfort; and severe OA, which included some problems with walking, self-care (for example, washing and dressing), and usual activities, as well as extreme pain and discomfort and moderate anxiety and depression. Willingness-to-pay (WTP, as a percentage of income) to relieve symptoms of mild OA for each of the two scenarios was highest for whites, intermediate for Hispanics, and lowest for blacks (33 percent, 26 percent, and 17 percent, respectively).

After controlling for income, WTP was lower for all health scenarios for Hispanics and blacks than for whites, with significant differences between blacks and whites. Thus, whites placed a much higher value on improvements in knee OA than blacks, while values for Hispanics fell somewhere between those for blacks and whites. Individuals who place a lower value on health improvements may be less willing to undergo procedures that entail significant initial pain, cost, or a chance of death, note the researchers.

See "Ethnic differences in health preferences: Analysis using willingness-to-pay," by Margaret M. Byrne, Ph.D., Kimberly J. O'Malley, Ph.D., and Maria E. Suarez-Almazor, M.D., Ph.D., in the September 2004 *Journal of Rheumatology* 31(9), pp. 1811-1818. ■

Race appears to be a factor in how doctors communicate with their patients during primary care visits

Lack of quality communication during primary care visits may contribute to disparities in health between blacks and whites, according to findings from a new study by researchers at the Johns Hopkins Bloomberg School of Public Health. They found differences in patient-physician communication during medical visits with white and black patients. Doctors were less likely to engage black patients in conversation, and the tone of visits with black patients generally was less friendly than with white patients. Poor doctor-patient communication may be partly to blame for health disparities, since more active participation of patients in conversations with their doctors has been linked to better treatment compliance and health outcomes, explains Rachel L. Johnson, M.D., Ph.D., lead investigator.

In a study that was supported in part by the Agency for Healthcare Research and Quality (F31 HS13265), Dr. Johnson and her colleagues analyzed audiotapes and questionnaire data from 458 patients who visited 61 physicians in the Washington, DC, metropolitan area in 1998 and 2002. They found that physicians tended to dominate conversations with black patients, with physicians talking 73 percent more than patients. In conversations with white patients, physicians talked 43 percent more than patients. Also, black patients and their doctors sounded less interested, engaged, and friendly, compared with conversations between white patients and their physicians.

The researchers recommend communication skills programs for medical students, residents, and practicing physicians that focus on patient-centeredness and how to build rapport with patients, which will benefit patients in general and racial/ethnic minority patients in particular. They also encourage

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Doctor-patient communication

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physicians to more actively engage black patients in conversations about their health, so that they become more confident participants in their own health care. This, in turn, may help to reduce racial disparities in health status.

See "Patient race/ethnicity and quality of patient-physician communication during medical visits," by Dr. Johnson, Debra Roter, Dr.P.H., Neil R. Powe, M.D., M.B.A., and Lisa A. Cooper, M.D., M.P.H., in the December 2004 *American Journal of Public Health* 94(12), pp. 2084-2090. ■

Minority physicians in Maryland are more likely than white physicians to be denied managed care contracts

Nearly 50 percent of revenues collected by all physicians were from managed care organizations (MCOs) in 1999. Yet a recent study of Maryland physicians found that more black, Asian, and Hispanic physicians than white physicians had been denied managed care contracts between one and three times in the preceding 2 years. This exclusion of minority providers may compromise access to health care among minority patients who are five times more likely than white patients to have a physician from a racial/ethnic minority group, explain Keith Elder, Ph.D., M.P.H., M.P.A., of the University of South Carolina, and Nancy Miller, Ph.D., M.A., of the University of Maryland, Baltimore County. Their work was supported by the Agency for Healthcare Research and Quality (F31 HS11486).

Drs. Elder and Miller analyzed data on 1,215 ethnically diverse Maryland physicians from all specialties from the 2000 Maryland Study on Physician Experience with Managed Care Survey. They estimated the probability of a contract denial or termination as a function of physician characteristics, physician practice characteristics, and managed care market characteristics (for example, HMO penetration and number of HMOs in a region).

Contracts were denied between one and three times in the preceding 2 years for 26 percent of black physicians, 23 percent of Hispanic and Asian physicians, and 20 percent of white physicians. Contracts were terminated during that time for 14 percent of black physicians, 12 percent of Asian physicians, 10 percent of white physicians, and 8 percent of Hispanic physicians. Nevertheless, racial differences in contract denial or termination were not statistically significant.

Hispanic, black, and Asian physicians' practices were more likely to have a patient load that was more than half minority patients, who tend to use more health resources than white patients. This may explain the disparity between white and minority physicians in managed care contract denials and terminations, since previous studies have suggested that physicians whose patients require greater health care resources are more likely to be denied contracts.

See "Managed care's effect on minority physicians and their patients," by Drs. Elder and Miller, in the September 2004 *Managed Care Interface* 17(9), pp. 25-31. ■

HIV/AIDS Research

Clinics funded by the Ryan White CARE Act provide more specialized and comprehensive HIV care than other HIV clinics

The Ryan White Comprehensive AIDS Resources Emergency (CARE) Act provides funds for comprehensive care for vulnerable individuals with HIV infection in all 50 States. As intended by the CARE Act, CARE clinics provide more specialized HIV care and multiple support services for vulnerable populations than other HIV clinics. CARE Act sites have more infectious disease specialists than other HIV clinics (3.1 vs. 1.7), more HIV-infected patients (an average of 1,048 vs. 512 at other clinics), and they provide more support services.

In a recent study that was supported in part by the Agency for

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Healthcare Research and Quality (HS10408, HS10227, and HS08578), researchers analyzed data from the HIV Cost and Services Utilization Study (HCSUS), a nationally representative sample of HIV patients, to examine whether CARE Act clinics differed from other HIV clinics in the characteristics of their patients and their organization, staffing, and services. Data revealed that patients of CARE clinics were more likely to be female, younger, minority, and less educated than patients at other HIV clinics. They also were more likely to be unemployed, uninsured, low-income, and to report heterosexual contact as an HIV risk factor.

Overall, 77 percent of the CARE Act clinics specialized in HIV care compared with 37 percent of other clinics. The majority of CARE clinics provided a comprehensive approach to care. CARE clinics were more likely than other HIV clinics to have on-site nutritionists, mental health professionals, substance abuse counselors, and social workers; to hold multi-disciplinary team meetings to discuss care of HIV patients; and to offer non-clinical support services, such as housing, counseling, and translators. On average, 71 percent of HIV patients at CARE Act sites had case managers compared with 52 percent of those at other sites.

See "Differences in patient and clinic characteristics at CARE Act funded versus non-CARE Act funded HIV clinics," by Keith McInnes, M.S., Bruce E. Landon, M.D., M.B.A., Faye E. Malitz, M.S., and others, in the October 2004 *AIDS Care* 16(7), pp. 851-857. ■

Health Care Costs and Financing

Rural workers have less employment-related health insurance for several reasons, including low wages and smaller employers

Rural residents make up a disproportionate number of the Nation's uninsured population. This disparity in health insurance among rural residents is related to the structure of rural employment, notably smaller employers and lower wages, according to Sharon L. Larson, Ph.D., of the Substance Abuse and Mental Health Services Administration, and Steven C. Hill, Ph.D., of the Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. They found that workers living in the most rural areas are 10.4 percentage points less likely to be offered health insurance than urban workers. In rural counties not adjacent to urban areas, lower wages and smaller employers each accounted for about one-third of the total difference in employment-related health insurance.

The researchers analyzed data from the Medical Expenditure Panel Survey Household Component (1996-1998). They evaluated which characteristics contributed to lack of employment-related insurance among nonelderly adult workers in three types of nonmetropolitan areas—rural counties adjacent to urban areas; large rural nonadjacent counties (a town or city with over 10,000 population); and small rural, nonadjacent counties (no town with more than 10,000 people)—compared with metropolitan workers.

The median hourly wages of workers in rural counties were lower than those of urban workers ($10 in adjacent counties and $9 in large and small nonadjacent counties vs. $12 in urban counties). Workers from the most rural counties were less likely to work full-time and more likely to work part-time. Workers from nonadjacent counties were more likely to be self-employed (15 percent large; 16 percent small) and less likely to be members of a union (10 percent large and small) compared with urban and adjacent residents. Also rural workers were less likely to work in companies with 100 or more employees and more likely to work in companies with 10 or fewer employees.

See "Rural-urban differences in employment-related health insurance," by Drs. Larson and Hill, in the Winter 2005 *Journal of Rural Health* 21(1), pp. 21-30. Reprints (AHRQ Publication No. 05-R026) are available from AHRQ.* ■

Collaboration within the health research community can move us from information about quality to information for decisionmaking

Some studies show that care providers tend to improve their care performance when that performance is reported to the public in "report cards." But we don't know whether care performance information is directly useful to purchasers or consumers who are making decisions about providers and health plans. Carolyn M. Clancy, M.D., Director of the Agency for Healthcare Research and Quality, addresses this topic in an editorial that appears in the December 2004 issue of *Health Services Research.*

Dr. Clancy points to the lack of reliable measures for many clinical domains (for example, mental health and maternal and child health) and our inability to predict how a provider's performance in one clinical area is related to performance in other areas. Indeed, a common complaint of clinicians is that what is measurable isn't always what's most important. Also, what's important to clinicians isn't always what's important to patients or employers. For example, few studies have examined the relationship between health outcomes and lost time from work.

Collaboration within the health care research community can speed the move from information about quality to quality information for decisionmaking, according to Dr. Clancy. For example, one study of the impact of use of highly active antiretroviral therapy (HAART) on a nationally representative sample of adults with HIV showed that HAART increased the probability of their remaining employed and the number of hours worked within 6 months of treatment. Resulting increases in income compared favorably with the cost of treatment.

This kind of information is relevant to both employers and individuals. Another study examined the impact of diabetes on adults' workforce participation as they made the transition from active work to retirement over an 8-year period. It revealed an estimated $60 billion in lost productivity associated with diabetes. A third study examined the impact of grandparents' caregiving for grandchildren on their own depressive symptoms. The period that one or more grandchildren resided with the grandparent corresponded with a significant increase in the grandparent's depressive symptoms.

See "From information on quality to quality information," by Dr. Clancy, in the December 2004 *Health Services Research* 39(6), Part I, pp. 1631-1634. Reprints (AHRQ Publication No. 05-R023) are available from AHRQ.* ■

Grant final reports now available from NTIS

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

Records of all 750,000 documents archived at NTIS—including many AHRQ documents and final reports from all completed AHRQ-supported grants—can now be searched on the new NTIS Web site. For information about findings from the projects described here, please access the relevant final reports at the NTIS Web site. Also, all items in the database from 1997 to the present can be downloaded from the Web site. Go to www.ntis.gov for more information.

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

To find information presented in back issues of *Research Activities*, go to the AHRQ Web site at www.ahrq.gov and click on "Research Activities Online Newsletter" and then "Search Research Activities." To search for information, enter either the grant or contract number or the principal

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investigator's last name in the query line. A reference librarian can help you find related journal articles through the National Library of Medicine's PubMed.®

AAMC HSR Institute for Minority Faculty. **Herbert W. Nickens, M.D., Association of Medical Colleges, Washington, DC. AHRQ grant HS09262, project period 9/30/96-6/30/02.**

The AAMC Health Services Research Institute is a program for junior minority faculty (African American, Hispanic, and American Indian) at U.S. medical schools to develop their skills in health services research. The focus was on developing a concept paper into a research proposal suitable for submission to AHRQ or another funding source. Students also took part in formal sessions, seminars, and mock study sections. (Abstract, executive summary, and final report, NTIS accession no. PB2005-102222; 164 pp., $47.50 paper, $20.00 microfiche)**

Access to Medicare Hospice for Nursing Home Residents. **Pedro Gozalo, Ph.D., Brown University, Providence, RI. AHRQ grant HS11457, project period 7/1/01-6/30/03.**

The main goal of this study was to explore the factors influencing access to hospice care for dying nursing home residents. After adjusting for patient, provider, and market factors, the researchers found no association between certain facility characteristics—such as for-profit status—and access to hospice care. However, nursing homes with a higher ratio of minority residents have fewer residents opting for hospice care. On the other hand, homes with special care units have a higher number of residents who choose hospice. Distance from the nursing home to the nearest hospice provider in excess of 15 miles was associated with significantly reduced access to hospice care. (Abstract, executive summary, and final report, NTIS accession no. PB2005-102214; 30 pp., $26.50 paper, $14.00 microfiche)**

Assessing Organizational Features of Health Care Settings to Improve Quality. **Deborah S. Main, Ph.D., University of Colorado Health Science Center, Denver. AHRQ grant HS12059, project period 9/30/01-9/30/03.**

This project provided support for a small conference involving 45 participants from different medical disciplines and the organizational and social sciences. They discussed conceptual and methodological models for understanding the organizational features of primary care settings. The goal was to develop strong conceptual models and methods for primary care research, which are presented in the conference proceedings. (Abstract, executive summary, and final report, NTIS accession no. PB2005-101336; 44 pp., $29.50 paper, $14.00 paper)**

Characterizing Medical Error: A Primary Care Study. **Steven H. Woolf, M.D., Virginia Commonwealth University, Richmond. AHRQ grant HS11117, project period 9/15/00-8/31/02.**

The four goals of this project were to: (1) develop patient-focused typologies of medical errors and injuries in outpatient primary care settings; (2) gain an understanding, from the patient's perspective, as to which of these errors and injuries are the most common and the most serious; (3) compare and contrast the patient descriptions with reports of errors obtained from physicians; and (4) provide a basis for further investigation of the epidemiology, cause, and prevention of the most common and most serious errors/harms. (Abstract, executive summary, and final report, NTIS accession no. PB2005-101335; 16 pp., $26.50 paper, $14.00 microfiche)**

Effect of Health Plans on Hypertension and Diabetes Care. **Edward Guadagnoli, Ph.D., Harvard Medical School, Boston, MA. AHRQ grant HS09936, project period 7/1/98-6/30/03.**

These researchers evaluated whether features of physicians' practices—including practice arrangements, clinical management strategies, and financial arrangements—influence the quality of care provided to patients with hypertension or diabetes. They studied 1,335 patients with hypertension and the same number with diabetes and collected data from physicians, patients, and medical records. In general, they found a lack of consistency in the practice characteristics related to the quality of care for both hypertension and diabetes. (Abstract, executive summary, and final report, NTIS accession no. PB2005-102218; 216 pp., $54.50 paper, $26.50 microfiche)**

Evaluation of an Adaptive Patient Data Entry Interface. **David F. Lobach, Ph.D., M.D., Duke University Medical Center, Durham, NC. AHRQ grant HS09706, project period 9/30/98-9/29/02.**

The goal of this project was to demonstrate the effectiveness of a computer system that uses multimedia and touch screen technology to adapt the human-computer interface to the native language and reading literacy of the user. The study involved 705

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adult patients and was conducted in two sites: an academic family medicine clinic and an indigent adult medicine clinic. The researchers found that the system collected significantly more information from patients, especially those with low reading literacy, than was collected with conventional (paper) means. They conclude that advances in technology now enable patients to directly enter their clinical information into a computer irrespective of reading or computer literacy. (Abstract, executive summary, and final report, NTIS accession no. PB2005-101337; 66 pp., $31.50 paper, $14.00 microfiche)**

Factors Associated with Hospice Utilization. **Susan C. Miller, Ph.D., Brown University, Providence, RI. AHRQ grant HS11004, project period 9/30/00-9/29/02.**

The goal of this study was to determine whether hospice daily visit volume varied by care setting (nursing home vs. non-nursing home). The sample included 9,460 patients cared for in a nursing home and 15,484 cared for in another setting during the period October 1998 through September 1999. Visits were provided by 21 hospices (all owned by one parent company) across seven States. Average daily hospice visits were 1.1 for nursing home patients and 1.2 for non-nursing home patients. After controlling for a number of confounding factors, site of care was not significantly associated with visit volume. However, nursing home patients were more likely than non-nursing home patients to have aide, clergy, and social worker average daily visits above the median. Thus, there were differences between the two groups in volume mix but not overall volume of hospice visits. (Abstract and final report, NTIS accession no. PB2005-102219; 22 pp., $26.50 paper, $14.00 microfiche)**

Family Physician Reports of Medical Error. **Anton J. Kuzel, M.D., Virginia Commonwealth University, Richmond, VA. AHRQ grant HS11725, project period 9/30/01-6/30/03.**

The researchers examined 75 anonymous error reports filed by 18 U.S. family physicians who were participating in an international study on the causes of medical errors. They reviewed the narratives of the reports and tabulated the consequences to patients, both those reported by physicians and those inferred by the investigators. A chain of errors was documented in 77 percent of incidents. Of the 83 percent of errors that involved treatment or diagnosis, 67 percent originated from miscommunication. When asked whether the patient was harmed, 7 physicians answered affirmatively in 43 percent of the cases in which their narratives described harms. Psychological and emotional effects accounted for 17 percent of physician-reported consequences but 69 percent of investigator-inferred consequences. The researchers conclude that physicians are an unreliable source for reporting harms; the emotional impact of errors is poorly recognized by physicians and deserves greater attention; and safety initiatives should focus more on preventing miscommunication than on improving judgment. (Abstract, executive summary, and final report, NTIS accession no. PB2005-101333; 28 pp., $26.50 paper, $14.00 microfiche)**

Fourth Annual Evidence-Based Practice Conference. **Bernadette Melnyk, Ph.D., R.N., University of Rochester, Rochester, NY. AHRQ grant HS13817, project period 9/30/02-9/29/03.**

This project provided support for a national conference attended by 218 nurses and other interdisciplinary health care providers from 18 States. The goal was to help attendees acquire the skills to search for the latest scientific evidence affecting practice, critically appraise the strength of the evidence, plan practice changes in response to the evidence, overcome barriers to evidence-based care, plan strategies to evaluate evidence-based care, and become knowledgeable about the latest evidence affecting certain populations, including high-risk children, older adults, and patients with acute/chronic illnesses. (Abstract, executive summary, and final report, NTIS accession no. PB2005-101334); 14 pp., $26.50 paper, $14.00 microfiche)**

Government Coverage of Traditional Indigenous Medicine. **J.K. Olson-Garewal, M.D., University of Arizona, Tucson. AHRQ grant HS10930, project period 8/15/00-2/14/02.**

This project provided support for two conferences focused on traditional indigenous medicine. The first conference included speakers from three countries—New Zealand, South Africa, and the United States—who discussed their respective countries' indigenous health care systems and problems and progress in incorporating these practices into government-regulated and supported health care systems. The second conference concentrated on government support of traditional Indian Medicine and included U.S. traditional healers, tribal leaders, and representatives of the leading Federal health care funding agencies. The major themes

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centered on the importance of traditional healing in the American Indian community, the need for support of traditional practitioners without compromising their integrity or autonomy, the role of traditional health care in economic self-sufficiency, and the Federal health care payers' willingness to follow the Tribes' lead in this area. (Abstract and final report, NTIS accession no. PB2005-102221); 212 pp., $54.50 paper, $26.50 microfiche)**

Hospital CEOs' Perception of Competition: A Pilot Study. **Min Woong Sohn, Ph.D., University of Chicago, Chicago, IL. AHRQ grant HS10810, project period 6/1/00-5/31/02.**

These researchers developed and pilot-tested a questionnaire on market competition among hospitals. They sent the questionnaire to 71 hospital administrators in the Chicago area in 2001 and achieved a 76 percent response rate. Overall, administrators were reluctant to share sensitive information with the researchers and did not respond to questions pertaining to competitor identification. Over 50 percent of respondents did not answer some questions (particularly those from for-profit hospitals), suggesting a potential selection problem in the data obtained through a survey like this. The researchers conclude that a survey of hospital administrators is not a reliable method for obtaining data on market competition among hospitals. (Abstract and final report, NTIS accession no. PB2005-102220; 48 pp., $29.50 paper, $14.00 microfiche)**

Innovations Incentive Initiative in a Health Services Research Training Program. **Patricia Danzon, M.D., Ph.D., University of Pennsylvania, Philadelphia. AHRQ grant HS09790, project period 9/1/98-8/31/03.**

This project provided support for two specific innovations. The first supported creation of a syllabus for a Ph.D., level course on outcomes research taught to health services research trainees in the National Research Service Award program at the University of Pennsylvania. The second innovation created a summer research scholars program for underrepresented minority students at the University to enhance their understanding and interest in a health services research career. (Abstract and final report, NTIS accession no. PB2005-102212); 14 pp., $26.50 paper, $14.00 microfiche)** ■

Research Briefs

Eng, J., Krishnan, J.A., Segal, J.B., and others. (2004, December). "Accuracy of CT in the diagnosis of pulmonary embolism: A systematic literature review." (AHRQ contract 290-97-0006). ***American Journal of Radiology*** **183, pp. 1819-1827.**

With the advent of high-speed helical scanners in the early 1990s, it became possible to examine the pulmonary arteries for emboli using computerized tomography (CT). These authors reviewed the available evidence on this technology—including both systematic reviews and primary studies—and found a moderate amount of variation in the reported sensitivity of CT angiography for the diagnosis of pulmonary embolism. Sensitivity ranged from 45 percent to 100 percent, with only three of eight primary studies reporting a sensitivity above 90 percent. Reported specificity was generally greater than 90 percent with less variability. MDCT—a significant technical advance that involves use of four or more detectors—allows visualization of finer pulmonary vascular detail and provides potentially greater diagnostic accuracy, but systematic evaluations of this technology are not yet available.

Fouad, M.N., Mayo, C.P., Funkhouser, E.M., and others. (2004). "Comorbidity independently predicted death in older prostate cancer patients, more of whom died with than from their disease." (AHRQ grant HS09446). ***Journal of Clinical Epidemiology*** **57, pp. 721-729.**

This study involved 561 men with prostate cancer from one Alabama county who were older than 65 when they died during the period 1993-1995. About one-third (37 percent) of white men and 50 percent of black men died from prostate cancer, while the remainder died from other causes. Increasing age was associated with less likelihood of prostate cancer as the cause of death, as was white race and a greater number of coexisting medical conditions. Prostate cancer treatment did not independently affect the cause of death (that is, death with versus from prostate cancer). For the study, the researchers cross-linked death certificate, Medicare, and VA databases and reviewed medical records to rate the men's coexisting medical conditions and determine

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whether or not death was due to prostate cancer.

Gray, D.T. (2004, November). "Neonatal circumcision: Cost-effective preventive measure or "the unkindest cut of all'?" *Medical Decision Making*, 24, pp. 688-692.

Neither the American Academy of Pediatrics nor the Canadian Pediatric Society still recommends circumcision as a routine procedure. They recommend that if circumcision is performed, the procedure be accompanied by documented informed consent and adequate analgesia. Administrative data from AHRQ's Healthcare Cost and Utilization Project indicate that 1.2 million males (59 percent of all male newborns and 86 percent of those without a complicating diagnosis) were circumcised at birth in 2000. This author reviews several cost-effectiveness analyses of circumcision. He points out that such studies should explicitly consider the importance of various sociocultural and other issues that may not be fully captured in quantitative analyses. If cost-effectiveness analysis does not justify the procedure, then the next step may be to address the degree to which finite societal health care resources should be expended for a procedure performed primarily for sociocultural and religious reasons. Reprints (AHRQ Publication No. 05-R029) are available from AHRQ.*

Gurvitz, M., Chang, R.K., Drant, S., and Allada, V. (2004). "Frequency of aortic root dilation in children with a bicuspid aortic valve." (AHRQ grant HS13217). *American Journal of Cardiology* 94, pp. 1337-1340.

Bicuspid aortic valve (BAV) is associated with aortic root dilation and dissection in adults, but the age and conditions when dilation begins are unknown. Using echocardiographic data, these investigators compared the aortic root dimensions and valve hemodynamics of 76 children with BAV with those of 41 children without BAV. They found that children with an isolated BAV had aortic roots that were larger than normal at all of the measured anatomic levels, regardless of the presence of aortic stenosis or regurgitation. The dilation was most pronounced in the tubular portion of the ascending aorta.

Johnson-Masotti, A.P., Laud, P.W., Hoffmann, R.G., and others. (2004, November). "A Bayesian approach to net health benefits: An illustration and application to modeling HIV prevention." (AHRQ grant HS11364). *Medical Decision Making* 24, pp. 634-653.

These authors used Bayesian analysis to estimate the incremental net health benefit (INHB) to seriously mentally ill men of advocacy training. The training group was compared with a control group in a randomized trial of HIV prevention. Advocacy training involved seven group sessions teaching effective communication strategies for disseminating HIV prevention messages to friends and acquaintances. Control conditions involved a one-on-one HIV/AIDS risk reduction education program. Using a Bernoulli model of HIV transmission, the authors converted changes in the participants' risk behaviors into the number of HIV infections averted. The authors obtained a positive mean INHB of 0.0008, indicating that advocacy training was just slightly favored over the control condition, assuming a $50,000 per quality-adjusted life year threshold.

Maslow, J.N., Lautenbach, E., Glaze, T., and others. (2004, September). "Colonization with extraintestinal pathogenic *Escherichia coli* among nursing home residents and its relationship to fluoroquinolone resistance."(AHRQ grant HS10399). *Antimicrobial Agents and Chemotherapy* 48(9), pp. 3618-3620.

Nursing home residents are at greater risk than others for developing urinary tract and bloodstream infections. These infections are often caused by a type of gram-negative bacteria (GNB), extraintestinal pathogenic *Escherichia coli* (ExPEC). GNB resistance to antibiotics is a growing problem among nursing home residents. Resistance to the fluroquinolone (FQ) class of antibiotics, commonly prescribed for *E. coli*, is also a growing problem. This study found that 59 percent of fecal samples of 49 residents of a Veterans Affairs nursing home were colonized with ExPEC, 22 percent were colonized with adhesin-positive *E. coli*, and 51 percent were colonized with FQ-resistant *E. coli.*

Mayer, M.L., and Skinner, A.C. (2004, December). "Too many, too few, too concentrated? A review of the pediatric subspecialty workforce literature." (AHRQ grant HS13309). *Archives of Pediatric and Adolescent Medicine* 158, pp. 1158-1165.

Improved survival rates among very premature infants and children with previously fatal childhood illnesses, such as cystic fibrosis, may lead to increased need for pediatric subspecialists. Yet, little is known about the distribution of the pediatric

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subspecialty workforce relative to the demand for their services, according to this review of literature on the topic. Of 41 studies, only 8 attempted to make future workforce projections, and only 1 explicitly accounted for non-clinical activities in its projections. While some studies suggested that additional pediatric subspecialists are not needed, these studies did not include objective assessments of demand in geographic areas where pediatric subspecialty physicians are not available.

Ondategui-Parra, S., Bhagwat, J.G., Zou, K.H., and others. (2004). "Practice management performance indicators in academic radiology departments." (AHRQ grant HS13234). ***Radiology*** **233, pp. 716-722.**

Assessing departmental performance with a wide range of management indicators is not yet an established and standardized practice in academic radiology departments in the United States, according to this study. The researchers sent a survey to members of the Society of Chairmen of Academic Radiology Departments. The survey examined six categories of practice management performance indicators ranging from general organization to radiology reporting and customer satisfaction. The most frequently used performance indicators were: productivity (78 percent), report turnaround (82 percent) and transcription time (71 percent), appointment access to magnetic resonance imaging (80 percent), patient satisfaction (84 percent), and expenses (67 percent).

Radwin, L.E., Washko, M., Suchy, K.A., and Tyman, K. (2005). "Development and testing of four desired health outcomes scales." (AHRQ grant HS11625). ***Oncology Nursing Forum*** **32(1), pp. 92-96.**

This study provides preliminary evidence of acceptable psychometric properties for four scales designed to measure desired outcomes of cancer nursing care. The four scales include: Fortitude Scale, Trust in Nurses Scale, Cancer Patient Optimism Scale, and Authentic Self-Representation Scale. Sixty-six recently treated cancer patients who attended a cancer support organization workshop responded to the four scales. Responses showed reliability for each scale: 0.81 for the Fortitude Scale; 0.81 for the Trust in Nurses Scale; 0.75 for the Cancer Patient Optimism Scale, and 0.71 for Authentic Self-Representation Scale. The authors recommend further psychometric testing of the scales with large samples.

Ramos, B.M. (2004, December). "Culture, ethnicity, and caregiver stress among Puerto Ricans." (AHRQ grant HS08641). ***Journal of Applied Gerontology*** **23(4), pp. 469-486.**

The author conducted focus groups in Spanish with 68 Puerto Rican female caregivers who were providing care for older relatives in community settings. Subjects talked about caregiving stressors and how they viewed and coped with the stressors. Most of the women lived in poverty and constantly struggled to make ends meet. They found caregiving difficult because of their limited English and unfamiliar environment. Many were caring for highly dependent elderly relatives, whose debilitating conditions required intense day-to-day care. As a result, some women could hold only part-time jobs or could not work at all. Since in the Puerto Rican culture, women are counted on to keep smooth family relations, the caregivers invariably identified interpersonal relationships as a major source of stress. Despite these problems, the caregivers unanimously viewed caregiving as rewarding and positive, which may have lessened their stress. Many appeared to cope with resignation. Religion and spiritual practices were the most commonly reported coping strategies, and the church was viewed as crucial for social support.

Wataganara, T., Peter, I., Messerlian, G.M., and others. (2004, September). "Inverse correlation between maternal weight and second trimester circulating cell-free fetal DNA levels." (AHRQ grant T32 HS00060). ***Obstetrics & Gynecology*** **104(3), pp. 545-550.**

Clinical applications of the analysis of cell-free fetal DNA in maternal plasma and serum are expanding. However, use of fetal DNA during prenatal screening requires knowledge of variables that might affect its levels in the maternal circulation. This study found, for example, that fetal DNA levels are affected by maternal weight in the second trimester. The investigators developed a database that included previously measured fetal DNA levels and newly acquired clinical information on women in their second and third trimesters, such as maternal age, weight, and smoking history. They observed no significant associations between maternal factors studied and plasma fetal DNA levels in the first trimester group. However, they found a significant inverse correlation between maternal weight and serum fetal DNA level in the second trimester group. ■

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