

REVIEW PAPERS

Factors Contributing to Variations in Physicians' Use of Evidence at The Point of Care: A Conceptual Model

James D. Reschovsky, PhD, Eugene C. Rich, MD, and Timothy K. Lake, PhD

Mathematica Policy Research, Washington, DC, USA.

There is ample evidence that many clinical decisions made by physicians are inconsistent with current and generally accepted evidence. This leads to the underuse of some efficacious diagnostic, preventive or therapeutic services, and the overuse of others of marginal or no value to the patient. Evolving new payment and delivery models place greater emphasis on the provision of evidence-based services at the point of care. However, changing physician clinical behaviors is likely to be difficult and slow. Policy makers therefore need to design interventions that are most effective in promoting greater evidence-based care. To help identify modifiable factors that can influence clinical decisions at the point of care, we present a conceptual model and literature review of physician decision making. We describe the multitude of factors—drawn from different disciplines—that have been shown to influence physician point-of-care decisions. We present a conceptual framework for organizing these factors, dividing them into patient, physician, practice site, physician organization, network, market, and public policy influences. In doing so, we review some of the literature that speak to these factors. We then identify areas where additional research is especially needed, and discuss the challenges and opportunities for health services and policy researchers to gain a better understanding of these factors, particularly those that are potentially modifiable by policymakers and organizational leaders.

KEY WORDS: evidence-based medicine; decision making; health services research; health care reform.

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Research has shown that many demonstrably effective services are underutilized, while many services are provided despite a lack of clear evidence of benefit.¹⁻⁴ Recently the American Board of Internal Medicine, in collaboration with numerous specialty societies, initiated the Choosing Wisely program to publicize common clinical practices inconsistent with evidence.⁵ Many studies have observed large variations in clinical practice, across geographic areas and within local areas or even specific physician organizations.⁶

We are undergoing rapid change in healthcare organization and delivery. Physicians are increasingly practicing in larger organizations and systems of care, in part prompted by widespread initiatives by federal, state, and private payers to

improve care quality and lower costs. These reform efforts, such as patient-centered medical homes and accountable care organizations, along with significant federal funding of comparative effectiveness research, incentives for adoption of health information technology that includes decision support, and feedback on clinical quality performance raise the hope and expectation that clinical decision making will improve, with greater adherence to accepted evidence.

Within this context, research and requisite data collection on key factors affecting physician decision making is necessary to design interventions and refine current ones. In this article, we present a conceptual framework for understanding factors contributing to physician clinical decision making, specifically those related to physicians' use of evidence at the point of care. With this framework, we conclude with directions for future research and the data needs necessary to conduct this research.

We frame our discussion in the context of physician decision making as part of a broader inquiry into collecting data on physicians and their practice organizations. Of course, evidence-based clinical decision-making is equally important for other clinicians, such as nurse practitioners, physician assistants, and therapists. While the literature mostly focuses on physicians, our conceptual model should apply equally to other clinicians who assess undifferentiated patient problems, order and interpret diagnostic tests, and recommend and initiate treatments.

CONCEPTUAL MODEL

The typical clinical work of a physician involves hundreds of daily decisions. Clinical decision making is a dynamic process (Fig. 1) that includes 1) recognizing and prioritizing a patient's problems; 2) deciding which diagnostic tests to perform; 3) interpreting information to make a diagnosis; 4) with consideration of patients preferences, recommending (and sometimes administering) relevant treatment; and 5) obtaining feedback on the treatment response, which may result in a subsequent set of decisions.⁷

This dynamic is predicated on and influenced by patient decisions to seek care. Patients may present with diverse concerns, may respond to treatment differently, and differ in their adherence to treatment recommendations. Consequently, most clinical decisions are made under differing circumstances

Physician Decisionmaking at the Point-of-Care

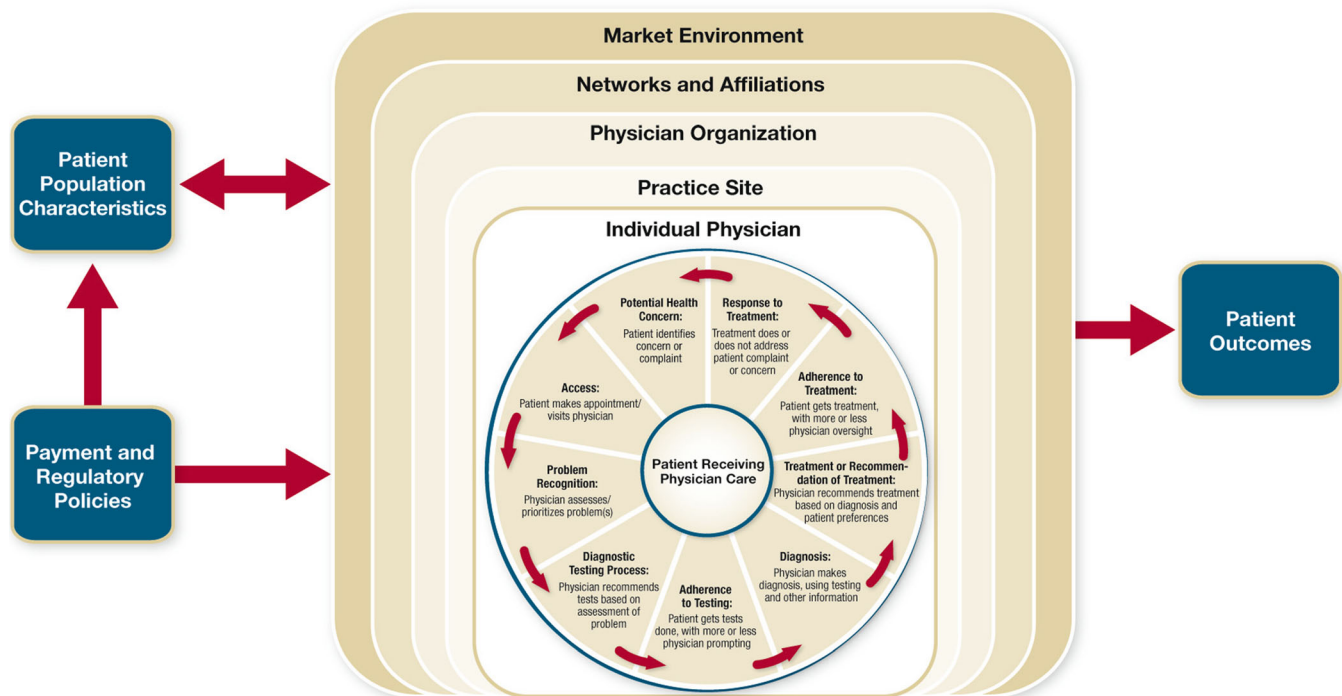


Figure 1 Context for physician decision making. Source: Rich, et al., 2013.

and varying degrees of uncertainty. Moreover what constitutes evidence-based care is often lacking consensus within the medical community.⁸

Within this context, it is not surprising that insight into physician clinical decision making draws from economic, organizational and psychological theories.⁹ We start by describing the economic framework for physician decision making, which provides context for the multifaceted and multi-layered factors influencing physician behavior around clinical decisions.

Economists have identified reasons why markets fail to allocate goods and services in an efficient manner. One such “market failure” particularly relevant to physician services is the lack of full information, in this case the asymmetry of clinical knowledge between physicians and patients. This gives rise to the principal–agent problem. The principal (patient) entrusts care decisions to the agent (physician), believing the agent will act in the principal’s interests by providing care consistent with best evidence. The principal–agent problem arises when the two parties have different interests, in particular when the patient cannot ensure that the physician is acting without self-interest; for instance, by overprescribing services of little value or failing to provide services that would serve the patient’s medical needs. Clinical activities costly to the agent (e.g., time consuming care coordination or research review for which little or no compensation is received) may be underprovided. Other services may be overprovided because they are remunerative to the physician. Indeed, the physician may not be self-aware they are acting in their self-interest over the interests of their patients.¹⁰

Potentially negative external influences on physicians’ clinical decisions are in part balanced by a strong professional ethos in medical practice, which holds that physicians’ utmost responsibility is to their patients, as reflected in the Hippocratic Oath. Professional standards of behavior are reinforced by intrinsic rewards physicians receive from helping their patients. Yet, organizational and payer incentives to the physician can aggravate or ameliorate the principal–agent problem, forcing physicians to weigh (consciously or not) professional obligations and intrinsic rewards against other extrinsic (e.g., financial) personal or organizational goals. The principal–agent problem illustrates that physicians’ decisions at the point of care can be influenced by various environmental factors at different levels that extend out from the patient/physician interaction to the practice site, practice organization (if different from site), broader health organization networks, and the healthcare market (Fig. 2). All may also be influenced by the broader policy context as well.

The Patient

Patient demands for health care, reflecting their health status, treatment preferences, and economic/insurance situation, influence physicians’ clinical decisions, as do patient characteristics such as social class, language, race, and health literacy.^{11–13} Patient characteristics can influence physician perceptions of the patient’s clinical presentation, capacity to engage in shared decision making, likelihood to follow treatment recommendations, and ultimately the clinical decisions

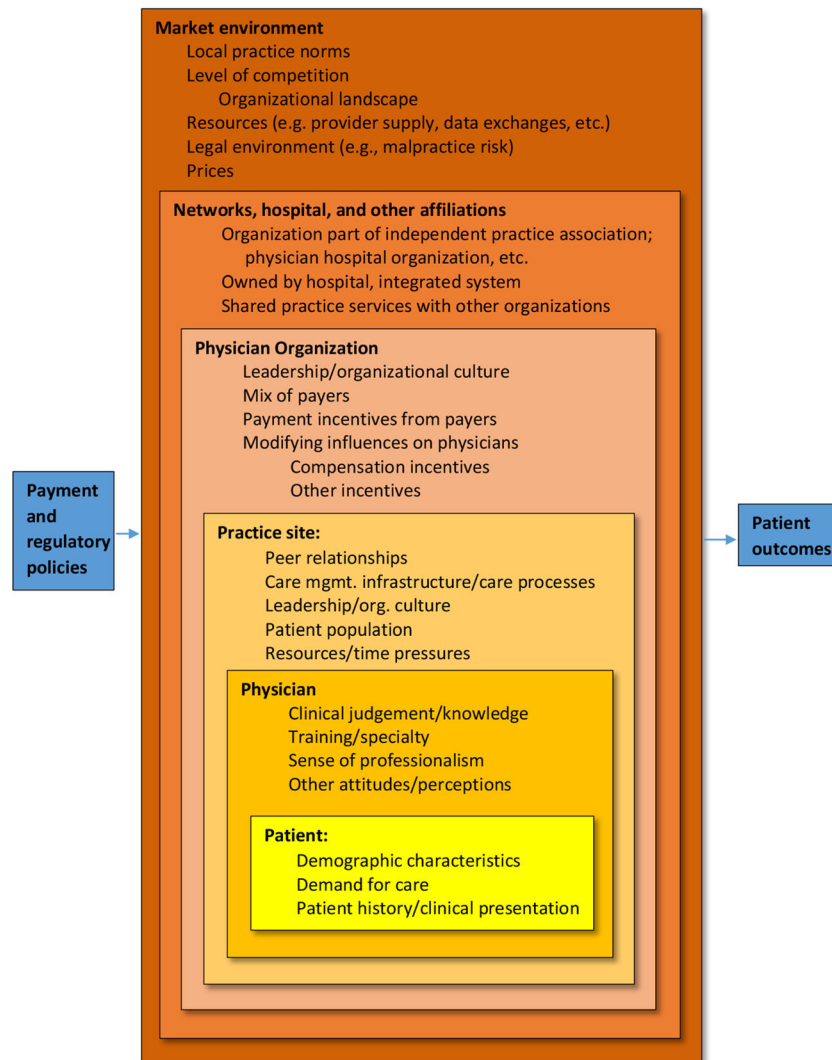


Figure 2 Key factors influencing clinical decision making.

made.¹⁴ Patient care preferences may conflict with clinical evidence; for instance, expecting antibiotics for upper respiratory infections, which likely are viral. Clinicians often accede to patient requests that are contrary to clinical evidence because of patient satisfaction and retention concerns, or because doing so is most expeditious under pressures to shorten visit lengths.^{3,15,16}

The Physician

There are a multitude of physician factors influencing clinical behavior at the point of care. Physicians vary with respect to innate abilities and their motivation, opportunities, and efforts to assimilate new medical knowledge.¹⁷ Physician decision-making skills and perceptions of what constitutes evidence-based practice are influenced by the training they received in medical school, residency, and fellowship programs, clinical experience, efforts to keep their medical knowledge current, susceptibility to product marketing and financial incentives.^{18–20} Physicians values differ—in particular, their definition of professionalism and how they balance professional values and the time and resources

available to meet these internal expectations.^{21,22} This can be manifested in efforts to seek out current clinical evidence, attitudes towards clinical autonomy, and—harking back to the principal-agent problem—how patient and personal considerations are balanced.¹³ Some clinicians, for instance, view the patient’s ability to pay as valid considerations in treatment decisions, while others don’t.²³

An extensive psychological literature focuses on the nature of and biases in physician decision making. Clinical decisions often depend heavily on synthesizing information and estimating probabilities of possible diagnoses and various treatment outcomes.^{24,25} Physicians, like others, often simplify cognitively difficult tasks through the use of heuristics.^{13,24,25} These heuristics can lead to medical errors, though they need not. Other psychological impediments to evidence-based practice are subjective probability assessments. For instance, physicians often exaggerate the probability of adverse patient outcomes viewed as especially undesirable, leading to risk aversion and over-prescribing diagnostic tests or specialist referrals.^{9,26}

The Practice Site

The practice site—where the physician provides clinical care—may differ from the physician organization employing the physicians. A physician employed by a regional physician-owned hospitalist group, for instance, likely has a contractor hospital as their practice site, and that hospital's influence on clinical behavior may predominate over those of the physician group.

The practice site is characterized by the diversity and severity of the patient population served, and consequently the breadth and nature of clinical decision-making. It also provides the context for social influences on physician clinical decision making, including peers after which physicians may model their own behavior and with whom clinical evidence can be shared.^{27,28} It also defines the clinical infrastructure for physician practice, including health information technologies, medical equipment, care processes, and support staff, as well as the work environment: resource levels, team-based culture, workload, and level of chaos, all of which can influence clinical decisions at the point of care. In particular, physician workload and pressures to limit visit lengths have been related to physician errors, the use of heuristics and failure to follow clinical guidelines.^{29–31} Point of care clinical decision support availability, either through technology or informal consultations with immediate colleagues, may reduce the use of heuristics and other cognitive biases in clinical decision making.²⁶

Physician Organizations

The organization employing the physician (or in which the physician has an ownership interest) may be akin to the practice site for many. Physician organizations typically negotiate contracts with payers and then translate clinical incentives implicit in payment methods across payers (e.g., fee for service, full or partial capitation, performance-based adjustments) into direct physician incentives through compensation methods or other management practices.^{9,32} The linkage between payer incentives and compensation incentives to physicians is not well understood.^{33,34}

While fee-for-service payer incentives encourage greater provision of services and, at the other extreme, capitation discourages overuse of services (but possibly encourages stinting on care), no single payment system—even those with incentives tied to quality measures—consistently incentivizes greater use of evidence-based care.^{35,36} Tying reimbursement to quality metrics (for instance through pay-for-performance programs) might logically encourage evidence-based clinical decisions, but there is inconsistent evidence on the effectiveness of this approach, which is limited by available quality metrics and the threat that overly prescriptive metrics could divert attention and resources from other more productive means of providing high quality care and undermine physicians' intrinsic motivation to provide high quality care.^{37–39}

Extrinsic incentives that conflict with intrinsic rewards of clinical practice may be less effective than those tailored to meet both intrinsic needs of the clinical staff and extrinsic needs of the organization.^{39,40} Hence, the organization's

leadership may reinforce intrinsic motivations to provide high quality care through managerial initiatives that emphasize quality improvement, along with a work culture and peer relationships that encourage better clinical decision making. Finally, resources provided to clinicians, such as time with patients, support staff, and clinical decision support tools, can affect physicians' need to use heuristics in decision making and influence the quality of care decisions. These various factors are also important at the practice site level.

Networks and Affiliations

Physician organizations often affiliate with other entities (e.g., regional health information organizations, independent practice associations, physician hospital organizations, accountable care organizations), or are linked through ownership by another entity, such as a local hospital system. These networks and affiliations are often formed to facilitate health plan contracting or to achieve scale economies for administrative functions (e.g., health information technology implementation). Accountable care organizations are formed to accept value-based payment intended to motivate improved clinical decision making. These various arrangements could provide physician organizations with greater resources, which need not necessarily enhance clinical decisions, as they could support higher physician incomes rather than support patients' ongoing care.⁴¹ Formal employment of physicians by hospitals and other entities, however, could reduce physician autonomy and affect evidence based-decisions at the point of care either positively or negatively, depending, for instance, on whether the employer's focus tilts toward quality improvement or revenue maximization.

The Local Market

The local healthcare market is characterized both by the size, number and characteristics of the various payers (including patients and insurers) and by providers, as well as the dynamics among these actors, which influence, for instance, the nature of health plan/physician organization contracts, and indirectly the incentives physicians face. Physicians may find themselves in more or less competitive situations in terms of attracting and retaining patients, which can influence the type and nature of incentives they face, and hence their clinical decisions at the point of care.^{42,43}

Peer effects on clinical practice, discussed previously in the contexts of practice location and physician organization, may also occur at the community level.^{12,28} Other market factors, such as the availability of specialty, inpatient, and post-acute services, and data exchange between providers, can influence the quality of clinical decisions. Malpractice concerns, which may vary at least modestly across local markets, influence provision of services that may be of marginal value to the patient—that is, defensive medicine.^{44,45} Reimbursement rates for physician services vary both across and within markets, and differ across physician specialties and physician

organizations.^{36,46} Reimbursement rates in a fee-for-service environment have been shown to influence physicians' provision of services.^{36,43}

Public Policy

Public policies can influence clinical decisions in various ways. Major federal investments are being made in comparative effectiveness research to expand evidence on efficacious care. In fee-for-service Medicare, the value-based modifier will soon reward or penalize physicians on their quality and cost performance, with performance metrics made public. New payment and delivery innovations, many spurred by the Affordable Care Act, such as accountable care organizations, patient-centered medical homes, and bundled episode payments, will alter payer incentives towards value-based care. Physicians involved with these efforts will likely face changing extrinsic incentives related to their care decisions, but will also likely see greater care management infrastructure investments and new care processes. The effect on evidence-based decisions may depend upon how complete and well-conceived these initiatives' performance metrics are.³⁹ These policies may also influence the organization of medical practice, altering practice organizations' size, composition, and compensation incentives. Policies to penalize hospitals for readmissions, complications, and errors may influence inpatient care processes and incentives, affecting physicians operating in these practice sites.

Finally, the Medicare physician fee schedule has widespread influence on payment of specific services throughout the healthcare system. The fee schedule is generally recognized as being very flawed, with some services over or undervalued, hence more or less profitable. The maladjustment of fees across various services has been identified as key driver of deviations from evidence-based clinical decision making.³⁵ A host of other public policies at the local, state, and federal level (e.g., regulations, price setting, support of medical education) could also directly or indirectly influence physician clinical decision making.¹²

AREAS FOR ADDITIONAL RESEARCH

There is growing recognition that the current health care delivery system is not sustainable, and that greater efforts are needed to encourage both improvements in care delivery and new incentives that encourage value over volume. The healthcare landscape is awash with experiments in new organizational, information technology, care delivery and payment arrangements. Yet to judge whether, how, and especially why clinical practice is changing, research needs to look beyond individual reform initiatives towards an understanding how the health care system is changing (or not changing) at all levels described in our conceptual framework. With a better sense of key drivers influencing clinical decision making, key public and private decision makers will be better positioned to

improve in clinical practice and expand use of evidence in clinical decisions.

CHALLENGES AND OPPORTUNITIES FOR FUTURE RESEARCH

Health services research has a role in identifying mutable levers to increase evidence-based care delivery. Our conceptual framework presents a complex web of influences on physician clinical decision making, including the use of sound evidence in clinical decisions. Case studies of how actions by individual practice locations or physician organizations changed the quality of clinical decision making can be a useful tool to gain understanding, although such studies would not be generalizable beyond that setting. There have been a number of studies that have used geographic variations in costs or practice to make inferences concerning reasons causing variations in physician practice, but these are susceptible to confounding and have other methodological limitations.^{6,47,48}

Some specific factors have been investigated empirically, but little research incorporates the full range of potential influences on evidence-based care. Our conceptual model can guide the collection of data by empirical researchers investigating the use of evidence at the point of care. In the same way physicians and their patients vary significantly at an individual level, so do the clinical, organizational, and market contexts in which physicians practice. As a result, researchers need to be mindful of interactions among factors, such that best methods to improve care can be tailored to particular situations.

Although the complexity of the underlying processes and multitude of factors poses significant obstacles to identifying the unique role of malleable factors in clinical decision making, progress in promoting healthcare improvement requires incremental steps at better understanding. As a prerequisite for obtaining greater understanding of malleable factors that can improve clinical decisions, we need good measures of physician decision making at the point of care. Information on physician decision making might be obtained from claims data, chart reviews, electronic health record data or from clinical vignettes on physician surveys. As described in Converse et al. elsewhere in this volume, each of these have their advantages and limitations in terms of feasibility, validity and generalizability.

To capture many of the key explanatory factors discussed here, surveys of both physicians and their organizations may be needed. Various specific characteristics of the work environment could be reported by physicians themselves: availability of peers, the perceived organizational culture, available staff and technical resources, functioning of teams, clinical workload and other day to day pressures. Since physicians may not be knowledgeable about important characteristics of the larger practice organization, concurrent surveys of physician organization informants would be desirable.

While such survey approaches have a number of limitations, the perfect should not be the enemy of the good. There are opportunities for new survey initiatives—perhaps linked with electronic health record and market information—to gather additional information to track how clinical practice is changing over time and to gain a better understanding of how physician clinical decisions at the point of care are made and influenced. Most importantly, these efforts would provide guidance to policy makers and organizational leaders about best ways to improve clinical care at the point of care.

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Corresponding Author: James D. Reschovsky, PhD; Mathematica Policy Research, 1100 1st Street NE, 12th Floor, Washington, DC 20002, USA (e-mail: jreschovsky@mathematica-mp.com).

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