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Not the Last Word

Not the Last Word: Specialization and its Discontents

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The practice of orthopaedic surgery has become highly specialized. According to a recent American Academy of Orthopaedic Surgeons (AAOS) census, 77% of members reported a specialty interest [1]. Along those lines, Morrell et al. [12] estimate that at least 90% of graduating orthopaedic surgery residents pursue fellowship training. It would be no surprise, therefore, to discover that the AAOS Board of Specialty Societies boasts 22 member groups.

To some, greater specialization is no doubt a step in the wrong direction. Back in the days of the giants, this nostalgic argument goes, a "real" surgeon would be happy to fix a femur fracture and straighten a spine on the same day. (In fact, the true giants would fix a fracture and straighten a spine only after removing an appendix and delivering a baby or two.) Today's orthopaedic surgeons, by contrast, are feckless and feeble.

A more reasonable view acknowledges the benefits of specialization. For one, surgeons who do only one procedure are apt to become quite efficient [6]. Better still, the high-volume specialist-surgeon will produce superior results [7]. Specialization similarly enhances career prospects: The Top Doctor lists are filled almost exclusively with specialists and academic advancement criteria emphasize depth over breadth.

Of course, a reasonable view would also acknowledge the costs of specialization. Specialists—like all of us—see the world through the prism of experience. As such, they can easily overlook or discount important findings. This so-called "availability bias" would spur a neurosurgeon to attribute index finger pain to a cervical radiculopathy and a hand surgeon to blame the median nerve—with both of them relatively blinded to the possibility that a metabolic abnormality, say, is the true cause.

Yet even if specialists could break free of their cognitive constraints, patients may still pay as they shuffle from expert to expert in search of total care. This cost comprises not only hassle and dollars, but a potential for poor communication and other forms of uncoordinated care [3].

There is, furthermore, a problem of distribution. Specialists quite rationally tend to congregate in larger urban areas: Places with enough patients to keep them busy in their own narrow practice enclaves. Hence, specialization can lead to a manpower shortage (and impeded access to care) in small towns and a glut (with overtreatment) in big cities.

In addition, too much specialization within a surgeon's practice exposes that surgeon to the risk his or her practice might implode if the demand for a particular service disappears. Simply put: The surgeon who knows how to do only knee replacements will be out of work if a medical cure for arthritis is discovered. Of course, it is highly unlikely that a medical cure for

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arthritis will be discovered so quickly that the surgeon will be unable to adapt, but the risk is not zero. (Those who place the risk at zero have never witnessed a cardiothoracic surgeon crying about the discovery of coronary stents). Maintaining mastery over many surgical procedures is an excellent hedge against the possibility that one of these procedures falls out of favor.

But there is an even more pressing reason for surgeons to resist too much specialization: It just might be bad for the soul.

In his classic book *The Wealth of Nations,* Adam Smith noted that the division of labor leads to "universal opulence." Smith clearly recognized the benefits specialization and is rightly considered one of its greatest champions. But Smith went on to assert "The man whose whole life is spent in performing a few simple operations … generally becomes as stupid and ignorant as it is possible for a human creature to become."

According to Smith, repeatedly doing the same operation (a word we may want to take in its modern medical sense) creates a "torpor of [the] mind." This torpor, Smith claims, is a state in which the specialist becomes unable to conceive of any "generous, noble, or tender sentiment, and consequently of forming any just judgment concerning many even of the ordinary duties of private life." In modern parlance: Burnout.

So what to do?

Because specialization imposes costs on patients, it may be reasonable to insist on professional rules to limit it somewhat. (The broad ABOS recertification examination can be considered such a step, as are normative standards that ask orthopaedic surgeons to provide general emergency room coverage in their community). In addition, our leaders should educate young orthopaedic surgeons about specialization's hidden costs. This knowledge will let enlightened self-interest—what Smith called the "invisible hand"—motivate the correct course of action.

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Hyperspecialization in orthopaedic surgery is here to stay. This is especially true in economically favored regions benefitting from high levels of resources [4]. Hyperspecialization has political support because of increasing public pressure stemming from the needs and demands of an aging and active population [2]. In this setting of economic affluence, orthopaedic surgeons have been able to narrow their surgical practice to one joint, to one disease process, or even to one technique. The corollary is that as the number of hyperspecialized experts increases, the quality of the holistic approach towards musculoskeletal care diminishes. How this situation of increasing hyperspecialization will progress will depend on many issues touching on education, legal environment, and economics.

Young surgeons training in academic centers are educated by teachers who themselves are highly specialized. These specialists serve not only as mentors but also as role models. It is likely that trainees will follow in the footsteps of their teachers. It is doubtful that this situation is likely to change soon given the structure and organization of most major teaching institutions.

The legal environment plays a major role in the molding of surgical practice. In fact, the first question facing a surgeon entangled in a medicolegal issue is how competent he or she is in performing a given procedure. A diploma attesting to the completion of a general orthopaedic education is no longer sufficient to demonstrate competence. Today, proofs of fellowship training as well as the performance of the appropriate numbers of specialized interventions have become mandatory if the surgeon is to convince opposing parties that he or she is competent to safely and effectively perform

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a given operation. This vision of capability embodied by the high-volume surgeon specialist will undoubtedly persevere [2, 8].

Arguably, regional economics differentiate surgical practice in affluent constituencies from less-prosperous areas. Well-equipped regions with high-quality infrastructures allowing rapid travel to centers of highly specialized expertise will have a large range of hyperspecialized surgeons providing expertise in all the domains of orthopaedics and traumatology. For the individual patient, this could mean better care, fewer complications, and improved efficiency for a given procedure [8, 11]. Conversely, hyperspecialization will entail higher costs because of the increased number of specialists working in a technology-rich environment. For less-favored regions, one surgeon will have to tackle a broad spectrum of diseases, master many techniques, and be knowledgeable in many areas. He or she will have to deal with a variety of situations, but perhaps not as efficiently or complication-free for a given procedure as the hyperspecialized surgeon. Although a generalist approach might appear to be cheaper in the short-term, patients may not always benefit from the latest, safest, and most efficient techniques [2, 11].

Since it appears hyperspecialists are here to stay, solutions must be found. The obvious answer lies in education. All practitioners of orthopaedic surgery, regardless of specialization, must possess a broad base of knowledge in the musculoskeletal field. One should not confound technical and procedural skills with overall expertise and knowledge [13]. The education of surgical trainees and fellows needs to emphasize the necessity of a broad culture in terms of diseases and trauma of the musculoskeletal system regardless of the field of hyperspecialization. This knowledge should be controlled in the recertification process, specializing on the joint, technique, or disease in which the surgeon is focused as well as on his or her general level of knowledge in the broader field of orthopaedics and traumatology.

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Dr. Bernstein identifies several important issues concerning exaggerated subspecialization in medicine and does not hide his personal concerns regarding its uncontrolled explosion. However, his attempts to propose solutions to the problem do not match his clear exposure of the unhealthy consequences of failure to arrest the progression of the trend. His suggestions along this line are rather timid and sometimes even unrealistic, such as "asking orthopaedic surgeons to provide general emergency room coverage in their community." This suggestion falls in shallow water even if the fear of litigation could be eliminated. Dr. Bernstein further suggests, "In addition, our leaders should educate young orthopaedic surgeons about specialization's hidden costs." In this instance, who will educate the "leaders" who have been the ones primarily responsible for the creation and perpetuation of the problem?

I commend *CORR*® for publishing this thoughtful article on a subject that needs a forceful and aggressive debate. However, in his column, Dr. Bernstein underestimates the fact that greed has crept into our profession to the point where many consider it as being primarily a profitable business. Unfortunately, greed is at the very essence of the subspecialization problem.

The current situation will not be assuaged with warm compresses and a few aspirins. The entire issue of education of the physician must be brought to the frontline [14–16]. This is a golden opportunity for orthopaedics, as a major and instrumental profession, to provide leadership to a force that requires active input from a variety of disciplines within the medical establishment as well as from other social and political bodies.

Harmful, exaggerated fragmentation of our discipline has allowed

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several traditional medical and paramedical professions to assume the care of musculoskeletal conditions, long a territory exclusively managed by the orthopaedist. For example, podiatrists and chiropractors have expanded the scope of their disciplines into orthopaedic territory, and more recently, nurse practitioners and physician assistants have claimed the right to provide care for conditions they consider themselves qualified to treat.

If we cannot appropriately correct the already ridiculous degree of fragmentation in orthopaedics, the overall situation will continue to deteriorate to a degree that could seriously compromise the vitality of our profession.

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Dr. Bernstein's article is an excellent summary of the benefits and risks of overspecialization. His arguments against specialization are all valid. I would add what Konrad Lorenz said about scientists, (even more appropriate for specialists): They "are people who know more and more about less and less, until they know everything about nothing" [5]. But as a hyperspecialist who specializes only in cervical spine, I have to respectfully disagree with the final message. In my opinion, not only is specialization inevitable, it is the correct path for science, education, and patient benefit.

The history of medicine has demonstrated an inexorable path towards subspecialization. In *The Evolution of Orthopaedic Surgery* [9], author Leslie Klenerman tells us how orthopaedics became a specialty and seceded from general surgery: "It is little more than a generation since orthopaedic surgery began its astounding and near exponential ascent from relative obscurity under the dominance of general surgery to itself become a major influence."

But Klenerman notes that the forces are inexorably pushing the subspecialties away from orthopaedics: "How much longer will the interests of specialization within it, allow it to remain united before it too falls victim to the fragmentation that destroyed the supremacy of its erstwhile master?"

The desire to subspecialize is driven by at least three factors. First, we live in a world of information overload. MEDLINE adds more than 5000 articles per weekday. Even if we assume that only 1% of these pertain to orthopaedics, it is nearly impossible for most busy physicians to stay current with all the articles. Would we want the next generation of surgeons to be trained by generalists who cannot keep up, or specialists, current with the literature in their area? Second, legally, general practitioners are held to the same standards as subspecialists. Therefore, if a generalist mismanages a cervical spine fracture, they will be held to the same standards as a cervical spine surgeon. Unless they are current with all aspects of cervical spine care, they are placing themselves at medicolegal risk. Third, in surgery, volume drives success, improves outcomes, shortens operative times, decreases complications, and improves efficiency.

We are the cognoscenti when it comes to orthopaedic problems. Who among us would choose to have a delicate tumor removed from our dominant hand by a general orthopaedic surgeon, instead of a hyperspecialized hand surgeon who has great experience with such tumors? Knowing that the results would be highly likely to be better, would we not want the same for all of our family and friends? If we would want these for our loved ones, do our patients deserve any less?

A generalist still serves a useful purpose and there are many downsides to everyone becoming a hyperspecialist. However, in my opinion, this is not an adequate reason to recommend that we remain a "jack of all trades and a master of none."

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