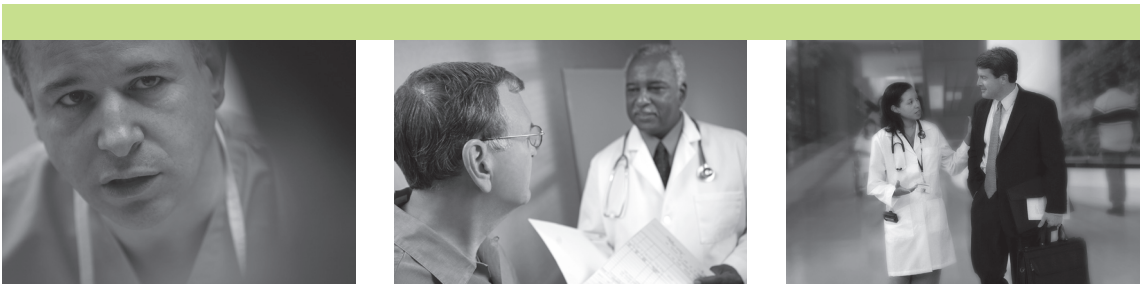


# *How Many More Studies Will It Take?*



A Collection of Evidence That Our  
Health Care System Can Do Better



New England Healthcare Institute



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Health Care System Can Do Better

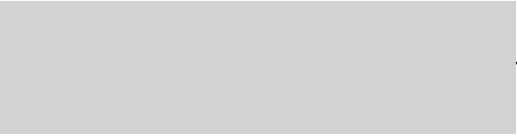
A Compendium of Evidence  
from  
1998-2006



**New England Healthcare Institute**

*Made possible by a grant from  
Blue Cross and Blue Shield of Massachusetts, Inc.*





# Introduction

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## About the New England Healthcare Institute

The New England Healthcare Institute (NEHI) is an independent, not-for-profit organization dedicated to transforming health care for the benefit of patients and their families. In partnership with members from all across the health care system, NEHI conducts evidence-based research and stimulates policy change to improve the quality and the value of health care. Together with this unparalleled network of committed health care leaders, NEHI brings an objective, collaborative and fresh voice to health policy. [www.nehi.net](http://www.nehi.net).

The U.S. spends more money on health care than any other nation in the world. According to Medicare actuaries, the U.S. will spend nearly \$2.3 trillion on medical care in 2007, representing approximately 16.7 percent of the nation's GDP. If health care spending remains unchecked, these National Health Expenditures are expected to grow to 20 percent of GDP by 2015.<sup>1</sup>

However, in spite of this significant investment in health care services, we lag behind other developed countries in the world on many important measures of our health status. Given the discrepancies between what we invest in health care and what we receive back in *health*, many experts believe that a large portion of our health care dollars are wasted, with estimates suggesting that up to 30 percent of total spending could be eliminated without reducing health care quality at all.<sup>2</sup> If these conservative estimates are correct, this equals an almost \$700 billion opportunity to improve the way we administer, manage, and deliver health care in the U.S. Realizing even a fraction of those savings would result in opportunities to redirect substantial funds to increase the quality of our health care and to provide access to care for every person in this country.

There is a compelling need to address waste for three reasons. First, the cost savings associated with eliminating waste are likely to be very large. Second, collaborative efforts to control waste could spur an emphasis on evidence-based practice that would lead to long-term quality improvement. Third, beyond

economic arguments, wasteful spending may actually decrease the quality of health care. Unnecessary procedures and medicines, for example, expose the population to significant health risks, complications and even death. In addition, waste associated with the failure to follow accepted treatment protocols not only costs money, but decreases productivity, reduces quality of life, and may cause serious harm to patients.

Although many policy experts and professional organizations have published well-regarded studies of specific areas of waste and inefficiency in clinical medicine, few have studied it from a system-wide perspective. As a result, opinions, rather than evidence-based solutions, have dominated the discussion to date. Until now there has not been a methodologically rigorous compilation of evidence on waste and inefficiency that stretches back more than a decade. Knowing where the waste is, why it exists and how many dollars are wasted are prerequisites for removing waste from the health care system.

Two important resources accompany this introductory summary:

- An annotated bibliography that was compiled by RAND researchers and published as an Appendix to the IOM report, *Crossing the Quality Chasm* (2001) and in *The Milbank Quarterly*. The IOM report examined studies published between January 1993 and July 1998, when the problems of overuse, underuse and misuse were poorly recognized and not accorded the importance they deserved.

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- A compendium of methodologically reliable studies created by the New England Healthcare Institute (NEHI). Researchers created an annotated list of 460 studies that represents a unique evidence base of peer-reviewed studies that appeared in the literature from 1998 through March of 2006. That was a period when interest in the quality of care exploded following the conclusions of the IOM's National Roundtable on Health Care Quality that "serious and widespread" problems of overuse, underuse, and misuse are harming "very large numbers of Americans" throughout the country.

While arguments can be made for adding some studies and omitting others in each of these bibliographies, there can be no doubt that these carefully documented lists identify compelling research that challenges each sector of the health care system to confront the physical and financial harm of wasteful, inefficient, or poor-quality care.



## *Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care*

We have tried to provide a common context for understanding waste in clinical care by defining it as *health care spending that can be eliminated without reducing the quality of care*. While many experts recognize the opportunities to reduce waste in the health care system, there is a significant gap between what we know and how we put that knowledge into action. The specific, clinically important examples of overuse, underuse, and misuse of health services that have been documented in the past 15 years are daunting, but they do provide us with a platform for serious change.

### A. Misuse

“Misuse” refers to care that causes harm to a patient or involves preventable complications of any treatment. Adverse treatment events are well documented sources of waste. Studies from Harvard Medical School suggest that adverse events conservatively account for five percent of total health care spending or \$100 billion per year, and that almost half of all adverse events (46.5 percent) are avoidable.<sup>14</sup>

Evidence shows that over half of all adverse drug events occur in the non-hospital setting.<sup>15</sup> Although ideas to address these errors are abundant, little has actually been done to solve the systemic causes that contribute to their existence, such as uncoordinated prescribing among physicians.

Hospital-acquired infections make up an additional set of avoidable costs. Between 5

and 10 percent of all patients admitted to acute care hospitals acquire one or more infections, resulting in an estimated 90,000 deaths each year and annual waste totaling an estimated \$4.5 to \$5.7 billion per year.<sup>16</sup> A recent report from the Pennsylvania Health Care Cost Containment Council (PHC4) has suggested that the problem may be much larger. In 2004, hospitals in Pennsylvania reported 11,668 hospital acquired infections; of these, 15.4 percent of the patients who acquired an infection died. The direct medical cost associated with these infections in Pennsylvania was \$2 billion.<sup>17</sup> If these findings are similar elsewhere, conventional estimates of the costs attributable to hospital-acquired infections are grossly understated.

Taken together, avoidable adverse treatment events and hospital-acquired infections conservatively result in a minimum of \$54.5 billion that are wasted each year, not to mention the human toll of these preventable events.

### B. Overuse

“Overuse” occurs when a health care service is provided in which the potential for harm exceeds the possible benefit of the care. By far the largest source of wasteful spending is unexplained variation in patterns of care that are not associated with improvements in clinical outcomes. Many interventions vary dramatically among regions with no real explanation for the variation.<sup>3</sup> The literature documents that the costs of the variation between high and low utilizing regions approaches 30 percent of **total** health care spending, or up

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## *Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care*

to \$690 billion.<sup>4</sup> Much of the evidence comes from studies of Medicare populations, but data exist to demonstrate the same variation in non-Medicare populations as well.<sup>5</sup>

For instance, 40 percent of all Emergency Department (ED) visits are for non-emergent conditions and 31 percent of non-emergent visits occur during regular business hours.<sup>6</sup> These visits are more expensive than comparable office visits. They result in higher volumes of more expensive testing and, in 5.5 percent of cases, potentially avoidable hospital admissions.<sup>7</sup>

More antibiotics are prescribed for acute respiratory infections than for any other illness. Otitis media (ear infection), pharyngitis (sore throat), and other upper respiratory infections account for approximately 75 percent of all ambulatory care prescriptions.<sup>8</sup> Our analyses of the peer-reviewed literature showed that there is strong evidence that most of the antibiotics prescribed for the treatment of these infections are unnecessary, as these common infections are largely due to viruses that are not susceptible to antibiotics. Although simple and inexpensive point-of-service lab tests are available to identify the patients who truly need antibiotics, these tests are not widely used. The data suggest that up to 55 percent of antibiotic prescriptions are medically unnecessary and could be avoided, resulting in annual savings of \$1.1 billion.<sup>9</sup>

### C. Underuse

“Underuse” is the failure to provide a health care service when it would have produced a favorable outcome for a patient. As the 1998 IOM National Quality Roundtable put it: “Underuse of proven effective interventions leads to major foregone opportunities to improve health and function.”

Just as overuse has an important economic component, so, too, does the underuse of services. According to a Kaiser Family Foundation research analysis, the uninsured receive less preventive care, are diagnosed at more advanced disease stages, and tend to receive less therapeutic care after diagnosis. The Foundation concluded that “having health insurance would reduce mortality rates for the uninsured by five to 15 percent.” Separately, the IOM concluded in 2004 that lack of health insurance causes roughly 18,000 unnecessary deaths in the United States every year.

There is a strong body of evidence to suggest that the underuse of generic antihypertensives is widespread and provides an opportunity to decrease costs.<sup>10, 11</sup> Many hypertensive patients could be treated with inexpensive generic medications, such as diuretics and first-generation  $\beta$ -blockers, rather than the more expensive, branded antihypertensives that are typically prescribed. Our analyses of the evidence suggest that at least \$3 billion could be saved each year by simply making less expensive but equally effective medication choices.

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## *Waste: The Triumvirate of Overuse, Underuse, and Misuse of Care*

Another important example of the underuse of appropriate medicines that is widely documented in the literature is the underuse of inhaled corticosteroids and other controller medicines in pediatric asthma. Evidence suggests that inhaled steroids and long-term controllers are underused by up to 60 percent of children with asthma, resulting in avoidable emergency visits and hospitalizations.<sup>12</sup> Regular use of inhaled steroids would reduce hospitalizations by 25 percent<sup>13</sup> and could avoid direct medical costs totaling \$2.5 billion each year.

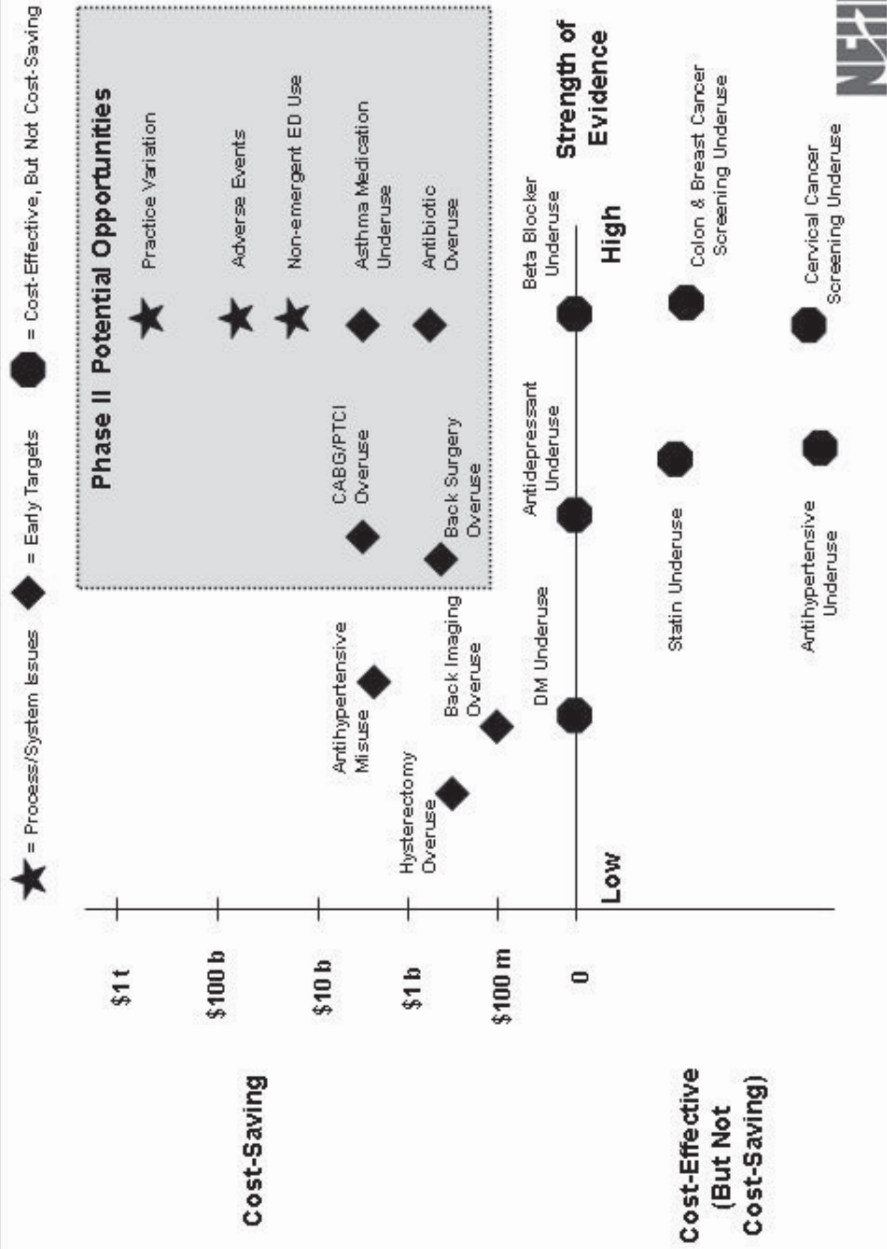


## *Five Broad Root Causes for the Sources of Waste in Clinical Care*

The NEHI findings demonstrate the pervasiveness of waste and identify five broad root causes for the sources of waste in clinical care:

- **Variation in the Intensity of Clinical Care:** Data show that the magnitude of waste due to unexplained variation in intensity of medical services among geographic areas is significant, with estimates reaching as high as 30 percent of total health care spending. While the causes of unexplained variation are only partially understood, the preponderance of unexplained variation leading to waste results from uncertainty. This uncertainty in health care arises from two causes. First, human biology inherently varies in response to both disease and treatment. Second, much of what physicians do in their daily work is not grounded in evidence, but represents the art of medicine rather than the science. Clinical decision making evolves from “schools of thought” formed during residency training which persist throughout a physician’s career and which are slowly molded by individual clinical experience. In this way, local medical norms or cultures—“the way we do things around here”—form physician behavior, leading to regional variations in approaches to diagnoses and treatments. Determining optimal practices and disseminating them have proven difficult, and it is important that evidence point to “doing the right thing and doing it *right*.”
- **Lack of Compliance with Evidence-based Guidelines:** Uncertainty clearly contributes to waste, but even when we think we know the “right thing,” doing it consistently remains elusive. From our analyses, much of the waste in clinical care results from failure to comply with established and accepted clinical practices. To many in the health care community, guidelines exemplify the scientific method whereby one adopts a process, measures the result, and then modifies the process—the cycle of continuous quality improvement. Guidelines, however, are not viewed favorably by all. They often disrupt existing practice patterns, and they threaten physician autonomy. Most importantly, perhaps, they are simply not available at the moment decisions are made.
- **Limited Adoption of Clinical Information Technologies:** Decision support systems available at the point of care, where clinical decisions are actually made, are available but not broadly adopted. In addition to facilitating guideline compliance, these technologies are proven to decrease adverse effects of treatment, such as drug errors and wrong-site surgeries, that are major drivers of avoidable waste in health care. Information technology offers a chance to dramatically decrease these events through expert decision support, drug tracking, and electronic order entry. Electronic medical record keeping and e-prescribing technologies exist today and can play an important role in reducing waste in clinical care.
- **Failure of Primary Care Systems to Provide Timely Access:** Evidence indicates that avoidable emergency department (ED) care, avoidable hospital admissions from

# Waste Phase I Findings



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## *Five Broad Root Causes for the Sources of Waste in Clinical Care*

the ED, and inappropriate intensity of ED services may stem from a lack of access to appropriate levels of primary care.<sup>18</sup> People use emergency services either because they do not have another source of care or because they feel that their clinician is not conveniently available. Unnecessary emergency visits can result in inappropriate diagnostic and therapeutic interventions, including antibiotic use and hospital admissions. According to The Commonwealth Fund, Americans of all incomes report greater difficulty accessing timely urgent care outside of hospital emergency departments than residents of most other industrialized countries.<sup>19</sup>

- **Underuse of Cost-Effective Diagnostic Tests:** Point of care testing is a technology that enables other health professionals—nurses, physician assistants, and pharmacists—to diagnose and treat many simple, common conditions that currently clog our emergency departments. These technologies could improve diagnostic accuracy in many conditions at a lower cost than conventional lab tests, and also decrease antibiotic pre-

scribing. They are readily available and affordable, yet not well adopted in clinical practice.

These opportunities to decrease waste in the health care system are displayed on the attached diagram. They provide a landscape or a potential roadmap for people to use in beginning to craft innovative policy changes that will simultaneously improve the quality of care while reducing the cost.





## The Resources

### A. The RAND Annotated Bibliography

As an important part of the Institute of Medicine's 2001 report: *Crossing the Quality Chasm: A New Health System for the 21st Century*, a team of senior researchers at the RAND Corporation reviewed the quality of care literature published between January 1993 and July 1998. They synthesized their results into "a profile of the quality of care in the U.S." that highlighted examples of overuse, underuse, and misuse of health care services. Their literature review, bibliography, and annotated examples of poor quality of care are an excellent source of data for policy changes to improve the quality of patient care and decrease its cost. The review is published as an appendix to *Crossing the Quality Chasm* and is also included in this report as an important resource.

### B. NEHI Compendium

In order to update the groundbreaking IOM report from the last RAND evidence reviews done in 1998, NEHI created a new, annotated compendium of methodologically reliable studies that appeared in the literature from 1998 through March of 2006. The NEHI reviewers worked with the National Library of Medicine and Countway Medical Library in Boston to locate 3,000 articles on waste and inefficiency in health care, ultimately narrowing them to 462 studies that met the review criteria.

Because many of the articles addressed multiple conditions and services, they were classified into relevant disease conditions (heart disease, diabetes, etc.), services (drugs, pro-

cedures, etc.), and mechanisms of waste (Misuse, Overuse, Underuse and Utilization Variation).

From these analyses, 578 specific examples of clinical waste emerged. These examples were categorized into "clusters of evidence" based on the quantity and consistency of the examples found in the literature. Each "cluster of evidence" addressed a single medical condition, service, and mechanism of waste and serves as a tangible example of how waste in health care can be identified and reduced.

The database has been constructed in such a way that the reader can search for information by many variables: by condition, by service, by mechanism of waste, by site of care, etc. We recognize that these analyses of the peer-reviewed literature offer an incomplete picture of waste, because they only reflect what health services researchers have chosen to investigate and publish. An electronic, searchable version of the database can be found at [www.nehi.net](http://www.nehi.net).

We also acknowledge that despite our best efforts to capture all relevant articles published between 1998 and 2006, some articles were likely missed. We strongly believe, however, that the omission of some articles has not prevented us from creating a thorough compendium that reflects the landscape of waste in clinical care.

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- <sup>17</sup> Pennsylvania Health Care Cost containment Council. Hospital Acquired Infections in Pennsylvania. Issue 5: July 2005.
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# Waste in Health Care

A \$700 Billion Opportunity

## Studies in Brief:

- *Waste and Inefficiency in the U.S. Health Care System* quantifies waste, identifies its root causes and proposes actions to successfully eliminate it.
- *How Many More Studies Will It Take? A Collection of Evidence That our Health Care System Can Do Better* presents compelling evidence of health care waste, from overuse of emergency rooms to medication errors.
- *Improving Physician Adherence to Clinical Practice Guidelines* examines an important source of waste: variation between recommended and delivered care.

## About NEHI

NEHI is an independent, not-for-profit research and health policy organization dedicated to transforming health care for the benefit of patients and their families.

More info at [www.nehi.net](http://www.nehi.net).

## PROBLEM: VALUABLE HEALTH CARE DOLLARS WASTED

The U.S. spends more money on health care than any other nation in the world – nearly \$2.6 trillion annually. Although much of this spending is dedicated to the diagnosis and treatment of disease, a disproportionate and alarming amount of it is wasted, meaning it could be eliminated without reducing the overall quality of care. In fact, many experts believe that **wasteful spending amounts to more than 30 percent of the total health care dollars spent** in the United States.

Addressing waste adds up to an almost **\$700 billion opportunity** to improve the way we administer, manage and deliver health care. Realizing even a fraction of those savings would result in opportunities to redirect substantial funds to increase the quality of and access to care. To achieve this, we must begin by identifying where the waste is, why it exists and how many dollars are wasted.

## SOLUTION: WEED OUT THE WASTE

NEHI has identified **five areas of waste** which, if eliminated, would offer significant potential cost savings to the health care delivery system. In order of greatest financial impact, they are:

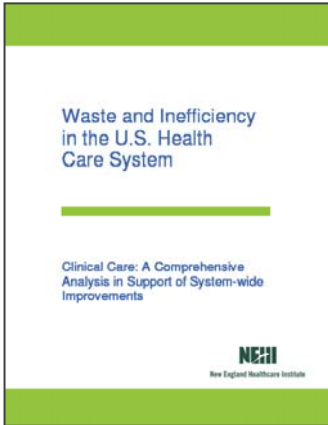
1. **Unexplained variation** in the intensity of medical and surgical services, including but not limited to end of life care, overuse of coronary artery bypass surgery and overuse of percutaneous coronary procedures, with total potential avoidable costs of up to **\$600 billion**;
2. **Misuse of drugs and treatments** resulting in preventable adverse effects of medical care that could save **\$52.2 billion**;
3. **Overuse of non-urgent emergency department care** that could save (conservatively) **\$38 billion**;
4. **Underuse of appropriate medications**:
  - o generic antihypertensives, with potential savings of **\$3 billion**;
  - o controller medicines, particularly inhaled corticosteroids in pediatric asthma, with projected savings of **\$2.5 billion**; and
5. **Overuse of antibiotics** for respiratory infections, with potential savings of **\$1.1 billion**.

NEHI is now pursuing **opportunities to enact policy change** to decrease waste, including:

- Examining causes of **emergency department overuse** for non-urgent conditions;
- Researching ways to improve current care practices through **innovation**;
- Considering ways to advance **information technology adoption**; and
- Improving patient medication adherence

# Sector Spotlight:

## What Health Care Waste Means to You



### MANUFACTURERS (PHARMACEUTICAL, BIOTECHNOLOGY AND DEVICE):

- Underuse of medical innovations, such as drugs, devices and procedures, is a major area of waste
- Failure of physicians to uniformly follow clinical practice guidelines leads to underuse of the most effective technologies
- Underuse of point-of-care testing results in lack of timely treatment for patients

### PROVIDERS:

- Underuse of information technology and systemic issues such as uncoordinated prescribing lead to nearly half of all preventable adverse treatment events
- Hospital-acquired infections cause an estimated 90,000 deaths and cost an estimated \$4.5 to \$5.7 billion each year
- Underuse of clinical practice guidelines creates wide and unexplained variation in medical services, leading to costly and poor-quality care

### PAYERS:

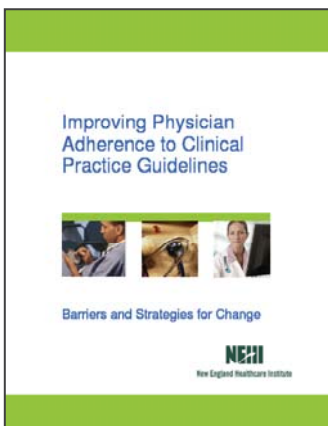
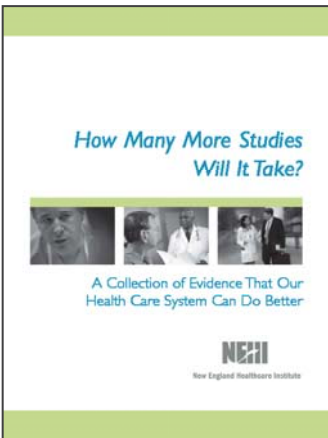
- Cost-effective diagnostic tests are significantly underused
- Wide variation in end-of-life care raises costs to payers and lowers the quality of care for patients
- Overuse of non-urgent emergency department (ED) care costs the system approximately \$38 billion annually

### EMPLOYERS:

- Waste in health care contributes significantly to higher employer costs for care and, ultimately, to higher premiums
- Lack of timely access to primary care services leads to increased absenteeism and loss of employee productivity
- Underuse of information technology by providers results in preventable medical errors and increased employer costs

### PATIENTS' GROUPS:

- Unnecessary procedures expose patients to significant health risks, complications and even death
- Underuse of medically appropriate drugs results in avoidable hospitalizations and unnecessary patient costs
- Misuse of ED services leads to unnecessary tests, hospitalizations and expenses





# NEHI Compendium

## *Misuse*



# Evidence Table—Misuse

## Study

## Outcome

*Inappropriate Prescribing For Elderly Americans In A Large Out-Patient Population*  
**Curtis, L.H., Ostbye, T., Sendersky, V., Hutchison, S., Dans, P. E., Wright, A., Woosley, R.L., Schulman, K. A. ; 2004; Arch Intern Med**

This study retrospectively reviewed claims data from a large national Pharmacy Benefit Manager (PBM) to determine the proportion of elderly patients who are prescribed one or more drugs that “should be avoided at any dose or frequency” in such patients according to revised Beer’s criteria.

There is misuse of some categories of drugs in the elderly. 21% of patients received one prescription drug of concern. 42.5% of these patients received a drug with the potential for severe adverse effects. 15% of patients received 2 prescriptions for drugs of concern. 4% of patients received 3 prescriptions for drugs of concern. Most of the 18 drugs studied were psychotropic drugs or neuromuscular agents.

*Coprescribing And Codispensing Of Cisapride And Contraindicated Drugs [Brief Report]*  
**Jones, J.K., Fife, D., Curkendall, S., Goehring, E. Jr., Guo, J.J., Shannon, M.; 2001; JAMA**

This study retrospectively reviewed an MCO pharmacy claims database to determine the frequency of contraindicated coprescribing and codispensings, in which cisapride and a contraindicated drug were prescribed or dispensed to the same patient for overlapping periods, and the proportion of contraindicated coprescribing by the same physicians and codispensing by the same pharmacies.

270 serious cardiac arrhythmias, including 70 deaths, would likely have been prevented if mutually contraindicated medications had not been misused by prescribing them together. Of 131,485 cisapride prescriptions dispensed after the warnings began, 4,414 (3.4%) overlapped with at least one drug contraindicated in the labeling. Of all overlapping prescription pairs, 2,190 (50%) were by the same physicians, 3,908 (89%) were by the same pharmacies, and 765 (17%) were dispensed on the same day.

# Misuse

## Study

## Outcome

*Potentially Inappropriate Medication Use In The Community-Dwelling Elderly: Findings From The 1996 Medical Expenditure Panel Survey*

**Zhan, C., Sangl, J., Bierman, A.S., Miller, M.R., Friedman, B., Wickizer, S.W., Meyer, G.S.; 2001; JAMA**

This study utilized an expert panel to review 1996 Medical Expenditure Panel Survey (MEPS) data to determine the prevalence of potential medication misuse in patients > age 65, and to examine risk factors for misuse.

In 1996, 21.3% of elders received at least one of 33 potentially inappropriate meds, including 2.6% who received one of the 11 “never use” and 9.1% who received one of the 8 “rarely appropriate” medications. Use of some inappropriate medications declined between 1987 and 1996. Persons with poor health and more prescriptions had a significantly higher risk of inappropriate medication use.

*Costs Of Medical Injuries In Utah And Colorado*

**Thomas, E.J., Studdert, D.M., Newhouse, J.P., Zbar, B.I., Howard, K., M., Williams, E.J., Brennan, T.A.; 1999; Inquiry**

This study consisted of a retrospective review of a random sample of records drawn from 28 hospitals in Colorado and Utah to estimate the frequency and costs of adverse events (AEs) in Colorado and Utah.

Half of AEs are avoidable, 46% occur in outpatient setting, and costs are identified.

*Pain Medication Beliefs And Medication Misuse In Chronic Pain*

**Schieffer, B.M., Pham, Q., Labus, J., Baria, A. van Vort, W., Davis, P., Davis, F., Naliboff, B.D.; 2005; J Pain**

This study surveyed 288 consecutive patients referred to a Veterans Administration Medical Center (VAMC) multidisciplinary pain clinic to assess the influence of medication beliefs, symptom severity, disability, mood, and psychiatric history on opiate medication misuse in chronic pain patients.

Misusers believed more strongly in the potential for opiate addiction and that they required higher doses than others. They also had a greater belief in opiate effectiveness and the importance of free access. Patients with a history of substance abuse report stronger beliefs in opiate effectiveness and show awareness of their addiction potential.



# Misuse

## Study

## Outcome

*Association Between Early Returns And Frequency Of ED Visits At A Rural Academic Medical Center*

**Riggs, J. E., Davis, S. M., Hobbs, G.R., Paulson, D.J., Chinnis, A.S., Heilman, P.L.; 2003; Am J Emerg Med**

This study analyzed emergency department (ED) visits to examine the influence of frequent ED visits on early returns to the ED.

Early return visits may be a result of poor quality in the first visit or use of ED for non urgent medical problems and follow-up. Early return visits were more frequent ( $p < 0.0001$ ) when an individual made four or more visits per year.

*Oral Antibiotic Use Without Consulting A Physician: A Survey Of ED Patients*

**Richman, P.B., Garra, G., Eskin, B., Nashed, A.H., Cody, R.; 2001; Am J Emerg Med**

This study was a prospective survey of patients presenting to an academic emergency department (ED) to estimate the extent to which patients use antibiotics without consulting a physician.

Patients are inappropriately self-prescribing antibiotics, leading to increased resistance. A significant proportion of patients (17%) reported that they had used "left-over" antibiotics over the past year without consulting their physician, most commonly for a cough (11%) or sore throat (42%), and much less frequently for urinary tract infection (UTI) symptoms (0.7%).

*Drug Use Inefficiency: A Hidden Source Of Wasted Health Care*

**Gillerman, R.G., Browning, R.A.; 2000; Anesth Analg**

This study prospectively documented drug waste in a single anesthesia department for one year.

The cost of waste (disposal of full/partially full syringes of drugs) was over \$165,000 annually, representing 26% of the expenditure for all drugs used in the department.

## Misuse

### Study

*Potentially Inappropriate Medication Use By Elderly Persons In U. S. Health Maintenance Organizations: 2000-2001*

**Simon, S. R., Chan, K.A., Soumerai, S.B., Wagner, A.K., Andrade, S.E., Feldstein, A.C., Lafata, J.E., Davis, R.L. Gurwitz, J. H.; 2005; J Am Geriatr Soc**

This study reviewed pharmacy data for 157,517 patients >age 65 who were members of 10 health maintenance organizations (HMOs) to determine the rate at which 33 “potentially inappropriate” meds are prescribed for persons >65 years old in 10 geographically diverse HMOs. Authors examined HMO administrative databases to determine prescriptions that were picked up or delivered to members.

*Asthma Medication Use And Disease Burden In Children In A Primary Care Population*

**Lozano, P., Finkelstein, J. A., Hecht, J., Shulruff, R., Weiss, K.B.; 2003; Arch Pediatr Adolesc Med**

This study used data from patients enrolled in the Pediatric Asthma Care Patient Outcomes Research Team (PAC PORT) study to describe the use of asthma medications, to determine if the use of “controller” medications and “reliever” medications is consistent with guidelines, and to estimate the adequacy of asthma control.

### Outcome

These 33 meds continue to be prescribed at rates similar to those in 1996 despite publication of guidelines advising against this. 28. 1% of subjects received at least 1 of these meds. Women more than men. Those with higher chronic disease scores were more likely to receive an inappropriate prescription.

In a population of children with health insurance, this study found the following to be common: (1) inappropriate reliance on “reliever” medications, and (2) non-adherence to “controller” medications. Inadequate asthma control was common regardless of whether or not “controller” medications were prescribed.

# Misuse

## Study

*Preventable Medical Injuries In Older Patients*  
**Rothschild, J. M., Bates, D.W., Leape, L.L., 2000; Arch Intern Med**

The article reviews the literature concerning the broad topic of preventable medical injuries in the elderly, which includes 6 categories: adverse drug events, falls, nosocomial infections, pressure sores, delirium, and surgical and perioperative complications.

## Outcome

For each of the six categories of injuries, older patients appear to be at higher risk. For medications, various interventions have been successful, and fall prevention programs have been demonstrated to be effective.

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*Use Of Inappropriate Prescription Drugs By Older People*

**Hanlon, J.T., Schmader, K.E., Boulton, C. Artz, M.B., Gross, C.R., Fillenbaum, G.G., Ruby, C.M., Garrard, J.; 2002; J Am Geriatr Soc**

This study examined data from 5,742 patients in the Duke Established Populations for Epidemiological Studies of the Elderly in order to determine the prevalence and predictors of inappropriate drug prescribing for community-dwelling older people.

20% of community dwelling seniors are prescribed inappropriate medications.

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*Update On Drug-Related Problems In The Elderly*

**Hanlon, J.T., Lindblad, C.I., Hajjar, E. R., McCarthy, T. C. ; 2003; Am J Geriatr Pharmacother**

This article reviewed 7 articles published in 2002 and 2003 on drug-related problems, inappropriate prescribing, and adverse drug events in the elderly.

Drug-related problems are common in elderly patients. Three articles described in this review article describe the development of sets of “quality indicators” for medication use in the elderly. Examples of quality indicators include the following: what drugs to avoid in the elderly, what drugs need lab monitoring (such as the international normalized ratio (INO) for warfarin), and what drug-to-drug interactions to watch out for.

# Misuse

## Study

## Outcome

*Misdiagnosed Patients With Bipolar Disorder: Comorbidities, Treatment Patterns, And Direct Treatment Costs*

**Matza, L.S., Rajagopalan, K.S., Thompson, C.L., Lissovoy G.; 2005; J Clin Psychiatry**

This study reviews data from the MarketScan Commercial Claims and Encounters (CCE) claims database to examine comorbidities, treatment patterns, and direct treatment costs of patients with bipolar disorder who are misdiagnosed with unipolar depression.

Some patients with bipolar disorder are getting inappropriate care because they are initially misdiagnosed as depressed. The study found that bipolar patients who are initially misdiagnosed as depressed (8%) are more likely to have comorbid personality disorder, psychosis, and substance abuse than patients correctly diagnosed with depression, and more likely to have comorbid general anxiety and panic than patients correctly diagnosed with bipolar disorder.

*Acute Stroke: Delays To Presentation And Emergency Department Evaluation*

**Kothari, R., Jauch, E., Broderick, J., Brott, T., Sauerbeck, L., Khoury, J., Liu, T.; 1999; Ann Emerg Med**

Information from 151 stroke patients was obtained in order to document pre-hospital and in-hospital time intervals from stroke onset to emergency department evaluation and to identify factors associated with presentation to the emergency department within 3 hours of symptom onset, which is the current time window for thrombolytic therapy.

There were 151 stroke patients in the study. Time of stroke onset and time to ED arrival were documented for 119 patients. The median time from stroke onset to ED arrival was 5.7 hours. Median time from ED arrival to physician evaluation was 20 minutes. Median time from ED arrival to computed tomographic evaluation was 72 minutes. When patients were asked the main reason they sought medical attention, 40% of those able to be interviewed said that they themselves did not decide to seek medical attention, but rather a friend or family member told them they should go to the hospital.

*Inappropriate Medication Prescribing In Residential Care/Assisted Living Facilities*

**Sloane, P.D., Zimmerman, S., Brown, L.C., Ives, T.J., Walsh, J.F.; 2002; J Am Geriatr Soc**

Medical records were reviewed from 2,078 patients from 193 residential care or assisted living facilities in order to identify the extent to which inappropriately prescribed medications (IPMs) are administered and to describe facility and resident factors associated with IPMs.

The majority of patients were taking 5 or more medications. 16.0% of these patients were receiving IPMs. IPM use was associated with the number of medications received, smaller facility bed size, nurse turnover, absence of dementia, low monthly fees, and absence of weekly physician visits.

# Misuse

## Study

*High Rates Of Adverse Drug Events In A Highly Computerized Hospital*  
**Nebeker, J.R., Hoffman, J.M., Weir, C.R., Bennett, C.L., Hurdle, J.F; 2005; Arch Intern Med**

This study retrospectively reviewed admissions to a VAMC to determine the rate and type of inpatient adverse drug events (ADEs) following adoption of a computerized order entry system (CPOE).

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*Frequency, Consequences And Prevention Of Adverse Drug Events*  
**Bates, D.W.; 1999; J Qual Clin Practice**

This article reviews the literature regarding adverse drug events and considers in detail the results of the adverse drug event (ADE) prevention Study at Brigham and Women's Hospital.

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*Reducing The Frequency Of Errors In Medicine Using Information Technology*  
**Bates, D.W., Cohen, M., Leape, L.L. Overhage, J.M., Shabot, M.M. Sheridan, T.; 2001; J Am Med Inform Assoc**

This paper describes how the frequency and consequences of errors in medical care can be reduced (although in some instances they are potentiated) by the use of information technology in the provision of care, and to make general and specific recommendations regarding error reduction through the use of information technology.

## Outcome

During the follow-up period, 483 adverse drug effects (ADEs) were identified, for a rate of 52 ADEs per 100 admissions. Of these, 9% resulted in serious harm. The large majority of errors (86%) occurred at the ordering and monitoring stages.

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6% of admissions resulted in an adverse drug event, of which 28% were preventable.

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Computerized physician order entry systems can decrease the rate of serious medication errors by 55%, and overall medication errors by 83%.

## Misuse

### Study

*Pediatric Medication Errors: What Do We Know? What Gaps Remain?*

**Kaushal, R., Jaggi, T. Walsh, K., Fortescue, E. B., Bates, D.W.; 2004; Ambul Pediatr**

This study builds on other classic Harvard studies and published literature to assess the causes and frequency of pediatric medication errors.

*Incidence And Preventability Of Adverse Drug Events Among Older Persons In The Ambulatory Care Setting*

**Gurwitz, J.H., Field, T.S., Avorn, J., McCormick, D., Jain, S., Eckler, M., Benser, M., Edmondson, A.C., Bates, D.W.; 2003; JAMA**

This study employed a cohort of 30,397 Medicare beneficiaries in a multispecialty group practice to estimate the incidence of adverse drug events (ADEs). ADEs were detected via provider reporting, claims and chart review, and administrative reporting.

*Adverse Drug Events In Emergency Department Patients*

**Hafner, J.W., Jr., Belknap, S.M., Squillante, M.D., Bucheit, K.A.; 2002; Ann Emerg Med**

This was a retrospective review of visits to a tertiary academic emergency department (ED) to examine the rate and consequences of adverse drug events (ADEs) in an emergency department setting.

### Outcome

Pediatric medication errors are common. 6% of pediatric prescriptions may contain an error, and 2.3%-6% of pediatric inpatients may suffer an adverse drug event (ADE).

During the follow-up period, 1,523 ADEs were identified, of which 28% were considered preventable. 38% of ADEs were considered serious, life-threatening, or fatal, of which 42% were deemed preventable. Errors occurred most frequently at the stages of prescribing and monitoring.

During the follow-up period, 321 suspected and 217 probable ADEs were identified. Most occurred prior to ED evaluation. Insulin and warfarin were the drugs most often associated with ADEs.

# Misuse

## Study

*Medication Errors And Adverse Drug Events In Pediatric Inpatients*

**Kaushal, R., Bates, D.W., Landrigan, C., McKenna, K.J., Clapp, M.D., Federico, F., Goldmann, D.A.; 2001; JAMA**

This prospective study conducted at Children's Hospital Boston and Brigham & Women's Hospital followed a cohort of 1,120 pediatric patients to estimate the frequency of ADEs.

## Outcome

During the follow-up period, 616 medication errors, 115 potential adverse drug events (ADEs), and 26 ADEs were detected. Of the ADEs, 5 (19%) were preventable. Most errors occurred at the drug ordering stage.

*Mistakes Happen. Improved Processes Mean Fewer Mistakes.*

**Bubin, C.; 1999; Ambul Outreach**

This article discusses avoiding mistakes by improving quality DURING the patient visit process. (This is in contrast to doing quality inspection AFTER an error has occurred, when it is already too late to help that individual patient. )

Mistakes in medical care can be avoided by improving quality during the patient visit.

*Use Of Hospital Emergency Departments For Nonurgent Care: A Persistent Problem With No Easy Solutions*

**Gill, James; 1999; Am J Manag Care**

This editorial discusses the role of educational materials and 24/7 nurse advice lines in reducing inappropriate emergency department (ED) use.

Educational pamphlets and nurse advice lines did not significantly alter inappropriate ED use.

*Potential For Misuse Of Sedatives*

**Sareen, J., Enns, M.W., Cox, B.J.; 2004; Am J Psychiatry**

This letter responds to a review article on the public health problem of insomnia which indicated that "the liability of abuse of benzodiazepines is generally low. "

The letter expresses concern that lifetime prevalence of benzodiazepine abuse is too high to take lightly, citing such statistics as 1. 2% in the epidemiologic catchment area (ECA), and 0. 3% in an analysis of theirs, with 4. 3% non-prescription use. They point out that lifetime sedative misuse has a high correlation with psychiatric disorders.

# Misuse

## Study

## Outcome

*Poverty, Health Care, And Problems Of Prescription Medication: A Case Study*

**Anglin, M.K., White, J.C.; 1999; Subst Use Misuse**

This study used observational and interview methods to examine the relationship between poverty, limited access to health care, and prescription medication use and misuse in rural eastern Kentucky.

Four patterns of prescription drug misuse are documented in this study: 1) the over-use of medications; 2) the acquisition of prescription drugs for the purpose of resale through illegal channels; 3) the borrowing or “swapping” of medications through informal exchange; and 4) the under- or non-use of prescription drugs.

*Disparities In Dental Service Utilization Among Alabama Medicaid Children*

**Dasanayake, A.P., Li, Y., Wadhawan, S. Kirk, K., Bronstein, J., Childers, N.K.; 2002; Community Dent Oral Epidemiol**

To evaluate the effect of racial and other factors related to dental care utilization among Medicaid eligible children.

Dental services are used by a minority of Medicaid-eligible children. Fewer black children (24%) and other non-white racial groups (22%) utilized dental services compared with white children (31%). Fewer adolescents aged 15-19 (15%) obtained dental care compared with younger age groups (30%).

*Potentially Inappropriate Medication Prescriptions Among Elderly Nursing Home Residents: Their Scope And Associated Resident And Facility Characteristics*

**Lau, D.T., Kasper, J.D., Potter, D.E., Lyles, A., Potentially Inappropriate Medication; 2004; Health Serv Res**

To estimate the scope of potentially inappropriate medication prescriptions (PIRx), among U. S. nursing home residents and to examine facility and patient characteristics associated with such PIRx.

Potentially inappropriate medication prescriptions (PIRx) are common among NH residents older than 65 years of age. 50% of patients who resided in NH for more than 3 months in 1996 received at least 1 PIRx; 40% represented an “inappropriate choice”, 11% excess dosage, 13% drug-disease interaction. In 35% of cases the PIRx persisted for the entire year. 34% of the PIRx were “severe.”



# Misuse

## Study

*Prevalence Of Illicit Drug Use Among Individuals With Chronic Pain In The Commonwealth Of Kentucky: An Evaluation Of Patterns And Trends.*

**Manchikanti, L., Fellows, B., Damron, K.S., Pampati, V., McManus, C.D.; 2005; J Ky Med Assoc**

A study of patients receiving controlled substances in an interventional pain management practice in Western Kentucky to evaluate the prevalence of illicit drug use, opioid abuse and noncompliance with opioid therapy.

## Outcome

Overall illicit drug use, opioid abuse and noncompliance of opioids are significant in Western Kentucky patients receiving Medicaid as primary insurance or as supplemental insurance to Medicare. Patients with third-party insurance showed 17% prevalence of illicit drug use; with Medicare with or without third party insurance 10%; Medicare and Medicaid 24%; and patients with only Medicaid 39%.

*Antibiotic Resistance And The Need For The Rational Use Of Antibiotics*

**Hueston, W. J., Dickerson, L. ; 2001; J Med Liban**

This article reviews common reasons for overuse of antibiotics in primary care settings and some strategies for reducing inappropriate antibiotic prescribing.

There are several reasons for antibiotic overuse in primary care settings. There are multiple different strategies that can be used to combat this problem.

*The Glaucoma Medications Taken By Their Patients*

**Jampel, H.D., Parekh, P., Johnson, E., Miller, R., Chart Documentation By General Physicians Of; 2005; Am J Ophthalmol**

Chart review of primary care physicians (PCPs) caring for glaucoma patients to determine the accuracy of documentation of eye drops used by these patients.

PCPs may not be completely documenting medicines their patients are being prescribed by specialists. The study found that many patients taking glaucoma eye drops according to their specialists' charts did not have record of glaucoma or the medicines in their PCPs charts. 14% had no mention of glaucoma or drops; 31% mentioned glaucoma, but not drops; 8% mentioned glaucoma and "eyedrops" without specifying medication(s); 7% specified eyedrops, but no glaucoma; 40% mentioned glaucoma and specific drops.

# Misuse

## Study

## Outcome

*Medication Use In Nursing Homes For Elderly People*

**Furniss, L., Craig, S.K., Burns, A.; 1998; Int J Geriatr Psychiatry**

This article reviews the topic of psychotropic drug use in nursing homes.

A number of studies have highlighted the overuse of psychotropic drugs. The identification of methods by which to improve awareness of inappropriate medication prescription and to avoid certain types of drugs is required.

*Evaluating The Capability Of Information Technology To Prevent Adverse Drug Events: A Computer Simulation Approach*

**Anderson, J.G., Jay, S.J., Anderson, M., Hunt, T.J.; 2002; J Am Med Inform Assoc**

This study used a computer simulation model to estimate how effective information technology applications were in detecting and preventing medication errors and the resulting adverse drug events (ADEs). The study used data from one private teaching hospital.

The computer simulation model estimated that an integrated medication delivery system can save up to 1,226 days of excess hospitalization and \$1.4 million in associated costs annually in a large hospital.

*Ciprofloxacin Use And Misuse In The Treatment Of Travelers' Diarrhea*

**Day, L.J., Golden, W., Lannen, L., Engleberg, N.C.; 2003; Am J Med**

This study, which is described in a letter to the editor, conducted post-travel telephone interviews of 99 people who had attended a travel clinic before their travels. The goal was to describe their pattern of use of ciprofloxacin, which had been prescribed in case of traveler's diarrhea.

Only 7 of the 17 patients who had traveler's diarrhea took ciprofloxacin, even though they had been prescribed the medicine. Only 2 patients took ciprofloxacin as directed.

# Misuse

## Study

*Drug-Related Morbidity And Mortality: Updating The Cost-Of-Illness Model*  
**Ernst, F.R., Grizzle, A.J.; 2001; J Am Pharm Assoc (Wash )**

To estimate the annual morbidity and mortality from “drug-related problems” (DRPs) including untreated indication, improper drug selection, sub-therapeutic dose, failure to receive drugs, overdosage, adverse drug reactions, drug interactions, and drug use without indication.

*Incidence And Preventability Of Adverse Drug Events In Nursing Homes*

**Gurwitz, J.H., Field, T.S., Avorn, J. McCormick, D., Jain, S., Eckler, M., Benser, M., Edmondson, A.C., Bates, D.W.; 2000; Am J Med**

Adverse drug events (ADEs), especially those that may have been preventable, are among the most serious concerns about medication use in nursing homes. We studied the incidence and preventability of ADEs and potential adverse drug events in nursing homes.

*The Incidence Of Adverse Drug Events In Two Large Academic Long-Term Care Facilities*

**Gurwitz, J.H., Field, T.S., Harrold, L.R., Rothschild, J., Debellis, K., Seger, A.C., Cadoret, C., Fish, L.S., Garber, L., Kelleher, M., Bates, D.W.; 2005; Am J Med**

This study used chart reviews of 1,247 residents of academic long term care facilities to estimate the incidence of adverse drug events (ADEs) in long- term care settings.

## Outcome

Using a decision-analytic model, the authors estimate the cost of drug-related morbidity and mortality in the year 2000 to be \$177. 4 billion. Hospitalization accounted for approximately 70% of total cost.

During the year of follow-up, there were 546 ADEs of which 51% were thought to be preventable. Preventable errors occurred most commonly at the stages of ordering and monitoring.

During the follow-up period, 815 ADE were identified (9. 8 per 100 patient-months), of which 42% were deemed preventable. Errors were most likely to occur at the ordering and monitoring stages. Patients taking antipsychotics, anticoagulants, diuretics, and antiepileptics were at increased odds of ADEs.





# NEHI Compendium

## *Overuse*



# Evidence Table—Overuse

## Study

## Outcome

### *Revisiting The Appropriateness Of Carotid Endarterectomy*

**Halm, E.A., Chassin, M.R., Tuhim, S., Hollier, L.H., Popp, A.J. Ascher, E., Dardik, H., Faust, G., Riles, T.S.; 2003; Stroke**

This study was a retrospective chart review of 2,124 procedures in 6 New York hospitals to determine appropriateness of carotid endarterectomy based on Rand effectiveness criteria.

There are 14,000 inappropriate cases of carotid endarterectomy annually. 84.9% of cases were judged to be appropriate, an increase from earlier studies (35% of Medicare cases judged appropriate). 10.6% judged inappropriate, primarily due to high co-morbid conditions.

### *Antibiotics For Upper Respiratory Tract Infections In Ambulatory Practice In The United States, 1997-1999: Does Physician Specialty Matter?*

**Rutschmann, O.T., Domino, M.E.; 2004; J Am Board Fam Pract**

This study used 1997-1999 National Ambulatory Medical Care Survey (NAMCS) data to examine antibiotic use for upper respiratory infection (URI) as a function of patient, physician and practice characteristics.

Antibiotics are overused for URI. Patients were less likely to receive antibiotic prescriptions from general internists than family practitioners. Rate of prescriptions written for URI decreased over the study period from 52.1% to 41.5%.

### *The Appropriateness Of Recommendations For Hysterectomy*

**Broder, M.S., Kanouse, D.E., Mittman, B.S., Bernstein, S.J.; 2000; Obstet Gynecol**

This study retrospectively reviewed the records of women who underwent hysterectomy in nine capitated medical groups in California to determine the appropriateness of recommendation for hysterectomy (not the surgery itself) based on guidelines developed by expert panel and three criteria sets published by American College of Obstetricians and Gynecologists (ACOG). The surgeries were actually performed prior to the publication of the guidelines used.

Chart reviews revealed that 70% of charts did not completely meet all indications for hysterectomy. The most common failures were lack of adequate diagnostic testing and failure to try alternative treatments prior to hysterectomy. The ultimate significance, however, is questionable, as the panel estimated that only 14% of procedures were actually inappropriate.

# Overuse

## Study

## Outcome

*Overuse Of Transthoracic Echocardiography In The Diagnosis Of Native Valve Endocarditis*

**Kuruppu, J.C., Corretti, M., Mackowiak, P., Roghmann, M.C.; 2002; Arch Intern Med**

This study reviewed hospital records of 98 patients with suspected infective endocarditis who underwent Transthoracic Echocardiography (TTE) to determine the impact that the study had on treatment decisions.

TTE is overused in cases of infective endocarditis (IE). The diagnosis of IE is a clinical diagnosis, and the results of the TTE did not significantly affect the duration of antibiotic therapy. The authors propose a new algorithm that would result in elimination of 53% of the TTEs done in this study, which can be avoided by treating patients empirically until the blood culture results are negative.

*Antibiotic Treatment Of Children With Sore Throat*

**Kuruppu, J.C., Corretti, M., Mackowiak, P., Roghmann, M.C.; 2005; JAMA**

The study used National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) data to measure rates of antibiotic prescribing and Group A Hemolytic Streptococcus (GABHS) testing and to evaluate the association between testing and antibiotic treatment in children with sore throat.

Antibiotics are generally overused, and the wrong antibiotics are prescribed (and misused) 27% of the time. Testing for GABHS is underused. Antibiotics were prescribed in 53% of visits for sore throats in children aged 3-17. Antibiotics are indicated for sore throats due to Group A Beta Hemolytic Streptococci infection, which accounts for only 15-36% of sore throats. When antibiotics are prescribed, the correct antibiotic is prescribed 73% of the time. Only 57% of children with a diagnosis of tonsillitis, strep sore throat, and pharyngitis had the GABHS test.



## Overuse

### Study

### Outcome

*Use Of Adenosine In Patients Hospitalized In A University Medical Center*

**Knight, B.P., Zivin, A., Souza, J., Goyal, R., Man, K.C., Strickberger, A., Morady, F.; 1998; Am J Med**

40% of hospitalized patients received adenosine for arrhythmias where adenosine is not indicated. 26 patients from the series were excluded because there was no evidence of their specific arrhythmia.

This retrospective record review of patients administered adenosine for tachyarrhythmias, combined with house staff surveys, was used to identify the heart rhythms for which patients are prescribed adenosine, and to identify reasons for misuse. This was done by looking at patients who received adenosine, and giving resident physicians a questionnaire about reading electrocardiograms (EKGs) and the appropriate use of adenosine.

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*Emergency Medicine Versus Primary Care: A Case Study Of Three Prevalent, Costly, And Non-Emergent Diagnoses At A Community Teaching Hospital*

**Martin, BC; 2000; J Health Care Finance**

Costs were significantly higher in the ED.

This study examines the implications of implementation of a prospective payment system for Medicare emergency department (ED) visits, using a large tertiary hospital as a data source. Costing systems were examined, and ED costs compared to outpatient primary care. For upper respiratory infections, ED costs were on average double those of out patient care, largely due to differences in ancillary tests ordered and prescription costs.

## Overuse

### Study

### Outcome

*Effectiveness Of A Medical Priority Dispatch Protocol For Abdominal Pain*

**Kennedy, J.D., Sweeney, T.A., Roberts, D., O'Connor, R.E.; 2003; Prehosp Emerg Care**

This study retrospectively reviewed the records of a regional Emergency Medical Service (EMS) service to determine the proportion of patients with abdominal pain who would benefit from advanced life support (ALS) when called for by these protocols.

Hospital records were available for 86% of cases, of which 12 were potentially life-threatening, requiring ALS intervention. Seventeen were non-life-threatening, but potentially benefited from ALS intervention. The remaining 157 were classified as not requiring ALS.

*A Clinician's Guide To The Appropriate And Accurate Use Of Antibiotics: The Council For Appropriate And Rational Antibiotic Therapy (CARAT) Criteria*

**Slama, T.G., Amin, A., Brunton, S.A., File, T.M., Jr., Milkovich, G., Rodvold, K.A., Sahm, D.F., Varon, J., Weiland, D., Jr.; 2005; Am J Med**

This study reviews literature regarding appropriate use of antibiotics.

The rate of misuse and overuse of antibiotic prescriptions might be lowered if clinicians were to use the 5 Council for Appropriate and Rational Antibiotic Therapy (CARAT) criteria to help select appropriate antibiotics. The 5 criteria of CARAT (evidence-based results, therapeutic benefits, safety, optimal drug for the optimal duration, and cost effectiveness) are important to consider when choosing an appropriate and accurate antibiotic therapy.

*Antibiotic Prescribing For Children With Colds, Upper Respiratory Tract Infections And Bronchitis*

**Nyquist, A.C., Gonzales, R., Steiner, J.F., Sande, M.A.; 1998; JAMA**

This study drew upon the responses of physicians to the 1992 National Ambulatory Care Medical Care Survey (NAMCS) to evaluate antibiotic prescribing practices for children younger than 18 years, who were diagnosed with a cold, upper respiratory infection, or bronchitis in the U.S., among pediatricians and nonpediatricians.

Overuse and underuse of antibiotics may result because some provider groups are more inclined to prescribe than others; also some patient groups are more likely to receive antibiotics than others. Pediatricians were 0.57 times less likely to prescribe antibiotics to children with otitis, sinusitis, or pharyngitis than non-pediatricians.

## Overuse

### Study

### Outcome

*Ceftriaxone Use In The Emergency Department: Are We Doing It Right?*

**Jain, S., Sullivan, K.; 2002; Pediatr Emerg Care**

This study evaluates ceftriaxone use in an urban pediatric emergency department (PED) to determine if overuse exists based on published guidelines for management of febrile infants.

Based on published guidelines, ceftriaxone use in the PED was not justified in the majority of cases (66.4%, with an additional 17% representing questionable use).

*Insurance Coverage And Health Care Consumers' Use Of Emergency Departments: Has Managed Care Made A Difference?*

**Speck, S.K., Peyrot, M., Hsiao, C.W.; 2003; J Hosp Mark Public Relations**

This study used National Hospital Ambulatory Medical Care Survey (NAHMCS) data from 1992 and 1996 to determine the effect of managed care on appropriateness of emergency department (ED) utilization.

The proportion of non-urgent ED visits decreased from 57.1% of visits in 1992 to 55.8% in 1996. However, over- and misuse of the ED did not decrease more for managed care patients compared with fee-for-service patients, nor for insured compared with uninsured patients.

*Prospective Determination Of Medical Necessity For Ambulance Transport By Paramedics*

**Gratton, M.C., Ellison, S.R., Hunt, J. Ma, O.J.; 2003; Prehosp Emerg Care**

This study prospectively assessed the medical necessity of emergency transport by a large urban EMS system.

Paramedics and emergency physicians agreed that a significant percentage of patients (30% for paramedics, 29% for physicians) did not require ambulance transport (76.2% agreement) to the emergency department.

# Overuse

## Study

## Outcome

*Cervical Cancer Screening Among Women With And Without Hysterectomies.*

**Eaker, E.D., Vierkant, R.A., Konitzer, K.A., Remington, P.L.; 1998; Obstet Gynecol**

This retrospective record and claims review compared cervical cancer screening rates in women who had previously undergone hysterectomy to women who had not.

Pap testing rates vary by type and reason for hysterectomy. Women with hysterectomy for malignancy have 1 more test a year than women without, and women with hysterectomy for benign reasons have 1 fewer test (potential overuse).

*Antibiotic Resistance: The Iowa Experience*

**Bell, N; 2002; Am J Manag Care**

This study reviews the literature and reports on the prevalence of drug-resistant Strep pneumonia in Iowa. The Department of Public Health convened a multidisciplinary task force in January 1998 to develop strategies to combat antibiotic resistance in the state because they were alarmed by these reports.

The profiling and educational interventions led to a substantial decrease in both overall antibiotic prescribing and drug costs. Other states may want to undertake similar programs to help protect their citizens from infections caused by resistant pathogens.

*Health Insurance, Primary Care, And Preventable Hospitalization Of Children In A Large State*

**Friedman, B., Basu, J.; 2001; Am J Manag Care**

This study was a retrospective record review of 1994 hospital discharge data for New York resident children with Ambulatory-Care Sensitive (ACS) conditions. Relationship between ACS admission rates and several factors were analyzed.

Admission rates for ACS conditions in New York children were higher in locations where there were fewer primary care physicians, lower percents of children with private health maintenance organization (HMO) insurance, and higher proportions of non-white ethnic groups.

# Overuse

## Study

## Outcome

*Lansoprazole Overutilization: Methods For Step-Down Therapy*

**Pohland, C.J., Scavnicky, S.A., Lasky, S.S., Good, C.B.; 2003; Am J Manag Care**

46% (n = 60) of recommended step-down therapies were accepted, resulting in an \$85,000 savings per year.

This study used a retrospective record review of all patients with prescriptions for lansoprazole at a Veterans Affairs Medical Center (VAMC) to identify the documented indications for long-term lansoprazole therapy and recommend appropriate step-down therapy in order to improve patient care and reduce medical costs.

*Trends In Antimicrobial Prescribing For Bronchitis And Upper Respiratory Infections Among Adults And Children*

**Mainous, A.G., III Hueston, W.J., Davis, M.P., Pearson, W.S.; 2003; Am J Public Health**

Inappropriate use of antibiotics for viral URI has decreased, but 10% of children and 20% of adults still receive inappropriate treatment.

This study used data from the National Ambulatory Medical Care Survey from 1993, 1995, 1997, and 1999 to examine antimicrobial prescribing patterns for adults and children with bronchitis or upper respiratory infections (URIs) before and after the 1998 release of national pediatric practice recommendations for minimizing use of antibiotics, and starting with narrow-spectrum medications if needed.

# Overuse

## Study

## Outcome

*The Impact Of Peer Management On Test-Ordering Behavior*

**Neilson, E.G., Johnson, K.B., Rosenbloom, S.T., Dupont, W.D., Talbert, D., Giuse, D.A., Kaiser, A., Miller, R.A.; 2004; Ann Intern Med**

This retrospective review of inpatient records in a large tertiary hospital was designed to examine whether changes to the software of a care provider order entry system (CPOE) at a large academic hospital could reduce variability in ordered lab tests, chest x-rays, and EKGs.

Peer management reduced provider variability. Hospitals with growing health care costs can improve resource utilization through peer management by using CPOE systems.

*Clinical And Economic Outcomes Assessment In Nuclear Cardiology*

**Shaw, L.J., Miller, D.D., Berman, D.S., Hachamovitch, R.; 2000; Q J Nucl Med**

This article reviews the current state of the evidence on the clinical and economic data regarding different nuclear cardiology imaging tests. A synthesis of current economic evidence for gated, Single-Photon Emission Computed Tomography (SPECT) is also presented.

The overuse of diagnostic angiography often leads to unnecessary revascularization that does not lead to improvement in outcome. Thus, the potential exists that stress SPECT imaging, a highly effective diagnostic tool, could reduce the inappropriate use of an invasive procedures resulting in cost-effective cardiac care.

## Overuse

### Study

*Self-Reported Papanicolaou Smears And Hysterectomies Among Women In The United States*

**Saraiya, M., Lee, N.C., Blackman, D., Smith, M.J., Morrow, B., McKenna, M.A.; 2001; Obstet Gynecol**

This study used 1992-1997 BRFSS, 1993-1994 NHIS, and 1980-1997 NHDS data to estimate the rates of Papanicolaou smears in women post hysterectomy.

### Outcome

There is significant overuse of pap smears following hysterectomy. 74.2-78.3% of women who have had a hysterectomy self-reported that they had a pap smear within the past 3 years. 77.2-82.1% of women without a hysterectomy self-reported that they had a pap smear within the past 3 years. Only 6.7-15.4% of women who had a hysterectomy need to have a pap smear due to supracervical hysterectomy or history of cervical neoplasia (including cervical cancer). 10.6-11.6 million pap smears were done unnecessarily at a cost of \$375-505 million for the study period, based on cost data for 1997.

*Antimicrobial Use For Pediatric Upper Respiratory Tract Infections (URI): Reported Practice, Actual Practice, Parental Beliefs*

**Watson, R.L., Dowell, S.F., Jayaraman, M., Keyserling, H., Kolczak, M., Schwartz, B.; 1999; Pediatrics**

This study surveyed 336 pediatricians and family physicians in Georgia regarding opinions of the treatment of URIs. Random chart reviews and parent interviews were performed in 25 randomly selected practices in order to examine the factors that relate to the over-prescribing of antibiotics in children 5 years of age and younger.

The overuse of antibiotics is prevalent for the 5 conditions studied in pediatric patients, despite stated beliefs that over-prescribing contributes to antibiotic resistance. The reasons cited included parental pressure, desire to avoid a follow-up visit in managed care patients, and a belief that parents could elect to obtain antibiotics from colleagues. Despite survey results indicating that pediatricians and family practitioners recognize the problems associated with overuse of antibiotics for URI, survey results (including both pediatricians and family physicians) and chart reviews (pediatricians only) showed significant levels of over-prescribing of antibiotics. Overprescribing was worse for family physicians compared with pediatricians and especially common for diagnoses of: sinusitis, purulent rhinitis, and common cold.

# Overuse

## Study

## Outcome

*Factors Affecting Prescription Of Ultra-High Potency Topical Corticosteroids In Skin Disease: An Analysis Of US National Practice Data*  
**Balkrishnan, R., Camacho, F.T., Pearce, D.J., Kulkarni, A.S., Spencer, L., Fleischer, A.B., Jr. Feldman, S.R.; 2005; J Drugs Dermatol**

This study analyzed data from the National Ambulatory Medical Care Survey (NAMCS) to examine the prescribing patterns of Class I (ultra-high potency) topical corticosteroids in patients with skin disease.

Class I topical corticosteroids were prescribed in 3% of all skin disease-related visits, with prescription rates being highest in psoriasis (22%). There were a large number of questionable prescriptions for other conditions, which could be construed as improper use of these medications.

*Characteristics Of Nonurgent Emergency Department Use In The First 3 Months Of Life*  
**Pomerantz, W.J., Schubert, C.J., Atherton, H.D. Kotagal, U.R.; 2002; Pediatr Emerg Care**

This study analyzed 965 visits by infants in the first 3 months of life to a single urban emergency room to determine the characteristics of non-urgent emergency room visits.

60.1% of all visits were nonurgent. Of all patients with non-urgent visits, 24.1% had more than 1. Younger maternal age, Medicaid, maternal parity, and non-white race all resulted in increased nonurgent emergency department (ED) use.

*Impact Of Simple Screening Criteria On Utilization Of Low-Yield Bacterial Stool Cultures In A Children's Hospital*  
**Zaidi, A.K., Macone, A., Goldmann, A.D.; 1999; Pediatrics**

This study used a retrospective analysis of hospital laboratory records to estimate the appropriateness of stool cultures and to develop guidelines for reducing unwarranted stool cultures for Salmonella, Shigella, Campylobacter, Yersinia enterocolitica, and E. coli 0157:H7 (SSCYE).

Guidelines for tests such as stool cultures can reduce overuse, particularly through the education of physicians about when such tests are appropriate. Using guidelines to limit stool cultures for SSCYE for inpatients reduced cultures by 43% (689)—primarily by reducing the number of tests ordered (497) rather than through a dramatic number of tests being rejected (192)—and saved the hospital of over \$50,000 per year.



# Overuse

## Study

## Outcome

*Keeping Children Out Of Hospitals: Parents' And Physicians' Perspectives On How Pediatric Hospitalization For Ambulatory Care-Sensitive Conditions Can Be Avoided*

**Flores, Glenn; 2003; Pediatrics**

This study used a survey of parents, primary care physicians (PCPs) and inpatient attending physicians about pediatric hospital admissions concerning whether the admission was avoidable.

About 50% of hospitalizations for children with 6 diagnoses may be avoidable through better parent education and follow-up clinical care. The most common diagnoses for avoidable hospitalization (AH) as agreed to by two of the three sources, were asthma (27%), skin infections (20%), and dehydration/gastroenteritis (15%). Overall, the agreement rate varied from 68% for parents and attending physicians to 79% for PCPs and attending physicians. Variables most associated with AH were being over the age of 10, and having a diagnosis of asthma.

*Provider And Practice Characteristics Associated With Antibiotic Use In Children With Presumed Viral Respiratory Tract Infections.*

**Gaur, A.H., Hare, M.E., Shorr, R.I.; 2005; Pediatrics**

This study used data from the 1995-2000 National Hospital Ambulatory Medical Care Survey (NHAMCS) to assess antibiotic prescribing to children in hospital outpatient clinics for 4 ICD-9 code diagnoses suggestive of viral respiratory infection acute nasopharyngitis.

Potential overuse of antibiotics in children is related to both provider and facility characteristics. Although there seems to be a downward trend, the overall rate of antibiotic prescribing for the 4 ICD-9 coded diagnoses was 33.2%. Antibiotic prescribing residents (19.5%) was less than physicians in teaching or non-teaching hospitals (39.6%). Other factors associated with increased likelihood of antibiotic prescribing included diagnosis of bronchitis (unspecified), being seen in a non-pediatric clinic, and being seen before the 1998 publication of the CDC/AAP guidelines.

*Use Of Open Access In GI Endoscopy At An Academic Medical Center*

**Charles, R.J., Chak, A., Cooper, G.S., Wong, R.C., Sivak, M.V., Jr.; 1999; Gastrointest Endosc**

This study examined records from 5 months of endoscopies at 1 hospital in order to compare appropriateness and yield of endoscopy for patients referred for open-access endoscopy with those for patients who had prior contact with a gastroenterologist.

86% of endoscopies after consultation with gastroenterologists were performed for accepted indications compared with 65% of open access procedures. Significant pathologic findings were present in 40% of the former group compared with 28% of those undergoing open-access endoscopy.

## Overuse

### Study

### Outcome

*Trends In Operative Management Of Pediatric Splenic Injury In A Regional Trauma System*  
**Davis, D.H., Localio, A.R., Stafford, P.W., Helfaer, M.A., Durbin, D.R.;**  
**2005; Pediatrics**

This study used state hospital discharge data to identify patients <19 years of age who presented to an emergency department (ED) in Pennsylvania with a diagnosis of splenic injury to characterize the variation in management of blunt pediatric splenic injury, comparing nontrauma hospitals with regional centers.

Hospitals that specialized in treating pediatric trauma were less likely to perform surgery for blunt splenic injury. At all types of hospitals, the rate of surgery was low from the years 1991 to 1993, rose in the years 1994 to 1997 (more in the less specialized hospitals), and declined to an intermediate level from 1998 to 2000.

*Factors Associated With Emergency Department Utilization For Nonurgent Pediatric Problems*  
**Phelps, K., Taylor, C., Kimmel, S., Nagel, R., Klein, W., Puczynski, S.;**  
**2000; Arch Fam Med**

This study surveyed 200 caretakers who brought children to 2 urban emergency departments (EDs) for non-urgent conditions to identify caregiver characteristics associated with the utilization of EDs for non-urgent pediatric care in Toledo, OH.

65% of ED visits in this study were classified as nonurgent by qualified medical personnel.

# Overuse

## Study

*National Trends In The Use Of Antibiotics By Primary Care Physicians For Adult Patients With Cough*

**Metlay, J.P., Stafford, R.S., Singer, D.E.; 1998; Arch Intern Med**

This study analyzed data from serial National Ambulatory Medical Care Survey (NAMCS) beginning in 1980 to examine national trends in the prescription of antibiotics by primary care physicians (PCPs) to adult patients with cough, and to identify factors influencing prescription.

## Outcome

The high rate of antibiotic prescription for symptoms of cough (66%) suggests overuse of antibiotics. However, there is no gold standard on this topic and the appropriateness of prescription may be confounded by the subjectivity of diagnosis. The percentage of outpatients receiving antibiotic prescriptions for cough increased modestly from 1980 to 1994 (1.05 per year). Overall, antibiotics were prescribed 66% of the time for adult patients with cough, rising from 59% in 1980 to 70% in 1994. Being under age 65, being white, visiting for the first time to complain of cough, and being diagnosed with bronchitis were associated with significantly increased odds of prescription.

*Beta-Blocker Dosages And Mortality After Myocardial Infarction: Data From A Large Health Maintenance Organization*

**Barron, H.V., Viskin, S., Lundstrom, R.J., Swain, B.E., Truman, A.F., Wong, C.C., Selby, J.V.; 1998; Arch Intern Med**

This study reviewed the clinical records of 1165 Northern California Permanente patients surviving Acute Myocardial Infarction (AMI) to examine a potential association between dosage of beta-blocker received at hospital discharge (for MI) and mortality.

Large doses of beta-blockers may be overprescribed, because smaller doses can be just as effective. Treatment with lower doses of beta-blockers (less than 50% of the dose used in RCTs) was associated with at least as much improvement in survival as higher doses. In fact, in this study, treatment with lower doses resulted in significantly improved mortality compared with treatment with higher doses.

*Evaluating The Appropriateness Of Digoxin Level Monitoring*

**Canas, F., Tanasijevic, M.J., Ma'luf, N., Bates, D.W.; 1999; Arch Intern Med**

This study used a retrospective record review to determine the appropriateness of a random sample of inpatient and outpatient digoxin levels at Brigham & Women's Hospital.

Digoxin blood tests are overused. Only 16% of tests on inpatients and 52% in outpatients were appropriate. The vast majority of inappropriate tests (76%) were for early routine monitoring, i.e., a test repeated less than 10 days after a previous test for inpatients, and less than 10 months for outpatients.

## Overuse

### Study

### Outcome

*Understanding Physician Adherence With A Pneumonia Practice Guideline: Effects Of Patient, System, And Physician Factors*  
**Halm, E.A., Atlas, S.J., Borowsky, L.H., Benzer, T.I., Metlay, J.P., Chang, Y.C., Singer, D.E.; 2000; Arch Intern Med**

Nonadherence occurred in 43.6% of cases and was associated with patient age (>65), gender (male), employment, multilobar disease, or comorbid conditions. PCP involvement and increasing physician experience with pneumonia management both contributed to increased non-compliance.

This study describes a retrospective chart review and physician survey designed to quantify non-compliance with a CAP guideline at the Massachusetts General Hospital.

*Unnecessary Use Of Antimicrobials In Hospitalized Patients: Current Patterns Of Misuse With An Emphasis On The Antianaerobic Spectrum Of Activity*  
**Hecker, M.T., Aron, D.C., Patel, N.P., Lehmann, M.K., Donskey, C.J.; 2003; Arch Intern Med**

Antimicrobials were overused in hospitalized patients, either through prescription where antibiotics are not necessary, or misapplication of drugs where antibiotics are necessary. Approximately 30% of the therapy days were deemed unnecessary.

This prospective observational study in an academic hospital was designed to assess the necessity of antibiotic prescriptions during a two-week period.

*Antimicrobial Resistance In The Intensive Care Unit: Understanding The Problem*  
**Houghton, Douglas; 2002; AACN Clin Issues**

This article reviews the literature pertaining to antibiotic resistance and the role of antibiotic misuse in its development.

The overuse and misuse of antibiotics is dangerous and costly. Treatment of nosocomial infections are estimated to cost nearly \$5 billion per year. While this article is more of a discussion, it takes the numbers of patients in an intensive care unit with nosocomial infections and shows the percentage increase of antimicrobial resistant pathogens which have increased across the spectrum since 1994-1998.

# Overuse

## Study

## Outcome

*Inappropriate Use Of Emergency Medical Services Transport: Comparison Of Provider And Patient Perspectives*

**Richards, J.R., Ferrall, S.J.; 1999; Acad Emerg Med**

This study prospectively surveyed patients and emergency medical services (EMS) providers arriving at an urban university emergency department (ED) in California to examine the use of EMS transport and determine how appropriately the service is used, evaluating both provider and patient perceptions.

Inappropriate ambulance use is a significant problem from both EMS provider and patient perspectives. Approximately 43% of transports were not true emergencies, diverting resources from true emergencies. 41-50 year olds, whites, men and people without medical insurance or Medi-Cal are more likely to use EMS.

*Emergency Medical Care: Types, Trends, And Factors Related To Nonurgent Visits*

**Liu, T. Sayre, M.R. Carleton, S.C.; 1999; Acad Emerg Med**

This study used National Hospital Ambulatory Medical Care Survey (NHAMCS) data to describe and compare trends in emergency department (ED) use from 1992 to 1996.

54% of ED visits in 1996 were non urgent in nature.

*The Influence Of Insurance Status On Non-urgent Pediatric Visits To The Emergency Department*

**Fong, Christina; 1999; Acad Emerg Med**

This study used a subset of 1994 National Hospital Ambulatory Medical Care Survey (NHAMCS) data (age <16) to investigate the overall rate of non-urgent visits was 58%, 51% for HMO, 56% for privately insured, and 60% for government insured pediatric patients.

Nonurgent emergency department (ED) visits can lead to inefficient utilization of resources. Patients with HMOs used the ED less often with nonurgent complaints than those with private health insurance. While 58% of visits were considered non-urgent, 10% of those visits were HMO-insured patients. Males make up more than 50% of the caseload in both urgent and non-urgent care.

# Overuse

## Study

## Outcome

*Parental Use And Misuse Of Antibiotics: Are There Differences In Urban Vs. Suburban Settings?*

**Edwards, D.J., Richman, P.B., Bradley, K., Eskin, B., Mandell, M.; 2002; Acad Emerg Med**

This was a prospective survey of parents of children presenting to two emergency department (EDs) (in NJ and CT) to compare the misuse of antibiotics by parents for their children in suburban and urban settings.

Parents in both settings are misusing and overusing antibiotics. However, the misuse in suburbia is different from urban misuse. Parents in suburban settings were more likely to have misused antibiotics for their children. Parents in urban settings were more likely to seek a prescription from more than one physician.

*Usual Source Of Care And Nonurgent Emergency Department Use*

**Sarver, J.H., Cydulka, R.K., Baker, D.W.; 2002; Acad Emerg Med**

This study used 1996 MEPS data to examine whether patient dissatisfaction with the usual source of care (USC) and perceived access difficulties to that USC were associated with nonurgent emergency department (ED) use.

Patients are more likely to use the ED for nonurgent visits when they believe that their usual source of care is not meeting their needs. Most participants reported high levels of satisfaction with their USC. Access to care items were also associated with nonurgent ED use.

*Repeat Patients To The Emergency Department In A Statewide Database*

**Cook, L.J. Knight, S. Junkins, E.P., Jr. Mann, N.C. Dean, J.M. Olson, L.M.; 2004; Acad Emerg Med**

This study used three years of statewide emergency department (ED) data to stratify ED use into single, repeat, or serial use, and then to assess differences between patients comprising each strata.

ED visits increased as the percentage of patients using government insurance increased. While repeat and serial ED patients made up one third of patients, they accumulated more than 60% of all ED visits and ED charges.

# Overuse

## Study

## Outcome

*Ineffective Use Of Radiology: The Hidden Cost Cascade, P.N., Webster, E.W. Kazerooni, E.A.; 1998; AJR Am J Roentgenol*

This narrative review describes the extent of overuse of radiologic procedures, and provides a brief description of the causes and the costs in terms of radiation-induced deaths.

The authors estimate that 10-30% of diagnostic radiologic procedures are unnecessary. They cite self-referral by doctors who own equipment, fear of litigation and “worried well” as causes. Based on various assumptions, they hypothesize that there are 5,540-7,200 radiation-induced deaths per year of in the US. They further estimate that 1,108-1,440 severe hereditary defects are inherited over succeeding generations as a result of diagnostic testing. Based on overuse rates of 10%-30%, the authors cite excess deaths due to unnecessary testing of around 110 (10%), 222 (20%) or 332 (30%).

*Long Term Use Of Acid Suppression Started Inappropriately During Hospitalization Zink, D.A., Pohlman, M., Barnes, M. Cannon, M.E.; 2005; Aliment Pharmacol Ther*

This study is a retrospective chart review of patients admitted to a general medicine inpatient teaching service to determine the appropriateness of using proton pump inhibitors (PPI) and Histamine Receptor Antagonists (H2RA) in inpatient general medicine service; to characterize patients discharged on PPI/H2RA; and to test the hypothesis that use of PPI/H2RA continues for an inappropriately long time.

196 out of 324 (60%) of general medical inpatients on acid-suppression therapy did not have an appropriate indication for the medication. 67 out of 196 (34%) were discharged on the medication with an appropriate indication. 84% were discharged on PPI, 15% were discharged on H2RA. At 3 months, 80% of those available for follow-up (31 out of 39) were still on it inappropriately. At 6 months, 50% of those available for follow-up (fifteen out of twenty-six) were still on it. Current costs of PPI are \$115 per month, generic H2RA costs \$35 per month, and brand H2RA costs \$112 month.

*Diagnosis And Management Of Acute Bronchitis Knutson, D., Braun, C.; 2002; Am Fam Physician*

This is a general review of the diagnosis and treatment of acute bronchitis.

The study discusses several studies that offer mixed evidence of symptomatic improvement resulting from antibiotic therapy.

# Overuse

## Study

## Outcome

*Vulnerable Populations At Risk Of Potentially Avoidable Hospitalizations: The Case Of Nursing Home Residents With Alzheimer's Disease*

**Carter, M.W., Porell, F.W.; 2005; Am J Alzheimers Dis Other Demen**

This study linked Medicaid reimbursement data with Massachusetts Medical Provider Analysis and Review data to determine whether nursing home patients with dementia were more likely to experience Ambulatory Care Sensitive Conditions (ACSC) admissions.

Dementia patients are at higher risk of admission for pneumonia, urinary tract infection (UTI), and gastroenteritis, but there is significant variation in ACSC admissions between nursing homes regardless of dementia status, suggesting an important quality issue.

*Is Appendiceal CT Scan Overused For Evaluating Patients With Right Lower Quadrant Pain?*

**Safran, D.B., Pilati, D., Folz, E., Oller, D.; 2001; Am J Emerg Med**

This is a series of 4 cases to illustrate the controversy surrounding the routine use of computed tomography (CT) for suspected appendicitis.

CT scans can prevent avoidable laparotomy in equivocal cases, but routine scanning in cases with low likelihood of appendicitis can, as shown in this report, lead to extended hospitalizations and unnecessary costs.

*Overuse Of Parenteral Antibiotics For Wound Care In An Urban Emergency Department*

**Waldrop, R.D. Prejean, C. Singleton, R.; 1998; Am J Emerg Med**

This study retrospectively reviewed records of 72 patients who received parenteral antibiotics in emergency departments (EDs) for wound care but were not admitted, and assessed discrepancy with current recommendations derived from the literature.

Antibiotic use in about one-fifth (18%) of wounds was incorrect according to the guidelines (although the authors themselves describe their criteria as "arbitrary in the face of no accepted consensus among infection disease experts"). Some wounds were unnecessarily treated with Ceftriaxone and Cefazolin.



## Overuse

### Study

### Outcome

*An Evidence-Based Clinical Pathway For Bronchiolitis Safely Reduces Antibiotic Overuse*  
**Wilson, S.D., Dahl, B.B., Wells, R.D.; 2002; Am J Med Qual**

This study reviewed the charts of 181 children admitted to an academic hospital and estimated the extent to which antibiotics were overused.

Patients who were treated according to the evidence-based clinical pathway received more antibiotics than those not treated on the pathway (9% vs. 35%) and received no systemic steroids (0% vs. 10%) significantly less often. The cost of hospitalization was significantly less (\$2,241 vs. \$3,257), length of stay was lower (2.09 vs. 2.55 days), and there was no statistically significant increase in return for unplanned care within 72 hours (3.3% vs. 2.7% NS).

*Nesiritide, Not Verified*  
**Topol, Eric; 2005; N Engl J Med**

A perspective piece expressing concern about the approval and use of nesiritide (recombinant human brain natriuretic peptide), a costly vasodilator used in congestive heart failure (CHF).

The author points out that the drug has been shown to increase mortality by 81% or 24% (two different studies) and cause 3 times as much deterioration in renal function as placebo. Mild efficacy in decreasing capillary wedge pressure was shown in one study. The author suggests that the drug should not have been approved, and notes that it is being heavily marketed.

*Antibiotic Prescribing Practices In A Teaching Clinic: Comparison Of Resident And Staff Physicians*  
**Mincey, B.A., Parkulo, M.A.; 2001; South Med J**

This study employed a record review of all patients in an academic practice presenting with acute sinusitis to determine the relationship between inappropriate antibiotic prescribing and years of training.

Residents adopted attending physicians' prescribing behavior over time. In this case, attending physicians' behavior was more likely to be wasteful. First- and second-year residents were significantly more likely to prescribe narrow spectrum antibiotics for acute sinusitis (56%) compared with attending physicians (34%).

# Overuse

## Study

*Association Between Medication Supplies And Healthcare Costs In Older Adults From An Urban Healthcare System*

**Stroupe, K.T., Murray, M.D., Stump, T.E., Callahan, C.M.; 2000; J Am Geriatr Soc**

This study used a retrospective record review in a tax-supported health system to determine the costs associated with the over- and under-supply of medications to seniors in a public, urban health care system.

*Is Colposcopic Biopsy Overused Among Women With A Cytological Diagnosis Of Atypical Squamous Cells Of Undetermined Significance (ASCUS)?*

**Lousuebsakul, V., Knutsen, S.M., Singh, P.N., Gram, I.T.; 2003; J Women's Health (Larchmt )**

This study evaluated a cohort of 651 women with a Pap diagnosis of atypical squamous cells of undetermined significance (ASCUS) who received follow-up to analyze determinants of the type of follow-up received (colposcopic biopsy v. repeat Pap).

*The Impact Of Drug Coverage On COX-2 Inhibitor Use In Medicare*

**Doshi, J.A., Brandt, N., Stuart, B.; 2004; Health Aff (Millwood)**

Data from the 2000 Medicare Current Beneficiary Survey were used to assess the impact of drug coverage on COX-2 inhibitor use among elderly people with osteoarthritis, taking into account risk for adverse gastrointestinal events.

## Outcome

16% had an under-supply and 47% had an over-supply of medications. Both over-and under-supply resulted in an increased chance of emergency room visits and hospital admission.

Women with high income, private insurance, and women aged 36-45 were more likely to undergo colposcopic biopsy for follow-up of ASCUS. In a multivariate model, women with income greater than approximately \$47,000 had an 8.5 times higher odds of follow-up by colposcopic biopsy than women with income less than approximately \$25,000. Women with private insurance had 2.8 times higher odds of follow-up by colposcopic biopsy than women with Medicaid. Women ages 36-45 had 3.1 times greater odds of follow-up by colposcopic biopsy than women older than 55.

Among patients with the most generous coverage, gastrointestinal risk had no independent effect on whether patients were prescribed this class of medications. Drug usage was higher in Medicare beneficiaries with coverage compared with no coverage. COX-2 use was twice as high in those with the most generous coverage compared with no third-party coverage. Among patients with the most generous coverage, patients with increased gastrointestinal risk are no more likely to be prescribed COX-2 inhibitors.

# Overuse

## Study

## Outcome

*Acetaminophen Overuse In The Ohio Medicaid Population*

**Heaton, P.C., Cluxton, Jr., R.J., Moomaw, C.J.; 2003; J Am Pharm Assoc (Wash DC )**

This was a retrospective review of Ohio Medicaid claims data to examine potential acetaminophen overuse in patients with and without risk factors for hepatotoxicity.

A relatively small, but significant, number of patients were prescribed doses of acetaminophen that were too high. 3% of patients were prescribed an average dose of acetaminophen greater than or equal to 4g/day or greater than or equal to 3g/day with an ICD-9 code suggesting liver dysfunction.

*Preventable Hospitalization Among Elderly Medicare Beneficiaries With Type 2 Diabetes*

**Niefeld, M.R., Braunstein, J.B., Wu, A.W., Saudek, C.D., Weller, W.E., Anderson, G.F.; 2003; Diabetes Care**

This study reviewed 1999 Medicare claims data to identify hospitalizations for diagnoses that could have been prevented with appropriate ambulatory care and associating them with comorbid conditions in this type 2 diabetic senior cohort.

7% of all hospitalizations in this cohort were avoidable.

*Prevalence And Correlates Of Potentially Inappropriate Prescribing Among Ambulatory Older Patients In The Year 2001: Comparison Of Three Explicit Criteria*

**Viswanathan, H., Bharmal, M., Thomas, III, J.; 2005; Clin Ther**

This study analyzed 7,243 visits by elderly ambulatory patients in the National Ambulatory Medical Care Survey (NAMCS) in order to determine the prevalence of prescribing potentially inappropriate medications (PIMs) based on the 2002 Beers criteria, and identify factors associated with receiving a PIM.

13.4% of patient visits involved PIMs based on the 2002 Beers criteria (and 4.2% visits involved PIMs based on the Zhan criteria). Factors associated with receiving a PIM included: a visit occurring in a metropolitan area, and a visit receiving higher number of medications during a single visit.

# Overuse

## Study

## Outcome

*Nonurgent Pediatric Emergency Department Visits: Care-Seeking Behavior And Parental Knowledge Of Insurance*

**Doobinin, K.A.,Heidt-Davis, P.E., Gross, T.K., Isaacman, D.J.; 2003; *Pediatr Emerg Care***

This study surveyed 251 parents of children attending a pediatric emergency department (ED) in order to: determine factors associated with utilization of emergency services for nonurgent illnesses by insured children, assess parental knowledge of their insurance, and assess if that knowledge influenced care-seeking behaviors.

The primary reason chosen by the parent for the ED visit was convenience (62.8% of cases). 38.7% stated that they were educated as to what problems are considered emergencies by their insurance. ED referrals for nonurgent complaints are required by the insurance carrier for 74.9%, but only 37.2% of the parents said referrals were necessary.

*Income, Race, And Preventable Hospitalizations: A Small Area Analysis In New Jersey*

**Cable, G.; 2002; *J Health Care Poor Underserved***

This study reviewed hospital discharge data from 53 contiguous zip codes in New Jersey to examine the effect of income, race, and cultural factors on preventable hospitalizations in New Jersey from 1993 to 1995.

High rates of preventable hospitalizations were associated with low income and race.

*Factors Related To Potentially Preventable Hospitalizations Among The Elderly*

**Culler, S.D., Parchman, M.L., Przybylski, M.; 1998; *Med Care***

This study examined inpatient claims data from Medicare beneficiaries in order to examine what factors are associated with having a hospitalization due to an ambulatory care-sensitive condition.

Higher odds of preventable hospitalizations were associated with being older, black, living in a metropolitan or a rural area, assessing oneself as having poor status, or having certain diseases such as diabetes. Factors associated with lower odds included: having attended college, or having only Medicare insurance coverage.

# Overuse

## Study

## Outcome

*Pap Screening In A U.S. Health Plan*  
**Insinga, R.P., Glass, A.G., Rush, B.B.; 2004; Cancer Epidemiol Biomarkers Prev**

This study analyzed claims data from 150,052 female members of Kaiser Permanente Northwest to estimate compliance with U. S. Preventive Services Task Force guidelines for cervical cancer screening.

Of the enrolled women, 31% received a Pap smear in 1998. The highest utilization rates were among 25-29 year olds, of whom 62% received a Pap smear in 1998. Rates declined with increasing age: 26% of 65-69 year old women received a Pap smear in 1998. Of women who were routinely screened during the follow-up period, 36% received annual smears, 22% received biennial smears, and 13% received triennial smears. This study, using administrative data, found lower utilization rates than similar studies using self-report.

*Inappropriate Prescribing For Elderly Outpatients*  
**Aparasu, R.R., Sitzman, S.J.; 1999; Am J Health Syst Pharm**

This study extracted data from the 1994 National Hospital Ambulatory Medical Care Survey (NHAMCS) to determine: (1) the frequency of potentially inappropriate prescribing for elderly outpatients; and (2) factors predicting inappropriate prescribing.

Potentially inappropriate medications were prescribed at 4.45% of elderly outpatient visits involving medications. Patients were more likely to be given potentially inappropriate medications if they had been referred; had a number of medications prescribed; had a prescription for certain types of medications; or had a medication prescribed by a provider from a nonmetropolitan area.

*Nosocomial Infections In The ICU: The Growing Importance Of Antibiotic Resistant Pathogens*  
**Weber, D.J., Raasch, R., Rutala, W.A.; 1999; Chest**

This article reviews the literature concerning nosocomial infections in intensive care units.

Studies have shown that patients infected with resistant strains of bacteria are more likely than control patients to have previously received antimicrobials, and hospital areas that have the highest prevalence of resistance also have the highest rates of antibiotic use. Additional interventions include hand washing and surveillance protocols, isolation measures, and occupational health services for employees.

## Overuse

### Study

### Outcome

*Inappropriate Medication Prescribing In Homebound Older Adults*

**Golden, A.G., Preston, R.A., Barnett, S.D., Llorente, M., Hamdan, K., Silverman, M.A.; 1999; J Am Geriatr Soc**

This study extracted data from records of 2,193 elderly patients in a managed care plan who were homebound and met nursing home eligibility. The objective of the study was to report on the prevalence and pattern of inappropriate medications in this population.

9.9% of prescriptions were inappropriate. 39.7% of the residents had at least one inappropriate prescription. Inappropriate drugs included: temazepam and zoldipem.

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*A Controlled Trial Of Arthroscopic Surgery For Osteoarthritis Of The Knee*

**Moseley, J.B., O'Malley, K., Petersen, N.J., Menke, T.J., Brody, B.A., Kuykendall, D.H., Hollingsworth, J.C., Ashton, C.M., Wray, N.P.; 2002; N Engl J Med**

This prospective randomized trial studied 180 patients with osteoarthritis of the knee to determine whether arthroscopic knee lavage and debridement resulted in greater symptomatic relief than a sham procedure.

Arthroscopic lavage or debridement was no more effective than a placebo procedure on pain or function. At 1- and 2-year follow-up, mean pain scale scores were not significantly different in the three groups.

# Overuse

## Study

## Outcome

*Patterns And Correlates Of Local Therapy For Women With Ductal Carcinoma-In-Situ*

**Katz, S.J., Lantz, P.M., Janz, N.K., Fagerlin, A., Schwartz, K., Liu, L., Deapen, D., Salem, B., Lakhani, I., Morrow, M.; 2005; J Clin Oncol**

This study interviewed 659 patients with Ductal Carcinoma In-Situ (DCIS) in Detroit and Los Angeles in order to determine if rates of mastectomy and radiation therapy are due to overuse or underuse of these treatments, or if they are due to patient preferences and physician recommendations.

Only 14% of patients at lowest risk of recurrence received a mastectomy compared with 22.8% and 52.6% of patients at intermediate and highest risk. Between-site differences in receipt of radiation after breast conserving surgery (BCS) were consistent with patient recall of surgeon discussions about treatment.

*Consequences Of Underuse Of Generic Drugs: Evidence From Medicaid And Implications For Prescription Drug Benefit Plans*

**Fischer, M.A., Avorn, J.; Economic 2003; Health Serv Res**

This study used 2000 state-level Medicaid data to estimate the rate of underuse of generic drugs and calculate potential cost savings.

In 2000, Medicaid could have saved between \$229 and \$450 million dollars if generic drugs were used instead of the brand-name versions of the same agents. The majority of the unrealized savings were concentrated in a small group of medications, including clozapine, alprazolam, and levothyroxine.

*Support Of Evidence Based Guidelines For The Annual Physical Examination: A Survey Of Primary Care Providers*

**Prochazka, A.V., Lundahl, K., Pearson, W., Oboler, S.K., Anderson, R.J.; 2005; Arch Intern Med**

This study used a mailed survey to assess the attitudes of 783 primary care physicians regarding annual physical exams.

Despite evidence to the contrary, 65% felt that an annual exam was necessary, 55% disagreed with evidence that exams were unnecessary, and 88% perform annual exams and screenings, including CBC, UA, lipid panel, glucose, and mammography.

## Overuse

### Study

### Outcome

*Distributional Issues In The Analysis Of Preventable Hospitalizations*  
**DeLia, D.; 2003; Health Serv Res**

ACS admissions are geographically concentrated and have increased to 12.2% of all admissions.

This study used New York State hospital discharge data to describe patterns in the rates of ambulatory care sensitive (ACS) admissions and preventable hospitalizations.

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*Utilization Management And Noninvasive Diagnostic Imaging*  
**Weiner, S.N., Komarow, M.; 2005; Manag Care Interface**

Utilization rates for nuclear imaging were 2-3 times higher in unmanaged plans. PET rates were comparable, and computed tomography (CT) rates 30% higher in unmanaged plans. Utilization Management consisted of both review and facility credentialing.

This study compared imaging rates between 2 plans that adopted proprietary imaging management systems and 2 unmanaged plans in the same geographic area.

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*Safety And Cost-Effectiveness Of Early Discharge After Primary Angioplasty In Low-Risk Patients With Acute Myocardial Infarction. PAMI-II Investigators. Primary Angioplasty In Myocardial Infarction*  
**Grines, C.L., Marsalese, D.L., Brodie, B., Griffin, J., Donohue, B., Costantini, C.R., Balestrini, C., Stone, G., Wharton, T., Esente, P., Spain, M., Moses, J., Nobuyoshi, M., Ayres, M., Jones, D., Mason, D., Sachs, D., Grines, L.L., O'Neill, W.; 1998; Journal of the American College of Cardiology**

Low-risk patients treated with PTCA randomized to an accelerated hospital course did not have inferior outcomes to those treated traditionally. The accelerated approach reduced hospital costs by \$2,000 per patient.

This prospective RCT study conducted in 34 centers evaluated the hypothesis that primary Percutaneous Transluminal Coronary Angioplasty (PTCA), with subsequent discharge from the hospital 3 days later, is safe and cost-effective in low-risk patients.



## Overuse

### Study

*The Cost-Effective Use Of Nebulized Racemic Epinephrine In The Treatment Of Croup*  
**Thomas, L.P., Friedland, L.R.; 1998; Am J Emerg Med**

This study used a survey of emergency department (ED) medical directors in Kentucky, Indiana, and Ohio to examine whether ED medical directors are adhering to guidelines which demonstrate that, under specific circumstances, it is safe to discharge to home many patients presenting with croup.

*Calling Acute Bronchitis A Chest Cold May Improve Patient Satisfaction With Appropriate Antibiotic Use*  
**Phillips, T.G., Hickner, J.; 2005; J Am Board Fam Pract**

459 people were given a written scenario describing a typical acute respiratory infection where they were given 1 of 3 different diagnostic labels: chest cold, viral upper respiratory infection, or bronchitis, followed by a treatment plan that excluded antibiotic treatment. Satisfaction levels were analyzed.

*Use And Costs Of Nonrecommended Tests During Routine Preventive Health Exams*  
**Merenstein, D., Daumit, G.L., Powe, N.R.; 2006; Am J Prev Med**

This study compared data from 1997 to 2002 National Ambulatory Medical Care Survey (NAMCS) to U.S. Preventive Services Task Force (USPSTF) recommendations to estimate the frequency and associated costs of nonrecommended tests during routine preventive health exams from 1997 to 2002.

### Outcome

Several ED medical directors (7/23, 30%) responded that they would automatically admit a child with croup despite recent studies suggesting safe discharge to home is possible.

26% of those that were told they had bronchitis were dissatisfied with their treatment, compared with 13% and 17% for colds and viral illness, respectively. Educational attainment, age, and gender did not affect satisfaction rates.

Tests for which there is no documented evidence were routinely ordered during annual preventive health exams (43% of the time). The frequency of ordering specific tests ranged from 7% to 37% of visits for x-rays and urinalysis, respectively.

## Overuse

### Study

### Outcome

*Cervical Cancer Screening Among Women Without A Cervix*

**Sirovich, B.E., Welch, H.G.; 2004; JAMA**

This study used behavioral risk factor surveillance system (BRFSS) and national immunization survey (NIS) data to estimate the number of women with a history of hysterectomy who reported a current Pap smear.

The proportion of women who had undergone a hysterectomy and reported a Pap smear in the prior 3 years did not change over the course of the study. In both 1992 (before the U.S. Preventive Services Task Force recommendation) and 2002 (after the recommendation), approximately 69% of hysterectomized women reported having undergone a recent Pap smear. The authors estimate that 10 million women, or half of all women who have undergone hysterectomy, are receiving Pap smears unnecessarily.

*Excessive Antibiotic Use For Acute Respiratory Infections In The United States*

**Gonzales, R., Malone, D.C., Maselli, J.H., Sande, M.A.; 2001; Clin Infect Dis**

This study used data from the 1998 National Ambulatory Medical Care Survey (NAMCS) to estimate primary care office visits and antibiotic prescription rates for acute respiratory infections.

In 1998, antibiotic prescriptions in excess of expectations amounted to 55% of all antibiotics prescribed for acute respiratory infections. Associated costs of this unnecessary prescription totaled approximately \$726 million.

*Trends In Antimicrobial Prescribing Rates For Children And Adolescents*

**McCaig, L.F., Besser, R.E., Hughes, J.M.; 2002; JAMA**

This study used physician provided National Ambulatory Medical Care Survey (NAMCS) data to assess antibiotic prescribing rates for respiratory infections in children < age 15.

Although the average annual rate of antibiotic prescription for children and adolescents decreased from 838 per 1,000 in 1989 to 503 per 1,000 in 1999, the authors conclude that it is important to continue efforts to improve appropriate antimicrobial prescribing.

# Overuse

## Study

## Outcome

*Desire For Antibiotics And Antibiotic Prescribing For Adults With Upper Respiratory Tract Infections*

**Linder, J.A., Singer, D.E.; 2003; J Gen Intern Med**

This is a prospective cohort study in adults with upper respiratory tract infections. The study sought to: (1) determine what proportion of patients wanted antibiotics, and (2) identify factors associated with wanting antibiotics and antibiotic prescribing.

39% of adults seeking care for upper respiratory tract infections wanted antibiotics, which is less than in previous studies. Predictors of wanting antibiotics were prior antibiotic use and current smoking. Wanting antibiotics was an independent predictor of antibiotic prescribing.

*A Prospective Study Of Reasons For Prolonged Hospitalizations On A General Medicine Teaching Service*

**Carey, M.R., Sheth, H., Braithwaite, R.S.; 2005; J Gen Intern Med**

This study collected data from 16 senior residents at a tertiary care, university-affiliated teaching hospital in order to quantify and characterize delays in care which prolong hospitalizations for general medicine inpatients.

13.5% of all hospital days were judged unnecessary for acute inpatient care and occurred because of delays in needed services. The majority of nonmedical service delays were due to difficulty finding a bed in a skilled nursing facility. Medical service delays were more common on weekend days.

*The Impact Of Empirical Management Of Acute Cystitis On Unnecessary Antibiotic Use*

**McIsaac, W.J., Low, D.E., Biringer, A., Pimlott, N., Evans, M., Glazier, R.; 2002; Arch Intern Med**

This study evaluated the appropriateness of empiric antibiotic use in a cohort of 231 women presenting to family physicians with symptoms of cystitis.

Empiric antibiotic use without testing for nitrites and pyuria increases antibiotic usage 41%.

## Overuse

### Study

### Outcome

*Antibiotic Use For Upper Respiratory Tract Infections: How Well Do Pediatric Residents Do?*

**Nambiar, S., Schwartz, R.H., Sheridan, M.J.; 2002; Arch Pediatr Adolesc Med**

This study surveyed residents in pediatrics about their familiarity with guidelines to avoid the unnecessary use of antibiotics in upper respiratory infection (URI).

Residents' knowledge of the guidelines increased with level of training, from 16% (first year) to 36% (second year) to 50% (third/fourth year).

*Acute Care And Antibiotic Seeking For Upper Respiratory Tract Infections For Children In Day Care*

**Friedman, J.F., Lee, G.M., Kleinman, K.P., Finkelstein, J.A.; 2003; Arch Pediatr Adolesc Med**

This study surveyed 211 parents of children attending day care in 36 Massachusetts centers, and day care staff, to determine both parental and day care level predictors of acute care and antibiotic seeking for upper respiratory infections (URIs).

Staff does not influence parental care seeking.

*Does Reimbursement Influence Chemotherapy Treatment For Cancer Patients?*

**Jacobson, M., O'Malley, A.J., Earle, C.C., Pakes, J., Gaccione, P., Newhouse, J.P.; 2006; Health Aff (Millwood)**

This study sought to determine if physician reimbursement rates for chemotherapy drugs affected the frequency of using chemotherapy in metastatic cancer patients during 1995 and 1998.

A physician's decision to administer chemotherapy to metastatic cancer patients was not measurably affected by higher reimbursement. Providers who were more generously reimbursed, however, prescribed more costly chemotherapy regimens to metastatic breast, colorectal, and lung cancer patients.

# Overuse

## Study

## Outcome

*Trends In Antibiotic Prescribing For Adults In The United States—1995 To 2002*

**Roumie, C.L., Halasa, N.B., Grijalva, C.G., Edwards, K.M., Zhu, Y., Dittus, R.S., Griffin, M.R.; 2005; J Gen Intern Med**

This study used data from the National Ambulatory Medical Care Survey (NAMCS) to estimate the impact of efforts to limit antibiotic prescribing in adults.

From 1996 to 2002, the percentage of out-patient visits resulting in an antibiotic prescription decreased from 18% to 15%. The reduction was completely attributable to a decrease in antibiotic prescription for acute respiratory infections (ARIs). However, the percentage of broad-spectrum antibiotics prescribed for ARIs increased from 41% to 77%.

*Measuring The Quality Of Care For Group A Streptococcal Pharyngitis In 5 US Health Plans*

**Mangione-Smith, R. Elliott, M.N. Wong, L., McDonald, L., Roski, J.; 2005; Arch Pediatr Adolesc Med**

This study used claims data from 5 health plans to estimate the rate of Group A Streptococcal (GAS) testing in children with a diagnosis of pharyngitis who are prescribed antibiotics.

There is substantial variability in GAS testing rates between health plans. Overall, the rate of GAS testing was 74%, but ranged from 59% to 83% among the 5 health plans studied. Rates of antibiotic prescription also varied tremendously by health plan, ranging from 9% to 61%.

*More May Be Better: Evidence Of A Negative Relationship Between Physician Supply And Hospitalization For Ambulatory Care Sensitive Conditions*

**Laditka, J.N., Laditka, S.B., Probst, J.C.; 2005; Health Serv Res**

This study analyzed data from 642 urban counties and 306 rural counties to determine the relationship between physician supply and ambulatory care sensitive conditions (ACSH). ACSHs are also called “potentially preventable hospitalizations” and are an indicator of accessibility and effectiveness of primary health care.

In urban settings, increased physician supply was associated with lower rates of potentially preventable hospitalizations. In rural areas, there was no association between physician supply and potentially preventable hospitalizations.

# Overuse

## Study

## Outcome

*Is Routine Postoperative Chest Radiography Needed After Open Nephrectomy?*

**Latchamsetty, K.C., La Rochelle, J.C., Hoeksema, J., Coogan, C.L.; 2005;**  
**Urology**

This study examined 150 retrospective cases of open nephrectomy at 1 institution in order to determine if routine postoperative chest X-ray is required after open nephrectomy for the detection and management of a pneumothorax.

Of the 150 patients undergoing nephrectomy, 92 (61%) underwent postoperative CXR, and 4 of these had a pneumothorax. Only 1 of these 4 needed a chest tube.

*The Value Of Clinical Examination Versus Magnetic Resonance Imaging In The Diagnosis Of Meniscal Tears And Anterior Cruciate Ligament Rupture*

**Kocabey, Y., Tetik, O., Isbell, W.M., Atay, O.A., Johnson, D.L.; 2004;**  
**Arthroscopy**

This study examined 50 patients in 1 orthopedic practice in order to compare the accuracy of clinical examination versus magnetic resonance imaging (MRI) in diagnosing meniscal and ACL (anterior cruciate ligament) pathology.

There was no statistical difference between MRI and clinical examination in diagnosing meniscal or anterior cruciate ligament injuries suggesting overuse of MRI.

*Magnetic Resonance Imaging Is Not Needed To Clear Cervical Spines In Blunt Trauma Patients With Normal Computed Tomographic Results And No Motor Deficits*

**Schuster, R., Waxman, K., Sanchez, B., Becerra, S., Chung, R., Conner, S., Jones, T.; 2005; Arch Surg**

This study reports results from 93 patients with negative computed tomography (CT) scans who were also examined by magnetic resonance imaging (MRI), in order to try to determine if MRI testing was necessary.

Out of the 93 patients with no motor deficits, a negative CT, and persistent cervical pain, none had evidence of fracture on MRI.

# Overuse

## Study

*Health Insurance, Neighborhood Income, And Emergency Department Usage By Utah Children 1996-1998*

**Suruda, A., Burns, T.J., Knight, S., Dean, J.M.; 2005; BMC Health Serv Res**

This study used ED discharge data reported in Utah to examine income, health insurance status, types of medical conditions, and whether introduction of managed care affected utilization by Medicaid children.

*Radiologic Tests After A New Diagnosis Of Cancer*

**Dillman, R.O., Chico, S.; 2000; Eff Clin Pract**

In this study, records of newly diagnosed breast cancer patients were retrospectively reviewed to determine the frequency with which radiologic tests are used in women with newly diagnosed breast cancer and the yield of such tests in these patients.

*Analysis Of Medication Use Patterns: Apparent Overuse Of Antibiotics And Underuse Of Prescription Drugs For Asthma, Depression And CHF*

**Gilberg, K.; 2003; J Manag Care Pharm**

This study used claims data from 3 California Managed Care Organizations (MCOs) to assess the appropriateness of prescription medication use based upon guidelines for various conditions.

## Outcome

The majority of usage for Medicaid and uninsured children (65%) was for non-traumatic conditions. Children with Medicaid had approximately 50% greater ED utilization rates than children with commercial health insurance or uninsured children.

A total of 1,910 radiologic tests, including 646 bone scans, 637 chest radiographs, and 627 other tests, were obtained in 1,167 patients with a known TN status. Radiologic tests were performed in 42% of patients with carcinoma in situ, but none of the 183 tests detected metastases. 828 radiologic tests were performed in patients who were classified as having stage I disease on the basis of TN criteria. Only 3 of these tests (0.4%) detected metastatic disease, and all 3 were performed in 1 patient with bone pain. For patients, who were classified as having stage IIA, stage IIB, or stage III disease on the basis of TN criteria, 5 of 410 tests (1.2%), 20 of 294 tests (6.8%), and 33 of 195 tests (17%), respectively, yielded positive results.

Of patients with cold or upper respiratory infection (URIs), conditions for which antibiotics are not indicated, 35.7% received antibiotics.

# Overuse

## Study

*The Cost Of Antibiotics In Treating Upper Respiratory Tract Infections In A Medicaid Population*

**Mainous, A.G., III Hueston, W.J.; 1998; Arch Fam Med**

This study examined Kentucky Medicaid claims in order to examine the use and cost of the nonindicated antibiotics for upper respiratory tract infections (URIs).

## Outcome

60% of outpatient episodes and 48% of emergency department episodes resulted in an antibiotic prescription being filled. In outpatient settings, secondary diagnoses of either otitis media or acute sinusitis accounted for less than 6% of the episodes that resulted in an antibiotic prescription being filled. The most frequently filled antibiotic was amoxicillin, although second- and third-generation cephalosporins were the second most frequently occurring antibiotic class. 23% and 9% of outpatient emergency department episodes, respectively, resulted in a prescription filled for antihistamines. In outpatient episodes, antibiotics account for 23% of the total cost of care or \$9.91 for each episode of care. In emergency department visits, antibiotics account for 8% of the cost of URIs. An estimate of the cost of antibiotics for URIs in a year for the Kentucky Medicaid program is \$1.62 million.

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*Prescribing Potentially Inappropriate Psychotropic Medications To The Ambulatory Elderly*

**Mort, J.R., Aparasu, R.R.; 2000; Arch Intern Med**

This study analyzed public use files from the 1996 National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) for inappropriate prescription of psychotropic medications for the elderly in office-based settings and outpatient departments.

Potentially inappropriate psychotropic agents were overused (27.2% of visits involving psychotropics).



# Overuse

## Study

## Outcome

*Resource Utilization Of Patients With Hypochondriacal Health Anxiety And Somatization*

**Barsky, A.J., Ettner, S.L., Horsky, J., Bates, D.W.; 2001; Med Care**

876 patients attending an academic primary care clinic were randomly selected to complete surveys designed to examine the resource utilization of patients with high levels of somatization and health-related anxiety.

Patients with healthcare-related anxiety use more services than those without it. The study found that patients with hypochondria or somatization have more outpatient visits (approximately 9 vs. 6), more outpatient costs (approximately \$1,300 vs. \$950), and greater likelihood of hospitalization (24% vs. 17%) than others.

*Overutilization Of Shoulder Magnetic Resonance Imaging As A Diagnostic Screening Tool In Patients With Chronic Shoulder Pain*

**Bradley, M.P., Tung, G., Green, A.; 2005; J Shoulder Elbow Surg**

This study examined 101 patients with chronic shoulder pain to see if magnetic resonance imaging (MRI) done before being evaluated by a shoulder specialist improved outcomes.

The study concludes that MRI is overused, based on two main outcomes: (1) There were no differences (in age, sex, insurance status, range of motion, or mechanism of injury) among patients who received a pre-evaluation MRI and those who did not. (2) There was no difference in outcomes between patients who did or did not have a pre-evaluation MRI. The first outcome could imply that there are no consistent criteria that doctors use to decide which patients should get a “pre-evaluation MRI” before being referred to a shoulder specialist.

*Musculoskeletal Imaging In Physical Therapist Practice*

**Deyle, Gail; 2005; J Orthop Sports Phys Ther**

This article reviews literature pertinent to evidence-based use of diagnostic imaging and overuse of imaging for musculoskeletal conditions.

This paper suggests that physical therapists use 50% less imaging than physicians in low-back-pain patients.

## Overuse

### Study

### Outcome

*Current Antibiotic Therapy For Isolated Urinary Tract Infections In Women*

**Kallen, A.J, Welch, H.G, Sirovich, B.E.; 2006; Arch Intern Med**

This study used data from 2000-2002 National Hospital Ambulatory Medical Care Survey (NHAMCS) to estimate the rate of antibiotic prescribing for women with isolated uncomplicated urinary tract infections (UTIs).

The study found that quinolones were prescribed more commonly than sulfa drugs for isolated outpatient UTIs, despite recommended guidelines. The former were prescribed for 44% of UTIs compared with 30% for the latter, and nitrofurantoin for 18%. There were few significant predictors of quinolone use, and more frequent quinolone prescription (e.g., in the Northeast) did not reflect geographically higher rates of sulfa-resistant organisms.

*Unnecessary Cesarean Delivery In Louisiana: An Analysis Of Birth Certificate Data*

**Kabir, A.A., Steinmann, W.C., Myers, L., Khan, M.M., Herrera, E.A., Yu, S. Jooma, N.; 2004; Am J Obstet Gynecol**

This study used the Louisiana birth certificate database to determine temporal trends and factors that are associated with Cesarean deliveries and potentially unnecessary Cesarean deliveries.

The average potentially unnecessary primary and repeat Cesarean deliveries were 17 and 43, respectively, per 100 cesarean deliveries. The primary Cesarean delivery rate decreased and the repeat Cesarean delivery rate increased during the study. But neither the absence nor the presence of potential risk factors accounted for these changes.

*Geographic Variation In Preventable Hospitalizations Of Older Women And Men: Implications For Access To Primary Health Care*

**Laditka, S.B. Laditka, J.N.; 1999; J Women Aging**

This study reviewed hospital discharge data in five upstate New York counties to demonstrate how readily available data and small area analysis can be used to identify potential problems of access to primary care services for older women and men.

Using hospital discharge data, 5 county and 24 intracounty areas in Upstate New York are studied. There is significant variation in preventable hospitalization within counties. Areas having significantly higher rates of these hospitalizations tend to have higher rates for both women and men. Problems of access are associated with lower income areas for women and men.

## Overuse

### Study

### Outcome

*Estimating The Proportion Of Unnecessary Cesarean Sections In Ohio Using Birth Certificate Data*

**Koroukian, S.M., Trisel, B., Rimm, A.A.; 1998; J Clin Epidemiol**

This study examined data from 262,013 patients in databases of Ohio birth certificates and Medicaid eligibility files in order to validate a method that can be used to estimate the proportion of unnecessary Cesarean sections.

Using the authors' methods, nearly 40% of repeat C-sections had no documented abnormalities on the birth certificate to justify a C-section.

*Association Between Antibiotic Prescribing And Visit Duration In Adults With Upper Respiratory Tract Infections*

**Linder, J.A., Singer, D.E., Stafford, R.S.; 2003; Clin Ther**

3,764 patient visits from the National Ambulatory Medical Care Survey (NAMCS) database were analyzed to determine the association between antibiotic prescribing and visit duration in adults with upper respiratory tract infections.

Antibiotic use was marginally associated with a shorter visit duration (0.7 minutes shorter).

*Does Litigation Influence Medical Practice? The Influence Of Community Radiologists' Medical Malpractice Perceptions And Experience On Screening Mammography*

**Elmore, J.G. Taplin, S.H., Barlow, W.E., Cutter, G.R., D'Orsi, C.J., Hendrick, R.E., Abraham, L.A., Fosse, J.S., Carney, P.A.; 2005; Radiology**

This study surveyed radiologists who interpret mammograms to determine whether the higher rate of repeat mammography and breast biopsy by U.S. radiologists relates to perceptions of, and experience with, malpractice claims for failing to identify breast cancer by mammography.

There was no correlation between concern about or experience of malpractice and higher rates of re-examination; however more than half of the radiologists (59%) reported that concerns about malpractice claims increased their rate of recommendation for breast biopsies, and 76% expressed concern about the impact of malpractice on mammography practice. About one-third were considering withdrawing from interpretation of mammograms.

# Overuse

## Study

## Outcome

*How Are Age And Payors Related To Avoidable Hospitalization Conditions?*

**Guo, L., MacDowell, M., Levin, L., Hornung, R.W., Linn, S.; 2001; Manag Care Q**

This study used hospital discharge data collected in Cincinnati Ohio to investigate how age and payor types were related to the rates of avoidable hospital conditions.

This study demonstrates that age and age/gender adjustments for AHC are needed for privately insured and Medicare patients while additional adjustment for community characteristics is needed for Medicaid and self-pay patients.

*Whither The Almshouse? Overutilization And The Role Of The Emergency Department*

**Malone, Ruth E.; 1998; J Health Polit Policy Law**

Interviews with frequent emergency department (ED) patients (i.e., those with more than four visits per year) and ED staff were used at 2 urban hospitals to determine what factors (traditional, medical and social) were related to their frequent ED visits.

70% of heavy ED users were either homeless or sufficiently poor or disabled to qualify for government assistance.

*Antimicrobial Resistance Among Pediatric Respiratory Tract Infections: Clinical Challenges*

**Jacobs, M.R., Dagan, R.; Antimicrobial; 2004; Semin Pediatr Infect Dis**

This study reviews the literature pertinent to the development of antibiotic resistance among upper respiratory infection (URI) pathogens and discusses both the overuse of antibiotics and the inadequate dosing of antibiotics.

The challenge for rational antibiotic use is to determine which patients can be treated conservatively and which require antimicrobial intervention. Different antibiotics are discussed. The pneumococcal vaccine introduced in 2000 has not had a major impact on decreasing antimicrobial resistance.

# Overuse

## Study

## Outcome

*Triage Services: A Profile Of High Utilization*  
**Berg-Weger, M., Gockel, J. Rubio, D.M., Douglas, R.; 1998; Soc Work Health Care**

This study examined the utilization patterns of 189 veterans in order to identify factors that are related to high utilization rates of ambulatory care triage clinic services.

Factors associated with high utilization of ambulatory care triage clinic services include: patient perception of health status; number of prescription medications; and social needs.

*Effect Of Managed Care Enrollment On Primary And Repeat Cesarean Rates Among U.S. Department Of Defense Health Care Beneficiaries In Military And Civilian Hospitals Worldwide, 1999-2002*  
**Linton, A., Peterson, M.R.; 2004; Birth**

This study used Department of Defense (DOD) hospital records for 365,648 singleton deliveries to assess the impact of enrollment in TRICARE prime, the department's managed care plan, on C-section rates. Rates among TRICARE Prime beneficiaries were compared to those for non-Prime beneficiaries.

The study found that primary C-section rates were significantly lower for TRICARE Prime enrollees when compared to non-TRICARE Prime enrollees. No significant differences in repeat C-section rates were found. Primary and repeat C-section rates were lower in military hospitals than in civilian hospitals. The study suggests that to lower C-section rates (which should decrease morbidity and decrease costs) we need to understand better why different health care plans have different C-section rates. Patients under the TRICARE Prime health plan had lower primary C-section rates, but it is not clearly understood why.

*Antibiotic Prescribing Rates In The US Ambulatory Care Setting For Patients Diagnosed With Influenza, 1997-2001*  
**Ciesla, G., Leader, S., Stoddard, J.; 2004; Respir Med**

This study used National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) data to document the rate and cost of antibiotic prescribing to patients diagnosed with uncomplicated influenza at ambulatory care visits from 1997-2001.

Antibiotic prescribing for influenza is widespread; 38% of visits where the diagnosis of influenza was made led to an antibiotic prescription of which one-third were for broad spectrum antibiotics. Inappropriate antibiotics cost \$18.5 million annually and may contribute to resistance.

## Overuse

### Study

### Outcome

*Regional Air Transport Of Burn Patients: A Case For Telemedicine?*

**Saffle, J.R., Edelman, L., Morris, S.E.; 2004; J Trauma**

225 cases of patients transported by air for burn injuries were reviewed to determine if telemedicine could have been used to assist in evaluation and treatment of burn patients.

In 92 out of 225 cases, overestimation or underestimation of burn size by referring physicians or performance of endotracheal intubation suggested that telemedicine evaluation before transport might have significantly altered transport decisions or care.

*Improving Quality Through Identifying Inappropriate Care: The Use Of Guideline-Based Utilization Review Protocols In The Washington State Workers' Compensation System*

**Wickizer, T.M., Franklin, G., Gluck, J.V., Fulton-Kehoe, D.; 2004; J Occup Environ Med**

This study examined patterns of denied requests through an analysis of the 100,005 utilization reviews that were done between 1993 and 1998 by the workers' compensation program of the Washington State Department of Labor and Industries.

The authors conclude that their program shows that "guideline-based utilization review protocols" can be used to identify inappropriate care, and improve quality. When "guideline-based review criteria" were used during a utilization review, denial rates were 7.9%. When "proprietary review criteria" were used, denial rates were 4.9%. When "other criteria" were used, denial rates were 1.8%.

*The Effects Of Preferred Provider Organizations On Cost And Utilization Of Hysterectomies*

**Currier, C.A., Smith, D.G., Wheeler, J.R., Hirth, R.A., Walker, D.S.; 2004; Nurs Econ**

This study used claims data to compare hysterectomy rates for beneficiaries of employer sponsored PPO and indemnity plans between 1988 and 1990.

Utilization rates among PPO participants were lower for TAH and (12% lower) for vaginal hysterectomy, suggesting overuse of these procedures in indemnity plan beneficiaries.

# Overuse

## Study

## Outcome

*Radiograph Use In Low Back Pain: A United States Emergency Department Database Analysis*

**Isaacs, D.M., Marinac, J., Sun, C.;**  
**2004; J Emerg Med**

A retrospective analysis of data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) from 1998-2000 to determine what factors were associated with having an x-ray if a person presented to an emergency room for uncomplicated low back pain.

Based upon published guidelines, the study identified over 3 million patients with uncomplicated low back pain, of whom 17.8% received an unnecessary radiograph.

*Evaluation And Treatment Of Acute Bronchitis At An Academic Teaching Clinic*

**Hall, K.K., Philbrick, J., Nadkarni, M.;**  
**2003; Am J Med Sci**

This study examined the medical records of 160 patients diagnosed with acute bronchitis to examine antibiotic prescribing patterns in a single university internal medicine clinic.

66% of patients diagnosed with bronchitis received an antibiotic. Increasing age, purulent cough, abnormal exam, and comorbidities were associated with higher likelihood of antibiotic use. Smoking, duration of symptoms, gender, and race did not predict antibiotic use.

*Computed Tomography For Evaluation Of Mild To Moderate Pediatric Trauma: Are We Overusing It?*

**Jindal, A. Velmahos, G.C. Rofougaran, R.;**  
**2001; World J Surg**

A retrospective case control study that examined 102 cases of pediatric trauma to determine if children with mild to moderate trauma are evaluated by more computed tomography (CT) scans than adults with injuries of similar severity. To look at morbidity, mortality, and lengths of hospital and ICU stays, and to see if the number of CT scans was associated with outcomes.

Comparing pediatric and adult trauma patients the number of patients who needed CT scans were equal. More CT scans were done in pediatric patients, due to more pediatric patients receiving scans of multiple body areas. The higher number of CT scans did not improve outcomes since they did not identify more injuries, and did not decrease morbidity, mortality, length of hospital or length of ICU stay.

# Overuse

## Study

### *Overuse Of Acid-Suppressive Therapy In Hospitalized Patients*

**Nardino, R.J., Vender, R.J. Herbert, P.N.; 2000; Am J Gastroenterol**

A chart review of 226 patients admitted to the general adult wards to determine the frequency of use and indications of acid-suppressive medications, and to determine if patients who were prescribed them for stress ulcer prophylaxis were also prescribed them on discharge.

## Outcome

At this hospital, acid-suppressant medications were inappropriately used among outpatient adults and inpatients. The study found that among patients who entered the hospital already on acid-suppressant medications, 54% were deemed to be taking them unnecessarily. Among patients who began acid-suppressant medication during their hospitalization, 75% of these cases were deemed unnecessary. When these medications were started during a hospitalization, 55% of low-risk patients were discharged with a prescription for these medications.

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### *Patient Characteristics And Patterns Of Use For Lumbar Patient Characteristics And Patterns Of Use For Lumbar Spine Radiographs: Results From The Veterans Health Study*

**Selim, A.J., Fincke, G., Ren, X.S. Deyo, R.A., Lee, A., Skinner, K., Kazis, L.; 2000; Spine**

To identify patient characteristics that predict different patterns in the use of lumbar spine X-rays, a prospective cohort study over 12 months of 401 patients who present to Veterans Administration clinics for low-back pain.

Lumbar X-rays for low-back pain are overused in patients who scored worse on surveys of mental health. The study found that higher rates of new lumbar spine X-rays were associated with both physical exam and psychological factors. Higher rates of repeat lumbar spine X-rays were associated with worse mental health, but they were not associated with worse physical health. There was no association between patterns of X-ray use and the following factors: age, income, education, alcohol or drug use, or number of medical and mental conditions.



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*Healthcare Utilization And Referral Patterns In The Initial Management Of New-Onset, Uncomplicated, Low Back Workers' Compensation Disability Claims*

**Tacci, J.A., Webster, B.S., Hashemi, L., Christiani, D.C.; 1998; J Occup Environ Med**

To describe the utilization and physician-referral patterns for new-onset, uncomplicated low back pain, an analysis of 415 cases of low back pain from the workman's compensation claims data of an insurance company that operates in 44 states in the U.S.

The study found that urgent care and emergency rooms were used more than what is probably indicated: only 56% of patients saw their primary care physician first.

Specialist care was provided more commonly than would be expected: 36% were seen by specialists. Referral to specialists was made sooner than expected: the median for referrals was 13 days.

*Regional Variation And Clinical Indicators Of Antipsychotic Use In Residential Treatment: A Four-State Comparison*

**Rawal, P.H., Lyons, J.S., MacIntyre, J.C., Hunter, J.C.; 2004; J Behav Health Serv Res**

The medical records of pediatric residential treatment patients in 4 states were retrospectively reviewed to determine if regional variation exists in off-label prescription and what clinical factors predict use. The study used clinical and pharmacological data collected via retrospective chart reviews (N=732).

There was significant regional variation. Of the children taking antipsychotic medication, 42.9% had no history of or current psychosis.

*Antibiotic-Seeking Behavior In College Students: What Do They Really Expect?*

**Haltiwanger, K.A. Hayden, G.F. Weber, T. Evans, B.A. Possner, A.B.; 2001; J Am Coll Health**

129 university students with upper respiratory symptoms were evaluated to determine if receiving an antibiotic prescription influenced patients' satisfaction with visits to a clinician.

A clear diagnosis, an explanation of the rationale for treatment, and an antibiotic prescription were significantly associated with patient satisfaction. Clinicians prescribed an antibiotic for 36% of the students.

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*Infantile Hypertrophic Pyloric Stenosis: Delays In Diagnosis And Overutilization Of Imaging Modalities*

**Abbas, A.E., Weiss, S.M., Alvear, D.T.; 1999; Am Surg**

This study is a retrospective chart review of 93 patients with infantile hypertrophic pyloric stenosis (IHPS) to determine if unnecessary and redundant diagnostic studies were done and to propose an algorithm for the management of patients with suspected IHPS.

Many patients who had the diagnosis confirmed on physical exam underwent unnecessary studies. Unnecessary studies were associated with delay in diagnosis, and possibly with adverse health problems. The authors propose an algorithm to decrease this waste; if there is clinical suspicion of pyloric stenosis, the first step is prompt referral to a pediatric surgeon or an “experienced physician,” before doing testing which may be unnecessary.

*Propensity Of HIV Patients To Seek Urgent And Emergent Care. HIV Cost And Services Utilization Study Consortium*

**Gifford, A.L., Collins, R., Timberlake, D., Schuster, M.A., Shapiro, M.F., Bozzette, S.A., Kanouse, D.E.; 2000; J Gen Intern Med**

This study interviewed HIV-infected adults in order to determine if they said that they would be more likely to seek care in the the emergency department (ED) or with their primary care provider.

Many patients reported that they would use the Emergency Department (ED) instead of same-day primary care for several common symptoms of HIV disease. African Americans, the poor, and patients with psychological symptoms were more likely to say they would use the ED.

*Medical-Resource Use For Suspected Tuberculosis In A New York City Hospital*

**Griffiths, R.I., Hyman, C.L., McFarlane, S.I., Saurina, G.R., Anderson, J.E., O'Brien, T., Popper, C., McGrath, M.M., Herbert, R.J., Sierra, M.F.; 1998; Infect Control Hosp Epidemiol**

This study analyzed 151 adult admissions for suspected Tuberculosis (TB) at one New York hospital, in order to compare resource use by diagnostic outcome.

Admissions without culture-proven TB accounted for 36% of the days of TB isolation, and for 65% of the days of anti-TB treatment. The vast majority of resource consumption occurred during the diagnostic period before a definitive culture result was known.

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*Preventive Pharmacologic Therapy Among Asthmatics Five Years After Publication Of Guidelines*

**Jatulis, D.E., Meng, Y.Y., Elashoff, R.M., Schocket, A.L., Evans, R.M., Hasan, A.G., Legorreta, A.P.; 1998; Annals of Allergy, Asthma, & Immunology**

This study used pharmacy and survey data for 7,423 asthmatic members of a California HMO to examine the use of routine anti-inflammatory steroids and bronchodilators.

*Are We Ordering Too Many PSA Tests? Prostate Cancer Diagnosis And PSA Screening Patterns For A Single Veterans Affairs Medical Center*

**Richter, F., Dudley, A.W., Jr. Irwin, R.J., Jr. Sadeghi-Nejad, H.; 2001; J Cancer Educ**

This study retrospectively reviewed computerized records of a Veterans Affairs Medical Center (VAMC) to estimate the appropriateness of Prostate-Specific Antigen (PSA) testing.

*Analysis Of Chronic Emergency Department Use*  
**Bond, T.K., Stearns, S., Peters, M.; 1999; Nurs Econ**

This is a retrospective chart review to determine the relationship between acuity level of illness and type of insurance for patients who visit an emergency department (ED) in Northern VA more than 6 times a year. It was hypothesized that uninsured/public aid chronic ED users would have more visits for nonurgent needs.

### Outcome

In contrast to the recommendations of the national guidelines, about half of moderate asthmatics and 40% of severe asthmatics did not fill any anti-inflammatory agents (AI) prescriptions. Approximately one-fourth of the asthmatics were relying on short-acting bronchodilators without AI-representing overutilization of symptom relief agents.

The study concludes that the findings raise the “possibility of indiscriminate PSA testing or unnecessary repetition of testing.” The study found that the number of cases of prostate cancer per PSA test performed decreased from 1.8% in 1997 to 0.8% in 1998. There was a significant increase in the number of PSA tests performed between 1997 (9,410 tests) and 1998 (23,684 tests).

62% of the visits were nonurgent, and the public aid/uninsured (or equivalent) patients were more likely to have nonurgent visits (70%). Looking at visits, a greater percentage of these visits were from public aid/uninsured (or equivalent) patients (61%), even though this group represented only 57.4% of patients. The study also found that the age group with the highest frequency of visits was the 24-64 year old patients, and that the peak visit period for these patients was between 0800 and 1600 and did not increase on weekends, leading the authors to conclude that these patients were not first seeking care elsewhere.

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*The Financial Burden Of Emergency Department Congestion And Hospital Crowding For Chest Pain Patients Awaiting Admission*  
**Bayley, M.D., Schwartz, J.S., Shofer, F.S., Weiner, M., Sites, F.D., Traber, K.B., Hollander, J.E.; 2005; Ann Emerg Med**

This study examined 904 emergency room ER visits for chest pain and admission to a telemetry bed in an urban university hospital. The purpose was to determine the additional cost of an extended emergency department (ED) stay while awaiting non-Intensive Care Unit (ICU), monitored (telemetry) beds.

Extended ED length of stay demonstrated no association with total hospital costs or revenues, or total hospital length of stay. However, patients awaiting telemetry beds prevented ER use for new patients, thereby causing a loss of potential revenue.

*Managed Care And Preventable Hospitalization Among Medicaid Adults*  
**Basu, J. Friedman, B., Burstin, H.; 2004; Health Serv Res**

The study used data from the Healthcare Cost and Utilization Project (HCUP) to examine the association between managed care enrollment and preventable hospitalization patterns of adult Medicaid enrollees in 4 states.

Private health maintenance organization (HMO) enrollment was associated with fewer preventable admissions, compared to private fee-for-service. However, Medicaid managed care enrollment was not associated with a reduction in preventable admissions, compared to Medicaid fee-for-service.

*Non-Emergent And Preventable ED Visits Massachusetts Division of Health Care Finance and Policy; 2004; Analysis in Brief*

To estimate the proportion of non-emergent and preventable emergency department (ED) visits in Massachusetts.

Approximately 21% of outpatient ED visits were considered non-emergent. A further 19% and 6% were deemed emergent but primary-care treatable and emergent but preventable with good primary care, respectively. Women, blacks, and the uninsured were more likely to visit the ED for non-emergent reasons.

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*Extended Use Of Indwelling Urinary Catheters In Postoperative Hip Fracture Patients*

**Wald, H., Epstein, A., Kramer, A.; 2005; Med Care**

This study used data from Medicare admissions to skilled nursing facilities (SNFs) from acute care hospitals with a diagnosis of hip fracture to estimate the probability and impact of having an indwelling urinary catheter.

32% of hip fracture discharges to SNFs had urinary catheters. At 30 days after operation, these patients had higher odds of death, and of rehospitalization for urinary tract infection. Western region and urban location were associated with a higher likelihood of having an indwelling urinary catheter.

*Decreasing Overuse Of Therapies In The Treatment Of Bronchiolitis By Incorporating Evidence At The Point Of Care*

**Muething, S., Schoettker, P.J., Gerhardt, W.E., Atherton, H.D., Britto, M.T., Kotagal, U.R.; 2004; J Pediatr**

This study used a cohort of infants < age 1 year admitted to an academic children's hospital with a first-time diagnosis of bronchiolitis to assess the use of bronchodilator therapy before and after guideline implementation.

Bronchodilator and chest radiograph use decreased, although 53.7% of patients still received bronchodilators and 46.5% a chest radiograph.

*Whole-Body Computed Tomography Screening: Looking For Trouble?*

**Anderiesz, C., Elwood, J.M., McAvoy, B.R., Kenny, L.M.; 2004; Med J Aust**

This review article discusses the issue of whether or not whole-body computed tomography scans are appropriate. The author discusses evidence from the US and other developed countries.

Despite the growth in demand for whole-body computed tomography scans, there is no evidence that they are effective in detecting serious, treatable disease without undue cost or undesirable effects.

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*Estimated Risks Of Radiation-Induced Fatal Cancer From Pediatric CT*

**Brenner, D., Elliston, C., Hall, E., Berdon, W.; 2001; AJR Am J Roentgenol**

This article discusses biologic responses to ionizing radiation and estimates potential cancer deaths attributable to current levels of pediatric computed tomography (CT) use.

In the U.S., of approximately 600,000 abdominal and head CT examinations annually performed in children under the age of 15 years, a rough estimate is that 500 of these individuals might ultimately die from cancer attributable to the CT radiation.

*The Clinical And Economic Correlates Of Misdiagnosed Appendicitis: Nationwide Analysis*

**Flum, D.R., Koepsell, T.; 2002; Archives of Surgery**

This study used data from the 1997 health cost and utilization project (HCUP) National Inpatient Sample to estimate the frequency and cost of negative appendectomy.

Nationwide, 15.3% of appendectomies are estimated to be negative appendectomies. Patients in whom negative appendectomies were suspected had longer lengths of stay (5.8 vs. 3.6 days), higher total charge-admission (\$18,780 vs. \$10,584), higher case fatality rate (1.5% vs. 0.2%), and higher rate of infectious complications (2.6% vs. 1.8%).

*An Evaluation Of Statewide Strategies To Reduce Antibiotic Overuse*

**Mainous, A.G., III, Hueston, W.J., Love, M.M., Evans, M.E., Finger, R.; 2000; Fam Med**

This article tested the hypothesis that interventions will decrease antibiotic overuse in treatment of upper respiratory infection (URI) in pediatric populations. There were three intervention groups: patient education only, provider education only, and both patient and provider education.

There is over- and misuse of antibiotics for the treatment of viral pediatric illness. Antibiotic use increased in all 3 intervention groups as well as in the control group, although the increases in 2 intervention groups (patient educated and patient educated/provider feedback) increased at a slower rate.

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*Urban Emergency Department Utilization By Adolescents*

**Grove, D.D., Lazebnik, R., Petrack, E.M.; 2000; Clin Pediatr (Phila)**

This study is a retrospective chart review at an academic medical center to determine emergency department (ED) utilization and follow-up referral patterns among adolescents.

Adolescents on public assistance or without insurance may frequently utilize an urban ED for nonurgent medical problems. The majority of triage codes for ED visits were nonurgent (n=140; 93%).

*Changes In Antibiotic Prescribing For Children After A Community-Wide Campaign*

**Perz, J.F., Craig, A.S., Coffey, C.S., Jorgensen, D.M., Mitchel, E., Hall, S., Schaffner, W., Griffin, M.R.; 2002; JAMA**

To evaluate the effectiveness of a multifaceted campaign to reduce unnecessary antibiotic prescriptions to children. The intervention included educational efforts directed at health care practitioners, parents, and the public.

Antibiotic prescription rates declined 19% in the intervention county compared with 8% in the control counties.

*Nonurgent Emergency Department Visits: The Effect Of Having A Regular Doctor.*

**Petersen, L.A., Burstin, H.R., O'Neil, A.C., Orav, E.J., Brennan, T.A.; 1998; Med Care**

This study used interviews of patients presenting to 5 major Boston teaching hospitals with diagnoses of abdominal pain, chest pain, or asthma, to assess the association between having a regular doctor and presentation for nonurgent versus urgent emergency department.

Lack of a PCP predicted overuse of the emergency department (ED) (odds ration 1.6). Half of the ED visits were deemed unnecessary.

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*Emergency Department Use By Family Practice Patients In An Academic Health Center.*

**Campbell, P.A., Pai, R.K., Derksen, D.J., Skipper, B.; 1998; Fam Med**

This retrospective review of emergency department (ED) logs assessed whether patients who call the ED before visiting, and are thus triaged by telephone, had fewer inappropriate ED visits.

Calling ahead was not associated with more appropriate ED use (63% vs. 61%).

*Nonurgent Use Of The Pediatric Emergency Department During The Day*

**Kini, N.M., Strait, R.T.; 1998; Pediatr Emerg Care**

This was a prospective study of non-urgent patients presenting to a pediatric emergency department (PED) to evaluate the pattern and reasons for nonurgent use of the pediatric emergency department during regular office hours.

Most Health Maintenance Organization (HMO) (62%) and non-HMO enrollees (86%) did not call their Primary Care Physician (PCP) prior to arrival in the PED. Comparing the reasons given by these patients (HMO enrollees vs. non-HMO) for not calling, we found: convenience (HMO 17% vs. non-HMO 42%) “no identified PCP”, (HMO 17% vs. non-HMO 42%), and “felt problem was an emergency” (HMO 19% vs. non-HMO 10%) to be important differences. HMO enrollees received approval for the visit 79% of the time. These approvals were mostly after noon, and due to “a full office schedule.”

*Resource Utilization And Its Management In Splenic Trauma*

**Cochran, A., Mann, N.C., Dean, J.M., Cook, L.J., Barton, R.G.; 2004; Am J Surg**

This study used emergency department (ED) and hospital discharge data to compare resource utilization and its management for splenic injury at 2 level-I trauma centers and a pediatric referral center with other facilities.

Splenic injury cases managed at pediatric referral centers and trauma centers had longer hospital stays and higher total costs when compared to cases managed at other facilities, even when controlled for injury type and severity.



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*Indigent Men's Use Of Emergency Departments Over Primary Care Settings (Letter)*

**Schanzer, B.M., Morgan, J.A.; 2004; Am J Public Health**

This letter to the editor commented on a study that surveyed 2 Bronx hospitals to examine the factors leading to emergency department (ED) overuse by men.

Factors including a lack of insurance, unemployment, and low income (less than \$20,000 a year) were associated with a higher rate of ED utilization. Lower income patients visited the ED 2.5 times the frequency of higher income patients.

*Emergency Department Management Of Acute Respiratory Infections*

**Ward, M.A.; 2002; Semin Respir Infect**

This study reviews common respiratory infections and considers the overuse of antibiotics.

Careful selection of antimicrobial agents is essential to maximize benefit and prevent overuse.

*Practical Considerations When Treating Children With Antimicrobials In The Outpatient Setting*

**Werk, L.N., Bauchner, H.; 1998; Drugs**

This article is an overview of practical considerations for providers when treating children with antimicrobials in the outpatient setting, with special attention paid to acute otitis media.

By avoiding inappropriate use of antimicrobials, we can avoid antibiotic resistance. Simple strategies can improve compliance with therapeutic regimens and improve parental satisfaction

*When The Visit To The Emergency Department Is Medically Nonurgent: Provider Ideologies And Patient Advice*

**Guttman, N., Nelson, M.S., Zimmerman, D.R.; 2001; Qual Health Res**

This study employed interviews of 26 emergency department (ED) providers in urban hospitals to determine their opinions about nonurgent pediatric ED visits and how they advise parents on appropriate ED use.

Three provider ideologies regarding the appropriateness of medically nonurgent ED use were identified and found to be linked to particular communication strategies that providers employed with ED users: restrictive, pragmatic, and all-inclusive.

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*Reducing Antibiotic Use In Children: A Randomized Trial In 12 Practices*

**Finkelstein, J.A., Davis, R.L., Dowell, S.F., Metlay, J.P., Soumerai, S.B., Rifas-Shiman, S.L., Higham, M., Miller, Z., Miroshnik, I., Pedan, A., Platt, R.;** 2001; **Pediatrics**

This study utilized educational outreach regarding antibiotics for upper respiratory infection (URI) in 12 pediatric practices in Massachusetts and Washington State.

Educational efforts targeting physicians and parents can contribute to the declining rate of antibiotic misuse and overuse in children between the ages of 3 months and 6 years. The educational interventions reduced antibiotic prescribing by 16% in children aged 3-36 months, and 12% in children 36-72 months compared to a control group of practices. These represented 0.23 fewer antibiotics per-patient per-year for ages 3-36 months, and 0.13 fewer antibiotics per-patient per-year for patients 36-72 months compared to the controls which showed smaller decreases in the intervention year. Also, most of the antibiotics prescriptions were for otitis media (62.1%).

*The Beginning Of The End Of The Antibiotic Era? Part I. The Problem: Abuse Of The "Miracle Drugs"*

**Harrison, J.W., Svec, T.A.;** 1998; **Quintessence Int**

This study presents a comprehensive review of the evolution of antibiotic resistance since WWII.

Antibiotic overuse is one factor in the emergence of significant antibiotic resistance.

*Health Care Utilization Of Chronic Inebriates*

**Thornquist, L., Biros, M., Olander, R., Sterner, S.;** 2002; **Acad Emerg Med**

Chronic inebriates often use emergency services because they lack other resources or access to primary care. Three county programs were developed to reduce emergency resource utilization which would be measured by medical visits, hospital visits, hospital inpatient days, and total charges.

These programs reduce health care use for most patients; however serious medical illness and injury in a small number of patients contributed heavily to resource utilization.

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### *Use And Misuse Of Corticosteroids*

**Borchers, A.T., Keen, C.L., Gershwin, M.E.; 2003; Compr Ther**

This article provides a systemic review of corticosteroid use, focusing on evidence supporting use in rheumatoid arthritis, asthma, COPD, and prematurity.

Corticosteroids appear to be either overused or over-prescribed in each of the conditions studied.

### *Use And Overuse Of Angiography And Revascularization for Acute Coronary Syndromes*

**Lange, R.A., Hillis, L.D.; 1998; N Engl J Med**

This is an editorial commenting on the Veterans Affairs Non-Q-Wave Infarction Strategies in Hospital (VANQWISH) Trial, published in the same issue. The study is the fourth large randomized clinical trial (RCT) looking at aggressive versus conservative management of acute coronary syndromes.

“Angiography, percutaneous transluminal coronary angioplasty (PTCA), and coronary artery bypass grafting (CABG) done routinely following myocardial infarction, rather than on the basis of ischemia, do not improve outcomes. All four studies show that routine angiography and revascularization do not reduce the incidence of nonfatal reinfarction or death as compared with the more conservative, ischemia-guided approach. Physicians who work in hospitals with catheterization facilities are more likely to recommend coronary angiography than those without easy access to such a facility.”

### *Preventing The Spread Of Antimicrobial Resistance Among Bacterial Respiratory Pathogens In Industrialized Countries: The Case For Judicious Antimicrobial Use*

**Schwartz, B.; 1999; Clin Infect Dis**

This article reviews the literature and discusses the joint Centers for Disease Control (CDC)/American Academy of Pediatrics (AAP)/American Academy of Family Physicians (AAFP) program to promote rational antibiotic use.

Patient pressure and suboptimal diagnosis and treatment contribute to antibiotic overuse. Curricula for doctors have been developed to describe the optimal management of respiratory infections. Patient education materials and strategies to improve doctor-patient communication have been developed. Studies are underway to evaluate interventions.

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*The Annual Physical: Are Physicians And Patients Telling Us Something?*  
**O'Malley, P.G., Greenland, P.; 2005; Arch Intern Med**

This editorial addresses the attitudes of primary care physicians regarding “annual physicals” that are discordant with U.S. Preventive Services Task Force (USPSTF) guidelines and evidence.

Although there is no evidence for the utility of the annual physical, this editorial suggests that it may persist because it provides a forum to build and nurture the physician-patient relationship.

*Wise Use Of Perioperative Antibiotics*  
**Plonczynski, D.J.; 2005; AORN J**

This article examines the relationship between microbial resistance and the overuse of antibiotics.

This article supports the use of prophylactic antibiotics for specific cardiac, colorectal, gynecologic, ophthalmologic, orthopedic, or urologic procedures when given as a single dose prior to incision.

*A Simple, Focused, Computerized Query To Detect Overutilization Of Laboratory Tests*  
**Weydert, J.A., Nobbs, N.D., Feld, R., Kemp, J.D.; 2005; Arch Pathol Lab Med**

This study tested a method for detecting repetitive daily ordering of a commonly ordered laboratory test (serum sodium). The results were followed by a chart review in order to determine the accuracy of the test.

A focused query of data derived from a clinical data repository can detect and document overutilization of a common laboratory test in a convincing fashion within a given institution.

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*Resource Utilization And Outcome In Gravely Ill Intensive Care Unit Patients With Predicted In-Hospital Mortality Rates Of 95% Or Higher By APACHE III Scores: The Relationship With Physician And Family Expectations*

**Berge, K.H. Maiers, D.R., Schreiner, D.P., Jewell, S.M., Bechtle, P.S., Schroeder, D.R., Stevens, S.R., Lanier, W.L.; 2005; Mayo Clin Proc**

This study evaluated APACHE III scores of all patients admitted to the intensive care unit (ICU) at the Mayo Clinic between 1994 and 2001. 248 had a predicted in-hospital mortality of 95% or higher, and the study evaluated the resource utilization and ultimate outcome of this cohort.

23% of patients in the cohort survived to hospital discharge; all but one were moderately or severely disabled. 10% were alive at 1 year. Resource utilization was extensive, but costs were not calculated. Survival was 5 times that predicted by the tool.

*Availability Of Antibiotics Without Prescription In New York City*

**Larson, E., Grullon-Figueroa, L.; 2004; J Urban Health**

This article describes a survey of the availability of non-prescription antibiotics in 101 independent stores in Manhattan, New York.

Antibiotics were available in all stores in the Hispanic neighborhood, but in none of the stores in non-Hispanic neighborhoods.

*Combating Antimicrobial Resistance: Intervention Programs To Promote Appropriate Antibiotic Use*

**Emmer, C.L., Besser, R.E.; 2002; Infect Med**

This article reviews current efforts to promote the appropriate use of antibiotics, and reduce the spread of antibiotic resistance.

It appears that these interventions are successfully reducing the inappropriate use of antibiotics.

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*Cost-Utility Analysis Of Screening Intervals For Diabetic Retinopathy In Patients With Type 2 Diabetes Mellitus*

**Vijan, S., Hofer, T.P., Hayward, R.A.; 2000; JAMA**

This study performed a Markov cost-effectiveness model using data from the Third National Health and Nutrition Examination Survey in order to examine the cost-effectiveness of various screening intervals for eye disease in patients with type 2 diabetes.

Patients in the high-risk group cost an additional \$40,530 per quality-adjusted life year (QALY) gained, while those in the low-risk group cost an additional \$211,570 per QALY gained. Retinal screening annually vs. every other year for patients with type 2 diabetes costs \$107,510 per QALY gained, while screening every other year vs. every third year costs \$49,760 per QALY gained.

*Diagnosis And Treatment Of Upper Respiratory Tract Infections In The Primary Care Setting*

**Fendrick, A.M., Saint, S., Brook, I., Jacobs, M.R., Pelton, S., Sethi, S.; 2001; Clin Ther**

This paper reviews the literature and the results of an industry-sponsored roundtable discussion regarding the management of acute exacerbations of chronic bronchitis (AECB), acute otitis media (AOM), and acute bacterial rhinosinusitis (ABRS).

Guidelines for the management of AECB, AOM, and ABRS emphasize the importance of differentiating between bacterial and nonbacterial infections, choosing an antibiotic based on the likelihood of infection with resistant pathogens, and providing coverage against the predominant pathogens.

*Appropriateness Of Ambulance Transportation To A Suburban Pediatric Emergency Department*

**Kost, S., Arruda, J.; 1999; Prehosp Emerg Care**

This study examined emergency department (ED) records of all patients arriving to a suburban ED during 1 year in order to assess the appropriateness of ambulance use with regard to both medical necessity and insurance status.

28% of patients who arrived by ambulance were judged to have used the ambulance transportation unnecessarily. Of the unnecessary transports, 60% were insured by Medicaid.

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*Medication Overuse Headache From Antimigraine Therapy Clinical Features, Pathogenesis And Management*  
**Smith, T.R., Stoneman, J.; 2004; Drugs**

This study is an examination of the literature on medication-overuse headaches (also termed analgesia rebound headaches) to describe a number of theories on cause and a number of suggestions for treatment.

*Transformed Migraine And Medication Overuse In A Tertiary Headache Centre—Clinical Characteristics And Treatment Outcomes*  
**Bigal, M.E., Rapoport, A.M., Sheftell, F.D., Tepper, S.J., Lipton, R.B.; 2004; Cephalalgia**

To compare the outcomes for patients with medication-overuse headaches (transformed migraines) who were able to stop overusing analgesics to those who were not.

*Use Of Antihypertensive Drug Therapy In Older Persons In An Academic Nursing Home*  
**Ziesmer, V., Ghosh, S., Aronow, W.S.; 2003; J Am Med Dir Assoc**

This study analyzed the charts of all residents of an academic nursing home to examine the prevalence of hypertension and appropriate treatment of hypertension in a nursing home population.

Patients are overusing analgesics for migraine headaches, leading to more headaches. According to the study, treatments for medication-overuse headaches should include replacement of analgesics with prophylactic and headache-aborting medications and the use of alternative treatments, such as biofeedback.

By overusing analgesics, patients worsen their illness. The study found that the frequency of headaches decreased by 74% in patients who were able to stop analgesic overuse (“detox”), and 17% in those who were not. The duration of headache pain was reduced by 61% (detox) vs. 15% (no detox).

A significant minority of patients (16%) had uncontrolled hypertension. Among patients with hypertension and concomitant diabetes, coronary artery disease, and/or heart failure, a specific recommended class of drugs (e.g., ACE inhibitors for diabetics) was often not being prescribed (3-47% of the time, depending on condition and drug class).

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*Prevalence Of Subacute Patients In Acute Care: Results Of A Study Of VA Hospitals*

**Weaver, F.M., Guihan, M., Hynes, D.M., Byck, G., Conrad, K.J., Demakis, J.G.; 1998; J Med Syst**

This study reviewed 858 medical and surgical admissions from 43 VA hospitals in order to determine the number of VA patients with subacute needs being cared for in acute care.

Over one-third of hospitalized patients had at least 1 subacute day; with an average length of stay of 12.7 days; of which 6.8 days were subacute.

*Laparoscopically Assisted Vaginal Hysterectomy*  
**Shwayder, J.M.; 1999; Obstet Gynecol Clin North Am**

This article is a review about the topic of “laparoscopically assisted vaginal hysterectomy” (LAVH). The review discusses the history, challenges, and future of this technique.

The growth and, at times, overuse of the laparoscopic approach have waned somewhat as physicians reevaluate LAVH, adopt new techniques such as arterial embolization and myolysis, and rediscover old techniques such as uterine morcellation at vaginal hysterectomy.

*Pediatric Emergency Room Visits For Nontraumatic Dental Disease*

**Graham, D.B., Webb, M.D., Seale, N.S.; 2000; Pediatr Dent**

This study reviewed 149 visits to an emergency room (ER) of a children’s hospital which had a diagnosis of dental caries, periapical abscess or facial cellulitis. The purpose was to determine “the incidence and predisposing, enabling, and need factors of outpatients” and to analyze the hospital charges.

During 1996-97, 149 patients made 159 ER visits. The most common diagnoses were ICD-9 codes 521.0 for dental carie (48%) and 522.5 for periapical abscess (47%). Medicaid recipients used the ER at an intermediate level between patients with no payor source and those with private insurance. Almost one-half of the accounts changed status during the billing process, with the majority being entered as private-pay upon admission, but changing to bad debt or charity after the registration records were processed and collection was attempted. Most patients were treated empirically by the ER physicians according to their presenting signs/symptoms.



# Overuse

## Study

## Outcome

*Propoxyphene Use By Community-Dwelling And Institutionalized Elderly Medicare Beneficiaries*  
**Kamal-Bahl, S.J., Doshi, J.A., Stuart, B.C., Briesacher, B.A.; 2003; J Am Geriatr Soc**

This study was conducted to provide the first comparable national prevalence estimates on the use of propoxyphene by elderly Medicare beneficiaries living in the community and in institutions, and to determine whether institutionalized beneficiaries are at greater risk for receiving propoxyphene than community-dwelling beneficiaries.

The results show that propoxyphene use by U.S. community-dwelling seniors is high, but is much higher in the institutionalized population. These findings suggest that prescribing for older adults with pain could be improved, especially for vulnerable long-term care residents.

*The LUNAR Project: A Description Of The Population Of Individuals Who Seek Health Care At Emergency Departments*  
**MacLean, S.L., Bayley, E.W., Cole, F.L., Bernardo, L., Lenaghan, P., Manton, A.; 1999; J Emerg Nurs**

This study employed a retrospective record review of 12,422 randomly selected emergency department (ED) visits at 89 EDs in 35 states to describe the population of patients who seek care in EDs.

Most patients had insurance (80%) and 78% of patients had a primary care physician (PCP), but only 51% of self-pay patients had PCPs. 31% of visits were for injuries, and 52% were for nonurgent care. The specific diagnoses were very varied, with the most frequent diagnosis being otitis media (4.5% of diagnoses). It was also noted that most visits were NOT related to alcohol or drugs (77%), and 16% of patients were admitted to the hospital.

*Variation In Psychotropic Drug Use In Nursing Homes*  
**Castle, Nicholas; 1999; J Health Soc Policy**

This study uses self reported data in the OSCAR databases to provide a descriptive analysis of nursing homes with and without high levels of psychotropic drug use and to provide an analysis of the determinants of high use.

Homes with high levels of antipsychotic drug use are less likely to be hospital-based, are less likely to have special care units, but are more likely to have Alzheimer's special-care units.

# Overuse

## Study

## Outcome

*Overcrowding In The Nation's Emergency Departments: Complex Causes And Disturbing Effects*

**Derlet, R.W., Richards, J.R.; 2000; Ann Emerg Med**

This study reviews the literature regarding overcrowding of emergency department (EDs) and describes root causes and consequences of overcrowding.

Root causes include increased complexity and acuity of patients using EDs; overall increases in populations; unintended effects of managed care; scarcity of inpatient beds; increasing intensity of ED interventions to avoid hospitalization; delays in providing ancillary services; nursing, clerical, and physician shortages; shortages of on-call specialty physicians; difficulty arranging follow-up care, limited physical space; language barriers; and increased documentation requirements. The results are: poor patient satisfaction, ambulance diversion of critically ill patients, and poor outcomes related to delays in treatment.

*1998 ARRS Executive Council Award. Radiology In The Emergency Department: Technique For Quantitative Description Of Use And Results*

**Lee, S.I., Chew, F.S.; 1998; AJR Am J Roentgenol**

This article describes how one hospital developed a method to analyze their records from the radiology department in order to describe the use and results of imaging studies in emergency department (ED) patients.

ED admissions and imaging studies were stable from 1991 to 1997, averaging 60,000 and 52,000 per year, respectively. Bone radiographs comprised 45.1% of examinations; chest radiographs, 44.6%; and abdominal radiographs, 10.4%. The percentages of radiographs interpreted as normal were 75.9% in 1992 and 75.3% in 1996, with cervical spine (88.7%), thoracic spine (86.3%), and knee (86.3%) yielding the highest proportion of studies with normal findings. The number of CT studies of the body increased from 1,840 in 1993 to 3,101 in 1997. Studies of the abdomen accounted for most of this increase (52.3% in 1993 to 66.0% in 1997). During evaluations for cervical spine injury, a mean of 6.5% of radiographic studies were followed by CT studies, and the findings of 89.0% of those CT studies were interpreted as normal.

# Overuse

## Study

## Outcome

*Care In The Emergency Department: How Crowded Is Overcrowded?*

**Hwang, U., Concato, J.; 2004; Acad Emerg Med**

This article examined 53 articles, which included all articles on PubMed and MEDLINE databases (1966 to 2002) about overcrowding in emergency rooms, in order to determine if there existed an explicit criteria for the term “emergency room overcrowding.”

43% of the articles had explicit definitions of crowding or overcrowding. The definitions varied widely in content and focus, including emergency department, hospital, or external (non-hospital) factors.

*Emergency Department Overcrowding In The United States: An Emerging Threat To Patient Safety And Public Health*

**Trzeciak, S., Rivers, E.P; 2003; Emerg Med J**

This is a systematic review that describes how emergency department (ED) overcrowding threatens patient safety and public health.

The study reports three findings: 1) the ED is a vital part of the safety net, 2) overcrowding threatens public health, 3) the main cause is inadequate inpatient capacity.

*Frequent Overcrowding In U.S. Emergency Departments*

**Derlet, R., Richards, J., Kravitz, R.; 2001; Acad Emerg Med**

This study employed a survey methodology to assess the frequency, determinants, and consequences of ED overcrowding.

91% of ED directors reported overcrowding as a problem. Common definitions of overcrowding (greater than 70%) included the following: patients in hallways, all ED beds occupied, full waiting rooms longer than 6 hours a day, and acutely ill patients who wait longer than 60 minutes to see a physician.

## Overuse

### Study

### Outcome

*Ethnic Differences In Past Hysterectomy For Benign Conditions*

**Powell, L.H., Meyer, P., Weiss, G., Matthews, K.A., Santoro, N., Randolph, J.F., Jr., Schocken, M., Skurnick, J., Ory, M.G., Sutton-Tyrrell, K.; 2005; Womens Health Issues**

Using a phone survey of women in 7 different U.S. cities, this study attempted to determine differences in hysterectomy rates among different ethnic groups.

The highest rates of hysterectomy occurred in the disadvantaged African American and Hispanic subgroups, and could not be explained by known risk factors. Therefore, overuse of hysterectomy in these disadvantaged groups may exist.

*Health Resource Utilization Of The Emergency Department Headache "Repeater"*

**Maizels, M; 2002; Headache**

This study employed retrospective emergency department (ED) and urgent care center chart reviews to analyze the health care utilization of patients who use EDs repeatedly for recurrent headaches.

Over a 6-month period, 502 patients made 1004 visits. 54 patients accounted for 502 visits. Retrospectively, the ED charges for this group of patients in the previous 12 months was \$183,760, 41/52 used narcotics, and 30/52 benzodiazepines.

*The Health Economics Of Asthma And Rhinitis. I. Assessing The Economic Impact*

**Weiss, K.B., Sullivan, S.D.; 2001; J Allergy Clin Immunol**

This paper is a narrative review that looked at 128 articles about asthma and allergic rhinitis in order to estimate the amount of direct and indirect costs of these 2 diseases in the U.S.

In 1998, asthma in the U.S. cost 12.7 billion dollars annually (for direct and indirect costs). In 1994, allergic rhinitis cost \$1.2 billion. Most of the costs were due to direct medical expenditures (especially medications).

## Overuse

### Study

### Outcome

*Helicopter Transport Of Pediatric Trauma Patients In An Urban Emergency Medical Services System: A Critical Analysis*  
**Eckstein, M., Jantos, T., Kelly, N., Cardillo, A.; 2002; J Trauma**

This study was a retrospective review of 175 pediatric patients transported by helicopter to a single pediatric trauma center in order to determine if helicopter transport was necessary.

Out of 175 patients transported by helicopter, 14% were incubated in the emergency department (ED), 18% were admitted to the intensive care unit (ICU), 4% were taken directly to the operating room (OR), 33% were discharged home from the ED.

*Prevention Of Catheter-Associated Urinary Tract Infection*  
**Trautner, B.W., Hull, R.A., Darouiche, R.O.; 2005; Current opinion in infectious diseases**

This article reviews the topic of catheter-associated urinary tract infections (UTIs). The article discusses etiology and pathology, and areas of research.

The underlying cause of catheter-associated UTIs is biofilm formation by pathogens on the urinary catheter. Research is ongoing regarding biofilm formation, and ways to prevent and treat these infections.

*The Quality Of Antipsychotic Drug Prescribing In Nursing Homes*  
**Briesacher, B.A., Limcangco, M.R., Simoni-Wastila, L., Doshi, J.A., Levens, S.R., Shea, D.G., Stuart, B.; 2005; Arch Intern Med**

This study retrospectively analyzed data from 1,096 nursing home patients in the Medicare Current Beneficiary Survey in order to determine the pattern of antipsychotic use and the appropriateness of antipsychotic use.

27% of all Medicare beneficiaries in nursing homes received antipsychotics. Patients receiving antipsychotic therapy within guidelines were no more likely to achieve stability or improved behavioral symptoms than were those taking antipsychotics outside the guidelines.

## Overuse

### Study

### Outcome

*Economic Evaluation Of Four Treatments For Low Back Pain: Results From A Randomized Controlled Trial*

**Kominski, G.F., Heslin, K.C., Morgenstern, H., Hurwitz, E.L., Harbor, P.L.; 2005; Med Care**

This study examined 18-month costs for 4 treatments for low-back pain.

The adjusted outpatient costs (not including pharmaceuticals) for the 4 modalities for low-back pain were \$369 for medical care only, \$560 for chiropractic care only, \$579 for chiropractic care with physical modalities, and \$760 for medical care and physical therapy.

*Medical Care- Is More Always Better?*

**Fisher, E.S.; 2003; N Engl J Med**

This editorial discusses the effect of the Veterans Administration's reform of its health care system on patients with chronic disease.

High-intensity practice patterns are associated with lower quality of care and worse outcomes than more conservative practice patterns.

*Responsible Use Of CT [Letter]*

**Frush, D.P.; 2003; Radiology**

This letter to the editor discusses theoretical risks and benefits of computed tomography (CT) scans in terms of the trade-off between low-level radiation exposure and increased diagnostic certainty

CT results in low level radiation exposure. The cumulative effect of repeated exams can lead to significant exposure which could predispose to a variety of malignancies.



# NEHI Compendium

## *Underuse*





# Evidence Table—Underuse

## Study

*Underuse And Overuse Of Diagnostic Testing For Coronary Artery Disease In Patients Presenting With New-Onset Chest Pain*

**Carlisle, D.M., Leape, L.L., Bickel, S., Bell, R., Kamberg, C., Genovese, B., French, W.J., Kaushik, V.S., Mahrer, P.R., Ellestad, M.H., Brook, R.H., Shapiro, M.F.; 1999; Am J Med**

This study retrospectively reviewed the records of patients who presented to five LA emergency departments (EDs) with new onset non-myocardial infarction (non-MI) chest pain to determine the extent of overuse and underuse of diagnostic testing for coronary artery disease and whether the socioeconomic status, health insurance, gender, and race/ethnicity of a patient influences the use of diagnostic tests.

*Antibiotic Treatment Of Children With Sore Throat*

**Linder, J.A., Bates, D.W., Lee, G.M., Finkelstein, J.A.; 2005; JAMA**

The study used National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) to measure rates of antibiotic prescribing and Group A Beta Hemolytic Streptococci (GABHS) testing and to evaluate the association between testing and antibiotic treatment in children with sore throat.

## Outcome

Underuse of testing for new onset chest pain without an MI is more significant than overuse. 51% of patients met criteria for necessary testing. 78% of these received one or more tests. 22% did NOT get the necessary testing. 215 patients underwent testing; in 3% testing was inappropriate. In 23% of the patients who underwent testing, the indications were inappropriate or of uncertain necessity. Those without insurance and lacking education beyond high school were less likely to undergo recommended testing. Among the insured, there was a 42% rate of underuse for Medicaid patients and only 11% for patients with private/HMO/Medicare insurance.

Antibiotics are generally overused, and the wrong antibiotics are prescribed (and misused) 27% of the time. Testing for GABHS is underused. Antibiotics were prescribed in 53% of visits for sore throats in children aged 3-17. Antibiotics are indicated for sore throats due to GABHS infection, which accounts for only 15-36% of sore throats. When antibiotics are prescribed, the correct antibiotic is prescribed 73% of the time. Only 57% of children with a diagnosis of tonsillitis, strep sore throat and pharyngitis had the GABHS test.

# Underuse

## Study

## Outcome

*Ten-Year Durability And Success Of An Organized Program To Increase Influenza And Pneumococcal Vaccination Rates Among High-Risk Adults*

**Nichol, Kristin L.; 1998; Am J Med**

This study utilized pharmacy data and patient surveys from a Veterans Affairs Medical Center (VAMC) to estimate vaccination rates for influenza and pneumonia.

For influenza, 84% of eligible individuals were vaccinated. The pneumococcal vaccination rate is 63%.

*Cancer-Directed Surgery For Localized Disease: Decreased Use In The Elderly*

**O'Connell, J.B., Maggard, M.A., Ko, C.Y.; 2004; Ann Surg Oncol**

1988-1997 SEER data was used to examine the probabilities of undergoing surgical resection for a number of cancers based upon age.

Rates of surgery were lower in the elderly for some cancers (esophagus, stomach, pancreas, and lung), and about equal for others (colon, rectal, breast).

*Attitudes Of Physicians Toward Objective Measures Of Airway Function In Asthma*

**O'Dowd, L.C., Fife, D., Tenhave, T., Panettieri, R.A., Jr.; 2003; Am J Med**

This study utilized a survey methodology to estimate the extent of pulmonary function testing in asthma by physicians in Philadelphia.

Primary care physicians are less likely to use spirometry than pulmonary or allergy specialists (44% versus 80%). Owning a spirometer was associated with conducting the test, but familiarity of expert recommendations/guidelines National Asthma Education and Prevention Program (NAEPP) was not associated with using the test frequently.

## Underuse

### Study

*National Use And Effectiveness Of [Small Beta]-Blockers For The Treatment Of Elderly Patients After Acute Myocardial Infarction: National Cooperative Cardiovascular Project*  
**Krumholz, H.M., Radford, M.J., Wang, Y., Chen, J., Heiat, A., Marciniak, T.A.; 1998; JAMA**

This study utilized Cooperative Cardiovascular Project data for 115,015 Medicare patients discharged alive following acute myocardial infarction (AMI) to identify the most important predictors in prescribing beta-blockers and to evaluate the association of use upon discharge with mortality.

*Methods To Encourage The Use Of Antenatal Corticosteroid Therapy For Fetal Maturation: A Randomized Controlled Trial*  
**Leviton, L.C., Goldenberg, R.L., Baker, C.S., Schwartz, R.M., Freda, M.C., Fish, L.J., Cliver, S.P., Rouse, D.J., Chazotte, C., Merkatz, I.R., Raczynski, J.M.; 1999; JAMA**

This retrospective chart review at 27 tertiary care institutions was designed to assess compliance with National Institute of Health (NIH) guidelines for antenatal corticosteroid use.

### Outcome

The New England region has a significantly higher use of beta-blockers at approximately 71% for patients who met the study criteria. Cardiologist and internists had similar prescribing rates, both of which were higher than general and family practice physicians. Beta-blockers were associated with a 14% lower risk of mortality at 1 year after discharge.

Premature delivery is associated with increased rates of morbidity and mortality as well as increased costs of care. Antenatal corticosteroid therapy is underused, and can reduce the risks associated with preterm delivery. Active dissemination efforts increased the rate of corticosteroid use by 108% over the baseline, whereas usual dissemination practices yielded a 75% increase over baseline.

# Underuse

## Study

## Outcome

*Measuring Underuse Of Necessary Care Among Elderly Medicare Beneficiaries Using Inpatient And Outpatient Claims*

**Asch, S.M., Sloss, E.M., Hogan, C., Brook, R.H., Kravitz, R.L.; 2000; JAMA**

In this study an expert panel examined the Medicare claims of a 1% sample of the Medicare population to estimate the rate of underuse of necessary care among elderly patients using inpatient and outpatient Medicare claims.

Underuse of necessary care is widespread for the 15 target conditions and contributes to more serious and costly problems. The system that was developed to measure underuse of care through claim review is potentially a lower cost process than patient surveys and chart reviews. Out of the 46 indicators, as decided upon by a Delphi-method expert panel, for almost half the indicators, less than two-thirds of beneficiaries received needed care. Underuse was more likely to occur among African Americans and residents of poverty areas.

*Health And Economic Benefits Of Increased Beta-Blocker Use Following Myocardial Infarction*

**Phillips, K.A., Shlipak, M.G., Coxson, P., Heidenreich, P.A., Hunink, M.G., Goldman, P.A., Williams, L.W., Weinstein, M.C., Goldman, L.; 2000; JAMA**

This study uses an existing epidemiological modeling program to predict potential savings in dollars and years lived if beta-blockers were consistently prescribed following a first Myocardial Infarction (MI).

The failure to consistently and responsibly use beta-blockers, when modeled over the next 20 years, could cause 72,000 unnecessary deaths, 62,000 unnecessary MIs, and cost \$18 million. Initiating beta-blocker use for all MI survivors except those with absolute contraindications in 2000 and continuing treatment for 20 years would result in 4,300 fewer coronary heart disease deaths, 3,500 MIs prevented, and 45,000 life-years gained compared with current use. The incremental cost per Quality-Adjusted Life Year (QALY) gained would be \$4,500.

*Correlates Of Colorectal Cancer Testing In Massachusetts Men And Women*

**Brawarsky, P., Brooks, D.R., Mucci, L.A.; 2003; Prev Med**

This study used 1999 Massachusetts Behavioral Risk Factor Surveillance System (BRFSS) data to examine colorectal cancer (CRC) as a leading cause of cancer-related death.

CRC screening is underused. Only 61% of respondents had any kind of screening, and of those screened 75% of men and 63% of women had a sigmoidoscopy or colonoscopy.

# Underuse

## Study

## Outcome

*A Propensity Score Analysis Of The Impact Of Angiotensin-Converting Enzyme Inhibitors On Long-Term Survival Of Older Adults With Heart Failure And Perceived Contraindications*  
**Ahmed, A., Centor, R.M., Weaver, M.T., Perry, G.J.; 2005; Am Heart J**

This study prospectively followed patients enrolled in a heart failure quality improvement project to determine the association between discharge use of angiotensin-converting enzyme (ACE) inhibitors in patients with perceived contraindications to these drugs and 4-year post-discharge survival among hospitalized older adults discharged alive with a primary discharge diagnosis of systolic heart failure.

Compared with the referent group, patients with perceived contraindications who were not discharged on an ACE inhibitor had a significant 2-fold increase in the risk of 4-year mortality. Patients with perceived contraindications who were discharged on ACE inhibitors had a non-significant 23% higher risk of 4-year mortality vs. the referent group.

*Benefits Of Inpatient Initiation Of Beta-Blockers*  
**Ventura, Hector O.; 2004; Am Heart J**

This is a literature review pertaining to the benefits and underuse of beta blockers in acute myocardial infarction (AMI) and congestive heart failure (CHF).

This study provides a non-systemic review discussing the underuse of beta-blockers and the perceived conditions and clinical situations that may be keeping physicians from using them, as well as addresses the question of why initiating therapy in hospitalized patients is both clinically beneficial for the patient's hospitalization and for long-term compliance with the medicine.

*Changes In Rates Of Beta-Blocker Use Between 1994 And 1997 Among Elderly Survivors Of Acute Myocardial Infarction*  
**Heller, D.A., Ahern, F.M., Kozak, M.; 2000; Am Heart J**

This study is a retrospective study of patients with history of acute myocardial infarction (AMI) enrolled in the Pennsylvania PACE project designed to examine changes in beta-blocker use in patients over age 65 in Pennsylvania who are lower income and lack prescription-drug insurance after they have an acute MI, and to identify factors associated with the use and non-use of beta-blockers.

Patients with AMI were more likely to get a beta-blocker in 1997 than in 1994. Major factors influencing the prescription of beta-blockers were historical comorbidities—especially chronic obstructive pulmonary disease (COPD), and treatment by a cardiologist (52% greater likelihood of getting a beta-blocker prescription).

# Underuse

## Study

## Outcome

*Resource Use And Quality Of Care For Medicare Patients With Acute Myocardial Infarction In Maryland And The District Of Columbia: Analysis Of Data From The Cooperative Cardiovascular Project*

**Berger, A.K., Edris, D.W., Breall, J.A., Oetgen, W.J., Marciniak, T.A., Molinari, G.F.; 1998 Am Heart J**

This study used Medicare claims data to identify 4,300 Medicare beneficiaries admitted to hospitals in Maryland and Washington, D.C. Hospital records were retrospectively reviewed to evaluate adherence to the Cooperative Cardiovascular Project's recommendations (derived from the American College of Cardiology and American Heart Association recommendations).

Patients received less than the recommended treatments. The rates for specific therapies where patients were considered ideal candidates were: Thrombolytic therapy (72%), Aspirin (87%), ACE inhibitor for low EF (65%), Avoidance of Calcium Channel Blockers (CCBs).

*Beta-Blocker Underuse In Secondary Prevention Of Myocardial Infarction*

**Everly, M.J., Heaton, P.C., Cluxton, R.J., Jr.; 2004; Ann Pharmacother**

This paper reviews the risks and benefits of beta-blockers for secondary prevention of myocardial infarction (MI) and examines reasons for their underuse in this setting.

A lower rate of beta-blocker usage was documented in elderly patients and those with concomitant diabetes, heart failure, chronic obstructive pulmonary disease (COPD), asthma, or peripheral vascular disease.

*Early Initiation Of Beta Blockade In Heart Failure; Issues And Evidence*

**Williams, R.E.; 2005; J Clin Hypertens (Greenwich)**

This study reviews the literature concerning the use of beta-blockers in patients with heart failure, and examines the underuse of these drugs in that condition.

Patients with heart failure are prescribed beta-blockers in only 28-48% of cases. Beta-blocker therapy can safely be initiated prior to discharge.

# Underuse

## Study

*Factors Determining Angiotensin-Converting Enzyme Inhibitor Underutilization In Heart Failure In A Community Setting*

**Philbin, E.F.; 1998; Clin Cardiol**

This record review of patients in 10 community hospitals compared utilization rates of angiotensin-converting enzyme (ACE) inhibitors in heart failure patients in 1992 and 1995 in several community settings.

*Variation In The Use Of Cardiac Procedures In The Veterans Health Administration*

**Mirvis, D.M., Graney, M.J.; 1999; Am Heart J**

This study reviewed records of 30,901 patients presenting to a Veterans Affairs Medical Center (VAMC) with coronary artery disease to determine whether the Veterans Affairs-structured referral system eliminates any confounding influences of hospital complexity or level of services in the likelihood of veterans with coronary artery disease receiving cardiac procedures: angiography, percutaneous transluminal coronary angioplasty, or bypass graft surgery.

## Outcome

ACE inhibitor use among patients hospitalized with congestive heart failure (CHF) was significantly greater in 1995 compared with 1992. Usage in both years was associated with lower ejection fraction (EF), lower creatinine, younger age, documentation of EF, and non-prescription of other vasodilators.

The likelihood of having cardiac catheterization was increased if the VAMC had a catheterization lab (86% greater), cardiac surgery program (65%), and was affiliated with a medical school (42%). The greater the complexity of the medical center also increased the likelihood of patients having a cardiac catheterization (35-89%). Also, living in areas other than the Northeast increased the likelihood of having a cardiac catheterization (11-58%). The likelihood of having percutaneous transluminal coronary angioplasty (PTCA) increased at centers with a catheterization lab (34%), cardiac surgery (46%), a medical school affiliation (15%) and at centers with increased complexity characteristics (34-46%). The likelihood of having coronary artery bypass grafting (CABG) increased at facilities with catheterization labs (15%), cardiac surgery (43%), and with increasing complexity (12-33%).

# Underuse

## Study

*The Use Of Angiotensin-Converting Enzyme Inhibitors In Patients With Acute Myocardial Infarction In Community Hospitals. Michigan State University Inter-Institutional Collaborative Heart (MICH) Study Group*  
**Dwamena, F.C., El-Tamimi, H., Watson, R.E., Kroll, J., Stein, A.D., McLane, A, Holmes-Rovner, M., McIntosh, B., Kupersmith, J.; 2000; Clin Cardiol**

This retrospective review of 1,163 acute myocardial infarction (AMI) patients was designed to examine usage rates (and predictors) of angiotensin-converting enzyme (ACE) inhibitors in patients discharged from a community hospital following AMI.

*Beta-Blocker Use In The Emergency Department In Patients With Acute Myocardial Infarction Undergoing Primary Angioplasty*  
**Pancu, D., Lee, D.C.; 2003; J Emerg Med**

This study was a retrospective medical record review of patients who presented to two emergency departments (ED) with signs of acute myocardial infarction (AMI) to determine the frequency of beta blocker administration in the ED.

## Outcome

Angiotensin converting enzyme (ACE) inhibitors were prescribed to only a minority of patients discharged after AMI (40% of ideal candidates). Prior use of ACE inhibitors and congestive heart failure (CHF) were positively associated with ACE inhibitor prescription, while female gender, lack of ejection fraction documentation, and acute renal failure were negative predictors.

Beta-blockers for the acute treatment of MI were significantly underused by ED physicians in this study. Of eligible patients, 99% received aspirin, 97% received heparin, and 28% received beta-blockers in the ED. Physicians cited bradycardia, asthma, and congestive heart failure (CHF) as reasons for withholding beta-blockers.



# Underuse

## Study

*Understanding Individual And Small Area Variation In The Underuse Of Coronary Angiography Following Acute Myocardial Infarction*

**Garg, P.P., Landrum, M.B., Normand, S.L., Ayanian, J.Z., Hauptman, P.J., Ryan, T.J., McNeil, B.J., Guadagnoli, E.; 2002; Med Care**

This study used CCP data for 9,458 patients hospitalized for acute myocardial infarction (AMI) in 95 hospital-referral regions to examine the association of patient demographics and clinical and hospital characteristics with geographic variation in coronary angiography usage.

*Underutilization Of Measurement Of Serum Low-Density Lipoprotein Cholesterol Levels And Of Lipid-Lowering Therapy In Older Patients With Manifest Atherosclerotic Disease*

**Mendelson, G., Aronow, W.S.; 1998; J Am Geriatr Soc**

This study consisted of a retrospective chart review of all patients seen in an academic geriatrics practice to examine the rates of lipid measurement and prescription of lipid-lowering drugs in elderly patients.

*A New Framework For Describing And Quantifying The Gap Between Proof And Practice*

**Sim, I., Cummings, S.R.; 2003; Med Care**

This study used published data regarding underuse of beta blockers at discharge post-myocardial infarction to analyze the substantial gaps that often exist between every day practice and best practice as defined by research evidence.

## Outcome

Coronary angiography was significantly underused in this study. Among patients for whom angiography was retrospectively deemed necessary, only 58% underwent the procedure. Underuse was associated with female gender, black race, treatment by a general practitioner (GP), and treatment in a hospital without angiography.

Serum low-density lipoprotein (LDL) testing and treatment of hyperlipidemia was suboptimal in this elderly population. LDL was measured in 42-51% of patients (lowest for stroke; highest for myocardial infarction); less received therapy. Prescription rates declined with age, though the effect was not statistically significant.

The authors apply a novel methodology (termed Number Not Prevented) to quantify the implications of underuse of beta-blockers at hospital discharge for acute MI. They estimate that 2,295 first-year post-MI deaths fail to be prevented due to underuse of this effective intervention.

# Underuse

## Study

## Outcome

*Under-Utilization Of Beta-Blockers After Acute Myocardial Infarction. Pharmacoeconomic Implications*

**Bradford, W.D., Chen, J., Krumholz, H.M.; 1999; Pharmacoeconomics**

This paper reviewed the literature regarding the efficacy, effectiveness, and underutilization of beta-blockers post myocardial infarction (MI).

Beta-blockers are not prescribed in 50% of MI survivors in whom they are appropriate.

*An Economic Model Of Stroke In Atrial Fibrillation*

**Caro, JJ; 2004; Am J Manag Care**

This study used published literature and Medicare claims data to develop an economic model for the underuse of oral anticoagulation in patients with atrial fibrillation (AF).

1.265 million patients with AF (55%) are not receiving appropriate anticoagulation and will suffer 58382 strokes each year, costing \$3.1 billion. Additionally it is purported that many patients receiving therapy are not optimally anticoagulated.

*Aspirin Treatment After Myocardial Infraction: Are Health Maintenance Organization Members, Women, And The Elderly Undertreated?*

**Hill, J.W., Roglieri, J.L., Warburton, S.W.; 1998; Am J Manag Care**

In this study a sample was drawn from members of a managed care organization (MCO) identified as having a myocardial infarction (MI) in 1995. Telephone interviews were used to estimate the rate of aspirin (ASA) use in the sample and factors contributing to its use.

Older patients are at risk for undertreatment, but risk is low; other subsets of MI patient groups also do not indicate undertreatment.

# Underuse

## Study

## Outcome

*Effective Anticoagulation Therapy: Defining The Gap Between Clinical Studies And Clinical Practice*

**Wittokowsky, AK; 2004; Am J Manag Care**

This article explores the scope of warfarin underutilization and undercoagulation that exists in current clinical practice, and provides a roundtable discussion of causative factors, economic implications, and strategies to increase use.

In patients with atrial fibrillation (AF), only 55% of appropriate patients were receiving warfarin, with the lowest rates among the elderly. Of patients receiving treatment, 54.4% failed to achieve an international normalized ratio (INR) in the desired therapeutic range.

*Hypertension Management: The Care Gap Between Clinical Guidelines And Clinical Practice*

**Andrade, S.E., Gurwitz, J.H., Field, T.S., Kelleher, M., Majumdar, S.R., Reed, G., Black, R.; 2004; Am J Manag Care**

This study used chart review and claims data from a mixed model health maintenance organization HMO in central Massachusetts to assess hypertension outcomes and the gap between guidelines and current practice.

38% of patients were at target at 50% of their visits, and 33% were never at target blood pressure.

*Problems Due To Medication Costs Among Veterans Affairs And Non-Veterans Affairs Patients With Chronic Illnesses*

**Piette, J.D., Heisler, M.; 2004; Am J Manag Care**

This study used a survey of 4055 patients with chronic illnesses to evaluate differences in cost-related adherence problems between Veterans Affairs (VA) patients and patients covered by Medicaid, Medicare, private, or no insurance.

Medicare and patients with no insurance coverage were 3.4 and 4 times more likely to report frequent medication underuse due to cost-related factors.

# Underuse

## Study

## Outcome

*Underuse Of Beta-Blockers In Cardiovascular Medicine*

**Gottlieb, SS; 2000; Am J Manag Care**

This study used Medicare claims data from the Cooperative Cardiovascular Project database to estimate the rates of beta blocker prescribing at discharge post-acute myocardial infarction (AMI).

Only 34% of patients were prescribed beta blockers at the time of discharge.

*Is Lipid-Lowering Therapy Underused By African Americans At High Risk Of Coronary Heart Disease Within The Veterans Affairs Health Care System?*

**Woodard, L.D., Kressin, N.R., Petersen, L.A.; 2004; Am J Public Health**

Imaging records in 5 Veterans Affairs Medical Centers (VAMCs) were reviewed to identify a cohort of 1,374 patients with heart disease used to examine possible racial disparities in the screening and treatment of hypercholesterolemia within the Veterans Affairs system.

Race (black or white) was not correlated with cholesterol monitoring, treatment, or achievement of guideline-recommended low-density lipoprotein (LDL) levels. Although no racial disparities were noted, 33% of patients (all with known coronary artery disease) did not receive a lipid screening.

*Physician Knowledge And Practice Patterns Relating To Diabetic Nephropathy*

**Wong, T., Foote, E.F., Lefavour, G.S., Cody, R.P., Brown, C.J., Sherman, R.A.; 1999; J Am Pharm Assoc (Wash)**

Mailed questionnaires were sent to primary care physicians (PCPs) to assess the knowledge and practice patterns of PCPs relating to the detection and treatment of diabetic nephropathy.

Of the physicians who claimed to monitor patients for microalbuminuria, 39% chose inappropriate methods for detection. Patients with proteinuria (86%) were more likely to be treated with an angiotensin-converting enzyme inhibitor (ACEI) than were patients with microalbuminuria (79%).

# Underuse

## Study

*Targeting The Underserved For Breast And Cervical Cancer Screening: The Utility Of Ecological Analysis Using The National Health Interview Survey*

**Wells, B.L., Horm, J.W.; 1998; Am J Public Health**

This study used 1990 National Health Institute Survey (NHIS) data to assess the role of education, income, neighborhood income and ethnicity, and neighborhood age in obtaining female cancer screening.

## Outcome

Certain variables (low education, low income, Hispanic areas, and lower age) are correlated with lower rates of screening; interventions can be targeted specifically to these groups to increase screening. All of these factors correlated to underuse of mammograms. Pap smears and clinical breast exams followed similar trends, though they were more common in younger women, and significantly less common in recent immigrants. The authors conclude that using ecological variables to analyze the data can be important in designing targeted messages for screening in underserved communities.

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*Underuse Of Screening Sigmoidoscopy And Colonoscopy In A Large Cohort Of U.S. Adults*  
**Chao, A., Connell, C.J., Cokkinides, V., Jacobs, E.J., Calle, E.E., Thun, M.J., 2004; Am J Public Health**

This study assessed the prevalence of bowel endoscopy (sigmoidoscopy or colonoscopy) for colorectal screening (versus diagnosis or follow-up) in adults over 50 in the Cancer Prevention Study Nutrition Cohort in 1997 and analyzed factors predictive of screening.

The study suggests that screening endoscopy is underused, though it does not provide data about what the benefit would be in increasing the screening rate. 29% of men and 21% of women (24% of total) reported a screening endoscopy within the past 5 years.

# Underuse

## Study

## Outcome

*Adherence To Medications By Patients After Acute Coronary Syndromes*

**Sud, A., Kline-Rogers, E.M., Eagle, K.A., Fang, J., Armstrong, D.F., Rangarajan, K., Otten, R.F., Stafkey-Mailey, D.R., Taylor, S.D., Erickson, S.R.; 2005; Ann Pharmacother**

208 patients were interviewed by telephone 10 months after discharge from an acute coronary syndrome hospital admission in order to describe medication-taking behavior and determine the relationship between self-reported adherence and patient characteristics.

26% of those that were told they had bronchitis were dissatisfied with their treatment, compared with 13% and 17% for colds and viral illness, respectively. Educational attainment, age, and gender did not affect satisfaction rates.

*Relation Between Influenza Vaccination And Outpatient Visits, Hospitalizations, And Mortality In Elderly Persons With Chronic Lung Disease*

**Nichol, K.L., Baken, L., Nelson, A.; 1999; Ann Intern Med**

This study used managed care organization (MCO) claims data to define the effects of influenza and the benefits of influenza vaccination in elderly persons with chronic lung disease.

Influenza vaccination is associated with substantial health benefits for elderly patients with chronic lung disease. Among staff model health maintenance organization (HMO) patients at least age 65 and diagnosed with chronic lung disease, influenza vaccination rates were 72%, 74% and 75% over three influenza seasons. Vaccinated patients had significantly fewer outpatient visits, inpatient stays, and deaths.

*Platelet Glycoprotein Iib/Iiia Receptor Antagonists In Non-ST Segment Elevation Acute Coronary Syndromes: A Review And Guide To Patient Selection*

**Atwater, B.D., Roe, M.T., Mahaffey, K.W.; 2005; Drugs**

This study reviews the literature surrounding the use of Gp Iib/IIIa antagonists in the treatment of patients with non-ST-segment elevation acute coronary syndromes.

Recent data from the CRUSADE (Can Rapid Risk Stratification of Unstable Angina Patients Suppress ADverse Outcomes with Early Implementation of the American College of Cardiology/American Heart Association Guidelines) initiative suggests that GpIib/IIIa antagonists are underused in clinical practice.

# Underuse

## Study

## Outcome

*Patterns Of Anticoagulation In Patients Hospitalized With Atrial Fibrillation: Warfarin Is Underused In Paroxysmal Atrial Fibrillation.*

**Marcu, C.B., Ghantous, A.E., Caracciolo, E.A., Donohue, T.J.; 2003; Conn Med**

This study defined the incidence of warfarin use at time of admission and discharge in patients hospitalized with paroxysmal atrial fibrillation (PAF) and chronic atrial fibrillation (CAF) at a single hospital.

Anticoagulation rates at hospital admission were 89% in the patients with CAF and 38% in patients with PAF, and increased to 100% for patients with CAF and 81% for patients with PAF at the time of hospital discharge.

*The Use Of Prenatal Care By Hispanic Women After Welfare Reform*

**Fuentes-Afflick, E., Hessol, N.A., Bauer, T., O'Sullivan, M.J., Gomez-Lobo, V., Holman, S., Wilson, T.E., Minkoff, H.; 2006; Obstet Gynecol**

This study interviewed women who delivered at participating hospitals in San Francisco, New York, or Miami to compare the use of prenatal care by Hispanic women in New York, California and Florida based on immigration status (U.S.-born citizen, foreign-born citizen, documented immigrant, undocumented immigrant) after implementation of the Personal Responsibility Work Opportunity Reconciliation Act of 1996 (PRWORA).

Hispanic women in Florida in all immigrant groups (U.S.-born citizen, foreign-born citizen, documented immigrant and undocumented immigrant) were more likely to have inadequate prenatal care than hispanic women in NY and CA. Hispanic women in FL in all categories had later onset of care and fewer visits than hispanic women in CA and NY. In multiple-regression analysis (using NY as the referent group) the statistically significant variables were state immigration status, maternal age, marital status, presence of health insurance, gravity and lack of money/insurance.

# Underuse

## Study

*Adherence To AAP Guidelines For Well-Child Care Under Managed Care*

**Byrd, R.S., Hoekelman, R.A., Auinger, P.; 1999; Pediatrics**

This study used data from a private health management organization (HMO) and a Medicaid plan to determine adherence to the American Academy of Pediatricians (AAP) schedule for well-child care (WCC) in Monroe County, NY.

## Outcome

There is significant underuse of WCC for both privately and publicly insured children. Utilization is slightly better for privately insured patients. Only 46% of privately insured children received 100% of the recommended WCC; 35% of the publicly insured children received 100% of the WCC. 17% of private and 35% of public children received no WCC. Only 5% of pediatricians had a 100% compliance rate for their patients. Pediatricians completed an average of 52% of WCC in publicly funded children and 68% of WCC in privately funded children.

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*Aspirin, Ticlopidine, And Clopidogrel In Acute Coronary Syndromes: Underused Treatments Could Save Thousands Of Lives*

**Tan, W.A., Moliterno, D.J.; 1999; Cleve Clin J Med**

This study provides a narrative review of the role of aspirin in the treatment of acute coronary syndromes.

Despite clear data, aspirin is woefully underused or is often used late. Ticlopidine and clopidogrel have a synergistic effect when used with aspirin and can also have a role in treating patients who are aspirin-resistant or have diffuse atherosclerosis.



# Underuse

## Study

*Asthma Symptoms, Morbidity And Anti-Inflammatory Use In Inner City Children*

**Warman, K.L., Silver, E.J., Stein, R.E.; 2001; Pediatrics**

This telephone study surveyed parents of children previously admitted to an inner-city (NYC) hospital with a diagnosis of asthma to determine the rate of persistent asthma symptoms among inner-city children in New York, NY aged 2-12 years hospitalized for acute asthma symptoms. Determining how many children with persistent asthma received the recommended treatment with anti-inflammatory agents and whether use of these agents is related to their caretakers' race, educational level, insurance, self-efficacy score and whether the care-taker receives public assistance.

## Outcome

Anti-inflammatory agents for persistent asthma are underused. The most effective medications (inhaled steroids) are not used by the majority of patients. 83% of inner city children hospitalized for acute asthma have persistence of symptoms; only 35% of these children receive recommended daily treatment with anti-inflammatory agents (83% received cromolyn alone). Of the subset of children for whom starting/increasing daily dose of anti-inflammatory agent is recommended, 39% received said medication. No differences in use of anti-inflammatory agents were based on child's age or gender. Race, educational level, insurance, receipt of public assistance or self-efficacy rating of caretakers did not impact rate of use of anti-inflammatory agents. Children who used anti-inflammatory agents were more likely to have a primary care physician, have a written asthma plan, have a peak flow meter and a mattress cover. Appropriate use of anti-inflammatory agents may prevent remodeling of lung tissue.

*Compliance With Guidelines For Medical Care In The First Urinary Tract Infection In Infants; A Population-Based Study.*

**Cohen, A.L., Rivara, F.P., Davis, R., Christakis, D.A.; 2005; Pediatrics**

This study used Washington State Medicaid data to determine how many children < one year with a documented urinary tract infection (UTI) received recommended care based on most the recent guidelines from the American Academy of Pediatrics.

The appropriate follow-ups are underused after UTI in the first year of life. Less than half of children received the recommended care after UTI in the first year of life. 44% had renal ultrasound; 39.5% had imaging to rule out reflux. 220 children (28.2%) had both imaging studies; 123 (15.8%) had only a renal ultrasound; 88 (11.3%) had imaging to rule out reflux. Of those who had any imaging study, only 51% had adequate antibiotic prophylaxis. Being hospitalized for the UTI was associated with increased compliance with guidelines.

## Underuse

### Study

*Factors Inhibiting Use Of The Pneumococcal Polysaccharide Vaccine: A Survey Of Connecticut Physicians*

**Metersky, M.L., Mennone, J.Z., Fine, J.M.; 1998; Conn Med**

A survey was completed by 397 internists and family doctors to determine their frequency of utilization of pneumococcal polysaccharide vaccine (PPV) and what factors inhibited utilization of PPV.

*Medication Use Among Children With Asthma In East Harlem*

**Diaz, T., Sturm, T., Matte, T., Bindra, M., Lawler, K., Findley, S., Maylahn, C.; 2000; Pediatrics**

A survey of parents at 2 East Harlem elementary schools about their children's asthma to determine what type of medicines were taken and how frequently they were used, to see if medication use complied with National Health, Lung, and Blood Institute guidelines and to see what factors were associated with deviation from these guidelines.

### Outcome

Forgetting to administer the vaccine (59% of respondents) and patient refusal (55% of respondents) were the factors most frequently noted as preventing vaccination in the outpatient setting.

There is significant underuse of anti-inflammatory medicines (inhaled steroid or chomyl/nedocromil) among children thought to have persistent/severe asthma. 89% of children with asthma used some medicine. 22% of children used an anti-inflammatory medicine daily, while 24% reported using a beta-agonist daily (10% used both daily). Of 107 children with severe asthma, only 39% used anti-inflammatory meds daily. Factors increasing the likelihood of using an anti-inflammatory daily were having a spacer tube and visiting a physician in the previous 6 months; not being Puerto Rican decreased the likelihood.

# Underuse

## Study

*Analysis Of The Degree Of Undertreatment Of Hyperlipidemia And Congestive Heart Failure Secondary To Coronary Artery Disease*

**Sueta, C.A., Chowdhury, M., Boccuzzi, S.J., Smith, S.C., Jr., Alexander, C.M., Londhe, A., Lulla, A., Simpson, R.J., Jr.; 1999; Am J Cardiol**

This study examined 58,890 patients from 140 practices with coronary artery disease (CAD) and/or congestive heart failure (CHF) in order to determine: (1) frequency of lipid documentation and prescription of lipid agents in patients with CAD, (2) frequency of assessment of left ventricular function and prescription of an angiotensin-converting enzyme (ACE) inhibitor in patients with CHF, (3) predictors of medication prescription.

*Immunizations: A Health Disparity Concerning African American Children And Implications For Community Health*

**Coleman, C.L.; 2004; J Natl Black Nurses Assoc**

This article reviews evidence regarding pediatric immunizations in African American children.

*The Urgent Need To Improve Hypertension Care*

**Trilling, J.S., Froom, J.; 2000; Arch Fam Med**

This study reports on a literature review of the underdiagnosis, misdiagnosis, underuse, overuse, and misuse of medications for hypertension.

## Outcome

Current practice patterns in the management of CAD and CHF are inadequate. Of the patients with CAD, 44% had annual diagnostic testing of low-density lipoprotein cholesterol. Of the patients with CHF, 64% had diagnostic testing of left ventricular function, and 50% of patients were taking an ACE inhibitor.

African American children from 19-35 months of age are falling below national goals. The study suggests intervention and prevention strategies and recommends implementation and evaluation strategies.

A narrative review of suboptimal blood pressure control in reference to Joint National Committee (JNC-6) guidelines (the goal of less than 140/90 was achieved by only 27% of hypertensive patients). The authors briefly review several potential improvements for hypertension care including computer-aided management, medical chart audit, academic detailing, and the addition of a nurse case manager.

## Underuse

### Study

*Temporal Patterns In The Medical Treatment Of Congestive Heart Failure With Angiotensin-Converting Enzyme Inhibitors In Older Adults, 1989-1995*

**Smith, N.L., Psaty, B.M., Pitt, B., Garg, R., Gottdiener, J.S., Heckbert, S.R.; 1998; Arch Intern Med**

This study used a prospective cohort of adults > age 65 and matching Medicare claims data to examine whether there was a temporal pattern from 1989-1995 of angiotensin-converting enzyme (ACE) inhibitor use in elderly patients with congestive heart failure (CHF), in accordance with accumulating evidence of the efficacy of this class of medications for this condition.

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*National Patterns And Predictors Of Beta-Blocker Use In Patients With Coronary Artery Disease*

**Wang, T.J., Stafford, R.S., 1998; Arch Intern Med**

This study used National Ambulatory Medical Care Survey (NAMCS) data to identify 11,745 visits by patients with coronary artery disease (CAD) to randomly selected office-based physicians in order to examine the frequency and predictors of beta-blocker use.

### Outcome

This study suggests that ACE inhibitors are significantly underused in elderly patients with CHF, though there was some increase in prevalent use from 1989 to 1995, from 26% in 1989 to 36% in 1994 ( $p < 0.01$ ).

There was no significant temporal change in the use of ACE inhibitors for incident CHF (defined as diagnosis within the previous year): 42% of patients diagnosed with CHF from 1989-1990 were taking ACE inhibitors in 1990 compared with 40% diagnosed from 1994-1995 taking ACE inhibitors in 1995.

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This study suggests that beta-blockers are significantly underused in ambulatory patients with coronary artery disease. This underuse may translate to significant preventable mortality given the strength of evidence for use of this class of medications.

# Underuse

## Study

*Warfarin Use Following Ischemic Stroke Among Medicare Patients With Atrial Fibrillation*

**Brass, L.M., Krumholz, H.M., Scinto, J.D., Mathur, D., Radford, M.; 1998; Arch Intern Med**

This study used a chart review of Medicare patients hospitalized in Connecticut with a diagnosis of atrial fibrillation (AF) to estimate the rate of warfarin prescription.

## Outcome

Underuse of warfarin in this population could lead to increased morbidity and mortality from cerebrovascular disease. Anticoagulation of elderly patients with AF is underused for secondary prevention of recurrent stroke, even among ideal candidates (i.e., those without possible contraindication). 53% of elderly patients with AF discharged alive after an ischemic stroke were prescribed warfarin at discharge. Patients older than 85, those with prior bleeding, dementia, or limitations in ADLs were less likely to be prescribed warfarin. Those receiving warfarin on admission, beta-blockers, or ACE inhibitors were more likely to be prescribed warfarin.

*Underuse Of Venous Thromboembolism Prophylaxis For General Surgery Patients: Physician Practices In The Community Hospital Setting*

**Bratzler, D.W., Raskob, G.E., Murray, C.K., Bumpus, L.J., Piatt, D.S.; 1998; Arch Intern Med**

This study used a retrospective records review of 419 Medicare beneficiaries undergoing major abdominal or thoracic surgery in 20 hospitals in Oklahoma to assess the rate of venous thromboembolism (VTE) prophylaxis.

The underuse of VTE prophylaxis at these small-to medium-size community hospitals is of concern, since the consequence of an embolus can be severe. Most Medicare patients over age 65 undergoing abdominothoracic surgery (gastrectomy, bowel resection, or lung resection) did not receive VTE prophylaxis. Overall only 38% of these patients received prophylaxis, and the percentage did not change with the patient's risk of venous thromboembolus (35% for moderate risk patients to 40% for very high risk patients).

## Underuse

### Study

*The Health And Economic Benefits Associated With Pneumococcal Vaccination Of Elderly Persons With Chronic Lung Disease*

**Nichol, K.L., Baken, L., Wuorenma, J., Nelson, A.; 1999; Arch Intern Med**

This study was a 2-year retrospective review of elderly members of a staff model health management organization (HMO) with chronic obstructive pulmonary disease (COPD) to assess the ability of pneumococcal vaccination to prevent hospitalization or death.

### Outcome

Pneumococcal vaccination is potentially underused; non-vaccinated, high-risk seniors are at higher risk for hospitalization for pneumonia or influenza and death. Vaccinated seniors are at a lower risk, with a 43% reduction in hospitalization for pneumonia or influenza, and 29% reduction in the death rate. There was no difference between the groups for non-pneumonia hospitalizations, and there was no cost differential between hospitalizations for vaccinated versus non-vaccinated individuals. However, the reduced number of hospitalizations for vaccinated individuals equated to savings of \$294 per person vaccinated.

*Treatment Patterns Among Adult Patients With Asthma: Factors Associated With Overuse Of Inhaled Beta-Agonists And Underuse Of Inhaled Corticosteroids*

**Diette, G.B., Wu, A.W., Skinner, E.A., Markson, L., Clark, R.D., McDonald, R.C., Healy, J.P., Jr., Huber, M., Steinwachs, D.M.; 1999; Arch Intern Med**

A 2-year cohort survey study of employees (and their adult dependants) who work at a consortium of 11 employers (who use managed care plans for their health benefits), to examine overuse of b-agonist inhalers, and underuse of inhaled corticosteroids.

Standard maintenance medications for asthma may be underused, while rescue medications may be overused. Patients with moderate to severe allergy in these managed care plans overused beta-agonists (15.8%) and underused inhaled steroids (64%). Overuse of beta-agonists was associated with the patient having a peak flow meter, greater knowledge about asthma, more use of other medications, and being treated by a pulmonologist. Underuse of inhaled steroids was associated with being female, non-white, younger, working full-time, and being treated by a generalist rather than a pulmonologist or an allergist.

# Underuse

## Study

*Prevention Of Venous Thromboembolism: Adherence To The 1995 American College Of Chest Physicians Consensus Guidelines For Surgical Patients*

**Stratton, M.A., Anderson, F.A., Bussey, H.I., Caprini, J., Comerota, A., Haines, S.T., Hawkins, D.W., O'Connell, M.B., Smith, R.C., Stringer, K.A.; 2000; Arch Intern Med**

This study is a review of charts from 10 hospitals to evaluate the adherence to American College of Chest Physicians (ACCP) guidelines for venous thromboembolism (VTE) prophylaxis treatments.

*Sex Bias And Underutilization Of Lipid-Lowering Therapy In Patients With Coronary Artery Disease At Academic Medical Centers In The United States And Canada. Prospective Randomized Evaluation Of The Vascular Effects Of Norvasc Trial (PREVENT) Investigators*

**Miller, M., Byington, R., Hunninghake, D., Pitt, B., Furberg, C.D.; 2000; Arch Intern Med**

This study prospectively evaluated 825 men and women with coronary artery disease (CAD) at 16 academic medical centers to determine whether lipid lowering therapies (LLTs) were being used appropriately.

## Outcome

The effects of less than total adherence to guidelines is unclear. 89.3% of these high risk patients received some VTE prophylaxis as inpatients, 97.3% for those undergoing orthopedic procedures (total hip, total knee, and hip fracture repair), and 75.2% for the high risk major abdominal surgery patients. However, only 63.6% of patients received prophylaxis that conformed to the ACCP guidelines: 45.2% for hip fracture; 50.3% for major abdominal surgery; 76% for total knee; and 84.3% for total hip.

LLT is underused for patients with CAD in academic medical centers and more so among female patients. The percentage of CAD patients on lipid-lowering therapy went from 30% to 56% over the course of the trial, even after the 4S trial results were released and publicized to the investigators early in this study. However, the percentage of men receiving LLT was greater than for women (63% vs. 47%), and the percentage of men achieving goal low-density lipoprotein (LDL) levels (less than 100mg/dl) was 31% versus only 12% for women.

## Underuse

### Study

*Prevalence And Quality Of Warfarin Use For Patients With Atrial Fibrillation In The Long-Term Care Setting*

**McCormick, D., Gurwitz, J.H., Goldberg, R.J., Becker, R., Tate, J.P., Elwell, A., Radford, M.J.; 2001; Arch Intern Med**

Medical records from residents of a sample of long term care facilities in Connecticut were reviewed to identify atrial fibrillation (AF) patients and estimate whether warfarin was being appropriately administered

*Effect Of Medicare Coverage On Use Of Invasive Colorectal Cancer Screening Tests*

**Ko, C.W., Kreuter, W., Baldwin, L.M.; 2002; Arch Intern Med**

This study used Medicare claims data from Washington State to determine the effects of Medicare reimbursement on the utilization rates of invasive screening tests such as those for colorectal cancer.

*Time Trends In High Blood Pressure Control And The Use Of Antihypertensive Medications In Older Adults: The Cardiovascular Health Study*

**Psaty, B.M., Manolio, T.A., Smith, N.L., Heckbert, S.R., Gottdiener, J.S., Burke, G.L., Weissfeld, J., Enright, P., Lumley, T., Powe, N., Furberg, C.D.; 2002; Arch Intern Med**

This study used a prospective cohort of 5,888 Medicare beneficiaries to evaluate the use of medications to treat high blood pressure in adults aged 65 years and older.

### Outcome

42% of all atrial fibrillation patients received warfarin for at least 2 weeks of the 12 month study period, an additional 27% received aspirin, and 32% received no antiplatelet therapy. Of 83 ideal candidates, 53% received warfarin, 22% received aspirin, and 25% received no stroke prevention therapy. For patients taking warfarin, their levels were therapeutic 51% of the time, below the therapeutic range 36% of the time, and above the therapeutic range 13% of the time.

Insurance coverage did not increase the screening rates for colorectal cancer. Insurance coverage is only one factor in affecting the use of screening tests, and the provision of insurance coverage for screening tests has not been immediately shown to increase the use of such tests.

51% of patients in this study did not achieve optimal control, although the variance was often mild systolic hypertension. Diuretics and beta-blockers were used in less than 50% of eligible patients.



# Underuse

## Study

## Outcome

*A Survey Of Oral Vitamin K Use By Anticoagulation Clinics*

**Libby, E.N., Garcia, D.A.; 2002; Arch Intern Med**

This study surveyed 53 anticoagulation clinics to assess whether Vitamin K is being administered by clinics according to the American College of Chest Physicians criteria in the treatment of patients who are having complications from warfarin therapy.

68% of anticoagulation clinics surveyed did not fully conform with guidelines concerning Vitamin K use.

*Cancer Survival In Kentucky And Health Insurance Coverage*

**McDavid, K., Tucker, T.C., Sloggett, A., Coleman, M.P.; 2003; Arch Intern Med**

This retrospective review of the Kentucky Cancer Registry database was designed to assess the influence of health insurance on the amount and quality of health care received by patient populations affected with prostate, breast, colorectal, and lung cancers.

Patients with private insurance fare better than patients without insurance, unknown insurance, or Medicaid when it comes to cancer survival rates. Differences in prostate cancer survival rates are 15%, breast 13%, colorectal 18% and lung 10%. This confirms the purported disparities in access to quality cancer care.

*In-Hospital Initiation Of Lipid-Lowering Therapy After Coronary Intervention As A Predictor Of Long-Term Utilization: A Propensity Analysis*

**Aronow, H.D., Novaro, G.M., Lauer, M.S., Brennan, D.M., Lincoff, A.M., Topol, E.J., Kereiakes, D.J., Nissen, S.E.; 2003; Arch Intern Med**

This retrospective review of patients enrolled in the EPILOG database was used to examine the relationship between pre-discharge initiation of lipid-lowering therapy and long-term use.

This study suggests that there is an under-use of lipid-lowering agents. Pre-discharge initiation is very effective in influencing subsequent use. 77% of patients who started taking lipid-lowering agents before hospital discharge continued taking the therapy. After adjusting for other confounders, initiation of lipid-lowering agents introduced during hospitalization was the strongest independent predictor of use at 6 months.

# Underuse

## Study

## Outcome

*Maternal Determinants Of Pediatric Preventive Care Utilization Among Blacks And Whites*  
**Alio, A.P., Salihu, H.M.; 2005; J Natl Med Assoc**

This study used 1996-2000 medical expenditure panel survey (MEPS) data to assess maternal characteristics that were predictive of preventative care utilization among children 0-5 years and compared black-white differences in preventative care usage.

Overall, the level of pediatric preventive services used regardless of race was 15.4% of expected.

*Lack Of Physician Concordance With Guidelines On The Perioperative Use Of Beta-Blockers*  
**Siddiqui, A.K., Ahmed, S., Delbeau, H., Conner, D., Mattana, J.; 2004; Arch Intern Med**

This study retrospectively reviewed the records of patients undergoing cholecystectomy at a tertiary academic center to estimate compliance with American College of Physicians ACP guidelines for the use of perioperative beta-blockers.

Only 43% of patients thought to benefit from perioperative beta-blockers actually received them.

*Underutilization Of Digital Rectal Examination When Screening For Prostate Cancer*  
**Murthy, G.D., Byron, D.P., Pasquale, D.; 2004; Arch Intern Med**

This study identified 588 patients at a Veterans Affairs Medical Center (VAMC) who underwent prostate-specific antigen (PSA) testing, and then reviewed the medical record to determine whether or not digital rectal examination (DRE) was done.

DRE is underused. 17% of the prostate cancers diagnosed were by DREs alone. DRE were performed less than 50% of the time. If those tests did not take place, about 37,500 cancers would not be diagnosed. This is important because DREs may detect early abnormalities before PSA test levels are abnormal. Female providers were more likely to perform DREs than male providers. And physician extenders outperformed physicians. Physician attitudes may be a factor in whether or not DREs are performed. Of 588 records reviewed, DRE was not performed in 311 patients.

# Underuse

## Study

## Outcome

*The Potential Preventability Of Postoperative Myocardial Infarction: Underuse Of Perioperative Beta-Adrenergic Blockade*

**Lindenauer, P.K., Fitzgerald, J., Hoople, N., Benjamin, E.M.; 2004; Arch Intern Med**

This study retrospectively reviewed records of patients sustaining a post operative acute myocardial infarction (AMI) at Baystate Medical Center to examine beta-blocker use among patients in order to estimate the potential preventability of postoperative MI among patients who underwent noncardiac surgery.

A large percentage of postoperative MI may be preventable through improved use of beta-blockers perioperatively. Greater efforts should be made to encourage beta-blocker use among high-risk patients undergoing major noncardiac surgery.

*Influenza Vaccination By Race Among Disabled Community Dwelling Older Women*

**Frick, K.D., Scanlon, D.P., Bandeen-Roche, K., Kasper, J.D., Simonsick, E.M., Sullivan, E.M.; 2004; J Health Care Poor Underserved**

This study used a survey of community-dwelling Medicare enrollees in Baltimore, MD to estimate the likelihood of receiving influenza vaccination and the role of race in that outcome.

Influenza vaccination remains underused: 70% of white and 45% black study beneficiaries received appropriate vaccination.

*Geriatric Trauma Patients: Are They Receiving Trauma Center Care?*

**Lane, P., Sorondo, B., Kelly, J.J.; 2003; Acad Emerg Med**

This study analyzed hospital discharge data in Pennsylvania to evaluate whether severely injured geriatric patients were as likely to be treated at designated trauma centers within the statewide trauma system. It compared the demographic and injury characteristics of severely injured older and younger patients in trauma centers and non-trauma centers.

Severely injured geriatric patients are not as likely to receive trauma center care for their injuries as younger patients. Geriatric patients are more likely to be injured in a given incident and the injuries they sustain are more severe and difficult to diagnose. They are also likely to suffer more complications.

# Underuse

## Study

## Outcome

*Early Glycoprotein Iib/Iiia Inhibitor Use For Non-ST-Segment Elevation Acute Coronary Syndrome: Patient Selection And Associated Treatment Patterns*

**Hoekstra, J.W., Roe, M.T., Peterson, E.D., Menon, V., Mulgund, J., Pollack, C.V., Miller, C., Palabrica, T., Harrington, R.A., Ohman, E.M., Gibler, W.B.; 2005; Acad Emerg Med**

This study used the CRUSADE Quality Improvement Initiative database to determine patient selection patterns with early use and the relationship between glycoprotein (GP) Iib/IIIa inhibitor therapy and the use of other guidelines recommended therapies for Non-ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS).

Only 35% of eligible patients received GP Iib/IIIa inhibitors within 24 hours of hospital admission.

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*Regulatory Issues In Pain Management*

**Fujimoto, D.; 2001; Clin Geriatr Med**

This study reviews the relevant issues of the regulation of controlled substances, updates the reader about the laws, and provides guidance to practitioners about the appropriate use of controller substances, especially opioids, to manage pain.

Opioids should be the mainstay for moderate to severe pain, however they are not used or are underdosed. Health care professionals fear sanctions of governing boards, law enforcement, and have limited knowledge on the laws and regulations.

# Underuse

## Study

## Outcome

*Delivery Of Preventative Services To Older Black Patients Using Neighborhood Health Centers*

**Wright, P.J., Fortinsky, R.H., Covinsky, K.E., Anderson, P.A., Landefeld, C.S.; 2000; J Am Geriatr Soc**

This study used retrospective chart review of 683 patients of low-income neighborhood health centers in Cleveland to assess the delivery of 5 preventive services in Title 330-funded health centers in low-income neighborhoods and determines the association of health system factors and health status with the delivery of these services.

Influenza vaccination, pneumococcal vaccination, mammography, Pap screening and fecal occult blood testing were achieved for 59%, 64%, 59%, 51% and 17% of patients respectively. Title 330 federally supported neighborhood health centers achieved high rates of performance in 4 of the 5 recommended preventive services.

*Aggressive Pharmacologic Treatment Of Pain*  
**Pappagallo, M.; 1999; Rheum Dis Clin North Am**

This is a narrative review of opioid and non-opioid analgesics for pain control and provides information on how to use analgesics for prompt, safe and effective pharmacologic treatment of acute and chronic pain.

Opioid analgesics have been underused in the management of pain.

*Predictors Of Treatment Adherence Among Asthma Patients In The Emergency Department*  
**Schmaling, K.B., Afari, N., Blume, A.W.; 1998; J Asthma**

This study used structured chart reviews of 120 randomly selected adults who presented with asthma at two university hospital emergency departments (EDs) to examine predictors of treatment adherence.

60% of subjects had evidence of nonadherence with asthma treatment. Younger age, more ED visits, using ED for medication refills, not being prescribed prednisone at discharge, and not keeping post-discharge follow-up appointments were variables associated with nonadherence.

# Underuse

## Study

## Outcome

*Optimizing Beta-Blocker Use After Myocardial Infarction*

**Howard, P.A., Ellerbeck, E.F.; 2000; Am Fam Physician**

This paper is a narrative review of use of beta-blocker therapy after myocardial infarction (MI) and in congestive heart failure (CHF).

Only 20-50% of eligible patients receive beta-blocker after MI. The failure to prescribe is based on perceived risk factors, doctor training, recent percutaneous transluminal coronary angioplasty (PTCA), and geographical location. Patients previously deemed high-risk (the elderly, diabetics, non-Q wave MI, CHF) benefit from beta-blocker use. The use of cardioselective agents in a low initial dose with titration to an effective dose are all associated with decreased side effects. This may also be useful in patients with lipid disorders, chronic obstructive pulmonary disease, and peripheral vascular disease.

*Psychological Factors Associated With Medication Nonadherence In Asthmatic Children*

**Bender, B., Milgrom, H., Rand, C., Ackerson, L.; 1998; J Asthma**

This study tracked adherence to inhaler prescribing for 3 months in a sample of clinic patients, and evaluated psychological factors that might contribute to non-compliance.

On 41.8% of days patients did not take any inhaled corticosteroids and 28.1% of days did not take inhaled beta-agonists, despite prescribed daily use. Nonadherence was correlated with lower levels of asthma knowledge and family dysfunction.

*Underutilization Of Lipid-Lowering Drugs In Older Persons With Prior MI And A Serum LDL Cholesterol >125 Mg/Dl*

**Aronow, Wilbert S.; 1998; Am J Cardiol**

This was a prospective study of patients admitted to an academic nursing home following Q-wave myocardial infarction (MI) to determine the rate of lipid lowering drug use in patients with low-density lipoprotein (LDL) cholesterol > 125.

In 500 people (age range 60-100) with documented Q-wave MI consecutively admitted to a long-term care facility, only 5% of those with LDL cholesterol of more than 125 mg/dl were on lipid-lowering drugs. American Heart Association/American College of Cardiology guidelines recommend lipid-lowering drugs in all persons status post-MI if their LDL cholesterol is higher than 125 mg/dl.

# Underuse

## Study

## Outcome

*Underutilization Of Beta-Adrenoceptor Antagonists Post-Myocardial Infarction*

**Gutierrez, M.E., Labovitz, A.J.; 2005; Am J Cardiovasc Drugs**

This paper presents a review of major studies showing the benefits of early use of beta-blockers following myocardial infarction (MI).

The underuse of beta-blockers after MI leads to increased mortality. Previous studies show the benefit of early use of beta-blockers following MI. There is brief discussion of studies showing underuse (only 29-58% of eligible patients receive this therapy).

*Survey Of Use Of ST-Segment Monitoring In Patients With Acute Coronary Syndromes*

**Patton, J.A., Funk, M.; 2001; Am J Crit Care**

This study used a mailed survey of 192 cardiac nurse managers to ascertain whether continuous ST-segment monitoring was routinely used in their institutions to diagnose ischemia.

Continuous ST-segment monitoring is underused in the acute setting. 54% of units use ST-segment monitoring according to a survey of ICU/CCU nurses. The percentage of units using it regularly was less than 50% and may be even lower. The majority of units did not use the 12-lead electrocardiogram (EKG) to monitor ST segments despite the recommendation that this is the most appropriate method.

*Pain Management In The ED*

**Wilsey, B., Fishman, S., Rose, J.S., Papazian, J.; 2004; Am J Emerg Med**

This narrative article reviews the current issues of pain control in the emergency department with specific reference to headaches, back pain, sickle cell crisis and renal colic.

Acute and chronic pain are undertreated. The study reviews general literature that shows inadequate treatment of all pain syndromes with relevance to practice in the emergency room and the specific conditions noted above.

## Underuse

### Study

*Computed Tomography For Blunt Abdominal Trauma In The ED: A Prospective Study*

**Richards, J.R., Derlet, R.W.; 1998; Am J Emerg Med**

This is a prospective study of stable patients with suspected blunt abdominal trauma presenting to an academic emergency department (ED) to determine whether abdominal computerized tomography (CT) in the ED could prevent unnecessary surgery for intra-abdominal injury.

*The Impact Of Computerized Clinical Reminders On Physician Prescribing Behavior: Evidence From Community Oncology Practice*

**Kralj, B., Iverson, D., Hotz, K., Ashbury, F.D.; 2003; Am J Med Qual**

This study reviewed 11,644 encounters in 2 community oncology practices to estimate the frequency with which erythropoietin (EPO) was not prescribed when clinically indicated.

*Adherence To Treatment With Antipsychotic Medication And Health Care Costs Among Medicaid Beneficiaries With Schizophrenia*

**Gilmer, T.P., Dolder, C.R., Lacro, J.P., Folsom, D.P., Lindamer, L., Garcia, P., Jeste, D.V; 2004; Am J Psychiatry**

This study used MediCal claims data to determine the level of adherence to medication seen in Medicaid patients with schizophrenia and to address the relationship between adherence and psychiatric or medical hospitalization.

### Outcome

Unnecessary admissions and possibly overuse of surgery can be avoided by appropriate use of abdominal CT for blunt abdominal trauma in the ED. A total of 40 potential trauma admissions were averted by obtaining CT within the ED.

More anemic cancer patients would receive epo if there were computer-based reminders when Hgb is less than 12. In the intervention clinic, use of epo increased from 21.2% to 24.2%; the difference in the intervention versus the control clinic was 9.3% (24.2% versus 14.9%).

Only 41% of patients studied were adherent to treatment with antipsychotic medications.



# Underuse

## Study

*Characteristics Of Children With Asthma Who Are Enrolled In A Head Start Program*

**Vargas, P.A., Simpson, P.M., Gary, Wheeler J., Goel, R., Feild, C.R., Tilford, J.M., Jones, S.M., 2004; J Allergy Clin Immunol**

This study enrolled 368 children who participated in a Head Start program in Arkansas, surveying caregivers regarding health care use and access, and home environmental factors. Children underwent urine cotinine and allergen sensitization testing.

## Outcome

Overall, children in the study had poor asthma control. At baseline, 64% of the children had more than 1 emergency department visit for asthma in their lifetime. 21% had symptoms consistent with intermittent asthma, 79% with persistent asthma. Only 32% with persistent asthma had both rescue and controller medications.

*Regionalization And The Underuse Of Angiography In The Veterans Affairs Health Care System As Compared With A Fee-For-Service System*

**Petersen, L.A., Normand, S.L., Leape, L.L., McNeil, B.J.; 2003; N Engl J Med**

This study used data from the Cooperative Cardiovascular Project and a national, hospital-based Veterans Affairs sample to compare the underuse of needed angiography after acute myocardial infarction in a traditional Medicare fee-for-service system in the regionalized Department of Veterans Affairs health care system.

Veterans Affairs patients were significantly less likely than Medicare patients to undergo the procedure (43.9% versus 51.0%). When controlling for on-site availability of angiography at the admitting hospital, there was no significant difference in the rates of use (odds ratio, 1.02) or in 1-year mortality (odds ratio, 1.08).

# Underuse

## Study

*Electronic Alerts To Prevent Venous Thromboembolism Among Hospitalized Patients*  
**Kucher, N.Koo, S., Quiroz, R., Cooper, J.M., Paterno, M.D., Soukonnikov, B., Goldhaber, S.Z.; 2005; N Engl J Med**

This prospective study of the value of computer alerts for venous thromboembolism (VTE) prophylaxis in reducing deep vein thrombosis and pulmonary embolism documents the extent to which indicated prophylaxis is underused at the Brigham and Womens' Hospital.

*Aspirin Administration For Cardiac-Related Acute Chest Pain/Angina: Increased Use In Medicare Patients*  
**Bing, M.Abel, R.L.Pendergrass, P., Malone, M., Sabharwal, K., McCauley, C.; 1999; South Med J**

Retrospective chart reviews were carried out in 10 acute care hospitals before and after a program designed to increase aspirin use in patients with diagnoses of coronary heart disease (CHD).

*Age-Related Underutilization Of Left Ventricular Function Evaluation In Older Heart Failure Patients*  
**Ahmed, A., Allman, R.M., DeLong, J.F., Bodner, E.V., Howard, G.; 2002; South Med J**

This study examines age-related variation of left ventricular function (LVF) evaluation in older Medicare-beneficiaries discharged with a diagnosis of heart failure in 1994 in Alabama to determine the relationship between age and underutilization of LVF evaluation.

## Outcome

Computer alerts increase the rate of prophylaxis for hospitalized patients at risk for thromboembolism, and reduce the rate of pulmonary embolism (PE) and deep vein thrombosis (DVT). In the intervention group (alerts), prophylactic measures were ordered more frequently and DVT or PE at 90 days was less likely resulting in a reduction of 41% in thromboembolism. There was no increase in the rate of hemorrhage at 30 days in patients who received prophylaxis versus those who did not.

Average time from arrival to Aspirin/dose (ASA) decreased 2.9 hours, but remains over 11 hours. ASA prescription at discharge increased to 68.8%.

There was overall underutilization of LVF evaluation (58%). Older patients (ages 75-84 and 85 or older) with heart failure were less likely to receive left ventricular assessment than younger patients (65-74). 66% of patients aged 65-74 had left ventricular evaluation at or before the index hospitalization, compared with 57% of those aged 75-84 and 51% of those 85 or older. After multivariate adjustment, patients aged 85 or older had 33% lower odds of left ventricular assessment than patients aged 65-74.

# Underuse

## Study

*Association Between Medication Supplies And Healthcare Costs In Older Adults From An Urban Healthcare System*

**Stroupe, K.T., Murray, M.D., Stump, T.E., Callahan, C.M.; 2000; J Am Geriatr Soc**

This study used a retrospective record review in a tax-supported health system to determine the costs associated with the over- and under-supply of medications to seniors in a public, urban health care system.

*Age-Related Underutilization Of Angiotensin-Converting Enzyme Inhibitors In Older Hospitalized Heart Failure Patients*

**Ahmed, Ali MD, MPH; 2002; South Med J**

This study examines age-related variation in the use of Angiotensin-Converting Enzyme (ACE) inhibitors in older Medicare beneficiaries discharged alive in Alabama with a diagnosis of heart failure to determine the extent to which age affects the underutilization of ACE inhibitors.

*Factors Influencing Access To Cardiovascular Procedures In Patients With Chronic Renal Disease: Race, Sex And Insurance*

**Daumit, G.L., Powe, N.R.; 2001; Semin Nephrol**

This study used both Medicare claims data and medical chart review to determine what effect race, sex and insurance status have on rates at which different groups receive cardiac procedures before and after development of end-stage renal disease (ESRD).

## Outcome

16% had an under-supply and 47% had an over-supply of medications. Both over- and under-supply resulted in an increased chance of emergency department visits and hospital admission.

There was overall underutilization of ACE inhibitors at discharge for hospitalization for heart failure (63%). Older patients (aged 85 or older) with heart failure were not significantly less likely to be prescribed ACE inhibitors than younger patients (ages 65-74). 66% of patients ages 65-74 were prescribed ACE inhibitors at discharge, compared with 64% of those ages 75-84 and 59% of those aged 85 or older. In a multivariate model, patients aged 85 or older had 56% lower odds of being prescribed an ACE inhibitor at discharge compared with patients ages 65-74.

White and black women as well as black men have lower rates of cardiac procedures both pre- and post-ESRD when compared with white men. These differences narrow after development of ESRD and dialysis.

# Underuse

## Study

## Outcome

*Racial Differences In Cardiac Catheterization Use And Appropriateness*

**Ferguson, J.A., Adams, T.A., Weinberger, M.; 1998; Am J Med Sci**

This study used a retrospective chart review at a Veterans Affairs Medical Center (VAMC) to determine whether medical appropriateness explained interracial cardiac procedure rate differences.

Using RAND criteria for appropriateness of cardiac catheterization, no underuse was identified for black males. Black males had fewer indications for and more against than whites. There was 10% overuse among whites.

*Underuse Of ACE Inhibitors And Angiotensin II Receptor Blockers In Elderly Patients With Diabetes*

**Winkelmayer, W.C., Fischer, M.A., Schneeweiss, S., Wang, P.S., Levin, R., Avorn, J.; 2005; Am J Kidney Dis**

This study used Medicare claims data and data from the Pennsylvania PACE program to evaluate the use of angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin receptor blockers (ARBs) in diabetics over 65 with hypertension and/or proteinuria.

Only 50.7% of diabetics with hypertension and/or proteinuria filled a prescription for ACE inhibitors or receptor blockers during the quarter studied. Factors associated with decreased use were gender (male), age > 75, chronic obstructive pulmonary disease (COPD), depression, and dementia.

*Warfarin Therapy: A Review Of The Literature Since The 5th American College Of Chest Physicians Consensus Conference On Antithrombotic Therapy*

**Lodwick, A.; 1999; Clin Appl Thromb Hemost**

This paper reviews studies published since 1998 pertaining to the appropriateness of warfarin use in atrial fibrillation (AF) and deep vein thrombosis (DVT).

The article concludes the warfarin is underutilized in AF and DVT, but refers to other sources and does not estimate the percent of underuse.

# Underuse

## Study

## Outcome

*Adherence To Screening Guidelines For Breast And Cervical Cancer In Postmenopausal Women With Coronary Heart Disease: An Ancillary Study Of Volunteers For HERS*

**Castellano, P.Z., Wenger, N.K., Graves, W.L.; 2001; J Womens Health Gend Based Med**

This study used data from the Heart and Estrogen/Progestin Replacement Study (HERS) to assess patients prior compliance with female cancer screening guidelines.

Compliance rates among women who volunteered for HERS were 59% for monthly breast self-exam, 67% for yearly mammography, 73% for yearly Pap smear and pelvic exam, and 76% for provider breast exam. For all types of preventive procedures, a significantly higher proportion of women received screening if cared for by providers who scheduled or performed the screenings themselves. For example, 80% of women whose providers scheduled or performed mammography reported receiving yearly mammograms compared with 56% of women whose providers did not schedule or perform the procedure.

*Correlates Of Surgical Treatment Type For Women With Noninvasive And Invasive Breast Cancer*

**Katz, S.J., Lantz, P.M., Zemencuk, J.K.; 2001; J Womens Health Gend Based Med**

This study used interviews and surveys to examine factors related to the type of surgery (mastectomy vs. breast-conserving) and satisfaction with surgery among women with invasive and in situ breast cancer.

There is a high rate of mastectomy among patients with in situ and invasive breast carcinoma. Overall, 53% of women received mastectomy, including 49% of women with in situ carcinoma. One third of patients reported that they were not given a choice between mastectomy and breast-conserving surgery (lumpectomy). Patients who did not perceive choice were less satisfied with the results of the surgery.

*Underutilization Of Mammography In Older Breast Cancer Survivors*

**Schapiro, M.M., McAuliffe, T.L., Nattinger, A.B.; 2000; Med Care**

This study matched Surveillance Epidemiology and End Results (SEER) and Medicare claims data to evaluate the use of mammography in older breast cancer survivors.

Elderly women underuse mammography. Overall, 62% of the cohort underwent annual mammography, 23% underwent mammography in 1 of 2 years, and 15% had no mammography claim in the 2 years evaluated.

## Underuse

### Study

### Outcome

*Diabetes Education Program Use And Patient-Perceived Barriers To Attendance*

**Graziani, C., Rosenthal, M.P., Diamond, J.J.; 1999; Fam Med**

A sample of 150 diabetics cared for in an academic family practice were surveyed to determine uptake rates for diabetic education programs.

Only 22% of eligible patients had ever attended a diabetes education program.

*Diabetes Process And Outcome Measures In The Department Of Veterans Affairs*

**Sawin, C.T., Walder, D.J., Bross, D.S., Pogach, L.M.; 2004; Diabetes Care**

This study used retrospective chart audits to report on the prevalence of diabetics receiving care at Veteran Affairs (VA) facilities. The study reports on the prevalence of patients receiving dilated eye exams, urinary protein tests, influenza vaccinations, and other preventive and diabetes-specific measures in 22 Veterans Affairs Medical Center (VAMC) networks.

From 1995 to 2000, more patients received dilated eye exams (from 44% in 1995 to 67% in 2000), urinary protein tests (from 23% to 54% in 2000), and influenza vaccines (from 34% to 78%).

*Problems Paying Out-Of-Pocket Medication Costs Among Older Adults With Diabetes.*

**Piette, J.D., Heisler, M., Wagner, T.H.; 2004; Diabetes Care**

This study used a proprietary panel to survey diabetic adults > age 50 regarding problems faced by older adults with diabetes due to out-of-pocket medication costs.

19% of respondents reported cutting back on medication use in the prior year due to cost, 14% increased their credit card debt, and 10% borrowed money to pay for their prescriptions. Medication cost problems were especially common among respondents who were younger, had higher monthly out-of-pocket costs, and had no prescription drug coverage.

## Underuse

### Study

*Pap Smear Use In A Population Of Older Mexican-American Women*

**Randolph, W.M., Freeman, D.H., Jr., Freeman, J.L.; 2002; Women Health**

This study conducted 452 in-person interviews from 1997 to 1999 in order to report the rates of cervical cancer screening in a group of older Mexican-American women in Texas, and to identify factors associated with having a Pap smear.

### Outcome

In this population, recent Pap smear use (within the last 3 years) was 64.1% which falls well below the year 2010 goal of 90%. The odds of having a recent Pap smear was lower for women who were older, below the poverty line, and did not have a regular doctor.

*Physician Recommendation For Papanicolaou Testing Among U.S. Women, 2000*

**Coughlin, S.S., Breslau, E.S., Thompson, T., Benard, V.B.; 2005; Cancer Epidemiol Biomarkers Prev**

This study used data from the 2000 National Health Interview Survey (NHIS) to determine whether women who failed to receive cervical cancer screening did so because of physician failure to recommend cervical cancer screening.

17% of women > age 18 had not had a Pap smear, 86% of women who did not have a Pap but had seen a physician within the past year reported that the test was not recommended.

*Primary Care Provider Perceptions Of Barriers To And Facilitators Of Colorectal Cancer Screening In A Managed Care Setting*

**Dulai, G.S., Farmer, M.M., Ganz, P.A., Bernaards, C.A., Qi, K., Dietrich, A.J., Bastani, R., Belman, M.J., Kahn, K.L.; 2004; Cancer**

This study used a survey methodology to assess the attitudes of California primary care physicians (PCPs) toward colorectal cancer (CRC) screening, and to assess facilitators for improving screening rates.

PCPs indicated that 79% of their standard-risk patients were screened for CRC.

## Underuse

### Study

*The Use Of Anti-Inflammatory Medications In Cystic Fibrosis: Trends And Physician Attitudes*  
**Oermann, C.M., Sockrider, M.M., Konstan, M.W.; 1999; Chest**

This study used a mailed survey to Cystic Fibrosis (CF) Centers in the U.S. to determine trends and physician attitudes in the use of anti-inflammatory medications (i.e., ibuprofen (IBU), oral corticosteroids (OCS) and inhaled corticosteroids (ICS). in managing cystic fibrosis long-term.

### Outcome

67 surveys were returned (60%). The responding centers represented 239 physicians and served 9,363 patients, 2,234 (24%) of whom were receiving routine anti-inflammatory drugs. Complete data sets were available for 8,803 patients with 2,169 (25%) receiving anti-inflammatory therapy. 98 (41%) physicians prescribed long-term use of oral steroids for 413 (5%) patients, 103 (42%) prescribed inhaled steroids for 1,032 (12%) patients, and 108 (45%) prescribed high-dose IBU for 723 (8%) patients to control CF. The practitioners reported familiarity and efficacy as the primary reasons for prescribing OCS; concerns over side effects were the major reason for not prescribing. Regarding ICS, the primary reasons for prescribing were familiarity and safety, with lack of efficacy being cited as the major reason for not prescribing. For IBU, efficacy was ranked highest among reasons for prescribing, with concern over safety being the highest ranked reason for not prescribing.

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*The Clinical Application And Cost Analysis Of Fine-Needle Aspiration Biopsy In The Diagnosis Of Mass Lesions In Sarcoidosis*

**Fonarow, G.C., French, W.J., Parsons, L.S., Sun, H., Malmgren, J.A.; 2000; Chest**

Records from 28 patients with diagnosed, suspected, or undiagnosed sarcoidosis who underwent fine needle aspiration biopsy (FNAB) were examined in order to analyze the utility and cost-effectiveness of FNAB in the clinical investigation of patients.

Sarcoidosis had already been diagnosed or was a clinical consideration prior to fine needle aspiration biopsy (FNAB) in 14 cases. Simultaneous or subsequent excisional biopsies confirmed the FNAB findings in 17 patients. The cost of FNAB was only 12.5% to 50% that of tissue biopsy.



# Underuse

## Study

*Characteristics Of Patients With Uncontrolled Hypertension In The United States*

**Hyman, D.J., Pavlik, V.N.; 2001; N Engl J Med**

This study used data from NHANES III to assess the role of access to and effectiveness of health care in the control of hypertension.

## Outcome

Only 23% of patients with hypertension were taking medications that adequately controlled their condition, despite the majority having insurance and frequent physician contact. Most cases were mild systolic hypertension in older adults.

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*Use Of Lipid-Lowering Medications At Discharge In Patients With Acute Myocardial Infarction: Data From The National Registry Of Myocardial Infarction 3*

**Fonarow, G.C., French, W.J., Parsons, L.S., Sun, H., Malmgren, J.A.; 2001; Circulation**

This study used data from 1,470 hospitals participating in the National Registry of Myocardial Infarctions 3 project to assess use of lipid-lowering medication at discharge in a current national sample of patients hospitalized with acute myocardial infarction (AMI) and to evaluate factors associated with prescribing patterns.

Lipid-lowering agents are underused in patients discharged from the hospital following AMI. A low percentage of patients (37.1%) following AMI were discharged with a prescription for a lipid-lowering medicine. Multivariate analysis showed that younger age, previous history of MI, PTCG, CABG, or high cholesterol increased the likelihood of receiving a lipid-lowering prescription. Other factors that increased the likelihood of receiving a prescription were being in a Medicare health management organization (HMO), or being in a teaching, urban or large hospital. Also noted was that only 40.6% of current smokers had documentation in their chart about discussion smoking of cessation counseling.

## Underuse

### Study

*Patterns And Correlates Of Local Therapy For Women With Ductal Carcinoma-In-Situ*

**Katz, S.J., Lantz, P.M., Janz, N.K., Fagerlin, A., Schwartz, K., Liu, L., Deapen, D., Salem, B., Lakhani, I., Morrow, M.; 2005; J Clin Oncol**

This study interviewed 659 patients with ductal carcinoma in-situ (DCIS) in Detroit and Los Angeles in order to determine if rates of mastectomy and radiation therapy are due to overuse or underuse of these treatments, or if they are due to patient preferences and physician recommendations.

*Impact Of Cardiac Service Availability On Case-Selection For Angiography And Survival Associated With Angiography*

**Dendukuri, N., Normand, S.L., McNeil, B.J.; 2003; Health Serv Res**

This study used Medicare claims data and medical record reviews of 37,788 Medicare beneficiaries discharged from 7 hospitals with a diagnosis of acute myocardial infarction (AMI) to determine the role of cardiac catheterization availability in the hospital in whether patients received indicated cardiac interventions.

### Outcome

Only 14% of patients at lowest risk of recurrence received a mastectomy compared with 22.8% and 52.6% of patients at intermediate and highest risk. Between-site differences in receipt of radiation after breast conserving surgery (BCS) were consistent with patient recall of surgeon discussions about treatment.

The probability of receiving angiography increased with the increasing capabilities of the hospitals (25% basic, 41% angiography, and 63% revascularization), and these differences persisted when patients were subdivided into necessary, appropriate, and unnecessary subgroups. However, year survival was not significantly different at hospitals with more intensive services available, (i.e., revascularization-capable hospitals 82% vs. basic hospitals 78%). Patients receiving angiography in all subgroups at all hospital types had higher survival than patients who did not receive angiography (8-23%). When patients were case matched, this difference remained, but was smaller (5-18%).

# Underuse

## Study

## Outcome

*Influenza And Pneumococcal Vaccination Coverage Levels Among Hawaii Statewide Long-Term Care Facilities*

**Cui, X.W., Nagao, M.M., Effler, P.V; 2001; Infect Control Hosp Epidemiol**

This study used a survey instrument to estimate the influenza and pneumonia vaccine rates in long-term care facilities in Hawaii.

Influenza vaccination rates remained over 89%, but pneumococcal vaccination was underutilized.

*Effects Of Noncardiovascular Comorbidities On Antihypertensive Use In Elderly Hypertensives*

**Wang, P.S., Avorn, J., Brookhart, M.A., Mogun, H., Schneeweiss, S., Fischer, M.A., Glynn, R.J.; 2005; Hypertension**

This retrospective study of patients enrolled in the Pennsylvania PACE study was designed to determine whether cardiovascular comorbidities contributes to the underuse of antihypertensives in the elderly.

Anti-hypertensive medications are under-used in patients with non-cardiac comorbidities (i.e., depression, gastrointestinal disorders, or osteoarthritis). Senior citizens who had non-cardiac comorbidities were approximately 2 times more likely not to take anti-hypertensive medications when compared to seniors who had diseases that usually are indicators for antihypertensives (i.e., coronary artery disease, cardiovascular disease, peripheral vascular disease, diabetes).

*Major Review: The Underutilization Of Vision Screening (For Amlyopia, Optical Anomalies And Strabismus) Among Preschool Age Children*  
**Castanes, Maria; 2003; Binocul Vis Strabismus Q**

This article is a review of the literature between 1992 and 2003 that was done in order to (1) determine what barriers contribute to the underutilization of vision screening among preschool-age children, and (2) identify gaps in the literature base regarding this problem.

There are a variety of barriers that prevent children from receiving proper vision screening, including social, economic and political barriers. Low-income, minority, and uninsured families are at higher risk of not utilizing vision screening.

# Underuse

## Study

## Outcome

*Undertreatment Of Panic Disorder In Primary Care: Role Of Patient And Physician Characteristics*

**Roy-Byrne, P., Russo, J., Dugdale, D.C., Lessler, D., Cowley, D., Katon, W.; 2002; J Am Board Fam Pract**

This study identified 58 patients with panic disorder getting care from 3 university affiliated primary care practices to determine the frequency of appropriate pharmaceutical management.

The proportion of patients receiving appropriate antipanic medication regimens varied between 46% and 52%.

*Use Of Angiotensin-Converting Enzyme Inhibitors At Discharge In Patients With Acute Myocardial Infarction In The United States: Data From The National Registry Of Myocardial Infarction 2*

**Barron, H.V., Michaels, A.D., Maynard, C., Every, N.R.; 1998; J Am Coll Cardiol**

This study collected data from 190,015 patients discharged from hospitals participating in the National Registry of Myocardial Infarction 2 project with a diagnosis of acute myocardial infarction (AMI) to determine the rate of angiotensin-converting enzyme (ACE) inhibitor therapy in this cohort.

Overall, ACE inhibitors were substantially underused in this large registry. Prescription rates at discharge following MI increased from 25% in 1994 to 31% in 1996; rates were up to 43% for the subset of patients with concomitant congestive heart failure (CHF).

*Use Of Echocardiography In The Management Of Congestive Heart Failure In The Community*

**Senni, M., Rodeheffer, R.J., Tribouilloy, C.M., Evans, J.M., Jacobsen, S.J., Bailey, K.R., Redfield, M.M.; 1999; J Am Coll Cardiol**

This study examined 216 patients who received an initial diagnosis of congestive heart failure (CHF) to determine the use and the impact of echocardiography in these patients.

63% underwent echocardiography within 3 weeks before or after the episode of CHF. Fewer patients in the No-Echo group were treated with angiotensin-converting enzyme (ACE) inhibitors. Survival after adjustment for age, functional class, and gender was lower in the No-Echo group than the Echo group.

# Underuse

## Study

## Outcome

*A Remarkable Medical Story: Benefits Of Angiotensin-Converting Enzyme Inhibitors In Cardiac Patients*

**Khalil, M.E., Basher, A.W., Brown, E.J., Jr. Alhaddad, I.A.; 2001; J Am Coll Cardiol**

This study reviewed the literature pertaining to the underuse of angiotensin-converting enzyme (ACE) inhibitors in patients with left ventricular (LV) dysfunction.

ACE inhibitors are underused.

*A Diabetes Report Card For The United States: Quality Of Care In The 1990's*

**Saaddine, J.B., Engelgau, M.M., Beckles, G.L., Gregg, E.W., Thompson, T.J., Narayan, K.M.; 2002; Ann Intern Med**

This study analyzed Third national Health and Nutrition Examination Survey (NHANES III) and Behavioral Risk Factor Surveillance System (BRFSS) 1995 data to document the quality of diabetes care between 1988-1995.

There was a significant gap between recommended diabetes care and care actually received from 1988-1995. 18% had HgbA1C greater than 9.5%, 34% had blood pressure greater than 140/90, and 58% had low-density lipoprotein (LDL) greater than 130. The rates of eye and foot exams within the previous year were also sub par (63% and 55% respectively).

*Utilization Of Implantable Cardioverter-Defibrillators (ICD) In Survivors Of Cardiac Arrest In The United States From 1996 To 2001.*

**Voigt, A., Ezzeddine, R., Barrington, W., Obiaha-Ngwu, O., Ganz, L.I., London, B., Saba, S.; 2004; J Am Coll Cardiol**

This study used the National Hospital Discharge Survey (NHDS) to estimate the percentage of patients admitted with cardiac arrest who underwent implantation of a defibrillator.

The rate of implantable cardioverter defibrillator (ICD) use remained low although it increased over the study period from 23.6% to 46.3%. Being of older age, of African American ethnicity, and being admitted to a smaller hospital were all significantly associated with absence of ICD at discharge.

# Underuse

## Study

*Is Warfarin Really Underused In Patients With Atrial Fibrillation?*

**Weisbord, S.D., Whittle, J., Brooks, R.C.; 2001; J Gen Intern Med**

This study utilized a chart review at a tertiary VAMC to determine if warfarin is underused in patients with atrial fibrillation.

*Preventive Health Care Measures Before And After Start Of Renal Replacement Therapy*

**Winkelmayer, W.C., Owen, W., Glynn, R.J., Levin, R., Avorn, J.; 2002; J Gen Intern Med**

This is a retrospective cohort study to see what percent of patients received preventive health care measures before and after starting renal replacement therapy. The preventive health care measures studied included: mammogram, Pap smear, prostate-specific antigen, diabetic eye exam, and hemoglobin A1c.

*Gaps In Asthma Care Of The Oldest Adults*

**Wolfenden, L.L., Diette, G.B., Skinner, E.A., Steinwachs, D.M., Wu, A.W.; 2002; J Am Geriatr Soc**

This study surveyed a sample of patients enrolled in the Managed Health Care Association Outcomes Management System Consortium Asthma Study to assess the adequacy of asthma care and knowledge reported by adults > age 70 who were subsequently admitted for asthma.

## Outcome

Warfarin was less underutilized in this population than in other studies. Of the 35% of patients not prescribed warfarin, many did not actually have atrial fibrillation (27%), had a contraindication to warfarin (16%), were receiving warfarin elsewhere (12%), or had only a history of, or transient, atrial fibrillation.

Mammogram, pap smear, prostate-specific antigen, diabetic eye exam, and hemoglobin A1c testing were done less often after renal replacement therapy (RRT) was begun than before RRT. Overall, screening rates were low with the exception of diabetic eye exams. Thus, they concluded that the tests were underutilized.

Of 254 older adults, 38 (15.0%) reported being hospitalized for asthma at 1 year follow-up. Of these, 22.9% owned a peak flow meter (PFM). Of those with allergies, only about half (56%) had been told how to avoid allergens and had been referred for formal allergy testing. Only 18.4% of respondents rated their overall asthma attack knowledge as excellent. Compared with non-hospitalized older adults, the hospitalized group reported care that was more consistent with guidelines, but also higher rates of potentially toxic combination of adrenergic drugs. Compared with younger hospitalized adults, older hospitalized adults had clear deficiencies, including lower use of PFMs (55.3% vs. 22.9%) and worse asthma self-management knowledge.

# Underuse

## Study

## Outcome

*Demonstrated Use Of Metered-Dose Inhalers And Peak Flow Meters By Children And Adolescents With Acute Asthma Exacerbations*  
**Scarfone, R.J., Capraro, G.A., Zorc, J.J., Zhao, H.; 2002; Arch Pediatr Adolesc Med**

This study prospectively identified patients presenting to an academic ED with acute asthma exacerbations to determine the extent to which children with asthma properly use metered dose inhalers (MDIs) and peak-flow meters (PFMs) as recommended by national guidelines.

Most children with asthma could not demonstrate perfect technique of a MDI, and only 24% of children were judged to use perfect technique. Reports of a primary care physician (PCP) demonstrating use and/or giving written or verbal instructions for MDIs were not significantly associated with improved technique. Of children who met national guidelines for PFM use at home, only 17% reported using one.

*Underuse Of Controller Medications Among Medicaid-Insured Children With Asthma*  
**Finkelstein, J.A., Davis, R.L., Dowell, S.F., Metlay, J.P., Soumerai, S.B., Rifas-Shiman, S.L., Higham, M., Miller, Z., Miroshnik, I., Pedan, A., Platt, R.; 2002; Arch Pediatr Adolesc Med**

This study used health plan data from 5 plans to identify a cohort of children with asthma whose caretakers were then surveyed to examine factors associated with underuse of controller medications.

Children with persistent asthma substantially underuse asthma controller medications. Among such children, 27% reported daily use of a steroid or mast cell stabilizer. Underuse was associated with children aged older than 4 and adolescents compared with school-aged children. Underuse was also associated with less parental education and with black and Latino race and ethnicity compared with white patients. Access to a primary care physician (PCP), having seen an asthma specialist, and having been given a written care plan were associated with significantly less underuse.

*Measuring The Quality Of Care For Group A Streptococcal Pharyngitis In 5 U.S. Health Plans*  
**Mangione-Smith, R., Elliott, M.N., Wong, L., McDonald, L., Roski, J.; 2005; Arch Pediatr Adolesc Med**

This study used claims data from 5 health plans to estimate the rate of group A strep (GAS) testing in children with a diagnosis of pharyngitis who are prescribed antibiotics.

There is substantial variability in GAS testing rates between health plans. Overall, the rate of GAS testing was 74%, but ranged from 59% to 83% among the 5 health plans studied. Rates of antibiotic prescription also varied tremendously by health plan, ranging from 9% to 61%.

# Underuse

## Study

*Adverse Outcomes And Predictors Of Underuse Of Antithrombotic Therapy In Medicare Beneficiaries With Chronic Atrial Fibrillation*  
**Gage, B.F., Boechler, M., Doggette, A.L., Fortune, G., Flaker, G.C., Rich, M.W., Radford, M.J.; 2000; Stroke**

This study used Missouri Medicare claims data and chart reviews to estimate the rate of antithrombotic use in Medicare beneficiaries with a diagnosis of non-valvular atrial fibrillation (AF).

*National Trends In Statin Use By Coronary Heart Disease Risk Category*  
**Ma, J., Sehgal, N.L., Ayanian, J.Z., Stafford, R.S.; 2005; PLoS Med**

This study took data from 45,311 patients with hyperlipidemia in the National Ambulatory Medical Care Survey (NAMCS) in order to determine their rates of using statin medications, and to see the different rates of statin use among groups of different levels of risk for coronary heart disease (CHD).

*Twelve-Month Use Of Mental Health Services In The United States: Results From The National Comorbidity Survey Replication*  
**Wang, P.S., Lane, M., Olfson, M., Pincus, H.A., Wells, K.B., Kessler, R.C.; 2005; Arch Gen Psychiatry**

This article reports data from the National Comorbidity Survey Replication, which included household interviews of 9,282 people in order to determine patterns and predictors of receiving psychiatric treatment during the 12 months prior to the interview.

## Outcome

Only 55% of eligible patients were prescribed aspirin or warfarin at hospital discharge. The use of antithrombotic therapy was especially low in elderly, female, and rural populations. The use of warfarin was associated with a 24% relative risk reduction in adverse outcomes.

Statin use by patients with hyperlipidemia, increased from 9% of patient visits in 1992 to 49% in 2000 but then declined to 36% in 2002. Increases in the rate of statin use were greatest for patients at high risk of coronary heart disease (CHD). Lower statin use was associated with younger patient age, female gender, African American race, and non-cardiologist care.

Out of all the people who had a psychiatric disorder, only 41.1% received some treatment in the past 12 months. If people were cared for by mental health specialists, they had more visits than if they were cared for by general medical providers.



# Underuse

## Study

## Outcome

*Problems With Inhaler Use: A Call For Improved Clinician And Patient Education*  
**Fink, J.B., Rubin, B.K.; 2005; Respir Care**

This study reviewed literature pertaining to the use and misuse of medication inhalers used for asthma, and estimate the prevalence and economic impact of misuse.

28-68% of patients do not use inhalers well enough to benefit from the medications. 39-67% of health professionals cannot adequately explain/perform their use. Authors estimate \$5-6 billion dollars in savings if these problems were corrected with education.

*Quality Of Care In U.S. Hospitals As Reflected By Standardized Measures, 2002-2004*  
**Williams, S.C., Schmaltz, S.P., Morton, D.J., Koss, R.G., Loeb, J.M.; 2005; N Engl J Med**

This article reported data collected by Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in order to determine how U.S. hospitals performed over a 2-year period on 18 standardized indicators of the quality of care for acute myocardial infarction, heart failure, and pneumonia.

There was a significant improvement in the performance of U.S. hospitals on 15 out of the 18 indicators of the quality of care for acute myocardial infarction, heart failure, and pneumonia.

*Cholesterol Management And The Reduction Of Cardiovascular Risk*  
**Nixon, J. V.; 2004; Prev Cardiol**

This study reviews the literature pertaining to the efficacy and underuse of statins in reducing cardiovascular risk.

Some studies have indicated dramatic underuse of statins. 20 million Americans who should be treated have never had a cholesterol level checked and only 38% of patients who are treated achieve recommended low-density lipoprotein goals.

# Underuse

## Study

## Outcome

*Underestimating Asthma Severity - Variability Of Classifications And Outcomes*  
**O'Connor, Richard; 2004; Managed Care**

This narrative review discusses the following issues: the state of asthma care, the argument to revisit the classification system for asthma, the underutilization of anti-inflammatory medicines, and medication persistence.

The current prevalence of asthma has increased to 7.2%. Inhaled corticosteroids remain underused.

*Costs And Utilization Patterns Associated With Persistent Asthma: A Comparison Of Texas Medicaid Patients With And Without Continuous Inhaled Corticosteroid Treatment*  
**Smith, M.J., Rascati, K.L., Johnsrud, M.T; 2001; J Manag Care Pharm**

This study analyzed Texas Medicaid database claims over 27 months in order to determine if prescription payments, medical payments, and utilization patterns were different between asthma patients who continuously took inhaled steroids vs. patients who continuously took therapies other than inhaled steroids.

Post-steroid monthly prescription payments were higher for the group taking inhaled steroids (compared to the group taking a medicine that was not an inhaled steroid), but a decrease in medical payments in this group offset this increase, so that overall cost was similar between groups.

*HIVAN And Medication Use In Chronic Dialysis Patients In The United States: Analysis Of The USRDS DMMS Wave 2 Study*  
**Abbott, K.C., Trespalacios, F.C., Agodoa, L.Y., Ahuja, T.S.; 2003; BMC Nephrol**

This was a historical cohort study that looked at 36 patients with End Stage Renal Disease (ESRD) as a result of HIV associated nephropathy (HIVAN) to see if angiotensin-converting enzyme (ACE) inhibitors and antiretrovirals (ARVs) improved outcomes.

Only 61% of patients with HIVAN were on ARVs and only 25% were on combination ARVs, which led the authors to conclude that ARVs are underutilized in patients with HIVAN. Other conclusion were: (1) patients with HIVAN have a lower survival rate than patients with ESRD due to other causes; (2) ACE inhibitors do not improve survival for patients with ESRD due to HIVAN.

# Underuse

## Study

## Outcome

*Statin Therapy After Acute Myocardial Infarction: Are We Adequately Treating High-Risk Patients?*

**Fonarow, G.C.; 2002; Curr Atheroscler Rep**

This study reviews the literature concerning the efficacy and underutilization of lipid-lowering treatment following acute myocardial infarction (AMI).

On average, only 30% of post-AMI patients are discharged with a statin prescription, and that gap persists in the outpatient setting despite the proven efficacy of statins to reduce mortality in this group.

*Impact Of Inhaled Anti-inflammatory Therapy On Hospitalization And Emergency Department Visits For Children With Asthma*

**Adams, L.L. Gatchel, R.J., Robinson, R.C. Polatin, P. Gajraj, N. Deschner, M. Noe, C.; 2001; Pediatrics**

This study examined data from a total of 11,195 children in 3 managed care organizations in order to determine the effect of inhaled anti-inflammatory therapy on hospitalization and emergency room (ER) visits. Inhaled anti-inflammatory therapy included inhaled steroids, cromolyn, and nedocromil.

The adjusted relative risk for an emergency department (ED) visit was .4 if patients received cromolyn and 0.4 if they received inhaled steroid. Hospitalization relative risk was 0.6 if they received cromolyn, and 0.4 for inhaled steroids.

*Racial/Ethnic Variation In Asthma Status And Management Practices Among Children In Managed Medicaid*

**Lieu, T.A., Lozano, P., Finkelstein, J.A., Chi, F.W., Jensvold, N.G., Capra, A.M. Quesenberry, C.P., Selby, J.V., Farber, H.J.; 2002; Pediatrics**

This study examined data from 1,658 Medicaid-insured children with asthma in 5 managed care organizations in order to determine if there were any associations between race and asthma status.

75% of children, regardless of race, reported no anti-inflammatory use, 22% had a written care plan, and only 58% had a preventive health visit within the prior 6 months.

## Underuse

### Study

*Pharmacologic Treatment Of Hypertension In The Department Of Veterans Affairs During 1995 And 1996*

**Siegel, D., Lopez, J., Meier, J.; 1998; Am J Erg Med**

This study examined the frequency at which anihypertensive medications were prescribed in Veterans Affairs hospitals in 1995 and 1996, and calculated an annual cost savings if beta-blockers were used instead of calcium channel blockers.

*A Retrospective Study Of Risk Factors For Repeated Admissions For Asthma In A Rural/Suburban University Hospital*

**Kuo, A.; Craig, T.J.; 2001; J Am Osteopath Assoc**

This study reviewed medical records of 65 patients cared for at an academic medical center who were hospitalized 2 or more times during a 7-year period to determine predictors of hospitalization.

*Change In The Quality Of Care Delivered To Medicare Beneficiaries, 1998-1999 To 2000-2001*

**Jencks, S.F., Huff, E.D., Cuerdon, T; 2003; JAMA**

This study analyzed data from the Medicare Quality Improvement program which tracked changes in performance on 22 quality indicators for inpatient and outpatient care of Medicare beneficiaries. Data from 1998-1999 were compared to data from 2000-2001.

### Outcome

Calcium antagonists and angiotensin-converting enzyme (ACE) inhibitors were the most commonly dispensed antihypertensives at Veterans Affairs facilities for both 1995 and 1996. The estimated annual cost savings for each 1% conversion of calcium antagonists to beta-blockers would be \$713,000 and to conversion to diuretics would save \$758,000.

95% of patients had access to primary care. 38% reported poor compliance with treatment regimens, and 69% had received a prescription for inhaled corticosteroids at some point.

The median state's performance improved from baseline to follow-up on 20 of the 22 indicators. In the median state, the percentage of patients receiving appropriate care on the median indicator increased from 69.5% to 73.4%, a 12.8% relative improvement. The average relative improvement was 19.9% for outpatient indicators combined and 11.9% for inpatient indicators combined. For all but 1 indicator, absolute improvement was greater in states in which performance was low at baseline than those in which it was high at baseline. When states were ranked on each indicator, the state's average rank was highly stable over time.

## Underuse

### Study

*A New Approach For Measuring Quality Of Care For Women With Hypertension*

**Asch, S.M., Kerr, E.A., Lapuerta, P., Law, A., McGlynn, E.A.; 2001; Arch Intern Med**

This study surveyed a sample of 234 women with hypertension belonging to a single health plan to determine quality of care received.

### Outcome

On average, a woman received 64% of the recommended care. Only 37% of hypertensive women with blood pressure above 160/90 mm Hg had changes in therapy or lifestyle recommended. Patients who did not receive or meet the indicators were more likely to have worse blood pressure control.

*Cost-Related Medication Nonadherence Among Elderly And Disabled Medicare Beneficiaries: A National Survey 1 Year Before The Medicare Drug Benefit*

**Soumerai, S.B., Pierre-Jacques, M., Zhang, F., Ross-Degnan, D., Adams, A.S., Gurwitz, J., Adler, G., Safran, D.G.; 2006; Arch Intern Med**

This study analyzed data from 13,835 non-institutionalized Medicare enrollees in order to report the rates of medication non-adherence in 2004 one year before the start of Medicare part D.

29% of disabled beneficiaries and 13% of the elderly reported a cost-related episode of prescription non-compliance.

*Effect Of Medication Nonadherence On Hospitalization And Mortality Among Patients With Diabetes Mellitus*

**Ho, P.M., Rumsfeld, J.S., Masoudi, F.A., McClure, D.L., Plomondon, M.E., Steiner, J.F. Magid, D.J.; 2006; Arch Intern Med**

This study retrospectively examined 11,532 patients with diabetes in a managed care organization to see the prevalence of medication non adherence, and to determine if there were associations between medication non adherence and clinical outcomes. Outcomes measured were hospitalization rates and mortality rates.

Medication non adherence had a prevalence of 21.3%. Non adherent patients had higher HbA1c, blood pressure, and cholesterol levels. Non adherent patients had higher rates of hospitalization and all-cause mortality.

## Underuse

### Study

*Impact Of Medication Therapy Discontinuation On Mortality After Myocardial Infarction*

**Ho, P.M., Rumsfeld, J.S., Masoudi, F.A., McClure, D.L., Plomondon, M.E., Steiner, J.F. Magid, D.J.; 2006 Arch Intern Med**

This multi-center prospective cohort study followed 1,521 patients with acute myocardial infarction (MI) in order to determine factors that were associated with medication discontinuation, and to assess the impact of medication discontinuation 1 month after MI on 12-month mortality.

### Outcome

Factors associated with discontinuation of medications after MI included not graduating from high school and increasing age. Patients who discontinued all medications at 1 month had a lower 1-year survival (88.5% versus 97.7%) than patients on 1 or more medications.

*Quality Of Medical Care Delivered To Medicare Beneficiaries: A Profile At State And National Levels*

**Jencks, S.F., Cuerdon, T., Burwen, D.R., Fleming, B., Houck, P.M., Kussmaul, A.E., Nilasena, D.S., Ordin, D.L., Arday, D.R.; 2000; JAMA**

This article reports the results of a monitoring system for 24 quality indicators (or “process-of-care measures”) for the care of Medicare fee-for-service beneficiaries during 1997-1999. The quality indicators were related to both prevention and treatment and they were related to 6 medical conditions.

The percentage of patients receiving appropriate care varied for different quality indicators: 95% of patients did not receive sublingual nifedipine after stroke; 11% of patients with pneumonia were screened for pneumococcal immunization. Some states consistently ranked higher in performance than other states.

## Underuse

### Study

### Outcome

*Direct Observation Of Smoking Cessation Activities In Primary Care Practice*

**Ellerbeck, E.F., Ahluwalia, J.S., Jolicoeur, D.G., Gladden, J., Mosier, M.C.; 2001; J Fam Pract**

This study used direct observation to estimate the frequency with which primary care physicians (PCPs) incorporate smoking cessation advice into patient encounters.

The study notes that physicians did not raise the issue of smoking frequently (it was raised in only 21% of encounters) and did not always make suggestions for smoking cessation (bupropion discussed in 31% of encounters, nicotine replacement therapy in 17% of encounters, both agents in 15% of encounters).

*Asthma: Resource Use And Costs For Inhaled Corticosteroid Vs Leukotriene Modifier Treatment: A Meta-Analysis*

**Halpern, M.T., Khan, Z.M., Stanford, R.H., Spayde, K.M., Golubiewski, M.; 2003; J Fam Pract**

This is a meta-analysis to compare the effects of inhaled corticosteroid treatment with leukotriene modifier treatment on resource use and costs for asthma patients.

Patients taking inhaled corticosteroids had lower rates of hospitalization and ER visits and lower total cost than those taking leukotriene modifiers.

*Depression Diagnoses And Antidepressant Use In Primary Care Practices: A Study From The Practice Partner Research Network (PPRNET)*

**Ornstein, S., Stuart, G., Jenkins, R.; 2000; Public Health Rep**

This study used data from a national network of 389 primary care physicians (PCPs) to identify 2,103 patients with a new diagnosis of depression in 1996, and to determine the percentage of those patients who received an antidepressant prescription within 5 days of diagnosis.

1.6% of the patients without a prior history of depression or treatment had a new diagnosis of depression in 1996 (range 0.4% to 4.0%). 49% of the newly diagnosed patients received an antidepressant prescription within 5 days of diagnosis (mostly selective serotonin reuptake inhibitors). 90% of the patients given antidepressants had at least 1 contact in the 6 months after diagnosis (mean = 5.3 contacts).

## Underuse

### Study

### Outcome

*Factors Associated With Underimmunization At 3 Months Of Age In Four Medically Underserved Areas*

**Bardenheier, B.H., Yusuf, H.R., Rosenthal, J., Santoli, J.M., Shefer, A.M., Rickert, D.L., Chu, S.Y.; 2004; Public Health Rep**

This survey of households residing within Community Health Network Childhood Immunization Demonstration Project communities was designed to examine the rates of appropriate vaccination at 3 months of age in 4 medically underserved areas and to examine factors associated with underimmunization.

The rates of appropriate vaccination coverage at 3 months of age varied across sites: 82.4% in northern Manhattan, 70.5% in Detroit, 82.3% in San Diego, and 75.8% in rural Colorado. Reasons that babies were not up-to-date on vaccinations included guardians having public or no insurance, having 2 or more children living in the household, and the adult respondent being unmarried.

*Analysis Of Medication Use Patterns: Apparent Overuse Of Antibiotics And Underuse Of Prescription Drugs For Asthma, Depression And CHF*

**Gilberg, K., Laouri, M., Wade, S., Isonaka, S.; 2003; J Manag Care Pharm**

This study used claims data from 3 California managed care organizations to assess the appropriateness of prescription medication use based upon guidelines for various conditions.

27.5% of antidepressant users received the recommended therapy, 49% of asthma patients received at least 1 inhaled corticosteroid prescription, and only 54.5% of patients with congestive heart failure (CHF) received angiotensin-converting enzyme inhibitor. Of patients with a cold or upper respiratory infection (URI), 35.7% received antibiotics.



# Underuse

## Study

## Outcome

*Adherence To Antipsychotic And Nonpsychiatric Medications In Middle-Aged And Older Patients With Psychotic Disorders*

**Dolder, C.R., Lacro, J.P., Jeste, D.V.; 2003; Psychosom Med**

This study reviewed the pharmacy records of 76 patients > age 40 being treated for psychotic disorders in a Veterans Affairs Medical Center (VAMC) to estimate adherence rates for antipsychotic, antihypertensive, lipid-lowering and antiglycemic drugs.

Adherence rates for antipsychotics, antihypertensives, antihyperlipidemics, and antidiabetics ranged from 52% to 64%.

Adherence was not better for patients taking atypical antipsychotics than for those taking typical antipsychotics.

*Lack Of Diagnosis And Treatment Of Osteoporosis In Men And Women After Hip Fracture*

**Follin, S.L., Black, J.N., McDermott, M.T.; 2003; Pharmacotherapy**

The records of a single academic teaching hospital were reviewed to determine if patients admitted to a university teaching hospital for low-trauma hip fracture were diagnosed, evaluated or treated for osteoporosis during admission, or within 1 year after admission.

After hospitalization for hip fracture, only 14% of the charts reviewed had a diagnosis of osteoporosis (OP) at discharge, and only 26% had a diagnosis of OP at 1 year after discharge. Only 4% of patients received tests for OP (such as bone densitometry) during the hospitalization, and only 9% within 1 year after discharge.

*Adherence To Surveillance Among Patients With Superficial Bladder Cancer*

**Schrag, D., Hsieh, L.J., Rabbani, F., Bach, P.B., Herr, H., Begg, C.B.; 2003; J Natl Cancer Inst**

This study analyzed Surveillance Epidemiology and End Results (SEER) data to evaluate the extent to which patients diagnosed with superficial bladder cancer undergo the recommended follow-up bladder cystoscopy every 3-6 months.

Only 40% of the cohort had an examination during all 5 consecutive intervals studied; 18.1% had fewer than 2 exams. Patient characteristics that were associated with fewer than 2 exams included being age 75 years or older, being non-white, being urban or low-income, and having less severe bladder cancer or fewer other illnesses.

# Underuse

## Study

### *Underuse Of Necessary Care Among Cancer Survivors*

**Earle, C.C., Neville, B.A.; 2004; Cancer**

This study linked Medicare claims data and Surveillance Epidemiology and End Results (SEER) data to determine whether Medicare beneficiaries who are disease-free for 5 years after treatment for non-metastatic colon cancer receive less recommended care for non-cancer conditions, compared to a control group without cancer, and to identify which factors relate to the delivery of recommended care.

## Outcome

The study found that seniors in fee-for-service Medicare who are 5 years disease-free and survivors of colorectal cancer receive less care for chronic conditions than similar patients who did not have cancer.

However, cancer survivors received the same level of acute care. Areas in which survivors received less care included influenza vaccinations and lipid screenings. Survivors with chronic obstructive pulmonary disease (COPD) were also admitted more often to the hospital. However, survivors who were seen regularly by both oncologists and a primary care physician were more likely to have more of their recommended care.

### *Mammographic Screening: Patterns Of Use And Estimated Impact On Breast Carcinoma Survival*

**Blanchard, K., Colbert, J.A., Puri, D., Weissman, J., Moy, B., Kopans, D.B., Kaine, E.M., Moore, R.H., Halpern, E.F., Hughes, K.S., Tanabe, K.K., Smith, B.L., Michaelson, J.S.; 2002; Cancer**

This study retrospectively reviewed screening mammogram data at Massachusetts General Hospital to determine the consistency with which women complied with American Cancer Society (ACS) guidelines.

Very few women (6%) received all yearly mammograms between 1985 and 2002. The mean number of mammograms received during this period was 5.06, or 51% of the 13 possible exams.

### *Myocardial Infarction In Women: A Critical Appraisal Of Gender Differences In Outcomes*

**Bell, D.M., Nappi, J.; 2000; Pharmacotherapy**

This study reviews clinical trials that demonstrate the importance of gender in myocardial infarction (MI) mortality and outcomes.

Women experience more vague symptoms than men, may benefit less from thrombolytic therapy than men, and are less likely to receive medically proven therapies.

# Underuse

## Study

## Outcome

*Underutilization Of Gastroprotective Measures In Patients Receiving Nonsteroidal Anti-inflammatory Drugs*

**Smalley, W.Stein, C.M.Arbogast, P.G.Eisen, G.Ray, W.A.Griffin, M.;** 2002; **Arthritis Rheum**

This study used data from the Tennessee Medicaid program to determine how often patients on non-steroidal anti-inflammatory drugs (NSAIDs) were receiving recommended "gastroprotective strategies." The two "gastroprotective strategies" were either: (1) using NSAIDs combined with anti-ulcer medication, or (2) using a Cox-2 inhibitor medication.

16% of patients on NSAIDs received 1 of the 2 recommended gastroprotective therapies. Among patients who had 2 or more risk factors for ulcer complications, 30% of these patients received 1 of the 2 gastroprotective therapies.

*Quality Of Care For Primary Care Patients With Depression In Managed Care*

**Wells, K.B., Schoenbaum, M., Unutzer, J., Lagomasino, I.T., Rubenstein, L.V.;** 1999; **Arch Fam Med**

This study used a survey of 1204 patients receiving care in 46 primary care clinics who were members of 7 managed care organizations MCOs to assess the quality of care for primary care patients with depression.

Evaluation for depression (29% to 43%) and antidepressant medication (35% to 42%) were underused.

*Undertreatment Of Hyperlipidemia In The Secondary Prevention Of Coronary Artery Disease*

**Majumdar, S.R., Gurwitz, J.H., Soumerai, S.B.;** 1999; **J Gen Intern Med**

This study analyzed records of 622 patients discharged from 37 community hospitals in Minnesota to estimate compliance with National Cholesterol Education Program (NCEP) II cholesterol guidelines.

Lipid-lowering agents were significantly underutilized in this population. Only 37% of eligible patients received these medications at discharge. Factors positively associated with prescription were age less than 75, managed care enrollee, previous smoker, prior revascularization, and use of aspirin or more than 3 other medications.

# Underuse

## Study

*Warfarin Use Among Ambulatory Patients With Nonvalvular Atrial Fibrillation: The Anticoagulation And Risk Factors In Atrial Fibrillation (ATRIA) Study*

**Go, A.S., Hylek, E.M., Borowsky, L.H., Phillips, K.A., Selby, J.V., Singer, D.E.; 1999; Ann Intern Med**

This study used claims data from a managed care organization to determine the probability of anticoagulation in patients with a documented diagnosis of nonvalvular atrial fibrillation.

*The Lipid Treatment Assessment Project (L-TAP): A Multicenter Survey To Evaluate The Percentages Of Dyslipidemic Patients Receiving Lipid-Lowering Therapy And Achieving Low-Density Lipoprotein Cholesterol Goals*

**Pearson, T.A., Laurora, I., Chu, H., Kafonek, S.; 2000; Arch Intern Med**

This study examined records of 4,888 patients in order to determine the percentage of patients in the multicenter Lipid Treatment Assessment Project who are achieving low-density lipoprotein cholesterol (LDL-C) goals.

*Outcomes Of Inappropriate Prescribing Of Beta-Blockers After An Acute Myocardial Infarction In A Medicaid Population*

**Fernandes, A.W., Madhavan, S.S., Amonkar, M.M., Bell, D., Islam, S.S., Scott, V.G.; 2005; Ann Pharmacother**

This study used West Virginia Medicaid data to assess the prescribing patterns for beta blockers in patients experiencing acute myocardial infarction (AMI).

## Outcome

Warfarin was substantially underused in patients with atrial fibrillation in this population. Of approximately 11,000 eligible patients, only 55% received warfarin within 3 months of diagnosis. Positive predictors included previous stroke, while negative predictors included age greater than or equal to 85, and previous gastrointestinal or intracranial hemorrhage.

Large proportions of dyslipidemic patients receiving lipid-lowering therapy are not achieving target levels. Overall, only 38% of patients achieved LDL target levels. Drug therapy was more effective than non-drug therapy in all patient risk groups.

Overall, approximately 64% of patients with an MI were prescribed beta-blockers appropriately. Patients who were appropriately prescribed beta-blockers had significantly lower all-cause mortality at 1 year, but also had significantly higher health care utilization.

# Underuse

## Study

*Physicians Underutilize Topical Retinoids In The Management Of Acne Vulgaris: Analysis Of U.S. National Practice Data*

**Balkrishnan, R., Fleischer, A.B., Jr., Paruthi, S., Feldman, S.R.; 2003; J Dermatolog Treat**

This study used National Ambulatory Care Survey (NAMCS) data from 1990-1999 to assess whether or not topical retinoids were underutilized in the management of acne.

*Quality Improvement Efforts And Hospital Performance: Rates Of Beta-Blocker*

*Prescription After Acute Myocardial Infarction*  
**Bradley, E.H., Herrin, J., Mattera, J.A., Holmboe, E.S., Wang, Y., Frederick, P., Roumanis, S.A., Radford, M.J., Krumholz, H.M.; 2005; Med Care**

This study used data from National Registry of Myocardial Infarction 2 to estimate levels of beta-blocker prescriptions at baseline.

*Oral Versus Intravenous: Rehydration Preferences Of Pediatric Emergency Medicine Fellowship Directors*

**Conners, G.P., Barker, W.H., Mushlin, A.I., Goepf, J.G.; 2000; Pediatr Emerg Care**

This study surveyed 60 pediatric emergency medicine program directors to examine whether American Academy of Pediatrics (AAP) recommendations for oral rehydration therapy (ORT) were followed.

## Outcome

Of the 54.2 million visits for acne, topical retinoids were prescribed at 35.3% visits. Dermatologists prescribed topical retinoids more often than non-dermatologists. Retinoid prescription has been increasing over the past decade, primarily among dermatologists.

The average rate for beta-blocker prescription post acute myocardial infarction (AMI) was 60%.

Compared with national guidelines, pediatric emergency medicine fellowship directors underuse ORT for children with acute gastroenteritis. 17% of interviewed doctors felt ORT was better than intravenous for all 10 clinical scenarios of mild or moderately dehydrated children. Cited barriers to the use of oral rehydration relative to intravenous included time and parental and primary care physician expectations.

# Underuse

## Study

## Outcome

*Correlates Of Underutilization Of Colorectal Cancer Screening Among U.S. Adults, Age 50 Years And Older*

**Cokkinides, V.E., Chao, A., Smith, R.A., Vernon, S.W., Thun, M.J.; 2003; Prev Med**

This study used data from the 1999 Behavioral Risk Factor Surveillance System (BRFSS) to identify what factors are associated with not receiving screening for colorectal cancer. Screening included a fecal occult blood test (FOBT) and/or sigmoidoscopy/colonoscopy.

Among adults > age 50, 40% reported ever having a FOBT and 44% reported ever having a sigmoidoscopy or colonoscopy.

*Visual Field Testing In Glaucoma Medicare Beneficiaries Before Surgery*

**Coleman, A.L., Yu, F., Rowe, S.; 2005; Ophthalmology**

This study used Medicare claims data to estimate the percentage of seniors who had visual field (VF) testing no more than 1 year prior to cataract surgery.

The study found that about 30% of Medicare beneficiaries older than 65 do not receive VF testing in the 12 months before glaucoma surgery. There are lower rates of VF testing in non-whites, patients with diabetic retinopathy, and bilateral blindness.

*Patient Factors Associated With Adherence To Immunosuppressant Therapy In Renal Transplant Recipients*

**Chisholm, M.A., Lance, C.E., Mulloy, L.L.; 2005; Am J Health Syst Pharm**

This survey of renal transplant patients and a review of pharmacy and clinical data for a subset of these patients sought to determine factors related to compliance with immunosuppressive therapy (IST).

35% of renal transplant patients sampled were not adherent to immunosuppressant therapy regimens.

## Underuse

### Study

*Underutilization Of Aspirin, Beta-Blockers, Angiotensin-Converting Enzyme Inhibitors, And Lipid-Lowering Drugs And Overutilization Of Calcium Channel Blockers In Older Persons With Coronary Artery Disease In An Academic Nursing Home*

**Ghosh, S., Ziesmer, V., Aronow, W.S.; 2002; J Gerontol A Bio Sci Med Sci**

This study utilized a chart review of all residents in an academic nursing home to report the prevalence of aspirin, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), statins, and calcium channel blockers in older people with coronary artery disease (CAD) at an academic nursing home.

*Discharge Disposition From Acute Care After Traumatic Brain Injury: The Effect Of Insurance Type.*

**Chan, L., Doctor, J., Temkin, N., MacLehose, R.F., Esselman, P.Bell, K., Dikmen, S.; 2001; Arch Phys Med Rehabil**

This study looks at whether patients with traumatic brain injury (TBI) are more likely than fee-for-service patients to go to skilled nursing facilities (SNFs) or rehabilitation facilities for Medicaid/health maintenance organization (HMO) patients.

### Outcome

Aspirin, beta-blockers, ACE inhibitors, ARBs, and statins were underused, while calcium channel blockers were overused by patients in this sample. Of the 77 patients with CAD, the proportion taking one or more of these medications ranged from 21% for statins to 62% for aspirin. Despite not being a Class I recommendation for patients with CAD, 27% of patients in this sample were being prescribed calcium channel blockers.

There is an association between insurance type and postacute care site: Medicaid patients were 68% more likely, and HMO patients were 23% more likely to go to a SNF than were fee-for-service patients.

# Underuse

## Study

## Outcome

*Venous Thromboembolism Prevention In Acutely Ill Nonsurgical Patients*

**Brophy, D.F., Dougherty, J.A., Garrelts, J.C., Parish, R.C., Rivey, M.P., Stumpf, J.L., Taylor, C.T., Mathis, A.S.; 2005; Ann Pharmacother**

This study reviewed available literature for advances in the prophylaxis of deep vein thrombosis (DVT) and venous thromboembolism (VTE) in acutely ill non-surgical patients.

Only 28-42% of acutely ill patients with risk factors for VTE received appropriate prophylaxis.

*Limiting Access To Psychiatric Services Can Increase Total Health Care Costs*

**Horn, Susan; 2003; J Clin Psychiatry**

This study used data from the Managed Care Outcomes Project to look at whether cost-containment strategies, such as limiting psychiatric referrals and tightly regulating the formulary, ultimately save or cost money, and what their impact is on the quality of care.

The study reports that cost containment measures lead to poorer care and ultimately cost more money because of additional visits, emergency room (ER) trips, or hospitalizations. For example, sites with the most restricted formularies often had twice the use of health care services than those with no formulary restrictions.

*Prophylactic Anticoagulation For Venous Thromboembolic Disease In Geriatric Patients*

**Jacobs, Laurie, G.; 2003; J Am Geriatr Soc**

This article reviews the literature regarding the indications for VTED prophylaxis, specific medical conditions appropriate for prophylaxis, and guidelines for prophylaxis, especially as related to elderly patients.

The study concluded that anticoagulation should be used in a wide variety of medical and surgical patients at risk for venous thromboembolic disease (VTED) but that literature shows that it is underused. This underuse may be due to concerns about the risks of bleeding and clinicians being unaware about all the conditions that increase risk for VTED.



# Underuse

## Study

## Outcome

*U.S. Adolescents Receive Suboptimal Preventive Counseling During Ambulatory Care*

**Ma, J., Wang, Y., Stafford, R.S.; 2005; J Adolesc Health**

This study used data from The National Ambulatory Medical Care Survey (AMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) to determine U.S. adolescents' (age 13-18) utilization of ambulatory care and the likelihood of receiving preventive counseling from 1993 through 2000.

Counseling services were documented for 39% of all adolescent general medical examination (GME) visits. These rates represented minimal improvements from 1993-1996.

*Examination Of The Treatment And Follow-Up Care For Adolescents Who Test Positive For Chlamydia Trachomatis Infection*

**Hwang, L.Y., Tebb, K.P., Shafer, M.A., Pantell, R.H.; 2005; Arch Pediatr**

This study provides a chart review of 122 cases of adolescent chlamydia infections at an health maintenance organization (HMO) in California to document and describe how chlamydia was managed in this population.

97% of patients were treated with appropriate antibiotics, but only 36% were tested for other sexually transmitted diseases (STDs) and only 10% received recommended chlamydia retesting.

*Healthcare Access And Utilization Among Women 40 And Older At The U.S.-Mexico Border: Predictors Of A Routine Check-Up*

**Hunter, J.B., de Zapien, J.G., Denman, C.A., Moncada, E., Papenfuss, M., Wallace, D., Giuliano, A.R.; 2003; J Community Health**

This study used population-based surveys to study access and utilization barriers in two U.S.-Mexico border communities. Household surveys were administered to U.S. and Mexican women 40 years of age and older.

Healthcare utilization was not significantly different for Mexican and U.S. residents living on the border. Pap smear rates for U.S. and Mexican women were 22% and 9.3% respectively, and mammography rates 2.5% and 16%.

## Underuse

### Study

### Outcome

*Racial Differences In Lipid-Lowering Agent Use In Medicaid Patients With Cardiovascular Disease*

**Litaker, D., Koroukian, S.M.; 2004; Med Care**

This study used a retrospective study of Ohio Medicaid claims data to assess the association between race and lipid-lowering agent use.

Only 26.4% with a new diagnosis of cardiovascular disease (CVD) received a lipid-lowering agent during the 24-month period surrounding the new CVD claim.

Minorities were less likely to have previously used a drug, received a new prescription, or refilled a prescription.

*Use And Persistence Of Pharmacotherapy For Elementary School Students With Attention Deficit/Hyperactivity Disorder*

**Bussing, R., Zima, B.T., Mason, D., Hou, W., Garvan, C.W., Forness, S.; 2005; J Child Adolesc Psychopharmacol**

This study interviewed 220 parents and students identified by school district screening for attention deficit/hyperactivity disorder (ADHD) to examine rates of pharmacologic treatment and district provided social service uptake.

About a third (35%) of the children received ADHD medications over 2 years; boys were more than twice as likely to receive medications than girls. About a quarter (28%) received school services over 2 years.

*Opioid Analgesic Drugs In Older People*

**Fine, P.G.; 2001; Clin Geriatr Med**

This article reviews literature pertaining to chronic pain management in older adults.

Older patients, especially the cognitively impaired, are at risk for under-treatment of pain, although increasing attention to quality of life is correcting this underuse.

# Underuse

## Study

## Outcome

*Are Stimulants Overprescribed? Treatment Of ADHD In Four U.S. Communities*

**Jensen, P.S., Kettle, L., Roper, M.T., Sloan, M.T., Dulcan, M.K., Hoven, C., Bird, H.R., Bauermeister, J.J., Payne, J.D.; 1999; J Am Acad Child Adolesc Psychiatry**

This study analyzed survey data obtained from 1,285 students and their parents in 4 communities to determine the prevalence of attention deficit/hyperactivity disorder (ADHD) and pharmacologic treatment rates.

Medication is underused in children with ADHD. 5% of a community sample met criteria for ADHD, and only 12.5% were receiving medication. School services and psychological services were used more frequently in children with ADHD than those without.

*Identification And Management Of Hepatitis C Patients In Primary Care Clinics*

**Shehab, T.M., Orrego, M., Chunduri, R.Lok, A.S.; 2003: Am J Gastroenterol**

This study sought to determine: (1) the level of care of hepatitis C-positive patients, and (2) the compliance of primary care physicians with hepatitis C screening guidelines. The study examined the primary care medical records of 229 hepatitis C antibody-positive patients and 229 patients not tested for hepatitis C antibody.

The study suggests that primary care physicians and clinics do less hepatitis C screening and testing than they should. The study found that only 16% of patients who were hepatitis C antibody-positive had been tested for hepatitis C based on risk factor. Only 1% of patients who did not receive hepatitis C antibody testing had documented discussion of hepatitis C risk factors during their initial visit with a primary care physician. 77% of hepatitis C ribonucleic acid (RNA)-positive patients with elevated liver function tests were referred to subspecialty care.

*An Investigation Of Why Eligible Patients Do Not Receive HAART*

**Maisels, L., Steinberg, J., Tobias, C.; 2001; AIDS Patient Care STDS**

For a sample of AIDS patients receiving care at a single community health center, medical record reviews and patient interviews were conducted to estimate the percentage of eligible patients receiving highly active antiretroviral therapy (HAART).

Of 88 patients eligible for HAART, 69% were prescribed it. Of those who did not receive HAART, it was recommended in 68% of cases.

## Underuse

### Study

### Outcome

*Detection And Documentation Of Actual And Potential Medication Adherence Problems In Patients Receiving Combination Therapies*  
**Servellen, Gwen; 2002; J Assoc Nurses AIDS Care**

This study used chart reviews of patients attending an HIV clinic to assess adherence to retroviral regimens.

Providers are not fully documenting adherence to AIDS regimens and not following up with patients. The study found that the current antiretroviral medication regimen was clearly documented in 91% of the cases. Antiretroviral adherence problems were clearly noted in 34% of the charts, medication history in 31% of the charts, and problems with missed clinic appointments in 31% of the charts.

*Vaccination Practices In U.S. Emergency Departments, 1992-2000*  
**Pallin, D.J., Muennig, P.A., Emond, J.A., Kim, S.Camargo, C.A., Jr.; 2004; Vaccine**

This study analyzed National Hospital Ambulatory Medical Care Survey (NHAMCS) data to determine the frequency of influenza and pneumonia immunizations in emergency departments (EDs).

Over 27 million immunizations were administered during the study period in EDs, but 93% were for tetanus. ED patients are rarely vaccinated against influenza or pneumonia.

*Identifying Factors Associated With Disability-Related Differences In Breast Cancer Screening (United States)*  
**Schootman, M., Jeffe, D.B.; 2003; Cancer Causes Control**

This study used 1996 Medical Expenditure Panel Survey (MEPS) data to identify factors that could explain breast cancer underutilization among women age 40 and older with disabilities.

Women with long-term limitations in their Activities of Daily Living (ADLs) or Instrumental Activities of Daily Living (IADLs) were less likely to be screened for breast cancer compared to those without such limitations.

# Underuse

## Study

## Outcome

*Nonsteroidal Anti-Inflammatory Drugs, Aspirin, And Gastrointestinal Prophylaxis: An Ounce Of Prevention*

**Scheiman, J. M.; 2005; Rev Gastroenterol Disord**

This study reviews the literature regarding gastrointestinal prophylaxis for patients on nonsteroidal anti-inflammatory drugs (NSAIDs) or aspirin.

Gastro-protective therapy with a proton pump inhibitor is beneficial to patients receiving NSAIDs, but despite current treatment recommendations, is underused for patients at risk.

*Underuse Of Procedures For Diagnosing Osteoporosis And Of Therapies For Osteoporosis In Older Nursing Home Residents*

**Gupta, G., Aronow, W.S.; 2003; J Am Med Dir Assoc**

A chart review of 136 women in an academic nursing home to determine the prevalence of osteoporosis, the prevalence of utilization of bone density test for diagnosing osteoporosis, and the prevalence of osteoporosis-related medications (including calcium, vitamin D, and bisphosphonates).

The study found that postmenopausal women at the academic nursing home studied had a low prevalence of bone density testing, and underuse of calcium, vitamin D, and bisphosphonate therapy. Out of all women in the nursing home, 49% had bone density testing. Out of those with osteoporosis, 55% were taking calcium carbonate, 42% were taking Vitamin D, and 61% were taking bisphosphonates. Out of the women who were on medications that increase the risk of osteoporosis, only 20% had bone mineral testing.

*Income-Related Differences In The Use Of Evidence-Based Therapies In Older Persons With Diabetes Mellitus In For-Profit Managed Care*

**Brown, A.F., Gross, A.G., Gutierrez, P.R., Jiang, L., Shapiro, M.F., Mangione, C.M.; 2003; J Am Geriatr Soc**

This study used interviews and clinical examinations in 301 patients to determine whether differences in income were associated with medication use among diabetics in managed care who have the same prescription drug benefit.

Statin use was observed in 57% of higher-income versus 30% of lower-income respondents. There were no differences by income in the rates of aspirin or angiotensin-converting enzyme (ACE) inhibitor use.

# Underuse

## Study

## Outcome

*Evaluation Of Angiotensin-Converting Enzyme Inhibitor Use In Patients With Type 2 Diabetes In A State Managed Care Plan*

**Timpe, E.M., Amarshi, N., Reed, P.J.; 2004; Am J Manag Care**

This study examined data from a drug utilization review database of a state managed care plan in order to compare ACE inhibitor use in patients with type 2 diabetes at 1 year and 3 years after guidelines were published.

Although ACE inhibitor use improved, fewer than 50% of patients received appropriate therapy. The proportion of patients with diabetes and hypertension who were taking an ACE inhibitor increased by 10 percentage points over the 2 years; however, ACE inhibitors were only used in 46% of those patients in 2000.

*Outpatient Utilization Of Angiotensin-Converting Enzyme Inhibitors Among Heart Failure Patients After Hospital Discharge*

**Butler, J., Arbogast, P.G., Daugherty, J., Jain, M.K., Ray, W.A., Griffin, M.R.; 2004; J Am Coll Cardiol**

This study followed 960 patients for 1 year after hospitalization for heart failure to assess the factors associated with utilization of an angiotensin-converting enzyme (ACE) inhibitor after hospitalization.

ACE inhibitors were prescribed at discharge for 67% of survivors with low ejection fraction (EF). For survivors who did not have a discharge script for ACE inhibitors, only 12.7% of appropriate patients filled a prescription by 30 days and 12.5% were still adherent at one year.

*The Epidemiology Of Major Depressive Disorder: Results From The National Comorbidity Survey Replication (NCS-R)*

**Kessler, R.C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K.R., Rush, A.J., Walters, E.E., Wang, P.S.; 2003; JAMA**

This study conducted face-to-face household survey of 9,090 people in 48 states, in order to determine prevalence and correlates of major depressive disorder (MDD).

The prevalence of MDD for lifetime was 16.2%. 51.6% of 12-month cases received health care treatment for MDD. Treatment was adequate in only 41.9% of these cases.

# Underuse

## Study

## Outcome

### *Compliance With Osteoporosis Medications*

**Sokol, M.C., McGuigan, K.A., Verbrugge, R.R., Epstein, R.S.; 2005; Arch Intern Med**

This study looked at pharmacy claims of 40,002 patients taking osteoporosis medications and followed them for 5 years in order to assess the level and determinants of compliance with drugs prescribed for osteoporosis.

5 years after initiation, 52.1% of patients were not continuing to fill prescriptions for an osteoporosis medication. Predictors of compliance included: fracture, female sex, younger age, fewer comorbid conditions, using fewer nonosteoporosis medications, bone mineral density testing before and after initiating a medication.

### *Impact Of Medication Adherence On Hospitalization Risk And Healthcare Cost*

**Sokol, M.C., McGuigan, K.A., Verbrugge, R.R., Epstein, R.S.; 2005; Med Care**

This study examines records from 137,277 patients with diabetes, hypertension, hypercholesterolemia, or congestive heart failure in order to determine the impact of medication adherence on healthcare utilization and costs.

For the 4 chronic diseases evaluated, adherence rates to recommended therapy ranged from 55%-73%.

### *Impact Of Antidepressant Drug Adherence On Comorbid Medication Use And Resource Utilization*

**Katon, W., Cantrell, C.R., Sokol, M.C., Chiao, E., Gdovin, J.M.; 2005; Arch Intern Med**

This study used data from a claims database to study 8,040 patients on antidepressant medications in order to determine if improved antidepressant medication adherence is associated with an increased likelihood of chronic comorbid disease medication adherence and reduced medical costs.

Only 40% of patients studied were adherent to antidepressant medication, but of those who were adherence rates to medications for comorbid conditions increased twofold.

# Underuse

## Study

*Adjuvant Radiation For Rectal Cancer: Do We Measure Up To The Standard Of Care? An Epidemiologic Analysis Of Trends Over 25 Years In The United States*

**Baxter, N.N., Rothenberger, D.A., Morris, A.M., Bullard, K.M.; 2005; Dis Colon Rectum**

A retrospective study of 45,627 patients with nonmetastatic rectal cancer to evaluate the rate of radiation therapy and the factors affecting its delivery.

*The Association Between The On-Site Availability Of Cardiac Procedures And The Utilization Of Those Services For Acute Myocardial Infarction By Payer Group. The National Registry Of Myocardial Infarction 2 Investigators*

**Canto, J.G. Rogers, W.J., Zhang, Y., Roseman, J.M., French, W.J., Gore, J.M., Chandra, N.C.; 1999; Clin Cardiol**

This study reviewed data on 275,046 patients with acute myocardial infarction (AMI) enrolled in the National Registry of Myocardial Infarction 2 to assess the interaction of payer status and availability of on site angiography capability and utilization of those services.

## Outcome

Adjuvant radiation therapy in the treatment of non-metastatic rectal cancer is under-used. In 2000, over 30% of patients with this condition did not undergo radiation therapy. Lower rates of receiving radiation therapy were associated with being female, being African American, being older, having low-grade lesions, and being from certain geographic locations.

Patients initially seen at a hospital with catheretization capabilities were about twice as likely to have a cardiac catheretization procedure than patients initially seen at a hospital without catheretization capabilities, and then later transferred out. The likelihood of having a cardiac catheretization was greater for patients with commercial insurance, and lowest for Medicaid patients.



# Underuse

## Study

*Providing Immunizations In A Pediatric Emergency Department: Underimmunization Rates And Parental Acceptance*  
**Cunningham, S. J.; 1999; *Pediatr Emerg Care***

This study prospectively enrolled 9,321 children presenting to a pediatric emergency department (ED) for any reason in an ED-based immunization program to estimate the uptake of the service and parental attitudes toward the service.

## Outcome

59% of participating children were under-immunized. Parents who carried portable immunization cards documenting that their child was underimmunized were almost 5 times more likely to accept immunization for their child than parents who lacked documentation.

*Preventive Pharmacologic Therapy Among Asthmatics Five Years After Publication Of Guidelines*

**Jatulis, D.E., Meng, Y.Y., Elashoff, R.M., Schocket, A.L., Evans, R.M., Hasan, A.G., Legorreta, A.P.; 1998; *Ann Allergy Asthma Immunol***

This study used pharmacy and survey data for 7,423 asthmatic members of a California health maintenance organization (HMO) to examine the use of routine anti-inflammatory steroids and bronchodilators.

In contrast to the recommendations of the national guidelines, about half of moderate asthmatics and 40% of severe asthmatics did not fill any anti-inflammatory agents (AI) prescriptions. Approximately one-fourth of the asthmatics were relying on short-acting bronchodilators without AI.

*Somatic Healthcare Utilization Among Adults With Serious Mental Illness Who Are Receiving Community Psychiatric Services*

**Dickerson, F.B., McNary, S.W., Brown, C.H., Kreyenbuhl, J., Goldberg, R.W., Dixon, L.B.; 2003; *Med Care***

200 outpatients being treated for schizophrenia or affective disorder were surveyed regarding their use of general health care.

Patients with schizophrenia and affective disorder were more likely to receive medical care than non-psychiatric patients, but less likely to receive dental care.

# Underuse

## Study

## Outcome

*A Population-Based, Community Estimate Of Total Colon Examination: The Impact On Compliance With Screening For Colorectal Cancer*

**Schoen, R.E., Weissfeld, J.L., Trauth, J.M., Ling, B.S., Hayran, M.; 2002; Am J Gastroenterol**

This study conducted telephone interviews of 496 residents in two Southwestern Pennsylvania communities to determine both the rate of total colonoscopy and other colorectal screening modalities.

Colorectal cancer screening is underused. The study found that 31% of people reported fecal occult blood testing (FOBT) within one year or flexible sigmoidoscopy within 5 years. If having a total colonoscopy within the previous 5 years is added to this 31% of people, then the total percentage of patients being “compliant” increased to 39%.

*Pressure Ulcers Among Patients Admitted To Home Care*

**Ferrell, B.A., Josephson, K., Norvid, P., Alcorn, H.; 2000; J Am Geriatr Soc**

Records from 3,048 patients from 41 different home care agencies were reviewed in order to determine the prevalence of pressure ulcers among patients admitted to home-care services and to describe the characteristics associated with pressure ulcers.

9.12% had pressure injuries. Characteristics associated with pressure ulcers included recent institutional discharge, functional impairment, incontinence, and having had a previous ulcer. About 30% of subjects were at risk for new pressure ulcers.

*Underutilization Of Controller And Rescue Medications Among Older Adults With Asthma Requiring Hospital Care.*

**Hartert, T.V., Toggias, A., Mellen, B.G., Mitchel, E.F., Snowden, M.S., Griffin, M.R.; 2000; J Am Geriatr Soc**

This was a retrospective analysis of claims for dual eligibles > age 65 in Tennessee designed to assess the utilization of asthma medications prior to asthma-related hospitalizations.

Among elderly patients hospitalized for asthma, only 25% filled prescriptions for inhaled corticosteroids, and only 5% received rescue (i.e., oral) corticosteroids.

# Underuse

## Study

## Outcome

*Underuse Of Antidepressants In Major Depression: Prevalence And Correlates In A National Sample Of Young Adults*  
**Druss, B.G., Hoff, R.A., Rosenheck, R.A.; 2000; J Clin Psychiatry**

As part of the National Health and Nutrition Survey (NHANES) III study, 7,589 individuals were administered the Diagnostic Interview Schedule to assess the prevalence and treatment rates of major depression.

Antidepressants (ADs) were underused. Only 7.4% of people who met criteria for major depression were taking ADs. Having a primary care physician and having insurance both increased the likelihood.

*Treatment For The Secondary Prevention Of Stroke In Older Patients: The Influence Of Dementia Status*  
**Moroney, J.T., Tseng, C.L., Paik, M.C., Mohr, J.P., Desmond, D.W.; 1999; J Am Geriatr Soc**

This is a prospective study of patients admitted to an academic center with a diagnosis of ischemic stroke. The study was designed to assess the influence of cognitive status (i.e., dementia) in seniors with a prescription of aspirin or warfarin at hospital discharge after acute ischemic stroke.

Patients with dementia have poorer outcomes after ischemic stroke and are less likely to receive anticoagulants as outpatients. The study found that only 11.4% of patients were discharged without either aspirin or warfarin. Patients with dementia were more likely to be in this group. It was also noted that the non-treated group had a higher rate of discharge to a nursing home, while a history of cardiac disease was associated with a higher likelihood of treatment. 1 year after discharge, 35.5% of untreated patients had an adverse outcome versus only 18.7% of treated patients. Dementia status did not change this outcome, except that patients with dementia had higher rates of adverse outcomes.

*Underused Options For Preventing And Treating Influenza*  
**Mossad, S.B.; 1999; Cleve Clin J Med**

This article reviews strategies for the prevention and treatment of influenza.

Influenza vaccine, the most effective preventive measure, is widely underused.

# Underuse

## Study

*Underutilization Of Angiotensin-Converting Enzyme Inhibitors In Older Patients With Q-Wave Anterior Myocardial Infarction In An Academic Hospital-Based Geriatrics Practice*  
**Mendelson, G., Aronow, W.S.; 1998; J Am Geriatr Soc**

A retrospective analysis of charts at one geriatrics practice to determine the prevalence of angiotensin-converting enzyme (ACE) inhibitors in patients who have indications for their use.

*Underutilization Of Breast-Conserving Therapy In A Predominantly Rural Population: Need For Improved Surgeon And Public Education*  
**Hokanson, P.Seshadri, R., Miller, K.D; 2000; Clin Breast Cancer**

This study used a survey of 171 breast cancer survivors referred to a cancer center in Fargo, ND to determine the probability of undergoing breast-conserving therapy (BCT) and characteristics of patients who ultimately did.

*Underuse Of Controller Medications Among Children With Persistent Asthma In The Ohio Medicaid Population: Evolving Differences With New Medications*  
**Wilson, S.E., Leonard, A., Moomaw, C., Schneeweiss, S., Eckman, M.H.; 2005; Ambul Pediatr**

This retrospective analysis of Ohio Medicaid claims data sought to determine the extent of underuse of asthma controller medications and to determine if there were racial differences influencing underuse.

## Outcome

In the population studied there is underutilization of ACE inhibitors and therefore suboptimal quality of care. The study found that ACE inhibitors were being used by only 56 out of 161 patients who had a history of a Q-wave anterior myocardial infarction without contraindications to ACE inhibitors.

BCT was underused; only 35% of patients eligible by current guidelines received BCT. The choice of therapy was predominantly surgeon driven.

Asthma controller medications are underused among all races, though African Americans are particularly underserved. The study found that the proportion of children with claims for a controller medication increased from 53% in 1997 to 67% in 2001. Although there were no racial differences in medication claims in 1997, a smaller proportion of African American children had a claim for a controller medication in 2001. Leukotriene antagonists (LTAs) were driving this difference. Individuals residing in urban areas were significantly less likely to have claims for LTAs.

# Underuse

## Study

## Outcome

*Missed Cancer Screening Opportunities Among Older Women: A Provider Survey*

**Gulitz, E., Bustillo-Hernandez, M., Kent, E.B.; 1998; Cancer Pract**

This study was a survey with data collected from a random sample of providers to ascertain whether providers performed screening tests on asymptomatic female patients over age 50, and the characteristics of providers who did not.

86% of respondents reported ordering mammograms, and 89% reported obtaining Pap smears. Predictors of not screening included provider age > 50, specialization in geriatrics, or practice in a rural setting.

*Colorectal Cancer Screening Among A Sample Of Community Health Center Attendees*

**Christman, L.K., Abdulla, R., Jacobsen, P.B., Cantor, A.B., Mayhew, D. Y., Thompson, K.S., Krischer, J.P., Roetzheim, R.G.; 2004; J Health Care Poor Underserved**

To determine the rate of colorectal cancer screening in patients attending community health centers, medical records of 1,176 patients from 8 community health centers were abstracted.

Screening was below guidelines, but better than the national average despite patients' low socioeconomic status. Among the patients studied, 43.8% of patients had undergone at least one of the 3 colorectal screening tests (fecal occult blood test, colonoscopy, or flexible sigmoidoscopy) in the recommended interval.

*The Role Of Physician Communication In Improving Compliance With Mammography Screening Among Women Ages 50-79 In A Commercial HMO*

**MacDowell, N.M., Nitz-Weiss, M., Short, A.; 2000; Manag Care Q**

This study used a commercial health maintenance organization (HMO) population of women ages 50-79 in which there are no known barriers (financial, access, or knowledge) to mammogram compliance to examine mammogram screening compliance

18-23% of women ages 50-79 enrolled in a commercial HMO failed to receive recommended screening mammography.

## Underuse

### Study

*Pneumococcal Vaccination In The Emergency Department: An Assessment Of Need*  
**Rudis, M.I., Stone, S.C., Goad, J.A., Lee, V.W., Chitchyan, A., Newton, K.I.; 2004; Ann Emerg Med**

This article described a survey completed by 250 adults seen in an urban, tertiary care emergency department (ED) during a period of 3 days in order to determine the pneumococcal vaccination rates, willingness to be vaccinated, and reasons for nonvaccination.

*Delivery Of Outpatient Cardiac Rehabilitation In A Managed Care Organization*  
**Roblin, D.Diseker, R.A., III Orenstein, D.Wilder, M.Eley, M.; 2004; J Cardiopulm Rehabil**

This study analyzed a cohort of 945 patients > age 30 in a staff model health maintenance organization (HMO) who were hospitalized with acute myocardial infarction (AMI) to estimate rates of referral to and enrollment in post-discharge cardiac rehabilitation

*Racial Disparity In Primary And Adjuvant Treatment For Nonmetastatic Prostate Cancer: SEER-Medicare Trends 1991 To 1999*  
**Zeliadt, S.B., Potosky, A.L., Etzioni, R., Ramsey, S.D., Penson, D.F.; 2004; Urology**

This study analyzed 90,128 cases of prostate cancer in the Surveillance, Epidemiology, and End Results (SEER) registry in order to assess trends in the initial care of non-metastatic prostate cancer, including the use of primary and adjuvant androgen deprivation therapy (ADT) from 1991 to 1999.

### Outcome

Of at risk patients (age > 65) surveyed, only 9% had ever received pneumococcal vaccination.

Cardiac rehabilitation was underused in this population. Of patients who visited a cardiologist within a year of hospitalization for coronary artery disease (CAD), 24% were referred to outpatient cardiac rehabilitation, and 7% enrolled.

Accounting for age, grade, socioeconomic status, and comorbidity, African American men were 26% less likely to receive aggressive therapy than white men.

# Underuse

## Study

## Outcome

*Stereotactic Neurosurgical Biopsy Is An Underutilized Modality*

**Plunkett, R., Allison, R.R., Grand, W.; 1999; Neurosurg Rev**

This study analyzed the records of 141 patients undergoing stereotactic brain biopsy at a single hospital to assess clinical outcomes.

Management was altered in 40% of cases due to histology. Morbidity was 10 asymptomatic hemorrhages on post-biopsy computed tomography (CT) scans and 2 cases of clinical deterioration. Our conclusions were that stereotactic neurosurgical biopsy produces high yield with low morbidity.

*Barriers To Fecal Occult Blood Testing And Sigmoidoscopy Among Older Chinese-American Women*

**Tang, T.S., Solomon, L.J., McCracken, L.M.; 2001; Cancer Pract**

101 Chinese-American women age 60 years and older in 2 metropolitan areas on the east coast of the U.S. completed questionnaires in order to examine factors associated with fecal occult blood test (FOBT) and sigmoidoscopy screening use among Chinese-American women.

Screening is underused in this population. 25% report ever having a FOBT, and 31% a sigmoidoscopy.

*Implantable Cardioverter Defibrillator Utilization Based On Discharge Diagnoses From Medicare And Managed Care Patients*

**Ruskin, J.N., Camm, A.J., Zipes, D.P., Hallstrom, A.P., Grory-Ussat, M.E.; 2002; J Cardiovasc Electrophysiol**

Managed care and Medicare databases were analyzed to estimate the number of patients at risk of sudden death, and these results were compared to current implantable cardioverter defibrillator (ICD) usage volumes.

The analysis identified between 736 to 1,140 ICD candidates per million population. This is in contrast to the ICD usage rate of 416 per million population in the United States. Thus, authors conclude that ICDs are underutilized.

# Underuse

## Study

## Outcome

*Regular Use Of Inhaled Corticosteroids And The Long Term Prevention Of Hospitalization For Asthma*

**Suissa, S., Ernst, P., Kezouh, A.; 2002; Thorax**

This 16 year-long cohort study followed 30,569 asthmatics in order to determine the association between long-term inhaled corticosteroid use, and rates of hospital admission and readmission.

Regular use of inhaled corticosteroids was associated with reductions of 31% in the rate of hospital admissions for asthma and 39% in the rate of readmission. Regular use of inhaled corticosteroids can potentially prevent between 5 hospital admissions and 27 readmissions per 1,000 asthma patients per year.

*Underutilization Of ACE Inhibitors In Heart Failure*

**Luzier, A.B., DiTusa, L.; 1999; Pharmacotherapy**

This article reviews the topic of the underutilization of angiotensin-converting enzyme (ACE) inhibitors in heart failure. It discusses physician practice patterns, reasons for underutilization and ways to improve the use of ACE inhibitors.

ACE inhibitors are used in 70-80 % of eligible patients, but only 15% reached their target dose.

*Potential Savings From Substituting Generic Drugs For Brand-Name Drugs: Medical Expenditure Panel Survey, 1997-2000*

**Haas, J.S., Phillips, K.A., Gerstenberger, E.P., Seger, A.C.; 2005; Ann Intern Med**

This study analyzed data from 18,474 patients in the 1997–2000 Medical Expenditure Panel Survey Household Component (MEPS-HC) to calculate the potential savings associated with substitution of generic drugs for non-generic drugs.

If a generic had been substituted for all corresponding brand-name outpatient drugs in 2000, the savings would have been \$5.9 billion for adults under 65 years old and \$2.9 billion for adults 65 years old and above. This represents 11% of drug expenditures.



# Underuse

## Study

## Outcome

*The Quality Of Early-Stage Breast Cancer Treatment: What Can We Do To Improve?*

**Bickell, N.A., Mendez, J., Guth, A.A.; 2005; Surg Oncol Clin N Am**

This article reviews the topic of the treatment of early-stage breast cancer treatment. The article discusses the evidence that breast cancer treatments are underutilized; possible causes of underutilizations; and possible ways to correct underutilization.

There is significant underuse of therapies (including adjuvant local and systemic therapies) for early-stage breast cancer that are proven to increase survival.

*Physicians' Reasons For Failing To Deliver Effective Breast Cancer Care: A Framework For Underuse*

**Bickell, N.A., McEvoy, M.D.; 2003; Med Care**

This study used interviews of 13 surgeons to determine the cause of the underuse of therapies for early-stage breast cancer.

Out of 275 cases of early stage breast cancer, 44 cases (16%) underused effective therapies. In 52% of these 44 cases, physicians thought treatment should not occur because evidence did not support treatment.

*Appropriateness Of Coronary Angiography After Myocardial Infarction Among Medicare Beneficiaries. Managed Care Versus Fee For Service*

**Guadagnoli, E., Landrum, M.B., Peterson, E.A., Gahart, M.T., Ryan, T.J., McNeil, B.J.; 2000; N Engl J Med**

This study compared data from Medicare beneficiaries with fee-for-service coverage versus Medicare beneficiaries with managed care coverage. The goal was to determine the rates of angiography after acute myocardial infarction (MI) in the 2 groups, and determine if differences in the rates of angiography were due to differences in rates of indication for angiography.

In patients with American College of Cardiologists/American Heart Association (ACC-AHA) class I indications for angiography, more fee-for-service beneficiaries than managed-care beneficiaries underwent angiography (46% vs. 37%). The rate of angiography was low for both groups when admitted to hospitals without angiography facilities.

# Underuse

## Study

## Outcome

### *Cost-Effectiveness Of Coronary Heart Disease Prevention Strategies In Adults*

**Brown, A.D., Garber, A.M.; 1998; Pharmacoeconomics**

This article reviews the existing literature on the cost-effectiveness of coronary heart disease (CHD) prevention, with an emphasis on primary prevention.

The studies reviewed show that prevention of CHD can be cost effective. Interventions include smoking cessation, treatment of hypertension, and hormone replacement in postmenopausal women.

### *Disparities In Diabetes Care: Impact Of Mental Illness*

**Frayne, S.M., Halanych, J.H., Miller, D.R., Wang, F.Lin, H., Pogach, L., Sharkansky, E.J., Keane, T.M., Skinner, K.M., Rosen, C.S.Berlowitz, D.R.; 2005; Arch Intern Med**

This study evaluated a cohort of 313,586 non institutionalized Veterans Health Administration (VHA) patients with diabetes to determine whether a concomitant diagnoses of a mental health condition impacted the intensiveness of diabetes care.

Patients with mental illness were less likely to receive recommended care for diabetes. Odds ratios for failing to receive recommended interventions ranged from 1.05 for no eye exam to 1.25 for no low-density lipoprotein testing. Disparities also existed in glycemic and lipid control.

### *Are Negative Appendectomies Still Acceptable?*

**Jones, K., Pena, A.A., Dunn, E.L., Nadalo, L., Mangram, A.J.; 2004; Am J Surg**

This was a retrospective review of appendectomies performed at a single institution during a 3 year period designed to examine whether the rate of negative appendectomies has declined with the increased use of computed tomography (CT) scans.

As the use of CT scan increased, the rate of negative appendectomy decreased. In 2000, 52% of patients had a CT scan prior to appendectomy. 17% of these patients had a negative appendectomy. In 2002, 86% of patients had CT scans prior to appendectomy. The negative appendectomy rate decreased to 2%.

# Underuse

## Study

## Outcome

*Factors Associated With Incidence Of “Inappropriate” Ambulance Transport In Rural Areas In Cases Of Moderate To Severe Head Injury In Children*

**Poltavski, D., Muus, K.; 2005; J Rural Health**

This study identifies factors involved in ambulance transport of pediatric patients sustaining moderate-to-severe head injury to nondesignated trauma centers in rural North Dakota.

Children were less likely to be taken to an emergency department with a trauma facility if the distance was greater, if it was winter, and if the child was Native American.

*Factors Associated With The Health Care Utilization Of Homeless Persons [Caring For The Uninsured And Underinsured]*

**Kushel, M.B., Vittinghoff, E., Haas, J.S.; 2001; JAMA**

This study is a secondary data analysis of the National Survey of Homeless Assistance Providers and Clients (NSHAPC) to investigate the use of various health care resources (emergency department, inpatient, outpatient, medications) for homeless individuals and to investigate the factors that increase their access to care.

The homeless underuse care, and if they had better access (including registering for the Veterans Affairs benefits for which they are eligible) it would improve their health and lower emergency room costs. 62.8% of subjects had 1 or more ambulatory care visits during the preceding year, 32.2% visited an emergency department, and 23.3% had been hospitalized. However, 24.6% reported having been unable to receive necessary medical care. Of the 1,201 respondents who reported having been prescribed medication, 32.1% reported being unable to comply.

*Improving The Use Of Hospice Services In Nursing Homes: A Randomized Controlled Trial*

**Casarett, D., Karlawish, J., Morales, K., Crowley, R., Mirsch, T., Asch, D.A.; 2005; JAMA**

This study reviewed the records of patients in 3 nursing homes, identified patients who were candidates for hospice, and determined whether communication with the physician impacted either hospice enrollment or family ratings of end-of-life care.

Intervention residents were more likely than control residents to enroll in hospice within 30 days of the intervention (20% versus 1%) and within full follow-up period (25% versus 6%).

# Underuse

## Study

*Randomized Trial Of A Daily Electronic Home Monitoring System In Patients With Advanced Heart Failure: The Weight Monitor In Heart Failure (WHARF) Trial*

**Goldberg, L.R., Piette, J.D., Walsh, M.N., Frank, T.A., Jaski, B.E., Smith, A.L., Rodriguez, R., Mancini, D.M., Hopton, L.A., Orav, E.J., Loh, E.; 2003; Am Heart J**

This is a prospective randomized trial of Class III/IV heart failure patients being treated by cardiologists specializing in heart failure management, testing if home monitoring of weight and other parameters by an automated reporting system (telemedicine) to nurses for evaluation would reduce hospitalization. Mortality was analyzed as a secondary end-point, but the study was not designed to assess this outcome.

## Outcome

There was no difference in rehospitalization rates or quality-of-life assessments between the 2 groups, but the intervention (telemedicine) group did have a statistically significant lower death rate.

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*A Longitudinal Study Of Schoolchildren's Experience In The North Carolina Dental Medicaid Program, 1984 Through 1992*

**Robison, V.A., Rozier, R.G., Weintraub, J.A.; 1998; Am J Public Health**

This evaluation of a state Medicaid dental program describes dental treatment received, related treatment needed to treatment received, and describes enrollment and use over an 8-year period.

Approximately half of Medicaid-enrolled children never used dental services. Among users, only 29% had all dental needs met and 28% had partial dental needs met. Thus, 48% of children who saw a dentist had none of their dental needs met.

# Underuse

## Study

*Relationship Between Children's Dental Needs And Dental Care Utilization: United States, 1988-1994*

**Vargas, C.M., Ronzio, C.R.; 2002; Am J Public Health**

Dental needs and dental service utilization in children were measured and compared using National Health and Nutrition Survey III (NHANES III) data.

*Tailored Interventions To Increase Influenza Vaccination In Neighborhood Health Centers Serving The Disadvantaged*

**Zimmerman, R.K., Nowalk, M.P., Raymund, M., Tabbarah, M., Hall, D.G., Wahrenberger, J.T., Wilson, S.A., Ricci, E.M.; 2003; Am J Public Health**

To examine intervention strategies to increase influenza vaccination rates at 2 inner-city health centers in Pittsburgh with racially mixed populations; to compare reasons for getting/not getting vaccinated between patients aged 50-64 and those older than 65; and to identify any racial disparities. The 2 health centers used somewhat different interventions based on their own populations, including walk-in "flu shot" clinics, standing orders and prompts to providers, free vaccines, community posters, and physician letters.

## Outcome

Dental care utilization falls short of dental care needs in this population. 37% of 2-5 year olds and 77% of 6-18 year olds had seen a dentist in the previous year.

Children from families with low educational attainment and racial/ethnic minorities were less likely to have received adequate dental care.

The study identified underuse of vaccines among Hispanics and blacks, and described an intervention that had moderate success in increasing immunization rates at one largely-minority clinic. The U.S. vaccination rate is 65% for people older than 65, and significantly lower for Hispanics (47%) and blacks (52%). According to electronic medical record (EMR) data vaccination rates were higher in the intervention year than in the previous year in the health center that had EMR. Patients older than 65 were more likely to be vaccinated than patients 50-64. Despite the interventions, neither convenience, nor free vaccinations were significant reasons for vaccination. In patients 50-64, the strongest predictor of vaccination was the belief that unvaccinated persons will contract influenza; in patients older than 65, it was the belief that friends/relatives thought they should be vaccinated.

# Underuse

## Study

## Outcome

*Underuse Of Invasive Procedures Among Medicaid Patients With Acute Myocardial Infarction*

**Philbin, E.F., McCullough, P.A., DiSalvo, T.G., Dec, G.W., Jenkins, P.L., Weaver, W.D.; 2001; Am J Public Health**

This study used administrative data from 226 New York hospitals to examine whether patients with Medicaid who were hospitalized for an acute myocardial infarction (MI) had fewer cardiac procedures independent of other variables such as age, race, sex, income, comorbidity or location of care.

Medicaid patients receive fewer procedures (cardiac catheterization, revascularization) following acute MI than do other patients. Independent of other factors, Medicaid patients had less frequent use of cardiac catheterization, percutaneous transluminal coronary angioplasty, and any revascularization procedure (Percutaneous Transluminal Coronary Angioplasty and Coronary Artery Bypass Grafting [CABG] combined). The difference between CABG rates was not statistically significant. In addition, women, African Americans, and older patients were less likely to undergo procedures independent of insurance status.

*Patient Education For Colon Cancer Screening: A Randomized Trial Of A Video Mailed Before A Physical Examination*

**Zapka, J.G., Lemon, S.C., Puleo, E., Estabrook, B., Luckmann, R., Erban, S.; 2004; Ann Intern Med**

This study examined the effectiveness of an educational video about colorectal cancer screening on screening rates, particularly sigmoidoscopy.

A mailed video did not have a statistically significant effect on colorectal cancer screening rates (55% in both intervention and control groups).

*Implementation Of Evidence-Based Tobacco Use Cessation Guidelines In Managed Care Organizations*

**Taylor, C.B., Curry, S.J.; 2004; Ann Behav Med**

This study employed surveys of managed care organizations to assess the frequency of implementation of smoking cessation guidelines.

Surveys show that effective tobacco use cessation interventions remain underutilized in managed care organizations. A few studies have evaluated and shown the benefit of insurance coverage for tobacco use and dependence treatments.

# Underuse

## Study

*Effects Of A Videotape To Increase Use Of A Poison Control Center By Low-Income And Spanish-Speaking Families; A Randomized Controlled Trial*

**Kelly, N.R., Huffman, L.C., Mendoza, F.S., Robinson, T.N.; 2003; Pediatrics**

This randomized controlled trial (RCT) evaluated the effectiveness of a video tape to increase use of poison control centers (PCC) by low-income and minority families. Research suggests that use of a PCC can reduce health care costs by providing telephone advice that enables parents/caretakers to manage most cases of poisonings at home. There are 1 million inadvertent home poisonings in the U.S. annually.

*Primary Care For The Medically Underserved: Challenges And Opportunities*

**Reilly, B.M., Schiff, G., Conway, T.; 1998; Dis Mon**

This report reviews the current thinking about the causes of unequal health, the effects of unequal healthcare, and the special opportunities for disease prevention among socioeconomically disadvantaged people in the U.S.

## Outcome

PCCs are underutilized by low income and minority families. Participants were parents of children younger than 6 enrolled at 2 Women, Infants, and Children (WIC) clinics in California who viewed a 9 minute videotape. The treatment group showed statistically significant increases in measures of knowledge regarding the use of PCCs. The treatment group was also more likely to know the telephone number for a PCC.

Underserved populations, even if insured, present specific challenges to providing high-quality primary care. Emphasis on 5 essential elements is required: 1) enlisting the patient's interest and cooperation, 2) educating the patient about illness and wellness, 3) explaining both the process and rationale for care, 4) empowering the patient to actively partner with the provider in actively maintaining health, and 5) emphasizing the patient's concerns, frustrations, failures and successes throughout the continuum. Physicians need to provide unique clinical skills, strong support systems, and a sense of community collaboration.

# Underuse

## Study

## Outcome

*Understanding The Consequences Of Access Barriers To Health Care: Experiences Of Adults With Disabilities*

**Neri, M.T., Kroll, T.; 2003; Disabil Rehabil**

This study used structured interviews of 30 persons drawn from a longitudinal national cohort of patients with spinal cord injury (SCI), multiple sclerosis (MS), or cerebral palsy (CP) to explore the scope and nature of the consequences that adults with disabilities perceive as the result of inappropriate access to health care services, the variability of these consequences, and the inter-relatedness and multidimensionality of these consequences.

Consequences were grouped into 1 of 5 categories: social, psychological, physical, economic and independence issues. Responses differed slightly with regard to disability type, gender and health insurance type.

There was substantial overlap among consequence categories. For most respondents, negative consequences were not limited to just one area—frequently, one consequence triggered others.

*Overcoming Barriers To Access And Utilization Of Hospice And Palliative Care Services In African American Communities*

**Winston, C.A., Leshner, P., Kramer, J., Allen, G.; 2004; Omega**

This literature review was designed to examine the barriers that prevent African Americans from using hospice and palliative care services.

Only 8% of African Americans use hospice and palliative care services. The underutilization can be attributed to incompatibility between hospice philosophy and African American religious, spiritual, and cultural beliefs; health care disparities; distrust of the medical establishment; physician influence; financial disincentives, and hospice admission criteria.

*Access To Mental Health Services And Health Sector Social Capital*

**Hendryx, M.S., Ahern, M.M.; 2001; Adm Policy Ment Health**

This study uses Community Tracking Study data from 43 cities to investigate the relationship between mental health utilization and community characteristics.

Use of mental health services was greatest when public health institutions collaborated with private insurance, when communities had a high level of health insurance overall, and when there were publically funded mental health services.



# Underuse

## Study

*Ace Inhibitor Therapy: Benefits And Underuse*  
**Smith, Sidney C.; 1999; Am Fam Physician**

Editorial that summarizes studies prior to 1998 that indicate underuse of angiotensin-converting enzyme (ACE) inhibitors in heart failure and acute myocardial infarction (MI).

## Outcome

Adherence to guidelines would save lives and dollars. The direct and indirect costs of congestive heart failure (CHF) in the U.S. in 1998 was \$20.2 billion. The article cites the guidelines of the Agency of Health Care Policy & Research, the American College of Cardiology and the American Heart Association regarding the use of ACE Inhibitors in CHF and acute MI. Various studies reveal only 31-50% of eligible patients receive this therapy.

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*The Influence Of An Urgent Care Center On The Frequency Of ED Visits In An Urban Hospital Setting*

**Merritt, B., Naamon, E., Morris, S.A.; 2000; Am J Emerg Med**

This study examined the effect of a visit to an Urgent Care Center (UCC) on emergency department (ED) use by patients with nonemergent complaints. A study population of 1,629 patients with no previous visit to a UCC were identified and served as their own controls. The ED and clinic usage 6 months before and 6 months after a UCC visit were examined.

The use of UCCs can significantly decrease visits to the ED, saving money and improving care. After visiting a UCC, patients' use of the ED is significantly lower. After the urgent care visit there was a 48% reduction in ED visits for adults and a 28% reduction in ED visits for children. Clinic visits increased for both populations.

# Underuse

## Study

*Gaps In Service Utilization By Mexican Americans With Mental Health Problems*

**Vega, W.A., Kolody, B., Aguilar-Gaxiola, S., Catalano, R.;** 1999; *Am J Psychiatry*

A random sample of 3,012 Mexican-Americans in Fresno County, CA were interviewed. 508 individuals were identified as having a mental health diagnosis. The utilization of mental health services by this cohort was determined.

## Outcome

Mexican-Americans are getting too little treatment for mental illness, and too little of it comes from trained mental health providers. The overall 12-month rate of utilization of any provider by persons with diagnosed mental disorders was 28.1%. The use of mental health care providers was 8.8%. The factors associated with utilization of mental health services included female sex, higher educational attainment, unemployment, and comorbidity. Mental health care (including informal providers such as folk healers and priests) was used by fewer Mexican-American immigrants (15.4%) than U.S.-born Mexican-Americans (37.5%).

*Access And Late-Stage Diagnosis Of Breast Cancer In The Military Health System*

**Bibb, S. C.;** 2000, *Mil Med*

This retrospective review of the tumor registry at U.S. Naval Hospital San Diego reports data from 635 women with breast cancer in order to describe the “extent to which potential and realized access predict stage at diagnosis within an equal economic access health care system.”

Late-stage breast cancer was more likely to be diagnosed in African American women from low socioeconomic strata with incidental breast self-examination-discovered cancers. The most significant predictors of late-stage diagnosis were means of discovery and the length of time between discovery and diagnosis.

*Prenatal Care Utilization In Hawaii: Did It Improve During The Last 16 Years?*

**Baruffi, G., Alexander, G.R., Perske, K.F., Fuddy, L.J., Onaka, A.T., Mor, J.M., Ward, K.L.;** 1998; *Hawaii Med J*

This article examined the utilization of prenatal care in Hawaii from 1979 to 1994 in order to determine if early and adequate utilization of prenatal care has changed during this period.

The proportion of women with “inadequate” care declined (10.3%), although the proportion of women with “no care” doubled. Complete reporting of use of care through birth certificates markedly deteriorated.

## Underuse

### Study

*Hospice And Primary Care Physicians: Attitudes, Knowledge, And Barriers*

**Ogle, K., Mavis, B., Wang, T.; 2003; Am J Hosp Palliat Care**

This article used a mail survey of 131 primary care physicians (PCPs) to examine their attitudes toward, knowledge about, and perceived benefits and barriers to hospice care.

*Breast And Cervical Cancer Screening Among Migrant And Seasonal Farmworkers: A Review*

**Coughlin, S.S., Wilson, K.M.; 2002; Cancer Detect Prev**

This article reviewed published studies that examined breast and cervical cancer screening in migrant and seasonal farm workers.

*Help-Seeking Behaviors By Korean Immigrants For Depression*

**Shin, J. K.; 2002; Issues Ment Health Nurs**

The study involved 6 focus group discussions and 24 in-depth interviews with 70 Korean immigrants in New York City in order to investigate Korean immigrants' help-seeking behaviors for depression and their underutilization of mental health services.

### Outcome

PCPs perceived many benefits to hospice care and identified patient and family readiness as the major barrier to earlier hospice referrals. A significant subgroup had concerns about problems in interacting with hospices. There were very few differences between family practitioners and general internists.

Underutilization of mammograms and Pap smears among migrant and seasonal farm workers may be due to: limited awareness of the importance of cancer screening, cultural beliefs, cost, lack of health insurance, lack of transportation, and child care difficulties.

Prolonged care within family and traditional Asian practices led to a delay in seeking mental health services. The lack of interface between formal service providers and psychiatric service providers also caused delayed treatment.

# Underuse

## Study

## Outcome

*Mammography And Clinical Breast Examination Among Korean American Women In Two California Counties*

**Wismer, B.A., Moskowitz, J.M., Chen, A.M., Kang, S.H., Novotny, T.E., Min, K., Lew, R., Tager, I.B.; 1998; Prev Med**

This study conducted a telephone survey of 1,090 Korean Americans in California in order to determine rates of mammography, clinical breast exam, and factors that predict these interventions.

34% of Korean-American women age 50 and older had a mammogram in the past 2 years. Only 32% had a clinical breast exam (CBE) in the past 2 years. The strongest independent correlate of both mammogram and CBE was having a regular medical checkup.

*Variations In Patients' Adherence To Medical Recommendations: A Quantitative Review Of 50 Years Of Research*

**DiMatteo, M. R.; 2004; Med Care**

This is a meta-analysis of 733 studies published between 1948 and 1998, which was done in order to examine the topic of patients' adherence to medical recommendations.

The average nonadherence rate is 24.8%. Adherence is significantly higher in more recent and smaller studies and in those involving medication regimens and adult samples. Adherence is highest in HIV disease, arthritis, gastrointestinal disorders, and cancer, and lowest in pulmonary disease, diabetes, and sleep.

*Breast And Cervical Cancer Screening Practices Among Asian And Pacific Islander Women In The United States, 1994-1997*

**Coughlin, S.S., Uhler, R.J.; 2000; Cancer Epide**

This study examined rates of breast and cervical cancer screening practices among Asian (and Pacific Islander) women living in the U.S.

Breast and cervical cancer screening is underutilized by Asian-American women, though the rates of screening were not too far below published targets. 72% of women aged 50 or older had had a mammogram in the previous 2 years; 70% of women aged 40 or over had had a clinical breast exam in the prior 2 years; and 74% of eligible women had had a Pap smear in the prior 2 years. Meeting population-level goals for breast and cervical cancer screening will require outreach to ethnic populations.

# Underuse

## Study

## Outcome

*Hospice Care For Patients With Advanced Lung Disease*

**Abraham, J.L.; Hansen-Flaschen, J.; 2002; Chest**

This article reviews hospice care in the U.S., with particular attention to hospice eligibility criteria for patients dying of advanced lung disease. It proposes 3 new guidelines that doctors can use to decide when to refer a patient to a hospice program.

This review described several reasons why hospice is underutilized by patients dying of nonmalignant lung diseases. It also proposes guidelines to help a physician to decide when to refer a patient with a non-malignant lung disease to a hospice program.

*Minoxidil: An Underused Vasodilator For Resistant Or Severe Hypertension*

**Sica, D.A.; 2004; J Clin Hyertens (Greenwich)**

This study reviews the indications and side effects of minoxidil as a medication for hypertension.

The use of minoxidil for hypertension is limited due to its side effects, but it does have a place in the treatment of resistant hypertension, especially in patients with advanced renal disease.

*Cardioprotection: The Role Of Beta-Blocker Therapy*

**Egan, B.M., Basile, J., Chilton, R.J., Cohen, J.D.; 2005; J Clin Hyertens (Greenwich)**

This paper reviews the protective role of beta blockade in the primary and secondary prevention of cardiovascular events and examines some of the potential barriers to appropriate beta-blocker use in patients with compelling indications.

Beta-blockers remain underutilized in many high-risk patients who would likely benefit from their use

## Underuse

### Study

*Utilization Of Papanicolaou Smears By South Asian Women Living In The United States*  
**Chaudhry, S., Fink, A., Gelberg, L., Brook, R.; 2003; J Gen Intern Med**

To examine rates of cervical cancer screening practices among South Asian women living in the U.S.

### Outcome

Cervical cancer screening with Pap smear is underutilized by South Asian women, though the rates of screening were not too far below published targets. 73% of women reported having a Pap smear in the previous 3 years. Significant predictive variables associated with having had a Pap smear included being married, more educated, more acculturated, and having a usual source of care.

*Access Barriers To Health Care For Latino Children*

**Flores, G., Abreu, M., Olivar, M.A., Kastner, B.; 1998; Arch Pediatr Adolesc Med**

This study was conducted to identify access barriers to health care for Latino children, as reported by their parents.

Several access barriers to health care were perceived by the parents of Latino children. In this study, 21% of parents reported routinely bringing their children to the emergency department for treatment. Parents cited, in descending order, language problems (26%), long waiting time at the physician's office (15%), no medical insurance (13%), and difficulty paying medical bills (7%) as the greatest barriers to care.

*Effect Of Antiplatelet And Anticoagulant Agents On Risk Of Hospitalization For Bleeding Among A Population Of Elderly Nursing Home Stroke Survivors*

**Quilliam, B.J., Lapane, K.L., Eaton, C.B., Mor, V.; 2001; Stroke**

Antiplatelet agents are underutilized in the nursing home setting, perhaps because trials demonstrating treatment efficacy excluded people resembling those with long-term care needs. This case-control study sought to quantify the effect of antiplatelet and anticoagulant agents on risk of hospitalization for bleeding among an elderly nursing home population of stroke survivors.

Aspirin and warfarin increase slightly the risk of nursing home patients developing cerebral bleeds.

# Underuse

## Study

## Outcome

*Trends In Screening For Colorectal Cancer - United States, 1997 And 1999*

**CDC, 2001; MMWR Morb Mortal Wkly Rep**

This Morbidity and Mortality Weekly Report (MMWR) gives data from the Behavioral Risk Factor Surveillance System, which uses telephone surveys in order to determine what percent of Americans received colorectal cancer screening (either fecal occult blood test, or sigmoidoscopy/ colonoscopy) in 1997 and 1999.

From 1997 to 1999, the rates of fecal occult blood testing within the past year increased from 19.6% to 40.3%, and the rates of sigmoidoscopy or colonoscopy within the last 5 years increased from 30.3% to 43.8%.

Efforts to address barriers and to promote the use of colorectal cancer screening should be intensified.

*Psychopharmacology: Underuse Of Evidence-Based Treatments In Psychiatry*

**Fayek, M., Flowers, C., Signorelli, D., Simpson, G.; 2003; Psychiatr Serv**

This article is an opinion column that points to 3 treatments in psychiatry that the authors feel are underused: electroconvulsive therapy (ECT), depot (injectable) antipsychotic medication, and clozapine.

3 useful psychiatric treatments are underused. The authors cite some evidence for the benefits of the 3 treatments and their underuse, but there is no new data and no systematic review of evidence or practice patterns.

*Ethnic Disparities In Use Of Public Mental Health Case Management Services Among Patients With Schizophrenia*

**Barrio, C., Yamada, A.M., Hough, R.L., Hawthorne, W., Garcia, P., Jeste, D.V.; 2003; Psychiatr Serv**

The article's purpose is to examine the use of case management (representing high-quality care) for schizophrenic patients in various ethnic groups. The authors hypothesize that use would be lower among Latino and African American patients.

Ethnic minorities with schizophrenia are underserved compared with European-Americans. European-Americans received case management services at a higher rate (30.2%) than patients from ethnic minorities (19.3% for Latinos, 17.4% for African Americans).

## Underuse

### Study

*Inhaled Corticosteroids As First-Line Therapy For Asthma. Why They Work And What The Guidelines And Evidence Suggest*

**Laurie, S., Khan, D.; 2001; Postgrad Med**

this study reviewed the justification behind the use of inhaled corticosteroids as first-line therapy for asthma; identified and described indication for the use of inhaled corticosteroids in treatment of asthma; and compared the potencies and adverse effects of the various corticosteroids available.

*Assessment Of Tuberculosis Treatment Completion In An Ethnically Diverse Population Using Two Data Sources - Implications For Treatment Interventions*

**Morisky, D.E., Ebin, V.J., Malotte, C.K., Coly, A., Kominski, G.; 2003; Eval Heath Prof**

This paper reports the results of 2 independent assessments: (1) an assessment of surveillance data from the Los Angeles Health County Department, and (2) a prospective/retrospective medical chart review from two clinics in Los Angeles County. The goal was to try to determine what factors could predict which adolescents were less likely to complete a full 6 month course of treatment for latent TB infection (LTBI).

### Outcome

There is abundant evidence supporting the efficiency of inhaled steroids as first-line therapy for persistent asthma. However, these medications continue to be under-used.

Patients who were younger, born in the U.S., or were of Asian ethnicity were more likely to complete the 6-month treatment course for LTBI. Latinos, African Americans, and non-U.S. born patients were more likely not to complete the treatment. Among the patients who did not complete the treatment, the average length of treatment was 13 weeks.



## Underuse

### Study

### Outcome

*The Health Economics Of The Treatment Of Hyperlipidemia And Hypertension*

**McMurray, J.; 1999; American Journal of Hypertension**

This article reports data on the cost-effectiveness of blood-pressure medications and statins (in quality adjusted life year, and number needed to treat) using studies done in different countries.

Blood-pressure-lowering therapy for the elderly and the use of statins for hypercholesterolemia in patients at high risk of coronary heart disease (CHD) are extremely cost-effective, compared with many other routine medical interventions (such as kidney transplantation, home hemodialysis, and coronary artery bypass grafting).

*Cost-Effectiveness Of Ambulatory Blood Pressure: A Reanalysis*

**Krakoff, Lawrence; 2006; Hypertension**

This article reports a cost-effectiveness analysis for the use of 24-hour ambulatory blood pressure monitoring (ABPM).

ABPM for newly detected hypertensive subjects could potentially save 3% to 14% for cost of care for hypertension. At current reimbursement rates, the use of ABPM could save money when annual treatment costs of hypertension is as little as \$300.

*Anti-Depressant Prescribing Patterns Among Prison Inmates With Depressive Disorders*

**Baillargeon, J., Black, S.A., Contreras, S., Grady, J., Pulvino, J.; 2002; J Affect Disord**

This study reviewed the records of 5,305 state inmates with a diagnosis of a depressive disorder to examine anti-depressant prescribing patterns in correctional institutions.

Antidepressants are underused among inmates in Texas (22% did not get medication). Older, tricyclic, antidepressants were used more frequently than newer selective serotonin reuptake inhibitors (SSRIs) (50% versus 30%), which is the reverse of the pattern in non-inmates.

# Underuse

## Study

*Prevention Methods Underused, Report Concludes*

**Marwick, Charles; 2003; J Natl Cancer Inst**

A news story reporting the findings of the Institute of Medicine's report "Fulfilling the Potential of Cancer Prevention and Early Detection."

## Outcome

The report claims that if sustained efforts were made to help people change their behavior (such as sustained efforts to help people stop smoking) and systems were in place to enable them to take advantage of cancer detection procedures, 60,000 cancer deaths and about 100,000 new cancer cases annually could be prevented by 2015. The report calls for a national strategy to be developed and coordinated by the Department of Health and Human Services to encourage lifestyle changes in the population, including helping people to stop smoking, to maintain a healthy diet, to keep their weight under control, to stimulate physical activity, and to moderate their alcohol consumption. According to the report, controlling tobacco offers the greatest opportunity to reduce cancer, and the single most effective method of reducing smoking is to raise tobacco taxes.

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*Cost-Effectiveness Of Cholesterol-Lowering Therapies According To Selected Patient Characteristics*

**Prosser, L.A., Stinnett, A.A., Goldman, P.A., Williams, L.W., Hunink, M.G., Goldman, L., Weinstein, M.C.; 2000; Ann Intern Med**

This study examined cost-effectiveness of lipid-lowering treatment according to selected patient characteristics.

Statin therapy costs \$54,000/quality-adjusted life years (QALY) gained.

# Underuse

## Study

## Outcome

*Beta-Blockers After Acute Myocardial Infarction In Elderly Patients With Diabetes Mellitus: Time To Reassess*

**Di, Bari M., Marchionni, N., Pahor, M.; 2003; Drugs Aging**

This article discusses current literature about the use of beta-blockers after acute myocardial infarction in elderly patients with diabetes mellitus.

Beta blockers are underused in clinical practice, especially in older patients with diabetes mellitus.

*Use Of Angiotensin-Converting Enzyme Inhibitors In Patients With Heart Failure And Renal Insufficiency: How Concerned Should We Be By The Rise In Serum Creatinine?*

**Ahmed, A.; 2002; J Am Geriatr Soc**

This study combined evidence from 12 clinical trials in order to determine the association between the early rise in serum creatinine levels associated with the use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) and the long-term renoprotective properties of these drugs in patients with chronic renal insufficiency.

In patients with renal insufficiency treated with angiotensin-converting enzyme (ACE) inhibitors, there is a strong association between early (within the first 2 months) and moderate (not exceeding 30% over baseline) rise in serum creatinine and a slowing of the renal disease progression in the long run.

## Underuse

### Study

*Regional Variation In The Cost Effectiveness Of Childhood Hepatitis A Immunization*

**Jacobs, R.J., Greenberg, D.P., Koff, R.S., Saab, S., Meyerhoff, A.S.; 2003; *Pediatr Infect Dis J***

To evaluate the costs and benefits of potentially immunizing healthy U.S. children for hepatitis A in regions of varying hepatitis A incidences.

### Outcome

The study concludes that Hepatitis A vaccination of all children in the U.S. would prevent substantial morbidity and mortality, and has similar cost effectiveness to that of other childhood immunizations that are being used. Vaccinating all healthy children throughout the U.S. for Hepatitis A would prevent more than 75,000 cases of overt hepatitis A for the “2000 birth cohort.” It would cost \$9,100 per quality-adjusted life year (QALY) - from the perspective of the health system. It would cost \$14,100 per life-year saved, which is similar to the \$26,400 and \$74,800 per life-year saved of the varicella and pneumococcal vaccines that are already being used.

*Hospital And Outpatient Health Services Utilization Among HIV-Infected Adults In Care 2000-2002*

**Fleishman, J.A., Gebo, K.A., Reilly, E.D., Conviser, R., Christopher, Mathews W., Todd, Korthuis P., Hellinger, J., Rutstein, R., Keiser, P., Rubin, H., Moore, R.D.; 2005; *Med Care***

A chart review of 11 sites in the HIV Research Network (8 academic sites), to examine resource utilization by HIV-infected adults, and to determine what variables influence both inpatient and outpatient visits and utilization.

From 2000-2002 there was no substantial change in the combined inpatient utilization by HIV-infected adults, but outpatient utilization dropped by about .5 days per person/year (from 6.06 to 5.66). Minorities and disadvantaged groups had higher hospitalization rates, and clinical costs for patients on highly active antiretroviral therapy (HAART) were not significantly different from those not on HAART. Overall, only about 18-23% of the patients were not receiving HAART. Outpatient visits were lower for uninsured patients, and highest for those with Medicare or Medicaid. Hospital admission rates were also highest for Medicare and Medicaid patients (23-25% vs. 11-16%).

# Underuse

## Study

## Outcome

*Cultural Influences On Health Care Use: Differences In Perceived Unmet Needs And Expectations Of Providers By Latino And Euro-American Parents Of Children With Special Health Care Needs.*

**Gannotti, M.E., Kaplan, L.C., Handwerker, W.P., Groce, N.E.; 2004; J Dev Behav Pediatr**

This study compares Latino and Euro-American parents of children with special health care needs in terms of service use, perceived unmet needs, and expectations of providers.

Textual analysis of open interviews revealed that the two groups of families had different expectations of providers. Latino cultural values play a role in these differences, creating barriers for effectively communicating with providers and for meeting children's needs.

*Explaining Black-White Differences In Receipt Of Recommended Colon Cancer Treatments*

**Baldwin, L.M., Dobie, S.A., Billingsley, K., Cai, Y., Wright, G.E., Dominitz, J.A., Barlow, W., Warren, J.L., Taplin, S.H.; 2005; J Natl Cancer Inst**

To assess racial and other factors associated with receiving chemotherapy for colon cancer among fee-for service (FFS) Medicare beneficiaries.

Blacks were less like to receive chemotherapy for colon cancer (59.3% versus 70.4%), and this was particularly true for patients ages 66-70 (65.7% versus 86.3%). However, the author's analyses indicate that about half of the disparity could be explained by other study variables, such as severity of illness, social support, and environment.

*Underuse Of Analgesia In Very Young Pediatric Patients With Isolated Painful Injuries*

**Alexander, J., Manno, M.; 2003; Ann Emerg Med**

This study compared the use of analgesic agents in very young children with that in older children with isolated painful injuries.

64.6% of the time, children younger than 2 years of age received no analgesia for injury. Children younger than 2 years of age receive disproportionately less analgesia than school-age children, despite having obviously painful conditions.

# Underuse

## Study

## Outcome

*Underserved Elderly Issues In The United States: Burdens Of Oral And Medical Health Care*

**Greene, V. A.; 2005; Dent Clin North Am**

This study reviews the topic of lack of medical and dental insurance in the elderly.

Although 10% of the elderly had no medical insurance in 2000, 78% had no dental insurance. In underserved communities, the management of the oral health and dental care needs of older Americans approaches negligence.

*Use Of Antihypertensive Drug Therapy In Older Persons In An Academic Nursing Home*

**Ziesmer, V., Ghosh, S., Aronow, W.S.; 2003; J Am Med Dir Assoc**

This study analyzed the charts of all residents of an academic nursing home to examine the prevalence of hypertension and appropriate treatment of hypertension in a nursing home population.

A significant minority of patients (16%) had uncontrolled hypertension. Among patients with hypertension and concomitant diabetes, coronary artery disease, and/or heart failure, a specific recommended class of drugs (e.g., angiotensin-converting enzyme [ACE] inhibitors for diabetics) was often not being prescribed (3-47% of the time, depending on condition and drug class).

*Correlates Of Underutilization Of Gynecological Cancer Screening Among Lesbian And Heterosexual Women.*

**Matthews, A.K., Brandenburg, D.L., Johnson, T.P., Hughes, T.L.; 2004; Prev Med**

Utilizing a multi-site survey study of women's health, screening rates for cervical cancer in lesbian and heterosexual women were compared.

Lesbians were less likely than heterosexual women to have had regular screening exams. Lesbians had more risk factors for cervical cancer.

# Underuse

## Study

## Outcome

*Association Of Patient Autonomy With Increased Transplantation And Survival Among New Dialysis Patients In The United States*  
**Stack, A.G., Martin, D.R.; 2005; Am J Kidney Dis**

This study assessed how autonomy in clinical decision making affects dialysis treatment selection for patients with chronic kidney disease and assessed subsequent transplantation and survival.

Chronic kidney disease patients who have greater participation in their care decisions were more likely to use peritoneal vs. hemo dialysis (66% vs. 34%), had higher survival rates, and had greater rates of transplantation. These differences were smaller, but persisted after adjusting for differences in comorbidities and socioeconomic factors, i.e., mortality for patient-led decision makers was 84% that of clinical team-led decision makers, and transplantation rates were 1.44 times greater for the patient decision makers.

*Lifetime Prevalence And Age-Of-Onset Distributions Of DSM-IV Disorders In The National Comorbidity Survey Replication*  
**Kessler, R.C., Berglund, P., Demler, O., Jin, R., Merikangas, K.R., Walters, E.E.; 2005; Arch Gen Psychiatry**

This study used face-to-face household surveys of 8,282 people (in the National Comorbidity Survey Replication) in order to estimate lifetime prevalence and age-of-onset distributions of diagnostic and statistical manual of mental disorders (DSM-IV) disorders.

About half of Americans will meet the criteria for a DSM-IV sometime in their life, with first onset usually in childhood or adolescence.

*Medication Non-Adherence And Asthma Treatment Costs*  
**Bender, B.G., Rand, C.; 2004; Curr Opin Allergy Clin Immunol**

This study reviews data describing the impact of asthma treatment non adherence on patients and the health care system, and to outline areas of responsibility towards improved adherence.

The total cost of treatment non compliance is estimated to be up to \$300 billion/year, although no total estimate is given for asthma-related non-compliance. It is estimated that 5.2% of hospitalizations for asthma result from non-adherence to prescribed regimens.

# Underuse

## Study

## Outcome

*Missed Appointments And Poor Glycemic Control: An Opportunity To Identify High-Risk Diabetic Patients*

**Karter, A.J., Parker, M.M., Moffet, H.H., Ahmed, A.T., Ferrara, A., Liu, J.Y., Selby, J.V.; 2004; Med Care**

This article is an analysis of data from 84,040 diabetics in the Kaiser Permanente system to evaluate the relationship between missed appointments and glycemic control.

Missed appointments could be used to help identify diabetics who have worse diabetic control, and may benefit from case management. The study found that 12% of subjects missed more than 30% of their appointments over a 1 year period. Patients who missed more than 30% of their appointments on average had a hemoglobin A1c of between 0.70 and 0.79 higher than those who missed less than 30% of their visits. Higher rates of missed appointments were associated with poor glycemic control, even after adjusting for age, sex, clinical status, and health care utilization.

*Oral Health Care Utilization By U.S. Rural Residents, National Health Interview Survey 1999*

**Vargas, C.M., Dye, B.A., Hayes, K.; 2003; J Public Health Dent**

Data on dental care utilization from the 1999 National Health Interview Survey was used to compare the dental care utilization practices of rural and urban residents in the United States (for ages 2 years and older).

Rural residents were more likely to report that their last dental visit was because something was “bothering or hurting” and that they had unmet dental needs. Urban residents were more likely to have a dental visit in the past year and to have private dental insurance. There were no differences in most reasons given for not visiting the dentist.

*Breast And Cervical Cancer Screening Practices Among Hispanic Women In The United States And Puerto Rico, 1998-1999*

**Coughlin, S.S., Uhler, R.J.; 2002; Prev Med**

This study examined the breast and cervical cancer screening practices of Hispanic women in 50 states by examining data from over 12,000 women in the 1999 Behavioral Risk Factor Surveillance System.

68.2% of women aged 40 years or older had received a mammogram in the past 2 years. 81.4% of women aged 18 years or older had received a Pap smear in the past 3 years. Lower rates of screening were associated with low income, less education, and no insurance coverage.



# Underuse

## Study

## Outcome

*Underutilization Of Mental Health Services By Asian-Americans Residing In The United States*  
**Herrick, C.A., Brown, H.N.; 1998;**  
**Issues Ment Health Nurs**

This article discusses the underutilization of mental health services by Asian Americans, and it provides “awareness tools” to guide mental health professionals in determining whether culturally competent care is available locally to meet the needs of this underserved population.

This article provides “awareness tools” to guide mental health professionals in determining whether culturally competent care is available locally to meet the needs of this underserved population.

*A Comparison Of Asthma-Related Healthcare Use Between African-American And Caucasians Belonging To A Health Maintenance Organization.*

**Blixen, C.E., Havstad, S., Tilley, B.C., Zoratti, E.; 1999; J Asthma**

This retrospective review of health management organization (HMO) data was designed to determine whether racial differences in patterns of asthma care persist when financial barriers to health care are minimized.

Statistically significant differences in utilization of health care services exist between African Americans and Caucasians in a managed-care environment. Differences also exist between African Americans with and without Medicaid.

*The Health Economics Of Asthma And Rhinitis. I. Assessing The Economic Impact*

**Weiss, K.B., Sullivan, S.D.; 2001; J Allergy Clin Immunol**

This paper is a narrative review that looked at 128 articles about asthma and allergic rhinitis in order to estimate the amount of direct and indirect costs of these 2 diseases in the U.S.

In 1998, asthma in the U.S. cost 12.7 billion dollars annually (for direct and indirect costs). In 1994, allergic rhinitis cost \$1.2 billion. Most of the costs were due to direct medical expenditures (especially medications).

# Underuse

## Study

## Outcome

*The State Of Health Care Quality: 2002*  
**National Committee for Quality Assurance; 2002**

This is the 5th annual report published by the National Committee for Quality Assurance (NCQA) that attempts to describe and evaluate the state of health care quality in the U.S.

In 2002 there were improvements in the quality of health care delivered by commercial managed-care plans. Individuals enrolled in NCQA-Accredited Medicare and Medicaid health plans receive better care than those in non-accredited health plans. Reporting quality information saves lives and money.

*Effectiveness And Cost-Benefit Of Influenza Vaccination Of Healthy Working Adults: A Randomized Controlled Trial*  
**Bridges, C.B., Thompson, W.W., Meltzer, M.I., Reeve, G.R., Talamonti, W.J., Cox, N.J., Lilac, H.A., Hall, H., Klimov, A., Fukuda, K.; 2000; JAMA**

This study was a randomized, placebo-controlled trial of 1,191 adults employed at one company to test the effectiveness and cost-benefit of influenza vaccine in preventing influenza-like illness (ILI), and reducing societal costs.

In 1997-1998 the vaccine virus differed from the predominant circulating viruses, and the net societal cost of the vaccine was \$66 per person. In 1998-1999 the vaccine matched the predominant circulating viruses, and the net societal cost of the vaccine was \$11 per person.

*Priorities Among Recommended Clinical Preventive Services*  
**Coffield, A.B., Maciosek, M.V., McGinnis, J.M., Harris, J.R., Caldwell, M.B., Teutsch, S.M., Atkins, D., Richland, J.H., Haddix, A.; 2001; Am J Prev Med**

This study assessed the value of clinical services recommended by the U.S. Preventive Services Task Force (PSTF) based on the burden of disease prevented by each service and the cost effectiveness of each service. Opportunities for improving delivery rates were prioritized by comparing these scores with current delivery rates.

The highest ranked services with the lowest current delivery rates were providing tobacco cessation counseling, screening adults for visual defects, chlamydia, colorectal cancer, and problem drinking, and providing adults with pneumococcal vaccine.

## Underuse

### Study

*Economic Impact Of Influenza Vaccination In Preschool Children*

**Cohen, G.M., Nettleman, M.D.; 2000  
Pediatrics**

This study was a decision analysis to compare the costs of giving the influenza vaccine to preschool children in two different settings: (1) a setting where the vaccine was available during flexible hours which included after-work hours, and (2) a setting where the vaccine was available only from 8 a.m. to 5 p.m.

*Physicians' Recommendations To Patients For Use Of Antibiotic Prophylaxis To Prevent Endocarditis*

**Seto, T.B., Kwiat, D., Taira, D.A., Douglas, P.S., Manning, W.J.; 2000;  
JAMA**

This study surveyed 218 patients who had previously undergone TTE at a major Boston teaching hospital to determine whether patients were appropriately told to take antibiotics prior to procedures known to produce bacteremia (e.g., before dental procedures) based on the results of echocardiography, as recommended by 1997 American Heart Association guidelines, and whether they did so.

### Outcome

Vaccination resulted in a net cost savings in both settings. The net savings per vaccine recipient were \$21.28 in the flexible setting and \$1.20 in the restricted setting.

Of the 108 patients who met American Heart Association recommendations for infective endocarditis prophylaxis, 71 (65.7%) reported that they were told by their physicians to take prophylaxis prior to dental work or other nonsterile procedures, including 88.9% of high-risk patients, suggesting some underuse of a guideline-based intervention (AHA 1997). In addition, among the 110 patients at negligible risk, 29 (26.4%) reported that they had been instructed to take IE prophylaxis, which represents overuse according to the guideline. Of those who were told to take antibiotics and subsequently underwent a procedure for which IE prophylaxis was indicated (n=68), nine (13.2%) elected not to follow their physician's advice to take prophylaxis.





# NEHI Compendium

## *Utilization Variation*



# Evidence Table—Utilization Variation

## Study

## Outcome

*Costs And Survival Of Patients With Colorectal Cancer In A Health Maintenance Organization And A Preferred Provider Organization*

**Kerrigan, M., Howlader, N., Mandelson, M.T., Harrison, R., Mansley, E.C., Ramsey, S.D.; 2005; Med Care**

This study used tumor registry data in Washington State and claims data from 2 health plans to compare treatment variables and outcomes for colorectal cancer patients with 2 types of health insurance: a preferred provider organization (PPO) and a group model health maintenance organization (HMO).

Initial treatment was different, but costs and survival were not significantly different between the 2 plans. Patients in the PPO were more likely to have local excision of their tumor (16% compared with 11%) and were less likely to receive chemotherapy (48% compared with 60%).

*Physical Therapy Use By Community-Based Older People*

**Freburger, J.K., Holmes, G.M; 2005; Phys Ther**

This study used Medicare Current Beneficiary Survey data to identify factors associated with physical therapy (PT) use by Medicare beneficiaries.

Results show evidence of both underuse and overuse of PT services based on factors other than need. Individuals are more likely to have PT if they have an inpatient, subacute or home health event; need help with activity of daily living (ADL) or independent activity of daily living (IADL); have difficulty in stooping or reaching overhead; have osteoporosis, arthritis or partial paralysis. Use of PT was positively associated with income, educational level, supplemental insurance, participation in a managed care plan and supply of physical therapists. Use was negatively associated with age. Amount of PT obtained was positively associated with income, supplemental insurance, residence in a metropolitan area, supply of physical therapists and African American race. Amount of PT was negatively associated with participation in a managed care plan.

## Utilization Variation

### Study

### Outcome

*Hospital Admissions Through The Emergency Department: Does Insurance Status Matter?*  
**Sox, C.M., Burstin, H.R., Edwards, R.A., O'Neil, A.C., Brennan, T.A.;** 1998; *Am J Med*

This study retrospectively reviewed the records of patients < age 65 presenting to 5 Harvard teaching hospitals with a diagnosis of abdominal pain, chest pain, or shortness of breath to determine whether insurance status affected admission decisions and whether health status was impacted by that decision.

Uninsured patients were significantly less likely to be admitted than insured patients. (37% v. 17.5%). The subgroup analysis was only statistically significant for patients with abdominal or chest pain. Patients with shortness of breath were less likely to be admitted, but the difference was not statistically significant. There was no difference in follow-up health status between admitted vs. non-admitted patients regardless of admission status.

*The Effect Of Hospital Volume On Cancer Control After Radical Prostatectomy*  
**Ellison, L.M., Trock, B.J., Poe, N.R., Partin, A.W.;** 2005; *J Urol*

This study used Surveillance Epidemiology and End Results (SEER) and Medicare data to identify men with newly diagnosed prostate cancer treated with radical prostatectomy in order to examine the association of hospital volume and long-term cancer control after radical prostatectomy.

Patients treated at very high volume hospitals (greater than 108 cases) did better (i.e., were less likely to need further treatment) than those treated at low and medium volume hospitals (1 to 61).

*Do We Know What Inappropriate Laboratory Utilization Is? A Systematic Review Of Laboratory Clinical Audits*  
**Van, Walraven C., Naylor, C.D.;** 1998; *JAMA*

This study utilized an extensive literature review to evaluate articles purported to demonstrate inappropriate laboratory use.

44 eligible studies were identified. 11 studies employed implicit criteria for inappropriate use, and 33 used explicit criteria that were often weakly supported by evidence. In these articles, estimates of inappropriate use ranged from 4.5%-95%.



## Utilization Variation

### Study

*Effects Of Geriatric Evaluation And Management On Adverse Drug Reactions And Suboptimal Prescribing In The Frail Elderly*  
**Schmader, K.E., Hanlon, J.T., Pieper, C.F., Sloane, R., Ruby, C.M., Twersky, J., Francis, S.D., Branch, L.G., Lindblad, C.I., Artz, M., Weinberger, M., Feussner, J.R., Cohen, H.J.; 2004; Am J Med**

This prospective study in 11 Veterans Affairs Medical Centers (VAMCs) examined whether inpatient or outpatient geriatric evaluation and management, as compared with usual care, reduces adverse drug reactions and suboptimal prescribing in frail elderly patients.

*Improving Prescribing Patterns For The Elderly Through An Online Drug Utilization Review Intervention: A System Linking The Physician, Pharmacist And Computer*  
**Monane, M., Matthias, D.M., Nagle, B.A., Kelly, M.A.; 1998; JAMA**

This study analyzed pharmacy benefit management (PBM) claims records of 23,269 Medicare beneficiaries to determine whether computerized Drug Utilization Review in combination with telepharmacy can reduce inappropriate medication use and improve suboptimal medication use in the elderly.

### Outcome

Geriatric evaluation and management in outpatients helps prevent drug misuse, overuse and underuse. Serious adverse drug reactions were reduced by 35%. Additionally, levels of suboptimal prescribing were reduced with geriatric evaluation and management for both outpatients and inpatients.

The utilization of a Drug Utilization Review (DUR) will help reduce medication errors thereby increasing patient safety and other negative health outcomes associated with medication misuse. A total of 43,007 medication alerts were generated for the study population, 24,266 of which required action. Using a system of integrating computers, pharmacist and physicians, there was an observed improvement of health outcomes for this geriatric population.

## Utilization Variation

### Study

### Outcome

*Geographic Variation In The Treatment Of Acute Myocardial Infarction: The Cooperative Cardiovascular Project*

**O'Connor, G.T., Quinton, H.B., Traven, N.D., Ramunno, L.D., Dodds, T.A., Marciniak, T.A., Wennberg, J.E.; 1999; JAMA**

This study used data from the Cooperative Cardiovascular Project to examine quality indicators such as pharmacological therapy, reperfusion, and smoking cessation advice for the treatment of acute myocardial infarction.

There is substantial geographic variation in the use of treatment strategies. Across all regions, aspirin (ASA) was used in 77.8% of eligible individuals, angiotensin-converting enzyme (ACE) inhibitors were prescribed in 59.3%, reperfusion using thrombolytics or angioplasty in 67.2%, and beta-blockers in 49.5% of appropriate cases.

*Variations In Hospitalization Rates Among Nursing Home Residents: The Role Of Facility And Market Attributes.*

**Carter, M.W., Porell, F.W.; 2003; Gerontologist**

This study used Medicaid and Medicare data from 527 nursing homes in Massachusetts in order to examine what factors influence hospitalization rates among nursing home residents.

Hospitalization rates were associated with facility characteristics such as profit status, nurse staffing patterns, nursing home size, chain affiliation, and percentage of Medicaid-and Medicare-reimbursed days.

*Influence Of Patients' Requests For Direct-To-Consumer Advertised Antidepressants: A Randomized Controlled Trial*

**Kravitz, R.L., Epstein, R.M., Feldman, M.D., Franz, C.E., Azari, R., Wilkes, M.S., Hinton, L., Franks, P.; 2005; JAMA**

This study employed standardized patients to seek antidepressants from 152 physicians in New York state and California.

Standardized patients (SPs) presenting with depression or adjustment disorder who made brand-specific requests, general medication requests, or no requests were prescribed antidepressants at significantly different rates (53, 76, and 31% respectively for SPs presenting with major depression, and 55, 39, and 10% respectively for SPs presenting with adjustment disorder).

## Utilization Variation

### Study

### Outcome

*Prognosis And Decision Making In Severe Stroke*

**Holloway, R.G., Benesch, C.G., Burgin, W.S., Zentner, J.B.; 2005; JAMA**

This study reviewed the literature pertaining to the overuse or underuse of life-sustaining therapies in stroke patients requiring mechanical ventilation.

A review of the prognostic evidence following severe stroke requiring mechanical ventilation is provided, followed by a discussion of the factors that may influence withdrawal of life-sustaining therapies and a theoretical framework for optimizing decision making in this setting.

*Regional Variation In The Treatment And Outcomes Of Myocardial Infarction: Investigating New England's Advantage*

**Krumholz, H.M., Chen, J., Rathore, S.S., Wang, Y., Radford, M.J.; 2003; Am Heart J**

This study analyzed records of 234,769 Medicare beneficiaries hospitalized for myocardial infarction (MI) and included in the cooperative CMC cardiovascular project (CCP) database to assess regional variation in quality of care.

Patients in New England were more likely to receive aspirin and beta-blockers, and less likely to receive reperfusion therapy and had the lowest 30 day risk adjusted mortality rate (15.3% vs. 17.9-21.7%).

*Impact Of Underuse, Overuse, And Discretionary Use On Geographic Variation In The Use Of Coronary Angiography After Acute Myocardial Infarction*

**Guadagnoli, E., Landrum, M.B., Normand, S., L.Ayanian, J.Z., Garg, P., Hauptman, P.J., Ryan, T.J., McNeil, B.J.; 2001; Med Care**

This study used cooperative cardiovascular project (CCP) data for 44294 patients hospitalized for acute myocardial infarction (AMI) in 95 hospital-referral regions to examine whether use of coronary angiography after AMI according to appropriateness criteria, varied across geographic regions and whether underuse, overuse, or discretionary use accounted for variation in overall use.

In this study, significant variation was found between regions, predominantly in rates of angiography categorized as appropriate, but not necessary and unnecessary. Overall, 21.5% of studies were classified as necessary, 29.5% appropriate but not necessary, 27.4% uncertain, and 21.3% unsuitable.

## Utilization Variation

### Study

### Outcome

*Do Competition And Managed Care Improve Quality?*

**Sari, N; 2002; Health Econ**

This paper employs econometric examination of National Inpatient Sample data and American Heart Association (AHA) Annual Survey data to investigate the impact of managed care and hospital competition on quality of care (using in-hospital complications as quality measures).

First, higher managed care penetration increases the quality, when inappropriate utilization, wound infections and adverse/iatrogenic complications are used as quality indicators. Higher hospital market share and market concentration are associated with lower quality of care. Hospital mergers have undesirable quality consequences.

*Anti-Inflammatory Therapy Reduces Total Costs Of Asthma Care Compared With Bronchodilation: The Asthma Outcomes Registry*

**Huse, D.M., Russell, M.W., Weiss, S.T., Hartz, S.C.; 2000; Am J Manag Care**

This study used a sample drawn from the Asthma Outcomes Registry to explore the relation between choice of maintenance therapy with anti-inflammatory agents vs. long-acting bronchodilators and annual costs of asthma care.

A total of 314 patients met criteria for study inclusion (237 treated with antiinflammatories and 77 treated with bronchodilators). Median costs during the baseline year were similar in the anti-inflammatory and bronchodilator groups (\$341 and \$335, respectively). In the follow-up year, the median change in cost in the anti-inflammatory group was a decline of \$93 compared with an increase of \$76 in the bronchodilator group.

*The Implications Of Regional Variations In Medicare Spending. Part 1: The Content, Quality, And Accessibility Of Care*

**Fisher, E.S., Wennberg, D.E., Stukel, T.A., Gottlieb, D.J., Lucas, F.L., Pinder, E.L.; 2003; Ann Intern Med**

This study examined a randomly selected national cohort of Medicare beneficiaries hospitalized for hip fracture, colon cancer, or myocardial infarction (MI), and a representative sample drawn from the Medicare Current Beneficiary Survey, to evaluate intensity of end-of-life care and whether regions with higher Medicare spending provide better care.

Increased spending is not associated with reduced mortality, improvement in functional status, or patient satisfaction. Patients in the highest spending Medicare quintile received 60% more care in the first year after diagnosis (of acute MI, colorectal cancer, or hip fracture) than patients in the lowest quintile. The increased utilization was partially explained by increased inpatient care and subspecialty consultation.

## Utilization Variation

### Study

*Chemotherapy Use, Outcomes, And Costs For Older Persons With Advanced Non-Small-Cell Lung Cancer: Evidence From Surveillance, Epidemiology And End Results-Medicare*  
**Ramsey, S.D., Howlader, N., Etzioni, R.D., Donato, B.; 2004; J Clin Oncol**

This study used linked Surveillance Epidemiology and End Result (SEER) and Medicare claims data to examine U.S. community patterns of care for older patients with advanced non-small-cell lung cancer (NSCLC).

*Impact Of Referral Patterns On The Use Of Chemotherapy For Lung Cancer*  
**Earle, C.C., Neumann, P.J., Gelber, R.D., Weinstein, M.C., Weeks, J.C.; 2002; J Clin Oncol**

This study used linked Surveillance Epidemiology and End Result (SEER) and Medicare claims data to determine the extent to which unexplained variation in the use of chemotherapy for advanced lung cancer is due to access to oncologists' services as opposed to treatment decisions made after seeing an oncologist.

### Outcome

Chemotherapy prolongs survival and is underused, particularly in females, African American patients, and patients in particular regions. The optimal chemotherapy increased cost by more than \$10,000 per patient.

Racial and socioeconomic factors influence whether patients are seen by physicians who can provide chemotherapy. For those who did see such a provider, treatment decisions largely correlated with medical factors.

## Utilization Variation

### Study

*Population Variations In The Initial Treatment Of Non-Small-Cell Lung Cancer*

**Potosky, A.L., Saxman, S., Wallace, R.B., Lynch, C.F.; 2004; J Clin Oncol**

This study retrospectively reviewed the records of a random sample of patients with non-small cell lung cancer (NSCLC) drawn from Surveillance Epidemiology and End Result (SEER) data to examine the patterns of initial therapy focusing on the investigation of differences in receipt of recommended therapies according to multiple clinical and non-clinical patient characteristics.

### Outcome

Overall, 52% of NSCLC patients received recommended therapy. Recommended therapy was more likely in early vs. late-stage disease, white vs. black patients, married vs. single patients, and younger vs. older patients (surgery).

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*Varieties Of Health Services Utilization By Underserved Mexican American Women*

**Iniguez, E., Palinkas, L.A.; 2003; J Health Care Poor Underserved**

Records of 250 women attending a primary care clinic were used to determine utilization of preventive medical services.

48.4% obtained preventive services in accordance with guidelines. 66% reported only visiting the clinic when acutely ill.

## Utilization Variation

### Study

*Diagnosis And Treatment Of Acute Otitis Media: An Assessment*

**Garbutt, J., Jeffe, D.B., Shackelford, P.; 2003; Pediatrics**

This study surveyed 29 pediatricians in St. Louis and used reviews of random medical records to assess compliance with the Centers for Disease Control and Prevention (CDC) evidence-based guidelines for the judicious use of antimicrobials in children with acute otitis media (AOM).

### Outcome

There is poor compliance with diagnostic and treatment recommendations.

Compliance was measured by both chart review and physician self-report.

Compliance with diagnostic criteria for AOM was 38% by chart review and 41% by self-report. 25% of physicians failed to use pneumatic otoscopy to confirm presence of middle ear effusion as required by CDC guidelines. Compliance with recommendation for treatment for new infections was 68% by chart review and 100% by self-report. For treatment failures, compliance was 63% by chart review and 83% by self-report. Compliance for recurrent disease was 50% by chart review. The most common reason for non compliance with treatment recommendations was overuse of broad-spectrum antibiotics. 26% of children received sub-therapeutic doses of amoxicillin. Fewer than 50% of MDs used the shortened course of amoxicillin recommended for uncomplicated new AOM.

## Utilization Variation

### Study

*Racial/Ethnic Variation In Parent Expectations For Antibiotics: Implications For Public Health Campaigns*

**Mangione-Smith, R., Elliott, M.N., Stivers, T., McDonald, L., Heritage, J., McGlynn, E.A.; 2004; Pediatrics**

This study used a survey of parents of children with upper respiratory infections (URIs) in 27 pediatric practices in Los Angeles, and their physicians, assess expectations for antibiotics for URIs and the actual prescriptions written.

### Outcome

Parents were more likely than physicians to feel that an antibiotic was required for their children. (Parent - 81% for bacterial diagnosis, and 66% for viral diagnosis). There were racial ethnic differences as well; non-Hispanic white parents were less likely to expect antibiotics (51% versus 67-80%); physicians also perceived this difference (48% versus 65-82%). Physicians underestimated parents' expectations for antibiotics (55% for bacterial diagnosis and 32% viral diagnosis), but physicians who perceived this expectation were 7% more likely to make a bacterial diagnosis, and 21% more likely to prescribe an antibiotic. Factors increasing the likelihood of expecting an antibiotic were children with ear pain (16% increase), Asian or Latino ethnicity (17% increase) or when guardians were very worried about their child's illness (15% increase).

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*Traumatic Brain Injury: Patterns Of Failure Of Nonoperative Management*

**Patel, N.Y., Hoyt, D.B., Nakaji, P., Marshall, L., Holbrook, T., Coimbra, R., Winchell, R.J., Mikulaschek, A.W.; 2000; J Trauma**

This study reviewed records from 462 cases of traumatic brain injury that were managed nonoperatively in order to try to understand what factors are associated with failure of the nonoperative management.

Of the variables investigated, only anatomic location of injury was found to be predictive of early failure of nonoperative management. Frontal intraparenchymal hematomas are particularly prone to early failure. Clinical examination and intracranial pressure monitoring are equally important in detecting failure.



## Utilization Variation

### Study

*Racial And Ethnic Variations In Office-Based Medical Care For Work-Related Injuries And Illnesses*

**Dembe, A.E., Savageau, J.A., Amick, B.C., III, Banks, S.M.; 2005; J Natl Med Assoc**

This study used National Ambulatory Medical Care Survey (NAMCS) data to estimate the role of race and ethnicity in ambulatory care for work-related illness.

*Preventable Hospitalizations In Primary Care Shortage Areas. An Analysis Of Vulnerable Medicare Beneficiaries*

**Parchman, M.L., Culler, S.D.; 1998; Arch Fam Med**

This study used data from the 1991 Medicare Current Beneficiary Survey to examine whether living in a county designated as a “primary care shortage area” is associated with a greater likelihood of “ambulatory care-sensitive” hospitalization.

*Variation In Routine Electrocardiogram Use In Academic Primary Care Practice*

**Stafford, R.S., Misra, B.; 2001; Arch Intern Med**

This study used claims data from 10 internal medicine practices associated with a large urban teaching hospital to examine the causes of variation in utilization rates for Electrocardiogram (ECK).

### Outcome

Compared to white patients, African American patients were more likely to receive mental health counseling and physical therapy, and less likely to see a nurse. Hispanic patients were more likely to receive X-rays and need insurer authorization for care, and less likely to receive a prescription drug or see a physician.

Residing in a geographic region with a primary care shortage may lead to unnecessary costs and worse outcomes. Medicare patients in these regions may be hospitalized for conditions that may have been preventable by adequate and timely primary care. However, the study likely suffers from residual confounding, and whether the hospitalizations were actually preventable was not verified at the patient level. The study found that Medicare beneficiaries who rated their health fair or poor were 1.7 times more frequently hospitalized for a potentially preventable reason if they lived in a county designated as a primary care shortage area. Results were adjusted for age, sex, race, marital status, income, educational level, and supplemental Medicaid coverage.

EKGs were ordered in 4.4% of visits of patients without cardiac disease of symptoms. There was significant within-group and between-group variation in order rates that was not explained by patient characteristics (0%-24% and .8%-8.6% respectively).

## Utilization Variation

### Study

*Use And Monitoring Of "Statin" Lipid-Lowering Drugs Compared With Guidelines*  
**Abookire, S.A., Karson, A.S., Fiskio, J., Bates, D.W.; 2001; Arch Intern Med**

This study used a record review of patients seen at Brigham and Women's Hospital (BWH) to assess the appropriateness of statin therapy compared with national guidelines and to examine the appropriateness of monitoring for adverse effects.

*Use Of Oral Antithrombotic Agents Among Health Maintenance Organization Members With Atherosclerotic Cardiovascular Disease*  
**Brown, J.B., Delea, T.E., Nichols, G.A., Edelsberg, J., Elmer, P.J., Oster, G.; 2002; Arch Intern Med**

This study reviewed the use of oral antithrombotic agents in a random sample of 2,500 patients with known atherosclerotic cardiovascular disease (CVD) who were members of Northwest Permanente.

*Impact Of Patient Race On Receiving Head CT During Blunt Head Injury Evaluation*  
**Wall, S.P., Ha, E.S., Habicht, M.E., Wawda, H., Merchant, G.L., Ettner, S.L, Mower, W.R.; 2005; Acad Emerg Med**

This cohort study was completed at 1 emergency room to determine whether ethnicity predicts if a patient receives computed tomography (CT) of the head during evaluation of blunt head injury.

### Outcome

Inappropriate overuse of statins and liver function monitoring is common and costly. With the high percentage of patients who are on statin therapy inappropriately, decision support offered during the prescribing and laboratory test ordering processes may help physicians optimize use of these medications.

84% of respondents reported using either aspirin or a prescription antithrombotic agent. Continued efforts (such as encouraging use, messages to clinicians, direct mailings to patients, nurse care management, alerts in electronic medical records) should be made in all settings to optimize the use of antithrombotic therapy among persons at an elevated risk of atherothrombotic events.

Minority patients had a probability of receiving head CT 0.84 times as high as that of non-Hispanic whites, but this result was not statistically significant. Minority and non-Hispanic white patients may not have significantly different rates of receiving head CT during evaluation of blunt head injury.

## Utilization Variation

### Study

*Patterns And Correlates Of Local Therapy For Women With Ductal Carcinoma In Situ*

**Katz, S.J., Lantz, P.M., Janz, N.K., Fagerlin, A., Schwartz, K., Liu, L., Deapen, D., Salem, B., Lakhani, I., Morrow, M.; 2005; J Clin Oncol**

This study surveyed women with Ductal Carcinoma In Situ (DCIS) reported to Detroit and Los Angeles Surveillance Epidemiology and End Result (SEER) registries regarding whether breast-conserving treatment was offered.

### Outcome

Patients seem to be getting the appropriate treatment and follow-up care, taking into account the stage of their disease, their surgeon's recommendations, and their own preferences, which suggests that radical mastectomy, breast-conserving surgery, and radiation were not over- or underused, as some fear.

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*Sedative, Hypnotic, And Antianxiety Medication Use In An Aging Cohort Over Ten Years: A Racial Comparison*

**Blazer, D., Hybels, C., Simonsick, E., Hanlon, J.T.; 2000; J Am Geriatr Soc**

This study analyzed data from a community-based cohort of 4,000 older adults in North Carolina to determine sociodemographic and health characteristics associated with sedative, hypnotic, and anxiolytic use.

Correlates of use at baseline were female gender, white race, depressive symptoms, poor self-rated health, impaired physical function, and health services use.

## Utilization Variation

### Study

*The Quality Of Health Care Delivered To Adults In The United States*

**McGlynn, E.A., Asch, S.M., Adams, J., Keeseey, J., Hicks, J.DeCristofaro, A., Kerr, E.A.; 2003; N Engl J Med**

The Community Quality Index (CQI) study involved chart reviews and telephone interviews of over 6,000 patients, using 439 indicators for 30 conditions (including preventive care) to ascertain whether appropriate care was given.

### Outcome

Overall, participants received 54.9% of recommended care; performance was similar in the areas of preventive care, acute care, and care for chronic conditions. Care requiring an encounter or other intervention (e.g., the annual visit recommended for patients with hypertension) had the highest rates of adherence (73.4%), and processes involving counseling or education (e.g., advising smokers with chronic obstructive pulmonary disease to quit smoking) had the lowest rates of adherence (18.3%). There were more problems with underuse (46.3% of participants did not receive recommended care) than with overuse (11.3 percent of participants received care that was not recommended and was potentially harmful).

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*Use Of Medicare Claims Data To Monitor Provider-Specific Performance Among Patients With Severe Chronic Illness*

**Wennberg, J.E., Fisher, E.S., Stukel, T.A., Sharp, S.M.; 2004; Health Aff (Millwood )**

This study used Medicare claims to study end-of-life spending for patients who received most of their care at 77 well known U.S. hospitals.

Inpatient days in the last 6 months of life ranged from 8.5-23 days for solid tumor cancers, 10.1-29.6-days for chronic obstructive pulmonary disease (COPD) and 8.9-32.3 days for congestive heart failure (CHF). Intensive care unit days in the last 6 month of life ranged from 0.6-8.1 days for solid tumor cancers, 1.8-13.1 days for COPD, and 2.1-13.4 days for CHF. Physician visits per decedent ranged from 13-64.6 days for solid tumor cancer, 15.4-87.4 for COPD, and 15.2-99.3 for CHF. The study also correlates utilization in the last 6 months of life with utilization in the last 2 years of life.

## Utilization Variation

### Study

*Trends And Geographic Variation In Major Surgery For Degenerative Diseases Of The Hip, Knee, And Spine*

**Weinstein, J.N., Bronner, K.K., Morgan, T.S., Wennberg, J.E.; 2004; Health Aff (Millwood)**

Medicare claims data was used to determine the rates of hospitalization for hip fracture, hip and knee replacement, and spine surgery in each of 306 hospital referral regions. Utilization rates in 1992 were compared to rates in 2000.

*Variations In The Longitudinal Efficiency Of Academic Medical Centers*

**Fisher, E.S., Wennberg, D.E., Stukel, T.A., Gottlieb, D.J.; 2004; Health Aff (Millwood)**

This study used Medicare claims data to compare the content, quality, and outcomes of care provided by academic medical centers.

*Nonsteroidal Anti-inflammatory Drug Use Among Patients With GI Bleeding*

**Dominick, K.L., Bosworth, H.B., Jeffreys, A.S., Grambow, S.C., Oddone, E.Z., Horner, R.D.; 2004; Ann Pharmacother**

4,338 veterans hospitalized for gastrointestinal (GI) bleeding were examined 6 months after hospitalization to examine the use of traditional non steroidal anti-inflammatory drugs (NSAIDs), inhibitors, and gastro-protective agents (GPAs) among patients recently hospitalized for GI bleeding.

### Outcome

There was significant variability in the rates of total knee and hip replacement and back surgery among hospital referral regions. For example, patients in Bradenton, FL were 75% more likely than their neighbors in Tampa to receive spine surgery, after adjustment for multiple confounders. Rates in 1992 were highly correlated with rates in 2000.

Patients of academic medical centers in the highest spending Medicare quintile received up to 60% more care in the 5 years after diagnosis of acute myocardial infarction (MI), colorectal cancer, or hip fracture than patients in the lowest quintile. The increased utilization was partially explained by increased inpatient care, subspecialty consultation, and imaging. Quality of and access to acute MI care, as gauged by limited metrics, was no better as intensity increased.

20% of subjects were prescribed an NSAID or COX-2 inhibitor. Only 5% were prescribed a traditional NSAID with no GPA. Subjects < 65 years of age and those with arthritis were more likely to be prescribed a traditional NSAID without a GPA.

## Utilization Variation

### Study

*Introducing A Multifaceted Intervention To Improve The Management Of Otitis Media: How Do Pediatricians, Internists, And Family Physicians Respond?*

**Francis, D.O., Beckman, H., Chamberlain, J., Partridge, G., Greene, R.A.; 2006; Am J Med Qual**

This study retrospectively analyzes a cohort of primary care physicians to explore the differential adherence to a guideline for the treatment of acute otitis media among pediatricians, family practitioners, and internists before and after a multi-faceted intervention.

### Outcome

Physicians opt out of guidelines for otitis media frequently. Pediatricians made exceptions in 33.7% of cases, internists in 33.9%, and family physicians in 40%.

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*Association Between Hospital Process Performance And Outcomes Among Patients With Acute Coronary Syndromes*

**Peterson, E.D., Roe, M.T., Mulgund, J., DeLong, E.R., Lytle, B.L., Brindis, R.G., Smith, S.C., Jr., Pollack, C.V., Jr., Newby, L.K., Harrington, R.A., Gibler, W.B., Ohman, E.M.; 2006; JAMA**

This study examined 64,775 patients at 350 locations who were enrolled in the CRUSADE National Quality Improvement Initiative to determine if adhering to hospital guidelines resulted in improved outcomes among patients with acute coronary syndromes.

American College of Cardiology (ACC)/American Heart Association (AHA) guideline-recommended treatments were adhered to in 74% of eligible instances. The guideline adherence rate was significantly associated with in-hospital mortality, with observed mortality rates decreasing from 6.31% for the lowest adherence quartile

## Utilization Variation

### Study

### Outcome

*The Relationship Between Evidence-Based Practices And Survival In Patients Requiring Prolonged Mechanical Ventilation In Academic Medical Centers*

**Keroack, M.A., Cerese, J., Cuny, J., Bankowitz, R., Neikirk, H.J., Pingleton, S.K.; 2006; Am J Med Qual**

This study used chart reviews of ventilator dependent patients in 2 academic intensive care units (ICUs) to evaluate the impact of 6 care guidelines on survival.

Care guidelines are underused in ICUs for patients on ventilators, and greater use of sedation management and glycemic control guidelines could reduce hospital mortality for these patients. Sedation management and glycemic control were the only care guidelines associated with reduced hospital mortality. Ulcer prophylaxis, deep vein thrombosis (DVT) prevention, position to prevent ventilator-associated pneumonia (VAP), and spontaneous breathing trials were not significantly associated with reduced mortality.

*Use Of Hospitals, Physician Visits And Hospice Care During The Last Six Months Of Life Among Cohort Loyal To Highly Respected Hospitals In The United States*

**Wennberg, J.E., Fisher, E.S., Stukel, T.A., Skinner, J.S., Sharp, S.M., Bronner, K.K.; 2004; BMJ**

This study used Medicare payment files to evaluate the use of healthcare resources in the last 6 months of life at 77 hospitals judged "Best" by *U.S. News and World Reports* for heart, pulmonary, cancer and geriatric care.

Extensive variation in each measure existed among the 77 hospital cohorts. Days in hospital per decedent ranged from 9.4 to 27.1; days in intensive care units ranged from 1.6 to 9.5; number of physician visits ranged from 17.6 to 76.2; percentage of patients seeing 10 or more physicians ranged from 16.9% to 58.5%; and hospice enrollment ranged from 10.8% to 43.8%. The percentage of deaths occurring in hospital ranged from 15.9% to 55.6%, and the percentage of deaths associated with a stay in intensive care ranged from 8.4% to 36.8%.

*Compliance With Recommendations For Follow-Up Care In Latinos: The Los Angeles Latino Eye Study*

**Unzueta, M., Globe, D., Wu, J., Paz, S., Azen, S., Varma, R.; 2004; Ethn Dis**

This study conducted 335 telephone interviews in order to determine the rates of compliance with follow-up eye and health care among Latinos in Los Angeles.

68% obtained follow-up care. Among those who did not seek follow-up care, 50% cited cost of care as the main reason, 28% indicated a lack of knowledge as to where to go for care, and 17% indicated the unavailability of health care. Having insurance, having a systemic disease, and higher education were associated with receiving follow-up care.

## Utilization Variation

### Study

*Geographic Patterns Of Prostate Cancer Mortality And Variations In Access To Medical Care In The United States*

**Jemal, A.Ward, E.Wu, X., Martin, H.J., McLaughlin, C.C., Thun, M.J.; 2005; Cancer Epidemiol Biomarkers Prev**

National Center for Health Statistics, Surveillance Epidemiology and End Result (SEER), and behavioral risk factor surveillance system (BRFSS) data was used to examine the association between geographic variations in prostate cancer mortality and regional variations in access to medical care, as reflected by the incidence of late-stage disease, prostate-specific antigen (PSA) utilization, and residence in rural counties.

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*Who You Are And Where You Live: How Race And Geography Affect The Treatment Of Medicare Beneficiaries*

**Baicker, K., Chandra, A., Skinner, J.S., Wennberg, J.E.; 2004; Health Aff (Millwood)**

This study employed an extensive review of Medicare claims data to determine the role of ethnicity and race in regional variation in health service utilization rates.

### Outcome

Geographic variation in prostate cancer death is associated with incidence of late-stage diagnosis and inversely correlated with rates of PSA testing.

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There is significant variability of racial disparities across regions and for different procedures. For example, regions with high racial disparities for 1 procedure are not more likely to be high in other procedures, and differences in care are driven more by region than race.



## Utilization Variation

### Study

*Influence Of Insurance Type On The Use Of Procedures, Medications And Hospital Outcome In Patients With Unstable Angina: Results From The GUARANTEE Registry. Global Unstable Angina Registry And Treatment Evaluation*  
**Every, N.R., Cannon, C.P., Granger, C., Moliterno, D.J., Aguirre, F.V., Talley, J.D., Booth, J., Sapp, S., Ferguson, J.J;** 1998; *J Am Coll Cardiol*

This study used data from 35 hospitals participating in the GUARANTEE Registry to investigate whether or not there is an association between managed care (MC) insurance and the delivery and outcome of care in patients presenting with unstable angina.

*Geographic Variation In Health Care Utilization And Outcomes In Veterans With Acute Myocardial Infarction*  
**Subramanian, U., Weinberger, M., Eckert, G.J., L'Italien, G.J., Lapuerta, P., Tierney, W.;** 2002; *J Gen Intern Med*

This study used national Veterans Affairs (VA) databases to examine the records of 67,899 patients admitted for acute myocardial infarction (AMI) in order to determine regional differences in treatment intensity and outcome.

### Outcome

Although there was little difference in baseline characteristics and hospital treatments between cohorts, MC patients were more likely to be discharged on guideline-recommended medications (aspirin and beta-adrenergic blocking agents). In addition, fee-for-service (FFS) patients were more likely to undergo cardiac catheterization, but not revascularization during the hospitalization. There was no difference in hospital mortality (0.9% vs. 1.2%) in MC vs. FFS.

Region of the country independently predicted time to death following AMI, with lower risks in the Northeast and West compared with the South. Patients in the Northeast and West had more primary care physician and cardiology follow-up within 2 and 12 months of the index hospitalization.

## Utilization Variation

### Study

### Outcome

*Can Guidelines Impact The Ordering Of Magnetic Resonance Imaging Studies By Primary Care Providers For Low Back Pain?*  
**Rao, J.K., Kroenke, K., Mihaliak, K.A., Eckert, G.J., Weinberger, M.; 2002; Am J Manag Care**

This study analyzed the records of primary care patients seen at a university-associated Veterans Affairs Medical Center (VAMC) to estimate the rate of primary care physician (PCP) ordered Magnetic Resonance Imaging (MRI) and surgical referral for low-back pain.

Use of MRI for low-back pain did not change appreciably after dissemination of the Agency for Healthcare Research and Quality (AHRQ) guideline.

*Long-Term Outcomes Of Regional Variations In Intensity Of Invasive Vs. Medical Management Of Medicare Patients With Acute Myocardial Infarction*  
**Stukel, T.A., Lucas, F.L., Wennberg, D.E.; 2005; JAMA**

This was a national cohort study of 158,831 patients with acute myocardial infarction (MI) who were followed for 7 years in order to determine if survival rates differed among patients who received cardiac catheterization vs. those who received medical management (with beta-blockers).

Regions using high intensity medical management had a 7-year survival advantage of 6.2 percentage points. It is unclear whether intensive invasive management added marginal benefit.

*Geography And The Debate Over Medicare Reform*  
**Wennberg, J.E.; Fisher, E.S.; Skinner, J.S., 2002; Health Aff (Millwood)**

This article reviews a large number of primary sources in order to support a proposal for Medicare reform. The article pays special attention to how there are geographic areas within the U.S. have much higher Medicare spending without better health outcomes.

Higher levels of Medicare spending are due largely to increased use of “supply-sensitive” services physician visits, specialist consultations, and hospitalizations, particularly for those with chronic illnesses or in their last 6 months of life. Also, higher spending does not result in more effective care, or better health outcomes.

## Utilization Variation

### Study

*Health Care Utilization By Children With Chronic Illnesses: A Comparison Of Medicaid And Employer-Insured Managed Care.*

**Wennberg, J.E., Fisher, E.S., Skinner, J.S.; 2002; Health Aff (Millwood)**

This study used claims data from one Medicaid plan and 2 independent practice association (IPA) model health maintenance organizations (HMOs) to compare utilization of health care services by children with chronic conditions (asthma).

*Economic Implications Of Evidence-Based Prescribing For Hypertension: Can Better Care Cost Less?*

**Shatin, D., Levin, R., Ireys, H.T., Haller, V; 1998; Pediatrics**

This study used data from 133,624 patients in the Pharmaceutical Assistance Contract for the Elderly (PACE) drug assistance program in order to calculate the cost savings if patients were prescribed medications consistent with evidence-based guidelines instead of the medicines that they were actually on.

*Economics Of Suboptimal Drug Use: Cost-Savings Of Using JNC-Recommended Medications For Management Of Uncomplicated Essential Hypertension*

**Fischer, M.A., Avorn, J.; 2004; JAMA**

This article used data from 1,588 hypertensive patients in the Medical Expenditure Panel Survey (MEPS) in order to determine the compliance rates with Joint National Commission V (JNC V) guidelines, and the potential cost savings associated with better compliance with the guidelines.

### Outcome

Medicaid-enrolled children had more out-patient services, laboratory services, and radiography services than their counterparts in employer-based managed care.

In examining drug benefit for Medicare recipients, 815,316 prescriptions (40%) were identified for which an alternative regimen appeared more appropriate according to evidence-based recommendations. Making these changes would have reduced the costs to payers in 2001 by \$11.6 million.

Compliance rates with the JNC guidelines were low. About 36%, 67%, and 87% of patients in the nation received first-, second-, and third-line drugs, respectively. The use of first-line drugs (vs. second-line drugs) was associated with expenditures that were \$2.6 billion to \$3.2 billion lower.

## Utilization Variation

### Study

*Correlations Between Access To Mammography And Breast Cancer Stage At Diagnosis*  
**Marchick, J., Henson, D.E.; 2005; Cancer**

This study used Surveillance Epidemiology and End Result (SEER) data to compare breast cancer incidence rates and stage at diagnosis with the number of Food and Drug Administration (FDA) certified mammography facilities by county.

### Outcome

A correlation existed between the percent of incident breast cancers that were diagnosed as in situ disease and the number of mammography facilities per 10,000 women among both whites and African Americans.

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*Cervical Carcinoma In The Elderly: An Analysis Of Patterns Of Care And Outcome*  
**Wright, J.D., Gibb, R.K., Geevarghese, S., Powell, M.A., Herzog, T.J., Mutch, D.G., Grigsby, P.W., Gao, F., Trinkaus, K.M., Rader, J.S.; 2005; Cancer**

This study used data from a single hospital tumor registry to compare treatment patterns and outcomes in women less than 70 years old vs. those greater or equal to 70 who have cervical cancer.

Elderly women with cervical carcinoma are less likely to receive surgery (16% vs. 54%), 9 times more likely to receive no treatment, and more likely to die from their disease.

## Utilization Variation

### Study

*Primary Care Practice Adherence To National Cholesterol Education Program Guidelines For Patients With Coronary Heart Disease*

**McBride, P., Schrott, H.G., Plane, M.B., Underbakke, G., Brown, R.L.;** 1998; *Arch Intern Med*

Physician surveys and medical records from 603 patients in 45 different practices were examined to determine physician and patient factors associated with adherence, or lack of adherence, to national guidelines regarding cholesterol management.

### Outcome

A total of 199 patients (33%) with cardiovascular disease (CVD) were not screened with lipid panels, 271 patients (45%) were not receiving dietary counseling, and 404 (67%) were not receiving cholesterol medication. Only 84 patients (14%) with CVD had achieved the recommended low-density lipoprotein (LDL) level of less than 100 mg/dL and 302 (50%) had triglyceride levels lower than 200 mg/dL. Patients with a revascularization history and higher low-density lipoprotein and/or triglyceride levels were more likely to receive treatment, but other patient factors, including CVD risk factors, did not predict treatment. Physician specialty was not associated with differences in treatment, but physicians in practice for fewer years ordered more lipid panels.

*Timeliness And Quality Of Care For Elderly Patients With Acute Myocardial Infarction Under Health Maintenance Organization Vs. Fee-For-Service Insurance*

**Soumerai, S.B., McLaughlin, T.J., Gurwitz, J.H., Pearson, S., Christiansen, C.L., Borbas, C., Morris, N., McLaughlin, B., Gao, X., Ross-Degnan, D.;** 1999; *Arch Intern Med*

This study reviewed the medical record of 2,304 Medicare patients admitted for acute myocardial infarction (AMI) to compare the quality of emergency care provided in Minnesota who are covered by health maintenance organizations (HMO) vs. fee-for-service (FFS) insurance.

No indicators of timeliness and quality of care for elderly patients with AMIs were lower under HMO vs. FFS insurance coverage in Minnesota. 2 indicators of quality care were slightly higher, but statistically significantly in the HMO setting (use of emergency transportation and aspirin therapy).

## Utilization Variation

### Study

*Withdrawal Of Support In Intracerebral Hemorrhage May Lead To Self-Fulfilling Prophecies*

**Becker, K.J., Baxter, A.B., Cohen, W.A., Bybee, H.M., Tirschwell, D.L., Newell, D.W., Winn, H.R., Longstreth, W.T., Jr.; 2001; Neurology**

This study examined 87 patients with intracerebral hemorrhage (ICH), in order to determine if physicians' preconceived notions about a patient's prognosis may prompt withdrawal of support and poor outcomes that could have been avoided.

*The Impact Of Medicaid Managed Care On Hospitalizations For Ambulatory Care Sensitive Conditions*

**Bindman, A.B., Chattopadhyay, A., Osmond, D.H., Huen, W., Bacchetti, P.; 2005; Health Serv Res**

This study used data from California Temporary Assistance for Needy Families (TANF) eligible Medicaid beneficiaries (mandatory enrollment in managed care) to determine whether Medicaid managed care plans have lower ambulatory care sensitive conditions (ACSC) admission rates than Medicaid fee-for-service (FFS) plans.

### Outcome

The most important prognostic variable in determining outcome after ICH is the level of medical support provided. Withdrawal of support in patients felt likely to have a "poor outcome" biases predictive models and leads to self-fulfilling prophecies.

The rate of hospitalization for managed-care Medicaid patients in mandatory programs was 33% lower than for FFS programs (9.36 vs. 6.4 per month per 10 thousand patients).

## Utilization Variation

### Study

*Contemporary Trends In Imaging Test Utilization For Prostate Cancer Staging: Data From The Cancer Of The Prostate Strategic Urologic Research Endeavor*  
**Cooperberg, M.R., Lubeck, D.P., Grossfeld, G.D., Mehta, S.S., Carroll, P.R.; 2002; J Urol**

This study used data from the Cancer of the Prostate Strategic Urologic Endeavor (CaPSURE) registry to evaluate the use of imaging tests in staging localized prostate cancer.

*Physician Referrals To Physical Therapy For The Treatment Of Musculoskeletal Conditions*  
**Freburger, J.K., Holmes, G.M., Carey, T.S.; 2003; Arch Phys Med Rehabil**

This study used National Ambulatory Medical Care Survey (NAMCS) data to analyze factors contributing to physical therapy (PT) referral decisions of orthopedists and primary care physicians (PCPs).

*Race And Gender Disparities In Rates Of Cardiac Revascularization: Do They Reflect Appropriate Use Of Procedures Or Problems In Quality Of Care?*  
**Epstein, A.M., Weissman, J.S., Schneider, E.C., Gatsonis, C., Leape, L.L., Piana, R.N.; 2003; Med Care**

This study analyzed data from a random sample of 5,026 Medicare beneficiaries in 5 states who underwent inpatient coronary angiography to examine the effect of race and gender on revascularization (Percutaneous Transluminal Coronary Angioplasty or Coronary Artery Bypass Grafting) following coronary angiography.

### Outcome

Many low-and intermediate risk patients continue to receive unnecessary imaging, but a growing number of high-risk patients are proceeding to treatment without imaging.

There is considerable variation in PT referral rates after controlling for diagnosis and illness severity. Osteopathic PCPs were 103% more likely to make a PT referral than allopathic PCPs. Orthopedic surgeons were 95% more likely than PCPs to make PT referrals, and for all physicians' insurance type and PT supply significantly impacted referral.

Racial differences in procedure use reflect higher rates of clinical appropriateness among whites, greater underuse among blacks, and more frequent revascularization when not clinically indicated among whites. Underuse was associated with significantly worse survival among all patients over the course of follow-up.

## Utilization Variation

### Study

*Quality Of Care: Partial Cystectomy For Bladder Cancer—A Case Of Inappropriate Use?*

**Hollenbeck, B.K., Taub, D.A., Dunn, R.L., Wei, J.T.; 2005; J Urol**

This study used data from Surveillance Epidemiology and End Result (SEER) and the National Inpatient Survey to determine whether partial cystectomy was inappropriately used in institutions and populations.

### Outcome

Partial cystectomy was overused (18-20% use vs. expectable 6-10%), particularly in rural areas, nonacademic settings, and among female, elderly, and black patients.

*Suboptimal Prescribing In Older Inpatients And Outpatients*

**Hanlon, J.T., Schmader, K.E., Ruby, C.M., Weinberger, M.; 2001; J Am Geriatr Soc**

This paper reviews the literature regarding suboptimal prescribing of medications in the elderly from 1985-1999.

14-27% of older outpatients are prescribed inappropriate drugs, and up to 55% are not prescribed indicated drugs. 35% of hospitalized patients are prescribed inappropriate drugs.

*Access To Coronary Artery Bypass Surgery By Race/Ethnicity And Gender Among Patients Who Are Appropriate For Surgery*

**Hannan, E.L., van Ryn, M., Burke, J., Stone, D., Kumar, D., Arani, D., Pierce, W., Rafii, S., Sanborn, T.A., Sharma, S., Slater, J., DeBuono, B.A.; 1999; Med Care**

This study tracked 1,261 postangiography patients in 8 New York hospitals in 1994 to 1996, in order to determine if there were race or gender differences in access to coronary artery bypass graft (CABG) surgery among patients who have been designated as appropriate and as necessary for that surgery according to the RAND methodology.

African American patients had significant problems in obtaining access to CABG surgery. These problems appeared not to be related to patient refusals, appropriateness or necessity for CABG surgery.



## Utilization Variation

### Study

### Outcome

*Cost Efficiency Of U.S. Hospitals: A Stochastic Frontier Approach*

**Rosko, Michael; 2001; Health Econ**

This study examined the impact of managed care and other environmental factors on hospital inefficiency in 1,631 U.S. hospitals during 1990 to 1996.

The statistical analysis suggests that: (1) managed care induces hospitals to restrain cost increases, and (2) managed care penetration is associated with less inefficiency. Higher rates of inefficiency in hospitals were associated with: (1) Medicare hospitalizations, and (2) hospitals that were “for-profit” instead of having “non-profit” status.

*Routine Surveillance Care After Cancer Treatment With Curative Intent*

**Elston, Lafata J., Simpkins, J., Schultz, L., Chase, G.A., Johnson, C.C., Yood, M.U., Lamerato, L., Nathanson, D., Cooper, G.; 2005; Med Care**

Patient records in a large group practice were reviewed to compare the rate of cancer survivors receiving routine surveillance for recurrent cancer to guideline recommendations.

There was wide variation in the use of surveillance care. Less than two-thirds of colorectal cancer patients received recommended colon examinations in the initial year after treatment, but colorectal, lung, and prostate cancer patients received excessive physical exams, and recurrence and metastatic testing.

*Diagnostic Practices For Attention Deficit Hyperactivity Disorder: A National Survey Of Primary Care Physicians*

**Chan, E., Hopkins, M.R., Perrin, J.M., Herrerias, C., Homer, C.J.; 2005; Ambul Pediatr**

This study surveyed 1,076 pediatricians and family physicians to understand their attitudes about attention deficit hyperactivity disorder (ADHD) and estimate compliance with American Academy of Pediatrics (AAP) guidelines.

90% of physician respondents did not meet all AAP guidelines pertaining to the diagnosis of ADHD, and > 50% felt that ADHD was over-diagnosed.

## Utilization Variation

### Study

*The Quality Of Pharmacologic Care For Vulnerable Older Patients*

**Higashi, T., Shekelle, P.G., Solomon, D.H., Knight, E.L., Roth, C., Chang, J.T., Kamberg, C.J., MacLean, C.H., Young, R.T., Adams, J., Reuben, D.B., Avorn, J., Wenger, N.S.; 2004; Ann Intern Med**

In this study the medical records of 372 elderly patients enrolled in two managed care organizations (MCOs) were reviewed to evaluate 43 quality indicators for pharmacological care across the domains of prescribing indicated medicines, avoiding inappropriate medicines, education and continuity, and medication monitoring.

*Variations In Managing Asthma: Experience At The Medical-Group Level In California*

**Legorreta, A.P., Liu, X., Zaher, C.A., Jatulis, D.E.; 2000; Am J Manag Care**

This study surveyed patients identified as having asthma by pharmaceutical claims data to obtain their assessment of asthma care. 47 physician groups cared for at least 35 patients, and the study examined variation in guideline compliance across these 47 groups.

### Outcome

The rates of appropriate pharmacologic management ranged from 10% for documentation of risks of non-steroidal anti-inflammatory drugs (NSAIDs) to 100% for avoiding short acting calcium-channel blockers in congestive heart failure (CHF) patients and beta-blockers in asthma patients. Rates of avoiding inappropriate medications were higher than rates of prescribing indicated medications.

Compliance with national guidelines was generally low and quality of asthma care and service varied significantly across physician groups. Physician group rates for patient use of steroid inhalers ranged from 10.7% to 45.5% and daily peak flow meter use ranged from 0% to 13.1%.

## Utilization Variation

### Study

### Outcome

*Racial Differences In End-Of-Life Care For Patients With AIDS*

**Sambamoorthi, U., Walkup, J., McSpirtt, E., Warner, L., Castle, N., Crystal, S.; 2000; AIDS Public Policy J**

Significant differences in pain treatment and place of death existed between members of racial minority groups and whites.

This study used AIDS surveillance data and paid Medicaid claims data for 1991 to 1998 in order to examine the place of death for persons with AIDS, and the adequacy of the pain treatment that they received in their final months of life.

*Surgical Treatment Of Early-Stage Breast Cancer In The Department Of Defense Healthcare System*

**Kelemen, J.J., Poulton, III, T., Swartz, M.T., Jatoi, I.; 2001; J Am Coll Surg**

Breast-conservation therapy increased between 1986 and 1996 from 16% to 47%.

This study looks at changes in the choice of breast-conservation therapy (BCT) which is now considered the standard of care vs. modified radical mastectomy for Stage I or II breast cancer.

*Screening Mammography: Is It Suitably Targeted To Older Women Who Are Most Likely To Benefit?*

**Scinto, J.D., Gill, T.M., Grady, J.N., Holmboe, E.S.; 2001; J Am Geriatr Soc**

Screening mammography may be underutilized among older women who are the most likely to benefit and overutilized among those who are unlikely to benefit.

This study used Medicare claims data and community interviews to determine whether screening mammography is appropriately targeted to older women who are most likely to benefit from the technology.

## Utilization Variation

### Study

### Outcome

*Medicare Beneficiaries' Costs Of Care In The Last Year Of Life*

**Hogan, C., Lunney, J., Gabel, J., Lynn, J.;** 2001; **Health Aff (Millwood )**

This study used Medicare claims data and medicare current beneficiary survey (MCBS) data to estimate Medicare costs in the last year of life.

5% of Medicare beneficiaries die each year, consuming 27.4% of all Medicare spending. 38% of Medicare beneficiaries used a nursing home and 19% used a hospice during the last year of life.

*Variations In Treatment For Ductal Carcinoma In Situ In Elderly Women*

**Gold, H.T., Dick, A.W.;** 2004; **Med Care**

This study used Surveillance Epidemiology and End Result (SEER) data to quantify variation and variability in treatment of ductal carcinoma in situ (DCIS), and to assess diffusion of breast-conservation surgery (BCS).

Overall, the rate of BCS has increased, but treatment varied significantly by factors including year of diagnosis, socioeconomic status, race, age, location, and number of radiation oncologists.

*How Good Is The Quality Of Health Care In the United States?*

**Schuster, M.A., McGlynn, E.A., Brook, R.H.;** 1998; **Milbank Q**

This study conducted an exhaustive literature review, based upon an initial Medline search and articles identified from the bibliographies of identified articles, to evaluate the quality of health care delivered in the U.S.

50% of patients receive recommended preventive care; 70% recommended acute care, 30% contraindicated acute care, 60% recommended chronic care, and 20% contraindicated chronic care.

## Utilization Variation

### Study

*Disparities In Adherence To Recommended Follow-Up On Screening Mammography: Interaction Of Sociodemographic Factors*  
**Strzelczyk, J.J., Dignan, M.B.; 2002; Ethn Dis**

Data collected by the Colorado Mammography Project were reviewed to examine disparities in adherence to screening mammography and to investigate whether race, ethnicity, education, age, health insurance, and family history of breast cancer as unique factors influence adherence to recommended follow up on screening mammography.

*Hysterectomy: A Review of the Literature On Indicators, Effectiveness, and Risks. Chapter Two: Utilization And Appropriateness*  
**RAND; 1998**

In this chapter, entitled "Utilization and Appropriateness," the authors discuss the utilization rates of hysterectomy in the U.S., the literature that has tried to investigate the rates of appropriateness of hysterectomies, and how to determine what is or is not appropriate.

*Hysterectomy: A Review of the Literature On Indicators, Effectiveness, and Risks. Chapter Five: Cost And Benefit*  
**RAND; 1998**

In this chapter entitled "Cost and Benefit," the authors review 7 articles from 1977 to 1993 about the costs and benefits of hysterectomies done in the U.S.

### Outcome

Of the 17,358 women who received follow-up recommendations, 80.7% adhered. Overall, non-white women in each of the racial/ethnic groups were less likely to adhere to recommendations than were white women. Also less likely to adhere were younger, less educated, uninsured/underinsured and women who reported not having a family history of breast cancer.

There is considerable variation among different locations and ethnicities in the rate of hysterectomy use. Determining the appropriateness of hysterectomy is complex and different criteria have been developed. There are many studies that report high rates of inappropriate hysterectomy use.

One source estimates a national expenditure of \$3.25 billion in 1985 for hysterectomies. The cost-effectiveness of hysterectomy varies significantly depending upon the indication for the procedure. One source calculated the cost-effectiveness to be between \$11,000 and \$28,000 per quality-adjusted life year (QALY).

## Utilization Variation

### Study

#### *Carotid Endarterectomy Utilization And Mortality In 10 States*

**Saleh, S.S., Hannan, E.L.; 2004; Am J Surg**

This study used 1999 state-level healthcare cost and utilization project (HCUP) data for 10 states to determine rates of carotid endarterectomy (adjusted for demographic factors) and compare rates of postoperative mortality.

### Outcome

The age-adjusted rates of carotid endarterectomy varied by location, with Colorado having the lowest rate (3.35 per 10,000) and Florida having the highest rate (6.32 per 10,000). There were no significant differences in mortality at the state-level.

#### *Care In US Hospitals- The Hospital Quality Alliance Program*

**Jha, A.K.Li, Z.Orav, E.J.Epstein, A.M.; 2005; N Engl J Med**

This study linked publicly reported Medicare quality data Hospital Quality Alliance (HQA dataset) to American Heart Association (AHA) hospital data to estimate hospital-specific factors contributing to better reported results.

Performance on 10 quality indicators varied between hospital-referral regions. Predictors associated with higher quality of care included being at an academic hospital, being in the northeast or midwest, and being at a not-for-profit hospital.

#### *Racial Differences In Cardiac Revascularization Rates: Does "Overuse" Explain Rates Among White Patients?*

**Schneider, E.C., Leape, L.L., Weissman, J.S., Piana, R.N., Gatsonis, C., Epstein, A.M.; 2001; Ann Intern Med**

This study analyzed data from a random sample of 3,960 Medicare beneficiaries in 5 states who underwent in patient coronary angiography to test the hypothesis that the higher rate of cardiac revascularization among white patients is associated with a higher prevalence of overuse (revascularization for clinically inappropriate indication) among white patients than among African-American patients.

Out of 3,960 Medicare patients ages 65-75 who underwent angiography, 1,692 of them had percutaneous transluminal coronary angioplasty (PCTA) and/or coronary artery bypass grafting (CABG). (There were 1,711 total procedures). Inappropriate revascularization was only found to occur significantly more often in white men undergoing PCTA. There was no difference for CABG for women or when the population was not divided by gender.

## Utilization Variation

### Study

*The Association Of Medicare Health Care Delivery Systems With Stage At Diagnosis And Survival For Patients With Melanoma*  
**Kirsner, R.S, Wilkinson, J.D., Ma, F., Pacheco, H., Federman, D.G.; 2005; Arch Dermatol**

This study linked Surveillance Epidemiology and End Result (SEER) data and Medicare claims data to evaluate differences in the stage at diagnosis and survival rates for melanoma between the two most common types of Medicare health care delivery systems, fee-for-service (FFS) and managed care (health maintenance organizations [HMOs]).

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*Race/Ethnicity And The Intensity Of Medical Monitoring Under 'Watchful Waiting' For Prostate Cancer*

**Shavers, V.L., Brown, M., Klabunde, C.N., Potosky, A.L., Davis, W., Moul, J., Fahey, A.; 2004; Med Care**

Surveillance Epidemiology and End Result (SEER) data and Medicare claims data from 1994-1996 were used to examine the type and intensity of medical monitoring received by African American, Hispanic, and white patients with prostate cancer managed with "watchful waiting" in fee-for-service systems.

### Outcome

HMO patients were diagnosed with melanoma earlier in the disease course than FFS patients if it was their first cancer, but not if it was their second or later. Survival rate varied by stage at diagnosis.

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In general, Hispanic and African American men received less medical monitoring than white men. Nearly 6% of African American, 5% of Hispanic, and 1% of white men did not have any medical monitoring visits or procedures during the 60-month follow-up period.

## Utilization Variation

### Study

*Racial And Ethnic Differences In Patients' Preference For Initial Care By Specialists*  
**Wong, M.D., Asch, S.M., Andersen, R.M., Hays, R.D., Shapiro, M.F.; 2004; Am J Med**

This study used prospective patient interviews in physician waiting rooms to examine preferences in seeking care from a primary care physician or specialist among blacks, Asians and whites.

### Outcome

Whites are more likely to seek specialist care. While 13% of patients prefer a specialist over a primary care physician for initial care, blacks are 55% less likely to seek a specialist first, followed by Asians at 46%. Latinos are also less likely than whites to seek specialist care but the data is not statistically significant.

*The Urgent Need To Improve Health Care Quality: Institute Of Medicine National Roundtable On Health Care Quality*  
**Chassin, M.R., Galvin, R.W.; 1998; JAMA**

This consensus statement from the National Roundtable on Health Care Quality identifies issues related to the quality of health care in the U.S., including its measurement, assessment, and improvement, requiring action by health care professionals or other constituencies in the public or private sectors.

The waste and inefficiency that exist in clinical care puts patients at risk for serious harm. Quality of health care can be precisely defined and measured with a degree of scientific accuracy comparable with that of most measures used in clinical medicine. The problems with quality of care can be classified as underuse, overuse, or misuse.

*Trauma In The Very Elderly: A Community-Based Study Of Outcomes At Trauma And Nontrauma Centers*  
**Meldon, S.W., Reilly, M., Drew, B.L., Mancuso, C., Fallon, Jr., W.; 2002; J Trauma**

This study analyzed data from 450 patients in a trauma registry to describe demographics, mechanism of injury, and injury severity of very elderly patients (above 79 years old). The study also examined the association between trauma center verification and hospital mortality in this age group.

Trauma centers had significantly better outcomes than acute care hospitals in a subset of severely injured patients. Head injury, injury severity, and lack of trauma center verification are associated with hospital mortality in very elderly trauma patients.



## Utilization Variation

### Study

*Rational Use Of Antibiotics To Treat Respiratory Tract Infections*

**File, Jr., T.M., Hadley, J.A.; 2002; Am J Manag Care**

This study reviews evidence-based recommendations for appropriate antibiotic use.

### Outcome

Antibiotic drug overuse and inappropriate antibiotic drug selection are associated with increased drug resistance among respiratory pathogens, possible progression to chronic disease, and increased treatment costs.

Awareness of clinical texts that help differentiate viral from bacterial infection and the use of guidelines can promote the appropriate management of respiratory tract infections. Community-acquired pneumonia, acute bacterial rhinosinusitis, and selected cases of acute exacerbations of chronic bronchitis warrant antimicrobial therapy, whereas otitis media with effusion, acute bronchitis, and most rhinosinusitis are viral and do not require antibiotic therapy.

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*Racial Differences In Surgical Evaluation, Treatment, And Outcome Of Locoregional Esophageal Cancer: A Population-Based Analysis Of Elderly Patients*

**Steyerberg, E.W., Earle, C.C., Neville, B.A., Weeks, J.C.; 2005; J Clin Oncol**

This study used linked Surveillance Epidemiology and End Result (SEER) and Medicare claims data to investigate racial disparities in access to surgical evaluation, receipt of surgery, and survival among elderly patients with locoregional esophageal cancer.

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Black patients had higher mortality than whites (2-year survival 18% vs. 25%), which was explained statistically by the fact that the rate of surgery for black patients was half that of white patients (25% vs. 46%).

## Utilization Variation

### Study

*Neuromuscular-Blocking Drugs. Use And Misuse In The Intensive Care Unit*

**Murphy, G.S., Vender, J.S.; 2001; Crit Care Clin**

This article reviews the use and misuse of Neuromuscular-blocking (NMB) drugs in the intensive care unit (ICU).

### Outcome

The use of NMB agents for more than 24 to 48 hours in critically ill patients is associated with many potential complications. Neuromuscular blocking drugs should only be used when it is essential for optimal patient care. The indications for neuromuscular blockade must be defined clearly, and patients should be evaluated during treatment for the need for continued muscle relaxation. The smallest doses of NMB agents that will accomplish clinical goals should be used. This dosage can be determined through clinical-evaluations and peripheral nerve monitoring. It is essential that all patients treated with NMB drugs receive appropriate sedation and analgesia. Clinicians should be aware of risk factors that may predispose certain patients to neuromuscular complications, including sepsis, and the use of high-dose steroids. Neuromuscular-blocking agents should be avoided in these patients if possible. Although not proved, early recognition and treatment of iatrogenic neuromuscular complications may improve patient outcome.

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*When Access-To-Care Indicators Meet. Designated Shortage Areas And Avoidable Hospitalizations*

**Pathman, D.E., Ricketts, T.C., III; 1999; Arch Fam Med**

An editorial regarding the validity of the “health professional shortage area” designation studied in Michael Parchman’s Preventable Hospitalizations in Primary Care Shortage Areas, from the Archives of Family Medicine, Volume 8, November/December 1999 (CCE\_143).

This editorial comments on the difficulty of drawing conclusions from the association found in CCE\_143 (of living in a health professional shortage area and having an increased likelihood of ambulatory care-sensitive hospitalizations). The author comments on the inherently political nature of the health professional shortage area designation, and explains why this designation may not reliably identify areas with true shortages. The author also points out that the use of ambulatory care-sensitive admissions as an indicator of access to care has not been validated.

## Utilization Variation

### Study

### Outcome

*Differences In Use Of Health Services Between White And African American Children Enrolled In Medicaid In North Carolina*

**Buescher, P.A., Horton, S.J., Devaney, B.L., Roholt, S.J., Lenihan, A.J., Whitmire, J.T., Kotch, J.B.; 2003; Matern Child Health J**

This study used North Carolina Medicaid records to examine differences in use of health services between white and African American children.

African American children had consistently lower Medicaid expenditures and lower use of health services than did white children. Total annual Medicaid expenditures were \$207-\$303 less for African American children than white.

*Lost To Follow-Up: Ethnic Disparities In Continuity Of Hospice Care At The End Of Life*

**Kapo, J., MacMoran, H., Casarett, D.; 2005; J Palliat Med**

This study followed a cohort of patients admitted to a single hospice program to determine whether African American patients who leave hospice are less likely to return before death.

African Americans were 47% less likely than other patients to return to hospice during the study period. Ethnic disparities in hospice utilization may extend even to those patients who do enroll in hospice.

*Assessment Of Psychological Factors Associated With Adherence To Medication Regimens Among Adult Patients With Asthma*

**Schmaling, K.B., Afari, N., Blume, A.W.; 2000; J Asthma**

This study used a sample of 53 adult asthma patients recruited from a private asthma clinic, a university hospital emergency department (ED), and a public pulmonary clinic to assess psychological factors important to adherence with medication regimens.

Psychological factors important to medication adherence were stage of change, decisional balance, and self-efficacy.

## Utilization Variation

### Study

*The Influence Of Physician Race, Age, And Gender On Physician Attitudes Toward Advance Care Directives And Preferences For End-Of-Life Decision Making.*

**Mebane, E.W., Oman, R.F., Kroonen, L.T., Goldstein, M.K.;** 1999; *J Am Geriatr Soc*

This study surveyed 502 physicians to determine whether physicians' preference for end-of-life decision-making differ between blacks and whites in the same pattern as patient preferences, with blacks being more likely than whites to prefer life-prolonging treatments.

### Outcome

Physicians preferences for end-of-life treatment follow the same pattern by race as patient preferences, making it unlikely that low socioeconomic status or lack of familiarity with treatments account for the difference.

*The Reproducibility Of A Method To Identify The Overuse And Underuse Of Medical Procedures*

**Shekelle, P.G., Kahan, J.P., Bernstein, S.J., Leape, L.L., Kamberg, C.J., Park, R.E.;** 1998; *N Engl J Med*

This study evaluated the reproducibility of making treatment decisions using expert panels to rate procedures as "necessary" or "not necessary" (to evaluate underuse), and "inappropriate" or "not inappropriate".

The appropriateness method of identifying overuse is far from perfect. The degree of agreement among panels about care identified as inappropriate was only moderate. However, agreement among panels was nearly perfect regarding underuse.

## Utilization Variation

### Study

*Racial Disparities In Access To Renal Transplantation—Clinically Appropriate Or Due To Underuse Or Overuse?*

**Epstein, A.M., Ayanian, J.Z., Keogh, J.H., Noonan, S.J., Armistead, N., Cleary, P.D., Weissman, J.S., vid-Kasdan, J.A., Carlson, D., Fuller, J.Marsh, D.Conti, R.M.; 2000; N Engl J Med**

The authors first developed a set of criteria to rate potential kidney transplant recipients as appropriate, inappropriate, or equivocal, based on a review of the literature and consultation with an expert panel of nephrologists and transplant surgeons. They then reviewed charts and contacted three quarters of the patients by telephone 10 months after they started dialysis to determine patient characteristics and the rate of transplantation.

*International Comparison Of Health Resource Utilization In Subjects With Diabetes: An Analysis Of Canadian And American National Health Surveys*

**Klarenbach, S.W., Jacobs, P; 2003; Diabetes Care**

This study analyzed data from 1,346 patients from the National Health Interview Survey (U.S.) and the National Public Health Survey (Canada) in order to compare health resource utilization among diabetics in the U.S. vs. in Canada.

### Outcome

Renal transplantation is more likely to be underused in black patients, and to be overused in white patients. Blacks were less likely than whites to be considered appropriate candidates for transplantation (9.0% vs. 20.9%); the most common reasons were obesity, infection, and medical comorbidity. Of patients considered appropriate, blacks were less likely to be referred for transplant than whites (90% vs. 98%), less likely to be placed on a waiting list (71% vs. 87%), and far less likely to receive a transplant (17% vs. 52%). Of the inappropriate candidates, whites were more likely than blacks to receive a transplant (2% vs. 10%).

Subjects from Canada were more likely than their American counterparts to have contact with a general physician, eye specialist, or any physician in the past year, but were less likely to have contact with other medical specialists. Subjects in Canada were more likely to have been hospitalized overnight.

## Utilization Variation

### Study

*Patterns And Predictors Of Asthma-Related Emergency Department Use In Harlem*

**Ford, J.G., Meyer, I.H., Sternfels, P., Findley, S., E.McLean, D.E., Fagan, J.K., Richardson, L.; 2001; Chest**

This study surveyed a self-selecting sample of English-speaking adults who presented to Harlem Hospital with a diagnosis of asthma to assess the roles of poor access to care, psychological risk factors, and asthma severity in frequent emergency department (ED) use.

### Outcome

Frequent ED users present with serious medical conditions. They do not substitute physician care with ED care; they augment it to address serious health needs. Persons with moderate or severe asthma were 3.8 times more likely to be frequent ED users compared to those with mild asthma.

*Welfare Reform And The Perinatal Health And Health Care Use Of Latino Women In California, New York City, And Texas*

**Joyce, T., Bauer, T., Minkoff, H., Kaestner, R.; 2001; Am J Public Health**

This study used birth records from 1995 and 1998 in Texas, New York, and California to compare rates of prenatal care and birth outcomes among foreign-born vs. U.S.-born Latino women following enactment of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in August 1996.

Except for non-Dominicans in New York City, there was no increase in the proportion of low- or very-low-birth-weight births among foreign-born vs. U.S.-born Latinas between 1995 and 1996. Therefore, there was little evidence that PRWORA had an impact on the perinatal health and health care utilization of foreign-born Latinas relative to U.S.-born Latinas.

## Utilization Variation

### Study

### Outcome

*Length Of Stay For Specialized Pediatric Urologic Care*

**Kogan, B.A., Baskin, L.S., Allison, M.J.; 1998; Arch Pediatr Adolesc Med**

This study was a retrospective analysis of data collected in California. The study sought to determine if the quality and expense of pediatric urologic surgery was different if the surgery was done by a pediatric urology specialist or a general urologist. "Quality" was measured by operative results and patient satisfaction surveys. "Expense" or "Costs" was measured by length of hospital stay after the surgical procedure.

Hospital stays were shorter at the hospital where the surgeries were done by a pediatric urologist, in comparison to longer hospital stays at other hospitals where the surgery was done by a general urologist. Out of 38 patients, the surgical outcomes were good, and parent satisfaction rates were very high.

*Variations In Asthma Care By Race/Ethnicity Among Children Enrolled In A State Medicaid Program*

**Shields, A.E., Comstock, C., Weiss, K.B.; 2004; Pediatrics**

This study examined differences in the process of care for Medicaid-enrolled white, Hispanic, and black children with asthma.

There were significant differences in several processes of care for white, black, and Hispanic children with asthma. Hispanic children were less likely than whites to have a subspecialist visit. Black and Hispanic children were less likely to receive follow-up within five days of an emergency department (ED) visit.

*The Unnecessary Pacemaker Controversy Revisited*

**Kowey, Peter; 2002; PACE**

In this editorial, the author highlights his own research activities identifying the unexplained variation in pacemaker utilization.

Over 30 % of pacemakers have been thought to be unnecessary in at least 2 large reviews.

## Utilization Variation

### Study

### Outcome

*An Assessment Of The Appropriateness Of Respiratory Care Delivered At A 450-Bed Acute Care Veterans Affairs Hospital*  
**Shelledy, D.C., LeGrand, T.S., Peters, J.I.; 2004; Respir Care**

24% of the delivered respiratory therapies were not indicated. 12% of the patients assessed were not receiving respiratory care that was indicated.

In order to assess the appropriateness of respiratory care delivered at a Veterans Affairs hospital, this study evaluated 75 patients during a 3 month period (using a complete respiratory care assessment, including a medical records review, patient interview, physical assessment, and measurement of blood oxygen saturation and inspiratory capacity).

*Geographical Variations In Medicare Spending*  
**Shine, Kenneth; 2003; Ann Intern Med**

This editorial describes articles presenting evidence that medical spending is higher in certain geographic areas of the U.S., without improved outcomes.

An increasing amount of attention has been given to the importance of improving quality and patient safety in Medicare. Medicare now pays for the correction of medical errors but does not pay for the costs of putting systems in place that might prevent these errors. We need to find ways to encourage better practices, not discourage them by creating disincentives. We need more thought about how to reward physicians who practice high-quality, conservative medicine.

*Geographic Variation In The Appropriate Use Of Cesarean Delivery*  
**Baicker, K., Buckles, K.S., Chandra, A.; 2006; Health Aff (Millwood)**

This article introduces a new methodology to determine whether higher cesarean rates reflect less medically appropriate use of the procedure.

A large part of the variation in cesarean rates remains unexplained by risk factors other than geographic variation; increases in the cesarean rate are associated with declines in the average medical appropriateness of the procedure; higher cesarean rates did not significantly lower neonatal or maternal mortality.



## Utilization Variation

### Study

### Outcome

*The New Era Of Medical Imaging, Progress And Pitfalls*

**Iglehart, John; 2006; N Engl J Med**

This narrative review discusses the recent rise in health care expenditures on imaging studies, and the efforts by Medicare, government and private industry to address this.

There are no specific outcomes reported.

*Underuse Of Cardiac Procedures: Do Women, Ethnic Minorities, And The Uninsured Fail To Receive Needed Revascularization?*

**Leape, L.L., Hilborne, L.H., Bell, R., Kamberg, C., Brook, R.H.; 1999; Ann Intern Med**

This study used retrospective medical records review to identify 631 patients who had angiography and met RAND criteria for revascularization in New York during 1 year, and then retrieved information from their medical records in order to try to answer if women, minorities, and the uninsured fail to receive cardiac procedures when they need them.

Although revascularization procedures are substantially underused, no variations in rate of use by sex, ethnic group, or payer status were seen among patients treated in hospitals that provide coronary artery bypass graft (CABG) surgery and percutaneous transluminal coronary angioplasty (PTCA). However, “underuse” was significantly greater in hospitals that do not provide these procedures, particularly among uninsured persons.

*Immigration/Acculturation, And Ethnic Variations In Breast Conserving Surgery, San Francisco Bay Area*

**Gomez, S.L., France, A.M., Lee, M.M.; Socioeconomic Status; 2004; Ethn Dis**

Previous studies have demonstrated substantial variations in breast-conserving surgery (BCS) across sociodemographic groups. This study explored the joint influences of socioeconomic, immigration/acclturation, and clinical factors on ethnic differences in breast cancer surgery for early-stage disease.

The option of BCS or no surgery varied by ethnicity and immigration status—whites, 45%; blacks, 45%; Hispanics 34%; Chinese 20%. Choice also varied by age, tumor size, and treatment site.

## Utilization Variation

### Study

### Outcome

#### *Understanding Variation In Chronic Disease Outcomes*

**Johnson, P.E., Veazie, P.J., Kochevar, L., O'Connor, P.J., Potthoff, S.J., Verma, D., Dutta, P; 2002; Health Care Manag Sci**

This study proposes an explanation for variation in disease outcomes based on patient adaptation to the conditions of chronic disease. The study developed the model of patient adaptation, using data from 609 patients with type 2 diabetes.

Outcomes of diabetes are associated with disease severity and patient archetype.

#### *Hospital And Outpatient Health Services Utilization Among HIV-Infected Adults In Care 2000-2002*

**Fleishman, J.A., Gebo, K.A., Reilly, E.D., Conviser, R., Christopher, Mathews W., Todd, Korthuis P., Hellinger, J., Rutstein, R., Keiser, P., Rubin, H., Moore, R.D.; 2005; Med Care**

A chart review of 11 sites in the HIV Research Network (8 academic sites), to examine resource utilization by HIV-infected adults, and to determine what variables influence both inpatient and outpatient visits and utilization.

From 2000-2002 there was no substantial change in the combined inpatient utilization by HIV-infected adults, but outpatient utilization dropped by about .5 days per person per year (from 6.06 to 5.66). Minorities and disadvantaged groups had higher hospitalization rates, and clinical costs for patients on highly active antiretroviral therapy (HAART) were not significantly different from those not on HAART. Overall, only about 18-23% of the patients were not receiving HAART. Outpatient visits were lower for uninsured patients, and highest for those with Medicare or Medicaid. Hospital admission rates were also highest for Medicare and Medicaid patients (23%-25% versus 11%-16%).

## Utilization Variation

### Study

### Outcome

*Latino Children With Asthma: Rates And Risks For Medical Care Utilization*

**Berg, J., Wahlgren, D.R., Hofstetter, C.R., Meltzer, S.B., Meltzer, E.O., Matt, G.E., Martinez-Donate, A., Hovell, M.F.; 2004; J Asthma**

This study analyzed a cohort of 193 Latino families containing children with asthma to determine the type and frequency of health care utilization.

74% of families reported an unscheduled event within the past year—23% a hospitalization and 45% an emergency department (ED visit). 78% never used an inhaler, and environmental triggers, including tobacco smoke, were extremely common.

*Review Of Studies That Compare The Quality Of Cardiovascular Care In HMO Versus Non-HMO Settings*

**Seidman, J.J., Bass, E.P., Rubin, H.R.; 1998; Med Care**

A review of studies before November 1995 that used process or outcome measures to evaluate the quality of cardiovascular care in health maintenance organization (HMO) vs. non-HMO settings.

7 of the 11 studies that examined process measures for cardiovascular care in HMO vs. non-HMO patients found more differences in 1 or more process measures that favored HMOs. 7 of the 10 studies that examined outcome measures found no statistically significant differences in patient care between HMO and non-HMO settings.

*Real World Compliance With Strategies To Prevent Early-Onset Group B Streptococcal Disease*

**Riley, L., Appollon, K., Haider, S., Chan-Flynn, S., Cohen, A., Ecker, J., Rein, M., Lieberman, E.; 2003; J Perinatol**

This study retrospectively reviewed medical records from 3 hospitals in order to assess the compliance rates with risk-based strategy vs. the culture-based strategy to prevent early-onset group B streptococcal disease in newborns.

Intrapartum compliance with the risk-based approach was similar to the culture-based approach. There were more cultures not done and cultures done at inappropriate gestations at the community hospital practice.

## Utilization Variation

### Study

*Health Care For Children And Youth In The United States: Annual Report On Patterns Of Coverage, Utilization, Quality, And Expenditures By Income*

**Simpson, L., Owens, P.L., Zodet, M.W., Chevarley, F.M., Dougherty, D., Elixhauser, A., McCormick, M.C.; 2005; *Ambul Pediatr***

This study reviewed medical expenditure panel survey (MEPS) and healthcare cost and utilization project (HCUP) data to evaluate how different levels of household income were associated with the following: insurance coverage, health care utilization, expenditures, and quality of care.

### Outcome

Low income children were more likely to be uninsured or covered by public insurance, less likely to have had a medical or dental visit, and less likely to have had a prescription filled. They were less likely to have used a hospital service other than emergency department (ED) and ambulatory care sensitive conditions (ACSC) admissions, where they were more likely than high income children. Perceptions of quality, including access to both primary care and specialists, provider attentiveness, and provider respect, were significantly lower.

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*Quality Of U.S. Outpatient Care: Temporal Changes And Racial/Ethnic Disparities*

**Ma, J., Stafford, R.S.; 2005; *Arch Intern Med***

This study examined 23 outpatient quality indicators in 1992 and again in 2002 to measure overall performance and racial/ethnic disparities in outpatient care in the United States using data from the The National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS).

Changes in quality between 1992 and 2002 were modest, with significant improvements in 6 indicators.

## Utilization Variation

### Study

### Outcome

*The Longitudinal Pattern Of Care*  
**Ostermann, J., Sloan, F.A., Herndon, L., Lee, P.P.; Racial Differences In Glaucoma Care; 2005; Arch Ophthalmol**

African Americans were not less likely to undergo eye examinations than non-African Americans. African Americans were 76% more likely to undergo surgical procedures.

This study is an analysis of Medicare claims data to examine if differences in long-term management of glaucoma existed between people of different races.

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*What Is Known About The Economics Of End-Of-Life Care For Medicare Beneficiaries?*  
**Buntin, M.B., Huskamp, H.; 2002; Gerontologist**

Studies have documented poor quality of care, dissatisfaction with care, and limitations in the coverage of end-of-life care for Medicare beneficiaries. Further research on how treatment decisions at the end of life are made and prospective studies of costs, satisfaction, and outcomes are needed.

This study reviews literature pertaining to overuse of services near end of life.