



RESEARCH ACTIVITIES

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The challenge of prioritizing care for complex patients

A patient with only one chronic condition walks into an exam room. This is becoming less common than it used to be.

Optimizing health care and ultimately the health of Americans is getting harder as patients increasingly have more than one chronic condition: diabetes, depression, heart disease, and more.

“We’re not surprised to have patients with five or more chronic conditions anymore,” says Cynthia Boyd, M.D., of the Johns Hopkins University School of Medicine’s

Division of Geriatric Medicine and Gerontology, who is studying how complex health status is associated with treatment burden. “We face enormous challenges trying to figure out which things are most important,” says Dr. Boyd.

Researchers are looking at how to prioritize treatment and preventive care for these patients. For example, how do you decide which medications to prescribe when treating patients with multiple conditions when the medicines may have dangerous interactions? And, what are the harms and benefits of preventive tests that may unnecessarily burden patients with multiple chronic conditions who are already juggling numerous drugs and doctors’ visits?

The care costs for these patients are also a concern. Treating patients with several chronic conditions can cost as much as seven times more than treating patients with only one chronic illness. Among Medicare beneficiaries, 66 percent of spending is for those with five or more chronic conditions.

Since 2008, the Agency for Healthcare Research and Quality (AHRQ) has awarded 47 grants to researchers looking for better ways to study and provide care for complex patients.

The perfect storm

Maureen Smith, M.D., refers to the growing number of complex patients as “a perfect storm.” And it’s a fast moving one. “We don’t have time to look for the perfect answer, but we do have the opportunity to look into treatments that will work in the real world,” says Dr. Smith, director of the Health Innovation Program at the University of Wisconsin School of Medicine and Public Health.

Dr. Smith is examining how tight adherence to diabetes treatments may affect patients with diabetes who also have chronic kidney disease and congestive heart failure. Her work aims to help clinicians prioritize which of these issues to address first in caring for complex patients. “Our project examined whether tight adherence to diabetes guidelines, particularly tight control of blood sugar, is indicated for all patients with diabetes,” Dr. Smith told *Research Activities*. “We found that diabetes patients with very tight control of their blood sugar (hemoglobin A1c < 5.5%) had a higher risk of hospitalization, emergency department visits, or death, and this risk was significantly increased in more complex patients.”

Highlights

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From the Director



patients with more than one medical condition are becoming more common and their care more costly.

Patients with multiple conditions often need more of everything—more time, treatments, and tests. And the more we do, the greater the chance of complications and confusion.

When I think about complex patients, I think about my father, Patrick, who died last October. He was the father of seven children, a husband, and an accountant who turned around bankrupt companies.

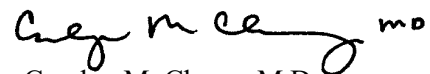
is late 70s and 80s, my father had several chronic illnesses, including lung disease, early Alzheimer's disease, and heart problems. He took 18 different medicines and was on oxygen at home during his last year of life, which he hated. He was extremely fortunate to have great doctors, a loving family, and a terrific wife who was essential to his enjoying life beyond dealing with health issues.

But even with more support than many patients have, my father still had difficulties. He needed to be re-admitted to the hospital because of a miscommunication about the blood-thinner drug he was taking. Miscommunication is the source of many medical errors. And communicating effectively can be

very challenging when dealing with the broad array of regimens often needed to maintain the health of complex patients.

Researchers are investigating ways to prioritize treatment and preventive care for these patients.

At the Agency for Healthcare Research and Quality, we've awarded 47 grants to researchers and clinicians seeking ways to provide better care for patients with more than one condition. Their work is as complicated as their patients' medical conditions, but it's needed. After all, there was only one man like my father, but there are many patients like Patrick.


Carolyn M. Clancy, M.D.

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Correction

The March cover story on the Re-engineered Discharge Project should have stated that many (not 4.4 million) hospital stays each year are due to potentially preventable readmissions.

Complex patients

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David M. Kent, M.D., of Tufts Medical Center, has spent the past 10 years studying this real world as he explores better ways to do subgroup analysis. “Because patients have too many different characteristics that can potentially alter the risks and benefits of therapy to consider each one separately, we advocate a risk-modeling approach to the interpretation of clinical trials,” Dr. Kent told *Research Activities*. “In contrast to the conventional one-variable-at-a-time approach to subgroup analysis, this approach seeks to describe the dimensions that determine the likelihood that a patient might benefit or be harmed by therapy.”

The role of prevention

By studying the benefits and harms of preventive interventions in elderly patients with cognitive impairment, Greg A. Sachs, M.D., hopes to improve decisionmaking. All of his patients are by definition “complex patients.”

Early in Dr. Sachs’s career, he received a fax from a pharmacist wondering why a woman with diabetes in the nursing home wasn’t on a statin for her cholesterol. The patient was 95 and had advanced dementia, among other conditions. “She was dead by the time the fax arrived,” says Dr. Sachs, of the Indiana University Division of General Internal Medicine and Geriatrics and Regenstrief Institute, Inc. He’s even had to explain why an 85-year-old patient with dementia and multiple other conditions shouldn’t be subject to a colonoscopy. “When patients don’t benefit from screenings, it’s not good medicine and it’s not smart

When patients don’t benefit from screenings, it’s not good medicine and it’s not smart spending.

spending,” he told *Research Activities*.

For clinicians like Dr. Boyd of Johns Hopkins University, who work with complex patients every day, one of the most difficult things to convey can be uncertainty. Yet, she says, “I have to communicate what I know and don’t know. We need to balance both patient-centered care and evidence-based guidelines. We can’t think about one without the other.”

In an article published in the *Journal of the American Medical Association* in 2005, Dr. Boyd and her coauthors applied evidence-based guidelines to a hypothetical elderly woman with five common chronic diseases. They found she would need at least 12 medications (costing her \$406 per month) and a complicated nonpharmacological regimen to manage her conditions.

Creating a care management plan that is achievable and not burdensome requires a large dose of reality. “If we try to do everything, it will be overwhelming for our patients and not even in line with their goals,” says Dr. Boyd. “I’m constantly trying to figure out the best way to energize and motivate my patients for the self-management, treatment, and interventions that are the highest priorities for their well-being.”

Caring for the whole patient

“We need to shift from caring for each of a patient’s conditions to caring for the patient as a whole,” says Dr. Victor Montori of the Mayo Clinic. His AHRQ grant focuses on how to optimize prevention and health care management for patients with diabetes.

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Dr. Victor Montori (right) discusses treatment options with Gary Hahn at the Mayo Clinic.

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On average, patients with diabetes often have coexisting medical conditions, with depression, hypertension, and hyperlipidemia (high levels of cholesterol or other lipids) being most common. “When patients aren’t achieving guideline-recommended levels of control of sugar or cholesterol, our reflex is to intensify care by offering more treatment. This intensification leads to more visits, tests, side effects,

and costs. Some end up being superfluous,” says Dr. Montori. “They don’t fit with the patient’s goals.”

“Sometimes, the solution is minimally disruptive medicine that allows patients to pursue their dreams,” he explains. For an elderly man with diabetes, depression, and a disability who desperately wants to maintain his independence, Dr. Montori is working to reduce the man’s workload as a patient and

simplify his routine to focus on preventing another stroke.

“We need more care that fits the patient,” Dr. Montori asserts.

AHRQ’s investments in exploratory research projects like these, as well as projects that develop new methods and data resources, will help researchers improve our understanding of complex patients and help personalize care for better results. ■ KM

Chronic Disease

Metformin just as effective as other medications for treating type 2 diabetes

When lifestyle changes, such as diet and exercise, are not enough, patients with type 2 diabetes often take one or more drugs to control their disease. Patients and physicians are faced with a dizzying array of no fewer than 11 different classes of diabetes medications. Recently, researchers conducted a major evidence-based review to determine which drug classes are most effective in treating type 2 diabetes, and if combination therapy confers additional benefits. They found that the older diabetes drug metformin is just as good, if not better, than newer classes of medications. In addition, any two-drug combination produces similar diabetes control, but they have different adverse events.

The researchers identified published studies that reported on major long-term clinical outcomes for approved diabetes medications. They looked at medication effects on control of hemoglobin A1c (blood sugar) levels, body weight, and lipid levels, as well as various side effects, such as hypoglycemia (excessively low blood sugar level). In addition to metformin, second-generation sulfonylureas, thiazolidinediones, meglitinides, DPP-4 inhibitors, and glucagon-like peptide-1 receptor agonists were included in the studies examined. A total of 166 articles were selected for review.

Overall, most of the diabetes medications used alone in the reviewed studies decreased HbA1c by about 1

percentage point. Similar results were obtained with various two-drug combinations. Metformin performed better than several other classes by not increasing body weight and by lowering LDL-cholesterol. There was also a better safety profile with metformin in terms of risk for low blood sugar. For example, sulfonylureas had a fourfold higher risk for mild or moderate hypoglycemia compared with metformin. This risk increased to fivefold when these types of drugs were used in combination with metformin compared with other combinations. Increased risks for congestive heart failure and bone fractures were observed for thiazolidinediones. More research is needed to evaluate long-term clinical outcomes, such as cardiovascular and kidney disease, of these various classes of diabetes drugs, particularly in older patients and those with other conditions who may be at increased risk for adverse events. The study was supported by the Agency for Healthcare Research and Quality (Contract No. 290-02-0018).

See “Comparative effectiveness and safety of medications for type 2 diabetes: An update including new drugs and 2-drug combinations,” by Wendy L. Bennett, M.D., M.P.H., Nisa M. Maruthur, M.D., M.H.S., Sonal Singh, M.D., M.P.H., and others in the May 3, 2011 *Annals of Internal Medicine* 154(9), pp. 602-613. ■ KB

Fewer heart bypass surgeries performed

Patients with heart disease may require interventions to clear blocked coronary arteries. The two most common procedures used to restore blood flow to the heart are coronary artery bypass graft (CABG) surgery and percutaneous coronary intervention (PCI or coronary angioplasty). A new study of national trends in use of these procedures found a substantial decrease in the number of CABGs being performed during the past decade, while PCI rates remained stable.

Researchers analyzed data from 2001 through 2008 from the Healthcare Cost and Utilization Project's Nationwide Inpatient Sample. This dataset includes information on patient discharge

data from approximately 1,000 hospitals in 42 States. Results showed a 15 percent drop in the annual rate of these coronary procedures overall from 2001-2002 to 2007-2008. During the earlier period, there were 1,742 bypass surgeries per million adults per year, which dropped to 1,081 by 2007-2008, with a trend indicating a steady, annual decline.

However, the number of PCI procedures performed did not change significantly. In 2001-2002, the PCI rate was 3,827 per million adults per year and remained essentially steady at 3,667 by 2007-2008. Although CABG rates declined, the number of hospitals offering this surgery grew by 12 percent, and the number of

hospitals providing PCI procedures expanded even more—by 26 percent. During the study period, drug-eluting stents were approved by the Food and Drug Administration in April 2003, and their popularity grew rapidly. At the end of 2008, 68 percent of all PCI procedures used drug-eluting stents. The study was supported in part by the Agency for Healthcare Research and Quality (HS18403).

See “Coronary revascularization trends in the United States, 2001-2008,” by Andrew J. Epstein, Ph.D., Daniel Polsky, Ph.D., Feifei Yang, M.D., Lin Yang, M.S., and Peter W. Groeneveld, M.D., M.S., in the May 4, 2011 *Journal of the American Medical Association* 305(17), pp. 1769-1776. ■ KB

Administrative data alone are insufficient to understand equivalence of two common blood pressure drugs

Both angiotensin receptor blockers (ARBs) and angiotensin-converting enzyme inhibitors (ACE inhibitors) lower blood pressure. ARBs, the new kid on the block, are more expensive, but they do not cause the cough that ACE inhibitors users sometimes experience. A new study finds that although the drugs appear to be different in preventing some clinical events, Medicare data lack detail for determining which drug is better.

ARBs were associated with lower risk of sudden cardiac death and heart attacks. For example, the risk of sudden cardiac death was much lower (49 percent) for patients with heart failure who took ARBs than for patients taking ACE inhibitors. And those who took ARBs had a 19 to 24 percent lower risk of being hospitalized for a heart attack than patients who took ACE inhibitors.

However, characteristics of ARB and ACE inhibitor users varied, making a true comparison of the drugs' effectiveness difficult. Prescribing practices and patient preferences may be at the heart of why patient characteristics were so different. For example, doctors could have been more likely to prescribe ARBs for patients who had chronic kidney disease, potentially

believing ARBs were easier on the kidneys. Further, patients who took ARBs were more likely to use preventive drugs to control their cholesterol levels or treat osteoporosis, which may mean they had better access to health care. And, because advertisements for ARBs are commonplace, savvy patients may be specifically requesting these drugs in lieu of ACE inhibitors.

The authors suggest that while Medicare data are an important resource that captures population-based real-world patients, long-term clinical outcomes, and detailed information on drug use, the absence of clinical information and behavioral characteristics may not provide an accurate picture of why a doctor or patient chose a particular drug. This study was funded in part by the Agency for Healthcare Research and Quality (HS17731 and 290-05-0016).

See “Angiotensin receptor blockers and angiotensin-converting enzyme inhibitors: Challenges in comparative effectiveness using Medicare data,” by Soko Setoguchi, Sc.M., Dr.P.H., M.D., M.P.H., W.H. Shrank, M.D., M.S.H.S., J. Liu, and others in the May 2011 *Clinical Pharmacology and Therapeutics* 89(5), pp. 674-682. ■ KFM

HIV/AIDS drugs have varied effects on lipid levels

Antiretroviral medications used to treat patients with HIV/AIDS affect cholesterol and triglyceride levels. One class of these drugs with noticeable effects on lipids is the nucleoside reverse transcriptase inhibitors (NRTIs). Recently, a study examined how these drugs impact lipid levels as part of combination antiretroviral therapy. The study found differences between pairs of NRTIs, with some causing more lipid changes than others. The study observed 2,267 patients who had started their first antiretroviral regimen containing two NRTIs and a third drug from another class of HIV therapies. Monitoring of lipids was conducted during

routine clinical care.

Changes in lipids overall were relatively modest for all of the NRTI combinations. The greatest increases in lipid levels occurred during the first 2 months after starting antiretroviral therapy. Tenofovir/lamivudine or tenofovir/emtricitabine had the smallest increase in total cholesterol levels, but did not have greater increases in the “good” HDL-cholesterol. The NRTI combination of didanosine/lamivudine had the greatest increase in “bad” LDL-cholesterol.

Stavudine/lamivudine was associated with the greatest increase in triglyceride levels, but

also an increase in the “good” HDL-cholesterol. Patient factors associated with lower lipid levels were concurrent infection with hepatitis C virus (HCV) and younger age. The study was supported in part by the Agency for Healthcare Research and Quality (HS19516).

See “Impact of NRTIs on lipid levels among a large HIV-infected cohort initiating antiretroviral therapy in clinical care,” by Heidi M. Crane, M.D., M.P.H., Carl Grunfeld, M.D., Ph.D., James H. Willig, M.D., and others in *AIDS* 25(2), pp. 185-195, 2011. ■ KB

Patient Safety and Quality

Surgical risk score does not work well for knee and hip replacement operations

The Surgical Apgar Score calculates a patient’s blood loss, lowest heart rate, and lowest mean arterial pressure during an operation to identify patients at risk for major complications or death within 30 days after surgery. While this score has been used for patients undergoing general and vascular surgery, a new study finds that it is not quite as useful for patients undergoing hip or knee replacement surgery.

Using medical records for 3,511 patients who had a hip or knee replaced from 2003 to 2006 at Massachusetts General Hospital, researchers calculated surgical Apgar scores. They found that the 10-point score was not able to comprehensively discriminate between patients who would and would not experience complications after undergoing those joint replacement surgeries. For instance, just 6.1 percent of patients who had major complications had an Apgar score of 4 or less, the

range that indicates a high risk for complications. In fact, 78.6 percent of the patients who had complications had a score of 7 or higher, indicating low risk.

Even though the score was unable to predict complications, the authors say it does provide useful information for the post-op health care team on how well a surgery went and how the patient fared during the operation. This study was funded in part by the Agency for Healthcare Research and Quality (T32 HS00060).

See “The surgical Apgar score in hip and knee arthroplasty,” by Thomas H. Wuerz, M.D., M.Sc., Scott E. Regenbogen, M.D., M.P.H., Jesse M. Ehrenfeld, M.D., and others in the April 2011 *Clinical Orthopedics and Related Research* 469(4), pp. 1119-1126. ■ KFM

Pay-for-performance project showed early gains but tapered in the fourth and fifth years

Pay-for-performance approaches reward hospitals that provide high-quality care with higher payments. In contrast, fee-for-service approaches pay providers for the volume of services they provide. Hospitals that participated in a Centers for Medicare & Medicaid Services (CMS) pay-for-performance demonstration project showed early gains in performance. However, hospitals not participating in the project also improved their scores over time. Thus, by the fourth and fifth year of the project, both sets of hospitals had nearly identical performance scores.

CMS deployed the pay-for-performance demonstration project in 260 hospitals nationwide in 2003. Participating hospitals received bonuses; reported quality data publicly; and received higher

payments for meeting quality standards when treating Medicare patients with heart attacks, heart failure, pneumonia, coronary artery bypass grafts, and hip and knee replacements. These hospitals showed performance improvements through 2006. But by 2007, the participating hospitals' performance scores were similar to 780 hospitals that did not participate.

Rachel M. Werner, M.D., Ph.D., of the University of Pennsylvania School of Medicine, and colleagues suggest that this eventual performance parity may have been a result of a performance improvement boom that occurred during the demonstration project's term as forward-thinking hospitals began preparing for a widespread deployment of pay-for-performance. Incentives appear to

be effective in improving scores only until performance actually improves, the authors find. That is, once hospitals excel, additional performance gains are difficult to eke out. The authors suggest that once performance scores are reached, incentives may be better used to target other areas in need of improvement. Not surprisingly, larger incentives spurred performance improvement at hospitals. This study was funded in part by the Agency for Healthcare Research and Quality (HS18409).

See "The effect of pay-for-performance in hospitals: Lessons for Quality Improvement," by Dr. Werner, Jonathan T. Kolstad, Ph.D., Elizabeth A. Stuart, Ph.D., and Daniel Polsky, Ph.D., in the April 2011 *Health Affairs*, 30(4), pp. 690-698. ■ *KFM*

Emergency Medicine

Leaving the emergency department without being seen more likely at hospitals that serve more low-income patients

As strains on the emergency care system have mounted, the proportion of patients who leave the emergency department (ED) without being seen has increased dramatically. Many ED patients who leave without being seen (LWBS) are seriously ill, require immediate evaluation, and are at risk of poorer outcomes. A new study reveals that EDs serving low-income communities and communities with a high proportion of poorly insured patients had higher LWBS rates. Overall, the LWBS rate among 262 California hospitals studied varied from 0 percent to 20.3 percent.

Patients who leave the ED without being seen represent the failure of an emergency care delivery system to meet its goals of providing care to those most in need, suggest the California researchers. They looked at the relationship between the rates of LWBS in 9.2 million

ED visits at 262 California hospitals in 2007 and hospital-level socioeconomic case mix and other hospital characteristics. Hospital structural characteristics associated with increased LWBS included county ownership, trauma center designation, and teaching program affiliation.

The researchers concluded that EDs seeking to decrease their LWBS rate will likely need to institute changes that go beyond fine-tuning ED operations. The study was supported in part by the Agency for Healthcare Research and Quality (HS18098).

See "Hospital determinants of emergency department left without being seen rates," by Renee Y. Hsia, M.D., Steven M. Asch, M.D., Robert E. Weiss, Ph.D., and others in the July 2011 *Annals of Emergency Medicine* 58(1), pp. 24-32. ■ *MWS*

Patients with sepsis fare better when admitted via the emergency department rather than directly to the hospital

Sepsis, a potentially life-threatening condition that requires immediate medical attention, occurs when the body's overwhelming immune response to infection triggers widespread inflammation that can lead to dropped blood pressure and shock. A new study finds that patients with sepsis who are admitted through emergency departments (EDs) may have a better chance of survival than patients who are directly admitted to the hospital.

Emilie Powell, M.D., M.B.A., Rahul K. Khare, M.D., and Northwestern University colleagues analyzed data from the Healthcare Cost and Utilization Project's Nationwide Inpatient Sample from

the Agency for Healthcare Research and Quality. They found a 17 percent lower likelihood of dying from sepsis when a patient was admitted through the ED than when a patient was directly admitted to the hospital. This lower mortality rate could be a result of EDs having more staff; better technology, such as central venous pressure monitors; and readily available antibiotics. The combination of these elements is crucial for providing patients with sepsis the recommended treatment of aggressive resuscitation within 6 hours, which is time- and resource-intensive.

The authors state that this study demonstrates the valuable role that

the often-overcrowded ED plays in providing sepsis care and early resuscitation. Given the more favorable mortality rates in the ED, patients with sepsis should be brought there first for resuscitation instead of admitted to a hospital floor. This study was funded in part by the Agency for Healthcare Research and Quality (T32 HS00078).

See "Lower mortality in sepsis patients admitted through the ED vs direct admission," by Dr. Powell, Dr. Khare, D. Mark Courtney, M.D., and Joe Feinglass, Ph.D., in the February 2011 *American Journal of Emergency Medicine* [Epub ahead of print]. ■ *KFM*

Disparities/Minority Health

Blacks who receive heart transplants have poorer survival than other racial groups

Despite improvements in transplant procedures over the past 2 decades, a new study finds that survival disparities still exist between black and white patients undergoing heart transplants. A group of Stanford University researchers analyzed national outcomes data for 39,075 patients who underwent heart transplants over a 22-year period. The 4,997 black patients had a 34 percent higher risk of transplant-related death than the 30,993 whites, after adjustment for recipient, transplantation, and socioeconomic factors.

Other nonblack minority transplant recipients (2,118 Hispanics, 967 Asians, and patients from other nonblack racial groups) did not differ from whites in adjusted risk of death. Overall, 16,880 patients died after transplantation during the period covered by the data. The rate of second transplants was similar for all of the groups (from 2–2.5 percent).

Blacks were more likely to die of graft failure or a cardiovascular problem than were whites or other nonwhites (57.9 percent, 37.8 percent, and 44.1

percent, respectively), but less likely to die from an infection or cancer (19.9 percent for blacks, 33.0 percent for whites, and 28.2 percent for other nonwhites). Rates of hospitalization for graft rejection and noncompliance with a regimen of immunosuppressive drugs were higher for blacks than for whites or other minority groups. According to the researchers, the patterns in causes of death suggest that black patients experienced inadequate immunosuppression. The findings were based on data from the United Network on Organ Sharing on adult patients who underwent heart transplant surgery between October 1987 and February 2009. The study was funded in part by the Agency for Healthcare Research and Quality (HS19181).

More details are in "Persistent racial disparities in survival after heart transplantation," by Vincent Liu, M.D., M.S., Jay Bhattacharaya, M.D., Ph.D., David Weill, M.D., and others in the April 19, 2011 *Circulation* 123(15), pp. 1642-1649. ■ *DIL*

Minority status has no effect on patient outcomes in the intensive care unit

White and minority patients in the intensive care unit (ICU) of the same hospital do not differ in mortality or length of stay, after adjustment for various factors. These factors included severity of illness, resuscitation status, socioeconomic status, insurance status, and admission type.

The final study sample included 9,518 ICU patients in 35 California hospitals. Black and Hispanic patients had the highest median ICU length of stay.

The researchers believe that their ability to detect disparities may have been reduced by only including hospitals that are more likely to provide high-quality care. This view is supported by a number of recent studies demonstrating that many of the differences in outcomes for black patients are explained by differences in quality of care provided by hospitals that serve high proportions of minority patients rather than differential treatment of minorities within the

same hospital. This study was supported by the Agency for Healthcare Research and Quality (HS13919).

See “The effect of race and ethnicity on outcomes among patients in the intensive care unit: A comprehensive study involving socioeconomic status and resuscitation preferences,” by Sara E. Erickson, M.D., Eduard E. Vasilevskis, M.D., Michael W. Kuzniewicz, M.D., and others in *Critical Care Medicine* 39(3), pp. 429-435, 2011. ■ MWS

Minority patients with nonsmall-cell lung cancer are less likely to receive hospice services than whites

There are substantial racial and ethnic disparities in the receipt of hospice care among elderly patients with advanced nonsmall-cell lung cancer (NSCLC), according to a new study. Patients diagnosed with late-stage NSCLC have a 5-year survival rate of only 2.8 percent. Patients who are not likely to benefit from curative treatment can enroll in hospice care instead, with the goal of living an alert, pain-free last months with dignity, according to the researchers. They retrospectively studied elderly patients diagnosed with advanced-stage NSCLC (107,149 urban residents and 10,745 rural residents). Among the urban residents, when the researchers compared whites with minority patients, the latter were from 19–58 percent less likely to receive hospice care. For patients living in rural areas, blacks (but not Asians/Pacific Islanders or Hispanics) had a significant 21 percent lower rate of hospice care than whites.

The difference in services when compared with whites was found for blacks and Asians/Pacific Islanders across all income quartiles, but only in the two lowest

socioeconomic quartiles for Hispanics. Regardless of income level, women were 30–34 percent more likely to receive hospice care than men, and patients over 69 years old were 7–26 percent more likely to receive hospice care than those 66–69 years. Finally, patients diagnosed after 1995 were more likely to receive hospice care than those diagnosed between 1991 and 1995. The study’s findings were based on linked data from the National Cancer Institute’s Surveillance, Epidemiology, and End Results registries and Medicare regarding patients over age 65, who died from NSCLC between January 1991 and December 2005. The study was funded in part by the Agency for Healthcare Research and Quality (HS16743).

More details are in “Racial disparities in the use of hospice services according to geographic residence and socioeconomic status in elderly cohort with nonsmall cell lung cancer,” by Dale Hardy, Ph.D., Wenyaw Chan, Ph.D., Chih-Chin Liu, M.S., and others in the April 1, 2011 *Cancer* 117(7), pp. 1506-1515. ■ DIL

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

Diagnosing and treating depression gets better in nursing homes but some disparities remain

Depression is often underdiagnosed and undertreated in nursing homes. This study demonstrated that diagnosis and treatment of depression among nursing home residents has risen significantly in the past decade. Yet some disparities persist, particularly among minority residents and those with significant cognitive impairment or dementia.

Rutgers University researchers used two databases to obtain detailed information on residents aged 65 and over in 5,445 nursing homes located in eight States. They analyzed data from every year during the period 1999 to 2007. The percentage of residents diagnosed with depression increased from 33.8 percent in 1999 to 51.8

percent in 2007. Diagnosis rates were highest for whites (55.1 percent), followed by Hispanics (48.3 percent), and blacks (39.4 percent). Use of antidepressants also increased steadily, from 71.2 percent of residents in 1999 to 82.8 percent in 2007. However, black residents with depression continued to be less likely than white residents to receive these medications.

In 2007, those less likely to be diagnosed with depression were blacks, residents aged 85 and older, and those with severe cognitive impairment. In addition to blacks, residents with moderate to very severe cognitive impairment, dementia, and total dependence in activities of daily living were

significantly less likely to receive antidepressants to treat their depression. While residents with more coexisting medical conditions were more likely to be diagnosed with depression, they were less likely to receive medication. The study was supported in part by the Agency for Healthcare Research and Quality (HS16097).

See “No longer undertreated? Depression diagnosis and antidepressant therapy in elderly long-stay nursing home residents, 1999 to 2007,” by Dorothy Gaboda, Ph.D., Judith Lucas, Ed.D., Michele Siegel, Ph.D., Ece Kalay, B.A., and Stephen Crystal, Ph.D., in the April 2011 *Journal of the American Geriatric Society* 59(4), pp. 673-680, 2011. ■ KB

Health Care Costs and Financing

Where low-wage employees work, who their colleagues are, and spouses' wage level affect health insurance coverage and cost

Different provisions in the Affordable Care Act (ACA), such as tax credits and penalties for employers for health insurance coverage of workers, vary by employer size and average wage level paid to workers. To illuminate the extent to which low-wage workers and their employers may be affected by different provisions in the ACA, Jessica Vistnes, Ph.D., of the Agency for Healthcare Research and Quality, and Alan C. Monheit, Ph.D., M.A., of the University of Medicine and Dentistry of New Jersey, analyzed data from the 2006 Medical Expenditure Panel Survey-Insurance Component. They examined offers of coverage and cost-sharing requirements by the wage distribution and firm size of employers to find out how employer-sponsored insurance varies by these dimensions. They also considered the employment circumstances of a worker's spouse.

They found that where low-wage workers are employed, who their colleagues are, and their spouses' wage levels are important factors in determining low-wage workers' access to coverage and the cost and generosity of coverage. Results showed that 75.3 percent of low-wage employees (those earning less than \$10.50 per hour) work at employers with a majority of low-wage workers (“low-wage employers”), but there is substantial variation in access to coverage within this category. For example, insurance offer rates of low-wage employers with fewer than 25 workers were 10 percent for those employing only low-wage workers compared with 46.4 percent for firms with low-, middle- (between \$10.50 and \$23.50 per hour) and high- (more than \$23.50 per hour) wage workers. In addition, employee premium contributions at the

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Low-wage employees

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smallest low-wage employers (fewer than 25 employees) and small employers with no low-wage workers are strikingly different, \$1,008 compared with \$602. Low-wage workers at establishments where low-wage workers are the minority fared better—across all firm sizes, they faced lower single premium contributions than low-wage workers in low-wage

establishments. The study also found that low-wage workers were more likely to be insured if they were married to spouses earning a high wage.

More details are in “The health insurance status of low-wage workers: The role of workplace composition and marital status,” by Drs. Vistnes and Monheit, in the May 2, 2011 *Medical Care Research and Review* [Epub ahead of print]. Reprints (AHRQ Publication No. 11-R051) are available from AHRQ.* ■

Rising health care costs may have spurred more individuals to use complementary and alternative medicine

Use of chiropractic care, massage, and acupuncture continues to grow, especially for individuals who have difficulty affording conventional medicine, a new study finds.

Comparing data from the National Health Interview Surveys from 2002 and 2007, researchers found a relative increase of 14.2 percent in use of at least one complementary and alternative medicine (CAM) service (25.7 percent in 2002 vs. 29.4 percent in 2007). In 2007, Whites (33 percent) and Asians (31.8 percent) were the greatest users of CAM, followed by blacks (20.1 percent) and Hispanics (16.9 percent).

When individuals face financial barriers that prevent them from receiving conventional care, they are more likely to turn to more affordable CAM therapies for relief, the authors suggest. For instance, 38.5 percent of individuals who said they used at least one CAM therapy in 2007 also reported having an unmet medical need or delayed care because of cost. In contrast, only 28.1 percent of CAM users did not report having unmet needs or delayed care.

This upswing in CAM use has coincided with escalating health care costs. The authors suggest that this increase in CAM use warrants

an evaluation of CAM therapies’ effectiveness and health consequences to determine if the therapies can be used as true alternatives or only as supplements to conventional medical care. This study was funded in part by the Agency for Healthcare Research and Quality (HS17003).

See “Trends in the use of complementary and alternative medicine in the United States: 2002–2007,” by Dejun Su, Ph.D., and Lifeng Li, M.P.H., in the *Journal of Health Care for the Poor and Underserved*, 22(1), pp. 296–310, 2011. ■ *KFM*

A program for laboratory monitoring of renin-angiotensin system drugs is cost-effective for certain high-risk patients

Patient safety studies of routine clinical practice show that most, but not all patients who are prescribed angiotensin-converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB), are routinely monitored with laboratory tests. According to a new study, the costs of laboratory monitoring of all patients in routine clinical practice outweigh the potential savings (and quality of life benefits). Yet focusing monitoring, or obtaining routine labs on patients at high risk of adverse drug events (ADEs) from ACEI or ARB therapy—in this case, patients with chronic kidney disease (CKD)—was cost-saving with 95 percent certainty. The authors also found that at a cost per quality-adjusted life-year of \$30,000, lab monitoring among patients with CKD was cost-

effective. Such findings are important, because earlier research shows that a quarter of preventable adverse drug events are associated with inadequate monitoring, and nearly two-fifths of patients receiving a medicine that required laboratory monitoring did not get the recommended baseline testing.

When the researchers looked at data on patients in a large health maintenance organization who were new users of an ACEI or ARB, they found that the 1-year cumulative risk of an ADE was four times higher for patients with CKD than for the patients overall. The risk for patients with diabetes was elevated by half.

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Laboratory monitoring

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Modeling the cost savings in these three groups for a laboratory monitoring program, only the patients with CKD were calculated to save costs at least 95 percent of the time.

The researchers used decision analysis to bring together data from a variety of sources to estimate costs and outcomes for the study. AHRQ's Healthcare Cost and Utilization Project was the source for costs for hospitalization and emergency department visits. Based on their findings, the researchers suggest that further studies examine the potential for laboratory monitoring of high-risk patients to reduce preventable ADEs and

investigate methods to identify patients at high risk of preventable ADEs. This study was funded in part by a grant from the Agency for Healthcare Research and Quality (HS10391) to the HMO Research Network Center for Education and Research on Therapeutics (CERT). For more information on the CERTs program, visit www.certs.hhs.gov.

More details are in "An economic evaluation of a laboratory monitoring program for renin-angiotensin system agents," by David H. Smith, R.Ph., Ph.D., Marsha A. Raebel, Pharm.D., Arnold Chan, M.D., Sc.D., and others in the March/April 2011 *Medical Decision Making* 31(2), pp. 315-324. ■ DIL

Uninsured patients respond well to paying a monthly retainer for primary care services

With so many uninsured Americans, creative ways need to be developed so that this underserved population can access primary care services and keep a regular physician. One solution is to apply the "concierge" or "boutique" approach to the uninsured, suggests a new study. Under this retainer arrangement, patients pay a fee every month to enroll in an academic family medicine clinic. In return, they receive office visits and can communicate with their providers via telephone and email. A recent study found that those who participated in the program were very happy with it and satisfied with the care they received.

Called Access Assured, the program was implemented at two family medicine clinics in Portland, OR. Uninsured individuals wishing to make an

appointment were asked to pay a fee of \$25 per month for a minimum of six months (\$150). There was a \$25 discount if they enrolled for a full year (\$275). In return, participants received unlimited office appointments, email access to physicians, and the use of a prescription refill system. Charges for lab tests, drugs, and other services were billed on a sliding-fee scale.

For this study, Oregon Health & Science University researchers interviewed 40 program participants, including 20 who had renewed after their initial 6 months and 20 who did not.

Patients reported liking how the program allowed them to select their own provider and maintain continuity of care. They also expressed appreciation for the program, felt like they were

respected and treated the same as other patients, and were satisfied with the quality of their care. Some participants did not understand why they needed to stay enrolled if they were healthy, or were confused about benefits and services entitled to them. However, 11 of the 20 patients who did not re-enroll planned to do so at some future point. The study was supported in part by the Agency for Healthcare Research and Quality (HS18403).

See "Uninsured patient opinions about a reduced-fee retainer program at academic health center clinics," by John W. Saultz, M.D., John Heineman, B.A., Rachel Seltzer, M.A., and others in the May/June 2011 *Journal of the American Board of Family Medicine* 24(3), pp. 304-312. ■ KB

Children's underenrollment in State health insurance programs may be due in part to parents' confusion about coverage

Many low-income children in the United States are eligible for public health insurance. Yet, a large number of uninsured children are not enrolled in this program, even though they are eligible and may be receiving other public assistance. A new study suggests that lack of enrollment in public health insurance programs may be due to parental confusion about whether or not their children are actually enrolled in the program. In a recent survey of Oregon parents with children eligible for public health insurance, some parents thought their children were enrolled when they were not. Other parents believed their children were not enrolled when, in fact, they were enrolled.

If Medicaid and the Children's Health Insurance Program (CHIP) are to be pillars in future health insurance reforms, efforts must be made to provide stable coverage and a system that boosts parental knowledge of their children's eligibility and enrollment status, assert Jennifer E. DeVoe, M.D., D.Phil., and Oregon Health & Science University colleagues. They examined administrative enrollment data from the Food Stamp Program in Oregon (FSP) and from the Oregon Health Plan (OHP), which is the State's Medicaid-CHIP. They also mailed surveys to a stratified, random sample of 10,175 households participating in the FSP that had at least one child aged 1 year or older to

determine whether parents of children enrolled in the FSP had also enrolled their children in the Oregon Health Plan.

Researchers observed a surprising number of discrepancies between parental report and State records with regard to their children's enrollment status in the OHP. For example, 171 (11.3 percent) parents reported that their child was not enrolled in the OHP, while State records indicated they were enrolled. Similarly, 252 (21.2 percent) parents reported their child was enrolled, but the State enrollment records did not show them to be enrolled.

Children most likely to have eligibility confusion had uninsured parents, were from families earning more than \$1,000 per month, had parents employed outside the home, and had no usual source of care. The study was supported in part by the Agency for Healthcare Research and Quality (HS16181).

See "Public health insurance in Oregon: Underenrollment of eligible children and parental confusion about children's enrollment status," by Dr. DeVoe, Moira Ray, B.S., and Alan Graham, M.D., in the May 2011 *American Journal of Public Health* 101(5), pp. 891-898. ■ KB

Low- and middle-income children with public and private insurance have similar rates of unmet health care needs

Families with children report similar rates of unmet health care needs, whether their children have public or private health insurance, according to a new study. These findings are somewhat contrary to many earlier studies that have shown significant differences between public and private coverage. However, consistent with earlier studies, children with coverage gaps or those uninsured all year were more likely to have unmet needs, note the researchers.

They used combined data on 41,498 children from AHRQ's Medical Expenditure Panel Survey Household Component for 2002

through 2006. They compared publicly and privately insured children among families earning less than 4 times the Federal poverty level (FPL) or less than 2 times the FPL. For households earning less than 4 times the FPL, the researchers found that 32.2 percent of children had public coverage all year, 40.5 percent had private coverage all year, and 7.7 percent were uninsured all year. For children with family incomes under 2 times the FPL, 49.6 percent had public insurance all year, 18.5 percent had private insurance all year, and 8.4 percent had no insurance all year.

Among children from lower-income families, those with public insurance were 21 percent less likely to have a usual source of care. However, that was the only significant difference in the comparisons of unmet health care needs among lower- and middle-income children with public or private health insurance. Possible unmet needs used in the analyses included: no doctors' visits during the year, unmet medical or prescription needs, no yearly dental visits, unmet dental needs, and unmet preventive health and safety

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Unmet health care needs

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counseling needs. The study was funded in part by the Agency for Healthcare Research and Quality (HS16181 and HS18569).

More details are in “Comparing types of health insurance for children. A public option versus a private option,” by Jennifer E. DeVoe, M.D., D.Phil., Carrie J.

Tillotson, M.P.H., Lorraine S. Wallace, Ph.D., and others in the April 2011 *Medical Care* [Epub ahead of print]. ■ *DIL*

Child/Adolescent Health

Clinicians cautioned about use of antihypertensive in children receiving kidney transplants who take tacrolimus

Patients who receive a kidney transplant risk having their body reject the new organ. The drug tacrolimus is given to reduce the patient's immune system activity, which lowers the risk of organ rejection. Children receiving a new kidney transplant may experience acute high blood pressure (hypertensive urgency) that can damage the transplanted kidney and cause other problems such as seizures. In order to control this high blood pressure, physicians may prescribe intravenous nicardipine, an antihypertensive agent. However, the authors of a new study warn clinicians to be cautious when using this antihypertensive in children receiving tacrolimus until completion of a full safety profile of nicardipine in transplant patients.

Their study found that the combination of tacrolimus and nicardipine may result in significant drug-drug interactions for some patients. These interactions may affect people in different ways, note the researchers at the Center for Education and Research on Therapeutics at Children's Hospital Medical Center in Cincinnati. In some patients, tacrolimus may build up in the body to toxic levels, which could cause kidney injury or other side effects. Other patients may experience low tacrolimus levels when intravenous nicardipine is stopped, making kidney rejection a possible complication. They reported on one adult and one child treated with both drugs after a kidney transplant. They also evaluated data obtained from 2,068 other children receiving these transplants to see if the use of both drugs predicted adverse effects of immunosuppression.

The large-group analysis of data from 42 pediatric hospitals showed that over a 5-year period, there was an increase in the use of intravenous nicardipine, from 6.2 percent in 2003 to 10.3 percent in 2008. The majority of kidney recipients (79 percent) received an order to receive tacrolimus. In addition, 225 children (11 percent) received intravenous nicardipine; 196 of these received both medications. Children receiving both drugs had a rate of adverse events of immunosuppression of 7.1 percent compared with 3 percent for those not receiving intravenous nicardipine.

White children had a nearly threefold increased risk for such adverse events than black children. This is likely due to the fact that most white patients rely on just one enzyme to metabolize tacrolimus compared with most black patients who have two enzymes, note the researchers. Their study was funded in part by a grant from the Agency for Healthcare Research and Quality (HS16957) to the Cincinnati Children's Hospital Medical Center CERT. For more information on the CERTs program, visit www.certs.hhs.gov.

See “Interaction between tacrolimus and intravenous nicardipine in the treatment of post-kidney transplant hypertension at pediatric hospitals,” by David K. Hooper, M.D., Adam C. Carle, M.A., Ph.D., Joseph Schuchter, and Jens Goebel, in *Pediatric Transplantation* 15, pp. 88-95, 2011. ■ *KB*

Friends' behavior and parental values influence rates of unprotected vaginal intercourse among teens

The attitudes of both friends and parents towards contraception and vaginal intercourse have an impact on later adolescent sexual behavior, according to a new study. This is important information because, in 2001, unintended pregnancies accounted for more than 75 percent of all pregnancies in women under 24 years old. Furthermore, a 1-year delay is typical between when adolescent girls begin sexual activity and when they seek out contraceptive services. The researchers analyzed factors influencing a main outcome of unprotected vaginal intercourse, based on two sets of interviews a year apart (mean age 15.7 years for the first interview and 16.3 years for the second).

A teen who reported at the initial interview having a friend who

engaged in sexual intercourse, either with or without protection against pregnancy, doubled the risk that the teen would report at follow-up having had unprotected vaginal intercourse versus never having had intercourse. Teens who had a distant relationship with their fathers were 2.4 times more likely than those with a close paternal relationship to report at follow-up having had unprotected intercourse versus never having had intercourse.

Parental attitudes towards teens having intercourse or towards use of contraception did not significantly influence the behavior of teens at follow-up at 16 years of age. This is consistent with the hypothesis that parental attitudes were most influential before the teens reached 15 years of age. Nor was there a significant effect on the

risk of having had unprotected intercourse by follow-up of teens' own attitude towards adolescent pregnancy or their confidence in being able to use contraception. The findings were based on analysis of data from the National Longitudinal Study of Adolescent Health, with baseline interviews of 6,649 teens conducted in 1995 and follow-up interviews with 3,899 teens in 1996. The study was funded in part by the Agency for Healthcare Research and Quality (HS15491).

More details are in "Longitudinal influences of friends and parents upon unprotected intercourse in adolescents," by Catherine Kim, M.D., M.P.H., Acham Gebremariam, M.S., Theodore J. Iwashyna, M.D., Ph.D., and others in the February 2011 *Contraception* 83(2), pp. 138-144. ■ *DIL*

A standard enzyme assay may help screen for rickets in breast-fed infants not given vitamin D supplements

Testing for increased alkaline phosphatase (AP) activity in the blood of breast-fed infants, who are not getting vitamin D supplements, can be effective in screening this population for rickets, a new study finds. Rickets in children is associated with interruption in bone growth and mineralization, and possible limb deformities. In 2003, the American Academy of Pediatrics recommended that all breast-fed infants receive 200 international units (IU) of supplemental vitamin D daily, later raised to 400 IU daily. Because rickets is known to be associated with increased levels of blood AP, James A. Taylor, M.D., of the University of Washington, and colleagues decided to test blood samples from breast-fed infants for the enzyme's level. They used radiography to confirm the presence of the disorder.

Based on the analysis of AP in blood from 246 children, enzyme levels were found to be elevated in 33 children (13.4 percent). Parents of 18 children (54.5 percent) with elevated AP levels agreed to allow

radiographs to be taken. The researchers found that the AP level with the highest sensitivity and specificity for rickets screening was 552 U/L, and 11 children (4.5 percent) in the study had AP values above this level. At this cutoff, most children with normal AP levels would not need further testing for rickets (test specificity = 97.4 percent) and two-fifths of those with AP levels above the cutoff were found to have rickets (positive predictive value [PPV] = 40.0 percent). This is comparable to or higher than the PPVs for other pediatric screening tests, the researchers note.

Participating practitioners came from six private-practice pediatric offices and one inner-city pediatric clinic. AP analysis was done on infants or toddlers who had blood samples taken for other reasons, as part of health supervision office visits. Children eligible for the study were 6 to 15 months old, predominantly breast-fed for the first 6 months of life, and did not

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Rickets

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routinely receive supplemental vitamin D. The study was funded in part by the Agency for Healthcare Research and Quality (HS16029).

More details are in “The utility of alkaline phosphatase measurement as a screen test for rickets in breast-fed

infants and toddlers: A study from the Puget Sound Pediatric Research Network,” by Dr. Taylor, Monica Richter, M.D., Ph.D., Stephen Done, M.D., and others in *Clinical Pediatrics* 49(12), pp. 1103-1110, 2010. ■ DIL

The quality of children’s asthma care is affected by emergency department crowding

Children seen at a crowded emergency department (ED) for acute asthma are less likely to receive timely and effective care than when the ED is less crowded, according to a new study. The care received is not influenced by equity measures such as insurance status or having a primary care provider. Studies in adults have found ED crowding to be widespread and a threat to quality of care for heart attacks and hospitalized cases of pneumonia, but these conditions are less common among children, the researchers note. They extracted data from a children’s hospital electronic medical record system for visits for acute asthma to the hospital’s pediatric ED from November 2007 through October 2008.

The measures of timely care were the percentage of children with acute asthma receiving an asthma score, beta-agonist, or steroid within the first hour after arrival. Effective care was measured by the percentage of patients receiving an asthma score and the percentage receiving a steroid during their visit. The researchers found that patients were 52 to 74 percent less likely to receive timely care—and were 9 to 14 percent less likely to receive effective care—when the pediatric ED was at the 75th percentile of the crowding measure than when it was at the 25th percentile.

Comparable results came when the number of children waiting to see the attending physician was used as

the crowding measure. Data was also analyzed for the 90th and 10th percentiles of crowding, and indicated, as expected, a greater difference in quality of care when measured across a greater range of crowding. The study was funded in part by the Agency for Healthcare Research and Quality (HS16418).

More details are in “Emergency department crowding is associated with decreased quality of care for children with acute asthma,” by Marion R. Sills, M.D., M.P.H., Diane Fairclough, Dr.P.H., Daksha Ranade, M.S.P.H., M.B.A., and Michael G. Kahn, M.D., Ph.D., in the March 2011 *Annals of Emergency Medicine* 57(3), pp. 191-200. ■ DIL

Health Information Technology

Computer system compares well with clinicians in assessing, but not treating children with asthma

The recommendations of a computer decision-support system (CDSS) for the assessment and management of pediatric asthma, implemented as an add-on to a medical center’s electronic medical record system, agreed with those of clinicians for most assessments of asthma control in returning patients. However, CDSS recommendations agreed with less than half of severity assessments and recommendations of treatment steps for new patients, according to a recent study of a pediatric pulmonology clinic.

Use of a CDSS has been proposed to improve adherence by clinicians to clinical practice guidelines, in part because treatment guidelines have not reduced the rate of emergency department visits and hospitalizations for children with asthma. However, there have been few studies to evaluate the accuracy and validity of advice given by such systems. For that reason, the researchers developed a CDSS for pediatric

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Computer decision-support system

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asthma, based on the most recent (2007) guidelines from the National Asthma Education and Prevention Program, and applied it to all clinic visits.

The system generated asthma control assessments for 74.3 percent of 1,032 returning patients and assessments of asthma severity for 59.9 percent and treatment step recommendations for 39.5 percent of 167 new patients. Clinician agreement with the CDSS was 70.8 percent for control assessments, but only 37 percent of severity assessments and 29 percent of treatment step recommendations. When outside experts analyzed the cases of disagreement between the clinicians and the CDSS, the source was judged to be CDSS error in 72 percent of control disagreements, 56 percent of disagreements on disease severity, and 76

percent of differences about control steps. However, pediatric pulmonologists were found to not follow the guidelines in 8 percent of return visits and 18 percent of new visits. Many of the CDSS errors, such as attributing all coughs to asthma, were easy to correct, the researchers noted. The study was funded in part by the Agency for Healthcare Research and Quality (Contract No. 290-08-10011).

More details are in “Accuracy of a computerized clinical decision-support system for asthma assessment and management,” by Laura J. Hoeksema, M.D., Alia Bazy-Asad, M.D., Edwin A. Lomotan, M.D., and others in the May 2011 *Journal of the American Medical Informatics Association* 18(3), pp. 243-250. Reprints (AHRQ Publication No. 11-R048) are available from AHRQ.* ■ DIL

Providers perceive e-prescribing as being very efficient

More and more physician practices are embracing electronic prescribing, believing it to be more safe and efficient than traditional methods. However, there are those in the health care community who question just how efficient e-prescribing really is, citing that it takes longer than handwriting a prescription. A new study recently explored the perceptions of e-prescribing among clinicians and office staff. The findings point to an overwhelming confirmation that e-prescribing is very efficient. Some inefficiencies do need to be addressed, however, in order for e-prescribing to be even more effective.

Researchers collected information from 64 physician practices in six States via surveys and onsite interviews and focus groups. All of

the practices were using one of six different e-prescribing systems. Overall, 64 percent of participants reported e-prescribing to be very efficient, with another 28 percent saying it was moderately efficient. Clinicians were more likely to rank e-prescribing as very efficient (71 percent) compared with non-clinical office staff (53 percent). The least efficient prescribing methods reported were fax and phone.

During the focus groups, participants cited several efficiency gains from e-prescribing. These included decreased errors and calls to clarify prescriptions, better refill processing, and increased knowledge of formularies and prior authorizations. E-prescribing also made the physician practice

look “high-tech” and “efficient” in the eyes of patients, who benefited from not losing paper prescriptions. In terms of inefficiencies, participants reported slow software functionality during busy times, delays in pharmacies receiving prescriptions, and correctly training staff on how to do e-prescribing. The study was supported in part by the Agency for Healthcare Research and Quality (HS16394).

See “Perceptions of e-prescribing efficiencies and inefficiencies in ambulatory care,” by Kate L. Lapane, Ph.D., Rochelle K. Rosen, Ph.D., and Catherine Dubé, Ed.D., in the *International Journal of Medical Informatics* 80, pp. 39-46, 2011. ■ KB

Informal caregivers of older adults need more practical information to care for loved ones

Caring for older adults with chronic health conditions is often the responsibility of family caregivers, such as spouses or children. The value of such care is estimated at \$375 billion annually. This amount exceeds government expenditures for nursing home and home health care combined. Given their critical role, family caregivers must have their information needs met if their loved ones are to receive optimal care in the home. A recent study found that caregivers have a great need for information, but that it often goes unmet.

Researchers conducted a systemic literature review to identify studies of caregiver information needs. Sixty-two studies were selected that provided original findings on the subject. Studies were conducted in

the United States, United Kingdom, Canada, and Australia, as well as in several European and Asian nations. Among the chronic health conditions cited were Alzheimer's disease, dementia, stroke, and various types of cancer.

Overall, the 62 studies demonstrated an acute desire by informal caregivers for practical and timely information on their loved one's situation. Their unmet information needs included details on medical issues and where to find services. Caregivers wanted more information on treatment options and their risk/benefit ratios, as well as information on complementary and alternative therapies. They also wanted information that was tailor-made for them and their unique needs. They wanted clear

explanations in a jargon-free format. They preferred proactive information so that they knew what to expect in the future. This was particularly true for caregivers of loved ones with Alzheimer's disease, where knowledge of its anticipated stages is critical. Finally, caregivers' information needs changed over time, particularly for informal caregivers of stroke survivors. The study was supported in part by the Agency for Healthcare Research and Quality (HS17948).

See "Information needs of informal caregivers of older adults with chronic health conditions," by Karla T. Washington, Ph.D., Susan E. Meadows, M.L.S., Susan G. Elliott, M.L.S., and Richelle J. Koopman, M.D., in *Patient Education and Counseling* 83, pp. 37-44, 2011. ■ KB

Anxiety is common among older adults receiving care from aging services agencies

Anxiety is common in the elderly, affecting an estimated 1 in 10 older adults. If left untreated, it can turn into depression, cause significant disability, and boost health care costs. More than 10 million older adults receive services from approximately 30,000 local and State aging services agencies. More than a quarter of this group had significant levels of anxiety, according to a new study.

Researchers conducted interviews with 378 adults aged 60 and over who were receiving services from an aging services center in the Rochester, NY area. Participants in the study were asked questions from validated survey instruments to determine their present state of well-being and social situation. Areas covered included anxiety levels, other mental disorders, social support, physical health and disability, and if the individuals had experienced stressful life events recently.

Of 377 participants with complete data, 27.3 percent had significant symptoms of anxiety. Those with

anxiety were more often younger and had lower incomes compared with non-anxious participants. There was a significant correlation between anxiety and depression, with more than half (54 percent) of those suffering from anxiety also having depression. Factors also associated with anxiety included higher levels of pain, having five or more medical conditions, and experiencing recent stressful life events. The study's findings support greater interventions to identify anxiety in this service population and to link aging services with primary care and behavioral health providers. The study was supported in part by the Agency for Healthcare Research and Quality (T32 HS00044).

See "Anxiety and its correlates among older adults accessing aging services," by Thomas M. Richardson, Ph.D., Adam Simning, B.S., Hua He, Ph.D., and Yeates Conwell, M.D., in the *International Journal of Geriatric Psychiatry* 26, pp. 31-38, 2011. ■ KB

Agency News and Notes

Heart disease, cancer, and mental disease among the most costly conditions for women

The cost of treating women for heart disease in 2008 was \$43.6 billion, leading a list of the top 10 most expensive conditions for women, according to the latest News and Numbers from the Agency for Healthcare Research and Quality. According to the analysis by the Federal agency, in 2008, the top 10 most costly conditions in terms of health care expenditures for women were:

- Heart disease
- Cancer
- Mental disorders
- Trauma-related disorders
- Osteoarthritis
- Chronic obstructive pulmonary disease and asthma
- Hypertension (high blood pressure)

- Diabetes
- Back problems
- Hyperlipidemia (high cholesterol levels)

Among the 10 costliest conditions:

- The second most costly disease to treat was cancer (\$37.7 billion), followed by mental disorders (\$37.3 billion), and trauma-related disorders (\$34.1 billion).
- The lowest expenditures among the top 10 costliest conditions were for hyperlipidemia (\$18.0 billion).
- The most common condition was high blood pressure (29.5 million).
- The least common condition was cancer (8.4 million).

The data in this AHRQ News and Numbers summary are taken from the Medical Expenditure Panel Survey (MEPS), a detailed source of information on the health services used by Americans, the frequency with which they are used, the cost of those services, and how they are paid. For more information, view Statistical Brief #331, *Top 10 Most Costly Conditions among Men and Women, 2008: Estimates for the U.S. Civilian Noninstitutionalized Adult Population, Age 18 and Older*, at www.meps.ahrq.gov/mepsweb.

For additional information, or to speak with an AHRQ data expert, please contact Linwood Norman at Linwood.Norman@ahrq.hhs.gov or call (301) 427-1248. ■

Drug expenses for children with asthma more than doubled in 10 years

The percentage of American children treated for asthma increased, while their annual drug expenses more than doubled over a 10-year period, according to the latest News and Numbers from the Agency for Healthcare Research and Quality. According to data from the Federal agency that compared the 1997-1998 and 2007-2008 time periods:

- Average annual percentage of American children treated for asthma increased from 4.7 percent to 6.1 percent.
- Average annual prescription drug expenses for a child with asthma more than doubled, from \$349 to \$838.
- Children ages 5 to 11 years were more likely to be treated for asthma than children ages 12 to 17.

- Overall average annual health care expenses per child with asthma increased 37 percent, from \$1,827 to \$2,503.

The data in this AHRQ News and Numbers summary are taken from the Medical Expenditure Panel Survey (MEPS), a detailed source of information on the health services used by Americans, the frequency with which they are used, the cost of those services, and how they are paid. For more information, view Statistical Brief #332, *Health Expenditures among Children with Reported Treatment for Asthma, United States, 1997-1998 and 2007-2008* at www.meps.ahrq.gov/mepsweb.

For additional information, or to speak with an AHRQ data expert, please contact Linwood Norman at Linwood.Norman@ahrq.hhs.gov or call (301) 427-1248. ■

Arizona and Maryland see great drop in in-hospital deaths from pneumonia

Deaths of Americans age 18 and over hospitalized for pneumonia plummeted by 45 percent between 2000 and 2007 regardless of who paid for their care, according to the latest News and Numbers from the Agency for Healthcare Research and Quality.

The Federal agency found that between 2000 and 2007, the average death rate due to pneumonia fell from 74 to 41 deaths per 1,000 admissions. At 23 deaths per 1,000 admissions, Arizona had the lowest pneumonia-related death rate for hospitalized patients, followed closely by Maryland, with 26 deaths per 1,000 admissions.

In 2007, eight States reported 50 or more deaths per 1,000 admissions:

- Nebraska – 57 deaths per 1,000 admissions
- Wyoming – 55 deaths per 1,000 admissions
- Hawaii – 55 deaths per 1,000 admissions
- West Virginia – 54 deaths per 1,000 admissions
- Arkansas – 53 deaths per 1,000 admissions
- Oklahoma – 53 deaths per 1,000 admissions
- New York – 52 deaths per 1,000 admissions
- Vermont – 50 deaths per 1,000 admissions

The 2007 pneumonia-related death rates of the other States ranged from 30 to 49 deaths per 1,000

admissions.

This AHRQ News and Numbers is based on information from the *AHRQ State Snapshots* (www.ahrq.gov/qual/qdr10/8_respiratorydiseases/T8_2_7-3.htm), which provides State-specific health care quality information, including strengths, weaknesses, and opportunities for improvement. The goal is to help State officials and their public- and private-sector partners better understand health care quality and disparities in their State.

For other information, or to speak with an AHRQ data expert, please contact Linwood Norman at Linwood.Norman@ahrq.hhs.gov or call 301-427-1248. ■

How much employees pay for health care coverage depends on where they live

Nationwide, private-sector employees with single coverage contributed 21 percent of the cost of their health insurance and employees with family coverage paid 27 percent, according to the latest News and Numbers from the Agency for Healthcare Research and Quality. According to data from the Federal agency:

- Health insurance premiums nationwide averaged \$4,940 for single coverage and \$13,871 for family coverage in 2010.
- Among the 10 largest States, the annual cost of single coverage ranged from \$4,669 in Ohio to \$5,220 in New York and family coverage ranged from \$13,083 in Ohio to \$15,032 in Florida.
- Some 18 percent of employees with single coverage and 10 percent of employees with family coverage were not required to pay for any part of their employer-sponsored health insurance.
- Among the 10 largest States in 2010, employees who didn't have to pay premiums for single

coverage ranged from 12 percent in Illinois to 24.5 percent in California, while the range for employees who didn't have to pay for family coverage ranged from 3 percent in Florida to 17.5 percent in Pennsylvania.

The data in this AHRQ News and Numbers summary are taken from the Medical Expenditure Panel Survey (MEPS), a detailed source of information on the health services used by Americans, the frequency with which they are used, the cost of those services, and how they are paid. For more information, see Statistical Brief #329, *State Differences in the Cost of Job-related Health Insurance, 2010* at www.meps.ahrq.gov/mepsweb. The 2010 health insurance data for all 50 States and the District of Columbia are now available at www.meps.ahrq.gov/data_stats/quick_tables.jsp.

For additional information, or to speak with an AHRQ data expert, please contact Linwood Norman at Linwood.Norman@ahrq.hhs.gov or call (301) 427-1248. ■

Ann

Report and designer's guide outlines the role of human factors in home health care

A new report and consumer health information technology (IT) designer's guide published by the National Academies of Science and the Agency for Healthcare Research and Quality outline the impact of technology, environment, policy, and human factors on the growing field of home health care. The report, *Health Care Comes Home: The Human Factors*, describes the areas in which human factors can influence health care in the home.

The report explores the role of the environment on the delivery of health care in the home; what

devices and tools are available; and the changes health IT has created in the delivery of home health care. It also discusses the ways different cultures approach health care in the home and the effects that policy and regulation can have on home health care.

The report offers recommendations on next steps to ensure quality health care in the home setting. As a companion to the report, a consumer health IT designer's guide, *Consumer Health Information Technology in the Home: A Guide for Human Factors*

Design Considerations, was also published. The guide offers consumer health IT developers and vendors guidance on issues to consider for health IT systems to be used in the home, and provides home health professionals guidance in selecting tools to complement professional home care services. To read the report and recommendations visit www.nap.edu/catalog.php?record_id=13149. For the designer's guide visit www.nap.edu/catalog.php?record_id=13205. ■

New toolkit helps medical practices examine the impact of health IT on workflow

A new toolkit prepared by the University of Wisconsin-Madison's Center for Quality and Productivity Improvement will assist small- and medium-sized practices in workflow analysis and redesign before, during, and after health information technology (IT) implementation. The toolkit, *Workflow Assessment for Health IT*, includes tools to analyze workflow, examples of workflow analysis and

redesign, and others' experiences with health IT and workflow. The toolkit was funded by the Agency for Healthcare Research and Quality. For more information and a copy of the toolkit, go to http://healthit.ahrq.gov/portal/server.pt/community/health_it_tools_and_resources/919/workflow_assessment_for_health_it_toolkit/27865. ■

Brief outlines strategies to put patients at the center of primary care

AHRQ has released a new brief, *The Patient-Centered Medical Home: Strategies to Put Patients at the Center of Primary Care*, highlighting opportunities to improve patient engagement in primary care. The brief focuses on involvement at three levels: the engagement of patients and families

in their own care, in quality improvement activities in the primary care practice, and in the development and implementation of policy and research related to the patient-centered medical home (PCMH). The brief provides a clear and concise definition of the PCMH and outlines six strategies that can

be used to support primary care practices in their efforts to engage patients and families. This brief, white papers, and a searchable database of PCMH-related articles, is available from AHRQ's PCMH Resource Center at www.pcmh.ahrq.gov/portal/server.pt/community/pcmh_home/1483. ■

AHRQ releases new CME/CE activities

The Agency for Healthcare Research and Quality (AHRQ) has released two new continuing medical education/continuing education (CME/CE) modules based on *Comparative Effectiveness of Angiotensin Converting Enzyme Inhibitors or Angiotensin II Receptor Blockers Added to Standard Medical Therapy for Treating Stable Ischemic Heart Disease*, a comparative effectiveness review developed by the Agency's Effective Health Care Program.

The formats include a supplement to the electronic *Journal of Managed Care Pharmacy* and a video discussion. The modules are available free of charge at www.ce.effectivehealthcare.ahrq.gov.

A copy of the report and more information on AHRQ's Effective Health Care Program are available at www.effectivehealthcare.ahrq.gov. ■

2009 HCUP Kids' Inpatient Database (KID) now available

The Kid's Inpatient Database (KID) featuring 2009 data was recently released by the Agency for Healthcare Research and Quality. The KID is part of the family of databases and products from the Healthcare Cost and Utilization Project (HCUP). The KID is the only national dataset on hospital use, outcomes, and charges designed to study children. Released every 3 years, the KID exists for data years 1997, 2000, 2003, 2006, and 2009. Data elements include diagnoses and procedures, patient characteristics, hospital characteristics, source of admission, charges, and expected payer.

The sample design of the KID enables analyses of common conditions and procedures, as well as rare ones, such as congenital anomalies and organ transplantations. The 2009 KID is a random stratified sample of pediatric discharges from 4,121 hospitals in 44 States, and includes 10 percent of normal newborns and 80 percent of sick infants, children, and adolescents from the sampling frame. The dataset contains over 3 million discharges, representing the nation's more than 7 million pediatric inpatient hospital visits that year. The KID allows researchers and policymakers to

identify, track, and analyze trends in pediatric health care utilization, access, charges, quality, and outcomes.

The KID can be purchased through the HCUP Central Distributor at http://hcup-us.ahrq.gov/tech_assist/centdist.jsp. Many statistical tables from the KID can be accessed free on HCUPnet at <http://hcupnet.ahrq.gov>. Additional information on the KID is available on the HCUP-US Web site at www.hcup-us.ahrq.gov/kidoverview.jsp. ■

AHRQ releases MONAHRQ Version 2.0

The Agency for Healthcare Research and Quality (AHRQ) has released Version 2.0 of MONAHRQ, its unique, desktop, Windows®-based software application for developing Web sites for hospital quality public reporting or research use. MONAHRQ 2.0 gives users the ability to report CMS Hospital Compare (www.hospitalcompare.hhs.gov) measure results along with, or instead of, their own inpatient discharge data. AHRQ has also updated the 2.0 Web page design to be more streamlined and user-friendly. Web sites created with MONAHRQ 2.0 provide information in four areas: quality of care for specific

hospitals; provision of services by hospitals for health conditions and procedures; potentially avoidable hospitalizations; and rates of health conditions and procedures. Users can download MONAHRQ 2.0 from the MONAHRQ site (www.monahrq.ahrq.gov). To explore a live MONAHRQ-generated Web site, visit AHRQ's new MONAHRQ demo Web site at www.monahrq.ahrq.gov/demo/index.html, which was generated using MONAHRQ 2.0 and synthetic data. Please contact MONAHRQ@ahrq.gov with any questions or comments. ■

New guides describe comparative effectiveness of therapies for autism, diabetes, and pain management of hip fracture

The Effective Health Care Program of the Agency for Healthcare Research and Quality has released new consumer and clinician summary guides on autism, diabetes, and the pain management of hip fracture.

The autism guides will help families of children living with Autism Spectrum Disorders (ASDs) and their clinicians work together to make important decisions about how to treat and manage the condition. These free guides examine treatment therapies for children ages 2–12 with ASDs that focus on improving key deficits in social communication, addressing challenging behaviors, treating commonly associated difficulties (e.g., anxiety, attention difficulties, sensory difficulties), promoting functional independence, and improving quality of life. The new guides do not address potential causes of autism. The consumer guide provides an overview of the types of programs and therapies available to children with ASDs, available evidence on each program or therapy, and questions to ask when planning therapies and programs for ASD. The clinician guide summarizes key findings, presents the clinician bottom line, and highlights areas for further autism-related research. A continuing education module supplements existing clinician resources on ASDs. View the guides at www.effectivehealthcare.ahrq.gov. Print copies are available by sending an email to ahrqpubs@ahrq.hhs.gov.

An update to the 2007 research review, *Comparative Effectiveness and Safety of Oral Medications for Adults With Type 2 Diabetes*, is also available from the Effective Health Care Program. The 2011 update includes newer medications and two-drug combinations.

The management of hyperglycemia is an important focus of treatment to achieve improved macrovascular and microvascular outcomes in patients with type 2 diabetes. Controlling blood-glucose levels often requires several strategies, including weight loss if needed, dietary control, increased physical activity, and antidiabetic medications. Treatment regimens include single drugs and combinations of drugs from different classes. Choosing among the available medications requires consideration of benefits, adverse effects, and mechanism of action.

You can read the report, companion summaries for patients and clinicians and faculty slides at AHRQ's Effective Health Care Web site at www.effectivehealthcare.ahrq.gov.

AHRQ's Effective Health Care Program has also released new consumer and clinician summary guides on the recent comparative effectiveness review on pain management interventions for hip fracture. The clinician guide focuses on the comparative effectiveness, benefits, and adverse events associated with interventions for acute-pain management compared to usual care, in elderly patients with hip fractures from low-impact injury. The consumer guide provides plain-language information on treatment for older adults who have pain from a broken hip, and helps patients and caregivers work with clinicians for treatment and pain management. In addition, continuing medical education (CME) activities and slide talks are available. View the guides, CME activities, and slide talks at www.effectivehealthcare.ahrq.gov. Print copies are available by sending an e-mail to ahrqpubs@ahrq.hhs.gov. ■

Data Points report on disease prevalence and Medicare reimbursement is available

A new Data Points report, *Prevalence and Medicare Reimbursement by Recurrent International Classification of Diseases Categories, 2006–2009* is available. This report examines

disease burden among Medicare beneficiaries and associated reimbursement costs within inpatient, outpatient, and skilled nursing facility claims. It also examines geographic trends in

reimbursement per claim for high-cost conditions that are common in the Medicare population. You can access the report at www.effectivehealthcare.ahrq.gov. ■

HCUP Data Users' Workshop registration closing soon

The Agency for Healthcare Research and Quality is conducting a full-day workshop September 15 from 9AM to 4PM at AHRQ for health services researchers interested in gaining instructor-led experience working on a computer with the Healthcare Cost and Utilization Project (HCUP) resources. The registration deadline is September 6. The workshop will provide in-depth exposure to HCUP resources through instructor-led training on several HCUP databases and related tools. The course will begin with a brief overview of HCUP products, including a demonstration of HCUPnet, a free on-line querying tool that provides instant access to HCUP data.

Following the brief introductory material, faculty will present step-by-step instruction on working with the HCUP databases to conduct revisit analyses with HCUP data. Attendees will use computers loaded with subsets of the HCUP State Inpatient Databases, State Emergency Department Databases, and State Ambulatory Surgery Databases. Attendees will run SAS programs on the HCUP databases. All SAS

programs will be provided. Faculty will cover the basics of loading data files to more advanced topics, including trend analyses and conducting revisit/readmission analyses.

Faculty will be available for consultation on how HCUP data can support attendees' research interests. Instructional and reference materials will be distributed and discussed. This is an intermediate-level workshop designed for health services researchers and analysts who want to learn how to use or improve their use of HCUP databases and products. Individuals interested in State and/or local health care analyses or clinical research using administrative health care data would benefit from this workshop.

Given the nature and pace of this course, some prior familiarity with health care administrative data and SAS is recommended. Prior experience with HCUP databases or prior attendance of HCUP overview presentations is encouraged. Registration details are available at http://hcup-us.ahrq.gov/hcup_workshop.jsp. ■

AHRQ releases new series on closing the quality gap

The Agency for Healthcare Research and Quality (AHRQ) has released a new series on *Closing the Quality Gap: Revisiting the State of the Science*. In 2004, AHRQ launched a series of reports on quality improvement strategies, tools, and processes aimed at reducing gaps in care quality in a number of areas. These included hypertension, diabetes, coordination

of care, and other topics. This new series of reports continues the focus on improving the quality of health care with the goal of applying and advancing the state of the science for improving the health care system for the benefit of all patients. You can read about the new series at www.effectivehealthcare.ahrq.gov. ■

Research Briefs

Arora, S., Kalishman, S., Dion, D., and others. (2011, June). “Partnering urban academic medical centers and rural primary care clinicians to provide complex chronic disease care.” (AHRQ grants HS15135, HS16510, and HS18171). *Health Affairs* 30(6), pp. 1176-1184.

In New Mexico, an innovative new model of health care education and delivery known as Project ECHO (Extension for Community Healthcare Outcomes) provides high-quality primary and specialty care to an underserved population with many unmet needs due to various chronic illnesses. New Mexico’s severe hepatitis C problem led to the idea for Project ECHO. The project concept involves a team of University of New Mexico specialists conducting weekly teleconferences to review and discuss cases with primary care providers. This allows a cadre of health professionals trained in hepatitis C care to deliver specialty-level care to thousands of patients across the State. To date, Project ECHO has provided more than 10,000 specialty consultations to patients throughout the State.

Bertakis, K.D., and Azari, R. (2011). “Patient-centered care is associated with decreased health care utilization.” (AHRQ grant HS06167). *Journal of the American Board of Family Medicine* 24, pp. 229-239.

This study correlated the amount of patient-centered care given to primary care patients during 1 year with their use of medical services

and subsequent charges in five categories: primary care clinic visits, specialty care visits, emergency department visits, hospitalizations, and diagnostic services. Patient-centered care was measured through the use of the Davis Observation Code which the researchers used to classify each of 20 clinically significant behaviors observed during videotaped office visits of 509 patients. Patients who received a higher average amount of patient-centered care had significantly fewer annual visits for specialty care, less frequent hospitalizations, and fewer diagnostic tests. The total median annual charges for patients who had less patient-centered care was \$1,435 compared with \$948 for those who received patient-centered care.

Clancy, C.M. (2011). “Commentary: Precision science and patient-centered care.” *Academic Medicine* 86(6), pp. 667-670. Reprints (AHRQ Publication No. 11-R059) are available from AHRQ.*

This article provides a commentary on a collection of comparative effectiveness research studies appearing in the same issue of this journal. Patient-centered outcomes research (PCOR), also known as comparative effectiveness research, examines which precise medications, treatments, devices, or delivery systems work best for which patients under which circumstances. Several of the articles describe the opportunities for academic health centers to

engage in PCOR, and some detail the important challenges that PCOR entails. The author describes how PCOR differs from biomedical and clinical research. The author advocates that researchers engaged in PCOR explore innovative means to accelerate the translation of their research findings into practice.

Clancy, C.M., and Berwick, D.M. (2011). “The science of safety improvement: Learning while doing.” *Annals of Internal Medicine* 154(10), pp. 699-701. Reprints (AHRQ Publication No. 11-R060) are available from AHRQ.*

The authors discuss how to design and analyze studies on patient safety improvement to facilitate their implementation on the front lines of care. They comment on an article in the same issue of this journal in which Shekelle and colleagues provide a framework for enhancing research in patient safety improvement by proposing criteria for the design and reporting of studies to facilitate the translation of the studies into practice. The article emphasizes how important it is that researchers clarify why they believe the intervention to improve patient safety should work. It also emphasizes the need to adequately describe the nature of the interventions as well as the need to document the characteristics of the setting and external environments in which an intervention took place. The goal is to guide potential implementation in similar and alternate settings.

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Davis, R.L., Eastman, D., McPhillips, H., and others. (2011). "Risks of congenital malformations and perinatal events among infants exposed to calcium channel and beta-blockers during pregnancy." (AHRQ grant HS10391). *Pharmacoepidemiology and Drug Safety* 20, pp. 138-145.

Calcium channel blockers (CCBs) and beta-blockers (BBs) are effective for the treatment of hypertension during pregnancy. The researchers studied more than 100,000 births from 1996 to 2000 in 5 large health maintenance organizations to discover the risks for perinatal complications and congenital defects among infants exposed in-utero to BBs and CCBs. They identified a total of 584 full-term infants exposed to BBs and 804 full-term infants exposed to CCBs at any time during pregnancy. They found an apparent increase in risk for seizures among infants whose mothers were taking CCBs during pregnancy and an increased risk for hypoglycemia among infants whose mothers were taking BBs during pregnancy. No increase in congenital anomalies among infants exposed to either CCBs or BBs was detected.

Dy, S.M., Taylor, S.L., Carr, L.H., and others. (2011). "A framework for classifying patient safety practices: Results from an expert consensus process." (Contract No. 290-2009-1001). *British Medical Journal of Quality and Safety* 20, pp. 618-624.

Evaluations of patient safety practices (PSPs) are frequently undermined by the lack of a commonly accepted and theoretically informed framework

within which to describe salient characteristics such as settings, participants, targeted clinical behaviors, and interventions. The authors develop and evaluate a framework for describing and classifying PSPs. Their final framework includes 11 classification dimensions such as setting, feasibility, and sensitivity to context. This framework may also serve as a foundation for further understanding of the role of context in evaluating effectiveness, uptake, and dissemination for diverse types of PSPs.

Eichenwald, E.C., Zupancic, J.A.F., Mao, W.Y., and others. (2011). "Variations in diagnosis of apnea in moderately preterm infants predicts length of stay." (AHRQ grant HS10131). *Pediatrics* 127(1), pp. e53-e58.

Apnea of prematurity is expected to be uncommon in moderately preterm infants. The researchers studied infants born between 33 and 35 weeks, in whom the diagnosis of recurrent apnea is expected to be rare, and therefore more likely to reveal effects of hospital practice on discharge timing. The results for a cohort of 264 moderately preterm infants born in ten different facilities showed significant inter-neonatal intensive care unit variation as well as regional variation in the diagnosis of apnea. These differences accounted for almost one-third of the variation between hospitals in discharge timing in this group of infants. The results suggest the need for better definitions of clinically significant apnea events to promote national guidelines for the safe and timely discharge of moderately preterm infants.

Foy, R., Ovretveit, J., Shekelle, P.G., and others. (2011). "The role of theory in research to develop and evaluate the implementation of patient safety practices." (AHRQ Contract No. 290-09-1000). *British Medical Journal of Quality and Safety* 20, pp. 453-459.

The authors of this paper highlight the value and uses of theory in research aiming to develop and evaluate patient safety practices (PSPs). They draw upon work undertaken for the Agency for Healthcare Research and Quality to improve the design, evaluation, and reporting of research on PSPs. Theory can be applied at different stages of developing and evaluating complex interventions to explain clinical and organizational behavior, inform PSP selection and development, and understand PSP effects, thereby developing a generalizable body of knowledge. The authors illustrate the value of theory in PSP development and evaluation by showing how the Theory of Planned Behavior applies to the example of hand washing.

Glance, L.G., Neuman, M., Martinez, E.A., and others. (2011). "Performance measurement at a "tipping point." (AHRQ grant HS13904). *Anesthesia & Analgesia* 112(4), pp. 958-966.

The authors' goal is to provide anesthesiologists with the background they need to actively participate in the development of performance measures for anesthesiologists. In discussing outcome measures, stress is placed on the use of risk adjustment to avoid penalizing hospitals and physicians who treat high-risk

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patients. Administrative data is criticized for often failing to distinguish between pre-existing conditions and complications that develop after hospital admission. One source of bias in quality reporting is hospital differences in diagnostic practices. The authors point out that care process measures do not typically require risk adjustment as long as the appropriate target population is correctly specified.

Goode, A.P., Cook, C., Gill, J.B., and others. (2011). “The risk of risk-adjustment measures for perioperative spine infection after spinal surgery.” (AHRQ grant HS19479). *SPINE* 36(9), pp. 752-758.

The authors of this study developed a comorbidity index specific for perioperative spine infection and compared the results of this condition-specific comorbidity index with the Deyo Comorbidity Index, a well-established index, by using a nationally representative sample. Included was any spine surgical procedure associated with compression, disc repair, fusion, laminectomy, or disc repair of a prior spine surgery. Data were collected by using the Nationwide Inpatient Sample, part of the Healthcare Cost and Utilization Project sponsored by the Agency for Healthcare Research and Quality. Twenty-three diagnoses found to be significantly associated with perioperative spinal infection made up the new condition-specific index. The new index was found to be significantly better than the Deyo Index at adjusting for total charges and length of stay at nonteaching hospitals, as well as death, length of stay, and total charges at teaching hospitals.

Lu, C.Y., and Johantgen, M. (2011). “Factors associated with treatment restriction orders and hospice in older nursing home residents.” (AHRQ grant HS11990). *Journal of Clinical Nursing* 20, pp. 377-387.

Although hospice care is viewed as the “gold standard,” geographic availability and financial reimbursement limits its use. Treatment-restriction orders may represent alternative approaches to defining wishes for end-of-life care. This study examined factors associated with do-not-resuscitate (DNR), do-not-hospitalize (DNH) orders, and hospice care in older nursing home residents. The researchers analyzed data from 10,023 admission records from 77 Maryland nursing homes. They found that the prevalence of DNR and DNH orders at admission was 28 and 3.4 percent, respectively. Only a small percentage (1.7 percent) of residents received hospice care on admission. White race increased the likelihood of having a DNR or DNH order. Treatment-restriction orders were associated with an increased likelihood of hospice use.

Maeda, J.L.K. (2011). “Evidence-based heart failure performance measures and clinical outcomes: A systematic review.” (AHRQ grant HS17944). *Journal of Cardiac Failure* 16(5), pp. 411-418.

The author conducted a systematic review of studies that assessed the relationship between the evidence-based heart failure performance measures in the inpatient setting and the clinical outcomes of patients. Eleven original studies and one literature review met the study inclusion criteria. Improved patient outcomes were most strongly

associated with angiotensin-converting enzyme inhibitor/angiotensin receptor blocker and beta-blocker use at discharge. In general, an increase in compliance with the heart failure performance measures led to a consistent improvement in patient outcomes. However, the strength, magnitude, and statistical significance of the positive effect was variable across the individual performance indicators.

Moy, E., Barrett, M., and Ho, K. (2011, January). “Potentially preventable hospitalizations—United States, 2004–2007.” *Morbidity and Mortality Weekly Report* 60 (Suppl.), pp. 80-83. Reprints (AHRQ Publication No. 11-R057) are available from AHRQ.*

To identify trends in a composite measure of potentially preventable hospitalizations among persons in the United States aged 18 and over, the Agency for Healthcare Research and Quality (AHRQ) analyzed data for 2004–2007 from AHRQ’s Healthcare Cost and Utilization Project. During this period, the AHRQ Patient Quality Indicator composite rate of hospitalization declined from 1,617 to 1,510 per 100,000 adults. This decline perhaps reflected greater attention to care coordination by hospital and primary care providers. The rate of preventable hospitalization was higher among residents of two lower-income quartile neighborhoods than residents of the highest-income quartile neighborhood. Significant declines in preventable hospitalization were observed among non-Hispanic whites, Asian and Pacific Islanders, and Hispanics. During all years, the

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adjusted rate of preventable hospitalizations was higher among blacks and Hispanics than whites.

Ovretveit, J.C., Shekelle, P.G., Dy, S.M., and others. (2011). “How does context affect interventions to improve patient safety? An assessment of evidence from studies of five patient safety practices and proposals.” (AHRQ Contract No. 290-09-1001). *British Medical Journal of Quality and Safety* 20, pp. 604-610.

This paper considers the research evidence about whether, or how, the implementation of five patient safety practices (PSPs) is influenced by context factors, such as an electronic medical record or the size of a health care organization. The study found little evidence reported in studies of five diverse PSPs that context factors influences implementation or effectiveness. For example, there was no strong evidence either for or against context factors either helping or hindering implementation of falls intervention in institutions. Also, no studies of different types of medication reconciliation interventions were found that rigorously assessed the influence of different context factors in implementation or in relation to outcomes of PSPs.

Peek, M.E., Tang, H., Cargill, A., and Chin, M.H. (2011, June). “Are there racial differences in patients’ shared decisionmaking preferences and behaviors among patients with diabetes?” (AHRQ grant HS10479). *Medical Decision Making* 31, pp. 422-431. The researchers surveyed 924 diabetes patients treated at 34

community health centers to determine any racial differences in patient preferences for shared decisionmaking (SDM) well as patient behaviors that may facilitate SDM. With regard to patient preferences, race was not associated with any of the three SDM domains (agenda setting, information sharing, or decisionmaking). With regard to patient behaviors, blacks were more likely to report initiating discussions with their physicians about four of six areas of diabetes care.

Peterson, E.D., Roe, M.T., Chen, A.Y., and others. (2010). “The NCDR ACTION Registry—GWTG: Transforming contemporary acute myocardial infarction clinical care.” (AHRQ grant HS16964). *Heart* 96, pp. 1798-1802.

The NCDR ACTION Registry—GWTG collects detailed in-hospital clinical, process of care, and outcomes data for patients admitted with acute myocardial infarction (AMI) in the United States. This paper briefly describes the methodology of the ACTION Registry—GWTG and summarizes the results of this registry’s data to date. The registry is designed to assist hospitals in their quality improvement efforts. A hospital’s aggregate composite performance score includes five acute guideline metrics and six discharge guideline metrics. As of September 2009, 383 sites had submitted 147,165 records into the database. The database includes information on patient demographics, processes of care, and in-hospital outcomes that can be used to provide important insights into the safety and effectiveness of AMI treatments when used in the ‘real world.’

Pincus, H.A. (2011, June) “Academic health centers and comparative effectiveness research: Baggage, buckets, basics, and bottles.” (AHRQ grant HS16092). *Academic Medicine* 86(6), pp. 659-660.

This editorial introduces a group of articles on comparative effectiveness research (CER) and its growing effect on academic health centers (AHCs). These articles illustrate diverse approaches that AHCs can apply to get involved in CER based on seven categories. These categories include workforce development, research infrastructure, evidence creation, analysis and synthesis, clinical and systems implementation, priority setting, and policymaking. The author concludes by stressing the need for AHCs to develop formalized institutional policy expertise in order to participate in the policy debates over rulemaking; coverage decisions; determination of quality, safety, and efficiency; and measures and expectations in evidence-based purchasing.

Pressler, S.J., Eckert, G.J., Morrison, G.C., and others. (2011). “Evaluation of the health utilities index Mark-3 in heart failure.” (AHRQ grant HS09822). *Journal of Cardiac Failure* 17(2), pp. 143-150.

Part of measuring cost-effectiveness in health care is measuring changes in the quantity and quality of life. In order to measure the health-related quality of life component of quality-adjusted life years, these researchers used the Health Utilities Index Mark-3 (HUI-3), an instrument designed to measure health status and produce utility

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scores of health-related quality of life. They evaluated the reliability, validity, and responsiveness of the HUI-3 in 211 patients with heart failure and compared the HUI-3 results with those of the Medical Outcomes Study Short-Form 12, the Living with Heart Failure Questionnaire, and the Chronic Heart Failure Questionnaire. The HUI-3 demonstrated satisfactory reliability and validity in this sample, supporting its use in cost-effectiveness studies.

Shamliyan, T.A., Kane, R.L., Ansari, M.T., and others. (2011). "Development of quality criteria to evaluate nontherapeutic studies of incidence, prevalence, or risk factors of chronic diseases: Pilot study of new checklists." (AHRQ Contract No. 290-02-2009). *Journal of Clinical Epidemiology* 64, pp. 637-657.

The prevalence and incidence of chronic conditions have implications for policy and health care utilization. The authors of this paper develop valid and reliable quality criteria for observational studies that examine the incidence or prevalence of chronic conditions and risk factors for diseases. They also propose criteria for the design, reporting standards, and assessment of nontherapeutic observational studies in systematic reviews and evidence-based reports. They developed two checklists, one for studies of incidence or prevalence and another for risk factors. Poor reliability in evaluating studies from different research areas precludes recommending the checklists for widespread use.

Shekelle, P.G., Pronovost, P.J., Rachter, R.M., and others. (2011, May). "Advancing the science of patient safety." (AHRQ Contract No. 290-09-1000). *Annals of Internal Medicine* 154(10), pp. 693-696.

The Agency for Healthcare Research and Quality (AHRQ) convened a panel of international experts in patient safety, who reviewed the literature and discussed how to improve the conduct and reporting of patient safety interventions. The group focused on why and how we evaluate safety interventions and make causal inferences about their effectiveness. Key evaluation issues that merit measurement and reporting include an explanation of the theory or logic model, a description of the patient safety practice in sufficient detail for others to replicate it, a detailing of the implementation process, and an assessment of the outcomes that include possible unintended effects. The authors propose that high-priority contexts of patient safety practices be grouped into: external factors, organizational structural characteristics, teamwork, leadership, patient safety culture, and management tools.

Shelton, J., and Jackson, G.P. (2011). "Palliative care and pediatric surgery." (AHRQ grant HS13833). *Surgical Clinics of North America* 91, pp. 419-428).

Between 53,000 and 55,000 children die each year, with half dying of chronic, life-long disorders. Many of these children's goals for symptom control at the end of life are not met. Pediatric surgeons can play an important role in offering procedures that may

improve the quality of life for terminally ill children. This article provides a palliative care primer for the pediatric care surgeon. The interventions discussed include gastrostomy, pain control, thoracostomy and pleurodesis, and tracheostomy. The delivery of palliative surgical interventions requires ongoing evaluation of treatment goals and weighing the risk and benefits of procedures in the context of a shortened life span. There is limited published evidence about the efficacy of these procedures, and further research is needed to enable informed discussions of the risks and benefits of interventions in this population.

Smith, H.A., Matthews, A., Markovic, N., and others (2010). "A comparative study of complementary and alternative medicine use among heterosexually and lesbian identified women: Data from the ESTHER project (Pittsburgh, PA, 2003-2006)." (AHRQ grant HS17587). *The Journal of Alternative and Complementary Medicine* 16(11), pp. 1161-1170.

Lesbians are more likely to use complementary and alternative medicine (CAM) than heterosexual women, according to data from the Epidemiologic Study of Health Risk in Women project. Of the 479 lesbians who participated in the survey, 57.3 percent reported ever using CAM compared with 40.8 percent of heterosexual women. However, the type of CAM the women used varied little by their sexual orientation. Other predictors of CAM use included being white, having more years of education,

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experiencing discrimination in a health care setting, living in a large city, being very spiritual, and having a history of a mental health disorder.

Taylor, S.L., Dy, S., Foy, R., and others. (2011). “What context features might be important determinants of the effectiveness of patient safety interventions?” (AHRQ Contract No. 290-09-1001). *British Medical Journal of Quality and Safety* 20, pp. 611-617.

Many practices have been implemented to improve the safety of patients, such as use of a checklist to prevent bloodstream infections. The effectiveness of these patient safety practices (PSPs) can vary markedly between different settings. Such variations in effectiveness are likely to be attributable to variations in a range of contextual factors affecting the implementation of PSPs, such as policies, regulations, or organizational characteristics. This paper reports on formal discussions with a 22-member technical expert panel to determine what contexts are likely to have major influences on PSP implementation and which should be described in PSP evaluations. The panel agreed on four context domains considered important: safety culture; teamwork and leadership involvement; structural organizational characteristics (e.g., financial or performance incentives or PSP regulations); and availability of implementation and management tools (e.g., training organizational incentives).

VanLare, J.M., Conway, P.H., and Rowe, J.W. (2011). “Building academic health centers’ capacity to shape and respond to comparative effectiveness research policy.” (AHRQ grant HS19682). *Academic Medicine* 86(6), pp. 689-694.

Comparative effectiveness research (CER) has implications for the research, education, and clinical care components of the missions of academic health centers (AHCs). The authors of this paper discuss specific opportunities for AHCs to shape and respond to CER policy—both Federal and that set by the new Patient-Centered Outcomes Research Institute—across the domains of research, human and scientific capital, data infrastructure, and translation and dissemination. They propose that AHCs develop a cross-functional role that integrates research and patient-outcome improvement responsibilities to inform CER policy and adopt CER findings at the local level. The organizational structure that best addresses this role will typically be a cross-cutting center or division that focuses on CER issues and opportunities in the AHC’s clinical, research, and educational components.

Vashi, A., and Rhodes, K.V. (2011, April). “Sign right here and you’re good to go”: A content analysis of audiotaped emergency department discharge instructions.” (AHRQ grant HS11096). *Annals of Emergency Medicine* 57(4), pp. 315-322.

The researchers analyzed audio recordings of 477 patient-provider conversations about discharge instructions recorded at two emergency departments (EDs): an urban academic tertiary medical

center ED and a suburban community hospital ED. They found that verbal discharge instructions were often incomplete and patients’ understanding of the instructions was seldom assessed. For example, although the majority of patients (73 percent) were instructed to seek primary care follow-up, less than half were given a specific time for followup. Patient-provider communication during the discharge process lasted less than an average of 4 minutes. The authors concluded that communication and content delivery during the ED discharge process needed improvement.

Xiao, Z., Li, X., and Stanton, B. (2011, January). “Perceptions of parent-adolescent communication within families: It is a matter of perspective.” (AHRQ grant HS07392). *Psychology, Health, & Medicine* 16(1), pp. 53-65.

The researchers examined the concordance between parental and youth’s perceptions of open communication in their families and its association with youth’s psychosexual adjustment. Participants were 336 inner-city black parent-youth dyads participating in a community-based violence effectiveness trial in an eastern city. Psychosexual adjustment was measured with 13 existing scales, ten of which were derived from the Child Health and Illness Profile-Adolescent Edition. Twenty-eight percent of parent-youth dyads reported consistent high (high-high) and 26 percent reported consistent low (low-low) levels of perceived open family communication. By comparison, 45

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percent reported inconsistent perceptions of open family communication (either high-low or low-high). Youth who perceived higher levels of open communication had higher indices of adjustment than youth who perceived low levels of open communication.

Zerzan, J.T., Gibson, M., and Libby, A.M. (2011). "Improving State Medicaid policies with comparative effectiveness

research: A key role for academic health centers." (AHRQ grant HS19464). *Academic Medicine* 86(6), pp. 695-700.

The authors discuss how State Medicaid programs are already using comparative effectiveness research (CER) to inform policy, and they outline ways that academic researchers can support States by developing and communicating targeted CER. Several State Medicaid programs have used CER since 2003 to make benefit-coverage decisions under the auspices of two particular programs, the Drug Effectiveness

Review Project (DERP) and the Medicaid Evidence-based Decisions project (MED). As of 2011, DERP has 11 States as members and has produced systematic reviews of 35 classes of drugs as well as numerous updates of reviews. DERP reviews the clinical literature comparing the safety, effectiveness, and effect on subpopulations of drugs within classes. MED, with 11 States participating, reviews clinical literature on various procedures and treatments and has, as of 2011, completed 170 reports. ■



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