Invited Commentary

From Tonsils to Scopes: 80 Years of Variation in the Practice of Otolaryngology

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Abstract

Variation in medicine and surgery is a critical contemporary health policy issue. Recent research demonstrates that variation in Medicare payments to otolaryngologists in a single metropolitan area was attributable to differences in health care resource utilization among physicians and that the hospital with the highest Medicare payments per physician had a higher proportion of office endoscopy-related relative value units than that of other providers, relying less on evaluation and management office visits for revenue. This study is the latest in a line of fascinating case records of variation in otolaryngology and other surgical specialties dating back to the work of J. Alison Glover in 1938.

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In this issue of Otolaryngology–Head and Neck Surgery, Cracchiolo and colleagues demonstrate that in a single metropolitan area, variation in Medicare payments to otolaryngologists were attributable to physician-level differences in health care resource utilization, rather than differences in reimbursement rates, patient volume, otolaryngologist sex or subspecialty, or complexity of hospital care. The authors found that the hospital with the highest Medicare payments per physician had a higher proportion of endoscopy-related relative value units than that of other hospitals and private otolaryngologists and relied less on evaluation and management office visits for revenue.

Unwarranted or unexplained variation in medicine and surgery is a critical health policy issue. The influential work of the Dartmouth Atlas Project, as well as Atul Gawande’s seminal examination of health care costs in McAllen, Texas, in the New Yorker in 2009, has been instrumental in propelling awareness of this phenomenon to the forefront of public consciousness in modern times. The analysis by Cracchiolo et al is an outstanding demonstration of small-area variations in contemporary otolaryngologist practice. Readers may be intrigued to learn that it now joins a pantheon of unique, often colorful case records of variation in otolaryngology and other surgical specialties, dating back to the pre–World War II era.

We can trace the study of variation in otolaryngologic practice—and, indeed, the very concept of variation in surgery itself—to 1938, when J. Alison Glover, a British general practitioner, published a treatise on the incidence of tonsillectomies performed in the United Kingdom during the 1919-1937 time frame. Glover discovered that tonsillectomy rates varied remarkably by geography, “the extremes often being in adjacent areas,” and could not be explained by nutrition, climate, overcrowding, unemployment, and a host of other factors. He also observed that the rate of tonsillectomy in children from wealthier households was at least 3 times greater than that in poorer children. Interestingly, regions of similar socioeconomic status often demonstrated large differences in operation rates:

Thus in that year [1931] the operation rate in Margate was eight times that in Ramsgate; that of Enfield was six times that of Wood Green and four times that of Finchley; that of Bath five times that of Bristol; that of Guildford four times that of Reigate; that of Salisbury three times that of Winchester.

Lacking any other explanation, Glover speculated that “variations of medical opinion on the indications for operation” were the reason for the geographic distribution of tonsillectomy. Unfortunately, his insights were not recognized immediately, and other than a reanalysis by Glover in 1948, little progress in the understanding of variation in medical practice would be made for decades.

Twenty-six years after Glover’s initial study, Heasman examined the mean length of hospitalization of 17,199 British

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children <15 years of age who had undergone tonsillectomy 4 years prior, reporting outcomes among 4 representative hospitals. Depending on the hospital, patients were discharged, on average, after 3 to 4 days (hospital A), 6 days (hospital B), 3 to 6 days (hospital C), 1 day (hospital D, 53% of cases), or 5 to 7 days (hospital D, 36% of cases). He explained the findings of hospital D by surmising that it had 2 surgeons with different postoperative practices.

Heasman’s explanations for the observed variation in length of stay after tonsillectomy mirrored the views of Glover while adding a potential institutional cause: “The training of the surgeon, his personal experience, and the pressure on beds are presumably the most important reasons for these variations.” Heasman also suggested “some form of clinical trial” as a mechanism for examining posttonsillectomy management and modifying hospital resource planning as needed “so that decisions can be based upon facts rather than on the often unreliable ‘personal experience.’”

Further studies in the late 1960s by Pearson et al and Lewis identified significant differences in tonsillectomy rates internationally and within the United States. In 1970, Bunker discovered that tonsillectomy was performed nearly twice as often in the United States as in England and Wales (637.0-641.0 vs 321.9-322.7 per 100,000 population) and that there were, at the time, proportionally more than twice as many surgeons in the United States as in England and Wales. Each of these authors posed increasingly sophisticated hypotheses for observed variation. Bunker considered differences in physician reimbursement, speculating how the traditional fee-for-service model in the United States and then novel alternative payment models, such as capitation or prepaid insurance plans, might have influenced operation rates. Others examined resource allocation and utilization, comparing the National Health Service of England—with its centralized planning and hierarchy of primary care providers and consulting specialists—to the more regionalized, institution-dependent variety of available services seen in the United States. Lewis wrote,

Perhaps the most comforting explanation would be to assume that hospital beds are built and surgeons aggregate in areas that have the greatest numbers of people prone to appendicitis or gallbladder disease as well as other surgical illnesses. It is difficult to avoid the impression that ritualistic surgery . . . does extend to other operations other than circumcision and tonsillectomy.

Yet despite these important publications, surgical variation remained a mostly mysterious phenomenon. A full 35 years passed after Glover’s landmark article before the issue of variation in surgical practice was popularized with Wennberg and Gittelsohn’s publication in Science, which, as of March 2015, had been cited nearly 1000 times according to the Web of Science database. How was this accomplished?

First, Wennberg and Gittelsohn studied variations in surgical practice among hospital service areas (HSAs)—small geographic regions that are typically served by a hospital and may include 1 or more adjacent towns—in the state of Vermont. Unlike most prior literature, which examined variation at the county, national, or international level, this study brought these abstractions down to “the microcosm of the doctor-patient relationship.” In effect, what Wennberg and Gittelsohn described was a detailed case series, with each “case” representing, not a specific patient, but rather 1 of the 13 HSAs of Vermont and its affiliated hospitals. Citing tonsillectomy as a major example of variation, Wennberg and Gittelsohn observed that 19% of children in Vermont will have had a tonsillectomy by the age of 20 years; the highest HSA-specific rate of tonsillectomy was >66%, with rates of 16% to 22% in the 5 presumably similar neighboring HSAs. Variation in surgical practice had now been made personal.

Second, Wennberg and Gittelsohn’s article marked a key early appearance of health care expenditures as a primary measurable outcome. While Lewis notably listed total charges and per-surgeon payments for 6 operations of interest in his analysis of Kansas Blue Cross Association records, these were not principal outcomes; moreover, he made several unsupported assumptions about surgeon reimbursement to calculate his results. Wennberg and Gittelsohn accumulated data from numerous listed resources, including a then newly implemented health care data-monitoring system for Vermont; surveys of hospital, nursing home, and home health agency encounters; Medicare Part B data; and a 1963 patient origin study carried out by the Vermont State Health Department—all of which was believed to encompass nearly the entire medical experience of the patients being studied. The study uncovered up to fivefold variation in expenditures for per-capita medical services while also showing that the range of Medicare Part B reimbursements in Vermont was, in 1969, highest among all 50 states.

Finally, the study was released during an era of markedly increasing regulation of American medicine. The Economic Stabilization Act of 1970 enabled governmental price controls of services and insurance. In 1972, amendments to the Social Security Act established professional standard review organizations, charged with establishing the necessity, appropriateness, and quality of medical care subsidized by Medicare and other federal health programs. The Hospital Survey and Construction Act, also known as the Hill-Burton Act, was passed in 1946 to develop and enhance hospital infrastructure nationwide and provide fair and equitable health care access, including emergency services for individuals unable to pay. The Hill-Burton Act was renewed in 1973 and codified into the Public Health Service Act in 1975. These major pieces of legislation combined to influence expenditures, physical plant, labor, and services available within the US health care marketplace. Stakeholders were thus obligated to fully consider the medical and economic impact of health care delivery to patients. In a potent response to the recently enacted federal regulations, Wennberg and Gittelsohn reported,

Both the Hill-Burton and the Price Commission decisions have served to increase variations in health care in Vermont . . . Both decisions probably will result in the
delivery of additional health services without evidence that additional health services are of specific value for the receiving population.9

Nearly 80 years after Glover, Cracchiolo et al utilized clinical visit types and office endoscopy to demonstrate that small-area variation in surgical practice remains alive and well in the American health care paradigm. Time will tell whether this latest case will resonate with the public or become another footnote in the long road toward better delivery of health care.

Author Contributions

Gordon H. Sun, substantial contributions to the conception or design of the work; and the acquisition, analysis, and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Disclosures

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