Professionalism in 21st Century Professional Practice

Autonomy and Accountability in Orthopaedic Surgery

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Abstract Orthopaedic surgical practice is becoming increasingly complex. The rapid change in pace associated with new information and technologies, the physician-supplier relationship, the growing costs and growing gap between costs and reimbursements for orthopaedic surgical procedures, and the influences of advertising on the patient, challenge all involved in the delivery of orthopaedic care. This paper assesses the concepts of professionalism, autonomy, and accountability in the 21st century practice of orthopaedic surgery. These concepts are considered within the context of the complex value chain surrounding orthopaedic surgery and the changing forces influencing clinical decision making by the surgeon. A leading impetus for challenge to the autonomy of the orthopaedic surgeon has been cost. Mistrust and lack of understanding have characterized the physician-hospital relationship. Resource dependency has characterized the physician-supplier relationship. Accountability for the surgeon has increased. We suggest implant surgery involves shared decision making and “coproduction” between the orthopaedic surgeon and other stakeholders. The challenge for the profession is to redefine professionalism, accountability, and autonomy in the face of these changes and challenges.

Introduction

Orthopaedic surgical practice is becoming increasingly complex. The rapid pace associated with development of new implants and technologies has had a number of unintended consequences. Surgeons and hospital clinical staff have been challenged to be proficient in all aspects of these new technologies. Dependencies have developed on suppliers (manufacturers and their representatives) by both physicians and hospitals. Conflict has developed between hospitals and physicians surrounding cost. The centrality of the physician-supplier relationship surrounding these products and technologies has led to concern about industry influence on physician choice of products. Physician clinical decision-making and autonomy have been challenged by external forces. Accountability for the physician has grown. A professional environment that has traditionally been characterized by the leadership and autonomy of the surgeon is strained to redefine itself to meet the demands of contemporary practice where surgeons, other clinicians and staff, suppliers, and hospital managers all have a hand in the coproduction of implant surgery (Fig. 1).

We assess the concepts of professionalism, autonomy, and accountability in the 21st century practice of orthopaedic surgery. Considered within the context of patient care are the interactions between the surgeon and other stakeholders in the complex value chain surrounding orthopaedic surgery and the changing forces influencing clinical decision making. Theses for this paper are (1) that professionalism, autonomy, and accountability of the orthopaedic surgeon need to be reexplored and redefined due to the influence of parties external to the physician—suppliers, hospitals, payors, and patients, and the impact of evidence-based medicine, and (2) that orthopaedic

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Fig. 1 Overlapping involvements in orthopaedic surgery and the centrality of professionalism, autonomy, and accountability are demonstrated.

surgeons, as a collective, need to take the lead and engage in a much more strategic adaptation of their professional environment.

Core to professionalism for orthopaedic surgery, as it is for other medical professionals, is the focus on optimal care for the patient [1]. Increasingly, nonphysicians are interjecting issues of cost effectiveness, value, reimbursement, comparative performance, and holding physicians to clinical standards based on “evidence-based” information. Important considerations relative to physician autonomy, accountability, and professionalism include the changing transparency of information pertaining to physician performance and judgment, the role of supplier service and relationships, the push for cost effectiveness and value from hospitals and payors, and the voice of the patient. The impact of synergies or in some cases lack of synergy between hospitals, surgeons, patients, and the device industry are also discussed. This paper is grounded in research carried out by the Health Sector Supply Chain Research Consortium at Arizona State University (HSRC-ASU) in assessing “supply intensive” admissions, such as orthopaedic implant surgeries, where supplies account for a principal part of the cost of care.

Background—Autonomy and Accountability

In the United States, the idea of medicine as a unique form of work has been associated with the concept “professional,” and viewed as a compact of autonomy and accountability of the physician and of the profession as a whole. Eliot Freidson in *Profession of Medicine* declared that medicine was worthy of the label “profession” because it regulated itself and was not subject to evaluation by others [8]. Caring for patients in a medically appropriate and ethical way, based on the physician’s own best judgment, represents the hallmark of the physician’s work as a professional. Autonomy characterizes the way that

physicians traditionally carried this out in their everyday work. Accountability has been traditionally attributed to self, society, the patient, the profession, and medical/ethical standards while carrying this out. Donald Light [14] insightfully suggested that the autonomy of Freidson’s depiction reflected a “constructed reality” of how physicians actually practiced at a point in time. In assessing contemporary medical practice from an overall perspective, Light explains that with increased observation of practice and access to information, accompanied by the setting of standards and/or intervention by nonphysicians, autonomy of the individual physician has been supplanted by accountability as the foundation of medical professionalism [14].

Light is correct in stating that the ability of the individual physician to control the content and conditions of practice, the traditional operational features of autonomy, has been challenged over time by a myriad of forces. Included in this are hospital protocols, formularies, and product standardization; payor formularies, frequent substitution of pharmaceuticals, physician report cards that may be tied to reimbursement/bonuses, requirements of preauthorization for consultations, procedures, and hospitalization, and denial of certain services; patient response to information on the Internet and direct-to-consumer advertising; declining reimbursements; rising overhead; difficult medical malpractice climate; and frequent decision making in all of these areas by nonphysicians. Review decisions made by entities other than the physician of record on the basis of large amounts of practice data or “evidence-based medicine” are frequently believed by the physician to challenge his/her personal autonomy. In addition, all of these add further dimensions of accountability to the work of the physician. As discussed by Rappolt, clinical guidelines “have a paradoxical relation to professional autonomy, since despite being the quintessence of medical knowledge at the collective level, they diminish the technical autonomy of the individual practitioner” [26]. The tension between individual physician autonomy and accountability must be regarded within the context of specialty practice which, in the modern world of medicine, is characterized by very diverse work processes, procedures, relationships with product manufacturers and their representatives, and work environments. Viewing this tension as not merely diametrically opposite ends of a continuum reflecting medical work is a very important aspect of the successful strategic management of the profession [2].

Accountability to a higher standard, bolstered by strong evidence from well-designed clinical trials, does not exist for all issues in clinical medicine. In some areas, evidence exists but level of evidence may be variable—some at a higher level (such as from randomized clinical trials) while

others at lower levels (such as from case series or trials of lesser rigor). In studies in orthopaedic surgery, Level IV evidence (case series, case-control study, poor reference standard, or no sensitivity analysis) is the most common level of evidence [21]. This variability in clinical evidence from research highlights the tremendous importance of physician anecdotal experience in conjunction with available and high-quality evidence-based medicine. This also highlights the challenge in forming and imposing clinical guidelines, and achieving physician acceptance, based on evidence-based medicine and why physician autonomy and decision making is challenged when hospitals and payors intervene in this arena.

Anyone who participates in or observes medical practice recognizes that autonomy, as it relates to the individual physician, is not dead. On a daily basis, physicians engage in encounters with patients where they exercise decision making grounded in their training and experience to assess patient symptoms, order and evaluate tests, and make clinical recommendations. This is particularly salient in surgery. Pope has described the contingent nature of surgical work which includes factors specific to the patient (eg, previous surgeries, unique anatomy, comorbidities, or preferences), surgeon contingencies (eg, tactile ability, ease of product use, and good patient outcomes) and external contingencies (operating theater environment and level of support) [23]. This contingent nature of surgical practice highlights (1) the extent to which surgeon decision making may go beyond protocols and standardization as the physician focuses on clinical accountability; (2) that a clash may exist between clinical and cost accountability surrounding patient care; and (3) the idea of accountability via standardization may be an enduring aspiration. This further suggests that a characterization of autonomy versus accountability, as dichotomous constructs depicting the profession's grounding, requires further scrutiny within the context of specialty practice.

The Impetus for Challenge of Physician Autonomy

Unlike the period depicted in Friedson's book, current realities involve healthcare costs as a substantial and increasing percentage of GDP. In the current environment, reimbursements frequently outpace costs in a highly managed reimbursement system. Practice also takes place inside a technology boom with many high-cost items continually entering the marketplace in a highly fragmented medical system. One consequence of this change has been the erosion of relationships between physicians and hospitals. As hospitals and payors have faced these financial realities, they have questioned the wide-ranging variation in the cost and quantity of clinical care as well as

changes in utilization. Over time, length of stay in the hospital has decreased and care has transitioned to the outpatient arena. DRGs, capitated payments, inpatient chart reviews by insurance companies, and relative ease of outpatient care were all forces in this change. The very recent challenge to the overutilization of imaging is only the tip of an iceberg in the assessment of appropriateness of the application of technology in practice [17]. Small area variation studies demonstrate that it is difficult to assess the extent to which utilization data reflects appropriate, under-, or overutilization [19, 31]. With the approval of over \$1 billion from the federal government for comparative effectiveness research, it is anticipated that the resultant new calculus of evidence has the potential to bring both challenges and clarity to these areas.

As supply costs have increased, with supply intensive admissions accounting for up to 60% of a hospital's supply cost, strategic management of the healthcare supply chain has emerged as a central characteristic of the best-managed hospitals and systems. The focus of cost reduction has shifted from commodity items to physician preference items (PPIs). Begun and Lippincott pointed out that while physicians have been successful in influencing the hospital's choice of products utilized in clinical care "with rising cost-containment efforts, healthcare delivery organizations are becoming more rigorous in monitoring and influencing the purchase of supplies and equipment" [2]. However, in the absence of clear guidelines regarding processes and products, suppliers engage both hospitals and physicians in a highly fragmented marketplace [24]. A new reimbursement model incorporates the costs of PPIs into a highly bundled "episode of care," which includes the physician, hospital, products and even posthospitalization costs [25].

Management of the product side of supply intensive admissions has been the responsibility of the hospital's materials management or supply chain management department. Until more recently, these departments have generally been transactional in nature with availability of product at the point of patient care being the measure of success. As costs attributable to PPIs have escalated, the supply function has become increasingly strategic. Due to financial concerns, hospitals and payors have begun to push for accountability from the orthopaedic surgeon for their choice of product from both a clinical and cost basis. With different surgeons utilizing different implants, which can vary considerably in cost without clear demonstrable gains in outcomes, there is a questioning of the individual surgeon's failure to recognize the financial aspects of supply intensive admissions and the failure to develop a level of accountability to those who pay for and support the surgeon's delivery of care. This divide of management and clinical medicine surrounding clinical care is a powerful force that continues to lead hospitals and payors to focus on

financial solutions often to the detriment of physician autonomy and long-term collaborative solutions. U.S. physicians characteristically have lacked organization, even when joined together within groups or “a legal umbrella.” Thus bringing physicians together to agree upon uniform approaches is difficult [16].

An Apparent Lack of Surgeon Concern?

When there has been guidance relating to the selection of expensive physician preference items, there has been little attention to these recommendations by physicians in both the United States and other nations [20]. When it is suggested that products are “equivalent,” based on available evidence-based information, or that surgeons should be “supply indifferent” (ie, use of any one of similar items will lead to similar clinical outcomes), surgeons often disagree, citing the importance of their judgment and tacit knowledge. They frequently contend that those who manage and pay for care do not understand the numerous factors that enter into clinical decision making, including their choice of implants. A recent study of surgeons provides important insight into surgeon views of EBM [12]: “(1) they believe that EBM marginalizes patient involvement in decision making; (2) they believe that EBM-generated knowledge is useful and is commonly used in daily clinical decision making; however, not using EBM does not adversely affect their daily clinical decision making; (3) they have high confidence in their own judgment compared with low confidence in clinical practice guidelines and other sources of evidence; and (4) journal summaries of the latest research related to a subject are the most useful resources in clinical practice.”

Obtaining both good clinical and cost evidence on specific products utilized in surgery is often difficult, resulting in surgeons deferring to existing clinical evidence, whether it is from research studies, anecdotal, or an accepted community standard. The push and recent funding for comparative effectiveness research has the potential to improve this area. There is opportunity to delineate what constitutes “evidence-based” information. In addition, there is opportunity to obtain more clarity in clinical effectiveness that in turn could drive cost effectiveness. Most surgeons choose products on the basis of familiarity and good clinical outcomes. Regardless of this, some see physician commitment to a product as resistance, reflecting the political edge of “free choice” associated with autonomy. With supply-intensive surgeries threatening profitability, an increasing number of managers seem prepared to carry out a program that channels physicians toward less expensive but seemingly equivalent products. In the pharmaceutical industry, drugs are frequently “tiered” by payors

and/or employers as a means to achieve cost control with three tiers: (1) generics, (2) “preferred brand name drugs”, and (3) “non-preferred brand name drugs.” The cost of the medication to the patient differs depending on the tier. At least one U.S. payor has considered “tiering” implant pricing—moving the implant surgical arena into the arena of pharmaceutical control and utilization. The idea of tiering implants to achieve cost control seems quite different from tiering pharmaceuticals. Unlike a pharmaceutical that can be discontinued and replaced with a different pharmaceutical if found to be suboptimal, an implant, once placed, does not have the same relative ease of replacement. Others are looking toward pay-for-performance programs where one might reward the surgeon for making choices that consistently lead to superior outcomes. There is a growing consensus, however, that “pay-for-performance systems are likely to influence clinician behaviors in [unpredictable] ways, and that attempts to increase reliability may be prohibitively costly or currently beyond system (eg, information management and monitoring) capabilities” [28]. Inquiry carried out by the HSRC-ASU on formal gainsharing, however, suggests that physicians do respond to economic incentives around product standardization [11].

Perhaps the real issue being confronted is the role of the individual physician as “a separate locus of economic power: Physicians are directly involved in deciding what resources are used, they prescribe drugs and diagnostic procedures, they refer to other practitioners, and they direct invasive procedures” [10]. A full understanding of how physicians in general approach their work and make clinical decisions remains clouded to those outside the profession [13].

Resource Dependency on Suppliers

Previous work by the HSRC-ASU indicated that the supplier control of resources poses very important challenges to hospitals and surgeons [32]. The supplier, or in some instances the distributor of the supplier’s products who actually interfaces with the surgeon, appears to act on the one hand as the agent of the physician by promoting the best possible care and support of the surgeons’ practice and, on the other, as the agent of the hospital by informally managing inventory, assuring instrumentation, etc. By creating a resource dependency, the supplier is working both to maximize his or her own income while assuring continued physician loyalty/hospital loyalty through services and resource management. There is very little rigorous research on how supplier dependency truly affects cost, quality, and outcome.

There are multiple responses to supplier dependency. In the course of research by the HSRC, it has become

apparent that few hospitals manage well in keeping the supplier out of the surgical suite with surgeons, operating room technicians, and those who manage supplies taking over the various clinical, managerial, and supply chain functions. Some hospitals believe that supplier-managed inventory actually reduces hospital costs and that supplier-managed instrumentation is more efficient. Others decry their inability to manage the flow of goods into and out of the hospital.

The financial support provided by industry in the form of continuing medical education, research funding, and via collaboration with orthopaedic surgeons is yet another area of resource dependency. Although many academic medical centers have begun addressing this issue to varying degrees, a consensus statement on this area is lacking.

Autonomy and Accountability in Orthopaedic Practice

It is now clear how orthopaedic practice, with a focus on implant surgeries, provides a very special backdrop for exploring the idea of accountability as the cornerstone of 21st century professionalism. Observed in orthopaedic practice is the downstream result of a very complex value chain that includes organizations, their products, and their people. Accountability not only occurs specific to patient characteristics and choices, surgeon ability and outcomes, but also to external factors that include products, the supplier role, and hospital-imposed choices. The role of these factors, in terms of surgeon accountability and professionalization, requires further elaboration.

The Surgeon as Patient's Agent

Orthopaedic practice has generally incorporated a "professional-as-agent" model in approaching the care of the patient in which "the professional-as-agent assumes responsibility for directing the healthcare utilization of the patient ... as an agent trying to choose what the patient would have chosen, had she been as well informed as the professional" [7]. This is a model where surgeon biases, in theory, are subverted to the preferences that matter to the patient alone [5]. While an orthopaedic surgeon may actively engage a patient to solicit such patient preferences, such solicitation is not always present or perhaps critical in the enacting of this model. A patient may be in no mental state to express preference. In emergency situations, or in choices made in the course of surgery, there is little time for the patient to actually choose among preferences. Finally, a patient might actually express a preference for a passive role in the choices that the physician must make [5]. While somewhat paternalistic in conception, surgery

continues as a curious mix of active and somewhat passive patient participation, but with the patient's benefit at the forefront.

Surgeons, Suppliers, and Their Products

The above discussion suggests that the surgeon is one part of the value chain that brings products, processes, and services to patients. Surgeons hone skills and become certified within the highly orchestrated system of graduate medical education, specialty certification, and practice. In the course of professional training and certification, the surgeon is exposed to a series of products that become central to everyday practice [28].

It is not clear how surgeon relationships with suppliers affect their ability to be "reflective practitioners"—continually questioning the products (eg, implants) and associated techniques within the context of achieving excellence in care for patients. Familiarity, of course, is important. Decisions made in the course of practice frequently become part of what the surgeon defines as the most appropriate materials and processes for achieving excellence with a given kind of patient. This is expected as *habitus* [3] results in "typifications" (patterned responses) [15] that streamline decision making and rationalize uncertainties that may remain in one's mind. Research on surgery has not clarified how such typifications improve performance or the extent to which they lead the surgeon to exclude alternatives.

The centrality of the materials to the act of implant surgery is obvious. What is not obvious is how strong physician-supplier relationships surrounding materials impact professionalism. Rather than directly addressing professionalism, hospital management is attempting to reshape the interface between the supplier and the physician through supplier credentialing strategies. These policies principally address issues of risk for the hospital and attempt to disintermediate the physician-supplier relationship so to affect physician product choice and cost to the hospital. It is noteworthy that hospital pressures on surgeons to consider alternatives are frequently driven by economic considerations. The hospital may want the physician to consider alternatives, not because they are superior, but because they are deemed "equivalent" and are more cost effective for the hospital.

Most recently the physician-supplier relationship in orthopaedics has been investigated by the U.S. Department of Justice leading to a challenge of physician-supplier financial arrangements [30]. Academic medical centers have been questioning the appropriateness of a variety of supplier-provided ancillary benefits [4]. A number of these medical centers have banned industry-sponsored free

lunches, gifts, and pharmaceutical samples and have strengthened institutional regulations surrounding industry funding [6, 27]. In all of these cases, the impact of supplier influence on physician professionalism is being questioned. Suppliers, however, continue to financially support a great deal of the continuing education and training for implant surgeons—frequently in collaboration with the profession itself.

Surgeons and Hospitals

The site of care is an important part of the value chain and should not be seen as “neutral” to achieving a high level of professionalism. The hospital as “doctors workshop” that economist Mark Pauly depicted as an institution designed around the physician’s needs, ready and willing to carry out the physician’s orders, is today subject to forces that can support or detract from professionalism [22]. The hospital frequently cannot understand the ways surgeons make decisions and resents surgeon resistance to their efforts to bring parties together to address clinical and cost effectiveness of surgical techniques and products.

In only the most progressive hospitals do physicians come together to build consensus regarding products and provide the hospital with the understanding of their preferences in a way that the hospital can act in their mutual best interests [18]. While hospitals are engaging in much more aggressive programs to control supplier influence and make surgeons aware of the financial ramifications of their clinical choices, it is unclear which incentives or mix of incentives, ranging from hospital/physician gainsharing to colleague-guided discussions to highly data-driven meetings hold the most promise [11].

The New Professionalism of Shared Decision Making in Surgery

Shared decision making is an idea that has generally been applied to the relationships between physicians and patients as one of the defining features of the new professionalism in medicine [5]. The four main characteristics of shared decision making include: “(1) both the patient and the doctor are involved, (2) both parties share information, (3) both parties take steps to build a consensus about the preferred treatment, and (4) an agreement is reached on the treatment to implement” [29]. Extending this idea, shared decision making for implant surgery represents surgeon, supplier, and hospital being involved in similar ways and sharing in a productive and transparent way their particular area of expertise surrounding implant surgery. Currently these stakeholders are involved in a myriad of relationships

and dependencies, as discussed above, and affect physician accountability and professionalism.

Pope identified type of equipment and quality of assistance as key variables pertaining to surgical quality and outcomes [23]. Paradoxically, the strong relationships between individual orthopaedic surgeons and these kinds of variables have not been rigorously studied. No research, for example, has reported data to understand how hospitals and surgeons define, recognize, and authorize appropriate supplier competencies or supplier input. To the extent that supplier representatives support high-volume implant surgeons as well as those who do relatively few, it is possible that their role is highly undervalued in some settings and overvalued in others. These supplier representatives have a variety of incentives associated with their behavior including sustained relationship by way of trust and reliability in sharing of information. Supplier representatives frequently provide assistance to multiple physicians, bringing knowledge from a much wider range of applications to the operating room table. Yet, they do not uniformly receive high levels of training nor are their conflicts of interest appropriately managed. Through their intensive relationships with surgeons, supplier representatives reduce the likelihood that surgeons will consider alternative supplies and work to keep product “switching costs” to a maximum, to sustain surgeon brand commitment [2]. In short, supplier representatives reduce the likelihood of the profession engaging a key part of its environment on its own. Some suggest that the problem will only be solved by the hospital taking over the non-business aspects of the supplier’s involvement in surgery. In only a very few instances has the supplier relationship with the physician been disintermediated with much of the role undertaken by hospital personnel. In a recent focus group with over 20 major U.S. health systems and four academic health centers, no participant has undertaken a program to reduce supplier role in the operating room and subsequent dependency on the part of physician and staff. Smaller hospitals will continually find themselves unable to provide the training and resources necessary to fully replace the supplier’s input.

Earlier research by HSRC-ASU identified a number of hospital supply selection strategies for physician preference items [18]. Some hospitals attempt to narrow the numerical base of suppliers while others focus on sustaining a larger number of suppliers but utilize the leverage of “equivalent” designation to assure comparable pricing across suppliers for a comparable construct. This is a process where non-physician managers frequently take the lead in organizing value analysis efforts, build the knowledge necessary to attempt to engage surgeons in a discussion regarding equivalencies, and then manage the process of contracting and channeling the flow of product into and out of the

hospital. These engagements between the hospital and surgeons are generally about price and control rather than about supporting surgeons who may believe they have made the best choices from a clinical point of view. Other hospitals and systems are more critically involved in managing, with physicians, the broader episode of surgical care. They see the surgeon, the surgeon's office and staff, the surgeon's experience in the hospital, and postsurgical care issues as critical to building a comprehensive commitment with the physician. Today, these efforts may or may not be physician led. What is clear, however, is that these efforts, when physician led, result in a broader integration of the physician and hospital's accountability for clinical care. This is one part of common interest and accountability by the hospital and physician.

Discussion and Summary—Toward a Professional Culture of Coproduction

This is a period of enhanced efforts by a variety of forces to shape the behavior of orthopaedic surgeons. The changing transparency of information surrounding physician performance and judgment, the role of the supplier, the push for cost effectiveness, and the stronger patient voice are all influential. Neither the profession as a whole nor orthopaedic surgeons alone have heeded the warning that "professions must act boldly to prevent their members from forming relationships with suppliers that exploit the client/professional relationship—thereby risking government intervention or further erosion of the profession's legitimacy" [2]. Much of the contested terrain between surgeons and hospitals has been centered on the belief by surgeons that hospitals only care about costs and have little interest in supporting physician practices in ways that meet their goals. As hospitals have employed a variety of tactics to influence physician choice, including prioritization of their relationships with physicians, presentation of good product data, and incentives for physicians [18], they are hampered in their efforts by the lack of evidence.

This paper has identified two opposing strategies about suppliers that are worthy of further discussion: (1) bringing suppliers into a much more meaningful role to support physician accountability and (2) substantially reducing physician dependency. The former is an area where physicians could lend a louder voice in redefining the supplier's role in patient care and how their presence impacts the accountability of both physicians and the hospital. Ways to integrate suppliers into the supply chain to improve quality and processes have not been adequately explored. Accomplishing this will require a substantial change on the part of both the hospital and physician, characterized by the creation of a culture of coproduction.

Despite questions of undue influence, suppliers bring value to the surgeon and the hospital. Utilization of the surgeon to develop new products is only logical as the surgeon is most well-versed in product limitations. A first step in transforming this complex relationship is disaggregating the service, advisory, and sales component.

The surgeon-supplier relationship is not well-understood by those outside of the profession, is unstudied, and is generally viewed in a derogatory light. Anecdotal evidence suggests that dependence on the supplier representative in the operating room is variable. The recent ethical challenges to surgeon-supplier relationships discussed briefly above do not appear to have contributed to a clear definition of appropriate supplier involvement to maximize accountable practice.

Today's supply chain managers are in the position of answering to the hospital in terms of risk reduction, cost effectiveness, and cost savings while also answering to physicians in terms of product availability for clinical care. The difficulty they often face is a lack of infrastructure that supports achieving all of these desired outcomes. This is an important opportunity for a physician-led effort to assure that the physician voice lends credibility and a focus on clinical care to this conversation.

Much of the discussion in this paper has been about the potential for the improved strategic management of orthopaedic surgery as an organized entity to redefine professionalism for 21st century practice. Areas requiring attention by the profession include the establishment and monitoring of standards for physician-supplier relationships and surgeon assumption of leadership roles in hospitals pertaining to product selection, supplier choice, and the orchestration of choice based on cost and clinical effectiveness. A key ingredient that is generally lacking for physicians to enter these leadership roles is the required knowledge to guide the business aspects and complexity of relationships as detailed above. Lacking in most graduate medical education (GME) residency programs is introduction to basic business concepts and terms, the different priorities of management, and experience in being a part of hospital committees while in clinical training. Equally lacking in most hospital management programs is an understanding of physician priorities and the essence of clinical medicine that often does not fit well into an economic cost model. Physicians who do enter leadership roles may have additional training in business (MBA) or may just have interest in cost and management issues along with their clinical care and pursue these opportunities. Inclusion of basic business concepts, some level of administrative experience, and focus on potential conflicts of interest with industry during GME is an important consideration to assist physicians to understand and be influential with issues surrounding their autonomy, accountability, cost, and

industry relationships and to lead strategic management of their profession. Finally, following Horton [9], it is important for surgeons to continue taking a leadership role in seeking funding for higher-level outcomes-based studies, comparative analysis, and advocating for large population-based data bases such as a national joint registry.

The terms “shared decision making” and “coproduction” have been utilized in this paper to represent the myriad of roles, relationships, and factors associated with contemporary implant surgical practice. Orthopaedic surgeons, supplier representatives, hospital personnel, and others come together to orchestrate the surgical episode of care. These synergies, and how each contributes to outcomes and affects accountability, are not well-understood. In the face of increased quality and transparency of information, there is a mounting demand for accountability relating to both cost and clinical outcomes. This demand, frequently made by outside agencies dominated by non-physicians, challenges the idea of the surgeon as an autonomous practitioner and extends his/her accountability. This is an area of opportunity for physicians to lend their voice and clinical expertise and be leaders in comparative effectiveness and in helping to bridge the gap between clinical and cost effectiveness. The suggestion here is that neither term—autonomy or accountability—fully reflects the reality of modern surgical practice or the reality of physician professionalism. Increasingly, invocation of autonomy fails to legitimize surgeon choice and behavior. The challenge before orthopaedic surgeons, as a profession, is to redefine the idea of professionalism, autonomy, and accountability for 21st century practice of orthopaedic surgery.

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