Research Activities

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Highlights

Departments

Regular Features

Bystanders inexperienced in CPR can use chest compression alone to revive victims of cardiac arrest

Many Americans have been trained in cardiopulmonary resuscitation (CPR) techniques. Yet half of the victims of out-of-hospital cardiac arrests in Seattle during the past few decades who were witnessed by bystanders did not receive bystander-initiated CPR.

The findings of a recent study should encourage more bystanders to step up to the plate. It shows that the outcomes of people who are administered CPR according to instructions given by the emergency medical dispatcher are the same after chest compression alone as after chest compression with mouth-to-mouth ventilation. Thus, bystanders inexperienced in CPR can use chest compression alone to help cardiac arrest victims, concludes the study, which was supported in part by the Agency for Healthcare Research and Quality (HS08197).

University of Washington researchers led by Alfred Hallstrom, Ph.D., randomly assigned 241 out-of-hospital cardiac arrest patients to receive chest compression alone and 279 to receive chest compression plus mouth-to-mouth ventilation. Emergency medical dispatchers gave bystanders instructions during 62 percent of episodes for chest compression plus mouth-to-mouth ventilation (taking about 2.4 minutes for instruction) and in 81 percent of episodes for chest compression alone, which required only 1 minute of instruction. Survival to hospital discharge was better among patients assigned to chest compression alone than those assigned to chest compression plus mouth-to-mouth ventilation, but the difference was not significant.

Only 20 dispatcher-instructed bystanders reported adverse effects to themselves, such as vomit from the patient or the sound of a rib cracking as they did the chest compressions. Callers receiving instructions in chest compression plus mouth-to-mouth ventilation were more likely to terminate them by hanging up or declaring that the instructions were too difficult than were callers

continued on page 2

CPR for victims of cardiac arrest

continued from page 1

receiving instructions in chest compression alone (7.2 vs. 2.9 percent).

See "Cardiopulmonary resuscitation by chest compression alone or with mouth-to-mouth ventilation," by Dr. Hallstrom, Leonard Cobb, M.D., Elise Johnson, B.A., and Michael Copass, M.D., in the May 25, 2000 *New England Journal of Medicine* 342(21), pp. 1546-1553. ■

Children's Health

Critically ill children have better outcomes when treated in high- vs. low-volume pediatric ICUs

Pediatric intensive care units (PICUs) mushroomed during the 1980s. Many local hospitals added these units to their nurseries, even though they didn't treat large numbers of children in need of such services. Yet critically ill children treated at high-volume PICUs have lower mortality rates and length of ICU stay than similarly sick children treated in low-volume PICUs, according to a recent study that was supported in part by the Agency for Healthcare Research and Quality (HS09055). Creating larger high-volume regional PICUs, to which all critically ill children in a region would be referred, may improve efficiency and quality of care as well as the outcomes of these children, suggests John M. Tilford, Ph.D., of the University of Arkansas for Medical Sciences and Arkansas Children's Hospital.

Dr. Tilford and his colleagues examined the relationships between the volume of children hospitalized at 16 PICUs in 1993 and risk of death and length of ICU stay. Patient volume ranged from a low of 147 children treated during the year to a high of 1,378. Results showed that a 100 patient increase in PICU volume significantly decreased mortality risk (adjusted for severity of illness and mix of patients) and reduced length of stay. Other PICU characteristics—such as fellowship training programs, university hospital affiliation, number of PICU beds, and children's hospital affiliation—had no effect on deaths or length of stay.

The study provided no evidence that low-volume PICUs were less likely to use appropriate therapies or more likely to use inappropriate therapies. However, greater patient volume provides surgeons and other providers with more experience and leads to a "practice-makes-perfect" effect. Pediatric intensivists often are confronted with rare life-threatening illnesses where clinical experience plays an important role in determining outcome, notes Dr. Tilford.

See "Volume-outcome relationships in pediatric intensive care units," by Dr. Tilford, Pippa M. Simpson, Ph.D., Jerril W. Green, M.D., and others, in the August 2000 *Pediatrics* 106, pp. 289-294. ■

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Study of ER care for febrile infants finds that system changes may be the best way to reduce medical errors

In a recent study, 7 percent of infants arriving at the emergency room with a high fever were treated inappropriately. Either they were given antibiotics they didn't need or they did not receive antibiotics they needed, even though doctors followed a strict protocol for identifying high-risk infants with serious bacterial infections.

If a protocol designated 75 percent of a hypothetical group of 10,000 febrile infants high-risk, misclassifying 7 percent would lead to 525 high-risk infants not receiving antibiotics. Of the remaining 2,500 low-risk infants, 175 would be hospitalized and treated unnecessarily. Finally, if 10 percent of febrile infants have a serious bacterial infection, misclassifying 7 percent would leave 70 infected infants untreated. Harm to at least some infants would be nearly inevitable, explain Donald A. Goldmann, M.D., of Children's Hospital, Boston, and colleagues, in a recent commentary.

Dr. Goldman and colleagues assert that despite protocols, medical errors are intrinsic to complex systems. Old-style peer review and quality assurance programs attempt to reduce error by increasing physician vigilance and identifying physician outliers (those who make the most mistakes). However, there were no outliers in the study of febrile infants; errors were evenly distributed among 13 of the 18 emergency department physicians. Also, physicians correctly treated 93 percent of patients, which indicates a level of diligence and expertise unlikely to be augmented by greater effort.

The researchers assert that the 7 percent failure rate is a function of the system of care, not of individual vigilance or motivation. They note that for the other 7 percent of patients to enjoy the therapeutic benefits of the protocol, systems must be redesigned to anticipate and avert cognitive errors, which are an expected by-product of any human process.

For more information, see "Reducing medical error through systems improvement: The management of febrile infants," by James Glauber, M.D., Dr. Goldmann, Charles J. Homer, M.D., M.P.H., and Donald M. Berwick, M.D., M.P.P., in the June 2000 *Pediatrics* 105(6), pp. 1330-1332. ■

Physicians may underestimate preterm infants' chances for survival and freedom from handicap

Obstetricians and pediatricians who are pessimistic about the outcomes of premature infants tend to underestimate their actual chances of survival and freedom from serious handicap. Physicians who are most pessimistic about these infants' outcomes are least likely to use potentially lifesaving therapies, concludes a recent study. Improving physicians' knowledge about the actual outcomes of preterm infants may lead to more appropriate use of lifesaving therapies, concludes the Patient Outcomes Research Team on the Prevention of Low Birthweight Among Minority and High Risk Women, led by Robert L. Goldenberg, M.D., of the University of Alabama, Birmingham. The Low Birthweight PORT was supported by the Agency for Healthcare Research and Quality (PORT contract 290-92-0055).

The researchers surveyed U.S. obstetricians and pediatricians

continued on page 4

Also in this issue:

Preterm infants

continued from page 3

about their knowledge of survival and handicap-free rates of infants born at 23 to 36 weeks of gestation and whether they would provide specific therapeutic interventions either to the expectant mother or infant. Pessimists among the 379 responding obstetricians and 362 responding pediatricians significantly underestimated survival and handicap-free rates for the premature infants, while optimists provided more accurate estimates.

Optimism and pessimism significantly influenced physicians' willingness to use certain lifesaving interventions. In contrast to pessimists, optimistic pediatricians were 1.1 to 1.8 times more likely to use mechanical ventilation and 1.1 to 1.6 times more likely to use inotropic support to strengthen cardiac contraction for infants between 23 and 27 weeks of gestation. Optimists were twice as likely to use thermal support, and they were more likely to use oxygen (1.22), cardiopulmonary resuscitation (1.24 to 1.35), and intravenous fluids (1.24 to 1.50) at 24 and 25 weeks of gestation. Among obstetricians, optimists were more apt to perform cesarean section for fetal distress (1.3 to 2.8) at 23 to 25 weeks of gestation, administer steroids to the mother (1.2 to 1.3), and transfer the mother in preterm labor to a tertiary care facility with neonatal intensive care services.

See "Estimation of neonatal outcome and perinatal therapy use," by Steven B. Morse, M.D., M.P.H., James L. Haywood, M.D., Dr. Goldenberg, and others, in the May 2000 *Pediatrics* 105(5), pp. 1046-1050. ■

Adolescents who weighed 2 pounds or less at birth are smaller overall than those who had a normal birthweight

Babies born at extremely low birthweight (ELBW, 2.2 lbs or less) have long been reported to experience "catch-up" growth until as late as 8 years of age. However, a new study of ELBW adolescents (12-18 years of age) reveals that those who survived without a major neurodevelopmental disability nevertheless continued to be smaller in height, weight, and head circumference than peers of normal birthweight (NBW, 5.5 lbs. or more). ELBW adolescents who were both very premature and small for gestational age (SGA) tended to be the smallest.

ELBW adolescents in this study were an average of 4.8 cm shorter (160.5 cm vs. 165.3 cm) and 9.1 kg lighter (55.3 kg vs. 64.4 kg) than NBW adolescents. In fact, far more ELBW than NBW adolescents were below the 25th percentile for height (36 vs. 11 percent) and weight (34 vs. 15 percent). Mean head circumference measurements, which have been shown to be related to cognitive outcomes, also were lower for the ELBW group compared with the NBW group (54.7 cm vs. 56.6 cm), and they were lowest for the ELBW/SGA group. Finally, bone age, measured in SD units, was more advanced in the ELBW group than the NBW group (0.86 vs. 0.42), which may have been due to suboptimal early nutrition—a factor in intrauterine growth retardation affecting SGA infants. Thus, intervention to improve the growth of ELBW children may be appropriate, notes lead author, Myriam Peralta-Carcelen, M.D., M.P.H., of the University of Alabama at Birmingham. The study was supported in part by the Agency for Healthcare Research and Quality as a component of the Patient Outcomes Research Team on Prevention of Low Birthweight in Minority and High-Risk Women (PORT contract 290-92-0055).

The researchers matched 53 ELBW adolescents (including those who were SGA) and 53 NBW adolescents by sex, race, age, and socioeconomic status. They had no major neurodevelopmental disability and were born and cared for in hospitals in one Alabama county. The researchers compared the adolescents' height, weight, head circumference, bone age, body composition, and sexual maturity.

See "Growth of adolescents who were born at extremely low birth weight without a major disability," by Dr. Peralta-Carcelen, DeeAnne S. Jackson, M.D., M.P.H., Michael I. Goran, Ph.D., and others, in the May 2000 *Journal of Pediatrics* 136, pp. 633-640. ■

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Researchers examine outcomes of newborns who leave the hospital 1 to 2 days after birth

Postpartum hospital stays declined dramatically from a mean of 4 days in 1970 to 2 days in 1993 to 1 day or less by 1995. Concerns about the impact of short hospital stays on infants' health prompted the U.S. Congress and most State legislatures to mandate that insurers cover minimum 48-hour hospital stays following vaginal deliveries and 96-hour stays following cesareans. The goal is to detect and treat infection, congenital heart disease, jaundice, and other problems that may show up in the first day or two after birth. Also, national guidelines call for a followup visit on the 3rd or 4th postpartum day for infants discharged within 48 hours of birth.

A new study supported by the Agency for Healthcare Research and Quality (HS09342) confirms the potentially adverse impact of early postpartum discharge. A second AHRQ-supported study (HS07910) demonstrates that home visits on the 3rd or 4th postpartum day are more costly than pediatric clinic visits but have comparable infant outcomes and much higher maternal satisfaction. Both studies are summarized here.

Malkin, J.D., Garber, S., Broder, M.S., and Keeler, E. (2000, August). "Infant mortality and early postpartum discharge." ***Obstetrics & Gynecology*** **96, pp. 183-188.**

This is the first study to establish a significant association between early postpartum discharge and newborn death, especially due to delayed diagnosis of curable, life-threatening conditions such as congenital cardiac malformations and sepsis. It found that infants discharged home within 30 hours of birth were nearly four times more likely to die within 28 days of birth (odds ratio, OR 3.65) and nearly twice as apt to die during the first year of life (OR 1.84) than newborns sent home later.

Newborns discharged early also were more likely to die of heart-related problems (OR 3.72), infection (OR 4.72), or other causes such as sudden infant death syndrome (OR 2.27) within a year of birth than newborns discharged later. Adjustment for clinical factors such as Apgar score, respiratory problems, seizures, assisted ventilation, and trauma had little impact on these findings.

Congenital heart malformations and infections can sometimes be cured if they are detected and treated quickly, explain the researchers. They analyzed data from Washington State linked birth certificates, death certificates, and hospital discharge records of 47,879 live births in 1989 and 1990. The data were collected under the AHRQ-funded Management and Outcomes of Childbirth Patient Outcomes Research Team (PORT) project funded by AHRQ (contract 290-90-0039 to RAND). The researchers compared the risk of death within the first year of life for infants discharged less than 30 hours after birth with the risk for infants discharged 30 to 78 hours after birth

Lieu, T.A., Braveman, P.A., Escobar, G.J., and others. (2000, May). "A randomized comparison of home and clinic follow-up visits after early postpartum hospital discharge." ***Pediatrics*** **105(5), pp. 1058-1065.**

Postpartum visits at 3 or 4 days after birth for newborns discharged within 48 hours are recommended to detect jaundice (hyperbilirubinemia), dehydration, and feeding problems, which are the leading causes of infant problems during the early postnatal period. Although more costly than pediatric clinic visits (average of $255 vs. $120), home visits to low-risk mothers and their newborns result in equivalent outcomes for the infants and much greater satisfaction for the mothers, conclude these researchers. They randomly assigned 1,163 medically and socially low-risk mother-newborn pairs at Kaiser Foundation Hospital in Sacramento to receive home visits by nurses or pediatric clinic visits by nurse practitioners or physicians on the 3rd or 4th postpartum day.

In contrast to the 20-minute clinic visits, the home visits were longer (median of 70 minutes), included preventive counseling about the home environment, and included a physical examination of the mother. There were no significant differences in clinical outcomes between the groups, such as maternal or newborn rehospitalization or urgent clinic visits within 10 days postpartum, breastfeeding discontinuation, or maternal depressive symptoms at the 2-week interview.

However, mothers were much more satisfied with the home visits. Home-visit versus clinic-visit mothers rated as excellent or very good the preventive advice delivered (80 vs. 44 percent), the provider's skills and abilities (87 vs. 63 percent), the newborn's posthospital care (87 vs. 59 percent), and their own posthospital care (75 vs. 47 percent). These findings suggest that either type of followup is clinically acceptable among medically and socially low-risk patients with good access to care. However, the results cannot be generalized to more socioeconomically disadvantaged or otherwise at-risk groups. ■

Later effects of persistent middle-ear fluid in the first 3 years of life are questionable

Doctors and parents are concerned about the impact of early-life middle ear infections and the middle ear fluid (otitis media with effusion, OME) that often persists after the infections have resolved. They are worried that constant fluid in the ear will impair hearing and adversely affect children's language, speech, or cognitive development later in life, well after OME has resolved and hearing has returned to normal. A new study suggests that for most children these worries may be unfounded. The study did find, however, that scores on all measures of language, speech, and cognition were consistently highest among the most socioeconomically advantaged children and lowest among those most disadvantaged.

Although the researchers found, as expected, that children who had MEE (middle ear effusion) fared worse on audiometric tests than children who did not, they uncovered only weak to moderately significant negative correlations between children's cumulative durations of MEE in their first year of life (or in age periods that included their first year of life) and their scores at age 3 on formal tests of spontaneous expressive language, speech sound production and other verbal aspects of cognition. Variance in scores explained by cumulative time with MEE in the first year of life beyond that explained by sociodemographic variables ranged from only 1.2 percent to 2.9 percent, and the negative correlations were concentrated in the subgroup of children who had private health insurance (rather than Medicaid). Moreover, they found no significant correlations between time with MEE and children's scores on measures of expressive language, speech sound production, or other measured aspects of cognition.

These findings suggest either that persistent early-life MEE actually causes later, small circumscribed impairments of receptive language and verbal aspects of cognition in certain groups of children or that unidentified, confounding factors predispose children both to early-life otitis media and to certain types of developmental impairment.

These findings were based on a prospective study of 6,350 healthy infants obtaining primary care at one of two urban hospitals or one of two small town/rural and four suburban private pediatric practices. Jack L. Paradise, M.D., of the University of Pittsburgh School of Medicine, and his colleagues monitored the children's middle ear status for 3 years, treated them for otitis media, and tested their language and cognition at 3 years. The study was jointly funded by the Agency for Healthcare Research and Quality and the National Institute for Child Health and Human Development (HD26026).

See "Language, speech sound production, and cognition in three-year-old children in relation to otitis media in their first three years of life," by Dr. Paradise, Christine A. Dollaghan, Ph.D., Thomas F. Campbell, Ph.D., and others, in the May 2000 *Pediatrics* 105(5), pp. 1119-1130. ■

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Primary care providers report most but not all cases of suspected child abuse

Doctors and nurse practitioners often treat children whom they suspect have been abused, and they report most, but not all cases, of suspected abuse to child protective services (CPS). Uncertainty about the abuse diagnosis, past negative experience with CPS, and a perception that past reporting of abuse did not benefit the child were reasons given by providers for not reporting all cases, according to recent study supported by the Agency for Healthcare Research and Quality (HS09811).

Providers who had some formal education in child abuse after residency were 10 times more likely than other providers to report all suspected abuse. Efforts must be made to ensure that all primary care providers receive continuing medical education about child abuse, concludes Emalee Gottbrath Flaherty, M.D., of Children's Memorial Hospital and Northwestern University Medical School.

Dr. Flaherty and her colleagues surveyed 85 primary care providers in a regional practice-based network to collect information about the demographic characteristics of each provider and practice, their overall experience with child abuse, and their experience during the previous year in identifying and reporting suspected child abuse, as well as past experience with CPS. In the prior year, over half of the providers (56 percent) said they had treated a child they suspected was abused; 8 percent did not report children with suspected abuse (5 percent of all suspected cases). A majority of providers (63 percent) believed that children they had reported previously had not benefitted from CPS intervention, and 49 percent said their experience with CPS made them less willing to report future cases of suspected abuse.

The most common negative consequences of reporting suspected child abuse among practitioners reporting abuse in the last year included losing other patients in the practice who had heard about the report and spending a lot of time on the phone or in court related to the case. Only one-third of providers said they had been informed by CPS of the progress and disposition of the reported case. Provider education about child abuse and a formalized process for CPS feedback to reporting providers could increase the probability that providers will report suspected abuse, conclude the authors.

For more details, see "Health care providers' experience reporting child abuse in the primary care setting," by Dr. Flaherty, Robert Sege, M.D., Ph.D., Helen J. Binns, M.D., M.P.H., and others, in the May 2000 *Archives of Pediatric and Adolescent Medicine* 154, pp. 489-493. ■

Expanded Medicaid and higher reimbursement rates only marginally improve access to dental services for poor children

Expansion of Medicaid eligibility in North Carolina from 1985 to 1991 doubled enrollment for individuals under age 21. Yet this expansion and a 23 percent increase in Medicaid reimbursement to dentists from 1988 to 1991 only marginally increased access to dental care for Medicaid-insured children, according to a study supported by the Agency for Healthcare Research and Quality (HS09330).

The percentage of dentists seeing five or more Medicaid-insured children per quarter remained fairly constant, and the percentage of dentists seeing 10 or more such children per quarter increased only slightly. The 23 percent nominal increase in fees over the study period also failed to influence the likelihood of dental participation. Greater participation may require much larger increases in reimbursement, concludes the study's first author Michelle L. Mayer, R.N., M.P.H., Ph.D., of Stanford University.

Dr. Mayer and colleagues analyzed North Carolina Medicaid dental claims from 1985 through 1991 and associated Medicaid eligibility and provider files, as well as dentists' data from the Cooperative Health Information System Provider file. Among those providers seeing at least 10 Medicaid children per quarter, an increase in real Medicaid reimbursement from $13 to $14 yielded an expected 3 percent (.83 person) increase in the number of Medicaid children seen per quarter.

continued on page 8

Access to dental care for poor children

continued from page 7

Pediatric dentists were significantly more likely to participate in Medicaid than general dentists (probability of .578 vs. .198). Pediatric dentists also saw more than 2.5 times as many Medicaid children per quarter as general dentists, holding other factors constant. Dentists in solo versus group practices were more likely to participate in Medicaid, and dentists with more years of experience were less likely to participate. Dentists may be willing to accept lower reimbursement for Medicaid patients provided the rates are sufficiently high to avoid or minimize the financial loss associated with seeing these patients.

See "The effects of Medicaid expansions and reimbursement increases on dentists' participation," by Dr. Mayer, Sally C. Stearns, Ph.D., Edward C. Norton, Ph.D., and R. Gary Rozier, D.D.S., M.P.H., in the Spring 2000 *Inquiry* 37, pp. 33-44. ■

Women's Health

Age, race, income, and other factors contribute to disparities in screening for breast and cervical cancer

Older, poor, and minority women are more likely to die of breast and cervical cancer than other women. Yet these women are less apt to be screened for these diseases than other women. A recent study supported by the Agency for Healthcare Research and Quality (HS08395) makes recommendations for breast and cervical cancer screening for older women. A second AHRQ-supported study (National Research Service Award fellowship F32 HS00137) focuses on another group of vulnerable women. It shows that overweight and obese women, who die more often from breast and cervical cancer than thinner women, are less apt than their thinner counterparts to be screened for these conditions with Pap smears and mammography. Both studies are summarized here.

Mandelblatt, J.S., and Yabroff, K.R. (2000, July). "Breast and cervical cancer screening for older women: Recommendations and challenges for the 21st century." ***Journal of the American Medical Women's Association*** **55, pp. 210-215.**

There have been impressive gains in the use of screening for breast and cervical cancer over the past two decades. However, certain vulnerable women, such as older and minority women, remain underscreened. Most older women visit a doctor at least once a year, providing an opportunity for their doctor to screen them for breast and cervical cancer. A major reason women cite for not undergoing screening is that their physicians never recommended it. Unfortunately, doctors are less likely to offer such screening to older patients compared with younger women.

This may be due to conflicting professional recommendations for screening older women and lack of inclusion of older women in clinical trials of screening efficacy. Doctors also may underscreen older women because of the many competing causes of mortality with increasing age and possible negative attitudes held by doctors and their older female patients, notes this recent commentary on the subject.

The authors suggest several ways to improve cancer control among older women for the next century. They propose developing definitions of groups of women most likely to benefit from screening based on age, disease risk, competing mortality, and quality of life. They recommend improving regular ongoing use of early detection and providing physician education to dispel negative attitudes related to age and race. Finally, they call for research on age-mediated differences in breast or cervical cancer biology that could affect screening recommendations.

Wee, C.C., McCarthy, E.P., Davis, R.B., and Phillips, R.S. (2000, May). "Screening for cervical and breast cancer: Is obesity an unrecognized barrier to preventive care?" ***Annals of Internal Medicine*** **132(9), pp. 697-704.**

This study found an inverse relationship between body weight and cervical and breast cancer screening, suggesting that obesity may be an unrecognized barrier to preventive care. The researchers assessed screening by analyzing responses to questionnaires completed by 11,435 women who responded to the "Year 2000 Supplement" of the 1994 National Health

continued on page 9

Screening for breast and cervical cancer

continued from page 8

Interview Survey. They measured weight by body mass index (BMI)–BMI is body weight in kilograms divided by height in meters squared. They found that among women 18 to 75 years of age who had not had a hysterectomy, 78 percent of overweight (BMI, 25 to less than 30 kg/m^2) and obese (BMI 30 or more kg/m^2) women compared with 84 percent of normal-weight women reported having Pap smears in the prior 3 years. In women 50 to 75 years of age, fewer overweight women (64 percent) and obese women (62 percent) than normal-weight women (68 percent) had received a mammogram in the previous 2 years.

Heavier women were usually older, were less likely to be white or to have private health insurance, had lower socioeconomic status, and suffered a greater burden of illness. Yet there was still a 3 to 5 percent difference in screening rates after adjustment for these and other known barriers to care. Overall, mammography rates decreased as BMI increased, and adjusted rates of Pap smears decreased significantly among women whose BMIs were greater than 25 kg/m^2. Rate differences according to BMI seemed stronger among white women than black women.

The researchers estimated that during a 3-year screening interval, a national reduction in cervical cancer screening of 3.5 percent in overweight women and 3.7 to 6 percent in obese women could result in missed or delayed diagnoses for 1,219 women with invasive cervical cancer. Similarly, among overweight and obese women 50 to 75 years of age, national differences in adjusted mammography rates of 2.8 percent and 4.5 to 8.8 percent, respectively, could result in more than 3,027 deaths from breast cancer by 80 years of age. ■

After age 80, women are less likely to receive full range of treatments for breast cancer

Women over age 80 with early stage breast cancer frequently do not get a full range of treatments, even after considering their health and treatment preferences, according to a new study funded by the Agency for Healthcare Research and Quality (HS08395). The study was conducted by researchers at Georgetown University's Lombardi Cancer Center in Washington and their colleagues at 29 hospitals across the country. The researchers studied 718 breast cancer patients age 67 years and older who were diagnosed with localized disease between 1995 and 1997.

Specifically, women 80 years and older were less likely to be referred to a radiation oncologist, and after breast conserving therapy, they were more than three times as likely not to receive radiation therapy. The risk of cancer recurrence approaches 40 percent within 10 years when radiation is not given after a lumpectomy, well within the life expectancy for most older women.

The study also found that older black women seem to be less likely than white women in the same age group to receive radiation after lumpectomy. Researchers note that while the sample of black women was fairly small, this finding of differences in breast cancer treatment patterns by race is consistent with other research. The researchers point out that older women's preferences, such as maintaining body image, were consistently important in determining treatment. They also note that when patient-physician communication focuses on patient concerns, it helps overall in patient selection of therapies and satisfaction with treatment.

This is one of the first large studies of breast cancer treatment to focus on older women that includes a defined stage of the disease and detailed information about patient, clinical, physician, and other factors affecting treatment patterns. Older women, particularly those 80 years of age and older, are the fastest growing segment of the U.S. population and will account for an increasing absolute number of breast carcinoma cases in the coming decades. Thus, additional research is urgently needed to determine the appropriate clinical approach to treating breast cancer in older women and to include this underrepresented population in future clinical trials.

Details are in "Patterns of breast carcinoma treatment in older women: Patient preference and clinical and physician influences" by Jeanne S. Mandelblatt, M.D., M.P.H., Jack Hadley, Ph.D., Jon F. Kerner, Ph.D., and others, in the August 2000 issue of *Cancer* 89, pp. 561-573. ■

Women who have c-sections or assisted vaginal deliveries are at increased risk for rehospitalization

In 1996, one in five pregnant women in the United States underwent cesarean delivery (c-section), and 14 percent had assisted vaginal deliveries (i.e., doctors used forceps or vacuum extraction). These women are more likely to be readmitted to the hospital, particularly for infections, than women who have uncomplicated vaginal deliveries, according to a study supported in part by the Agency for Healthcare Research and Quality (National Research Service Award training grant T32 HS00034). University of Washington researchers linked Washington State birth data with hospital discharge data to determine the relative risk (RR) of rehospitalization within 2 months of delivery among women giving birth to their first child in a Washington hospital.

They found that 1.2 percent of women were rehospitalized within 2 months of delivery. After adjustment for maternal age, rehospitalization was more likely among women with cesarean delivery (RR, 1.8; equal risk is 1) or assisted vaginal delivery (RR, 1.3) than among women with spontaneous vaginal delivery. Compared with women who had spontaneous vaginal delivery, women who had c-sections were more apt to be rehospitalized with uterine infection (RR, 2), gallbladder disease (RR, 1.5), genitourinary tract conditions (RR, 1.5), obstetrical surgical wound complications (RR, 30.2), cardiopulmonary conditions (RR, 2.4), thromboembolic conditions (RR, 2.5), and appendicitis (RR, 1.8). Women who had assisted vaginal delivery had a greater risk than women with spontaneous vaginal delivery of rehospitalization for postpartum hemorrhage complications (RR, 1.3), genitourinary tract conditions (RR, 1.4), obstetrical surgical wound complications (RR, 4.2), and pelvic injury (RR, 2.5).

Infection was the predominant reason for rehospitalization. However, these findings also suggest that the level of mechanical trauma associated with assisted vaginal delivery (for example, anal sphincter tears, anal or urinary incontinence, and pain on intercourse) can be severe enough to necessitate postpartum rehospitalization. The researchers suggest that physicians find effective ways to prevent and control peripartum infection. They also recommend that physicians selectively substitute vacuum extraction for forceps, restrict use of episiotomy, and use effective suture techniques to decrease risk of pelvic injury or wound complications among women with assisted vaginal deliveries.

See "Association between method of delivery and maternal rehospitalization," by Mona Lydon-Rochelle, M.P.H., Ph.D., C.N.M., Victoria L. Holt, M.P.H., Ph.D., Diane P. Martin, M.A., Ph.D., and Thomas R. Easterling, M.D., in the May 10, 2000 *Journal of the American Medical Association* 283(18), pp. 2411-2416. ■

Lack of insurance may not be the only barrier to timely prenatal care for low-income women

Doctors recommend at least one prenatal care visit during the first trimester of pregnancy. Expanded Medicaid eligibility for low-income pregnant women was initiated during the late 1980s/early 1990s to improve timely prenatal care, given that the lack of insurance is considered to be a key barrier to timely care.

A recent study of women covered by private insurance or California Medicaid suggests an important role for other barriers to care in addition to lack of insurance. It found that low-income women with unwanted or unplanned pregnancies, no regular provider before pregnancy, and less than a high school education were significantly less likely to have timely prenatal care than other low-income women with continuous prenatal insurance coverage, either private or California Medicaid (Medi-Cal).

Apparently, focusing on noninsurance barriers to care just during pregnancy may not be the best approach to improving timely prenatal care. Instead, broad social and health policies need to focus on low-income women before they become pregnant. These include reducing barriers to effective family planning, increasing the proportions of nonpregnant women who have a regular source of health care, and reducing the disadvantages associated with lack of education beyond high school, according to study leader Paula Braveman, M.D., M.P.H., and her colleagues at the University of California, San Francisco.

continued on page 11

Timely prenatal care for low-income women

continued from page 10

In the study, which was supported in part by the Agency for Healthcare Research and Quality (HS07910), the researchers analyzed survey responses from 3,071 low-income women in California who had Medi-Cal or private insurance coverage throughout pregnancy. The women were interviewed after delivery during 1994-1995. After controlling for numerous sociodemographic and logistical obstacles that might deter seeking care, the following were significant risk factors for untimely care that were experienced by more than one-fifth of the women: unwanted or unplanned pregnancy (affecting 43 and 66 percent of women, respectively), no regular provider before pregnancy (22 percent), and no schooling beyond high school (76 percent). The only significant logistical barrier to timely prenatal care involved transportation problems, which affected 8 percent of the women.

See "Barriers to timely prenatal care among women with insurance: The importance of prepregnancy factors," by Dr. Braveman, Kristen Marchi, M.P.H., Susan Egerter, Ph.D., and others, in the June 2000 *Obstetrics and Gynecology* 95, pp. 874-880. ■

Heart Disease and Stroke

Older age, high blood pressure, and other factors increase the risk of complications from cardiac catheterization

People who are older than 60 years, suffer from high blood pressure, or have peripheral vascular disease are more apt to experience complications from cardiac catheterization (coronary angiography) than individuals without these problems. In this procedure, a contrast dye is injected into the heart via a catheter, which is threaded up the leg into the heart, in order to image heart problems. The risk of complications is further increased if the procedure is done on an emergency basis or at the same time as coronary angioplasty (insertion into the heart of a balloon catheter to open up a blocked artery).

While any one of these factors alone increases the risk of complications, the greater the number of risk factors a person has, the greater the overall risk of complications. In fact, the risk of complications may be as high as 10 percent in patients with more than three risk factors. Yet these high-risk patients are the ones most likely to benefit from the procedure, explains Gregg S. Meyer, M.D., M.Sc., of the Agency for Healthcare Research and Quality.

Dr. Meyer and his colleagues retrospectively reviewed the medical charts of 3,494 patients (most of whom were white men) who underwent cardiac catheterizations at 28 military facilities that performed many such operations from 1987 to 1989. They correlated potential risk factors with three types of complications: major (heart attack, stroke, or death within 24 hours of catheterization), minor (hemorrhage requiring transfusion, pseudoaneurysm, fistula, or femoral thrombosis), and any other type of complication.

Overall there were 59 major, 71 minor, and/or 122 complications of any type (since some patients experienced more than one complication). Complications were more likely in patients with hypertension (odds ratio, OR 1.8; 1 is equal odds) or peripheral vascular disease (OR 2.9), those older than 60 years (OR 2.1), and patients undergoing angioplasty (OR 6.0). There was a stepwise relationship between the number of risk factors present and the likelihood of any complication, with 1.4 percent, 4 percent, 6 percent, and 16 percent of patients with 0, 1, 2, and 3 to 4 risk factors, respectively, experiencing complications.

See "Complications from cardiac catheterization: Analysis of a military database," by Jeffrey L. Jackson, Major, M.C., U.S.A., Dr. Meyer, and Theron Pettit, Captain, M.C., U.S.A., in the April 2000 *Military Medicine* 165, pp. 298-301. Reprints (AHRQ Publication No. 00-R037) are available from AHRQ.** ■

Invasive treatments for heart attack may be underused in patients who do not have insurance

Patients who suffer a heart attack (acute myocardial infarction, AMI) often benefit from invasive surgical procedures, such as cardiac catheterization, angioplasty, and coronary artery bypass graft (CABG) surgery. Use of these procedures varies, however, among different groups of patients. John M. Brooks, Ph.D., of the University of Iowa, Mark McClellan, Ph.D., M.D., of Stanford University, and Herbert S. Wong, Ph.D., a senior economist at the Agency for Healthcare Research and Quality, teamed up to assess whether these invasive therapies are over- or underused and whether and how use varies by payer group.

The researchers estimated the "marginal" benefits for patients covered by five payer groups: private non-HMO health plans, private HMO plans, Medicare, Medicaid, and self-pay (i.e., no insurance coverage). Data for the study are from hospital inpatient discharge records from the Washington State Inpatient Database, one in a set of 22 State Inpatient Databases (SID) that are part of AHRQ's Healthcare Cost and Utilization Project (HCUP). Over 30,000 patients who were treated for heart attacks in hospitals in the State of Washington between 1989 and 1994 were included in the study.

Marginal benefits are the average benefits for patients on the "extensive margin." Such patients can be thought of as those who would receive treatment next if the treatment rates were increased or those who would be first to lose treatment if the treatment rates were lowered. Estimates of significant treatment benefits for patients on the extensive margin would suggest that the treatment may be underused and should be expanded. Alternatively, negligible estimates of treatment benefits for these patients would suggest that the treatment may be overused and should be discouraged.

The results of this study show that patients in the insurance group with the greatest estimated marginal benefits, controlling for clinical factors, are self-pay patients. Next are Medicare patients, followed by privately insured HMO, Medicaid, and privately insured non-HMO patients. According to the authors, differences in the generosity of reimbursement by different payers may help explain the differences observed among patients with different types of coverage. The rank order by marginal benefits is roughly inversely related to the expected generosity of the insurers' payments to providers. These findings suggest that increasing the rate of invasive surgery for uninsured heart attack patients would yield the largest benefits, and that increasing the rate of invasive surgery for privately insured non-HMO heart attack patients would yield the least benefits.

Of special interest to researchers, this study also demonstrates the value of using an analytic tool called "instrumental variable (IV) estimation" for assessing the marginal benefits of treatments for other conditions. The authors point out the usefulness of IV-based estimates to help policymakers evaluate whether a treatment has been over- or underused within a population. They caution, however, that further research is needed before the results of this study can be used for specific policy recommendations.

See "The marginal benefits of invasive treatments for acute myocardial infarction: Does insurance coverage matter?" by Drs. Brooks, McClellan, and Wong, in the Spring 2000 *Inquiry* 37, pp. 75-90. Reprints (AHRQ Publication No. 00-R039) are available from AHRQ.** ■

Stroke type influences chance of recurrence, survival, and poststroke functioning

Stroke recurrence and survival rates are well documented, but it is less clear what the rates are for patients with different types of stroke. A recent study that was supported in part by the Agency for Healthcare Research and Quality (Stroke Patient Outcomes Research Team, PORT, contract 290-91-0028), focused on the differences among patients who had strokes without bleeding in or around the brain. For example, stroke patients whose embolism originated in the heart (cardioembolic) had the poorest survival, patients whose stroke was caused by intracranial atherosclerosis with narrowing or stenosis had higher recurrence rates, and patients with lacunae (small areas of cerebral infarction) had better poststroke functional status than patients with other types of nonhemorrhagic (ischemic) stroke.

continued on page 13

Survival and outcomes of stroke patients

continued from page 12

These findings are based on a study of functional outcomes of residents of Rochester, MN, who had a first ischemic stroke between 1985 and 1989. The researchers compared how survival and recurrence rates varied among patients with common stroke subtypes. A first ischemic stroke occurred in 454 Rochester residents during the study period; 80 percent were hospitalized, and 75 percent were evaluated by a neurologist. Subtypes of stroke were atherosclerotic (16 percent), cardioembolic (29 percent), lacunar (16 percent), uncertain type (36 percent), and other or unusual causes (3 percent).

Lacunar stroke patients had milder maximal neurological deficits at the time of stroke and better poststroke functional scores compared with patients who had other types of stroke. Lacunar stroke patients also had the best functional outcomes, with more than 80 percent having minimal or no impairment 1 year after the stroke. Cardioembolic stroke patients had poorer prestroke functional status, more severe neurological deficits at the time of stroke, and poorer functional outcomes compared with other subtypes. Cardioembolic stroke patients also were nearly four times as likely to die within 30 days after stroke than patients with ATH and 2.5 times more likely to die in the next 5 years. Twenty-five patients had recurrent stroke within 30 days; 13 of these patients had large-vessel atherosclerosis with narrowing (stenosis) of the artery as the first stroke subtype.

See "Ischemic stroke subtypes: A population-based study of functional outcome, survival, and recurrence," by George W. Petty, M.D., Robert D. Brown Jr., M.D., Jack P. Whisnant, M.D., and others, in *Stroke* 31, pp. 1062-1068, 2000. ■

Primary Care

Coordination between primary care physicians and specialists improves the quality of the referral process

When a primary care physician (PCP) decides to refer a patient to specialty care, he or she must coordinate service delivery across settings, multiple providers, and time to maintain continuity of care. Breakdowns in coordination of primary and specialty care have the potential for missed or delayed diagnoses and treatments, repeated or unnecessary testing, adverse drug reactions, and a host of other problems, including an increased risk of litigation. Yet, integrating referral care with primary care is a complex and time consuming process that often is not adequately reimbursed.

A recent study supported by the Agency for Healthcare Research and Quality (HS08430) examined how physicians coordinate patient care for specialty referrals and the effects of these activities on the completion of referral care (written communication of referral results from the specialist) and referring physicians' satisfaction with the specialty care their patients receive. The study involved a consecutive sample of 963 referrals made from the offices of 122 pediatricians in 85 practices in the Pediatric Research in Office Settings (PROS) network, a practice-based research network. Participating physicians completed a survey when the referral was made and 3 months later.

The researchers found that referring physicians often do not communicate relevant patient information to specialists when making referrals, and even when they do, the reasons for the referral are often absent. Yet when PCPs schedule a patient's appointment with the specialist and/or send information to the specialist, it substantially improves the chances that the specialist will give the referring physician feedback on the specialty care provided. This in turn improves the referring physician's satisfaction with the specialty care provided to the patient, according to the study's co-leaders, Christopher B. Forrest, M.D., Ph.D., and Barbara Starfield, M.D., M.P.H., of Johns Hopkins University.

In this study, pediatricians scheduled appointments with specialists for 39 percent of the patients they referred and sent patient information to specialists for 51 percent of referrals. The odds of referral completion increased three-fold for those referrals for which the pediatrician scheduled the appointment and communicated with the specialist compared with those for which neither activity occurred. The satisfaction ratings of referring pediatricians increased

continued on page 14

Referrals from primary to specialty care

continued from page 13

significantly by any type of specialist feedback, especially feedback by both telephone and letter.

Elements of specialists' letters that significantly increased physician ratings of quality included presence of patient history, suggestions for future care, followup arrangements, and plans for the specialist and referring physician to comanage the patient's care. These results support the need for physicians who receive either primary care or subspecialty training to be educated on ways that patients can be successfully comanaged, suggest Drs. Forrest, and Starfield.

Details are in "Coordination of specialty referrals and physician satisfaction with referral care," by Dr. Forrest, Gordon B. Glade, M.D., Alison E. Baker, M.S., and others in the May 2000 *Archives of Pediatric and Adolescent Medicine* 154, pp. 499-506. ■

HIV/AIDS Research

Serum albumin level can predict disease progression in patients with HIV infection

Reduced levels of serum albumin, a major blood protein, are associated with increased mortality in individuals who have certain chronic conditions. A new study adds the human immunodeficiency virus (HIV) that causes AIDS to the list. The study focused on HIV-infected women and found that those with the lowest levels of serum albumin had a risk of death three times greater than women with the highest levels of serum albumin, even after adjusting for other markers of HIV disease progression such as CD4 cell count and HIV-1 RNA levels. In fact, 48 percent of women in the lowest serum albumin category (less than 35 g/l) died within 3 years compared with 11 percent of women in the highest category (42 g/l or less). Women with serum albumin levels of 35-40 g/l (which falls in the range considered normal) were almost twice as likely to die as women with levels of 42 g/l or higher, other factors being equal.

The magnitude of risk of death for women with serum albumin levels of less than 35 g/l was similar to that of patients with CD4 cell counts of 50-199 and viral loads of 20,000-500,000 copies/ml. Serum albumin was a better predictor of mortality in women with CD4 cell counts over 200 than under 200, suggesting that serum albumin may be a particularly good predictor in the earlier stages of HIV infection before patients have progressed to AIDS. This makes sense, given that low serum albumin, a marker for malnutrition, may reflect poor nutritional status at early stages of HIV disease before changes in body weight or other clinical markers are apparent.

These findings are based on a study of 2,056 HIV-infected women at various stages of HIV disease, who participated in the Women's Interagency HIV Study (WIHS), a multicenter prospective study of the natural history of HIV infection in women conducted in five U.S. cities. This research involved women who were enrolled in WIHS during 1994 and 1995. WIHS is cosponsored by the Agency for Healthcare Research and Quality, the National Institutes of Health, and the Centers for Disease Control and Prevention. The researchers analyzed deaths during the first 3 years of followup and assessed relative risk of death by serum albumin level after adjusting for other factors indicative of disease progression.

More details are in "Serum albumin as a predictor of survival in HIV-infected women in the Women's Interagency HIV Study," by Joseph G. Feldman, Dr.P.H., David N. Burns, M.D., Stephen J. Gange, Ph.D., and others, in the May 2000 issue of *AIDS* 14(7), pp. 863-870. ■

Satisfaction and clinical outcomes are similar for patients with schizophrenia treated in VA and non-VA facilities

Veterans with schizophrenia who received treatment through the Department of Veterans Affairs (VA) between 1994 and 1996 were less likely on some measures to have access to state-of-the-art community-based, recovery-oriented services than similar patients treated in hospitals and clinics operated by State and local providers, although outcomes were similar. In a recent study, the Schizophrenia Patient Outcomes Research Team (supported by the Agency for Healthcare Research and Quality, PORT contract 290-92-0054) compared treatment of schizophrenia in two organizational systems: a national Government-operated health care system, the VA, and in facilities operated by State and local providers.

During the time of the study, VA care relied more on hospital-based services and less on community-based psychosocial services such as work therapy, job training, and case management. However, since that time, the VA has expanded its outpatient mental health care services and reduced the number of inpatient psychiatric beds. Because the data for this study were collected between 1994 and 1996, they probably do not reflect the most recent changes in either VA or non-VA care, cautions the PORT's principal investigator Anthony F. Lehman, M.D., of the University of Maryland School of Medicine.

The researchers used face-to-face patient interviews and review of medical records to compare patterns of care for 192 VA inpatients with 96 non-VA inpatients and 274 VA outpatients with 184 non-VA outpatients at VA and non-VA facilities in two States. All VA patients were veterans; about one-fifth of non-VA service users also were veterans.

Patients treated for schizophrenia by the VA had similar satisfaction and clinical outcomes as those not treated by the VA. However, VA outpatients were more likely to have been hospitalized during the previous year than non-VA outpatients. They also were less likely to have received services from a day hospital, from a case manager or social worker, or to have received crisis intervention services. Both inpatient and outpatient VA patients had seen a greater number of psychiatrists. Adherence to treatment recommendations for both VA and non-VA patients was generally quite low, with only 41 percent overall adherence among inpatients and 31 percent adherence among outpatients.

For more information, see "Benchmarking treatment of schizophrenia," by Robert A. Rosenheck, M.D., Rani Desai, Ph.D., Donald Steinwachs, Ph.D., and Dr. Lehman, in the April 2000 *Journal of Nervous and Mental Disorders* 11, pp. 209-216. ■

Materials now available for quality improvement of depression care in primary care practices

Serious depression affects more than 10 percent of the U.S. adult population each year, but most depressed people receive inappropriate care or no care at all for their depression. Many of those who do receive treatment for depression are treated in primary care settings rather than mental health specialty practices. Yet the feasibility and cost-effectiveness of this level of care are still open to question.

To address these issues, the Agency for Healthcare Research and Quality supports a Patient Outcomes Research Team (PORT-II) on improving the cost-effectiveness of prepaid depression care, which is led by Kenneth B. Wells, M.D., M.P.H., of RAND, a nonprofit research group in Santa Monica, CA. The PORT-II, which began in April 1995 and will continue through March 2001, is a large demonstration project designed to address issues for depressed patients in primary care. As an outgrowth of this project (AHRQ grant HS08349) and with additional support from the National Institute of Mental Health and the John D. and Catherine T. MacArthur Foundation, the PORT researchers have developed a quality improvement program containing a set of practical tools that can be used in managed care practices.

continued on page 16

Treating depression in primary care

continued from page 15

Known as the Partners-in-Care Quality Improvement Program, the full set of materials includes everything users need to implement the program. The set includes introductory materials, training materials, materials for primary care physicians, nurses, and patients (available in English and Spanish), as well as various forms. There are guides and manuals, reference cards for clinicians, a patient education video, patient brochure, overview, training agenda and materials, worksheets, personal plans, registers and logs, tracking file cards, therapist study record forms, and comprehensive patient record forms. The materials are not licensed and can be adapted to fit the needs of individual practices.

The materials are available for purchase ($275) from RAND on a cost-recovery basis. For complete ordering information, visit the RAND Health Web site at www.rand.org/organization/health/pic.products/index.html or call RAND's distribution services toll free at 877-584-8642. ■

Monograph and summary focusing on children's mental health issues now available from AHRQ

A monograph and a reprint of an issue brief on children's mental health issues are now available from the Agency for Healthcare Research and Quality. These two publications provide a wealth of information about children's mental health issues, particularly where the field stands today and where it needs to go over the next few years. These materials stem from a project that was supported in part by AHRQ (HS09813), the Children's Mental Health Alliance Project, and led by Annie G. Steinberg, M.D., of the Center for Children's Policy, Practice, and Research at the University of Pennsylvania and the Children's Seashore House, Children's Hospital of Philadelphia. The alliance also received support from the Robert Wood Johnson Foundation.

The monograph was produced by the Alliance, which was established as an interdisciplinary, collaborative effort to:

1. Review an evidence-based, best-practices approach to the primary care/specialty care relationship as it pertains to child mental health.
2. Address underrecognition of the mental health problems that affect children and adolescents and the poor outcomes that often occur.
3. Clarify professional responsibilities across systems of care to avoid duplication, address shortages, and define health services research priorities.

The monograph addresses these topics and includes input from a number of participants in a multidisciplinary consensus conference, "Mental Health Services Delivery in Primary and Specialty Care Settings," which was held in November 1998. Implications for action are also presented, as well as a series of recommendations for children's mental health services research topics spanning the next 5 years.

Copies of the monograph, *Children's Mental Health: The Changing Interface Between Primary and Specialty Care*, (AHRQ Publication No. 00-R040) are available from AHRQ.*

The reprint is an issue brief published by the University of Pennsylvania's Leonard Davis Institute of Health Economics and written by Dr. Steinberg and coauthors Anne Gadomski, M.D., M.P.H., of the Bassett Research Institute, and Michele D. Wilson, M.D., of the Children's Hospital of Philadelphia. It briefly summarizes, in bullet form, much of the information presented in the monograph described above, including the following topics:

- Changes in children's mental health services over the past decade.
- Increases in psychotropic drug use in children.
- Effects of managed care on the delivery of mental health services to children.
- Resources needed by primary care providers to identify and address children's mental health needs.
- A promising system of care model.
- A children's mental health research agenda.
- Policy implications associated with meeting the need for mental health services among children.

Copies of the reprint, *Leonard Davis Institute of Health Economics Issue Brief–Children's Mental Health: Recommendations for Research, Practice, and Policy* (AHRQ Publication No. 00-R042) are available from AHRQ.** ■

Access to medical care is worse for Asians and Pacific Islanders than for whites and other ethnic groups

A new study shows that Asians and Pacific Islanders on the West Coast had worse access to care than whites or any other ethnic group. This was surprising, since Asians had the highest proportion of high-income people and a larger proportion of well-educated individuals than other groups in the study, factors usually associated with better access to care.

Cultural differences and associated communication problems may better explain the access problems experienced by Asians. More studies are needed to understand why Asians are more likely to experience problems in accessing care than members of other ethnic/racial groups who experience similar barriers to care, note researchers from the University of California, Los Angeles, and RAND. The study was supported in part by the Agency for Healthcare Research and Quality (National Research Service Award training grant HS00046).

The researchers surveyed demographics and access to care of Asians and Pacific Islanders and other ethnic and racial groups receiving managed health care from 48 physician groups in California and five other States (Washington, Oregon, Texas, Arizona, and New Jersey). They defined access to care as preventive services, time-related access for routine care or general needs, telephone access, specialty services, and general access. With the exception of two preventive service measures, Asians had the worst access scores and scored their plans as needing improvement more often than any other group on amount of time waiting for service approval (85 percent vs. 67 percent for whites), waiting time before appointments with specialists (85 percent vs. 74 percent for whites), and ability to obtain treatment when needed (72 percent vs. 55 percent of whites).

Asians and Pacific Islanders were consistently the largest group giving their health plan a very poor/poor or fair rating for ease of getting staff by phone, ease of scheduling appointments by phone, access to a specialist when needed, ease of getting laboratory tests or radiology exams ordered by the primary care physician, and ease of getting a referral for mental health care. Whites had the best access to care followed by Native Americans, others, blacks, Hispanics, and finally, Asians and Pacific Islanders. Better translation services and training of providers in cultural sensitivity may reduce cultural and communication barriers to care for Asians, conclude the authors.

For more details, see "Access to medical care reported by Asians and Pacific Islanders in a West Coast physician group association," by Rani E. Snyder, William Cunningham, Terry T. Nakazono, and Ron D. Hays in the June 2000 *Medical Care Research and Review* 57(2), pp. 196-215. ■

Patients often do not understand information about the financial incentives offered to physicians by insurers

Federal and State governments now require health plans to disclose physician financial incentives. However, many patients do not know about their physicians' financial incentives and do not understand their implications, according to a study supported by the Agency for Healthcare Research and Quality (HS09810). For example, many focus group participants did not understand that capitated payments (a limited reimbursement to the doctor for individual patients, despite services rendered) were an incentive to doctors that could limit the tests, referrals, and/or procedures provided to a patient.

Disclosure practices must take into account the lack of understanding patients have of physician incentives, conclude study authors Tracy E. Miller, J.D., and Carol R. Horowitz, M.D.,

continued on page 18

Financial incentives offered to physicians

continued from page 17

M.P.H., of the Mount Sinai School of Medicine. They conducted five focus groups (two Medicare, two non-Medicare, and one mixed Medicare and non-Medicare) and postgroup surveys of 29 focus group participants in New York City. The patients were introduced to three types of reimbursement: traditional fee-for-service (FFS), where a fee is provided for each service rendered; capitation, which involves a fixed monthly payment for health care services; and a fixed physician annual salary regardless of visits, tests, and procedures provided. Despite presenting physician incentives in the most basic terms to participants, almost one-third of them could not correctly identify the definitions of FFS or capitation in the survey administered immediately afterwards.

Participants also revealed significant barriers to learning about physician financial incentives. These ranged from high trust levels in primary care doctors and reluctance to think about the patient-physician relationship in financial terms to lack of understanding about how the incentives might relate to their own access to care and treatment. However, the possibility that incentives could influence decisions about hospitalization or major treatments sparked more interest in learning about physician incentives. The authors conclude that education about physician financial incentives must take into account the fact that the topic is new to most patients and unwelcome to some.

See "Disclosing physician financial incentives: Will consumers understand and value the information?" by Drs. Miller and Horowitz, in the July/August 2000 *Health Affairs* 19, pp. 149- 155. ■

Agency News and Notes

AHRQ, HRSA, and other agencies team up to fund grants for medical faculty training in genetics

The Nation's primary care physicians need specialized training to translate the dramatic advances in genetics knowledge and technology resulting from the Human Genome Project into real medical benefits for their patients. To help meet this need, the Health Resources and Services Administration (HRSA) and the Agency for Healthcare Research and Quality, in collaboration with the National Human Genome Research Institute and the National Institutes of Health, have awarded $200,000 in grants to 20 faculty teams. The teams, which were selected through a peer review process, will create models for adapting the very latest in scientific knowledge to everyday clinical practice.

This new faculty development initiative will give students, faculty, and primary care researchers in-depth training on a variety of issues that relate to blending genetics information into primary care practice. For example, participants will learn when it is appropriate to collaborate with geneticists, how best to apply newly available genetic tests, and ways to help patients make informed decisions about using genetic information.

HRSA's Maternal and Child Health Bureau and Bureau of Health Professions will take the lead for the project. The 20 teams participating in this project are based at:

Baylor College of Medicine, Houston, TX

Boston University School of Medicine/Boston Medical Center, Boston, MA

Brody School of Medicine/East Carolina University, Greenville, NC

Cedars-Sinai Medical Center, Los Angeles, CA

Cook County Hospital/Rush Medical College, Chicago, IL

Lancaster General Hospital Family Practice Residency Program, Lancaster, PA

Mayo Clinic Scottsdale, Scottsdale, AZ

Medical College of Wisconsin, Milwaukee

New York Medical College, Valhalla

continued on page 19

Medical faculty training in genetics

continued from page 18

Palmetto Health Alliance/University of South Carolina School of Medicine, Columbia

State University of New York School of Medicine, Buffalo

University of California School of Medicine, Los Angeles

University of Cincinnati College of Medicine, Cincinnati, OH

University of Florida College of Medicine, Gainesville

University of Maryland School of Medicine, Baltimore

University of Oklahoma Health Sciences Center, Tulsa

University of Utah Health Sciences/Primary Children's Medical Center, Salt Lake City

University of Vermont College of Medicine, Burlington

University of Washington Family Practice Residency Network, Seattle

Vanderbilt University Medical Center and Meharry Medical College, Nashville, TN ■

Announcements

AHRQ establishes centers of excellence to conduct research on market forces affecting health care

The Agency for Healthcare Research and Quality has established three new centers of excellence to conduct research on how market forces are affecting the quality of health care, access to care, and health care costs. Total projected funding over the next 5 years is expected to be $12.5 million for the three centers.

Each center will carry out a number of interrelated research projects, some of which may be led by researchers at other institutions. The projects will include a special focus on market effects on rural and minority populations and on the influence of purchasers in local markets.

The new AHRQ-funded centers of excellence are:

Harvard Medical School, Boston, MA. Structuring Markets and Competition in Health Care. Principal investigator Joseph P. Newhouse, Ph.D. Total funding $4.5 million; project period July 5, 2000 to June 30, 2005. (In collaboration with Boston University and the University of Puerto Rico, San Juan).

Projects: Impact of market forces on the performance of health plan network hospitals (Albert Ma, Ph.D., Boston University); Market-based reforms and quality of care (Edward Guadagnoli, Ph.D., Harvard); Mental health carve-outs and cost shifting (Haiden Huskamp, Ph.D., Harvard, and Margarita Alegría, Ph.D., University of Puerto Rico); Selection and risk adjustment in private employer plans (Dr. Newhouse); and Managed care penetration in rural settings (Dr. Newhouse).

University of California, San Francisco. Quality Measures and Managed Care Markets. Principal investigator Harold S. Luft, Ph.D. Total funding $4.5 million; project period July 15, 2000 to June 30, 2005. (In collaboration with the University of Michigan, Ann Arbor).

Projects: Health plan performance and employer choice of plan (Catherine McLaughlin, Ph.D., University of Michigan); Health plan quality and market forces (Michael Chernew, Ph.D., University of Michigan); Market incentives and health plan advertising strategies (Adams Dudley, M.D., UCSF); and Market changes and minorities: national and community perspectives (Jennifer Haas, M.D., UCSF).

RAND, Santa Monica, CA. Health Care Markets and Vulnerable Populations. Principal investigator José J. Escarce, M.D., Ph.D. Total funding $3.5 million; project period July 1, 2000 to June 30, 2005. (In collaboration with the University of Rochester, Rochester, NY).

Projects: Health care markets and the quality of hospital care for vulnerable populations (Jeannette Rogowski, Ph.D., RAND); Market competition and safety-net hospitals (Jack Zwanziger, Ph.D., University of Rochester); and Health care markets, the safety net, and access to care for the uninsured (Dr. Escarce). ■

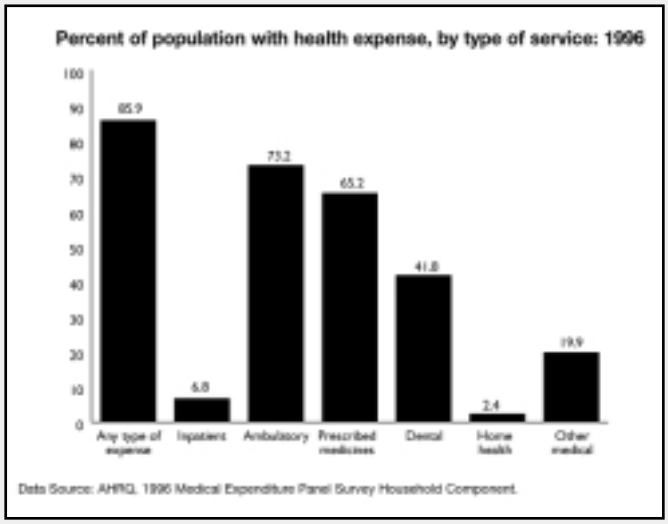
AHRQ announces new MEPS publications on the cost of health care

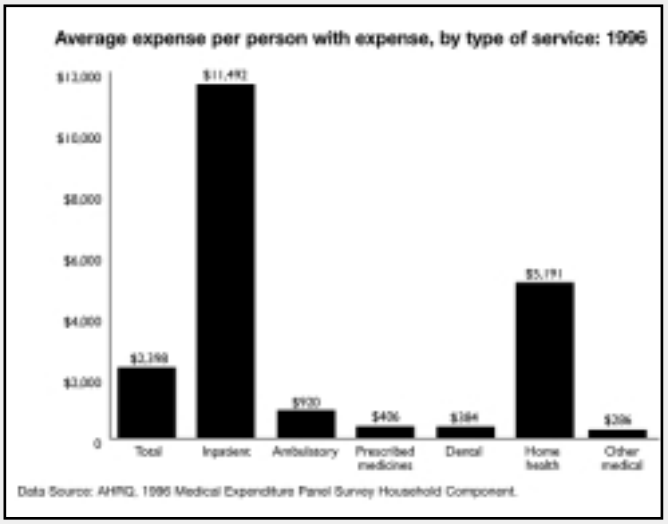
In 1996, about $554 billion in payments were made for health care services and supplies used by the U.S. population not in the military or living in institutions. The average cost per person who had medical expenses was about $2,400. However, half of these people had medical expenses of less than $559.

The charts presented here show that only small proportions of the population had expenses for inpatient hospital care (6.8 percent) and home health services (2.4 percent), although these health services had the highest average annual expenses ($11,492 for inpatient hospitalization and $5,191 for home health care).

These estimates from the Agency for Healthcare Research and Quality's Medical Expenditure Panel Survey (MEPS) are lower than those recently released by the Health Care Financing Administration's National Health Accounts (NHA). This is primarily because the MEPS Household Component is focused on the civilian noninstitutionalized population and does not collect data on people in the military or living in institutions such as nursing homes or prisons. It also omits costs for program administration and revenues not associated with patient care. When the surveys are adjusted for these and similar differences, the MEPS expenditure estimates are not substantially different from those contained in the NHA.

More information is presented in two MEPS Highlights publications that are available from AHRQ: *Distribution of Health Care Expenses, 1996. MEPS Highlights No. 11* (AHRQ Publication No. 00-0024) and *Per Capita Health Care Expenses, 1996. MEPS Highlights No. 12* (AHRQ Publication No. 00-0026).** ■





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Grant final reports now available from NTIS

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

Assessing Match in Child-Clinician Communication. Charles W. Kalish, Ph.D., University of Wisconsin, Madison, WI. AHRQ grant HS09556, project period 9/30/97 to 9/29/99.

There is increasing sentiment that children, like other patients, should be active participants in their own health care. Yet to what degree are young children capable of managing health information? Thirty 4- and 5-year-old children were interviewed following a simulated clinical health assessment. Results demonstrated that children and clinicians shared interpretations of many aspects of the examination. However, children had a narrower definition of health relatedness. Moreover, the importance children attached to elements of a health encounter was proportionate to their perceptions of the elements as related to health. Results also suggest that the role of the parent as intermediary between the child and clinician may be problematic. In particular, children seemed not to attend to communication directed at or made by the parent during a clinical examination. (Abstract, executive summary, and final report, NTIS accession no. PB2000-106430; 22 pp, $23.00 paper, $12.00 microfiche)***

Clinical Performance Measures for Dental Care Plans. James D. Bader, D.D.S., M.D., M.P.H.,Ph.D., University of North Carolina, Chapel Hill, NC. AHRQ grant HS09453, project period 9/30/96 to 9/29/99.

The objective was to develop standardized measures to assess clinical aspects of the performance of managed dental care plans. Stakeholders representing dental plans, purchasers, and providers refined initial sets of measures. Refined administrative data-based measures were piloted tested in two dental HMOs. Chart audit-based measures were tested in seven dental programs. Seven effectiveness-of-care measures assessing disease activity classification, preventive treatment, and outcomes for caries, periodontal disease, and tooth loss were developed. Six use-of-services measures focusing on prophylaxis, third-molar surgery, and preventive, restorative, prosthetic, surgical, and endodontic care were specified. Five access-to-services measures for visit and examination rates, appointment waiting time, and provider availability and turnover also were specified. Pilot testing of the administrative data-based version of the effectiveness of care and use of services measures indicated reasonable reliability and sensitivity but also demonstrated the need for supervision or auditing of the process. The chart-audit-based procedures also yielded reasonably reliable data. However, missing data in patient charts rendered the calculation of some measures problematic, namely caries and periodontal disease assessment and experience. Agreement between administrative and audit-based measures was good for most but not all measures in the one program where the comparison could be made. (Abstract, executive summary, and final report, NTIS accession no. PB2000-106630; 66 pp, $27.00 paper, $12.00 microfiche)***

Impact of Managed Care on African-Americans. Mahmud Hassan, PH.D., University of Alabama at Birmingham, Birmingham, AL. AHRQ grant HS09569, project period 9/30/97 to 1/31/00.

This study examined the impact of managed care on African-Americans with respect to their access to and use of health-care services. Using data from the National Health Interview survey of 1994, the researchers estimated the managed care penetration rates among blacks in 33 Standard Metropolitan Statistical Areas. They used the number of physicians' visits and the days of hospital inpatient stays in 1 year as two alternative measures of use of health care services. The regression analysis clearly showed that an increase in managed care penetration in the market and/or among whites has a proportional positive increase in managed care penetration rates among blacks. The multinomial logit regressions showed that the number of annual visits to physicians is very similar for blacks enrolled in either managed care or non-managed care plans. However, blacks enrolled in managed care plans were less likely to have a high level of inpatient days compared with blacks enrolled in non-managed care plans. The researchers speculate that enhanced preventive care and early treatment

continued on page 22

Grant final reports

continued from page 21

of illness avoid the need for hospital care for many managed care enrollees. (Abstract and executive summary, NTIS accession no. PB2000-105771; 46 pp, $25.50 paper, $12.00 microfiche)***

Market Forces and Rural Health: System and Consumer Impact. Keith J. Mueller, Ph.D., University of Nebraska Medical Center, Omaha, NE. AHRQ grant HS09196, project period 9/30/95 to 9/29/98.

The goals of this project were to assess how rapidly changes in health care delivery are occurring in rural areas, determine the involvement of rural providers and community leaders in the changes, and disseminate information gained through this project to policymakers and educators. Data were collected through telephone interviews of 63 key informants and field studies of activities in six communities. This project found that there has been very little change in health care financing in rural areas. Where change has occurred, through the use of different strategies for purchasing health care services, there has been little behavioral change on the part of rural health care providers. Three factors are important in differentiating across different responses by rural communities to changes in health care financing: feelings of local leadership about change, resources available locally to support change, and community capacity, in health care infrastructure and payment from residents, to support new systems. (Abstract, executive summary, and final report, NTIS accession no. PB2000-106628; 22 pp, $23.00 paper, $12.00 microfiche)***

Meeting the Challenge of Managing Health Care Information: Strategies and Investments. Kathleen H. Gersowitz, Research Foundation of SUNY, Albany, NY. AHRQ grant HS10078, project period 9/15/99 to 2/15/00.

Local healthcare information management professionals were invited to attend a day-long conference focused on managing healthcare information. Speakers and panelists presented views and perspectives and audience members participated in the dialog on strategies, investments, and best practices for managing health care information and technology. Discussions focused on current levels of information technology, management strategies being used today, and future directions. The attendees agreed to the value and future benefits to be gained and called for more focus on a cost/benefit analysis of various strategies, practical guidelines for managing health care information, models from other industries, and specific strategies that can be implemented to deal with the ever-changing field of information technology. (Abstract, executive summary, and final report, NTIS accession no. PB2000-106629; 34 pp, $25.50 paper, $12.00 microfiche)***

Risk-Bearing Arrangements and Capital Financing for Integrated Health Systems. Douglas A. Conrad, Ph.D., University of Washington, Seattle, WA. AHRQ grant HS09536, project period 7/1/97 to 6/30/99.

These researchers conducted case studies in emerging integrated health systems. The goals were to develop a preliminary assessment of the cost and quality implications of risk-bearing arrangements crafted between health plans and provider organizations and gain insights concerning alternative capital financing strategies used by systems. The study revealed that capitating appropriately sized and managed medical groups for either professional services only (primary care and specialty care) or a more inclusive range of services (approaching "global" risk) appears to result in reduced health care costs per member per month. In the cases considered, plans and provider organizations were able to sustain such arrangements, and selected consumer satisfaction and clinical measures did not suggest a reduction in quality. In capital financing, health care organizations follow a "pecking order," from bank loans and internal equity financing at early stages in their growth, then publicly issued debt, and finally public equity. Systems' "make-buy" decisions reflect that even in markets with excess capacity, the effective price for "renting" (rather than owning or creating one's own) services includes not just the "spot price" (short run marginal cost) of those services, but also the renter's expected incremental capacity costs. (Abstract, executive summary, and final report, NTIS accession no. PB2000-105772; 136 pp, $36.00 paper, $17.00 microfiche)***

Taxonomy of Patient Requests and Physician Responses. Richard L. Kravitz, M.D., M.S.P.H., University of California, Davis, CA. AHRQ grant HS09812, project period 3/1/98 to 2/29/00.

The goal of this project was to develop a reliable and valid system for identifying and classifying patients' requests for services in office practice. In phase one of the study, the researchers tested a preliminary taxonomy of patient requests and physician responses

continued on page 23

Grant final reports

continued from page 22

(TORP-I), which they found to be valid and reliable in general internal medicine. They could not confirm its applicability in other clinical settings. In phase two, TORP was refined and expanded and assessed for its reliability, validity, and utility in both internal medicine and cardiology. The researchers found TORP to be a potentially useful tool for studying an important aspect of the physician-patient interaction. (Abstract, executive summary, and appendix 3, NTIS accession no. PB2000-107461; 48 pp, $25.50 paper, $12.00 microfiche)***

Value of Future Health and Preventive Health Behavior. Gretchen B. Chapman, Ph.D., Rutgers State University of New Jersey, New Brunswick, NJ. AHRQ grant HS09519, project period 9/30/96 to 9/29/98.

Two studies examined the relationship between preventive health behavior and an aspect of patient preferences known as time preferences–the subjective value of future outcomes relative to immediate ones. Two preventive health behaviors were examined: acceptance of a free influenza vaccine by workplace employees and medical management of hypertension among community-dwelling elderly adults. The researchers predicted that people with more future-oriented time preferences would be more likely to accept a flu shot and adhere to medication prescriptions. The study of influenza vaccination found only a small association between time preference and shot acceptance, and the study of hypertension medication found no such relationship. It appears from this study that time preferences play little role in decisions about preventive health behaviors. (Abstract, executive summary, and final report, NTIS accession no. PB2000-106627; 14 pp, $23.00 paper, $12.00 microfiche)*** ■

AHRQ funds new projects

The following research grants, small project grant, and conference grants were funded recently by the Agency for Healthcare Research and Quality. Each listing includes the project title, principal investigator, performing organization, project number and dates, and funding. Note that research findings usually are not available until a project has ended or is nearing completion.

Research Projects/Cooperative Agreements

Home screening for chlamydia surveillance

Project director:	Roberta Ness, M.D.
Organization:	University of Pittsburgh Pittsburgh, PA
Project number:	AHRQ grant HS10592
Project period:	7/25/00 to 6/30/05
First year funding:	$356,394

Impact of ethics consultation in the ICU

Project director:	Lawrence Schneiderman, M.D.
Organization:	University of California La Jolla, CA
Project number:	AHRQ grant HS10251
Project period:	9/1/00 to 8/31/03
First year funding:	$673,031

Processes of care and outcomes in chronic rhinosinusitis

Project director:	Kenley W. Chin, M.D.
Organization:	University of California Los Angeles, CA
Project number:	AHRQ grant HS00012 (K08)
Project period:	8/1/00 to 7/31/05
First year funding:	$121,494

Profiling the needs of dying children

Project director:	John Feudtner, M.D., Ph.D.
Organization:	University of Washington Seattle, WA
Project number:	AHRQ grant HS00002 (K08)
Project period:	8/1/00 to 7/31/05
First year funding:	$124,185

Quality measures and managed care markets

Project director:	Harold S. Luft, Ph.D.
Organization:	University of California San Francisco, CA
Project number:	AHRQ grant HS10771
Project period:	7/15/00 to 6/30/05
First year funding:	$900,000

continued on page 24

New projects

continued from page 23

Structuring markets and competition in health care
Project director: Joseph Newhouse, Ph.D.
Organization: Harvard Medical School
Boston, MA
Project number: AHRQ grant HS10803
Project period: 7/5/00 to 6/30/05
First year funding: $899,873

Understanding variability in community mammography
Project director: Joann Elmore, M.D.
Organization: University of Washington
Seattle, WA
Project number: AHRQ grant HS10591
Project period: 9/1/00 to 8/31/03
First year funding: $768,484

Unstudied infants: Low-risk babies in a high-risk place
Project director: Douglas Richardson, M.D.
Organization: Beth Israel Medical Center
Boston, MA
Project number: AHRQ grant HS10131
Project period: 8/1/00 to 7/31/03
First year funding: $286,289

Small Project Grant

Timing prophylactic surgery for diverticulitis
Project director: Robert Richards, M.D.
Organization: University of Kansas Medical Center
Kansas City, KS
Project number: AHRQ grant HS10827
Project period: 8/1/00 to 7/31/01
Funding: $42,705

Conference Grants

Government coverage of traditional indigenous medicine
Project director: J. Kristin Olson-Garewal, M.D.
Organization: University of Arizona
Tucson, AZ
Project number: AHRQ grant HS10930
Project period: 8/15/00 to 8/14/01
Funding: $19,010

INCLEN 2000: Workshops for improving the quality of care
Project director: Alan B. Fogel
Organization: International Clinical Epidemiology Network
Philadelphia, PA
Project number: AHRQ grant HS10103
Project period: 8/1/00 to 7/31/01
Funding: $17,200

Patient safety in ambulatory care settings
Project director: Glenn T. Hammons, M.D.
Organization: Center for Research in Ambulatory Health Care Administration
Englewood, CO
Project number: AHRQ grant HS10106
Project period: 8/1/00 to 7/31/01
Funding: $49,987 ■

Bryce, C.L., Engberg, J.B., and Wholey, D.R. (2000, June). "Comparing the agreement among alternative models in evaluating HMO efficiency." (AHRQ grant HS09200). *Health Services Research* 35(2), pp. 509-528.

These authors use alternative models—data envelopment analysis (DEA), stochastic production frontiers (SPF), and fixed-effects regression (FER)—for evaluating the efficiency of health maintenance organizations (HMOs) using a nationwide sample of HMOs. These approaches all assume that output is homogeneous. Researchers therefore must choose a way to model efficiency as well as a method to adjust for differences in output quality and case mix. These researchers compared the results of these alternative models in terms of individual performance and industry-wide trends. All three models identified similar trends for the HMO industry as a whole. However, they assessed the relative technical efficiency of individual firms differently. Thus, these techniques are limited for either benchmarking or setting rates. While concurrence among techniques is no guarantee of accuracy, it can be reassuring. Conversely, radically distinct inferences across models can be a warning to temper research conclusions.

Fiser, D.H., Tilford, J.M., and Roberson, P.K. (2000). "Relationship of illness severity and length of stay to functional outcomes in the pediatric intensive care unit: A multi-institutional study." (AHRQ grant HS09055). *Critical Care Medicine* 28(4), pp. 1173-1179.

Mortality by itself is probably not a sufficient indicator of outcomes for pediatric intensive care units (PICUs) because it is a relatively rare event. Supplementing mortality data with functional outcomes data can provide a broader view of unit performance, according to these researchers. They used multi-institutional data to study the relationships between illness severity, length of stay, and functional outcomes among 11,106 patients at 16 PICUs across the United States. They measured functional outcomes by the Pediatric Overall Performance Category (POPC) and Pediatric Cerebral Performance Category (PCPC) scales at baseline and discharge from the PICU. Baseline, discharge, and delta POPC and PCPC outcome scores were associated with length of stay in the PICU and with predicted risk of mortality. Moderate and severe baseline deficits for both the POPC and PCPC score predicted increased length of stay between 30 and 40 percent. The authors conclude that the POPC and PCPC outcome scales can be used as reference values for evaluating clinical programs or for clinical outcomes research.

Hoffman, J.R., Mower, W.R., Wolfson, A.B., and others. (2000, July). "Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National Emergency X-Radiography Utilization Study Group." (AHRQ grant HS08239). *New England Journal of Medicine* 13, pp. 94-99.

Because of their fear of missing a diagnosis of cervical spine injury (which can produce catastrophic neurologic disability) in blunt trauma victims, doctors obtain cervical spine x-rays on virtually all such patients. However, this study shows that a decision instrument that uses a small set of clinical criteria can identify most cervical spine injury victims without x-rays. The researchers examined the ability of a decision instrument to detect cervical spine injury among 34,069 blunt trauma victims undergoing cervical spine x-rays (including 818 with cervical spine injury) at 21 medical centers across the United States. The decision instrument identified all but 8 of the cervical spine injury victims, for a near 100 percent sensitivity for detecting clinically important injuries. Based on classification by the decision instrument, 13 percent of blunt trauma victims could have been spared x-ray imaging.

Kovner, C., Mezey, M., and Harrington, C. (2000, first quarter). "Research priorities for staffing, case mix, and quality of care in U.S. nursing homes." (AHRQ grant HS09814). *Journal of Nursing Scholarship,* pp. 77-80.

Nursing homes are being called on to care for a more acute and diverse mix of patients, who by nature of their health conditions use more resources than nursing home residents of 10 years ago. These authors describe research priorities for studies on staffing, case mix, and quality of care in U.S. nursing homes. They point out that variations in health problems of people in nursing homes require any analysis of staffing and quality

continued on page 26

Research briefs

continued from page 25

to include an adjustment for case mix. Research on staff should include a mix of RNs, LPNs, nursing assistants, and therapy staff by appropriate mix of time as well as training level, especially since most nursing homes have no daily physician presence. More work needs to be done on quality-of-care measures, which rarely incorporate intrainstitutional quality factors such as inappropriate transfer of residents to hospitals. Other research priorities include such issues as the time required for carrying out basic nursing activities to deliver high-quality care, the relationship between nursing education and training on resident outcomes, and the relationship between caregiver wages and resident outcomes.

Ross, S.D., Sheinhair, I.A., Harrison, K.J., and others. (2000, June). "Systematic review and meta-analysis of the literature regarding the diagnosis of sleep apnea." (AHRQ contract 290-97-0016). *Sleep* 23, pp. 519-532.

These authors systematically reviewed the literature and did a meta-analysis of 249 relevant studies from 1980 through 1997 to develop an Evidence Report on the diagnosis of sleep apnea in adults. Sleep apnea is a 50 to 100 percent cessation of airflow during sleep, and may be responsible for 38,000 cardiovascular deaths per year and annual costs of $42 million for related hospitalizations. These authors found that the diversity of study designs and the objectives were very high, and the methodological rigor of these studies as assessments of diagnostic tests was very low. As a result, they cannot recommend standardization of diagnostic methodology for sleep apnea. Instead, they recommend that future research include standardization of terms and diagnostic criteria and consistently reported statistics to enhance the utility of studies on sleep apnea.

Editor's note: Copies of AHRQ Evidence Report Number 1, *Systematic Review of the Literature Regarding the Diagnosis of Sleep Apnea* (AHRQ Publication No. 99-E002) and a *Summary* (AHRQ Publication No. 99-E001) drawn from the report are available from AHRQ.* The report and summary were prepared for AHRQ under contract by MetaWorks, Inc., of Boston, MA. See the back cover of *Research Activities* for ordering information.

Zhou, X-H., and Higgs, R.E. (2000). "Assessing the relative accuracies of two screening tests in the presence of verification bias." (AHRQ grant HS08559). *Statistics in Medicine* 19, pp. 1697- 1705.

An ROC curve is commonly used to measure the accuracy of a medical test. It is a plot of the true positive fraction (sensitivity) against the false positive fraction (1-specificity) for increasingly stringent positivity criterion. Bias can occur when estimating an ROC curve if, for example, only some of the tested patients are selected for disease verification and if analysis is restricted only to the verified cases. This is known as verification bias. In this paper, the authors propose the use of two methods to construct confidence intervals for the difference in accuracy of two screening tests for dementia—an initial screening instrument and a more extensive followup clinical assessment for selected patients. They illustrate the application of the proposed methods to a simulated data set from an actual two-stage study of dementia that motivated the present research. ■

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