Orthopaedic Surgeon Ownership of In-Office Ancillary Services: Overview of the Evidence

In recent years there has been renewed attention devoted to physician ownership of free-standing ancillary services, such as imaging centers, as well as in-office ancillary services (IOASs). Advocates of the IOAS exception say that the IOAS’s purpose is to permit physicians to supervise the quality of care, to allow for better coordination among patients, physicians, and ancillary services, and to provide incentives for patients to adhere to recommended treatment plans.

Opponents argue that IOAS create incentives for physicians to increase the volume of services provided. But for every argument that economic incentives imply overutilization there is an argument that ownership results in improved quality and access, improved patient adherence to treatment plans, and reduced transaction costs. In our report, we identify three aspects of IOASs that are critical to a complete understanding and assessment of their effects:

1. Benefits to consumers and clinicians;
2. Critics’ reliance on the unconvincing theory of “supplier-induced demand” (SID);
3. The role of practice variation

► CONSUMER DEMAND

Consumer transaction costs are expected to be lower in the case of IOAS because patients have ready access to ancillary services and have the opportunity to economize on identifying, vetting, locating, and traveling to a provider. In addition, there are several convenience-related benefits associated with IOASs, including easier scheduling, enhanced adherence to treatment plans, and “one-stop shopping.” The benefits of integrated care include: (1) the benefits to clinicians of “knowledge spillovers” and cross-training of non-physician providers (particularly in the case of PT); (2) the clinical benefits to the consumer associated with initiation and continuity of care (i.e., optimal timing of ancillary services, adherence to treatment plans, etc.); and (3) the benefits to clinicians and patients in the efficiency and ease of clinical information sharing (e.g., medical records) and other forms of knowledge transfer.

► INDUCED DEMAND

A critical part of the concern over IOASs is the theory that physicians are able to “create” demand for their services, commonly referred to in medical care as:


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“supplier induced demand” (SID). In the medical care context, SID is defined as “the effect that doctors (or some other group of professionals), as providers of services, may have in creating more patient demand than there would be if they acted as perfect agents for their patients.”

The existence of an association between availability and utilization does not establish that greater availability “causes” greater utilization. For instance, Dranove and Wehner looked for evidence of demand inducement in childbirths. Using rigorous econometric methods to adjust for the “endogenous entry” of obstetricians into market areas, they still found “evidence” that obstetricians induced demand for childbirths. The authors conclude that this obviously nonsensical finding illustrates the inherent methodological difficulties encountered when assessing the magnitude of demand inducement given this “chicken or egg” problem. It is obvious that physicians were attracted to areas with a strong potential for growth in the rate of childbirths.

▶ PRACTICE VARIATION

The third likely explanation for differences in utilization rates is variation in the way that medical care is practiced and the inherent uncertainty associated with medical diagnosis and treatment. The literature on IOAS seems to imply that all excess utilization is unnecessary and inappropriate. But it is also possible that increases in utilization reflect “pent-up” demand for services (i.e., services that would have been performed at higher rates if there were sufficient capacity) or differences in patient characteristics rather than inappropriate care. In recent years there has been an increase in consumer demand for a wide variety of services, thereby making the distinction between consumer demand and inappropriate (or “induced”) services particularly imperative. As Lurie et al. (2009) assert, “the right rate is usually the one that results from choices of a fully informed and empowered patient population.”

CONCLUSION

The recent controversy surrounding orthopaedic surgeon ownership of IOASs has been driven by a handful of studies that have shown, on the surface, an association between orthopaedic surgeon ownership of IOAS and utilization of the owned services. But these studies share a common set of critical methodological problems which imply the absence of a rational basis for concluding that ownership of IOASs increases inappropriate referral to those services. No study has successfully disentangled consumer demand, induced demand, and practice variation-- the three most important drivers of variation in utilization.

Debates over IOASs have largely ignored the benefits of integration to consumers and clinicians. Consumer benefits include reduced search costs and improved convenience, and clinical benefits include knowledge spillovers and cross-training of non-physician providers, continuity of care and ease of clinical information sharing and other forms of case-specific knowledge transfer. Future research should focus on the benefits of IOASs while emphasizing the limitations on the “supplier induced demand” basis for analyzing utilization effects.

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10 For a recent review, refer to T. L. Hafemeister and R. M. Gubransen, "The fiduciary obligation of physicians to "just say no" if an "informed" patient demands services that are not medically indicated," Seton Hall Law Review 39, no. 2 (2009).
11 J. D. Lurie, J. E. Bell, and J. Weinstein, "What rate of utilization is appropriate in musculoskeletal care?", Clin Orthop Relat Res 467, no. 10 (2009).
Full Report—
Orthopaedic Ownership of In-Office Ancillary Services:
A Review of the Theory and Evidence
Orthopaedic Surgeon Ownership of In-Office Ancillary Services: A Review of the Theory and Evidence

DRAFT

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1. INTRODUCTION

In recent years there has been renewed attention devoted to physician ownership of health-care related assets, with concerns raised over hospital ownership, ambulatory surgery center (ASC) ownership, and ancillary service ownership. The latter category generally includes ownership of free-standing ancillary services, such as imaging centers, as well as in-office ancillary services (IOASs), which typically includes standard imaging, advanced imaging, ultrasound, clinical laboratory, and outpatient therapy (e.g., occupational and physical therapy).

The Stark Laws prohibit physicians from referring patients to imaging centers or clinical labs that the referring physicians own. The IOAS exception to Stark allows

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4 MedPAC, "Report to the Congress: Aligning Incentives in Medicare."

5 In 1989 Congress adopted Stark I, also referred to as the Ethics in Patient Referrals Act. The law went into effect on January 1, 1992. Stark was amended in 1993, with the new amendments, entitled Stark II, going into effect on January 1, 1995. The law was amended for a third time, with
physicians to own in-office ancillary services. However, according to CMS, the IOAS exception has since created a loop-hole in the referral system, and the amount of services included in the exception has grown rapidly. Advocates of the IOAS exception say that the IOAS’s purpose is to permit physicians to supervise the quality of care, to allow for better coordination among patients, physicians, and ancillary services, and to provide incentives for patients to adhere to recommended treatment plans. On the other hand, it has been argued that the exception creates incentives for physicians to increase the volume of services provided.\textsuperscript{6}

However, the balance of evidence on physician ownership of ancillary services is not as conclusive as some of the arguments have suggested. While economic incentives are important, ownership arrangements imply many other important organizational features, and it is important to consider the tradeoffs associated with these kinds of arrangements. For every argument that economic incentives imply overutilization there is an argument that ownership results in improved quality and access, improved patient adherence to treatment plans, and reduced transaction costs. Moreover, two key underlying conjectures—that physicians are able to induce demand for their services and that higher utilization rates reflect unnecessary care—are not generally supported by the balance of literature. Thus, based on the correct interpretation of the theory and a balanced assessment of the extant evidence, a case can be made to show that, at worst, the net effects of IOAS ownership are neutral and, at best, there are real benefits.

This report focuses on orthopaedic surgeon ownership of two types of IOASs: imaging equipment and physical therapy (PT) services. The main methodology employed is the building of a broad conceptual framework supported by published literature. The conceptual framework is straightforward: we identify three aspects of IOASs that are critical to a complete understanding and assessment of the effects of the new amendments, referred to as Stark III, going into effect on December 4, 2007. Stark prohibits physicians from referring Medicare patients to entities for certain “designated health services” if the physician, or an immediate family member of the physician, has a financial relationship with the entity. Financial relationships are broadly defined under Stark and include both investment and ownership interests, as well as compensation arrangements between a physician, or his/her family member, and an entity.

\textsuperscript{6} MedPAC, "Report to the Congress: Aligning Incentives in Medicare."
IOAS adoption and diffusion. These areas are: (1) the benefits to consumers and clinicians; (2) critics’ reliance on the unconvincing theory of “supplier-induced demand” (SID); and (3) the role of practice variation. For each of these areas, we conduct a comprehensive review of the relevant literature, reports, and other publicly available materials. We evaluate the strengths and weaknesses of the empirical literature, and distinguish between theory and conjecture in the non-empirical literature.

The main methods employed in this study are to (1) create a simple conceptual framework based on a broad overview of the relevant theory and literature, and (2) for each element of the conceptual framework, conduct a comprehensive review of the published literature, reports, and other publicly available materials relevant to the topic. Sources of evidence were identified using Medline, PubMed, Business Source Premier, Lexis-Nexus, and broad searches using various internet-based search engines. As materials were identified, bibliographic references and citations were reviewed, which in some cases resulted in additional materials retrieved and reviewed.

2. THEORY

There are two bodies of theory that are relevant to the debates over physician ownership of IOASs. The first body of theory is rooted in institutional economics and is the basis for “make or buy” decisions on owning versus referring ancillary services. The second is the theory of “supplier induced demand,” a theory that is a necessary part of the arguments made against physician ownership of ancillary services. To some extent, it is the tension between these theories that lies at the center of the IOAS debates. The role of these theories is shown in Figure 1. The left side of the diagram portrays physician ownership of ancillary services (“make”) and the right side of the diagram portrays arms-length referrals by physicians to providers of ancillary services (“buy”). Each of these organizational arrangements has implications for service utilization.
In a “make or buy” framework, the physician ownership of ancillary services is explained using a combination of organizational theory and transaction cost economics. Ancillary services are an integral part of the medical care “supply chain,” and total costs (production costs and transaction costs) are minimized when those elements of the supply chain are linked together in a coherent way. Transaction cost economics offers a framework through which to make such determinations. In general, more complex transactions require more governance, and less complex transactions require less governance.\textsuperscript{7} In the case of physician ownership of IOASs, resultant continuity of care,

consumer convenience and clinical integration are likely to reduce production costs primarily through the reduction of transactions costs.

From the perspective of the consumer, there are two factors that are important to consider when assessing the value of IOASs: (1) consumer transaction costs, and (2) consumer convenience. Each of these can be thought of as a cost of obtaining ancillary services. Transaction costs are essentially the costs of using markets to transact; they are the “friction” common to most multifaceted transactions.\(^8\) Purchasing a cup of coffee at a café is a simple transaction, but obtaining medical care services is a complex transaction, involving high levels of technical information, trust, oversight, quality assessment, timing, and so on. As transactions move from the simple to the complex, the settings in which those transactions take place become mechanisms to reduce transaction costs, much in the same way that any business will look for ways to minimize operating costs.\(^9\)

Consumer transaction costs are the costs incurred to the consumer to complete a transaction, including the time necessary to implement informed choice, such as evaluating, choosing and locating a care provider. These are the costs Princeton University economics professor Alan Krueger described as being the “hidden costs” of health care.\(^10\) In his analysis published in the *New York Times*, Krueger used data from the American Time Use Survey (ATUS) to calculate the transaction costs associated with obtaining medical care, finding that Americans spent the equivalent of $240 billion in 2007 in health-related transaction costs—11% of total health care expenditures nationwide. In sum, IOASs have the potential to reduce these transaction costs.

The lower part of Figure 1 shows two types of utilization outcomes. Utilization (q) is considered low or “normal” if the level of utilization is equal to or less than expected


utilization \( [i.e., q \leq E(q)] \). Expected utilization is calculated by applying advanced statistical methods to patient level data, and is equal to the level of utilization that would be expected given the socio-economic, demographic and clinical characteristics of the patients treated in the practice. Conversely, the observed level of utilization is considered “high” if it exceeds the expected level of utilization \( [i.e., q > E(q)] \).

The concept of expected rates of utilization raises an important methodological issue in comparative studies in utilization rates: studies that fail to take into account the expected levels of utilization between two types of practices are potentially biased. However, even if differences in expected rates are taken into account, remaining explanations for higher than expected utilization rates are limited. There are essentially three potential causes of higher than expected utilization rates, each of which is at least possible on either side of the make versus buy decision. First, calculations of expected rates are likely to underestimate the role of consumer transaction costs, preferences and tastes. Put differently, consumer demand for medical care in many cases transcends traditional measures used in calculating expected rates (e.g., age, gender, and health status). Second, providers of medical care could be “inducing” demand for their services, commonly referred to as “supplier induced demand,” or SID. Third, differences could be explained entirely by practice variation—that medical care is as much art as it is science.

For each of these potential explanations, an important dimension is the presence of inappropriate or medically unnecessary care. In cases where \( q > E(q) \), to what extent does the difference reflect inappropriate or medically unnecessary care? This is a key question in determining whether higher than expected utilization reflects consumer demand versus supplier-induced demand. One could assume that consumer-driven demand represents appropriate care, whereas supplier-induced demand represents inappropriate care.\(^{11}\)

\(^{11}\) This conjecture is of course debatable. Consumers lack the same levels of training as physicians, and could in some cases seek services for which there is no medical evidence of effectiveness. Physicians willing to provide such services may do so not by inducement or practice variation, but instead a desire to improve patient satisfaction. Insofar as patient satisfaction is increasingly used to evaluate the performance of physicians, this assumption may or may not be reasonable.
In the remaining sections of this paper, we explore the evidence for each of these potential explanations for higher than expected utilization of physician-owned IOASs (“make”) versus non-owned ancillary services (“buy”)—a research finding that has surfaced with some consistency over the past two decades. In the course of discussion, we also raise methodological issues with those studies, and how the conceptual framework presented in this section can be used to assess the limitations of existing studies.

3. EVIDENCE

3.1 Consumer Demand

Studies of the effects of ownership must take into consideration consumer demand. Defined-contribution benefit plans, consumer-directed insurance plans, and Health Savings Accounts (HSAs) have encouraged consumers to become more involved in choosing health care plans and providers, facing incentives to seek the highest quality at the lowest price. In response, third-parties have dramatically increased the amount of information available to consumers, and providers of care have developed consumer-oriented centers of care focused on providing a limited range of services tailored to the specific needs of patients.

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IOASs can be viewed as a response to consumer demand, consistent with these general trends. IOASs provide an added convenience to the consumer, and are likely to reduce transaction costs. In the case of PT, these costs include finding a PT (or a set of potential or “feasible” PTs), determining the quality of the PT, determining the location of the practice and traveling to the facility. Consumer transaction costs are expected to be lower in the case of IOAS because patients have ready access to ancillary services and have the opportunity to economize on indentifying, vetting, locating and traveling to a provider.14

In addition, there are several convenience-related benefits associated with IOASs, including easier scheduling, enhanced adherence to treatment plans,15 and “one-stop shopping.”16 The latter benefit has been challenged in a recent study by Sunshine and Bhargavan (2010), who examined Medicare claims showing a visit to a specialist (and “index” visit) followed by an imaging claim associate with the same physician (i.e., a self-referred imaging service).17 The authors found that 74% of self-referred x-rays were conducted on the same day as the index visit, but only 15% of CTs and MRIs were conducted on the same day. The authors conclude that these data imply the absence of a “one-stop shopping” benefit to consumers, especially for CT and MRI. There are at least two flaws with the conclusion reached by Sunshine and Bhargavan. First, there is clearly

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14 See, for example, S. N. Ogulata et al., "Personnel and patient scheduling in the high demanded hospital services: a case study in the physiotherapy service," Journal of Medical Systems 32, no. 3 (2008).


a one-stop shopping benefit associated with x-ray, which is a relatively quick procedure that is unlikely to prolong an office visit. Second, the findings on CT and MRI are entirely expected and are not inconsistent with consumer convenience. Most likely these data reflect the fact that CT and MRI scans take more time, and prolonging a visit for more time-intensive services is not necessarily feasible for employed patients. Moreover, these data do not reflect the likely convenience associated with on-site scheduling of CT and MRI scans for times more convenient to the patient, and the reduced search costs associated with not having to locate an off-site imaging location.

It is also likely that IOASs accrue direct benefits to the providers of care (physician owners and their ancillary care givers), and that these benefits also provide benefit to consumers. A theoretical and empirical case can be made that the joint production of orthopaedic surgery and ancillary services is more efficient than the separate production of each service. This case is based on three defining characteristics of orthopaedic IOASs: (1) the benefits to clinicians of “knowledge spillovers” and cross-training of non-physician providers (particularly in the case of PT); (2) the clinical benefits to the consumer associated with initiation and continuity of care (i.e., optimal timing of ancillary services; adherence to treatment plans); and (3) the benefits to clinicians and patients in the efficiency and ease of clinical information sharing (e.g., medical record) and other forms of case-specific knowledge transfer.

Aiken et al. (2008) found that when orthopaedic surgeons work closely with PTs they were more likely to recommend non-surgical treatment options.18 This finding was also observed during wartime, when military orthopaedic surgeons facing increasing caseloads were able to treat a larger volume of patients by triaging cases between surgical and non-surgical treatment pathways.19 Similarly, there appear to be synergies associated with interdisciplinary teams conducting rounds at hospitals. In a study by Dutton et al. (2003), multidisciplinary hospital rounds for trauma patients included trauma center

physicians, orthopaedic surgeons, physical therapists, and other members of the trauma care team. The study found that the implementation of interdisciplinary teams reduced hospital length of stay by 36%.

The synergies observed in interdisciplinary teams are attributable in part to improved information flow across the care giving team. There are likely to be considerable benefits associated with improved flow of clinical information among members of the patient care team (orthopaedic surgeons, physical therapists, physician assistants, nurses, etc.) and between the care team and the patient. Often referred to as “corridor consultations,” physicians and PTs can consult with one another with very little scheduling or planning.21

One example of the benefits of ease of PT-physician communication is in order clarification. There is some evidence that physicians typically provide non-specific and sometimes unclear referral diagnoses to PTs; according to one study, only 32% of physician referrals were judged to contain critical information regarding anatomy and pathology.22 Orthopaedic surgeons and PTs practicing together have the potential to reduce these inefficiencies in knowledge transfer and face few impediments to doing so. In addition, physicians tend to underestimate pain and overestimate functioning,23 which suggests potential benefits from improved post-treatment communication between patients and physicians; in-office PTs offer a conduit for this type of information feedback.

Finally, medical care embodies “temporal specificities” in that diagnosis and treatment outcomes depend not only on which diagnostic test or treatment is performed, but also when the diagnosis or treatment is performed. Diagnosis and treatment timing is dependent on a variety of factors, including disease progression and symptoms, availability of providers, and patient adherence to treatment plans. For example, Gilbert

21 Duxbury, "The physician-owned physical therapy department."
et al. (2004) conducted a randomized controlled trial of patients with low back pain, and found that patients who received “early” imaging had better clinical outcomes than those who did not receive early imaging.24 IOASs are a means of optimizing the timing of diagnostic testing (in the case of in-office imaging) and treatment (in the case of in-office PT).

3.2 Induced Demand

A critical part of the concern over IOASs is rooted in the decades old theory that physicians-- by virtue of their professional autonomy and the inherent information asymmetry existing between patients, physicians and payers-- are able to “create” demand for their services, commonly referred to in medical care as “supplier induced demand” (SID). In the medical care context, SID is defined as “the effect that doctors (or some other group of professionals), as providers of services, may have in creating more patient demand than there would be if they acted as perfect agents for their patients.”25

This theory has proven to be quite popular in mainstream health services research,26 but has received regular criticism from health economists.27 Criticisms have generally focused on two issues. First, the basis for SID theory is highly dependent on the


determination of causation. To what extent can higher utilization be attributable to demand inducement versus other causes, such as higher consumer demand or regional differences in medical practice norms? Second, SID by itself lacks the ability to *a priori* identify types of physician arrangements susceptible to inducement. Does an independent physician with admitting privileges to Hospital A have less incentive to admit patients to Hospital A than a physician engaged in a joint venture with the same hospital?

Perhaps the most significant problem with SID theory is that it is highly susceptible to determination of causation. It should be obvious enough that areas with greater availability of physician services would be expected to be characterized by higher utilization rates. However, the existence of an association between availability and utilization does not establish that greater availability “causes” greater utilization. To illustrate this point, Dranove and Wehner looked for evidence of demand inducement in childbirths.28 Using rigorous econometric methods to adjust for the “endogenous entry” of obstetricians into market areas, they still found “evidence” that obstetricians induced demand for childbirths. They conclude that this obviously nonsensical finding illustrates the inherent methodological difficulties encountered when assessing the magnitude of demand inducement given this “chicken or egg” problem. It is obvious that physicians were attracted to areas with a strong potential for growth in the rate of childbirths.

The model that Dranove and Wehner use attempts to account for this “demand pull” phenomenon by isolating the effects from any “supply push” utilization caused by physician availability (i.e., SID). Their nonsensical findings indicate that commonly used empirical strategies to isolate the portion of the association between availability and utilization “caused” by availability are inadequate. The same methodological challenges emerge when assessing the extent of SID for any other physician specialties or service lines.29 The advantage of the Dranove and Wehner study is the focus on a measure of utilization that entails no clinical judgment and thus is not subject to “manipulation” by

28 Dranove and Wehner, "Physician-Induced Demand for Childbirths."

29 Similar to any “market entry” argument, this point is consistent with the economic theory of location.
physicians, as the SID hypothesis assumes. Indeed, an essential element of the SID hypothesis is the assumption of a passive and myopic buyer—an assumption that may have been appropriate twenty years ago but is less plausible in today’s payment environment characterized by managed care and better-informed patients.30

A general problem with studies drawing inferences from differences in utilization rates is that the rates are based predominantly on supply factors and do not adequately account for consumer demand factors. Although some studies do attempt to account for demand factors through patient-level covariates such as age and sex, these are only rough approximations of demand, and as the Dranove and Wehner study illustrates, are inadequate for measuring the extent of demand. For example, it is not possible to accurately assess the “true” number of people in an area who really “want” knee replacement by accounting for the age distribution of the population of the area or even the proportion of the population with osteoarthritis. Demand for medical care is a function of several factors, including individual preferences and price.31 All of these demand determinants are expected to vary by hospital referral region, metropolitan area, and county, depending on the socioeconomic characteristics of the area.32


32 Even if we were able to adequately control for socioeconomic differences between market areas, we would still be faced with the problem of variation in net prices. Since most prices charged by ancillary services are administered by third-party payers using variants of essentially the same fee-schedule, the only prices left to vary are those related to transaction costs. As we argue in a later section, IOASs, by virtue of their design, scope, and amenities, may be associated with lower search costs [e.g. J. E. Schneider et al., "The Economics of Specialty Hospitals," *Medical Care Research and Review* 65, no. 5 (2008)]. For the “marginal” patient, these lower search costs may be enough to encourage them to seek treatment (as opposed to not seeking
Thus, a major limitation of all of the extant studies of ancillary service use under physician ownership is the problem of “endogeneity.” Figure 2 shows how endogeneity can influence study results. Consider two practices, A and B, both of which in “Year 1” do not own IOASs. Assume that, in Year 1, Practice A has ancillary utilization rates that are expected, and Practice B has higher than expected ancillary utilization. Now assume that Practice B decides to “make” ancillary services and adds IOASs in Year 2, and that Practice A makes no organizational changes. A cross sectional study of the utilization affects of IOASs conducted only in Year 3 would show a positive association between ancillary ownership and utilization, as several such studies have shown.

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<th>Year 1</th>
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<tr>
<td>Practice A</td>
<td>$q \leq E(q)$</td>
<td>A-no change</td>
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<tr>
<td>Practice B</td>
<td>$q &gt; E(q)$</td>
<td>B-adds IOAS</td>
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**Figure 2** – Example of Endogeneity in IOAS Ownership

In this example, however, Practice B’s ancillary utilization was high before IOASs were added. A study using data only from Year 3 would likely suffer from endogeneity in that it would fail to take into account the important fact that utilization rates were high before IOASs were added, and that the root cause of the higher utilization in Year 1 must be unrelated to IOAS ownership. In spite of this simple logic, all of the extant studies of ownership-based demand inducement in ancillary services suffer from this

treatment at all). It is methodologically difficult to identify such patients using conventional databases, but the main point is that we do not know the proportion of increased utilization that can be attributed to such factors.
methodological limitation,\(^{33}\) and as the recent research suggests,\(^{34}\) this approach continues to be the preferred method of detecting “ownership effects.”

Moreover, the problem of endogeneity is likely to be large, as physicians with even a small degree of business acumen will be more likely to diversify into ancillary services when they believe that the market (that is, patient demand) will utilize the added capacity. Insofar as physicians are more likely to diversify into ancillary services in high-growth markets, the relationship between utilization and ownership may simply reflect endogenous market characteristics and may not at all indicate a causative relationship between ownership and utilization. For example, Schneider et al. (2010) recently showed that the alleged utilization effect associated with physician ownership of acute care facilities\(^ {35}\) disappears when endogeneity is properly accounted for in the regression models.\(^ {36}\)

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\(^{34}\) Hillman and Goldsmith, "Imaging: The Self-Referral Boom And The Ongoing Search For Effective Policies To Contain It.,” Hughes, Bhargavan, and Sunshine, "Imaging Self-Referral Associated With Higher Costs And Limited Impact On Duration Of Illness.,” Sunshine and Bhargavan, "The Practice Of Imaging Self-Referral Does Not Produce Much One-Stop Service."


In addition to problems of causation and endogeneity, SID theory is highly dependent on the concept of “imperfect agency” on the part of physicians. While imperfect agency is an important concept in the patient-physician relationship, it has substantial limitations in providing a reasonable basis for SID. The main limitation is that there are many factors that cause physicians to act as imperfect agents for their patients, including, for example: (1) information asymmetry between patient and physician; (2) financial incentives associated with third-party payment mechanisms; and (3) physician associations and business relationships (e.g., joint ventures and other collaborative arrangements; granting of admitting privileges; etc.) with medical groups, practice associations, and hospitals. Each one of these factors is enough to move physicians away from “perfect” agency on behalf of patients and toward some degree of imperfect agency.37

Insofar as imperfect agency is inherent to any provider-patient transaction, it seems unlikely that SID will occur in IOAS settings differently than other ancillary settings. To some, the answer to this critical question is provided through mere assertion, typically along the lines of “returns to ownership provide strong incentives to induce demand.” For example, in his synthesis of the literature on physician self referral, Casalino (2008) asserts at the outset that incentives to self-refer are a function primarily of financial incentives (p.2-3).38 However, SID theory does not a priori suggest that free-standing ancillary service settings are free from similar inducement incentives. Do independent free-standing ancillary service providers, for example, face different utilization incentives than IOAS providers? Again, SID theory would suggest that both organizational arrangements would face similar inducement incentives and, arguably, the free-standing independent providers would face greater incentives to induce demand.


To further illustrate this point, consider the incentives facing the PT employed by a physician or medical group. In order to directly employ PTs, orthopaedic surgeons must pay market salaries (approximately $72,900).\(^{39}\) However, it is likely that salaried PTs will have somewhat lower productivity than self-employed PTs.\(^ {40}\) Thus, an orthopaedic surgery practice will have the same costs but earn lower revenue than self-employed PT practices, the net result of which will be lower operating margins on PT services provided through the orthopaedic practice.\(^ {41}\) In sum, the combined effect of PT incentive attenuation associated with employment and differences in marginal revenue imply that profit-seeking is unlikely to be the main goal of clinical integration of orthopaedic surgery practice and PT, and it is likely that many of the same incentives apply to radiologic imaging as well.

### 3.3 Practice Variation

The third likely explanation for differences in utilization rates is variation in the way that medical care is practiced and the inherent uncertainty associated with medical diagnosis and treatment.\(^ {42}\) The literature on IOAS seems to imply that all excess

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41 In addition, when compared to surgeons’ own marginal revenue on resource-intensive procedures such as hip and knee replacement, it is unlikely that low operating margins on PT services would provide sufficient financial incentive to invest in IOASs. For example, for all services performed by orthopaedic surgeons, the 50\(^{th}\) percentile (median) billing rate per service is approximately $2,300, compared to a median billing rate per service of only $94 for PT (based on data reported in PMIC, *Medical Fees in the United States: Nationwide Charges for Medicare, Surgery, Laboratory, Radiology and Allied Health Services, 2010 Edition* (Los Angeles, CA: Practice Management Information Corporation, 2009).

utilization is unnecessary and inappropriate; that is, where \( q > E(q) \), then \( q - E(q) \) represents the volume of unnecessary services.

Much of the research on ancillary service utilization, however, is limited by inadequate controls for case mix severity and other demand-side factors. Consequently, these studies offer little evidence that higher utilization rates resulting from self-referral to ancillary services represent inappropriate or unnecessary care.\(^{43}\) An important limitation with many studies of “the effects of X on utilization” is that researchers cannot objectively determine the *appropriateness* of the additional utilization attributable to X. Put differently, it is possible that increases in utilization reflect “pent-up” demand for services (i.e., services that would have been performed at higher rates prior to X were there to have been sufficient capacity) rather than inappropriate care. In recent years there has been an increase in consumer demand for a wide variety of services,\(^{44}\) thereby making the distinction between consumer demand and inappropriate (or “induced”) services particularly imperative. As Lurie et al. (2009) assert, “the ‘right rate’ is usually the one that results from choices of a fully informed and empowered patient population.”\(^{45}\)

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\(^{44}\) For a recent review, refer to T. L. Hafemeister and R. M. Gulbrandsen, "The fiduciary obligation of physicians to "just say no" if an "informed" patient demands services that are not medically indicated," *Seton Hall Law Review* 39, no. 2 (2009); in addition, refer to data published by the Centers for Medicare and Medicaid Services (CMS, at [www.cms.gov](http://www.cms.gov)), which document annual trends in medical care expenditures over time. Average annual growth in national health expenditures for 2009 through 2019 is expected to be 6.3% (see CMS, "National Health Expenditure Projections 2009-2019 (Forecast Summary & Tables)," (Baltimore, MD: Centers for Medicare and Medicaid Services, 2010.)), a large proportion of which reflects expected increases in consumer demand.

\(^{45}\) Lurie, Bell, and Weinstein, "What rate of utilization is appropriate in musculoskeletal care?."
Although unmet need and pent-up demand are difficult to directly measure, there is some indication that these factors are important in IOAS demand and utilization. For example, in the case of PT, according to one study the proportion of patients with perceived need for PT but receiving no PT services increased during the two-year post-discharge period from 23% to 68%, suggesting substantial unmet need in physical therapy. In the case of imaging, the issue has more to do with the wide range of factors driving imaging decisions than unmet imaging need. For example, Carey and Garrett (1996) found that the use of CT and MRI for low back pain patients was associated primarily with patient characteristics, such as baseline functional status.

Restuccia et al. (1996) assessed whether the rate of inappropriate hospital admissions is higher in areas with higher rates of hospital admissions. Seventy small geographic areas were formed by grouping Massachusetts ZIP codes by similarity of hospital use. Appropriateness of hospital admission was measured by applying an appropriateness protocol combined with physician judgment based on chart review. The authors found no relationship between hospital admission rate and inappropriate admission rate, calling into question the common assumption that areas with higher hospital use have more inappropriate use of hospital care.

Appropriateness also appears to be insensitive to financial incentives, even on the part of price-sensitive consumers. Further supporting the fact that inappropriate care is simply a by-product of any medical care transaction, a study of the Veterans Health Administration (“VA”) hospitals found evidence of relatively high levels of inappropriate care.

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46 R. C. Castillo et al., "Use and perceived need of physical therapy following severe lower-extremity trauma," *Arch Phys Med Rehabil* 86, no. 9 (2005).
care in spite of the lack of financial incentives to physicians associated with VA hospital admissions. Even Mitchell and Scott (1992)—strident supporters of SID theory—concede in their article summary that “none of the studies to date...has been able to determine whether the increased utilization...represents inappropriate or unwarranted services.” Finally, in some managed care settings ancillary service referrals require pre-certification. This is especially true for MRI scans. Thus, unless the pre-certification process is itself broadly flawed or ineffective, it is unlikely that a substantial proportion of pre-certified MRIs could be considered inappropriate.

In some instances, physician ownership has been criticized simply by tying the issue, by assertion, to the broad findings of the Dartmouth Atlas data—data that show that utilization rates vary by region and concludes that this variation can be attributed in large part to inappropriate care. These data help highlight the important point that medical care diagnosis and treatment are complex processes and susceptible to uncertainty. In spite of its worthy intentions, there are at least three serious methodological problems with the Dartmouth Atlas data and approach, some of which have been recently publicized by the New York Times. First, using area variation in utilization rates for specific services as evidence of geographic variation in “practice patterns” relies on the (demonstrably false) assumption that people residing in these small areas received services from the same (small) set of physicians and hospitals. The Dartmouth Atlas researchers do not have much choice, because they cannot create a true “denominator” at the physician practice or hospital level, which they would need to calculate variation in rates by providers. But the assumption that variation in rates by people who happen to live in the same small area but receive care from numerous different providers reflects local “practice preferences” is dubious. Second, there has been widespread criticism that

51 Mitchell and Scott, "Physician ownership of physical therapy services. Effects on charges, utilization, profits, and service characteristics."
the Dartmouth Atlas data do not sufficiently adjust for patient health status (e.g., presence of co-morbid diseases; functional status) or patient preferences (i.e., allowing for the possibility that demand for some types of services can, and will, vary geographically). Third, the Dartmouth Atlas data is not adjusted for differences in medical care prices and costs.

4. CONCLUSIONS

The recent resurgence of controversy surrounding orthopaedic surgeon ownership of IOASs has been driven by a handful of studies that have shown, on the surface, an association between orthopaedic surgeon ownership of IOAS and utilization of the owned services. But these studies share a common set of critical methodological problems which imply the absence of a rational basis for concluding that ownership of IOASs increases inappropriate referral to those services.

Central to the methodological limitations are two issues—endogeneity and appropriateness. Endogeneity exists when there is a statistical association between utilization rates (or demand) and the presence of physician ownership. Is the ownership driving demand and utilization, or is the ownership arrangement a response to high demand and utilization? This is a critical question, and one that, if not disentangled, neutralizes the findings of any study that does not effectively account for endogeneity explicitly, such as through the use of instrumental variables or propensity score matching. Even if endogeneity can be effectively addressed statistically, a much more difficult research task is identifying the appropriateness of ancillary service use. Whether IOAS ownership is undesirable from a payer perspective depends entirely on whether additional services performed represent appropriate or inappropriate care. In the absence of clear determinations of appropriateness, the findings of existing studies do not offer a rational basis for limiting physician ownership of IOASs.

Policy concerns over IOASs appear disproportionate to the financial impact of these arrangements on the Medicare program. In a recent study conducted by RTI International based on Medicare claims data, outpatient therapy services (PT and occupational and speech therapy) based in physician offices declined more than 21% from 2004 to 2007,
and in 2007 comprised only 5.8% of total outpatient therapy services. The median amount paid per user of outpatient therapy in physician offices was half the average per user paid amount ($238 v. $555, respectively). Thus, the overall budget impact of physician-based therapy services is likely to be minimal.

Perhaps most importantly, the debates over IOASs have largely ignored the benefits of integration to consumers and clinicians. Consumer benefits include reduced search costs and improved convenience, and clinical benefits include knowledge spillovers and cross-training of non-physician providers, continuity of care and ease of clinical information sharing and other forms of case-specific knowledge transfer. Future research should focus on these benefits of IOASs while emphasizing the limitations on the “supplier induced demand” basis for analyzing utilization effects.

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