

Exploring the Harmful Effects of Health Care

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WHILE VARIOUS FORMS OF HARM RESULTING from health care are well known, the full nature of such harm and the magnitude of health care's aggregate adverse health effects deserve more exploration. On balance, the data remain imprecise, and the benefits that US health care currently deliver may not outweigh the aggregate health harm it imparts. In this Commentary, we discuss potential harms from health care, suggest a taxonomy for health care harm, and suggest that investigators start addressing this issue.

This concern is raised with great respect for health care professionals. To be sure, ill intent is rare, and many health services are effective. Nonetheless, it is time to address the possibility of net health harm by elucidating more fully aggregate health benefits and harms of current health care. This information should help clinicians, health care leaders, policy experts, and politicians improve health outcomes by allowing more explicit consideration of the trade-offs involved in health interventions and expenditures, and help guide health care reform efforts.

Unlike health, health care is not an unalloyed good. Fisher¹ estimates that perhaps one-third of medical spending is for "services that don't appear to improve health or the quality of care—and may make things worse." Although health care contributes to health through disease prevention and treatment, the aggregate effect on health may be smaller than generally assumed.

Determinants of well-being transcend health care. They include the complex interaction over time between genetics, social circumstances, education, income, housing, public safety, job satisfaction, behavioral patterns, and environmental quality, in addition to access to appropriate health care services.² For example, since health care contributes only about 10% toward reducing premature death, even a perfectly designed delivery system would prevent only a modest proportion of premature death.³

A Taxonomy of Health Harm

Harm may occur as a direct or indirect consequence of health care. Direct harm includes adverse physical and emotional

effects, generally to individuals, as a by-product of health care delivery. Indirect harm is a collateral effect on individuals and communities not directly involved in care. Indirect harm is closely associated with excess health care costs, which may induce harm by competing with other health-producing services.

Direct Harm

Physical Harm. Physical harm is a by-product of routine care processes. Some aspects of physical harm (eg, adverse drug effects and medical errors) are better known than others (eg, untoward effects of radiation from computed tomography). Although physical harm is an accepted risk of treatment with increasingly powerful medications and interventions, much consequent harm is avoidable when treatments are overused or used without sufficient evidence of effectiveness.

Some overtreatment happens when physicians lack evidence about the ineffectiveness or risks of a treatment. For example, encainide and flecainide were widely used before their harmful effects were elucidated and more than 50 000 individuals were estimated to have died from their cardiovascular effects.⁴ Rofecoxib had a similar trajectory. Medication harm may become apparent only long after widespread use.

Data on the safety and efficacy of procedures or devices may be similarly delayed. The Swan-Ganz pulmonary artery catheter was introduced in 1970 for hemodynamic management. In the 1990s, an estimated 1.2 million were sold annually at a cost of approximately \$2 billion.⁵ Although studies suggested that patients fared worse with them, it took until 2005 to clearly demonstrate their lack of benefit even in patients with severe heart failure.⁶ Demonstrating the lack of utility took decades, while consuming substantial resources and adversely affecting many individuals.

Similarly, percutaneous coronary intervention is likely being overused in the Medicare population.⁷ Contrary to national guidelines, more than half of Medicare patients with stable coronary disease lack noninvasive documentation of ischemia before elective percutaneous coronary intervention.

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End-of-life care provides another example of medical excess. One study found that only 30% of hospitalized patients older than 80 years wanted care to prolong life, but 63% received life-prolonging care such as intensive care unit admissions, intubation, surgery, and dialysis.⁸ Wide variation exists in end-of-life care. Comparing the most with the least expensive academic medical centers, average Medicare spending ranged from \$53 432 to \$93 842 in the last 2 years of life and from \$28 763 to \$52 911 in the last 6 months of life.⁹ The variation was due to the volume of services provided, not the price per service or patient preference.

Although the potential for harm is substantial, both physicians and patients generally embrace technology enthusiastically—implicitly trusting in its benefit before adequate assessment is made. However, higher-intensity care generally does not improve survival, and complications of medical care accounted for 1.1 million hospitalizations in 2006—costing nearly \$42 billion.¹⁰ Medicare spending shows wide per-capita variability across the United States, with patients receiving 60% more care in high-cost than in low-cost cities. Paradoxically, patients in higher-cost cities are more likely to die of colon cancer, myocardial infarction, and hip fracture.¹¹

Emotional Harm. Unnecessary care can also cause emotional harm, including anxiety from testing or treatment and from creating inappropriate expectations. Emotional harm, although less well studied than physical harm, has important effects on patient well-being.

A diagnosis of hypertension made through screening resulted in more office visits and sick role behavior without improved medication adherence or blood pressure control.¹² Spinal magnetic resonance imaging often reveals alarming but clinically irrelevant findings, and adults with back pain who receive magnetic resonance imaging results may experience worse dysfunction than those not given the results. Likewise, many unproven screenings, such as the prostate-specific antigen test, remain commonly used; although relatively inexpensive and often sought by patients, they are unlikely to help and may induce harm, including anxiety associated with false-positive results. Exaggerated fears and “medicalizing” normal phenomena are as harmful as unrealistic expectations and are fostered frequently by marketing hype and sometimes inadvertently by health care clinicians.

Indirect Harm

Indirect harm is a by-product of health care, usually by health care expenditures that are excessive or of low clinical value. Its magnitude may outweigh that of direct harm, but it is seldom apparent to those who create it or whom it affects.

“Opportunity cost” is the trade-off made when deciding how to allocate resources. When financial resources are limited, as they generally are, deciding to buy one product or service may preclude buying another that might provide

greater benefit. Providing an expensive intervention of marginal value to one patient may deprive many others of less expensive care that is more effective. Understanding such trade-offs is critical to ensuring that resources are used to achieve the greatest benefit.

Analyzing opportunity cost requires comparing costs vs effectiveness of different spending options. Such analyses often compare medical interventions, but rarely weigh them against other interventions to address the social or behavioral determinants of health. Health care may cause indirect harm by diverting resources from other determinants of health, such as education, environmental quality, jobs, and income.

For example, the cost-effectiveness of education likely exceeds that of many health care interventions.¹³ Health care and education increasingly compete in national and state budgets. By diverting money from education, excess health care spending may risk worsening population health.

Likewise, health care costs adversely affect household finances. The average family now spends more of its disposable income on health care than on housing, food, or clothing.¹⁴ In 2007, 62% of personal bankruptcies were due to health care costs, with 92% of those individuals having medical debts greater than \$5000, or 10% of pretax family income. Because personal finances strongly affect the health of individuals and families, health care’s untoward effect on personal finances may degrade health.

US health care spending totaled approximately \$2.5 trillion in 2008, accounting for nearly 17% of the gross domestic product, and is projected to reach 20% by 2016. Despite these resources, an estimated 46 million individuals (about 15% of the population) lack health insurance and 25 million more are underinsured. Increasing health care costs increase the numbers of uninsured and underinsured—a 1% increase in insurance premiums leads to an estimated 300 000 individuals losing coverage, thus adversely affecting health.

Government spending on health care diverts funds from other health-producing services. In 2007, the federal government spent approximately 28% of its total revenue on health care.¹⁵ Medicaid spending accounts on average for approximately 22% of state expenditures, compared with 21% for K-12 education, 10% for higher education, and 8% for transportation. Aggregate state spending on Medicaid increased from \$89 billion in 2000 to \$151 billion in 2007, leaving less money for education and infrastructure needs.

Although health care’s objective should be to improve health, its primary emphasis has been on producing services. Health care lacks sufficient measures to assess its influence—either positive or negative—on health at the individual or community level. To ensure appropriate distribution of resources relative to other health-producing investments, it is crucial to understand how the health-producing effects of health care interventions vary. Educa-

tion, living wages, health insurance, and a safe environment are important determinants of health, much like smoking cessation or cancer treatment.

The possibility that health care might cause net harm is increasingly important given the sheer magnitude of the modern health care enterprise. Serious review of these issues will likely challenge assumptions about the value of many current health care practices. It will require more disciplined measurement of both health benefit and harm. Health care influences both the duration and quality of life, which must be measured and weighed against other health determinants if spending priorities are to be rationalized.

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