



RESEARCH ACTIVITIES

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Dr. Clancy bids farewell to AHRQ

Having led AHRQ for a decade, Dr. Carolyn Clancy left the Agency August 23 to begin work as Assistant Deputy Undersecretary for Health, Patient Safety, Quality, and Value at the Veterans Administration. First and foremost a physician, Dr. Clancy worked at AHRQ for 23 years. As an internist, she continued to see patients until she became director in 2003. Before her work at AHRQ, she was director of a medical clinic and professor of medicine at several universities. She continues to chair numerous HHS and other Federal groups and sits on the editorial board of many medical journals. Dr. Clancy was named the

most powerful physician-executive in health care in 2009 by *Modern Healthcare* and *Modern Physician* magazines and the first woman to top the list. She was named third on the list in 2010 and 2011.

Research Activities (RA) talked with Dr. Clancy about what has changed in health services research during the decade she was at the helm of AHRQ, areas of AHRQ's greatest impact on health care, and her personal accomplishments and future plans.

RA: Since you assumed leadership of the Agency in February 2003 you've been passionate about making health services research relevant. You wanted it to change health care delivery and to do it quickly. What's an example of how that research has changed medical practice in the past decade of your stewardship at AHRQ?

Clancy: Probably the most stunning example has been in the field of reducing healthcare-associated infections through the Comprehensive Unit-Based Safety Program (CUSP), which developed 5 steps designed to prevent certain hospital infections. We funded CUSP, led by a team at Johns Hopkins, when we first were tasked by Congress to make a difference in patient safety. What's most



Carolyn Clancy, M.D.

notable about this project was the very dynamic and vital partnership between a stellar research team of Johns Hopkins scientists, the Michigan Blue Cross Blue Shield Plans, and the Michigan Hospital Association who implemented CUSP in Michigan. What we've seen over time—and this project has now been spread across the country—is that with a practical approach that makes it easy to make science operational, you can actually have dramatic results—in this case, reductions of over 40 percent of infections in intensive

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From the Director



In this, my last Director's Column, I'd like to briefly reflect on how AHRQ's research and tools have

improved clinical practice from when I first became a physician to now. If you look at today's residents, they have the pockets of their white coats stuffed with little books, notebooks, PDAs, etc. They always want to know "What do I do right now?" AHRQ's clinical tools—such as surgical checklists, teamwork protocols, and our prevention guide that allows physicians to key in a patient's characteristics to identify the preventive tests they need—really build on this old-time model.

However, all the operational pieces need to be in place, because health care has gotten a lot more complex. Medical simulation and other approaches help train residents in procedures and patient care.

When I first began as an internal medicine physician many years ago, I was never supervised or observed with patients. When I saw my first patient, a middle-aged man with diabetes and its complications, including eye disease, he told me as I was conducting the physical examination, "I come here a lot, and you're not going about this the right way." I was a bit taken aback, but I listened to what he had to say. And that was a lesson to me to listen to my patients, which has become the cornerstone of today's patient-centered care that takes into account patient's values and preferences in treatment decisions.

We've also figured out that clinicians can't just watch a

Webinar to improve their practices. That's like watching the Food Network, which is very different from taking cooking lessons in your own kitchen. It's not just content, but actually doing it yourself. That's why AHRQ's clinical tools have been designed so they can be adapted and implemented locally at individual health care facilities. In the end, these tools and our research help clinicians answer the question, "What do I do now, for this patient, in this situation?" That's a huge step forward compared to the resources available to me when I began as a physician, and it has made a huge difference in patient care and outcomes.

Carolyn Clancy, M.D.

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Dr. Richard Kronick is new AHRQ director

On August 19, HHS Secretary Kathleen Sibelius announced that Richard Kronick, Ph.D., would be the new director of AHRQ following Dr. Clancy's departure. Dr. Kronick joined the Department in January 2010 as Deputy Assistant Secretary for Planning and Evaluation, overseeing the Office of Health Policy. In that role, he has conducted and coordinated research on policies relating to public health; health care delivery; health insurance; and health care financing programs, including Medicare, Medicaid, State Children's Health Insurance Program, and private insurance coverage. His work, and that of the Office of Health Policy under his leadership, has been integral to the implementation of the Affordable Care Act.

Additionally, his team has provided insight and information critical to the effort to improve the health of the nation. Prior to joining HHS, Dr. Kronick conducted health policy research in academia as well as in Federal and State government, including as Director of Policy and Reimbursement for the Medicaid Division of the Massachusetts Department of Public Welfare, and most recently, as a Professor and Chief of the Division of Health Care Sciences in the Department of Family and Preventive Medicine at the University of California, San Diego. "AHRQ has important work ahead, and I look forward to continuing to work with Dr. Kronick in this new role," Secretary Sebelius said in a statement. ■

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care units and almost 60 percent for neonatal intensive care units.

RA: You also have a reputation for encouraging researchers, who are fiercely independent, to engage clinicians, patients, policymakers, and other stakeholders in their research to make it more relevant. You've called research a "team sport." What difference has AHRQ's engagement of stakeholders in research made in health care?

Clancy: In a number of instances, I think AHRQ's stakeholder engagement has made research far more practical. We have funded some very specific initiatives in patient safety, for example, that focus on practical improvements in patient safety. I think we are learning how to do that quickly. There is still not a roadmap for it, and to a large extent, it has to be customized. For example, for some efforts in safety it is thought

to be incredibly important that the CEO literally walks around to see some of this work in progress. It gets everyone's attention. That said, some of these leaders aren't instantly comfortable doing that. They haven't actually set foot in a clinical unit for awhile and not walked around and talked to patients. So they needed some coaching to make that happen. But I am very optimistic that the earlier engagement can help us accelerate the timeline from research to practice. This Agency from the very moment it was created has had a very clear mandate to disseminate what's known to make a difference in health care. We have a unique responsibility and opportunity to shorten that timeline dramatically.

RA: Do you think it has shortened?

Clancy: I don't think anyone has done the calculation, but in some areas it has. What we see every year from the annual reports on quality and disparities is the most dramatic

improvements in acute care settings. So my guess is for a number of acute care areas that timeline has indeed shortened.

RA: You are also well-known for championing the involvement of patients in their care. You've noted that patient engagement is being called by some the "blockbuster drug of the 21st century." How has AHRQ championed patient engagement and has this been an impetus for improved care?

Clancy: Over time there has been a steady increase in the involvement of multiple stakeholders in agenda-setting meetings. What I've noticed, particularly in patient safety, is that when there are consumers, patients in the room, it changes the entire conversation. So we've tried to include patients, families, caregivers, consumers, early and often, because it really brings a sense of urgency. We've tried to

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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.

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engage patients through a whole variety of venues, from our recently released guide on how hospitals can involve patients and families at a governance level, to supermarket announcements, public service ads, monthly advice columns and telenovelas to reach the Latino population. I've always thought we should leave no stone unturned in reaching people where they are, because if we really build a patient-centered health care system, it will be where the patients are rather than have them come in and navigate a byzantine bureaucracy.

RA: Where do you think AHRQ's research has made the biggest impact in care? Where is more work needed?

Clancy: It is hard to talk about impact, because some impacts are immediate and you can point to a big success before and after and healthcare-associated infections certainly fits that mode. In the long run, some of what we have funded that has given people tools that they can use to improve care onsite where they see patients will ultimately have the more lasting and sustainable impact. Tools include current data that can be easily accessed such as MEPS or HCUP or other sources and programs that promote teamwork in health care or assess the culture of safety in a hospital or other institution. All of these change the model of research having an impact on care from giving people fish to teaching them how to fish, which I think ultimately will have a more durable impact. In other words, clinical settings were not designed with the systematic capacity for incorporating the most up-to-date evidence in mind, so our overall strategy has to address both the 'what' and the 'how'.

RA: Where is more work needed?

Clancy: Two areas I think need a lot more work. One is chronic illness. A lot has to do with the fact that making dramatic improvements in chronic illness is truly a partnership between patients, caregivers, families, and what we call the clinical enterprise. That often means going way outside the usual boundaries of what we think of in clinical care.

It is really easy for me to tell people what they need to do in terms of changing their lifestyle or managing their diabetes, but actually doing it is much harder. And if I am going to be successful with patients, I need to know what supports are available in the community. And frankly, that's not how most doctors and other health professionals were trained, which doesn't mean they can't learn. At the top of the list also has to be disparities in health care. We're seeing enough improvements to know that we can make change, but we are also seeing that care disparities continue to be pervasive and that we can do a much, much better job.

RA: When you first became director of AHRQ, the Agency published its first annual *Healthcare Quality Report* and *Healthcare Disparities Report*. You just published the tenth set of reports. How much have care quality and safety improved over the past 10 years, and how have care disparities changed over time?

Clancy: The good news is in quality. We have seen significant improvements across all settings and populations every year for the past 10 years. The slightly less good news is the magnitude of those improvements. We need to, and I believe, can do it much, much faster than we have. A lot of that comes

down to having timely data. If I just submit data and someone tells me a year later how I am doing, it doesn't have a lot of meaning. A year ago is ancient history. If I get much more timely feedback than that, it is far more relevant. In the example I used on healthcare-associated infections, those teams got quarterly feedback.

“The health care research enterprise has to transition from describing problems to solving them.”

And when you start to see success, it's like rocket fuel. With the HITECH Act and the dramatic increase in the number of hospitals and physicians and others adopting electronic health records, we are going to see more and more rapid data collection and feedback that people can act on. Rapid data collection will also help us make some big improvements in reducing disparities. There remains sensitivity about how and when you collect the data and so forth. But the Affordable Care Act has provisions that specifically address those challenges, so I am very optimistic.

RA: At the recent AcademyHealth meeting you said that with passage of the Affordable Care Act, more eyes will be on the health services community to bring about change. What type of change?

Clancy: At a very high level, it means that the health care research

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enterprise has to transition from describing problems to solving them, in the words of an AcademyHealth leader, from “a focus on decisions to a focus on implementation.” And that’s a very different skill set. That’s a very different team that you’re working with. Ultimately it may mean that we need to train people who will be bilingual in terms of what research can bring to solving problems and what it’s going to take operationally to put some of these findings into practice. But we don’t actually have a clear set of competencies or clear path for people to develop that skill set.

Improving care will also require timely data and constant evaluation—and looking back to see how we are doing and where we dropped the ball. That has to be a key part of the fabric of health care. And that is not how today’s health care professionals have been trained. They have been trained to focus on one patient at a time, then move on to the next patient. I think they are more than up to the task. It may mean conferences for every shift in intensive care units or weekly conferences in outpatient offices.

RA: How important a role will AHRQ’s patient-centered outcomes research play in improving care in the future?

Clancy: It’s going to be huge, and I’m very proud of the fact that the outcomes research work we did at the very beginning of the Agency and continue to do has created an amazing foundation of patient-centered outcomes research. We live in an incredible time, whether for treatment or diagnosis, there are two or more good options. That is such

a great place to be. But knowing what’s the best starting point in caring for a particular individual—trying to match what we know in science with the unique needs and preferences of that individual—that’s what patient-centered outcomes research is all about. It’s also about how to improve care delivery and customize it for specific settings. With the creation of the Patient-Centered Outcomes Research Institute, our role is changing, because the Affordable Care Act gives us a very explicit stream of funding to build capacity in this field, which we know how to do, and also to disseminate the results more rapidly. So that is where the rubber meets the road and we’re very, very excited about that.

“We live in an incredible time, whether for treatment or diagnosis, there are two or more good options.”

RA: You’ve noted that the future direction of health services research is going to be increasingly local and that local solutions can become national solutions. What do you mean by that?

Clancy: At the end of the day, all health care is local. For example, where I am from in Massachusetts, there are four medical schools, and in Connecticut right next store there is one. Every community and region has a different mix of assets and opportunities for improvement.

That’s one reason it’s extremely local. And fundamentally, it’s local because of the way the Affordable Care Act is constructed. It is very much a State-based bill and its implementation is going to have a huge impact.

Because they are State-Federal partnerships, the State Medicaid programs tend to be very different in terms of how they work. Ultimately you can never do something that is ‘just’ national. You’ve got to figure out the how in a much smaller unit of scale. Anyone can command all health care professionals to wash their hands all the time. In fact we’ve been doing that for awhile, but it doesn’t work. The trick is at my hospital or in my community, how do I make this so easy and so irresistible that it becomes the new normal? I think when we work these things out on a local level, it becomes much easier to scale.

RA: What are the accomplishments as director of the Agency you are most proud of and what legacy do you leave behind?

Clancy: First, the notion of legacy always makes me a little uncomfortable, because by definition this is a team sport, so I have had the wisdom to work with the most fantastic team of people at AHRQ. Taking credit for our collective accomplishments, I think we’ve gotten many people much more focused on how to implement research findings in the hospital or other health care settings. We’ve also gotten better over time in creating research partnerships where there really is a serious partnership between those who lead and actually run care operations

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and those who do research. The ACTION network is a fantastic example of that. I think we've helped a lot of people work with data that they never thought was possible to do before, and that is a tribute to our folks who make it easy and fun.

Fundamentally, I think we've also helped equip patients to have

more of a voice in their own care. Last, I am very proud that we have worked with many Federal and private partners in trying to figure out how to accelerate the pace of quality improvement. That includes AHRQ's role in implementing the National Quality Strategy, which is a brand new idea, as part of the Affordable Care Act. It's an annual report on progress in care quality that has become a very vital

framework for HHS in partnership with the private sector, and one I am very excited about. I am also proud of funding medical liability demonstration projects that have dramatically changed the model of how health care providers address medical errors with patients and their families and have already markedly reduced malpractice lawsuits at one hospital. ■

Patient Safety and Quality of Care

Most primary care diagnostic errors stem from process breakdowns during the clinical encounter

The primary care setting is particularly vulnerable to diagnostic errors (missed, delayed, or wrong diagnosis). Recently, researchers used electronic health record (EHR) triggers to identify diagnostic errors at two primary care sites. They found that most missed diagnoses were for common conditions, such as pneumonia and worsening heart failure. In addition, process breakdowns during the patient-practitioner clinical encounter were responsible for the majority of the errors.

The study was conducted in the primary care clinics of a large urban Veterans Affairs facility and a private health care system. EHR triggers flagged situations when patients had unexpected return visits or unplanned hospitalizations after their initial primary care visit. Detailed medical reviews determined if there was a diagnostic error at the initial visit. A second level review determined the process breakdowns and contributing factors involved.

A total of 190 diagnostic errors were discovered and involved 68 different types of medical conditions. In addition to pneumonia, other commonly missed

diagnoses included worsening congestive heart failure, acute renal failure, cancer, and urinary tract infection.

Nearly 80 percent of breakdowns occurred during the clinical encounter. These included problems with the medical history, physical examination, and the ordering of diagnostic tests. Other process breakdowns outside of the patient-practitioner clinical encounter involved referral processes, patient-related issues, followup of diagnostic test result information, and interpreting test results.

Most of the diagnostic errors identified (86.8 percent) had the potential to produce moderate to severe harm. The researchers suggest that future interventions to address these errors must address common contributory factors across the several types of errors and provide better cognitive support to practitioners to enhance data gathering and synthesis in the clinical encounter. The study was supported in part by AHRQ (HS17244).

See "Types and origins of diagnostic errors in primary care settings," by Hardeep Singh, M.D., M.P.H., Traber Davis Giardina, M.A., M.S.W., Ashley N.D. Meyer, Ph.D., and others in the March 25, 2013 *JAMA Internal Medicine* 173(61), pp. 418-425. KB



How nurses keep patients safe may be better understood through risk management theory

Nurses working in hospitals keep their patients safe by risk management, suggests a new study. Interviews with registered nurses (RNs) revealed that the nurses continually assess the clinical environment for possible risks of harm and use their knowledge of potential risks and knowledge of the patient to prevent harm. Successful risk management requires nurses to recognize risks before they reach the patient, constantly prioritize the identified risks, then act to prevent those that would cause the patient the most serious harm.

The researchers based this theory of managing risk on 16 qualitative interviews with 12 female RNs with direct patient care roles (9 in adult acute care, 2 in adult intensive care, and 1 involved in care for both types

of patients) at a 247-bed academic medical center in the Midwest. Previous studies on the process of patient safety in hospitals had focused on systemic factors such as organizational reliability, or how an accident penetrates organizational defenses, but not on how nurses behave to reduce the risks of harm to individual patients or how their actions help create the institutional patient safety culture.

In the course of their interviews, the researchers found that the nurse participants perceived that their patients were always at risk. They assessed their patients for common and uncommon risks using their own knowledge and experience to recognize deviations from the norm and to choose an appropriate counteraction. Even if

one harm was prevented, another could develop, making the process of protecting patients from harm a repetitive cycle of observation, evaluation, and action. The researchers suggest more studies that involve both male and female nurses and licensed practical nurses that are conducted in community and academic hospitals to better understand how managing risk can vary. The study was funded by AHRQ (HS21075).

More details are in “It’s always something: Hospital nurses managing risk,” by Patricia Groves, Ph.D., R.N., Deborah Finfgeld-Connett, Ph.D., R.N., and Bonnie J. Wakefield, Ph.D., R.N., in the December 2012 online *Clinical Nursing Research*. ■ *DIL*

More intensive pediatric resident training called for to improve performance of tracheal intubations in children

Tracheal intubation is one of the most important ways to stabilize critically ill or injured children to ensure they get enough oxygen and eliminate carbon dioxide. The ability to manage the pediatric airway, which includes performing needed tracheal intubations, remains one of the most vital skills to develop when caring for critically ill children. Little is known about the relationship between provider level of training in pediatric intensive care units (PICUs) and either successful tracheal intubations or adverse tracheal intubation-associated events (TIAEs). However, a new study suggests that before permitting live tracheal intubations in the PICU, more intensive pediatric resident training is necessary.

In a study of 1,265 tracheal intubations performed in 15 different PICUs, first and overall attempt success rates varied between pediatric residents (37 percent, 51 percent), pediatric critical care fellows (70 percent, 89 percent), and PICU attending physicians (72 percent, 94 percent). Among the 1,265 tracheal intubations, there were 270 adverse TIAEs. The most frequently reported nonsevere TIAE was the immediate recognition of

esophageal intubation (125 events), while the most frequently reported severe TIAE was hypotension (observed in 46 encounters). Pediatric critical care fellows were associated with significantly fewer TIAEs than pediatric residents.

Across a broad spectrum of PICU settings, the success rate of medical residents was low and adverse associated events high compared with rates for pediatric fellows or attending physicians. While some of the TIAEs were not considered severe, they can potentially harm children who are already critically ill. More training for residents and assessment of the skill set of trainee providers to match patient’s potential risks are necessary to avoid complications, suggest the researchers. Their study was funded by AHRQ (HS21582).

See “Level of trainee and tracheal intubation outcomes,” by Ronald C. Sanders, Jr., M.D., John S. Giuliano, Jr., M.D., Janice E. Sullivan, M.D., and others in *Pediatrics* 131, p. e821-e828, 2013. ■ *MWS*

Automated tool to determine medication regimen complexity may help identify patients at high risk of adverse events

Poor adherence to recommended medication treatment plans has been associated with adverse consequences for patients and higher costs. A contributing factor to poor adherence is the complexity of a medication regimen, according to a number of studies. Use of a medication regimen complexity index (MRCI), a tool for quantifying multiple features of drug regimen complexity, together with a medication database, could help to identify patients who are at higher risk of adverse events, suggests a new study. To reliably quantify medication regimen complexity, the MRCI extracts information found in patient charts and prescriptions, and assigns weights to dosage forms, dosing frequencies, and additional instructions.

The authors describe the process of adapting an MRCI, previously developed by other researchers, for use at the Visiting Nurse Service of New York (VNSNY), the largest non-profit Medicare/Medicaid-certified home health organization in the United States. In the first phase, the researchers abstracted medication data from 89,645

electronic health records to line up with the MRCI's components: dosage form, dosing frequency, and additional instructions.

A committee reviewed output to assign index weights and determine necessary adaptations. In the second phase, the authors examined the face validity of the modified MRCI through analysis of automatic tabulations and descriptive statistics. The MRCI tool was then translated for use within the VNSNY's electronic health record system.

The result was the first comprehensive quantitative data on medication regimen complexity in a large population of post-acute care patients characterized by multiple conditions and medical complexity. The researchers found that most patients (55 percent) were taking medications in only one route/form (tablet or capsule), although 16 percent had regimens with three or more medications with different routes or forms. The biggest contributor to the MRCI score was dosing frequency. Over 36 percent of patients needed to remember two or more special instructions (e.g., take on alternate days, dissolve).



The researchers anticipate that, at some point, automated MRCI scores can be linked to patient outcome data to determine risk thresholds for adverse events. This study was supported by AHRQ (HS17837).

See “Automating the medication regimen complexity index,” by Margaret V. McDonald, M.S.W., Timothy R. Peng, Ph.D., Sridevi Sridharan, M.S., and others in the May 1, 2013 *Journal of the American Medical Informatics Association* 20(3), pp. 499-505. ■
MWS

Some transitional care interventions reduce 30-day readmissions and emergency department visits

More than 20 percent of medical patients sustain a preventable adverse event (AE) within 3 weeks of hospital discharge. In an effort to reduce 30-day readmissions, hospitals are implementing strategies to prevent adverse outcomes after discharge. A team of researchers from the University of California at San Francisco conducted a systematic review of the effectiveness of hospital-initiated care transition interventions to reduce AEs, emergency department (ED) visits, and readmission after discharge in general medical patients. They identified 15 studies showing

that interventions successfully reduced readmission or ED visit rates after discharge. Eight of these studies showed that interventions reduced 30-day readmission rates.

Because few studies specifically addressed the problem of postdischarge AEs, there were no firm conclusions regarding effective strategies in this area. Typically, a transitional care strategy consists of one or more interventions initiated before hospital discharge with

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Transitional care interventions

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the aim of ensuring the safe and effective transition of patients from the acute care setting to home. Nearly all of the 15 studies used a bridging intervention (incorporating both predischarge and postdischarge interventions), and 10 of the 15 used a dedicated transition provider who contacted patients before and after discharge.

The most commonly used interventions included patient engagement, ranging from general patient education to more specific instruction on symptom management and medication counseling. Other interventions included postdischarge outreach to patients by telephone and/or home visit. One of the strategies used by some hospitals, the Care Transitions Intervention, has been successfully implemented and evaluated in multiple

patient populations and health care systems. A similar intervention, Project RED (Re-Engineered Discharge), has been implemented in a safety net system.

Although these strategies are relatively intensive and probably require considerable resources, information on the cost of transitional care strategies was lacking. The researchers concluded that, although hospitals are being penalized for excessive readmission rates, the strategies that an individual hospital can implement to improve transitional care remain largely undefined. This study was supported by AHRQ (Contract No. 290-07-10062).

See “Hospital-initiated transitional care interventions as a patient safety strategy,” by Stephanie Rennke, M.D., Oanh K. Nguyen, M.D., Marwa H. Shoeb, M.D., and others in the March 5, 2013 *Annals of Internal Medicine* 158(5) Part 2, pp. 433-440. ■ MWS

Multicomponent intervention programs are effective in preventing delirium in older hospital patients

Delirium, also known as acute confusional state, affects between 14 and 56 percent of older hospitalized patients. It is linked to increased risk for death, postoperative complications, longer hospital and intensive care unit stays, and functional declines. To lessen or prevent the occurrence of delirium, hospitals have implemented multicomponent interventions. Most are effective in preventing the onset of delirium in at-risk patients in a hospital setting, according to a systematic review of 19 studies by a team of researchers with the ECRI Institute.

Evidence from the review was insufficient to determine the benefit of such programs in palliative care or long-term care settings. In addition, the evidence was insufficient to identify which multicomponent interventions are most beneficial, and the studies do not address the question of which components within a program provided the most benefit for delirium prevention.

Many factors contribute to delirium, including age, cognitive impairment or dementia, depression, multiple medications, and procedures such as blood transfusions. In general, successful delirium prevention programs involved a multidisciplinary team of clinical experts, nurses, and other staff such as physical therapists or volunteers, and included protocols for



early mobilization of patients, volume repletion (for hydration and electrolyte balance), and addressing visual or hearing deficits.

A few programs included elimination of unnecessary medications. Future comparative effectiveness studies will be needed to identify which components in multicomponent interventions are most effective for delirium prevention. This study was supported by AHRQ (Contract No. 90-07-10062).

See “In-facility delirium prevention programs as a patient safety strategy. A systematic review,” by James T. Reston, Ph.D., and Karen M. Schoelles, M.D., in the March 5, 2013 *Annals of Internal Medicine* 158(5) Part 2, pp. 375-380. MWS



Study reviews patient safety strategies targeting diagnostic error and identifies promising interventions

Missed, delayed, or incorrect diagnosis can lead to inappropriate patient care, poor patient outcomes, and higher costs. A systematic review of 109 studies of patient safety strategies (PSSs) targeted at diagnostic errors has categorized and identified promising interventions that warrant evaluation in large studies across diverse settings. The evidence seemed strongest for interventions such as technology-based systems (e.g., text message alerting), and specific techniques (e.g., testing equipment adaptations). Over 100 evaluations of interventions to reduce diagnostic errors, many of which had a reported positive effect on at least one end point, were identified by a team of researchers from Stanford University and the

Palo Alto Medical Foundation Research Institute.

The researchers grouped the PSSs targeting diagnostic errors from an organizational perspective into changes that an organization might consider more generically (techniques investment; personnel configurations; additional review steps for higher reliability; structured processes; education of professionals, patients, and families; and information and communications technology-based enhancements). The two most common types of PSSs were structured process changes, most of which involved the addition of a tool, often a checklist or a form, and the introduction of redundancy in interpreting test results, usually by a separate reader.

Limited evidence from randomized, controlled trials showed that some interventions, such as text messaging, can reduce diagnostic errors in certain situations. Very few studies evaluated the utility of engaging patients and families in prevention of diagnostic errors. This study was supported by AHRQ (Contract No. 290-07-10062).

For further details, see “Patient safety strategies targeted at diagnostic errors,” by Kathryn M. McDonald, M.M., Brian Matesic, B.S., Despina G. Contopoulos-Ioannidis, M.D., and others in the March 5, 2013 *Annals of Internal Medicine* 158(5) Part 2, pp. 381-389. ■ MWS

Health Care Costs and Financing

The proportion of middle-income families with health insurance coverage declined from 2003 to 2008

The percentage of middle-income U.S. families with full-year health insurance coverage declined significantly from 2003 to 2008, revealed a new study. Researchers analyzed data from AHRQ’s Medical Expenditure Panel Survey-Household Component for 2003 and 2008. A total of 18,581 children, aged 0 to 17 years, were studied; all were linked to 1 or both parents. Various demographic variables were obtained, including the child’s age and race, parent employment and education, and monthly health insurance coverage status.

Insurance coverage changes were most notable among middle-income families, with non-significant change for low-income and little change for high-income families. For example, middle-income children and their parent(s) insured for the full year decreased from 78.8 percent to 72.8 percent.

When assessed cross-sectionally, the percentage of uninsured middle-income families rose significantly from 5.6 percent to 8.3 percent, and those with private insurance decreased from 75.7 percent to 70.2 percent.

Even with the Affordable Care Act and the availability of health insurance exchanges, current estimates predict that a small percentage of the U.S. population may remain uninsured. To correct this problem, the authors suggest that private health insurance coverage must become more affordable and public coverage must become more widely available. The study was supported in part by AHRQ (HS16181).

See “Changes in health insurance for US children and their parents: Comparing 2003 to 2008,” by Heather Angier, M.P.H., Jennifer E. DeVoe, M.D., D.Phil., and others in the January 2013 *Family Medicine* 45(1), pp. 26-32. ■ KB

Information on assets should be incorporated when measuring the financial burdens of health

When assessing the out-of-pocket burdens of health care costs, a person's annual income is used to determine the financial resources available. A person's assets, however, are not included, except for interest and dividends as part of regular income. Yet these assets are particularly important to those who are unemployed or who have high out-of-pocket medical expenses.

Didem Bernard, Ph.D., from AHRQ, and Jessica S. Banthin, Ph.D., of the Congressional Budget Office, investigated how to incorporate assets when determining out-of-pocket health care burdens. One approach is to add a portion of assets to income or annuitize wealth to measure the resources of retired persons. A second approach is to apply different income thresholds to different subpopulations by age.

The researchers used data from the Medical Expenditure Panel Survey. Out-of-pocket burden is defined as the share of family income spent on out-of-pocket expenditures on

health care services and premiums for all family members. The median out-of-pocket burden for elderly families was 10.7 percent compared to just 2.9 for nonelderly families. This burden increased to 13.5 percent of family income for elderly families living in poverty. The researchers found large disparities in the distribution of net assets.

The elderly had a median \$146,000 in family net wealth, 7 times as much as \$20,000 for the nonelderly. Among those living below poverty, elderly families had more than \$20,000 in net wealth; nonelderly families reported zero. About 52 percent of the elderly and 17 percent of nonelderly families were spending 10 percent or more of their income on medical care; 26 percent of the elderly and 7 percent of the nonelderly were spending 20 percent or more of their income.

As an alternative measure of resources, the researchers adjusted the incomes of the elderly families to include 5 percent of the value of their total net assets. This shifted the average income up by about \$16,000. Among those elderly families living below poverty, the adjustment increased average income from \$6,550 to nearly \$12,000. This decreased the

percentage with medical burdens exceeding 20 percent of income from 44 percent to 29 percent.

The researchers conclude that incorporating assets into the measure of resources is one approach in developing a consistent measure of medical risk in comparing the relative status of elderly and nonelderly subpopulations in terms of health-related financial burdens.

More details are in "Incorporating data on assets into measures of financial burdens of health," by Drs. Bernard and Banthin in *Medical Care Economic Risk: Measuring Financial Vulnerability from Spending on Medical Care* (Michael J. O'Grady and Gooloo S. Wunderlich, editors), National Academies Press 2012, pp. 267-280. Reprints (AHRQ Publication No. 13-R035) are available from AHRQ.* KB



Managed care continued to exert observable effects on hospital cost and quality in the post-managed care era

Managed care has transformed the health care landscape during the last two decades of the 20th century, but the total enrollment in HMO plans has been decreasing since 2000. AHRQ researcher, H. Joanna Jiang, Ph.D., and coinvestigators examined whether managed care and hospital competition continue to demonstrate positive effects on hospital cost and quality performance. Average hospital cost and mortality rates were analyzed from 1,521 urban hospitals located in markets with different degrees of HMO penetration. The time

frame examined was between 2001 and 2005 during which there was a decline in HMO enrollment. Two market forces were measured: HMO penetration and hospital competition.

Hospitals located in areas with high competition had significantly lower mortality rates of 7 percent less in 2001 and 4 percent less in 2005. By 2005, there were also lower mortality rates for hospitals located in high HMO penetration markets. In markets with high HMO penetration, increase in hospital competition over this time period resulted in decreased mortality but no change in cost. However, in markets without high HMO penetration, increase in hospital competition over time was associated with increase in cost but no change in mortality. These findings suggest that HMO plans

may be paying more attention to quality of care than before.

While managed care seems to have lost strength in slowing the growth rate of hospital costs in this post-managed care era, there continues to be differences in hospital cost performance associated with different levels of HMO penetration across markets, note the researchers.

More details are in “Hospital cost and quality performance in relation to market forces: An examination of U.S. community hospitals in the ‘post-managed care era,’” by Dr. Jiang, Bernard Friedman, Ph.D., and Shenyi Jiang, Ph.D., in the *International Journal of Health Care Finance and Economics* 13, pp. 53-71, 2013. Reprints (AHRQ Publication No. 13-R036) are available from AHRQ.* KB



Declines seen in direct-to-consumer promotion of drugs

Pharmaceutical companies spend billions of dollars to promote their drugs, \$30 billion in 2005 alone. The majority of this spending, 84 percent, goes toward physician detailing (visits by drug representatives) and free samples. However, a good portion is also set aside for direct promotion to consumers, called direct-to-consumer advertising (DTCA). A new study reveals that drug companies are reducing overall promotion efforts, largely in response to drugs going off patent. In the case of DTCA spending, it grew 68 percent between 2001 and 2006, then declined 25 percent by 2010. DTCA was also concentrated on a small number of drugs.

The researchers examined trends in drug promotion spending from 2001 to 2010 using data from several sources covering physician detailing, dispensed free samples, journal ads, electronic promotion spending, meeting/conference promotion, and DTCA. Top-promoted and top-selling drugs were categorized as either biologic therapies (manufactured using biologic processes) or small molecules, which represent the majority of all prescription medications.

Total promotional spending peaked in 2004, amounting to \$36.1 billion. By 2010, however, it had declined 23 percent to just \$27.7 billion. In the case of free samples,

their retail value also declined 23 percent, from \$18.1 billion in 2004 to \$13.9 billion in 2010. Electronic promotion to providers increased twofold, although its share was just 2 percent of provider promotion. Across the study period, the largest expenditures were for office-based detailing and free samples. DTCA declined 25 percent from \$5.9 billion in 2006 to \$4.4 billion in 2010, when it accounted for 16 percent of all promotional spending. Less than 5 percent of DTCA was Internet-based. In 2010, the top three drugs promoted directly to consumers were the statin Lipitor®, the erectile dysfunction drug Cialis®, and the antidepressant

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Direct-to-consumer

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Cymbalta®. Among biologic therapies, the agents with the most promotional spending were the diabetic drugs Lantus® and Byetta®. The study was supported in part by AHRQ (HS18960).

See “Promotion of prescription drugs to consumers and providers, 2001-2010,” by Rachel Kornfield, M.A., Julie Donohue, Ph.D., Ernst R. Berndt, Ph.D., and G. Caleb Alexander, M.D., M.S., in *PLoS ONE* 8(3), p. e55504, 2013. ■ KB

Having dental coverage boosts the use of preventive and restorative dental services

Despite the availability of dental services in the United States, less than half of the population goes to the dentist each year. Dental coverage is a major incentive for persons to seek out preventive and restorative dental care, concludes a new study. AHRQ researchers Samuel H. Zuvekas, Ph.D., and Richard Manski, D.D.S., M.B.A., Ph.D., analyzed data from the AHRQ’s 2001–2006 Medical Expenditure Panel Survey and additional price data from the American Dental Association. They determined three measures of out-of-pocket prices: the average cost for preventive care visits during the year, the total spending incurred during the first episode of basic treatment, and the total spending incurred during the first episode of major treatment.

Race and ethnicity, gender, childhood, and education were strong predictors of using dental care services. For example, minorities were significantly less likely to have dental visits compared to whites. Blacks were 15 percentage points less likely to have preventive care visits than whites. Individuals with dental coverage had 19 percent greater use of preventive dental services. Restorative services also increased 11 to 16 percent with insurance coverage. Enrollment in a health maintenance organization increased the use of restorative services, but not preventive services. The



reverse effect was found for those enrolled in private health insurance.

More details are in “The demand for preventive and restorative dental services,” by Dr. Zuvekas, Dr. Manski, and Chad D. Meyerhoefer, Ph.D., in the January 2013 *Health Economics* [Epub ahead of print]. Reprints (AHRQ Publication No. 13-R033) are available from AHRQ.* ■ KB

Early discharge planning at hospital admission can lower mortality after a heart attack

Hospitals vary widely in their 30-day mortality rates for patients with heart attacks. One key to lowering these rates is to employ early and comprehensive discharge planning and processes. The most successful hospitals start these discharge processes immediately upon hospital admission, according to a new study. Also, once patients are released, they are followed up by their primary care physicians 2 days after discharge.

The researchers selected hospitals that were at the top 5 percent and the bottom 5 percent of hospital 30-day risk-standardized mortality rates for heart attack patients. All hospitals were in either category for 2 consecutive years. Visits were made to 14 sites where 57 in-depth interviews were conducted. Those participating in these interviews ranged from physicians, nurses, and

chief medical officers to quality management staff.

High-performing hospitals tended to start discharge planning immediately after the patient was admitted to the hospital. Low-performing hospitals tended to conduct discharge planning at the end of the patient's stay, focusing on complying with guidelines rather than individual patient needs. High-performing hospitals also had strong, multidisciplinary case management services. At these sites, patients were not discharged until a plan was in place.

In addition, there was a strong shared responsibility to educate and follow up with patients about their medications and post-hospital care. Education focused on both the patient and their families. Finally, in high-performing hospitals, primary care physicians were

contacted within 1 to 2 days after discharge. At lower performing hospitals, the burden of passing discharge information along to the primary care physician was placed on the patient. The authors call for more efforts to improve communication among different hospital departments and to foster a culture that uses creative problem solving when it comes to improving discharge planning for these patients. The study was supported in part by AHRQ (HS16929).

See "Features of high quality discharge planning for patients following acute myocardial infarction," by Emily J. Cherlin, Ph.D., M.S.W., Leslie A. Curry, Ph.D., M.P.H., Jennifer W. Thompson, M.P.P., and others in the *Journal of General Internal Medicine* 28(3), pp. 436-443, 2013. ■ KB

Adults with childhood-onset illnesses are a small, but high-risk group of users of pediatric intensive care units

Some patients with childhood-onset illnesses such as congenital heart disease, cystic fibrosis, and sickle cell disease continue to receive inpatient care from pediatrics hospitals well into adulthood. A new study of 70 pediatric intensive care units (PICUs) found that 2.7 percent of admissions (1,954) in 2008 were patients 19 years or older. There was a wide variation (from 0 to 9 percent) in the proportion of adult patients across PICUs. These adult PICU patients had a greater severity of illness and preadmission disability, longer stays, and higher mortality compared with adolescent patients.

After age 18, close to 80 percent of PICU patients had a complex chronic condition, compared with 53 percent of adolescents. One in five adult PICU patients 21 years

or older had congenital heart abnormalities and/or had cardiac procedures or operations. The researchers believe that as the number of adults with childhood-onset chronic illnesses grows, PICUs will need to prepare for increasingly older patients and adult ICUs will increasingly need to care for these adults. This study was partially funded by AHRQ (HS17716).

See "Multi-institutional profile of adults admitted to pediatric intensive care units," by Jeffrey D. Edwards, M.D., Amy J. Houtrow, M.D., Eduard E. Vasilevskis, M.D., and others in the May 2013 *JAMA Pediatrics* 167(5), pp. 436-443. ■ MWS

Hospitals that collaborate with emergency medical services have fewer heart attack deaths

Emergency medical services (EMS) are a critical component of the care provided to heart attack patients. Evidence suggests that hospitals that collaborate closely with EMS providers tend to have lower mortality rates for heart attack, acute myocardial infarction (AMI). Through interviews with key hospital personnel, a new study characterizes the nature of the EMS-hospital collaborations that may impact mortality.

Higher-performing hospitals (those with lower mortality rates) tended to have broad, close, and multifaceted strategies to support collaboration with EMS on heart attack care. Such hospitals demonstrated more investment in and respect for EMS as key professionals in the care process.

Site visits and interviews were conducted at 11 hospitals at the extreme ends of the range for

risk-standardized mortality rate for AMI. Higher-performing hospitals ranked in the top 5 percent of performance on 30-day mortality rates from heart attack for 2 consecutive years. Lower-performing hospitals ranked in the bottom 5 percent. Key staff members providing care to patients with heart attack were interviewed about their roles, process of care, and improvement efforts.

Four themes emerged from the study. First, both higher and lower performing hospitals indicated that EMS is important in providing timely care to heart attack patients. Second, higher-performing hospitals had respect for EMS as valued professionals and colleagues. They treated them as professionals rather than just technicians responsible for transport, and did not criticize them if they falsely activated the cardiac catheterization laboratory.

Third, higher-performing hospitals also articulated strong communication and collaboration with EMS. Finally, EMS was actively engaged in quality improvement efforts at higher-

performing hospitals, with EMS providers represented on hospital quality improvement committees. They also shared performance data regularly with hospital personnel. The study authors suggest that hospitals work in tandem with EMS providers to develop new protocols to improve care and outcomes of heart attack patients via strong working relationships. Their study was supported in part by AHRQ (HS16929).

See “Hospital collaboration with emergency medical services in the care of patients with acute myocardial infarction: Perspectives from key hospital staff,” by Adam B. Landman, M.D., M.S., Erica S. Spatz, M.D., M.H.S., Emily J. Cherlin, Ph.D., and others, in the February 2013 *Annals of Emergency Medicine* 61(2), pp. 185-195. KB



Study reveals differences in mortality rates of patients transported to trauma centers by private car versus those transported by ambulance

Contrary to expectations, a new statewide study of 91,132 injured persons in Pennsylvania found that the 90.4 percent of individuals taken to accredited trauma centers by an emergency medical services (EMS) ambulance were twice as likely to die than the 9.6 percent brought by private vehicle. This was despite the fact that pre-hospital time for persons transported by EMS was substantially shorter than for those taken by private vehicle (66.2 vs. 245.5 minutes). Individuals transported by EMS were, on average, about a year older, were 2.9 percent more likely to be male, and had higher injury severity scores (ISS—mean patient ISS was 13.7 for EMS vs. 9.2 for private vehicle transport).

In analyses that did not adjust for patient factors, patients transported by EMS were 5.2 times more likely to die than those transported by private vehicle. Also, the increased death rate remained 90 percent higher for EMS patients, even after adjusting for injury severity. When



the researchers analyzed death rates by type of transportation and type of injury, patients transported by EMS still had higher death rates for both blunt-force trauma (by 120 percent) and penetrating wounds (by 70 percent).

The researchers also examined the effect of the level of prehospital care in the EMS transport on mortality for all patients: whether care was classified as advanced life support or basic life support; by level of care; and ISS values for severe (ISS greater than 15 or greater than 25) versus nonsevere (ISS 15 or less, or 25 or less) trauma. The probability of transport by EMS or private vehicle was also analyzed by locale of trauma (major cities, other cities, suburbs, or rural/small towns). The findings were based on retrospective analysis of data from 2003 through 2007 from the Pennsylvania Trauma Outcome Study. The study

was funded in part by AHRQ (HS17960).

More details are in “Characteristics and outcomes of injured patients presenting by private vehicle in a state trauma system,” by Nicholas J. Johnson, M.D., Brendan G. Carr, M.D., M.S., Rama Salhi, M.H.S., and others in the February 2013 *American Journal of Emergency Medicine* 31(2), pp. 275-281. *DIL*



Expanded National Emergency Airway Registry for Children has the potential to improve safety in pediatric intensive care units

The National Emergency Airway Registry for Children (NEAR4KIDS), which captures information about the process of airway management in critically ill children in pediatric intensive care units (PICUs), may help improve the safety of this procedure, a new study suggests. Tracheal intubation, the most common practice in airway management, is performed in critically ill children for a wide variety of problems. However, safety-associated factors have previously been studied only in single PICUs. The current registry that looked at 15 PICUs found that adverse tracheal intubation-associated events (TIAEs) were common, occurring in 20 percent of intubation attempts in one study and over 40 percent in another.

NEAR4KIDS was developed to collect and compare information on tracheal intubation process and care from many diverse PICUs. The registry began with 15 academic PICUs in North America that submitted data on 1,715 patients who underwent initial—and, in some cases, second or third attempts—of tracheal intubation. The researchers found that registry patients (median age of 1 year) underwent intubation for a respiratory diagnosis in 45 percent of cases and because of respiratory failure associated with other diagnoses (such as cardiac problems, sepsis or shock, neurological problems, or trauma) in 34 percent.

Tracheal intubation was successful in 98 percent of cases—62 percent of first attempts, with 14 percent of the patients requiring three or more attempts for success (1,821 total attempts). Among all of the attempts, 20 percent were associated with at least one TIAE, with the event rate per PICU ranging from 0–41 percent of intubation. Severe TIAEs were reported in 6 percent of attempts, with severe event rates ranging from 0–20 percent of attempts per PICU. The most common of the



284 non-severe events (16 percent of attempts) were 167 instances (9 percent) of intubating the esophagus rather than the trachea, with immediate recognition of the problem. Despite the small number of PICUs involved, the researchers demonstrated the magnitude of the current gap in practice and identified some potential risk factors for TIAEs.

The researchers recruited the 15 participating PICUs from members of the Pediatric Acute Lung Injury and Sepsis Investigators, and analyzed data on all tracheal intubations performed between July 2010 and December 2011. The study was funded in part by AHRQ (HS21583).

More details are in “A National Emergency Airway Registry for Children: Landscape of tracheal intubation in 15 PICUs,” by Akira Nishisaki, M.D., M.S.C.E., David A. Turner, M.D., Calvin A. Brown III, M.D., and others in the March 2013 *Critical Care Medicine* 41(3), pp. 874–885. ■ DIL

Several rheumatoid arthritis drugs are associated with gastrointestinal perforation

Although rare, gastrointestinal (GI) perforation is a serious condition that affects patients with rheumatoid arthritis (RA). A new study reveals that the risk of GI perforation in patients with RA varies with the medications used to treat their arthritis. The researchers retrospectively analyzed data on adults with RA from a large U.S. health plan database. The researchers also identified patients who were hospitalized for upper or lower GI perforation. Data on medical and pharmaceutical expenditures furnished information on specific medications patients were taking to treat their RA. The final analysis included 143,433 patients.

There were 696 hospitalizations for perforations. The majority (83 percent) of perforations occurred in the lower GI tract. The rate of

perforation was 1.70 per 1,000 person-years. Perforations in the upper GI tract were associated with gastric and duodenal ulcers. Those in the lower GI tract were associated with diverticulitis and appendicitis. The majority of patients (91 percent) received some medications for RA.

The most popular drugs were nonsteroidal anti-inflammatory drugs (NSAIDs), glucocorticoids, methotrexate, disease-modifying antirheumatic drugs (DMARDs), and biologic agents. Use of glucocorticoids and NSAIDs was associated with GI perforation. Other identified risk factors were old age, a history of diverticulitis, and multiple coexisting medical conditions. Diverticulosis without diverticulitis and the use of biologic agents like tumor-necrosis-factor-inhibitors (anti-TNF

therapy), were not risk factors for GI perforation. In diverticulosis, pouches develop in the wall of the colon. If the opening to a pouch becomes obstructed, infection and inflammation of the wall of the pouch, painful diverticulitis, may occur. The researchers suggest that clinicians use caution when prescribing glucocorticoids or NSAIDs in aged patients and in those with a history of diverticulitis. The study was supported in part by AHRQ (HS18517).

See “Factors associated with gastrointestinal perforation in a cohort of patients with rheumatoid arthritis,” by Jeffrey R. Curtis, M.D., M.S., M.P.H., Angel Lanus, M.D., D.Sc., Ani John, B.S.N., M.P.H., and others in the December 2012 *Arthritis Care & Research* 64(12), pp. 1819-1828. ■ KB

Surgical rates for intractable epilepsy remain flat while monitoring for epilepsy increases

Epilepsy surgery remains a surprisingly underused treatment option for persons with intractable epilepsy, despite an accumulation of positive outcome data, concludes a new study. It found that between 1998 and 2009, hospitalization rates related to intractable epilepsy rose, but there was no significant increase in surgical rates for this condition. The Cleveland-based team of researchers analyzed nationwide trends in epilepsy. They derived annual rates of pre-surgical evaluations and surgeries from a random sample of approximately 20 percent of all hospitalizations in the United States over a 12-year period.

Since epilepsy surgery requires specific pre-surgical investigations, including video-electroencephalogram (VEEG) and intracranial EEG (IEEG) monitoring, they also investigated trends in these diagnostic

tests. In VEEG, the patient is videotaped at the same time as the EEG is recorded; IEEG involves an operation under general anesthetic to place electrodes either on the surface or deep within the brain. Although researchers found no increase in IEEG monitoring, hospitalizations for VEEG monitoring rose. Also, the proportion of pre-surgical evaluations and surgery performed in non-teaching hospitals increased. However, the majority of pre-surgical evaluations and surgery were performed in large medical centers.

Part of the reason for the growth in VEEG monitoring, despite the stagnant rate of epilepsy surgery, is that the



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Epilepsy surgery

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majority of this monitoring is performed to characterize seizures or paroxysmal events, rather than for pre-surgical workup, even in people with intractable epilepsy. Also, it is very likely that an increase in VEEG monitoring reflects a trend where neurologists with epilepsy or EEG expertise are now widely dispersed to many hospitals outside of academic medical centers.

The researchers did find a significant increase in epilepsy surgery in children over time. This may be

a reflection of an expansion in pediatric epilepsy and pediatric epilepsy surgery expertise. Also, older patients with epilepsy are not referred to specialist care as often as their younger counterparts. Only a very small number of surgeries were performed in the elderly. This study was supported in part by AHRQ (T32 HS00059).

See “Temporal trends in pre-surgical evaluations and epilepsy surgery in the U.S. from 1998 to 2009,” by Nicholas K. Schiltz, Ph.D., Siran M. Koroukian, M.D., Samden D. Lhatoo, Ph.D., and Kitti Kaiboriboon, M.D., in *Epilepsy Research* 103, pp. 270-278, 2013. ■ MWS

Adherence to osteoporosis medications decreases fracture risk

Prior studies have demonstrated that adherence to osteoporosis medications reduces the risk of fractures. A new study has examined this relationship to see whether this reduction is due to the specific pharmacologic effects of these drugs or instead to the healthy adherer effect, in which patients who adhere to their medications may differ in important ways from patients who do not take their medications as directed. The study found that the association between medication adherence and fracture risk differed by medication exposure, suggesting little role for the healthy adherer effect.

Researchers selected persons who had osteoporosis and had experienced a fracture from a 5 percent sample of Medicare enrollees aged 65 years or older. The investigators then identified which of these patients had begun taking bisphosphonates for

osteoporosis, selective serotonin reuptake inhibitors (SSRIs) for depression (which can increase the risk of fractures), or angiotensin-converting enzyme (ACE) inhibitors or calcium-channel blockers for hypertension during the 9 months after their fracture. Adherence was assessed 6 months after the start of a medication using the medication possession ratio (MPR). The MPR is the percentage of time a patient has access to medication as determined by refill and pill count. The researchers also examined patients' fractures of the hip, spine, arm (from the shoulder to the elbow), and wrist.

Good adherence to bisphosphonates was significantly associated with a low rate of hip and major fractures. Patients with the highest fracture rates among those taking bisphosphonates had an MPR of less than 50 percent. Those patients most adherent to SSRIs had higher fracture rates than experienced by their less adherent counterparts, but the differences were not statistically significant.

According to the researchers, if there were any healthy adherer effect present, it did not impair the ability to detect the possibility of an association between SSRI use and high fracture risk. However, the rates of fracture were comparable for adherent and nonadherent patients taking ACE inhibitors and calcium channel blockers, with no important healthy adherer effect present in this group. The study was supported in part by AHRQ (HS18517).

See “Does medication adherence itself confer fracture protection? An investigation of the healthy adherer effect in observational data,” by Jeffrey R. Curtis, M.D., M.S., M.P.H., Huifeng Yun, Ph.D., Jeff L. Lange, Ph.D., and others in the December 2012 *Arthritis Care & Research* 64(12), pp. 1855-1863. KB



Agent to combat anemia in patients with bone marrow neoplasms is not used according to clinical guidelines

Myelodysplastic syndromes (MDS) are a group of bone marrow neoplasms that commonly progress to acute myeloid leukemia. Approximately 80 percent of patients with MDS experience symptomatic anemia and approximately 60 percent of these patients receive erythropoiesis-stimulating agents (ESAs). ESAs mimic the effect of the naturally occurring hormone erythropoietin to stimulate red blood cell production. ESAs are key elements of a strategy to improve anemia and reduce dependence on red blood cell transfusions. Published clinical guidelines that suggest approaches to patient targeting and management are designed to optimize drug safety and effectiveness. Yet a study of 6,588 Medicare patients diagnosed with MDS over a 5-year period found clinically important discrepancies between observed practice- and guideline-recommended therapy.

In elaborating on their findings, AHRQ researcher, Amy J. Davidoff, Ph.D., and colleagues stated that patients were frequently not targeted for therapy based on risk status, as evidenced by high rates of use across all risk

groups, or on the likelihood of achieving response, as evidenced by frequent lack of measurement of serum erythropoietin levels prior to ESA use. Patients with low serum erythropoietin levels are much more likely to respond to ESAs, yet only 45 percent of patients had their levels measured prior to ESA initiation. Also, duration of therapy in 60 percent of episodes was not of sufficient length to produce treatment responses. Over one-fourth of users never received a therapeutic-length episode of ESA. These results suggest that stricter adherence to guidelines would decrease inappropriate use of ESAs, presumably substantially decreasing costs associated with this therapy.

See “Patterns of erythropoiesis-stimulating agent use among Medicare beneficiaries with myelodysplastic syndromes and consistency with clinical guidelines,” by Dr. Davidoff, Sheila R. Weiss, Ph.D., Maria R. Baer, M.D., and others in *Leukemia Research* 37, pp. 675-680, 2013. Reprints (AHRQ Publication No. 13-R049) are available from AHRQ.* ■ MWS

Disparities/Minority Health

Lower consent rates for organ donation found among racial and ethnic minorities and older donors

The current number of donated organs is insufficient to meet the demand for organ transplants. A new study suggests that organ donation varies by age and race/ethnicity, with lower consent rates among racial and ethnic minorities and among older people. Consent was significantly more likely to be obtained from white patients (77.0 percent), compared to Hispanics (67.5 percent), “other races” (59.0 percent), blacks (54.9 percent), and Asians (48.1 percent). In addition, there was substantial variability in consent rates by race/ethnicity across the 11 geographic regions defined by the United Network for

Organ Sharing (UNOS). UNOS is the organization that maintains the nation’s organ transplant database.

Appropriate and effective contact with next-of-kin is critical in the chain of the organ consent process. However, analysis of data on the lower consent rates among families of older potential donors suggests that this is related to provider/organ procurement organization practices. Among racial and ethnic minorities, lower consent rates may be due, in part, to personal, cultural, or religious beliefs. When this is so, lower rates do not represent problems to be fixed;

however, some of these differences are due to miscommunication, misinformation, or trust among racial and ethnic minorities.

The study analyzed 35,283 deaths of potential organ donors reported to the Organ Procurement and Transplantation Network during the 2008–2011 study period. Some form of consent was obtained from family members or other decision makers in 26,016 (72.6 percent) eligible deaths. In the 4,415 (17.0 percent) other eligible deaths, authorization came from a donor

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Organ donation

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registry and/or prior documentation. The researchers suggest some ways of increasing consent rates, such as offering an ethnicity-matched requestor for racial and ethnic minorities. They also note that providing accurate and sufficient

information about the organ donation process, the definition of brain death, the potential for donation to help others, and the impact of donation on funeral arrangements can help to raise consent rates among minorities. This study was funded by AHRQ (HS18406).

See “Deceased organ donation consent rates among racial and ethnic minorities and older potential donors,” by David S. Goldberg, M.D., Scott D. Halpern, M.D., Ph.D., and Peter P. Reese, M.D. in the February 2013 in *Critical Care Medicine* 41(3), pp. 496-505. ■
MWS

South Asians face several barriers when it comes to promoting cardiovascular lifestyle changes

Among all ethnic groups, South Asians (people from India, Pakistan, Bangladesh, or Sri Lanka) have the highest rates of cardiovascular disease. This group faces a number of barriers to adopting lifestyle behavioral change to reduce their risk of cardiovascular disease, according to a new study. These barriers result from several beliefs South Asians hold regarding body image, cultural identity, and gender roles, among others.

Researchers conducted a literature review to identify 24 studies that addressed the relationship between the South Asian belief system and how this group approaches modifying lifestyle habits. Six categories of beliefs were identified that promote barriers to lifestyle changes: gender roles, body image, physical activity misconceptions, cultural priorities, cultural identity, and explanatory model of disease.

In the case of gender roles, the female is responsible for food preparation and raising children. However, the male or the eldest women in the household exert influence over dietary decisions and are resistant to dietary modification. In certain communities, exercising is seen as taking time out for oneself as opposed to tending to the family’s needs, and is thus viewed as inappropriate for women. With so many responsibilities, South Asian women find it difficult to make time to exercise. Also, in this culture, a larger body size is associated with sound health, affecting motivation to participate in healthy lifestyle behaviors.

Traditionally, South Asian culture has not placed much emphasis on physical activity as many South Asians have not been brought up to exercise. This unfamiliarity has led to a misunderstanding of the physical effects of exercise (such as increased heart rate and shortness of breath) and are viewed as alarming rather than expected. There are also societal pressures that time outside of work should be spent helping or caring for relatives and children and not in leisure activities such as exercising, even for men. Food is also central to South Asians’ identity. There is a cultural reluctance to reduce the butter and milk content of foods, particularly in social gatherings, as these ingredients are seen as nurturing.

Finally, under the explanatory model of disease, South Asians believe that acquiring diseases is not under one’s own control. Many South Asians develop disease due to factors one has little control over such as psychological stress, adjusting to life in a new country, and lack of food options, as opposed to one’s own dietary and exercise habits. The study authors suggest that clinicians become aware of these barriers and employ culturally relevant interventions to promote healthy lifestyle changes in this group. The study was supported in part by AHRQ (T32 HS00066).

See “Barriers to lifestyle behavioral change in migrant South Asian populations,” by Mihir Patel, M.D., Erica Phillips-Caesar, M.D., M.S., and Carla Boutin-Foster, M.D., M.S., in the *Journal of Immigrant and Minority Health* 14, pp. 774-785, 2012. KB



Pediatric leukemia patients are among the childhood cancer patients most likely to develop central line-associated bloodstream infections when hospitalized

Children with leukemia are the pediatric patients most likely to develop central line-associated bloodstream infections (CLABSI) when hospitalized, according to a new study. These children accounted for 64 percent of CLABSIs in a population of pediatric hematology-oncology (PHO) patients followed at 36 PHO centers across the United States. Although central venous catheters help medical staff manage patients with bloodstream cancers and other hematologic conditions, their use increases the risk of bloodstream infections such as CLABSIs. The

researchers examined 576 cases of CLABSI in PHO patients reported by members of the Children's Hospital Association during November 2009 through July 2011.

The median time from hospital admission to CLABSI was 14 days (range = 1–411 days). A variety of central venous catheters were used, with 62 children having more than one catheter type. The median patient age was 8 years and 53 percent were boys. Among the 335 CLABSI events in patients with leukemia, 60 percent had acute myeloid leukemia and 35 percent had acute lymphoblastic leukemia. Most of the CLABSIs (80 percent) occurred in patients with very low absolute neutrophil counts (less than 100 cells/mm³).

A single organism was isolated in 88 percent of the events, with 54 percent of these being gram positive—predominantly *Viridans streptococci*, an organism type not commonly reported causing

CLABSI in non-oncology patients, or coagulase-negative *staphylococci*. Gram-negative bacteria were found in 39 percent of single-organism CLABSIs, with *E. coli* and *Enterobacter cloacae* being the most prevalent. This is the first multicenter, contemporary report of prospectively identified CLABSIs in PHO patients in the United States. The study was funded in part by AHRQ (HS19590).

More details are in “Surveillance of hospital-acquired central line-associated bloodstream infections in pediatric hematology-oncology patients: Lessons learned, challenges ahead,” by Aditya H. Gaur, M.D., M.Sc., David G. Bundy, M.D., M.P.H., Cuilan Gao, Ph.D., and others in the March 2013 *Infection Control and Hospital Epidemiology* 34(3), pp. 316-320. *DIL*



Highly educated mothers spend more time in active child care than less-educated mothers

Spending quality time with children is critical to their proper development and maturing, especially during the early infant and toddler years. Highly educated mothers invest more time than less-educated mothers in basic child care and play during the infant and toddler years, according to a new study.

Researchers analyzed four categories of active parenting in the study: basic care, play, teaching, and management (planning, organizing, and monitoring the child's life outside the home). Using data from the 2003–2007 American Time Use Surveys, the researchers compared these activities among 6,640 mothers across different

child age periods. Among the mothers studied, 31 percent had a 4-year college degree while 28 percent had a high school diploma. Another 12 percent had less than a high school education or a GED.

More highly educated mothers spent more time in all four parenting categories compared to less-educated mothers. College-educated mothers spent 67 more minutes in total care time with their children aged 0 to 2 compared to mothers with only a high school diploma. For children aged 3 to 5, the total care time increase was

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Child care

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21 more minutes and 22 minutes more for children aged 6 to 13. College-educated mothers spent 42 percent more time in basic care and 94 percent more time in play compared to mothers with a high school education.

Highly educated mothers also invested 130 percent more time in management activities when their children

were 6 to 13 years of age compared to mothers with a high school education. The study was supported in part by AHRQ (T32 HS00084).

See “Diverging destinies: maternal education and the developmental gradient in time with children,” by Ariel Kalil, Ph.D., Rebecca Ryan, Ph.D., and Michael Corey, Ph.D., in *Demography* 49, pp. 1361-1383, 2012. ■ KB

Elderly Health/Long-Term Care

Before Nursing Home Compare, most nursing home selections were made on accommodation quality, not clinical care quality

The quality of clinical care has not been among the top factors in consumers’ choice of a nursing home for long-term care, whether for themselves or a family member, according to a new study by AHRQ researcher, William D. Spector, Ph.D., and colleagues. Before the Centers for Medicare & Medicaid Services began publishing Nursing Home Compare—an online Federal nursing home report card—in 2002, visits by prospective residents or their families were the primary way consumers collected information to inform their choice. The researchers used available data on nursing homes in four States as of 2001 to create their own scorecard of the care quality issues reported in Nursing Home Compare (decline in activities of daily living [ADLs] since admission; pressure sores; physical restraints, hotel quality (number of deficiencies

in 42 patient environment quality measures), and other facility characteristics).

Among 4,287 nursing homes in the four States, the percentage of residents with a decline in ADLs ranged from 13.6–14.8 percent, residents with pressure sores from 8.5–10.4 percent, and residents with physical restraints from 7.4–17.9 percent. Regarding hotel services quality, the nursing homes ranged from 1.4–3.4 deficiencies per bed. Most of the nursing homes were for-profit, and the average distance between the chosen home and the individual’s prior residence was 16 to 26 miles across all States.

A 1 standard deviation decrease in hotel services quality significantly lowered the nursing home’s odds of being selected (by 20 percent in California, 11 percent in Ohio, 17 percent in New York, and 12

percent in Texas). Yet, none of the measures of clinical care quality were significantly associated with a facility’s probability of choice. The strongest predictor of choice for a nursing home was distance (closeness to prior residence), thus allowing continued interaction with friends and relatives. The findings were based on 2001 data on the quality of nursing homes in California, Ohio, New York, and Texas, which did not have their own scorecards at the time.

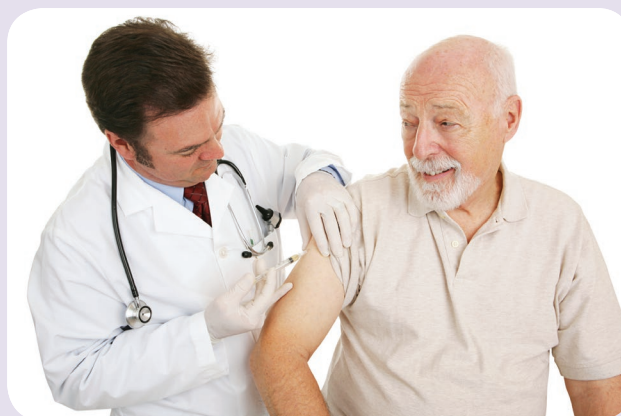
More details are in “Making difficult decisions: The role of quality of care in choosing a nursing home,” by Irena Pesis-Katz, Ph.D., Charles E. Phelps, Ph.D., Helena Temkin-Greener, Ph.D., and others in the May 2013 *American Journal of Public Health* 103(5), pp. e31-e37. Reprints (AHRQ Publication No. 13-R050) are available from AHRQ.* ■ DIL

Pharmacy-based program improves flu immunization rates among health care workers in long-term care settings

A new program using a pharmacy-based, voluntary health care worker influenza immunization approach is improving immunization rates in long-term care facilities, according to a new study. The approach uses a single, regional pharmacy to promote organizational change by having direct oversight and control over all immunization policies and processes in all facilities participating. Overall, immunization rates among health care workers rose from 58 percent to 76 percent in 5 years.

Called Raising Immunizations Safely and Effectively (RISE), the quality improvement program involved 14 long-term care facilities in western Pennsylvania. Each facility agreed to transfer immunization policies and procedures from the domain of nursing to that of the long-term care pharmacy. Working collaboratively with the facilities, the pharmacy oversaw management of vaccine supply and ordering, process revisions, vaccine administration, record keeping, and data collection. Each facility also agreed to designate an immunization champion, guarantee leadership support, and attend educational activities.

Facilities also received written immunization policies, educational flyers, posters, and forms from the pharmacy. Health care workers were vaccinated, at no cost, during all three shifts, both on and off work units. The program eliminated written consent documents, making vaccination easier and more efficient. By the



last season of the program, all facilities had reached a 60 percent immunization rate of their health care workers. Nearly two thirds reached a rate of 80 percent or better. Three facilities (20 percent) exceeded a rate of 90 percent or better, one of the goals of the Centers for Disease Control and Prevention *Healthy People 2020* recommendations. The study was supported in part by AHRQ (HS18721).

See “Impact of the raising immunizations safely and effectively (RISE) program on healthcare worker influenza immunization rates in long term care settings,” by David A. Nace, M.D., M.P.H., C.M.D., Steven M. Handler, M.D., Ph.D., C.M.D., Erika L. Hoffman, M.D., and Subashan Perera, Ph.D., in the *Journal of the American Medical Directors Association* 13, pp. 806-810, 2012. KB



Effectiveness of pressure ulcer treatment strategies unclear

There is limited evidence to draw firm conclusions about the best approaches for treating pressure ulcers, according to a new research review by AHRQ's Effective Health Care Program. This finding is consistent with other recent reviews on this topic. It is also generally unknown whether the effectiveness of treatment strategies differs by settings and their characteristics, patient characteristics, or features of pressure ulcers.

However, some evidence suggests wound improvement (reduction in ulcer size) was better on air-

fluidized beds compared to other support surfaces, including standard hospital beds. Using protein-containing nutritional supplementation also resulted in wound improvement when used with other measures for treating pressure ulcers.

Given the serious impact pressure ulcers have on health status and patient quality of life, as well as health care costs, treatments are needed that promote and shorten healing and minimize the risk of complications. Standards of care for pressure ulcer treatment

are typically guided by clinical practice guidelines, but also are informed by patient-related factors such as coexisting conditions and nutritional status, local practice patterns, and the stage and features of the wound.

These findings can be found in the research review *Pressure Ulcer Treatment Strategies: A Comparative Effectiveness Review* at <http://go.usa.gov/jzYY>. ■

New review examines pressure ulcer risk and prevention

Commonly used instruments to assess risk of pressure ulcers, such as the Braden, Norton, and Waterlow scales, can identify patients at increased risk for ulcers when compared with clinical judgment, finds a new AHRQ Effective Health Care Program review. There is no clear difference in diagnostic accuracy between instruments, though direct comparisons were limited. More research is needed to understand how the use of these instruments impacts pressure ulcer incidence compared with clinical judgment. In higher-risk populations, studies consistently found advanced static support mattresses and overlays were associated with lower risk of pressure ulcers compared with standard mattresses, with no clear differences between different advanced static support surfaces. However, more research is needed to understand the effectiveness of other preventive interventions over standard care, and the comparative effectiveness of preventive interventions.

Pressure ulcers are defined as localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. They are often associated with severe pain and can create decreased function or lead to complications such as infection. In an inpatient setting, pressure ulcers are associated with increased length of hospitalization and delayed return to function. The presence of pressure ulcers is associated with poorer general prognosis and may contribute to mortality risk.

These findings can be found in the research review *Pressure Ulcer Risk Assessment Prevention and: Comparative Effectiveness Review* at <http://go.usa.gov/jzYB>. Visit the EHC Inside Track at www.ahrq.gov/news/newsletters/insidetrack, AHRQ's Effective Health Care Program's newsletter, to learn more about important program news and developments. ■

Evidence lacking on effectiveness of most hay fever treatments

A new research review from AHRQ's Effective Health Care Program finds that for most treatments for seasonal allergic rhinitis (SAR), also known as hay fever, there is not enough evidence to draw conclusions about the comparative effectiveness or harms of treatment options for adults and adolescents over the age of 12, pregnant women, and children younger than 12 years of age. However, available evidence indicates that for adults and adolescents over the age of 12, montelukast was as effective as intranasal corticosteroid in the treatment of SAR nasal symptoms.

For the treatment of nasal symptoms and eye symptoms in this population, intranasal corticosteroid, nasal antihistamine,

and combination intranasal corticosteroid plus nasal antihistamine were similarly effective. Moderate evidence indicates that for the treatment of nasal symptoms and eye symptoms and for improved quality of life, montelukast and oral selective antihistamine were similarly effective.

SAR affects approximately 10 percent of the United States population, or 30 million individuals. The lack of comparative evidence for all drugs within each class highlights the need for increased methodological rigor in future SAR research to inform the understanding of the comparative effectiveness and harms of SAR treatments in different groups. This research is also needed to inform



understanding of the expression of SAR in various ethnic groups and the effect, if any, of early treatment on later symptom expression. These findings can be found in the research review *Treatments for Seasonal Allergic Rhinitis* at <http://go.usa.gov/jzYQ>. ■

Women's Health

Women with polycystic ovary syndrome taking combined oral contraceptives have greater risk of blood clots

Polycystic ovary syndrome (PCOS) affects as many as 15 percent of women of reproductive age. Treatment consists of combination oral contraceptive therapy. Oral contraceptives, however, are known to increase the risk for blood clot (venous thromboembolism) and cardiovascular disease in women without PCOS. A recent study found a twofold increased risk of blood clots in women with PCOS taking combined oral contraceptives compared to women without PCOS taking combined oral contraceptives. Even women with PCOS not taking oral contraceptives still had a 1.5-fold increased risk of venous thromboembolism compared to women without PCOS.

Using managed care claims, the researchers identified 43,506 women with PCOS aged 18 to 46. All were taking combined oral contraceptives. This group was

matched to a second group of 43,506 women without PCOS who were taking combined oral contraceptives and had similar baseline coexisting conditions. Another random sample of 2 million women not taking combined oral contraceptives was used to determine the risk for blood clots among women with PCOS who were not using combined oral contraceptives.

The incidence of venous thromboembolism in women with PCOS taking combined oral contraceptives was 23.7 per 10,000 person-years. Among the matched control women taking combined oral contraceptives but without PCOS, the incidence was 10.9 per 10,000 person-years. This amounts to a twofold increased risk in women with PCOS being treated with oral

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PCOS

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contraceptive therapy. The incidence was 6.3 per 10,000 person-years in women with PCOS not taking oral contraceptives. The researchers suggest that physicians be vigilant about the increased risk for venous thromboembolism in women with PCOS taking combined oral contraceptives. The study was supported in part by AHRQ (HS19516).

See “Risk of venous thromboembolism in women with polycystic ovary syndrome: A population-based matched cohort analysis,” by Steven T. Bird, Pharm.D., M.S., Abraham G. Hartzema, Ph.D., Pharm.D., James M. Brophy, Ph.D., M.D., and others in the February 5, 2013 *Canadian Medical Association Journal* 185(2), pp. E115-E120. ■ KB

Health Information Technology

Clinical decision support system can reduce inappropriate prescribing of antibiotics for acute respiratory infections

Antibiotics prescribed for acute respiratory tract infection (ARI) most likely due to viruses (not treatable by antibiotics) accounts for more than half of all antibiotics prescribed in primary care, despite recommendations against it. Unfortunately, this practice encourages the development of drug-resistant bacteria. A new study indicates that incorporating clinical decision support software (CDSS) into a primary care practice's electronic health record (EHR) system can significantly reduce inappropriate prescribing compared to practices without CDSS.

The researchers tested the impact of incorporating the CDSS on treatment of ARIs into the

intervention practices' EHRs (totaling 27 physicians, 6 nurse practitioners, and 6 physician assistants). They compared quarterly data on the occurrence and treatment of ARIs with a group of primary care control practices. Inappropriate prescribing of antibiotics among intervention practices at the end of the study period was 0.6 percent below that for the 3-month baseline period versus 4.2 percent above baseline for the control practices.

However, this trend was not seen for pediatric patients. The researchers also compared the impact of the intervention on prescription of broad-spectrum antibiotics (that treat a broad range of bacteria) for ARIs. The use of broad-spectrum antibiotics fell significantly more from baseline among the intervention practices (down 16.6 percent for adults and 19.7 percent for children) compared to the control practices (up 1.2 percent for adults and up 0.9 percent for children).

The findings were based on analysis of data from primary care practices belonging to the Practice Partner Research Network, a group of practices using the same commercial EHR (each in a different State) and 61 control practices. The study was funded by AHRQ (Contract No. 290-07-10015).

More details are in “Impact of a clinical decision support system on antibiotic prescribing for acute respiratory infections in primary care: Quasi-experimental trial,” by Arch G. Mainous III, Ph.D., Carol A. Lambourne, Ph.D., and Paul J. Nietert, Ph.D., in the March/April 2013 *Journal of the American Medical Informatics Association* 20(2), pp. 317-324. DIL



Study outlines physicians' difficulties in transitioning from older to newer electronic health records for e-prescribing

Federal health policy initiatives are promoting the adoption and meaningful use of certified electronic health records (EHRs) with electronic prescribing (e-prescribing) in order to improve the safety, quality, and efficiency of health care delivery. As a result, many institutions and providers currently using locally developed EHRs will likely be transitioning to newer, commercial EHRs to ensure that their systems meet certification standards that make them eligible for incentive payments. A new study reveals that some physicians consider the transition very difficult, despite the customization, training, reduced schedules, and pre-transfer of medical data. Many physicians felt that their efficiency was significantly reduced, even well after the initial transition.

The researchers studied the challenges associated with the transition to commercial EHRs when a large ambulatory care network at an academic medical center switched from an older EHR to a newer, commercial EHR with a more robust clinical decision support (CDS) to aid providers in the prescribing process. The researchers conducted field observations and interviewed 19 physicians involved in the process.

Although a few features of the newer commercial system were highly valued, such as the ability to access the system remotely and to have shared medication lists with subspecialists, the majority of physicians preferred a much simpler system. Most physicians in the study did not perceive the commercial EHR as better able to decrease prescribing errors, even though it had the capability to provide more robust CDS.

Although some alerts were perceived as useful, the benefit was often lost because of the high volume of clinically irrelevant alerts. Understanding physician experiences with this type of transition and their general preferences for prescribing applications may lead to less disruptive system implementations and better designed EHRs, suggest the researchers. Their study was supported by AHRQ (HS17029).

See “Physician experiences transitioning between an older versus newer electronic health record for electronic prescribing,” by Erika L. Abramson, M.D., Vaishali Patel, Ph.D., Sameer Malhotra, M.D., and others in the *International Journal of Medical Informatics* 81, pp. 539-548, 2012. ■ MWS

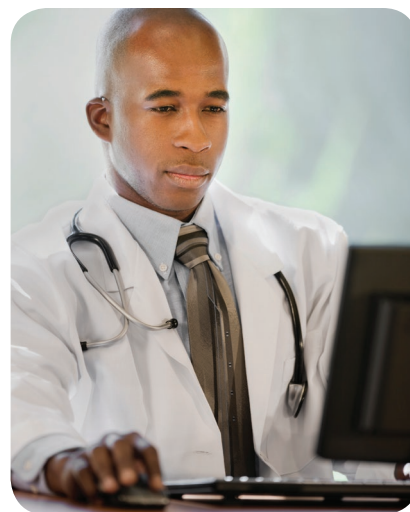
Health care professionals devise ways to get around using electronic health record systems

Despite more widespread use, electronic health records (EHRs) are not always embraced by health care professionals. Some shortcomings, such as complex order entry processes and alerts, can be perceived as impediments to delivering efficient patient care by some. As a result, providers invent ways to get around using elements of the EHR, called workarounds. A new study found that the most popular reasons for workarounds are efficiency, memory, and awareness.

The researchers collected data from 11 primary care outpatient clinics affiliated with 3 health care organizations, including 2 Veterans Affairs medical centers considered

leaders in health information technology implementation. Observations were made at each site to discover best practices and to identify barriers to using colorectal cancer clinical decision support tools. During the time they were observed, providers were asked questions about their use of the EHR. A total of 120 clinic providers and staff and 118 patients were observed.

Efficiency was cited as one of the reasons for using workarounds. One type of workaround designated one individual to enter patient information into the EHR. Patients also received paper-based health screenings and medication lists to confirm for accuracy. Computer-



based workarounds included copying and pasting text from previous patient progress notes

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EHRs

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into a new note. Workarounds that increased awareness included such things as writing down vital signs at intake in addition to entering them into the EHR. Staff also used paper-based memory workarounds, such as making reminder notes to complete future tasks or to follow-up on a patient issue.

The researchers also identified a new category of workaround,

called the “no correct path.” This consisted of a desired option that did not exist in the computer interface, resulting in a workaround. By studying workarounds, EHR designers can make future innovations and changes to improve provider use of this technology. The study was supported in part by AHRQ (Contract No. 290-06-00013).

See “Paper-and computer-based workaround to electronic health

record use at three benchmark institutions,” by Mindy E. Flanagan, Ph.D., Jason J. Saleem, Ph.D., M.S., Laura G. Millitello, M.A., and others in the *Journal of the American Medical Informatics Association* 20, pp. e59-e66, 2013.

■ KB

Intensive care unit clinicians moderately satisfied with computerized provider order entry

Overall acceptance of a computerized provider order entry (CPOE) system by nurses in four hospital intensive care units (ICUs) increased significantly over time at 3 months and a year later, found a new study. For prescribing providers (physicians, nurse practitioners, physicians’ assistants) in the same ICUs, acceptance of the CPOE system changed minimally over the same period. Nurse satisfaction increased from 48.6, on a 0–100 scale after 3 months of use to 56.8 after 12 months of use; for prescribing providers, it was 57.8 at 3 months and 57.3 at 12 months.

After 3 months’ CPOE use, nurses were most satisfied with getting help when they had problems with order entry and with the system’s reliability. However, they reported being most dissatisfied at this point with the time-consuming effects of CPOE and their lack of training. At 3 months, prescribing providers reported having greatest satisfaction with CPOE system reliability, the availability of support, and the CPOE training they received. They were least satisfied with the impact of CPOE on their work speed, the CPOE system response time, and the impact of the system on patient care.

At the end of 12 months, nurses’ satisfaction was still greatest for the availability of support and system reliability, and they were most dissatisfied with the training they had received. Although the nurses still reported that CPOE did not save them time, it did not slow them down as much as at 3 months. For the prescribing providers, the level of overall satisfaction did not change significantly over time, but at 12 months they were much more positive about the impact of CPOE on patient care.

Both groups wanted improved system usability, nurses wanted easier modification of orders and improved communication, and providers wanted improved ability to find specific information in the system. The findings were based on data from a previously validated questionnaire on CPOE implementation administered at 3 months and 12 months after implementing the CPOE system at several ICUs at a large teaching hospital. The study was funded in part by AHRQ (HS15274).

More details are in “Change in end-user satisfaction with Computerized Provider Order Entry over time among nurses and providers in intensive care units,” by Peter L.T. Hoonakker, Ph.D., M.Sc., Pascale Carayon, Ph.D., Roger L. Brown, Ph.D., M.S., and others in the March 2013 *Journal of the American Medical Informatics Association* 20(2), pp. 252-259. DIL

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HHS releases the National Quality Strategy for promoting better health, quality care

This summer the Department of Health and Human Services (HHS) released the 2013 *Annual Progress Report to Congress on the National Strategy for Quality Improvement in Health Care*.

The report provides details on implementation activities by the private and public sectors, efforts to align quality measures, and successes in six priority areas, including patient safety, community health, and affordability. Since the National Quality Strategy was first released in 2011, the private and public sectors have continued to implement activities that improve the delivery of health care services, patient health outcomes, and population health, as directed by the Affordable Care Act. This year's report highlights:

- **Effective performance measurement**, including efforts to identify and adopt unified measures that meet the reporting requirements of programs across the Federal government, the private sector, States, and even individual health systems and providers. These alignment efforts include the work of the Measures Application Partnership, composed of more than 60 public- and private-sector organizations, and the Buying Value Initiative, a group of 19 private health care purchasers and purchasers' representatives.

- **Quality improvement** in the six priority areas that include patient safety, community health, and affordability. While 2012 focused mainly on HHS-led initiatives, this year's report describes public- and private-sector efforts such as the Irving, Texas-based VHA cooperative of nonprofit hospitals that reduced all-payer, all-cause readmissions by 17.6 percent in just 12 months across 192 hospitals.

- **Progress against the three strategic opportunities**, first identified in the 2012 update, including the development of organizational infrastructure at the community level. The 62 Health Information Technology Regional Extension Centers work with more than 31,000 medical practices and 140,000 providers—nearly 45 percent of the nation's primary care providers—to adopt and meaningfully use electronic health records to improve patient health and care delivery.

You can access the annual progress report and other materials at <http://go.usa.gov/jzYn>.

Find out more about achieving a culture of safety on AHRQ's Patient Safety Network

A lack of a "culture of safety" is linked to increased error rates, according to a patient safety primer available on AHRQ's Patient Safety Network (PSNet). The primer identifies key features of organizations committed to a culture of safety. It also outlines specific measures and introduces a strategy to improve safety culture. You can access the patient safety primer "Safety Culture" at <http://psnet.ahrq.gov/primer.aspx?primerID=5>.

Electronic Data Methods Forum focuses on lessons learned using electronic data

AHRQ has released the Electronic Data Methods Forum's second special supplement with *Medical Care*, The Electronic Data Methods Forum 2013: Advancing the National Dialogue on Use of Electronic Clinical Data to Improve Patient Care and Outcomes. The supplement features 13 papers that highlight the challenges and successes of using electronic health records for comparative effectiveness research (CER), standardizing terminologies in adherence, protecting patient privacy, and improving synergy between research and clinical care.

AHRQ's Effective Health Care Program established the Electronic Data Methods Forum to advance the

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national dialogue on use of electronic clinical data to conduct CER, improve care quality, and develop clinical decision support systems.

You can access the journal supplement at <http://journals.lww.com/lww-medicalcare/toc/2013/08001>.

Journal supplement focuses on comparative effectiveness and patient-centered outcomes research methods

A new special supplement to the *Journal of Clinical Epidemiology* provides proceedings from the fourth AHRQ-sponsored symposium on research methods for comparative effectiveness

and patient-centered outcomes research. The symposium was developed via AHRQ's Effective Health Care Program through the DEcIDE Network. It examined the methodological work that serves to illuminate the mechanisms contributing to potential differences between research results from randomized clinical trials that measure treatment efficacy versus observational studies that measure effectiveness. Each of the 17 articles can be downloaded for free from the Effective Health Care Program Web site at <http://go.usa.gov/jzgx>.



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<http://healthcare411.ahrq.gov>.

Research Briefs

Bell, S.K., Smulowitz, P.B., Woodward, A.C., and others. (2012). "Disclosure, apology, and offer programs: Stakeholders' views of barriers to and strategies for broad implementation." (AHRQ grant HS19537). *Milbank Quarterly* 90(4), pp. 682-705.

The Disclosure, Apology, and Offer model, a response to patient injuries caused by medical care, is an alternative to the current inherently adversarial, inefficient, and inequitable medical liability system, note the authors of this paper. Using interviews with key informants, the researchers investigated the potential for more widespread implementation of this model. They believe it holds considerable promise for transforming the current approach to medical liability and patient safety.

Clancy, C.M. (2012, December). "New Patient Safety Improvement Toolkit Builds on Clinical Best Practices, Science of Safety." *Infection Control Today*. Reprints (AHRQ Publication No. 13-R060) are available from AHRQ.*

Carolyn M. Clancy, M.D., director of the Agency for Healthcare Research and Quality, outlines the Comprehensive Unit-based Safety Program (CUSP) Toolkit's components, describes its importance in reducing infections, the critical role played by nurses in

implementing its components, and additional areas where CUSP may be useful.

Duke, J.D., Han, X., Wang, Z., and others. (2012). "Literature-based drug interaction prediction with clinical assessment using electronic medical records: Novel myopathy associated drug interactions." (AHRQ grant HS19818). *PLOS Computational Biology* 8(8), p. e1002614.

The authors developed an automated search algorithm, which can predict new drug interactions based on published literature. Using a large electronic medical record database, they then analyzed the correlation between concurrent use of these potentially interacting drugs and the incidence of myopathy as an adverse drug event. Their statistical analysis identified five drug interaction pairs.

Dukhovny, D., Dukhovny, S., Pursley, D.M., and others. (2012). "The impact of maternal characteristics on the moderately premature infant: An antenatal maternal transport clinical prediction rule." (AHRQ grant T32 HS00063). *Journal of Perinatology* 32, pp. 532-538.

The researchers sought to determine the impact of maternal characteristics and antenatal medical management on the early neonatal course of the moderately premature infant. They derived a clinical prediction rule to determine which infants require tertiary neonatal care in the first 24 hours of life, prompting antenatal maternal transfer. They found four antenatal risk factors associated with a

requirement for care in a Level III neonatal intensive care unit, defined by the need for surfactant administration.

Escobar, G.J., LaGuardia, J.C., Turk, B.J., and others. (2012). "Early detection of impending physiologic deterioration among patients who are not in intensive care: Development of predictive models using data from an automated electronic medical record." (AHRQ grant HS18480). *Journal of Hospital Medicine* 7(5), pp. 388-395.

The authors describe the development and validation of a complex predictive model suitable for use with ward patients. The objective was to develop a predictive model based on clinical and physiologic data available in real time from a comprehensive electronic medical record (EMR), not a clinically intuitive, manually assigned tool. They concluded that EMR-based detection of impending deterioration outside the intensive care unit is feasible in integrated health care delivery systems.

Govindarajan, P., Desouza, N.T., Pierog, J., and others. (2012). "Feasibility study to assess the use of the Cincinnati stroke scale by emergency medical dispatchers: A pilot study." (AHRQ grant HS17965). *Emergency Medicine Journal* 29, pp. 848-850.

The objective of this pilot study was to determine the feasibility of the application of the Cincinnati stroke scale by emergency medical

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Research briefs

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dispatchers (EMDs) and the ability of EMDs to collect responses from the caller/subject to make a determination of stroke. Although the pilot findings favor the implementation of the stroke scale, the researchers recognize the need for a large-scale study.

Johnson, J.K., Farnan, J.M., Barach, P., and others. (2012). “Searching for the missing pieces between the hospital and primary care: Mapping the patient process during care transitions.” (AHRQ grant HS17119). *BMJ Quality and Safety* 21, pp. i97-i105.

The authors present process mapping as an effective tool to assess communication patterns during transition from the inpatient to ambulatory setting and to identify barriers and facilitators to effective communication in six academic health centers in the United States and Europe. They present the similarities and differences between the handover processes used in different nations and settings. They also discuss the methodological strengths of process mapping as a generalizable tool for engaging stakeholders and in redesigning clinical services during care transitions.

Kim, J.M., Labrique, A., West, K.P., and others. (2012, December). “Maternal morbidity in early pregnancy in rural northern Bangladesh.” (AHRQ grant T32 HS19488). *International Journal of Gynecology and Obstetrics* 119(3), pp. 227-233.

The researchers used cross-sectional data from 42,896 pregnant women (5–12 weeks of gestation) enrolled in a vitamin A supplementation trial

in Bangladesh to determine baseline maternal morbidity in the rural northern region of this poor country. The researchers found significantly increased risk of malnutrition for women with symptoms of anemia (30 percent), vaginal discharge (37 percent), or high-grade fever (23 percent) than among women without these symptoms.

Lacson, R., Andriole, K.P., Prevedello, L.M., and Khoransi, R. (2012). “Information from searching content with an ontology-utilizing toolkit (iSCOUT).” (AHRQ grant HS19635). *Journal of Digital Imaging* 25, pp. 512-519.

This study aims to implement and demonstrate the use of a toolkit for retrieving radiology reports that describe clinically relevant findings, using the specific clinical case of liver cysts. The toolkit provides several components that can be used alone or in combination, without the need for further customization or programming. Among the core set of modules are the Data Loader, Header Extractor, Terminology Interface, Analyzer, and Reviewer.

Olfson, M., Gerhard, T., Huang, C., and others. (2012). “Comparative effectiveness of second-generation antipsychotic medications in early-onset schizophrenia.” (AHRQ grants HS17918 and HS16097). *Schizophrenia Bulletin* 38(4), pp. 845-853.

The researchers found no significant difference in the proportion of children and youths diagnosed with schizophrenia, aged 6–17 years, who discontinue their medication or need inpatient psychiatric hospitalization within 180 days of a new episode of treatment with any

one of five commonly prescribed second-generation antipsychotic medicines (risperidone, olanzapine, quetiapine, aripiprazole, or ziprasidone). Data was obtained from a 45-State Medicaid claims file for 2001 through 2005.

Patel, M.B., Guillamondegui, O.D., Ott, M.M., and others. (2012). “O’ surgery case log data, where art thou?” (AHRQ grant T32 HS13833). *Journal of the American College of Surgery* 215, pp. 427-431.

Using the American College of Surgeons Case Log, the authors developed a method of data capture, categorization, and reporting of acute care surgery fellows’ experiences. Fifteen report types were created, with results viewable via a secure Web application, accessible nationally, and exportable to many formats.

Putzer, G.J., Koro-Ljungberg, M., and Duncan, R.P. (2012, December). “Critical challenges and impediments affecting rural physicians during a public health emergency.” (AHRQ grant HS14355). *Disaster Medicine and Public Health Preparedness* 6(4), pp. 342-348.

The authors of this study analyzed structured interviews with six physicians in five rural Florida counties. They found that the rural physicians identified three primary barriers to emergency preparedness: limited accessibility of health care (including financial barriers and transportation problems), physician–patient communication barriers, and resource barriers, such as a lack of hospitals close to the rural inhabitants.

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Research briefs

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Sokas, R., Braun, B., Chenven, L., and others. (2013, April). “Frontline hospital workers and the worker safety/patient safety nexus.” *The Joint Commission Journal on Quality and Patient Safety* 39(4), pp. 185-192. Reprints (AHRQ Publication No. 13-R058) are available from AHRQ.*

The authors summarized presentations and discussions at a 1-day workshop on the relationship between worker safety for frontline—but nonclinician—health care workers and patient safety. One recommendation emerging from the workshop was to develop champions and leaders at hospitals to push for the implementation of “person safety” for anyone entering the facility as a patient, visitor, or health care worker.

Wisk, L.E., and Witt, W.P. (2012, December). “Predictors of delayed or forgone needed health care for families with children.” (AHRQ grant T32 HS00083). *Pediatrics* 130(6), pp. 1027-1037.

The extent to which health care-related financial burden directly influences access to care for

families with children is currently unknown. Using a nationally representative, population-based sample, the researchers sought to determine how health care-related financial burden and other need and enabling factors are related to delayed or forgone care for families with children.

Zhu, V. J., Grannis, S.J., Tu, W. and others. (2012). “Evaluation of a clinical decision support algorithm for patient-specific childhood immunization.” (AHRQ grant T32 HS17588). *Artificial Intelligence in Medicine* 56(20), pp. 51-57.

This study compares the accuracy of a clinical decision support system (CDSS) algorithm to human experts, using real-world patient data from Wishard Hospital. Specifically, the researchers compared vaccine recommendations from the CDSS for both eligible and recommended timelines, based on the child’s date of birth and vaccine history, to recommendations from registered nurses who routinely selected vaccines for administration.



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