



Costly and Dangerous Treatments Weigh Down Health Care

Ellen-Marie Whelan and Sonia Sekhar July 9, 2009

Our health care system is wrought with inefficiencies and waste that account for up to \$700 billion of health care spending annually. Indeed, some researchers speculate that one-third or more of all treatments and procedures performed in the United States have no proven benefits.¹ What's more, a number of these unhelpful services produce hazardous side effects in patients. All too often, by the time studies are performed to determine these health services' effectiveness, the nation has spent millions, or in some cases billions, of dollars on them. It is crucial to reduce the unnecessary costs that are dragging down our health system's efficiency. Recognizing and eliminating the utilization of unnecessary services can increase savings in the system, help slow the staggering growth rate of health care costs, and keep our population healthier.

The overuse of health services is in part due to the lack of comparative effectiveness research—research that tells us what works and what doesn't, especially when comparing two different treatments for the same illness. Most research done today only examines whether a certain service works compared to doing nothing—but doesn't indicate which works best among a range of possibilities. Comparative effectiveness research sometimes compares similar treatments, such as competing drugs, or a brand new drug versus a known generic. Or the research may compare very different therapies such as major surgery compared to just taking a medication.

But the provision of unnecessary services is not entirely due to lack of information; some services are overused or overprovided because of perverse financial incentives. Our current medical reimbursement system pays much more generously for high-tech, high-cost services while underpaying for primary care, prevention, and chronic illness management. We reimburse health care providers based on volume: more tests, more services, more money. This can be more expensive and dangerous.

Unnecessary services are inappropriate and potentially dangerous

We are fortunate to benefit from dramatic new advances in medicine that have undoubtedly saved and improved countless lives. But the new advancements do not always provide better care for everyone. Some of the reliable older treatment might still be the best choice for some patients.

Heart stents, for example, have saved numerous lives since their introduction, yet evidence now indicates that stents are being overused with some dangerous outcomes. The procedure for placing a stent is quite invasive: It requires an angioplasty, can be painful, and is not without side effects. A [study](#) published in the *New England Journal of Medicine* found that it is less expensive and just as effective to treat many heart attack patients with drugs instead of angioplasty with stent.² Researchers found that the stents were unnecessary in many cases and that those receiving the drug treatment only had a slightly longer life expectancy. [Other studies](#) found the overuse of unnecessary stents is leading to thousands of heart attacks and deaths each year.³ Unnecessary use of heart stents is also expensive—providing unnecessary stents to the [100,000 heart attack patients](#) in the United States that do not need them costs [\\$700 million](#) a year.⁴

Researchers estimate that the cost of overuse of spinal surgery for low back pain is even more expensive than stents, and exceeds [\\$11 billion](#) each year.⁵ Another [study](#) estimates that 70 percent of the women receiving a hysterectomy did not need this major abdominal surgery and would have benefited from less severe therapies.⁶ In this case nearly [450,000](#) women undergo an unnecessary surgery, which requires weeks of recovery, at the cost of an additional [\\$1.1 billion](#) each year.⁷

Unnecessary services are ineffective and overused

Researchers are finding that many procedures may be a waste of time and money. We know it's better—and cheaper—to get the treatment right the first time and no one wants to waste time getting a treatment that hasn't been shown to work. But that doesn't always happen.

One prime example is radiology services. Recent [studies](#) show that [20 percent to 50 percent](#) of medical imaging—a \$100 billion-a-year industry including CT, MRI, and PET scans—is unnecessary because the results do not help diagnose ailments or treat patients.⁸ It is generally not dangerous to get an extra X-ray, but researchers believe that the radiation from CT studies may account for between [1.5 percent and 2 percent](#) of cancer cases in the United States.⁹ The most striking thing about the overuse of radiologic imaging is the cost. Economists estimate that this overuse accounts for between [\\$18 billion and \\$33 billion](#) of overall health care spending.¹⁰

Another very expensive and systemic problem with the health system occurs when patients have to be rehospitalized because of care they did or did not receive while in the hospital or when they were discharged. The New England Journal of Medicine just reported that almost one fifth (19.6 percent) of Medicare beneficiaries were rehospitalized within 30 days of being discharged, and another 34 percent were rehospitalized within 90 days.¹¹ Over half of the patients never saw a doctor in the month after discharge. The extra hospitalization is both an inconvenience for patients and potentially a safety hazard. And it is very expensive for the Medicare program and the nation. The authors of that same study estimated that unplanned rehospitalizations cost Medicare \$17.4 billion in 2004.

Taking antibiotics for a common cold is another overused service that has no benefit to the patient. Antibiotics kill bacteria and are therefore completely ineffective in treating viral upper respiratory infections such as cold and flu. This treatment also costs the nation nearly \$550 million every year.¹² And excessive use of antibiotics has contributed to the emergence and spread of antibiotic-resistant bacteria in many communities.

We can promote better care at lower costs

In health care, more is not always better—and it's often worse. Who wants to have an unnecessary surgery? Who wants to take medicine that doesn't work? What these and the following examples suggest is that more medical care may actually be contributing to poorer health outcomes.

We must first learn what works and what does not in order to address the problem of unnecessary services. As Dr. Atul Gwande noted in the *New Yorker* and researchers have documented, there is less variation in services when the right treatment is well established. But all too often we just do not know what works best.¹³ Comparative effectiveness research will help provide guidance about which treatments, drugs, and devices work best for a given condition.¹⁴

We also need to change the payment system so that it compensates health providers based on quality rather than quantity. Today we get what we pay for. We pay for high-tech, high-volume services and we get a fragmented system of health care focused on specialty care rather than primary care. We need to move payment away from rewarding more tests and procedures and toward reimbursing primary care, care coordination, and prevention.

In order to measure better outcomes we will also need to invest in better health information technologies to help medical practices monitor patients and to keep track of how they are doing.¹⁵ Health IT systems should be designed in conjunction with payment reform policies. Health IT, if properly developed, has the potential to offer the health care team critical support in providing comprehensive preventive care, chronic-care disease management, improved care coordination across providers, and patient education.

Researchers at Dartmouth University have found that the areas of the country with the highest costs and highest volume of services have the poorest health outcomes.¹⁶ What's more, patients in areas of the country that deliver more expensive, high-tech services report less satisfaction with health care than patients in areas with lower spending.¹⁷ Health care reform provides us with an opportunity to get better care and better value by promoting more and better comparative effectiveness research, providing better financial incentives for health professionals, and encouraging better use of health IT. Our health and financial well-being depend on replacing the overprescription of unnecessary services with support for better care at lower costs.

Additional Examples

Inappropriate—and Potentially Hazardous—Procedures

Hysterectomies

A study in *Obstetrics and Gynecology* found that the majority of surgeries removing a women's uterus was completely unnecessary.¹⁸

Health: Up to 70 percent of hysterectomies performed have been judged as inappropriate by experts. This represents nearly 450,000 women who undergo major abdominal surgery and weeks of recovery.¹⁹

Cost: Unnecessary hysterectomies account for over \$1.1 billion of waste in spending.²⁰

Heart stents

Stents have saved countless lives, but evidence now indicates that in many cases stents are being overused with some dangerous outcomes. The procedure for placing a stent involves an angioplasty, is invasive, painful, and not without side effects. To place a stent, a catheter is routed up a large blood vessel in the groin and the wire stent is inserted and expands an artery.

A *NEJM* study in 2006 found that it is less expensive and just as effective to treat many heart attack patients with drugs instead of angioplasty with stent.²¹

Health: Not only did the researchers find that the angioplasty with stent was unnecessary in many cases, they also found slightly longer life expectancy for those with the drug treatment only.

Cost: The same authors calculated the costs associated with drug therapy compared to the unnecessary stenting.²² They estimated that 100,000 heart attack patients in the United States do not need stents, and this could translate to annual savings of \$700 million.²³

A January 2009 [study](#) published in *NEJM* shows that stents have been overused in situations where a simple blood-flow test could prevent unnecessary and potentially dangerous care.

Health: Researchers speculate that the use of stents when they are not necessary is leading to [thousands of heart attacks and deaths](#) each year.²⁴

A 2007 *NEJM* [study](#) compared the effects of two treatments: an angioplasty with a metal stent combined with a drug regimen versus the drug regimen alone.

Health: The [study](#) found that patients treated with angioplasty and a stent had better blood flow and fewer symptoms of heart problems initially, but the differences declined over time. More importantly, it found no differences between the two groups in survival rates or the occurrence of heart attacks over a five-year period.²⁵

Spinal-fusion surgery

A February 2004 [analysis](#) of spinal-fusion surgery published in *NEJM* concluded that its efficacy for the most common indications remains unclear.²⁶

Health: This type of back surgery leads to more complications than other types of spinal surgery.

Cost: Inappropriate spinal-fusion surgeries account for approximately [\\$11.1 billion](#) of waste in health care spending a year.²⁷ There were over [303,000](#) spinal-fusion surgeries in 2004, and the average hospital bill is over [\\$34,000](#), not including professional fees.²⁸ What's more, the amount Medicare spends on fusion surgeries has risen [500 percent](#) over a decade and now represents nearly half of the \$1 billion that Medicare spends on all spine surgeries.²⁹

Lung surgery

The *NEJM* reported on a [trial](#) in 2003 that compared the effects of lung volume surgery with standard medical therapy (medicines, oxygen, and pulmonary rehabilitation) for patients suffering from emphysema. This surgery had anecdotal support but lacked hard evidence about its effectiveness.

Health: Lung surgery increased many patients' risk of death slightly and [did not improve their functional status](#).³⁰

Antihypertensive drugs

A landmark [eight-year study](#) published in the *Journal of the American Medical Association* in 2002 found "that relatively inexpensive blood-pressure-lowering drugs, known as diuretics, worked better than newer, more expensive calcium channel blockers and ACE inhibitors."³¹

Health: During the course of the study the researchers had to stop comparing one of the newer drugs since it caused substantially more cardiovascular problems, especially hospitalizations for heart failure compared to the others.

Cost: Older diuretic drug use declined from 56 percent to 27 percent of antihypertensive prescriptions between 1982 and 1992. If the treatment remained at the 1982 level, the health care system would have saved \$3.1 billion over those 10 years.

Arthroscopic surgery for osteoarthritis

NEJM published a study of a trial in 2008 that compared arthroscopic knee surgery for osteoarthritis patients with physical therapy and medication.

Health: The researchers found that arthroscopic surgery for these patients provides no additional benefit compared to traditional medical care.³² Knee surgery was in fact an unnecessary surgery that did not help these patients.

Cost: The nation spends over \$2 billion annually on arthroscopic knee surgery for people with osteoarthritis—a surgery we now know does not help these individuals.

Overused services and procedures

Use of antibiotics for the common cold

Antibiotics kill bacteria and are therefore completely ineffective in treating viral upper respiratory infections (cold and flu). Using these unnecessary drugs costs the nation nearly \$550 million annually.³³

Overuse: The Commonwealth Fund's National Scorecard on U.S. Health System Performance finds that 35 percent of children with a sore throat are potentially inappropriately prescribed antibiotics.³⁴ Each year in the United States, an estimated 50 million antibiotic prescriptions are for illnesses such as colds or flu for which antibiotics offer no benefit.³⁵

Health: The excessive use of antibiotics has contributed to the emergence and spread of antibiotic-resistant bacteria in many communities. Antibiotic resistance is causing fewer drugs to be effective to treat many infectious diseases. The remaining alternative drugs may be less effective, more expensive, and more difficult to administer.³⁶

Cost: The unnecessary use of antibiotics accounts for up to \$550 million in wasted spending each year. In addition, the rise in antibiotic-resistant bacteria demands the development of new kinds of treatments for superbugs.

Prostate cancer screening

A recent study in *NEJM* on the effectiveness of prostate cancer screening versus a prostate-specific antigen (PSA, a blood test) showed that the rate of death from prostate cancer was very low and did not differ significantly between the group that received an annual PSA test and the group that received usual care.³⁷

Overuse: Only 25 percent of men who have a positive PSA test turned out to have prostate cancer.³⁸ This means that three out of four of the men who had positive tests were “false” positives.

Health: Men who had false-positive results had to go through intensive follow-up procedures, including invasive biopsies, that have their own side effects.³⁹

Cost: In addition to the cost of the initial screening, there are the additional costs from the follow-up screenings.

Medical imaging

Recent studies show that 20 percent to 50 percent of medical imaging—a \$100 billion-a-year industry including CT, MRI, and PET scans—are unnecessary because their results do not help diagnose ailments or treat patients.⁴⁰

Overuse: Diagnostic imaging services delivered in Medicare grew more rapidly than any other type of physician service between 1999 and 2003. Physician services grew on average 22 percent in those years, but imaging services grew by 45 percent—twice as fast. Some specific services grew even faster: MRIs grew by 99 percent, and CT scans grew 82 percent.⁴¹ The Commonwealth Fund also found about one quarter of imaging services for lower-back pain were potentially inappropriate. The National Scorecard on U.S. Health System Performance finds that 26 percent of adult private health plan members and 22 percent of Medicaid recipients received an unnecessary imaging study within the month following an acute low back pain episode.⁴²

Health: Radiation from CT studies may account for between 1.5 percent and 2 percent of cancer cases in the United States.⁴³

Cost: Overuse of noninvasive radiologic imaging accounts for between \$18.2 billion and \$33.3 billion in overall health care spending waste.⁴⁴ Even the private sector concurs. A group of medical insurers led by WellPoint and Magellan Health Services claim that medical scans waste \$30 billion a year (specifically noted are MRIs and CT scans).⁴⁵ Indeed, Medicare spending for imaging services grew over 60 percent in only four years from \$5.7 billion in 1999 to \$9.3 billion in 2003.⁴⁶

Preventable unnecessary hospital readmissions

NEJM just this year reported that almost one-fifth (19.6 percent) of Medicare beneficiaries who had been discharged from a hospital were rehospitalized within 30 days, and another 34.0 percent were rehospitalized within 90 days.⁴⁷ Over half of the patients *never* saw a doctor in the month after discharge.

Cost: Unplanned rehospitalizations cost Medicare \$17.4 billion in 2004.

Endnotes

- 1 Orszag, Peter R. "Testimony of Peter R. Orszag, Director of the Office of Management Ad Budget, before the Committee on Finance, U.S. Senate." 2009. Wennberg, John E., Elliott S. Fisher, and Jonathan S. Skinner. "Geography and the Debate over Medicare Reform." *Health Affairs* Web Exclusives, (2002): w96-w114.
- 2 Hochman, Judith S. et al. "Coronary Intervention for Persistent Occlusion after Myocardial Infarction." *New England Journal of Medicine (NEJM)* 355, no. 23 (2006): 2395-407. <http://content.nejm.org/cgi/content/abstract/NEJMoa066139>
- 3 Tonino, Pim A., et al. "Fractional Flow Reserve Versus Angiography for Guiding Percutaneous Coronary Intervention." *New England Journal of Medicine (NEJM)* 360, no. 3 (2009): 213-24. <http://content.nejm.org/cgi/content/abstract/360/3/213>; Marchione, Marilyn. "Overuse of Stents in Heart Cases Reported." *The Boston Globe*, 2009. http://www.boston.com/news/nation/articles/2009/01/15/overuse_of_stents_in_heart_cases_reported/
- 4 Mark, Daniel B. et al. "Quality of Life after Late Invasive Therapy for Occluded Arteries." *New England Journal of Medicine (NEJM)* 360, no. 8 (2009): 774-83. <http://content.nejm.org/cgi/content/short/360/8/774>; Avery, Sarah. "Drugs Can Save Hearts and Cash." *The News & Observer*, 2009. http://www.newsobserver.com/news/health_science/story/1411073.html
- 5 Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 6 Broder, Michael S. et al. "The Appropriateness of Recommendations for Hysterectomy." *Obstetrics and Gynecology* 95, no. 5 (2000): 199-205.
- 7 "Are Most Hysterectomies Unnecessary?: Is a Turf War Compromising Women's Medical Care?." *ABC News*, 2004. <http://abcnews.go.com/2020/Story?id=124229&page=1>; Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 8 Iglehart, John K. "Health Insurers and Medical-Imaging Policy -- a Work in Progress." *New England Journal of Medicine (NEJM)* 360, no. 10 (2009): 1030-37. <http://content.nejm.org/cgi/content/short/360/10/1030>; Kolata, Gina. "Good or Useless, Medical Scans Cost the Same." *The New York Times*, 2009. <http://www.nytimes.com/2009/03/02/health/02scans.html>
- 9 Brenner, David J., and Eric J. Hall. "Computed Tomography -- an Increasing Source of Radiation Exposure." *New England Journal of Medicine (NEJM)* 357, no. 22 (2007): 2277-84.
- 10 Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 11 Jencks, Williams, and Coleman (2009) Rehospitalizations among Patients in the Medicare Fee-for-Service Program, *NEJM*, April 2, 2009, Volume 360 Number 14:1418-1428.
- 12 Bentley, Tanya G., Rachel M. Effros, Kartika Palar, and Emmett B. Keeler.(2008) "Waste in the U.S. Health Care System: A Conceptual Framework." *The Milbank Quarterly* 86, no. 4 (2008): 629-59.
- 13 Gawande, A. (2009). The Cost Conundrum, What a Texas town can teach us about health care. *The New Yorker*: Sirovich, B., P. M. Gallagher, et al. (2008). "Discretionary Decision Making By Primary Care Physicians And The Cost Of U.S. Health Care." *Health Affairs* 27(3): 813-823.
- 14 Ellen-Marie Whelan "Better Information, Better Decisions: Comparative Effectiveness Research Will Help Us Make Better Health Decisions" (Washington: Center for American Progress, 2009) available at http://www.americanprogress.org/issues/2009/04/better_information.html
- 15 Todd Park and Peter Basch, "A Historic Opportunity: Wedding Health Information Technology to Care Delivery Innovation and Provider Payment Reform" (Washington: Center for American Progress, 2009), available at http://www.americanprogress.org/issues/2009/05/health_it.html.
- 16 Fisher, Elliott, David Goodman, and Jonathan Skinner. "The Policy Implications of Variations in Medicare Spending Growth." The Dartmouth Institute for Health Policy & Clinical Practice, 2009.
- 17 John E. Wennberg, Kristen Bronner, Jonathan S. Skinner, Elliot S. Fisher, and David C. Goodman "Inpatient Care Intensity And Patients' Ratings of Their Hospital Experiences" (Health Affairs, 2009)
- 18 Broder, Michael S. et al. "The Appropriateness of Recommendations for Hysterectomy." *Obstetrics and Gynecology* 95, no. 5 (2000): 199-205.
- 19 <http://abcnews.go.com/2020/Story?id=124229&page=1>
- 20 Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 21 Hochman, Judith S. et al. "Coronary Intervention for Persistent Occlusion after Myocardial Infarction." *New England Journal of Medicine (NEJM)* 355, no. 23 (2006): 2395-407. <http://content.nejm.org/cgi/content/abstract/NEJMoa066139>
- 22 Mark, Daniel B. et al. "Quality of Life after Late Invasive Therapy for Occluded Arteries." *New England Journal of Medicine (NEJM)* 360, no. 8 (2009): 774-83. <http://content.nejm.org/cgi/content/short/360/8/774>
- 23 Avery, Sarah. "Drugs Can Save Hearts and Cash." *The News & Observer*, 2009. http://www.newsobserver.com/news/health_science/story/1411073.html
- 24 Tonino, Pim A., et al. "Fractional Flow Reserve Versus Angiography for Guiding Percutaneous Coronary Intervention." *New England Journal of Medicine (NEJM)* 360, no. 3 (2009): 213-24. <http://content.nejm.org/cgi/content/abstract/360/3/213>; Marchione, Marilyn. "Overuse of Stents in Heart Cases Reported." *The Boston Globe*, 2009. http://www.boston.com/news/nation/articles/2009/01/15/overuse_of_stents_in_heart_cases_reported/
- 25 William E. Boden and others, "Optimal Medical Therapy With or Without PCI for Stable Coronary Disease," *The New England Journal of Medicine*, vol. 356, no. 15 (April 12, 2007), pp.1503-1516. CBO "Research on the Comparative Effectiveness of Medical Treatments." Congressional Budget Office (CBO), 2007. pg 12
- 26 Deyo, Richard A., Alf Nachemson, and Sohail K. Mirza. "Spinal-Fusion Surgery -- the Case for Restraint." *New England Journal of Medicine (NEJM)* 350, no. 7 (2004): 722-26.
- 27 Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 28 Appleby, Julie. "Back Pain Is Behind a Debate." *USA Today*, 2006. http://www.usatoday.com/money/industries/health/2006-10-16-back-pain-usat_x.htm
- 29 Wang, Shih-Tien et al. "Is Fusion Necessary for Surgically Treated Burst Fractures of the Thoracolumbar and Lumbar Spine?: A Prospective, Randomized Study." *Spine* 31, no. 23 (2006): 2646-52.
- 30 National Emphysema Treatment Trial Research Group, "A Randomized Trial Comparing Lung-Volume-Reduction Surgery with Medical Therapy for Severe Emphysema," *The New England Journal of Medicine*, vol. 348, no. 21 (May 22, 2003), pp. 2059-2073. "Research on the Comparative Effectiveness of Medical Treatments." Congressional Budget Office (CBO), 2007. pg 13
- 31 The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research "Major Outcomes in High-Risk Hypertensive Patients Randomized to Angiotensin-Converting Enzyme Inhibitor or Calcium Channel Blocker Vs Diuretic: The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (Allhat)." *Journal of the American Medical Association (JAMA)* 288, no. 23 (2002): 2981-97. The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research "Major Outcomes in Moderately Hypercholesterolemic, Hypertensive Patients Randomized to Pravastatin Vs Usual Care." *JAMA* 288, no. 23 (2002): 2998-3007.
- 32 Carey, John. "Is Roche Buying Genentech's Ills?; Roche's \$46.8 Billion Acquisition Makes Sense at First. But Insurers May Balk at Covering Some of Genentech's Expensive New Cancer." *Business Week Online*, 2009. http://www.businessweek.com/technology/content/mar2009/tc20090312_235221.htm. Kirkley, Alexandra, et al. "A Randomized Trial of Arthroscopic Surgery for Osteoarthritis of the Knee." *New England Journal of Medicine (NEJM)* 359, no. 11 (2008): 1097-107. <http://content.nejm.org/cgi/content/full/359/11/1097>
- 33 Bentley, Tanya G., Rachel M. Effros, Kartika Palar, and Emmett B. Keeler. "Waste in the U.S. Health Care System: A Conceptual Framework." *The Milbank Quarterly* 86, no. 4 (2008): 629-59.
- 34 Commonwealth Fund National Scorecard on U.S. Health System Performance "Potentially Inappropriate Antibiotic Prescribing for Children with Sore Throat." 2008. <http://www.commonwealthfund.org/Content/Charts/Report/Why-Not-the-Best-Results-from-a-National-Scorecard-on-U-S-Health-System-Performance/P/Potentially-Inappropriate-Antibiotic-Prescribing-for-Children-with-Sore-Throat.aspx>

- 35 "Health Experts Issue 'Principles for Appropriate Antibiotic Use' For Adults with Upper Respiratory Infections." Centers for Disease Control and Prevention (CDC), 2001.
- 36 Ibid.
- 37 Andriole, Gerald L, et al. "Mortality Results from a Randomized Prostate-Cancer Screening Trial." *New England Journal of Medicine (NEJM)* 360, no. 13 (2009): 1310-19. Lee, TH, PW Kantoff, and MF McNaughton-Collins. "Screening for Prostate Cancer." *New England Journal of Medicine (NEJM)* 360, no. e18 (2009).
- 38 Mayo Clinic Staff. "Prostate Cancer Screening: Should You Get a Psa Test?" <http://www.mayoclinic.com/health/prostate-cancer/HQ01273>. <http://www.mayoclinic.com/health/prostate-cancer/HQ01273>
- 39 Fact Sheet: Prostate-Specific Antigen (PSA) Test. National Cancer Institute, National Institutes of Health. <http://www.cancer.gov/cancertopics/factsheet/detection/PSA>.
- 40 Lopatto, Elizabeth. "False Positives Common on Cancer Tests, Scientists Find." *Bloomberg*, 2009. <http://www.bloomberg.com/apps/news?pid=20601124&sid=areU4ct5H4F0&refer=home>. Iglehart, John K. "Health Insurers and Medical-Imaging Policy -- a Work in Progress." *New England Journal of Medicine (NEJM)* 360, no. 10 (2009): 1030-37. <http://content.nejm.org/cgi/content/short/360/10/1030>. Kolata, Gina. "Good or Useless, Medical Scans Cost the Same." *The New York Times*, 2009. <http://www.nytimes.com/2009/03/02/health/02scans.html>
- 41 MedPAC "Report to the Congress: Medicare Payment Policy." Medicare Payment Advisory Commission (MedPAC), 2009.
- 42 "The National Scorecard on U.S. Health System Performance." The Commonwealth Fund, 2008. <http://www.commonwealthfund.org/Content/Publications/Fund-Reports/2008/Jul/Why-Not-the-Best-Results-from-the-National-Scorecard-on-U-S-Health-System-Performance--2008.aspx>
- 43 Brenner, David J., and Eric J. Hall. "Computed Tomography -- an Increasing Source of Radiation Exposure."
- 44 Bentley, Tanya G. et al. "Waste in the U.S. Health Care System: A Conceptual Framework."
- 45 Goldstein, Avram. "Medical Scans Waste \$30 Billion a Year, Insurers Say." *Bloomberg*, 2008.
- 46 Miller, Mark E. "Medpac Recommendations on Imaging Services, before the Subcommittee on Health, Committee on Ways and Means, U.S. House of Representatives." March 17, 2005.
- 47 Jencks, Stephen F., Mark V. Williams, and Eric A. Coleman. "Rehospitalizations among Patients in the Medicare Fee-for-Service Program." *New England Journal of Medicine (NEJM)* 360, no. 14 (2009): 1418-28.