The Disaggregation of Radiology

Michael N. Brant-Zawadzki, MD[a], Dieter R. Enzmann, MD[b]

The authors discuss certain market and political forces buffeting the traditional structure of radiology, both in practice and in the academic setting. These forces can be, to a certain degree, disruptive and produce fragmentation of what are now integrated radiology services and specialties. The potential fallout from the current rapidly changing environment of health care, including strategies for delivering care along service lines or within discrete episodes of care, may have a profound impact on the future of radiology. Understanding the dynamics of the current environment may help plan strategies for dealing with the potential impact on our specialty.

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On August 22, 2007, the Advisory Board Company (a prominent hospital administration consulting group) [1] sent out the following message to its subscribers:

Faced with turf battles, St. Luke's separated neuroradiology group

In light of its growth, St. Luke's has struggled to staff an adequate number of neuroradiologists and neurointerventionalists for its acute stroke program. Since 1993, St. Luke's grew its number of neurologists from three to twelve and its neurosurgeons grew from three to seven, but maintained only one neuroradiologist. The decision stemmed from St. Luke's private practice radiology group's refusal to hire additional neuroradiologists to keep pace with the rapidly expanding volumes of the stroke institute, forcing St. Luke's neurologists and neurosurgeons to read their own patients' brain images after hours.

While Rymer [a hospital administrator quoted throughout the communication] notes that St. Luke's "crisis situation" of relying on one neuroradiologist was not unique, she says the hospital directly addressed its concerns by strategically moving its neurointerventionalists and neuroimagers out of the radiology group. As a result, the current, independent neuroradiology group allows neuroradiologists and neurointerventionalists more control over the development of services, while also ensuring a more equitable call schedule and distribution of revenue. In addition, this new group resolves neuroradiologists' dissatisfaction over taking more call than St. Luke's other radiologists, but not being compensated at a higher rate. . . . Based in part on the strength of its regional stroke network, St. Luke's has become the de facto neurosciences center in the region, with physicians from regional hospitals frequently referring any complex neurovascular case to St. Luke's.

The Advisory Board Company went on to point out that St. Luke's has not only gone on to improve clinical outcomes but has reaped an average 10% annual increase in stroke volumes. The hospital boasts an intervention rate of almost 30%, 10 times greater than the national average, for acute stroke admissions to the emergency room.

The implications of this vignette are significant for radiology. One of the traditional competitive advantages of radiology as a specialty has been the ability to gather multiple physicians with subspecialization interest into one business aggregate. However, as medical "service lines" are beginning to compete at the patient value level in teams that do not necessarily conform to a traditional (if not medieval), academically derived departmental structure, this competitive advantage is eroding.

A compelling argument for medical service integration and competition of integrated providers directed at the continuum of care of specific disease processes, such as neurovascular disorders (service lines), was made in the recent book *Redefining Health Care: Creating Value-Based Competition on Results* by Porter and Teisberg [2]. This text has become required reading for hospital administrators and has influenced health care policy planners. One of its main themes is that integrated practice units can optimize quality while reducing costs by promoting competition at the patient value level. A basic assumption made is that patients often require services around relatively discrete disorders. Given this, integrated practice units can provide and compete most efficiently for such services. Reimbursement structure, argue the authors, would be transformed to reward this strategy. Obviously, the historical, economic, and cultural underpinnings of our existing health care system present many roadblocks to the authors' vision. The practicality of their vision has been debated, and that debate is illuminating (and can be found online for any interested reader [3]). The arguments notwithstanding, there is a clear trend in medicine toward the greater integration of health care services into more efficiently organized teams, and this trend affects radiology significantly.

[a]Hoag Memorial Hospital Presbyterian, Newport Beach, California.

[b]Department of Radiological Sciences, David Geffen School of Medicine, University California, Los Angeles, Los Angeles, California.

Corresponding author and reprints: Michael N. Brant-Zawadzki, MD, Hoag Memorial Hospital Presbyterian, 1 Hoag Drive, PO Box 6100, Newport Beach, CA 92658; e-mail: mbrant@hoaghospital.org.

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RADIOLOGY'S CHANGING TRAJECTORY

It is important to appreciate the health care industry's changing paradigms. Writing in the *Harvard Business Review* in 2004, McGahan [4] postulated that an organization's strategy cannot succeed unless it is aligned with its industry's change trajectory. That change trajectory is, to a significant degree, determined by two threats of obsolescence. The first category of threat is one aimed at the organization's core activities, a threat usually posed by new outside alternatives. The second category of threat is aimed at the organization's core assets, that is, its resources, knowledge, or brand, because of changes that diminish value.

It can be argued that the core activities of radiology as an organization include the production, interpretation, and distribution of quality imaging studies of patients. Because the production of quality imaging studies has become almost automatic through advances in technology, and because the interpretation and distribution of the information has been enabled by teleradiology, the need for point-of-service core activity by radiologists is diminishing. The threats to radiology's core activities include competition from cardiologists, orthopedists, and others who want to produce and distribute, if not interpret, images.

The core assets of radiology as a specialty are an independent consultative service based on whole-body knowledge, a brand name, early and deep knowledge of state-of-the-art technology, and, most important, visual skill and experience with in vivo pathology. However, the value proposition of these core assets is diminishing when integrated service units take over the strategy of patient care, as the independence of the subspecialized radiologists begins to wane and specific organ system knowledge begins to dominate the whole-body knowledge asset. Additional threats to the core assets of radiology include anything that diminishes the need for radiologists, imaging studies themselves, or specific imaging equipment or that supplants visual diagnostic capability. In addition to teleradiology, computer-aided diagnosis, genomics, and others can be added to the list.

Not surprisingly, the change trajectory in radiology is being experienced not only with the neuroradiology services at St. Luke's. Indeed, certain integrated neurologic institutes, such as Barrow's in Phoenix, Arizona, have sliced the pie even thinner. Interventional neuroradiologists, once part of an independent radiology group that had split off from its general radiology group a long time ago, are being supplanted by endovascular neurosurgeons, with only the diagnostic aspects of neuroradiology being left in the disaggregated, independent-contractor radiology sphere. Elsewhere, interventional radiology is joining vascular surgery and, in some instances, cardiology, in a separate integrated approach to cardiovascular and peripheral vascular disorders. Dedicated musculoskeletal imaging groups have developed over the past 2 decades, and some are being assimilated into orthopedic practices. Mammography, boosted by recent increases in reimbursement for digital diagnostic mammography and the upsurge in applications for breast magnetic resonance imaging and magnetic resonance-guided biopsy, likewise has begun to splinter from the traditional core of general radiology.

Historically, radiologists have aggregated for the purposes of covering numerous specialties, allowing efficiency of deployment within hospitals, particularly at night. After hours, in particular, the value of subspecialized radiology waned in favor of lifestyle factors (lesser frequency of night call). In a more recent trend, night call has begun to be outsourced. At first hastened by the same lifestyle decisions, and not threatened by the healthy margins in reimbursement, the practice of outsourcing night call has spread to approximately 25% of all US hospitals [5]. The development of "dayhawk" outsourcing was predictably not far behind. Indeed, a number of hospitals around the country have replaced on-site radiologists with a combination of outsourced services and locum tenens interventionalists, including Long Beach Memorial Hospital, one of the foremost institutions in southern California (and ironically the spawning ground of NightHawk Radiology Services). Another example, El Camino Hospital, was one of the "plum" practices for Stanford University and University of California, San Francisco, radiology trainees entering private practice in years past, but it recently outsourced its radiology department to a combination of a remote service, in-house cardiologists for endovascular intervention, and a hodgepodge of locum tenens coverage.

TELERADIOLOGY: ENABLING, DISRUPTIVE

The threat of teleradiology to nonspecialized radiology groups has not gone unnoticed by the radiology establishment. A resolution presented at this year's ACR annual meeting reflects this:

> that the ACR is concerned about a model of care where the radiologists are removed from (point of service) . . . the ACR regards care by on-site radiologists preferable to that of teleradiology, the latter being most useful as a supplement to on-site care for purposes such as subspecialty consultation, and to provide coverage for underserved areas where the physical presence of radiologists is not feasible.

This language still begs the question of sites where radiologists are present but underserving. The requisite service level at any facility may be in the eyes of the beholder. The authors of the resolution seem unaware that the train has left the station.