

Surgical Streams in the Flow of Health Care Financing

The Role of Surgery in National Expenditures: What Costs Are Controllable?

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The dollar flow in United States medical care has been analyzed in terms of a six-level model; this model and the gross 1981 flow data are set forth. Of the estimated \$310 billion expended in 1981, it is estimated that \$85–\$95 billion was the “surgical stream”, *i.e.*, that amount expended to take care of surgical patients at a variety of institutional types and including ambulatory care and surgeons’ fees. Some of the determinants of surgical flow are reviewed, as well as controllable costs and case mix pressures. Surgical complications, when severe, increase routine operative costs by a factor of 8 to 20. Maintenance of high quality in American surgery, despite new manpower pressures, is the single most important factor in cost containment. By voluntary or imposed controls on fees, malpractice premiums, case mix selection, and hospital utilization, a saving of \$2.0–\$4.0 billion can be seen as reachable and practical. This is five per cent of the surgical stream and is a part of the realistic “achievable” savings of total flow estimated to be about \$15 billion or 5 per cent.

THE TOTAL FLOW OF DOLLARS in United States health care can be analyzed in terms of several economic models. We have proposed a simple six-level model. Whatever model one adopts, such analytic modeling is essential to assess expenses or proposed economies as well as their relation to other social or political options.

The United States expenditure for medical care is not a “budget” voted by any responsible body or enacted by some state health system. It is instead a flow of funds from many sources, expended for various aspects of the health care system. Medical care conforms to a “flow-through” economic model; there is no inventoried product at the end; there is no commodity output and very

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little (only about 1%) capitalized increment. All the money entering the system (about 99%) emerges from it in different hands and returns to the national economy. The health care funds are thus expended in a sequential set of resource redistributions in return for goods and services and then returned to the uncommitted national economy.

The six levels of this flow may be described briefly as follows.

The Six-Level Model

Level 1: Source. Monies expended for clinical care, teaching, and research (*i.e.*, the biomedical establishment) arise from four main sources: *government* (as federal, state, or local tax monies), private or corporate *current earnings*, private capital *investment*, and *philanthropy*.

Level 2: Transfer Modes to Providers. These funds are then distributed *via* three conduits for their first order expenditure. The first of these conduits is *brokerage*, the agencies—often called “third party payors”—that take money from prospective customers or patients, hold it, and then expend it for care by the providers. This medical brokerage includes all the health insurance companies, Blue Cross/Blue Shield, and many government bureaus such as Veterans, Medicare, and Medicaid. The second conduit is *direct pay*, being those monies that pass (without brokerage) directly from personal or patient funds to those who provide drugs or care. Third is *administrative costs* of the insurance companies, bureaus and brokers, and the internal costs of government programs, either federal, state, or local.

Level 3: Provider Budgets. The second order expenditure of the funds is now carried out by passing them through the operating budgets of four categories of care

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providers. Largest among these are two: the *hospitals and the nursing homes* of the country, who expend approximately two-thirds of the flow. Second in magnitude are the *practices of physicians and dentists*. It has been a common error in the past to regard these practices as the incomes of physicians and dentists. Instead, they are the aggregate budgets by which practice is carried out including expenditures for rent, office space, instruments, insurance coverage, secretarial or nursing help, etc., as well as the take-home pay of the professionals. Third are the total of all *other providers*, including freestanding ambulatory care centers, HMOs, drugstores, and appliance sales directly to patients, and other paraprofessional practitioners or cults such as psychologists, osteopaths, and chiropractors. Lastly, this level includes payments from the *administrative* expense budgets and profits of brokers (third party payor, including private insurers) and bureaus of government.

Level 4: Personnel and Vendors. Here at the third order resource distribution or "expenditure" of these funds, the dollars find their way *via* the above-mentioned provider budgets to two large repositories, "hiring and buying." First are *personnel*. These are not only the health care personnel themselves (such as physicians, dentists, nurses, physicians' assistants, etc.) but also their administrative counterparts, such as hospital administrators, government bureau administrators, including the salaries and wages of all the less skilled employees of these hospitals, nursing homes, and other health agencies. Personnel ultimately received about two-thirds of the total flow. The second category is the purchase of *goods and services* from the firms (vendors) who provide everything from supplies and food to money (on which interest is paid), legal services, insurance, real estate, and construction.

Level 5: Final Distribution of Funds. As the money has now been "expended" for health care services, it begins to find its way back into the national economy through several channels: *investment*, including net system growth (*i.e.*, the construction of new hospitals or nursing homes) and the purchase of retirement annuities; *personal income tax*, *corporate taxes*; *living expenses* of individuals; and the *income of vendors*. These latter two represent a large portion (70–75%) of the total. The first are those expenses paid for out of the *disposable income of individuals* for the education of their children, living expenses, investment and retirement annuities, etc. Second are the *purchase of goods, products, and services*, such as fuel oil, food, surgical or medical instruments, money (on which providers pay interest) insurance, legal advice, construction costs, and insurance. These goods and services are purchased by all providers in order to take care of patients. Drugs are purchased by direct patient funds.

Level 6: Return To Source. The funds now return to the national economy from which they came and can be considered as falling into three main repositories: *national wealth* (including net system growth—about 1% of the total), *governments* (as tax), and *disposable income* expended as a portion of the gross national product, as previously mentioned.

Important constraints should characterize any such flow-through model: the same amount of money must be accounted for at each level. In addition, in adapting figures available for any fiscal year, one must use as much hard data as possible, employing "residuals" for the fewest possible items or dollars.

Our initial exploration of the practical nature of this model was in using it to evaluate the flow of funds for the year 1981. This is the most recent year for which complete data are now available. In that year, the Division of National Health Accounts of HCFA calculated \$286.6 billion as expended in the national health care establishment. It is this figure that is so often quoted as a fraction of the gross national product (9.7%), although of course some of these funds do not arise from the gross national product itself, but instead from the national wealth, investments, real estate, etc. It is in this very category of private investment and bond issues that the national health accounts are not all-inclusive. There is strong evidence that at least \$20 billion and probably as much as \$30 billion additional was spent that year in the form of private capital formation in the health industry. It is this sum (estimated as an additional \$23.4 billion) that yields our figure for total national fiscal flow in 1981 of \$310 billion. Table 1 summarizes the dollar amounts involved in this flow for the year 1981, according to our best estimates.*

The National Health Accounts figures for 1982 are now available at \$322 billion. By our calculation this would be slightly (about 9%) greater (\$350 billion) if private capital and investment are counted. The figures for 1983 will soon be available and will show some continued growth, though possibly not as great.

In this article I would like to explore the nature and estimated magnitude of the surgical component of this national flow and some of the practical, theoretical, and moral aspects of efforts at so-called "cost containment" or reduction in the flow, as applied to surgery.

* A more detailed account of this model and its many ramifications is in preparation. The 1981 data are drawn primarily from the work of Gibson and Waldo, at the HCFA National Health Accounts Unit in Bethesda, MD. Their publications for 1981 (1) and 1982 (2) are basic to any analysis of this sort. In addition, many other sources have been drawn upon for details, a few of which are shown in the bibliography as references 3 to 10. The model with detailed resource lists for entry figures will be published separately.¹¹

TABLE 1. *The Six-Level Model of U.S. Health Expenditure; 1981 Data*

Level I. Source of Funds (\$310 billion): Federal Tax \$84 billion (27%), State and Local Tax \$39 billion (13%), Earnings \$164 billion (53%), Investment & Loans \$16 billion (5%), Philanthropy \$7 billion (2%)
Level II: Transfer Modes (\$310 billion): Private Capital and Philanthropy to Provider \$23 billion (7%), Direct Pay Pass Through to Provider \$85 billion (27%), Brokers \$202 billion (66%)
Level III: Provider Budgets (\$310 billion): Administrative Costs of Brokers and Bureaus \$11 billion (4%), Direct Pay Pass Through to Vendors (Drugs) \$29 billion (9%), Practices of Physicians and Dentists \$72 billion (23%), Budgets of Provider Institutions \$198 billion (64%)
Level IV. Personnel and Vendor Aggregates (\$310 billion): Personnel—\$196.2 billion (63%) (Take Home Pay and Benefits), Administrative Including Hospitals \$16 billion (8%), Physicians and Dentists \$51 billion (26%), Nurses \$47 billion (24%), Salaries and Wages \$82.2 billion (42%), Vendors—\$113.8 billion (37%) (Goods and Services)
Level V. Final Distribution (\$310 billion): Investment and Retirement \$32.7 billion (10%), Personal Income Tax \$47.8 billion (16%), Corporate Income Tax \$2.8 billion (1%), Living Expenses (Disposable Income) \$158.4 billion (51%), Social Resources \$68.3 billion (22%)
Level VI. Return to Source (\$310 billion): National Wealth \$35.7 billion (11%), Government as Tax \$50.6 billion (17%), Social Resources of All Types (Disposable Income, Goods and Services) \$223.7 billion (72%)

TABLE 2. *An Estimate of Surgical Streams in Total Dollar Flow (1981)*

	Totals	Surgical Estimates
Acute Care Hospital Budgets		
Total	\$122.0 billion	
Surgical (60%)		\$73.2 billion
Nursing Home Budgets		
Total	24 billion	
Surgical (3%)		0.72 billion
Practice Charges of Physicians and Dentists		
Total	72 billion	
Surgical (20%)		14.4 billion
Brokers and Bureau Costs		
Total	11 billion	
Surgical (10%)		1 billion
All Other Provider Budgets		
Total	81 billion	
Surgical (6%)		5 billion
TOTAL SURGICAL (30%)	\$310 billion	\$94.3 billion
Take Home Pay of Surgeons and Benefits		
Total Take Home Pay of Physicians and Dentists (Including Residents and Fellows)		\$51 billion
Take Home Pay and Benefits of Surgeons (20%)		10.0 billion
(Alternative Calculation:)		
Total Surgical Practice Incomes		\$14.4 billion
Take Home Pay and Benefits Fraction of Practice Income (57%)		8.2 billion

Surgical Fraction of the Mainstream

According to Brandt, Undersecretary for Health, approximately 250 persons per thousand population will visit a physician and 120 will be hospitalized in any 1 year.¹² Of these, ten will die and 80 to 90 will be operated upon. It is the cost of this inhospital operative surgery that is the most easily quantified aspect of the surgical stream. Softness in numbers for total operations relates to the extent to which minor, ambulatory or office surgery, and dental surgery (extractions) are to be included. In addition to operative surgery, office practice must be included, although in surgery it is small compared with other fields more involved with office and nursing home care, such as ambulatory medicine, psychiatry, and pediatrics. In the field of long-term care for mental retardation, chronic hospitalization for neurologic disease, and nursing home care, surgery is a vanishingly small fraction of the total.

Based on the above, our estimate for the total surgical fraction of the national flow is \$90 billion (\$85–\$95 billion) or about 30% of the flow as shown in Table 2. This aggregate estimate of \$85–\$95 billion for the surgical component of total U.S. dollar flow in health is *not* the personal earnings of surgeons (see below). It is the total cost of caring for surgical patients; surgeons' earnings, hospital, and practice expenses are all included. These surgical expenditures can be grouped under five headings: *acute care hospitals, nursing homes, practices, broker and bureau administrative costs, and all other provider budgets.* Surgical estimates for this fractionation are shown in Table 2.

Discussion*A. COSTS AND CONTROLS**Case Mix as a Determinant of Surgical Dollar Flow; The Epidemiology of Surgical Care*

An important determinant of surgical dollar flow lies in the clinical case mix of patients cared for by surgeons. Over the short term, there is a rather fixed epidemiology of surgical care, a definable and satiable social need. This constancy is possibly best demonstrated by the fact that the 50 most common operations in the United States occupy about 75%–85% of total surgical work and change very little from year to year. Furthermore, a surprisingly large number of these operations are employed for the treatment of one specific disease (*i.e.*, vagotomy, mastectomy, coronary bypass, hip replacement, prostatectomy, and stapedectomy). Therefore, the societal need for these operations is determined by the frequency of these diseases in the population. The list of operations performed in a hospital changes little from

year to year. In the case of most community hospitals such changes, when they do occur, are due to the arrival (or the departure) of a specialist in some one field of work.

In contrast to this short range constancy, the kinds of patients taken care of by surgeons vary noticeably over decades. Any surgeon of the older generation remembers well the high frequency of carcinoma of the stomach and rarity of carcinoma of the pancreas 40 years ago; now the curves have crossed. The advent of cardiac surgery, joint replacement, retinal detachment surgery, middle ear surgery, extensive surgery of the liver, lungs, open heart surgery, and transplantation all demonstrate this dynamic.

At the local community hospital, variations in case mix—no matter how infrequent—produce sudden massive changes in cost. An example is the arrival of a 60% burn at a community hospital, mandating the expenditure of large amounts of money and the subsequent repayment of these funds from brokerage (Medicare, Medicaid, Blue Cross Blue Shield). Such an event might not be repeated at that hospital again for several years. Possibly the hospital will transfer the patient, but the mandate for expenditure remains.

Capital Costs; Overhead for Surgical Capability

The surgeon carrying out major operations in a hospital has a uniquely low overhead. It is the hospital that invests in the expensive panoply of operating room, intensive care, anesthesia, blood bank, and supportive care. These are capital investments. The surgical office practice may be rather small. In some fields (such as orthopedics and ophthalmology), office practice is larger but even there the office expenses are small when compared with the hospital outlays for surgical capability. In this regard surgery makes a strong contrast with fields such as family practice, general practice, psychiatry and much of pediatrics, in which the capital outlay for practice maintenance is largely paid by the practitioner himself rather than by an institution, although the latter of course provides bed and board for patients and diagnostic capability, as in all fields.

Where are Surgical Costs Controllable?

The control of national health care costs finally occurs at the third order expenditure (“hiring and buying”). This means fewer personnel employed (*e.g.*, by the acute care hospitals that control 60% of the total flow) or the purchase of less equipment.

Although hiring and buying are the loci of specific economies at the third order resource redistribution, it is not the area in which health care economies will first

be initiated. Instead, health care economies come about by one of three primary mechanisms:

1. Reduction in the *occurrence or frequency* of disease
2. Reduction in *demand* for care per unit disease
3. Reduction in *response* of physicians to that demand

Reduction in disease, failure of the government to continue its support of research, both basic and applied, represents a shortsighted and false economy. Sound basic research pays important fiscal dividends. It has been estimated that over \$12 billion a year would be expended annually through orthopedic services at the present time if poliomyelitis still existed in the population at the epidemic levels observed between 1920 and 1950.

Reduction in popular *demand* for services is an interesting aspect of surgical care. Every surgeon is confronted from time to time by patients who need a surgical operation but who do not wish to have it; the surgeon may at times have to resort to personal pressure (ranging from modest to severe) to convince his physician colleague that an operation is required. It therefore comes as a surprise when that same physician colleague feels driven to seek a surgical operation for a patient in whom the surgeon sees no object in the procedure, or the patient seeks surgical care with little rationale. Although these differences in demand for services are not large as potential cost containment strategies, it was not infrequently the anxious mother (or the family practitioner) who sought the tonsillectomy; the woman at menopause who seeks the hysterectomy; the aging athlete who seeks the knee repair. It is the surgeon's job to be willing and able to say “No” and make it stick.

It is in the third category, *response to demand*, that surgical dollar flow has most often been analyzed for routes to economy. The response-reduction modes that have been recommended, in surgery, take several forms.

1. *Reduction in Unnecessary Surgical Operations.* Tonsillectomy was overused, particularly from 1955 to 1975, after the antibiotic era had arrived. At the present time its appropriate use may be only 10% of its level 12 or 15 years ago.¹³ Certain other operations (cholecystectomy for silent gallstones, hysterectomy for postmenopausal bleeding, removal of bunions, or hemorrhoids) are challenges to the judgment of the surgeon. Their categorization as “unnecessary” by sociologists and economists may often neglect the clinical reality of pressing situations. It is often based on an outright misunderstanding of the nature of clinical surgery (see below).

2. *Reduction in Tests or Ancillary Procedures; “Defensive Medicine.”* Fewer x-rays, laboratory tests, etc., could surely be ordered. This category should fall under the heading of avoidance of waste: it should be done as

a normal discipline in good surgical care, the malpractice threat notwithstanding. While any thinking surgeon endorses such normal economies, I am quite skeptical as to the total national impact, viewed in the framework of dollar saving, that is potentially involved here.

3. *Reduction in Length of Stay.* There has been a big push on here for at least 40 years, when "early ambulation" was first begun. Consider the reduction in the length of an obstetrical stay. Further reduction in the length of the surgical stay finally reaches the point of ambulatory surgery. However as ambulatory surgery increases at the expense of in-hospital admissions, most hospitals add a mark-up to the ambulatory charges to maintain revenue. Despite this, money will surely be saved here and possibly in significant amounts. Although the entry of the Investor-Owned-For-Profit (IOFP) chains into the "surgicenter" business would appear to be cost saving in avoiding hospitalization, it involves expenditure for central office management expenses and the payment of dividends. How much will be saved here cannot be estimated until some comparative studies have been done.

4. *Reduction in Practice Costs and Insurance.* This is surely a route to some economy. The most flagrant waste is in the area of malpractice insurance costs. No one is served by these excessive premiums and judgments save the insurance companies and lawyers. They lead to higher surgical fees. Standardized legislation should be introduced to limit judgments and reduce the premiums massively. This may require a social revolution, but it is going to save significant money in the surgical dollar flow.

5. *Reduction in the Most Important Controllable Cost: Complications.* Far more important than any of the potential cost control routes is a most significant single area for health care economy in surgery—avoidance of complications. Here is the area where the type of economic analysis of the cost of complications recently presented by several scholars¹⁴⁻¹⁸ could be the main thrust of this entire article.

A straightforward major surgical operation requiring a day or two in the hospital before operation (or some appropriate study on ambulatory basis), an operation of 2 to 4 hours in length, and a normal hospital stay of 5 to 7 days represents an expenditure of about \$4000–\$6000. Of this, 8%–20% is the surgeon's fee, which further subdivided within the budget of his practice, about 60% becoming take home pay plus benefits for the surgeon.

When the patient's course is marked by surgical complications, the economic impact is massive. Examples are the advent of infection, anastomotic leak, arterial thrombosis, intravenous line sepsis, immunosuppression

(either intentional or unintentional), a drug reaction, stroke, pulmonary embolus, or myocardial infarction. Any of these will have a spectacular effect on cost. There is no other field of medical care in which the difference between the "smooth" and the "complicated" course has such a spectacular difference in price tag. Based on the studies of Couch, we would estimate that a factor of 8–20 must be applied to ordinary surgical costs if serious complications arise.

If current surgical costs nationally are \$85–\$95 billion, and the complication rate is 5 per cent, it is possible to make a calculation of what the overall national cost increment would be if the complication rate rose to 7.5%. This back-of-the-envelope calculation suggests that such a decrease in the quality of American surgical training, of hospital facilities, and of surgical excellence, would cost this country \$8–\$15 billion.

The principal moral of this estimate is that excellence in technical operative surgery, in the use of anesthesia and drugs, in pre- and postoperative management, all require the most extensive education and the greatest perfection in training.

Surgery is a craft and a skill based on biological science. Some people have a "feel" for it and others do not. In this era of greatly expanded manpower pressure in surgery, we should continue to maintain the highest possible standards of excellence and should not feel the least bit chagrined over a severe weeding-out process when, either during the course of training or in the first few years of practice, an individual is simply found to be unsuited to this profession. This could save millions of dollars.

Leaving out all other considerations, the simple fact remains that the economic efficiency of American surgery (as part of the \$310 billion fiscal flow) depends upon the following: (1) having surgeons of the highest possible level of competence working in institutions of maximum capability for safe and effective surgery; (2) the avoidance of unfamiliar or complicated surgery in settings (small hospitals specialized care institutions) where such operations should not be performed; and (3) adherence to highest standards in manpower recruitment, acceptance, and credentialing.

Populist pressures of the type associated with the Federal Trade Commission, osteopaths, chiropractors, and non-board certified surgeons all attempt to combat these obvious requirements for excellence in surgery. As medicine and surgery in this country have sought to improve themselves by raising standards, they are now accused of restraint of trade.¹⁹ Readers should realize that in this area (and in the problem of malpractice insurance cost reduction), political pressures by surgeons directly on representatives, both state and federal, are eloquent and effective. Good surgery is good economy.

Appropriateness of surgery and surgical outcomes should be analyzed for each hospital by some statewide agency in each state, and such data made available to the hospital staffs. This would take the form of a standardized method for examining the treatment options offered by a hospital (*i.e.*, in cardiology, orthopedics, and trauma). There are at least four clearcut hospital and staff classifications with respect to treatment options in these fields. The practice profiles, including morbidity and mortality, for standard DRG clusters should also be analyzed and made available to the surgeons, the surgical staff, and hospital management. These are the people who are in charge of quality control and who should see the data. If by analysis of treatment options and practice profiles a hospital, a service within a hospital, or a surgeon within such a service finds itself out of line with peers, strong steps should be taken to rectify such uneconomic situations.

National surgical organizations have been remarkably slow to perceive the importance of this step. Local and state disciplinary committees are usually impotent. What has happened in the past is that the situation deteriorates until it makes headlines; that is no help to anyone, and surely no economy.

An understanding of the economic role of complications, maintenance of the highest standard in training and practice, a standardized method for analysis of treatment options and practice profiles in surgery, and the self discipline of hospital staffs together constitute the most important cost containment strategy that surgery can undertake at this time in this country.

The Surgeon's Fee

If we consider only those surgeons who are Board Certified having completed residency (plus their own residents still in training), we are dealing (1981) with a basic cohort of 120,000 practicing surgeons and their residents.²⁰⁻²² Whatever the noncertified surgeons family practitioners do, it is this basic cohort of practicing Board Certified surgeons who provide the vast majority of the surgical weight in this country; operative "weight" indicates the magnitude of operations. If one simply enumerates operations, the ambulatory fraction carried out by dermatologists, nonqualified surgeons, family practitioners, or endoscopists would appear larger. However, the cost of surgery is related to its "weight" as is also its resource-utilization, its time-burden, and risk. Professional fees are likewise loosely related thereto.†

Of the total surgeons in this category, it is estimated that eight per cent are on regular salary with no additional

fee income. Another 15% are on partial salary or a salary (such as that from a group practice or HMO) related to their fee earning in a loose way, often by bonus incentives. Fee earnings help to determine salaries when there is a bonus incentive in the plan; more importantly, they are a general determinant of salary levels. A university hospital that is conducting a group practice can maintain a top quality cardiac surgeon only if it pays him something that is in the same general ballpark as the earnings of his freestanding fee-earning colleague. In sum, about 80% of surgeons' incomes in this country are either directly fee-determined or indirectly fee-related.

The total expense of surgical care is estimated to be in the range of \$85-\$95 billion. On this basis, the total practice charges would be \$10-\$20 billion and surgeons' take home pay \$6-\$12 billion (Table 2). This is based on the fact that surgeons' fees are generally in the range of 8%-25% of the total hospital cost and take home pay 55%-60% of the total professional charge. This figure will seem low to some cardiac surgeons and orthopedists. It may actually be high for those in other fields of surgery where fees or salaries are not quite so elevated. It is based on our data from a random sample of hospital charges and surgical fees from urban and rural group practices.

Surgical fee earnings in certain areas have ballooned in the last few years; the writings of Roe and the correspondence stimulated by his articles have helped to focus attention on this matter.²³⁻²⁵ This is clearly one of those fiscal problems where the spectacular upper end should be trimmed. But we should not delude ourselves that this is going to make a large difference in the fiscal flow for health care in this country. For example, if the top fees for operations that are very expensive (open heart surgery, transplantation, total joint replacement, brain tumors, certain types of radical cancer surgery, and certain types of vascular surgery) were cut by 50%, the estimated saving nationally would be about \$0.6-\$0.8 billion or about 0.25% of the total flow (0.75% of surgical stream). While such a cut would arouse quite a reaction from some surgeons involved with such work (even though their incomes are far above those of their colleagues), others would realize that some of these "big ticket" procedures, no longer so risky and experimental, are often over-rated in the fee scales.

If, in addition to taking such a step, surgical fees were held down by some sort of across-the-board reduction (as has been attempted in Massachusetts with a new law on Blue Shield charges and nationally in certain Medicaid categories), there might be some additional cost-reduction. Reductions in the surgeon's fee will have no impact on hospital billing and, if a surgeon finds his earnings constrained by fee reductions in one area, he will tend

† Some weighting scale for operations, such as the California Relative Value Scale or "Hernia Equivalents," may be used.

to make that up by a higher volume or higher fees in some other area (e.g., ambulatory surgery).

We therefore have a familiar enigma: surgical earnings and incomes are generous in this country. In some cases fees are too high and out of relation to collegial earnings; there should be a national sense of discipline in this area. Were this self-discipline, plus some sort of regulatory step, successful in reducing surgical fees across the board by 25%, the impact on total fiscal flow would still only be \$2.5–\$5.0 billion or about 0.6%–1.2% of total flow. This maximum and unrealistic expectation would wrench the social fabric of American medicine for a pitifully small gain; one professional group would be penalized while others (lawyers, insurance companies, hospital administrators, supply and pharmaceutical purveyors) went unscathed.

In sum, control of very high surgical fees should be a matter of self-discipline as indicated by Roe. Some sort of fee control is probably inevitable; we should not expect this to make a huge impact on total fiscal flow in U.S. health care because it simply will not.

B. ANALYTIC PITFALLS, TERMINOLOGY, AND ALTERNATIVES

Confusion in Analysis of Surgical Work: A Problem for Health Policy Analysts

Containment of health costs in this country cannot be measured by reduction in the cost of unit items such as a single x-ray, a red cell count, an operation, or the cost of a C.A.T. scan. Instead, such measurement of savings must come about by examining the impact of a proposed economy on the total health costs for a definable population or region, large or small.‡

Health policy planning is dangerously ineffective when it is based on misunderstanding of the nature of clinical care; surgical work is often misinterpreted by individuals who have not had contact with the practice of surgery. One of the problems in the health policy literature (the publications of sociologists, economists, and statisticians) and in the regulatory measures of state or federal agencies, is widespread misinterpretation of the nature of American surgery. This takes several forms.

1. *Classification of surgical operations* is imperfect and misleading; it must be standardized. One of the most disturbing trends in the literature is the constant confusion as to the meaning of "emergency" or "elective." For example, it is not uncommon to hear a health

policy worker state that emergency operations "like cancer" are pretty much the same in all areas, whereas elective operations "like cholecystectomy" show a lot of variation. Such persons are staggered to learn that most cancer operations are strictly elective and that some cholecystectomies are indeed pressing emergencies. What the speaker meant was that cancer operations are in a group in which the patient's discretion played comparatively little role because the diagnosis itself is critical in determining the advisability of operation, and the operation is required to save the patient's life. Misunderstandings here are almost too obvious to bear further description. The surgical profession should agree on some standard classification of surgical operations.

A classification along the lines of the following should be considered.

A. Emergency Operations: Operations that must be carried out within a time frame of 6 hours or less in order to achieve the maximum salvage of the patient's life or limb. A further subdivision into degrees of emergency pressure could be made.

B. Urgent Operations: Operations that should be carried out within 48 hours of diagnosis or admission in order to achieve the maximum salvage of life and limb.

C. Elective Surgery for Life-Threatening Disease: This large category will include a very major share of surgery; it is exemplified by cancer surgery, aneurysm surgery, certain vascular operations, and certain infections. The presence of the diagnosis and the lack of suitable alternative treatment makes the operation essential. But its exact timing is to be measured in fractions of a week or month, rather than in minutes or hours. It is thus "elective."

D. Discretionary Surgery: This will include operations where the patient's symptomatic picture is a major factor in the decision: the patient's judgment as to whether they wish to trade the cost and discomfort of a surgical operation for relief of symptoms. This is often a matter of fine judgment on the part of patient and physician. Cholecystectomy for recurrent biliary colic, varicose vein operations, operations for recurrent pancreatitis, for uterine bleeding, operations for mild angina pectoris or mild intermittent claudication, reparative orthopedics, minor prostatic obstruction, would all fall into this category. It is in this category that a surgical second opinion is most welcome both by the patient and by the surgeon.

E. Lifestyle Surgery: Not only would this category include almost all of conventional plastic and cosmetic surgery, but it would also include other operations done on the patient's volition, and based on patient-initiated request, a desire to change self-image or

‡ If some type of hospital cost restraint results merely in the hospital's unloading ("unbundling") that service so that someone else has to pay for it possibly at greater cost, the impact appears favorable only if you examine hospital costs alone. When you look at the total community costs, they may have been increased.

adapt to lifestyle. Such operations include those for mild internal derangements of the knee where the degree of athletic participation is a controlling factor. The same thing would go for some operations on the middle ear with mild hearing impairment. The main thrust of this category is that these operations are "patient-initiated." They are done at the patient's request because of some perceived disorder of body or lifestyle that is surgically reparable or some low level symptom they do not wish to endure and cannot medicate successfully. They are less than "discretionary," they are based on self-image and desired quality of life.

To the above classification must be added a collective or aggregate resource-utilization weight for any grouping. Then "major" *versus* "minor" and "hospital" *versus* "ambulatory" become unnecessary and useless adjectives.

2. *Indications for surgery* are another widespread source of misinterpretation. In a recent search of the literature, for example, a group of health policy analysts came to the conclusion that the indication for cholecystectomy was acute cholecystitis. This was the only category where, in a search of the English language literature since 1978, they could find much about gallbladder surgery. They completely overlooked the fact that over 90% of gallbladders are removed in this country for cholelithiasis with recurrent biliary colic, in which acute cholecystitis plays little or no role.

3. *The purposes of a surgical operation* also lead to misunderstanding. A prime example here is coronary bypass surgery. There has been a recent extensive literature on the question of whether or not this operation prolongs the life of the patient. While that is indeed an interesting and important problem, it leads to widespread misunderstanding of the primary purpose of the operation, which was originally and still remains that of control of the symptoms of angina pectoris. Even in authoritative articles in widely circulated national magazines and newspapers one still gets the impression that this operation was developed originally and is still largely done to prolong life. Actually, it is an excellent example of the elective use of "high-tech" surgery to improve the quality of life.

4. *The role of "high-technology" in surgery* is often misinterpreted, leading to false doctrines in the national economy. One occasionally encounters an individual who believes that, as "technology" improves, less surgery will be needed. I would like to think that might be true; but history shows exactly the reverse to be the case. As surgery improves (and this improvement is often due to high-tech advances such as the pump oxygenator or the C.A.T. scanner) more patients are operated upon more

accurately and effectively because their disease can be detected and handled more expeditiously and safely. The advent of high-tech methods has brought about joint replacement, improved cancer surgery, modern vascular surgery, microsurgery, and many other fields. Morbidity and mortality are lowered and, often, unit cost is reduced.

The generalization continues to hold good: that as surgical methods improve, more patients are admitted for operation, whereas, as medical and pediatric methods improve, fewer patients require hospitalization.

5. *Reductions in volume of operations* have not arisen from high-tech advances, but rather from the discovery and development of other ways of treating disease or the changing epidemiology of disease. Many more operations have been abandoned in the last 50 years than have been invented or introduced. The most important examples of near or total abandonment of operations formerly of high frequency are thyroidectomy for thyrotoxicosis, mastoidectomy for middle ear sepsis, osteotomy for osteomyelitis, radical mastectomy for breast cancer, tonsillectomy for the sniffles, theracoplasty for tuberculosis, and many others. In most of these instances of reduced surgical volume there has been an obvious cost reduction. The reduction in surgery for cancer of the stomach has been due to the reduction in frequency of that disease. By contrast, the apparent reduction in duodenal ulcer surgery seems to be due largely to the introduction of a new drug to control gastric acidity.

6. *Small area variations* in the frequency of surgical operations has been a topic of study for 20 years, more intensively during the past 5 years. If one compares the frequency of hemorrhoidectomy in two closely adjacent areas, contrasts indeed may be found that suggest the operation is being overused in one place and underused in another. But such a study is meaningless unless the office practice (including hemorrhoid injection and other methods of treatment) is also taken into consideration. Furthermore, two areas with exactly the same utilization of a surgical operation based on population frequencies may hide or mask marked aberrations: one hospital that is markedly overusing an operation (laminectomy for low back pain, carotid denervation for asthma), balanced by lack of utilization in another hospital. Small area variations have been stimulating to the literature as a first approximation, but require much fine tuning to be useful. The examination of individual hospital treatment options and practice profiles is much more revealing: in some cases the work of individual physicians and surgeons must be profiled.

The Role of Surgical Manpower; Vertical Disintegration

The impact of a hugely increased number of physicians in this country on the cost of surgery has yet to be

reckoned. On the surface, it would look as though "with more surgeons, then there will be more surgery carried out." This ancient platitude may not turn out to be the case because so much of surgery is dictated by the epidemiology of disease. The number of transurethral resections that can be carried out depends upon the number of patients with benign prostatic hypertrophy—that is, unless (as many sociologists appear to believe) some transurethral resections are carried out merely as a form of indoor sport. If the highest standards are maintained, the manpower pressures will not result in more operations.

Surgery is interesting, challenging, effective, and often financially rewarding. Everyone wants to "get into the act." The vertical fragmentation of surgical care is therefore a probably outcome of increased manpower pressures. This vertical fragmentation will surely not reduce costs: it will just get more people into the act.

An example is to be found in a patient with angina pectoris who appears to have had a heart attack. Not long ago this would have resulted in a call for an ambulance, the patient being admitted and cared for by his internist, and seen in consultation by a surgeon. At the present time, this patient may be cared for by all of the following: emergency medical technician, an emergency ward physician, an emergency ward surgeon, a general internist, a cardiologist, a cardiologist who includes cardiac catheterization in his worklist, a cardiac surgeon, and finally by a cardiac rehabilitationist. It is difficult to avoid the conclusion that this will increase cost. It is also difficult to conceive of this vertical fragmentation as improving care, although it might improve access to care.

Vertical fragmentation and the creation of new intervening specialty cohorts introduces a whole new set of "turf wars." The recent flood of books on emergency medicine and emergency medical care make it clear that physicians trained in this field regard large areas of human disease formerly treated by surgeons as their own proper private province. It is up to surgeons who have had long experience with trauma and the acute abdomen to be the whistleblowers when the emergency medical team hangs on too long.

The Maximum Attainable Economy

We have estimated that the maximum attainable annual economy within the framework of American medicine as we know it and as our society is accustomed to it is about five per cent of the total, or approximately \$15 billion. In view of the current inflationary tendency, this might well mean "holding the line" by avoiding a \$15 billion increase in cost.

The realistic attainable economy within the confines of surgery itself is less. Reduction in unnecessary operations, in ancillary usage, office practice expenses including malpractice insurance, avoidance of complica-

tions, control of excessive fees, and trying to control the expense increments of vertical fragmentation might save about \$2–\$4 billion in the surgical area, or about 3%–5% of the surgical stream and one per cent of the total fiscal flow. Every effort should be made to accomplish this, but at the same time it is essential to examine the ethics of such economies and their relation to other aspects of the national expense habits of the American people.

Economy, Ethics, and Rationing

The late E. D. Churchill, always fascinated by the logistics of the armies with which he served in World War II, enjoyed making an analogy between the conduct of military operations and the conduct of surgical operations. In both cases, he said that "You must have a lot more of everything available than you will ever use, to avoid disaster." This was a neat way of pointing out that the surgeon must be prepared for many eventualities and must be ready to treat all sorts of diagnoses and possibilities before, during, or after operation. This looks uneconomic; it therefore attracts health policy analysts who would like to "strip surgery" to the very bone. When a patient is admitted to the hospital for knee surgery and is found to have bleeding from the rectum and a carcinoma of the rectum is discovered, I have regarded that as a sign of excellence in the conduct of a surgical department. The same is true for a patient entering with varicose veins who is discovered to have breast cancer. "Stripping surgery to the bone" often means an attempt to wipe out all of the ancillaries around surgical care that have made it safe and practical for the patient's ultimate welfare. Economy therefore has a clearly ethical overtone; it is up to surgeons themselves to determine when and if proposed economies impact unfavorably on the welfare of the patient.

The current interest in "rationing" of health care is health policy persiflage: something to talk about that says more than it is. In one sense, health care in this country has always been rationed through the limitations in access or payment mode. This has usually been unfortunate, and has largely disappeared with increased social awareness and improved legislation. An attempt to ration health care according to age has always been evident: the current tendency to limit transplantation to certain age groups and open heart surgery to others represents an example. While the stimulus of external pressures is undeniable, rationing of surgical care so as to exclude the feeble-minded, the elderly, or those who want expensive surgery only to improve their own self image is not going to be welcome as a feature of our culture. It is a feeble way to achieve economy.

Waste, Corruption, and Fraud

By sharp contrast, the elimination of waste, corruption, and fraud from the American health system is a nonfiscal

mandate. These must be eliminated at every possible step; finding justification in cost saving is quite specious. In the surgical area, the most flagrant examples of waste have been unnecessary operations and the occasional maintenance of a surgeon or a surgical service that has an unacceptably high complication rate. Most of the fraud that one reads about in the daily press has to do with falsification of Medicaid billing and other abuses of governmental programs; comparatively little of this has been in the surgical area. I know of no current estimates as to the cost of corruption, waste, and fraud in the American medical system today.

Social Alternatives for Spending the Money Saved

A final aspect of any article on cost reduction in American medicine should grapple with the problem of social alternatives. Those who would most loudly proclaim the need for cost containment in American medicine and surgery are apt to state with some alarm that "an amount equal to almost ten per cent of the gross national product is being spent on health care." One should always ask them the question, "What would you prefer to spend it for?"

The entire gross national product gets spent. That is how it is defined. The United States leads the world in expenditure for automobile paint, cosmetics, brokerage fees, refrigerators, state lotteries, and television. We also have a large defense budget. Money is misspent in the defense budget through contract overruns and retrofit expenses. The development of nuclear energy in this country has been accompanied by two or three of the record-breaking bankruptcies of American history and by the misexpenditure of billions of dollars.

When push comes to shove in the legislative process, every physician in this country—as well as his patients—is entitled to ask what the money saved will in truth be expended for.

On the medical side, there are many things that the money could be expended for: better domiciliary care for frail elderly; improved management of Medicare and Medicaid benefits; and the avoidance of lifestyle diseases such as alcoholism, drug abuse, overeating, high speed driving. The elimination of the cost of categorical Federal systems (*i.e.*, endstage renal disease) would be an example of priority planning. There is nothing about endstage renal disease that makes it more worthy of taxpayer support than endstage multiple sclerosis or endstage cancer of the breast.

Conclusion

Cost reduction in American medicine and surgery requires a definition of social objectives. Viewing this topic at present, I fail to see alternative expenditures of this money that are any more in the interests of the

average American person, his or her family, and unborn offspring than the dollar flow in health. It should be trimmed where possible, the fat wrung out of it, research reestablished, and corruption, waste, and fraud eliminated, access improved, and cost/benefit maximized. Anything beyond that requires a very strong case to be made as to the purposes for which those "saved" dollars are to be expended.

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