The Nature of Care

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Abstract

Approaches to the management of health care have been framed around two broad conceptions of the nature of the health care process. The mechanistic view of care treats the process as a standardizable production process comprising a relatively unvarying sequence of decisions and tasks. The individualistic view regards medicine as an art not a science and the process one in which the professional uniquely crafts a care management strategy for each patient. Each view is associated with a different set of management tools – care paths and guidelines in the former case and financial and non-financial incentives in the latter. Both sets of tools are primarily used as mechanisms of control. This paper argues that the true nature of the care process, of which these two views are special cases, is a learning process comprised of a linked set of decision-implementation cycles. These cycles yield both a medical outcome and new information upon which the subsequent cycle is based. As it unfolds the process of health care yields learning for the patient, the care giver, the delivery organization and medical science. An understanding of the nature of care leads managers to manage the process in a different way, for learning not control.
INTRODUCTION

The symptoms of the malaise of the US health care delivery system are in plain sight. Everyone, regardless of training in medicine or health policy, can easily detect the widespread dissatisfaction of all parties - be they providers, employers, patients or health insurers. Failures of the system are manifest as horror stories of care denied or delivered erroneously, insupportable cost increases, millions of working Americans uninsured and labor unrest among the professional classes. The posited causes of such unhappiness are many and varied and include the structure of the care delivery system, our preferred method of employer based health care financing, high priced technological innovation and the intransigence of the various health professions. The optimal therapy is also far from clear as well: we don’t actually know how to treat this “disease” in its every manifestation. Yet we employ technology as if we do, and technology itself becomes both the savior and the cause of our problems, playing a significant role in both cost increases and improvements in health and patient outcomes. Managed care, originally proposed as a solution - increased and overt competition would bring about improved efficiency and increased quality as it has in other industries - is now vilified as the problem.

Meanwhile, conspicuously absent from discussions about the origins of the problems besetting health care delivery and optimal interventions is any consideration of what the system is supposed to achieve. All systems support underlying operational processes, yet the current debate about the functioning of the health care system has not considered the nature of this underlying process: the rationale of health care itself.

With the aim of informing the debate about how health care should function, this paper will examine the core unit of health care delivery, the process of health care. In other
words, this paper argues that there is an underlying “care process,” and by better understanding its nature, components, and implications, we are better positioned to improve the performance of the existing system.

In particular, I shall argue that the “the process of care” is a “learning process”, one that advances as it operates among providers, patient, and the delivery system as decisions are made and new information generated and incorporated. Current models of care delivery - based on assumptions of routinized treatment or individualized treatment as ideal alternatives – are consistent with this “learning process” nature of care.

THE PROCESS OF CARE

When an individual arrives in a medical “place,” that person has a self-perceived health problem and seeks information and counsel from an agent who is presumed to have knowledge about this problem. Typically, the agent, after examining the individual, identifies the problem, forms a hypothesis about what the problem is, and on the basis of that, recommends a course of action for the individual to follow. If the patient continues in treatment, both the assessment of the problem and its treatment are measured and either reaffirmed or adjusted. Hence health care comprises a set of problem-solving activities: problem identification, diagnosis, treatment planning, treatment implementation, and follow-up.

What is significant about thinking of “health care” this way is in that providing care to an individual seeking a solution to his or her health problem the agent shifts from a focus on the disease as the primary phenomenon to the specific patient with that disease. As such, both the individual patient’s context and the disease as a “state” are considered in the attempt to explain both the cause of the patient’s problem and the planning of the solution. That is, the body of medical knowledge the clinician draws upon to solve a patient’s problems treats a disease as an isolated phenomenon. In caring for an individual patient, however, the clinician in effect connects the patient with the disease

that she or he has learned about when going through the steps of diagnosis, treatment planning and treatment delivery. In so doing, a new phenomenon arises: the “patient with the disease” (see Figure 1). The disease manifest in a specific patient is subtly different from the disease as an isolated phenomenon. As an isolated phenomenon the disease is associated with a set of therapeutic interventions known to cure or modify it. When manifest within an individual patient the treatment set associated with the disease may be modified due to considerations of the patient’s preferences or specific biology. Thus in treating the patient with the disease the clinician/agent is treating both the disease and the patient. The set of activities by which the agent identifies, characterizes and resolves a patient’s problem by treating the disease and the patient is “the process of care”. This process – the connection of a patient with a disease through the activities of diagnosis, treatment planning, treatment delivery, and the monitoring of patient well-being during recovery – is universal. Over the course of medical history our understanding of diseases and the tools we use to make the connection have grown more sophisticated but the basic process has stayed the same.

![Figure 1: Connecting the patient with the disease](image)

To the outside observer how particular patients are connected to general diseases may not be immediately apparent. It is obscured by the visible activities that characterize the health care delivery system. In this system physicians and nurses give drugs, operations and counsel to patients and these activities occur within the myriad of organizations.

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2 In this paper the terms “individual” and “patient” are used synonymously, as are “physician” and “agent”. The term caregiver is used to denote a member of the care giving professions, such as a doctor, nurse, or physical therapist.
where these professionals work - emergency rooms and group practices, hospitals and homes - and utilize resources that depend on the insurance system that pays for care (HMOs and customer service telephone lines, etc.).

[Diagram of the care process]

Figure 2: Phases of the care process

These visible structures and activities - the work of caregivers, and the institutions of health care delivery and financing - all overlay the process of care defined above. Health care systems vary from state to state and nation to nation, shaped by cultural norms and available resources. In each region they comprise different institutions and professions and draw from different bodies of knowledge. Moreover, each represents differing implicit societal agreements about the nature of illness, the role of the sick, and the appropriate apportionment of decision and property rights related to illness.

Nonetheless, regardless of the structure of the system in which care takes place, the process of care is made up of the same four basic activities that connect the patient and the disease: diagnosis, treatment planning, treatment delivery and monitoring (Figure 2). Each activity involves both decision making and decision implementation. They occur within the context of a key relationship between the caregiver and the patient. At each step in this process patients interact with their caregivers who determine and then deliver the interventions most appropriate to their needs at that time.

This process may last days or years, depending on the patient’s underlying illness, and may take place in many settings including physician’s offices, acute and sub-acute settings and the patient’s own home. For example, patients with an acute condition like a broken bone go through this process once over a relatively short period of time. In
contrast, patients with chronic relapsing diseases may go through the cycle of diagnosis, treatment planning, treatment delivery and monitoring many times over many years as each new exacerbation or development will initiate a separate process when the individual seeks care for a new problem.

The process of care lies at the heart of a health care system. Moreover, other processes and systems derive from the process of care. The decisions and activities of diagnosis, treatment selection and implementation, and monitoring determine the demand function for many sub-sectors of the health care industry, for example the pharmaceutical, device, diagnostic and hospital industries. Equally, the specifics of the decisions and interventions for any particular patient are also constrained by various sub-sectors of the industry that determine the available resources, such as the health care financing and regulatory sectors. For example, most interactions between patient and caregiver generate a bill, thereby initiating many subsequent transaction processing steps and creating the market in which billing companies compete. Supplies used during the care process - such as tests, hospital bed days, pharmaceuticals, and medical devices - are delivered to that moment in which the patient and caregiver interact by a complex supply chain. The industries that develop and market pharmaceuticals and devices, distribute medical supplies, process bills, provide ancillary services, and manage clinical and billing data are all tied to the core process by which an individual patient’s medical problems are identified and solved. The process of care not only generates these industries’ demand but is also the process into which their products and services must ultimately be integrated.

Components of the Care Process

The process of care can be distilled into two major components: decision-making (what is the cause of the problem - i.e. what is the disease and how is it manifested in this specific patient?), and decision implementation (what is to be done, given this
I will define these components then explore them in subsequent sections, looking at their implications for the health care delivery system.

Decision Making in the Process of Care

Decision making in the health care process refers to the application of a generalized body of scientific knowledge to an individual patient circumstance – the “implementation of science” (Figure 1). In applying medical science to an individual patient the clinician makes a series of decisions that, when implemented, define the care the patient receives. When implemented, these decisions trigger the utilization of health care resources as diverse as medications, therapies, alternative therapies, radiological and laboratory tests, hospital accommodations and surgical procedures that are the ultimate drivers of health care costs. Fully 85% of all the costs of health care are realized on the signature of an individual physician.

Several bodies of knowledge inform these decisions. Medical science includes basic human biology and clinical practice, i.e., knowledge about the “disease”. Industry and organizational knowledge comprises an understanding of the industry structure and regulations that determine what care may be delivered as well as how best to organize its delivery. And, individual patients have personal knowledge of their own values and preferences that shape their health care consumption decisions.

In delivering care, expert clinicians attempt to make decisions, and thereby solve problems, through matching their observations of the individual patient’s medical condition to known patterns described by medical science. They attempt to resolve discrepancies between the picture the patient presents and these known patterns by either seeking more information or making a tradeoff between the risks and benefits of acting in the case of an imperfect match. These decisions precede the tasks that constitute the external manifestation of health care, what we think of as health care.

3 The activities that generally fall under the heading of “health care delivery” – undertaken by the “health care delivery system” - include both diagnostic and therapeutic decision-making and the enactment of these decisions. Of course the patient who sought the agent’s advice is free to
Significantly, however, the decisions that define clinical care are made under conditions of uncertainty. Uncertainty surrounds the class of problems to which a patient belongs, and the individual patient – both by the very fact that a disease exists within an individual, and because important information about the patient may be not be accessible to the physician. Some uncertainty may be reduced by better information and forecasting ex ante, as well as through the ex post observation of the results of prior decisions. Some uncertainty is intractable, however, in that our current understanding of disease is insufficient for us to predict the optimal course of treatment for an individual patient or their response. As such, the matching of the particular patient to the presumed patterns of a disease is always probabilistic. Relatively few decisions are deterministic and few care paths are linear. The net effect of this kind of uncertainty is to permit a wide range of variation in what is regarded as “acceptable” care.

And, it is not only the physician who makes the decisions about the patient and his or her disease and thus causes health care resources to be expended. The patient’s physician is increasingly part of a care delivery team comprising multiple specialist physicians, nurses and therapists. The decisions ultimately reflected in an individual patient’s care represent both the decisions of individual caregivers and the consensus among the team as a whole. Furthermore, beyond the care delivery team are equally, if not more important decision-makers, the patients themselves. The extent to which patients participate in the decision-making process ranges along a spectrum. At one end is the decision to seek care - traditional or complementary – itself and the decision to comply with - to implement - the treatment plan recommended (e.g., to fulfill the prescription for specific medication provided and to actually take the medication as prescribed). At the other end are patients who do more than seek care and comply; they inform themselves and participate fully in their own health care decisions.

accept or reject the advice by accepting or rejecting the diagnosis and consenting or not consenting to the recommended treatment. Hence not all decisions are implemented.

5 To be able to do so is, of course, both promise and allure of the human genome project and “personalized medicine.”
Decision Implementation and the Process of Care

Once a decision (diagnosis or treatment strategy) has been made, it is intended to be implemented. Indeed, diagnosis and setting forth of a treatment strategy represent decisions made in tandem. Yet it is not a safe presumption that the care decided upon will be implemented. As noted, the patient may decide against following a recommendation, or be prevented from doing so by any number of financial and non-financial barriers to access to care, such as the fragmentation of the delivery system. Furthermore, care decisions are often operationalized by different professionals, and may be further separated in time and place. The physician may write an order for chemotherapy in the outpatient clinic but the drugs may be delivered hours or days later in a chemotherapy infusion unit or an inpatient oncology ward by nursing and pharmacy staff. The separation of the decision makers from the decision implementers is not simply a recent phenomenon that is a function of the size of the modern care delivery team. At a minimum care giving professionals have always left some part of the implementation of their advice to patients and their families – making the process of care inherently a “co-production” process. Patients are usually responsible for many of the logistics of care, such as obtaining medications, setting a schedule and actually taking the drugs. Increasingly, patients are being asked to take on other care tasks that derive from the diagnosis and treatment selection, such as caring for wounds and intravenous lines. The fact of this separation has an important ramification – it potentially fragments the inherent coherence of the care process causing variance between what was intended and what actually occurred.

If a medical decision has been implemented, the clinician and patient can then observe the outcome of the care delivered – which either confirms or denies the accuracy of the decisions. In observing the outcomes of care both clinician and patient learn. Most frequently the clinician learns about the specific patient being treated – his or her individual biology and personal preferences. The clinician may also learn about the way in which local conditions, such as the demographics of the population being treated or the functioning of locally available resources, influence the way in which medical decisions should be made and implemented. Occasionally the clinician, alone or in
collaboration with colleagues, may learn something unique about the class of patients of which this patient is an example or the solution to a class of problems. As such, the body of science pertaining to this type of patient is advanced, and the understanding of “disease” becomes more refined.

Over time this learning increases the body of knowledge underlying care decisions at both the diagnostic and implementation levels. Local delivery systems improve as we learn more about the optimal design of the mechanisms by which we apply that science to our patients. Clinicians’ knowledge of individual patients also advances (usually in concert with the thickness of the patient’s medical record). Finally, patients’ own knowledge and expertise increases – knowledge of themselves and of that corner of medical science that applies to them, and expertise in applying that knowledge to their own health care and own diseases.

<table>
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<tr>
<th>Decision-making</th>
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<tr>
<td>applies medical science, organizational and personal knowledge to a specific patient</td>
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<tr>
<td>comprises a set of decisions and their execution</td>
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<td>decisions are made under conditions of uncertainty</td>
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<tr>
<td>each decision is made by both the clinician (or clinical team) and the patient</td>
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<td>dynamic inasmuch as medical science, organizational and individual patient knowledge is continually developing</td>
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<table>
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<tr>
<th>Decision implementation</th>
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<tr>
<td>decision-making and decision execution may be separated in time, place and person</td>
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<td>both caregivers and patients implement care decisions</td>
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<td>each implemented decision either directly or indirectly generates new information (and is in this sense experimental), thereby reducing the uncertainty associated with that patient’s care</td>
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**Figure 3: The components of the care process**

This then is the fundamental process of care – a process in which individual patients’ health problems are treated by connecting them to a general body of knowledge about a disease and making interventions based on this connection to the patient-with-that-
disease. It comprises a set of clinical decisions that when implemented constitute an n-of-1 experiment, the results of which inform the next decision about the patient being treated and occasionally decisions about a class of problems (Figure 3).

The above discussion reveals that the components of the care process are interdependent; they are not “stages” - one leading inexorably to the next, because the clinician’s knowledge of disease interacts with the individual’s manifestation of the disease. Clinician and patient (ideally) collaborate on the disease problem as part of the care process. Each learns through this process. In the following sections we will explore how this works.

TYPES OF KNOWLEDGE DRAWN UPON IN THE PROCESS OF CARE

Medical decision making represents the reconciliation of the caregiver’s general medical knowledge about diseases, their causes and therapies, and the organizational context of care delivery with specific knowledge of the particular patient. In characterizing a patient’s medical problem and planning and executing a course of treatment intended to resolve it, caregivers make reference to four separate bodies of knowledge. Three are general inasmuch as they are independent of the patient whose problem is the current focus of attention. By integrating these bodies of knowledge, the caregiver is able to craft a care process that is uniquely suited to the needs of the individual patient, yet reflective of the current state of medical knowledge about the general class of problems the patient represents. The caregiver acquires some of this knowledge during training and postgraduate continuing medical education courses, but a large part of the knowledge base derives from his or her unique experience.

The first body of knowledge informing care decisions is that contained in the medical literature, which is acquired through individual study of texts and journal articles both during and after medical and other professional schooling. This body of medical knowledge continually evolves, and practicing physicians and other care givers with little time for study rely on conferences and pharmaceutical representatives to keep them up to date.
The second body of knowledge derives from the practitioner’s unique experience base. In general, inexperienced practitioners tend to rely on rigid guidelines and rules learned in medical school to guide their interpretation of their observations of the patient and their attempts to solve problems and make medical decisions. Experience, by comparison, allows the practitioner to observe the outcomes of multiple uses of the rules taught in professional schools and thereby learn through experimentation. The practitioner is able to refine internal criteria for distinguishing when one rule is more applicable than another, to integrate many simple rules into sophisticated patterns, to weight some observations more heavily than others and thereby develop hierarchies of observations, rules, and patterns. These can then be matched to individual patients. As experience varies this knowledge is unique to that practitioner.

Much modern care is delivered by an organization that employs many care givers whose coordinated and integrated activities determine the patient’s outcome. The third body of knowledge is organizational knowledge embedded in the system which delivers care as that organization’s norms, policies and procedures. Physicians frequently practice medicine in conjunction with several organizations, including the delivery system, their own practice, and the patient’s payor. Knowledge of all of these organizations’ strengths and weaknesses and rules and procedures play into physician decisions. Thus, physicians take the reliability of the local laboratory into account when evaluating a patient’s results and the payor’s formulary (to the extent that the physician knows this information) when prescribing medications or recommending a site of care.

Finally, there is patient-specific knowledge derived from the medical record, the patient’s disclosures to the physician/care giver at the time of the consultation and the past and present observations of the patient. This is knowledge of the patients’ personal, medical and family histories, that individual’s unique biology and physiology, personal values and preferences. Subsequent observations of the patient, especially

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their response to therapeutic interventions, increase the practitioners’ knowledge of the particular patient.

In making clinical decisions these bodies of knowledge are integrated and conflicts among them are reconciled. For example, a physician treating a patient with new onset atrial fibrillation (an abnormality of heart rhythm) will be aware of the guideline recommending the use of the anticoagulant warfarin for patients with this disease in order to prevent stroke. She will also be aware of the hospital’s process for anticoagulation and the strengths and weaknesses of her hospital’s anticoagulation clinic (if indeed one exists) and its success in monitoring patients on this dangerous drug. Finally she will be aware of the fact that the particular patient has a past history of alcoholism and falls, which are associated with an increased risk of bleeding in patients taking warfarin. Ultimately, she may decide that, in spite of the general recommendation, this patient ought not be commenced on warfarin. In reconciling these four bodies of knowledge the physician is applying general medical science to knowledge of a particular patient.

Types of Decision and Decision Making Process

In integrating and reconciling these four bodies of knowledge caregivers arrive at one or more of many decisions, including the core care process components of making a diagnosis and selecting a therapy and implementing it. These decisions are made at every stage in a patient’s interaction with the care delivery system through the phases of diagnosis, treatment selection, treatment delivery and monitoring (Figure 2). In other words, the care process comprises multiple care team–patient interactions, each of which consists of decision making and / or the implementation of these decisions. This is a recursive learning process, whose various decision points inform each other.

As we have seen, the key decisions are as follows. First, a problem is identified, either by the patient or as a result of some screening effort and the patient decides to seek
care. Once a care delivery process has been initiated (by the patient or a care delivery organization) a diagnosis is sought and defined. Several smaller decisions lead up to the diagnosis decision. For example, the physician makes the decision whether or not to gather additional information and decides on how to interpret subsequent laboratory results.

Next an appropriate treatment is selected, often from among many that are available. The choice of treatment is obviously dependent on the diagnosis but also on the special characteristics of the particular patient such as other diagnoses and treatments and the patient’s preferences. This treatment choice is implemented through a series of narrower, though not insignificant, operational decisions – often the locus of important medical errors. The physician’s judgment about how effectively a treatment choice is likely to be implemented will affect the choice of treatment. Finally, the care delivery process frequently extends to the ongoing monitoring of a patient over time during which the significance of change is repeatedly evaluated. If the care process was initiated to address a chronic health problem, then there will be many iterations of the cycle involving monitoring, evaluation and diagnosis, and adjustments to the treatment.

Models of Decision Making

Two very different models are drawn upon to represent how clinical decisions are made at various phases in the care process. The first, called “recognition primed decision-making (RPD)” attempts to characterize the way in which physicians make decisions in practice and represents the physician as an expert pattern recognizer relying on the intuition developed over years of experience. The second, classical decision making, is normative rather than descriptive, and is based on a view of the physician as a rational actor dispassionately computing probabilities internally.

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7 In this paper I am focusing exclusively on the medical care process and am therefore not considering the decision to purchase health insurance.
The RPD model depicts decision making as dynamic, iterative and sequential. The physician matches her observations of the patient to well-recognized patterns she has learned during formal training and refined or added to during her post training experience. This matching process involves a mental simulation of the “goodness of fit” between the patient observations and known patterns or the diagnosis and the potential therapeutic intervention. Significant gaps between the patient observations and the known patterns may occasion more information gathering (i.e. increasing the number of patient observations) or risk benefit tradeoff.

We should note that in recognition primed problem solving the physician does not develop and then select from an exhaustive (or even short) list of all the possible patterns that could account for the patient observations. Rather, selecting from her own personal archive of patterns and experiences, she goes straight to the pattern most likely to fit the observations of the patient. Then through information gathering, mental simulation of the likely outcome of a particular course of action, or therapeutic trial, she tests that single pattern. The experienced observer does not accord all observations about a patient equal weight, but places greater significance on some. Hence the process of decision making is actually very parsimonious. For an individual patient the differential diagnosis list (of all possible diagnoses) may be quite long but the expert physician only seriously considers, and further investigates, a handful.11

Recognition primed problem solving is intended to describe decision making by an individual clinician about an individual patient at a particular point in time. This is decision making about the patient with the disease, not the disease as an isolated phenomenon. The patterns that the physician uses to organize and make sense of her observations synthesize and reconcile multiple “best practice guidelines”, themselves descriptions of idealized care of a disease.

The second model of decision-making, the classical decision model (CDM), is best characterized as a selection from among explicit alternatives. In contrast to RPD the

physician first develops a defined set of alternatives (fully specified outcomes) from which to choose. Each alternative has an associated explicit probability of a positive and negative outcome and a value for each of these outcomes. The probabilities and values associated with each outcome are computed mathematically to generate an expected “utility” for each outcome. The expected utility of each alternative is compared to all the others and the practitioner selects the option with the greatest expected utility.

This model is not purported to describe the way physicians make decisions in daily practice. On the contrary, it has been developed as a normative description of the way clinical decisions ought to be made in response to the growing body of evidence suggesting that physicians are imperfect decision-makers. Nonetheless, the expectation of orderly algorithmic physician decision making underlies many of the thousands of “best practice guidelines” to which physicians in daily practice are expected to adhere. Utilization management algorithms and criteria sets that are used determine the appropriateness of individual tests and therapies are primarily based on this model of medical decision making. It is the core of the techniques of cost benefit and cost effectiveness analysis that underlie many economic and clinical analyses of medical interventions.

Problem Structure and Decision Making

Not all decisions are the same. In some cases to “decide” means to solve a problem. The clinician seeks a single right answer, such as that single diagnosis that matches the particular patient’s mix of symptoms, signs and laboratory results. On another occasion to decide means to select the best from the finite list of defined options associated with the disease (as an isolated phenomenon). The options may differ from one another long one or more of several dimensions, such as cost, likelihood of survival, or quality of life. None is either “right” or “wrong”. The decision requires making tradeoffs among these attributes.

In connecting the particular patient with the general disease – during which the physician makes a diagnosis and selects a therapy – the problems the physician is attempting to solve and the choices she is making are more or less structured. When a problem is new to the particular physician or is not well understood by medical science no established patterns exist to explain the patient’s condition and constellation of observations thereby connecting it to a disease. In this case the problem faced by the physician is unstructured. The physician solves the problem by reasoning from first principles using all of the knowledge she has available. Cognitively, such unstructured problem solving is intentional, slow and effortful.\[14\]

More frequently, the patient’s condition conforms, more or less closely, to a pattern the physician well recognizes – either because she has seen it before or was taught it during training. In this case the connection between patient and disease is made through a process of pattern matching. Where there is an imperfect match the physician will either seek more information or make a tradeoff between the risks and benefits of acting or not acting in the case of an imperfect match. Cognitively such pattern matching is often automatic and rapid.

Finally, in the most structured circumstance, the connection between patient and disease may be made using a rule – a simple “if-then” statement. In practice the difference between a pattern and a rule is simply the level of probability of the association between the observations and the phenomenon, the strength of the coupling between cause and effect. If a pattern is connected with a known outcome with a high enough probability then it becomes a “rule”. For example, a simple rule regards immunization of children against measles. Not all unvaccinated children will contract the disease, and not all with the disease will develop its worst complications. However the association between vaccination and not contracting measles is strong enough and the social benefits are high enough that measles vaccination is widely treated as a rule.

These three possible modes - unstructured problem solving, pattern recognition, and rules application – are alternative ways in which alternatives are generated and selections are made. Different modes may be used in different phases of care. So a physician may make decisions in diagnosis and treatment selection based on pattern recognition but the implementation of the treatment may be governed by simple rules, or diagnosis may involve pattern recognition but treatment selection is driven by a rule. Which mode pertains for any given physician, patient and decision depends on the structure of the problem at hand, and, ultimately on the state of both general medical knowledge and the physician’s own personal knowledge. The less structured the problem the less easily it can be reduced to an explicit choice or algorithm. Debate exists about whether the structure of a problem is an independent function of the problem itself, or a function of the way in which the problem is framed by the decision-maker. Experts, the argument goes, structure problems more effectively than novices. Novices tend to apply the rules they have learned during training without modification. Hence what for one physician is an unstructured problem is to another a pattern, and to yet another a “rule”. With increasing experience decision-makers learn to recognize subtle patterns in their observations allowing them to organize these observations differently and reach conclusions that a novice would not by simply applying their rules they had learned.

The freedom for so much discretion for the individual decision-maker derives from the uncertainty underlying almost all medical decisions. As we have seen, uncertainty may be a function of the decision – some decisions are more uncertain than others - or the decision-maker - some decision-makers more experienced than others. The effect of this uncertainty in the process of care is that acceptable care is a range not a point. There is ample room for each caregiver to apply their own models of cause and effect when creating a care process for a given patient – in effect, to conduct minor “experiments”.

16 Ibid
Patient Decision Making

Once again, it is important to note that decision making is not the purview of the physician alone, or of the care delivery “team” alone. Health care delivery is a true “co-production” process in which the customer is directly involved in the “production process.” To this extent patients are equal participants in any decision, although their role is frequently understated and reduced to the level of “compliance.” At a minimum patients exercise their decision rights by choosing to seek, or not to seek, care and choosing to comply with or disregard the recommendations of their clinicians. At a maximum, patients are equal, informed partners with their clinicians in decisions about their care and, in some cases the primary decision-maker who only infrequently consults with their clinician as an advisor. Providers are not necessarily aware of the extent of patient’s independent decision-making, as demonstrated by one survey of alternative medicine use in which 33% of respondents admitted consulting an alternative care provider in the preceding year. Of these, 83% consulted a physician concurrently but most neglected to tell their physicians about their unconventional therapy.

Figure 4: Alternating primary responsibility for decision making between patient and physician

19 Other examples of co-production include bank customers undertaking their own transactions via ATMs or home computers, and airline customers doing their own searching and reservations via the web.
Regardless of the spirit of patient involvement in decisions about their own care (passive recipient or active participant) the primary responsibility for decision making shuttles between the clinical team and the patient during the course of an episode of care (as illustrated in Figure 4). The decision to seek care is largely the patient’s. Caregivers have primary responsibility for diagnosis (although patients have often developed their own diagnostic hypotheses at the time of presentation). Therapy selection may be a joint or unilateral decision, depending on the patient’s preferences and the physician’s practice style, and both patients and clinicians contribute to treatment implementation and post treatment surveillance.

Of course, patient decision making differs from clinician decision making in important ways. First, patients make different decisions from physicians, including, the decision to seek care and divulge personal information, and the decision to accept the care giver’s recommendation and actively participate in treatment implementation. Second, usually lacking a relevant knowledge and experience base they rely heavily on the advice of others to guide their decisions. Patient’s advisors include, but are not limited to, their physicians and nurses. Patients also look to their friends and family’s prior experiences, other providers such as pharmacists and alternative therapists, and more recently, the Internet to provide specific advice. Third, the process by which patients make decisions may not be the same as the decision-making process of professionals. Patients are not expert decision-makers in clinical matters and typically do not have an archive of experiences and patterns upon which to draw when they make decisions about their own care. Hence the recognition primed decision making model of expert clinician decision making is less applicable to them.

In summary, clinicians draw upon a number of knowledge bases to inform a set of decisions that define the process of care for an individual patient. These decisions connect the patient with a disease and then generate a treatment plan which is subsequently implemented. The clinician makes the connections either through unstructured problems solving, pattern recognition, or the application of specified rules. Which mode pertains depends on the nature of the decision being made, the state of the underlying medical and organizational knowledge and the knowledge and uncertainty, and the expertise of the particular decision maker (Figure 5). Finally, these decisions are made jointly by the caregiver (or care giving team) and the patient. The extent to which the joint nature of this decision-making process is explicit depends on the styles of the particular clinician and patient.

### The Role of New Information

Clinical tasks (diagnosis identified, treatment selected, or treatment delivered) and medical outcomes (improvement or worsening of the medical problem) are not the only outcomes of medical decision making. Each decision, when implemented, also generates new information. Diagnostic investigations and trials of therapy confirm or deny the physician’s expectations, provide new observations (such as propensity for side effects, responsiveness to specific therapies or doses) and update the prior probabilities that form the basis for the next decision. Each new piece of information reduces the uncertainty that underlies subsequent decisions. In this sense, the process of
care is highly experimental (defining a experiment as an act or set of activities deliberately undertaken to generate information). For any given patient entering care the physician does not know which pattern best matches the patient with their unique mix of demographic characteristics, diseases, manifestations of these disease and values and preferences. The process of diagnosis and treatment delivery has as one of its goals characterizing the patient – finding out about them as an individual. The act of making a diagnosis, i.e., deriving a therapy from that diagnosis and implementing that therapy, is in effect an experiment.

The predominant outcome of “care experiments” is information about the particular patient. Occasionally, however, caregivers also gain information about the performance of the delivery system – about its reliability and capability. By observing each other in action, members of the care giving team learn about each other’s particular competencies and weaknesses. Decision-makers also observe the reliability and turnaround time of laboratory results, and the performance characteristics of therapies such as medications and devices.

Less frequently as noted, information about the class of problems (the disease as an isolated phenomenon in Figure 1) of which the particular patient is an example is created. In utilizing a therapy and observing the outcome a decision-maker learns about applicability of that therapy to a class of patients – the eligibility criteria. For example, minimally invasive cardiac surgery was initially thought not to be applicable to obese patients by some early adopters. Later they noted that in fact it was ideally suited to some of these patients. Such information is very specific. It is not only information about the performance of a therapy in isolation (efficacy data - which may be gained from early clinical trials that makeup the bulk of FDA submissions) but also information about the performance of the therapy in the decision-maker’s hands – its effectiveness.

It is important to note that such experimentation is a fundamental to the nature of the care process. It is not “experimental care” in the sense that the effects of the therapy are

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not known. Even when a therapy is well characterized and part of routine and standard care, its first use for a given patient or by a given care giving team is an “experiment”. Hence such “experiments” do not require patient or Internal Review Board (IRB) consent. For example, many well-known side effects of common medications cannot be predicted for an individual patient without trying the drug. Simply put, the only way to find out if a patient is allergic to penicillin is to try it.

In summary, routine care generates information that updates one or more of the physician’s knowledge bases. The knowledge is of varying generalizability – some only relevant to that specific patient being treated and some more broadly applicable to groups of patients and processes of care. Some can only be appropriated by the individual clinician (as part of their personal experience base and tacit knowledge) and some that may be captured by a delivery system and codified as a new or refined process of care.

Caregivers are not the only ones who may appropriate new knowledge from “care experiments,” however. As they make and implement decisions in their own care, patients learn about both their preferences and values and about their disease and its treatment. By participating in the delivery of their care patients become experts in their own diagnosis and treatment. An experienced diabetic patient, for example, routinely increases and decreases his daily insulin dosage in response to his daily diet and exercise patterns and clinical data he collects using his glucometer. In effect he is making many of the same clinical management decisions that his physician would make.

Because the net effect of this “routine experimentation” is an increase one or more of the knowledge bases that underlie medical decisions the knowledge bases are inevitably in continual evolution. Evolution of these knowledge bases occurs at three levels; the individual practitioner, the care delivery system, and the general knowledge base of medical science.

23 One, still unrealized, promise of the genome is the ability to predict beforehand if a patient is genetically
**Individual Practitioner:** Each time a physician interacts with a patient, either by questioning and observing the patient, or by seeing the results of investigative tests or trials of therapy, she learns more about that patient. She learns about the patient’s unique biology, their specific disease, their social and family situation, their capabilities and their preferences. She also learns about the capabilities of the organization in which she is delivering care with each new decision-implementation “experiment.” Furthermore, each interaction presents the physician with an opportunity to augment their experiential knowledge base.

Recognition primed decision making is highly dependent on the physician’s experience and expertise - that is, it is an expression of the physician’s “knowledge-in-use” as much as the body of medical science (“knowledge-in-books”) from which it draws. It is through this experience that the physician develops her own personal “library” of patterns that she uses to ascribe meaning to a set of patient observations. The knowledge the physician uses on a daily basis therefore represents a synthesis of her theoretical knowledge (from the medical literature), local knowledge (of the ways in which the local delivery systems functions) and her implicit hypotheses, developed iteratively through personal trial and error, about cause and effect. Each physician therefore makes clinical decisions using a unique knowledge base.

Each decision-implementation cycle is an opportunity to test implicit theories about cause and effect. As a clinician treats more patients and manages more clinical situations, she gains the experience needed to become expert. Expertise develops when a clinician develops and refines patterns, hypotheses and expectations that guide their response to any actual situation.

The knowledge an expert employs is qualitatively different from that employed by a novice. Experts employ tacit knowledge which, unlike explicit, is hard to articulate and predisposed to a particular side effect.

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is acquired through experience. A nurse or physician who makes a prognostic statement about a patient based simply on their “look” is relying on tacit knowledge. The practitioner is not able to articulate what it is about the patient’s “look” that implies that prognosis. Practitioners develop tacit knowledge through practice and experience, not study of texts. The nurse or physician will have seen many previous patients with the same “look” that have gone on to a particular outcome. Novices, on the other hand, rely on explicit knowledge, easily transmitted because it has been codified as a care path or guideline the tasks and their sequence that need to be undertaken in order to achieve a desired clinical outcome. A care path can be created because the knowledge of what variables are important and how they interact with each other can be written down.

Hence the individual physician’s personal knowledge base is continually developing, either through the learning of explicit knowledge through study or through the development of tacit knowledge through experience. Each new decision-implementation cycle is an opportunity for an individual physician to enhance their personal expertise. In the same way patients also gain explicit and tacit knowledge when they are involved in their own care. As patients make and implement some of their own health care decisions they also go through this process of developing expertise and tacit knowledge. The diabetic patient described above learns to recognize patterns in his own symptoms and signs.

**Care delivery system:** The way systems learn is different from how an individual learns. System knowledge is embedded in the organization’s routines and the behavior of individuals and teams within the organization. The mechanism by which systems “learn” (and thereby improve their performance) is the revision of organizational routines and the changing of individual and team behavior. As individuals or teams of caregivers develop increased understanding and new and improved ways of doing things they update organizational routines. When this knowledge is tacit it becomes

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27 Feldman, MS. Organizational routines as a source of continuous change. Organization Science, 2000; 11: 611-629
part of the culture and the implicit principles that underlie daily work. When this knowledge is explicit it may be codified in policies and procedures. Through system redesign and quality improvement activities health care delivery systems are continually developing new routines and updating old ones. The knowledge embedded in the care delivery system, expressed as the organization’s capabilities is also evolving over time.

**Medical Science:** Of all the knowledge bases accessed by a physician perhaps the most rapidly evolving is the body of general medical knowledge. The information published in the medical literature ranges from formal randomized controlled trials to descriptions of single cases. General medical knowledge is, by definition, explicit. Therefore it is relatively easy to disseminate and, at least in theory, incorporate into the physician’s knowledge base. This assumption underlies the use of continuing medical education (CME) to change physician’s practices. Of course new knowledge may not be that easy to communicate to all physicians. If nothing else, it is voluminous. There are approximately 30,000 new citations added to Medline each month and hundreds of new drugs and devices registered with the FDA each year. It is therefore unlikely that any practicing physician will be totally up to date with the medical literature.

These three knowledge bases do not evolve independently. Caregiver’s increasing expertise, development of delivery system capabilities and the advance of science are all inter-related. Knowledge flows among all three. The usual presumption is that knowledge flows from medical science to individual practitioners. CME is designed to keep practitioners current with developments in medical science and clinical practice. By definition the knowledge communicated during CME activities is explicit since it is transmitted via lectures, workshops and publications. Knowledge also flows in the

29 A notoriously slow and expensive process – see for example Mason, J. et al. When is it cost-effective to change the behavior of health professionals? *JAMA*, 2001, 286(23): 2988-2992.
30 These data were gathered from the Ovid website, a commercial database company whose products include the clinical and general science database Medline. "Database Products and Services: Medline." <http://www.ovid.com/products/databases/database_info.cfm?dbID=53> (19 March 2002).
other direction. Knowledge developed by individuals during routine clinical practice motivates future basic science and clinical research thereby increasing general medical understanding.

In summary, the knowledge bases that inform the decisions defining the process of care are continually evolving. Such evolution occurs on two levels, at the level of the individual practitioner, who becomes more expert, and at the level of the general medical knowledge base, which becomes more extensive. Knowledge of the “patient with the disease” increases with each new test and trial of therapy. Little by little our understanding of diseases and their therapies as independent phenomena increases as knowledge of them that was once tacit - held in the experience base of individuals and the cultures of organizations - becomes explicit and testable and can ultimately be articulated as a fact, pattern, rule or algorithm. Finally, the patient too potentially becomes more expert as general medical knowledge becomes more easily articulated as simple rules and patient becomes a more experienced decision maker in the care of their own disease.

HEALTH CARE AS A LEARNING PROCESS

This paper has described the nature of care as a decision focused process that learns through a set of nested decision making – decision implementation cycles. The three elements - the knowledge bases, the decisions, and the new information - interact to create new patient specific knowledge that is integral to the process of health care because it is about the patient with the disease. In this sense the care of each patient is an observational experiment and the process of care is a “learning process” inasmuch as the process learns as it unfolds. Indeed, it is the nature of the process of health care to actively seek and assimilate new information about the patient, information that will modify the next step in the process.

In the longer term, the process of health care results not only in a medical outcome - a cure or mitigation of the medical problem for which the patient originally sought care - but also an information outcome. Information gleaned from the care-provisioning processes of many individual patients may also update one or more of the knowledge bases - the organizational and medical knowledge bases that are not patient-specific - on which decisions are based (Figure 6) and so inform the care of future patients. This is the second sense in which the process of health care is a “learning process”. Such learning is an inevitable byproduct of the care of individual patients.

Finally, participants in the process - physicians, nurses, other allied health professional and, of course, patients - also learn through cumulative experience. Over time such learning changes the way in which they make decisions - from the rote rules application of the novice to the sophisticated pattern recognition primed decision making of the expert.32

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32 Note that the focus of this paper is on the "static" manifestation of health care as a learning process, and the implications that flow from that perspective. We have examined the process’ structural parts and how they fit together. The "dynamic" manifestations – the evolution of the process over time - and implications will be examined in a subsequent Working Paper.
Current Approaches to Managing Medical Care

That the process of health care is by its nature a “learning process” in no way implies that the health care delivery system, as it is currently configured, optimizes such learning. Indeed it could be argued that the US health care delivery system, fragmented professionally and organizationally, actively thwarts learning within and across teams and organizations by impeding the transfer of information and the accretion of knowledge.

Furthermore, most current approaches to the management of the delivery system treat the underlying process as anything but a learning process. In the medical literature two competing views of the process of health care exist among clinicians and health care managers. Each implies its own approach to the management of medical care and a repertoire of particular management tools.

Mechanistic health care: On the one hand, the provision of health care is viewed as a reproducible routine in which there is relatively little variation from one patient to the next. In this view a knee replacement is a knee replacement and the criteria used to establish whether a knee replacement is necessary, the processes by which the replacement is performed and post operative care delivered are all substantially unvarying. Proponents of this view look to operations research, manufacturing industries, and those service industries in which “processes” are highly reproducible for insights into how to increase the efficiency and quality of care. They ask, “if McDonald’s can do it, why not health care?” The process of cooking and serving hamburgers is of particular interest because the key unit of analysis is the production worker, not the production machine, yet the outputs are highly standardized, and indeed, their quality is related to their standardization. Absence of variation is one of the bases upon which McDonald’s competes. An important characteristic of this view of the process of health care is that there is an intended outcome - for any given patient with a disease a preferred course of action and result exist - and quality can be measured in terms of success in meeting that outcome.
**Individualistic health care:** An alternative perspective, perhaps best characterized as the “health care is not hamburgers” view, holds that the care process is highly idiosyncratic and appropriately so. Human beings and patients vary infinitely and, consequently, the care of an individual patient can never be adequately pre-specified. Each patient’s care must be designed afresh by the clinician of the moment with reference to the patient’s unique biology and personal circumstances. A patient may have many diseases concurrently, or her personal characteristics may exert such a powerful modifying force on a single disease that the process of health care must be defined at the level of the patient with the disease, not the disease in isolation. Importantly, in this view, the quality of care for an individual patient cannot be judged by measuring the difference between the care actually delivered and the standard operating procedure because there may be many legitimate patient-specific reasons for this difference. There is no single intended outcome of care but rather an intended value that is jointly determined by the patient and practitioner when they make tradeoffs between clinical considerations and personal preferences.

The existence of these two viewpoints leads clinicians and managers to adopt differing sets of management tools to improve the quality and efficiency of health care. Interventions that primarily target the process itself (care paths, guidelines, utilization management and second opinions) conceive of health care as a specifiable manufacturing style routine in which the process of care for a particular patient can be compared to a “production specification”. The attempt is to lay out, in advance of care, a best practice pathway, based on the best currently available evidence. This pathway is a function of the disease, or the technology used in its diagnosis or treatment. When applied to a patient with the disease the pathway is expected to be modified - hence the usual disclaimer of the form “this guideline is not intended to replace informed clinical judgment.” But such modification is typically around the margins. In effect routine care is routine, and most patients are similar.

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33 Some guidelines and pathways pertain to the use of a specific piece of technology.
Higher level management interventions such as financial incentives, professional socialization and practitioner education, by comparison, are rooted in the view of the health care process as a unique set of individual events customized for each patient. If a patient’s care cannot be pre-specified then the only loci of possible intervention are the various incentives that shape a clinician’s decision making as she or he creates that patient’s health care process de novo. Financial incentives, for example, are predicated on the assumption that a physician’s enlightened self interest and value creation for the patient, which are connected by the physician’s decisions about that particular patient’s care, can be made congruent.

These two views frequently co-exist. A patient may be managed according to a strict protocol that defines the caregiver’s every action and decision until such time as something unusual transpires. When patients undergo anesthesia, for example, activities are highly routinized. One of the anesthesiologists’ roles is to monitor for deviations from this routine and manage each as a unique event. In oncology the choice of which chemotherapy regimen to deliver to a patient with cancer may depend on the expert judgment of the experienced clinician, but the logistics of drug delivery may be entirely standard. Similarly, the decision to immunize a patient against a given disease may be driven by a simple rule, yet the treatment of the patient, should they develop the disease may require a completely customized clinical strategy. In many circumstances the care of the same individual may require both standardization and individualization, often simultaneously.

The two views may also clash, although often in ways that are socially beneficial. The management tools associated with each viewpoint counterbalance each other. Fee for service payment systems provide a powerful incentive for physicians to over serve by ordering tests and therapies that may be in excess of the patient’s needs but justified on

the grounds of completeness\cite{36} and an ethic that favors doing all that is possible for a patient. Along with other non-price mechanisms, guidelines often act as a countervailing force to fee for service payment, recommending more parsimonious testing strategies. Conversely, in the context of capitation, often regarded as an incentive to under provide, inasmuch as they specify the minimal components of care, the same guidelines may act as a mechanism of ensuring that more is done, not less.\cite{37}

The “learning process” description of health care sits somewhere between the two extremes discussed above. On the one hand, steps in the process are more intimately connected than the “care as a customized collection of idiosyncratic events” view would have it. This is not because sequences of steps for an individual patient can necessarily be specified in advance or elegantly mapped as flow charts, but because each step generates information essential for subsequent steps. On the other hand, the health care process is much more variable and flexible than a “manufacturing” viewpoint would suggest. The information generated by each decision-implementation cycle in the care of a patient with a disease that influences the next step is highly specific to that individual patient. Furthermore, decisions and their implementation are undertaken by multiple parties, each with their own incentives, models of cause and effect, and resources such that it is not always feasible to create a standard operating procedure that would govern the behavior of all the participants in the health care process.

The learning process itself can be either mechanistic or individualistic (Figure 7). These two extremes in fact represent special cases of the more general learning process. When knowledge is explicit and uncertainty low then decisions can be proscribed and articulated as care paths and criteria sets accessible to less expensively trained and less experienced decision makers. Conversely, when problems are highly unstructured and uncertain, or the knowledge required to deliver care is tacit and cannot be easily articulated then more highly trained and experienced decision makers are required. In such situations physician behavior cannot be influenced by clinical rules, but only by the

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37 Robinson ibid.
various incentives available to health care managers. The vast majority of care is between these extremes. Some aspects of care are highly specifiable with explicit criteria and rule based decisions, and others are highly idiosyncratic and individual. In either case the process of care is one in which the four knowledge bases inform a set of decisions that when implemented generate new information that informs the next decision.

![Diagram of the two extremes of the learning process](image)

**Figure 7:** The two extremes of the learning process

**IMPLICATIONS**

To view the fundamental nature of health care delivery as neither mechanistic nor individualistic but as a learning process is to think about health care management in a different way. In particular this viewpoint has two important applications, one for the management of health care delivery process and the delivery organizations and systems that support it, and the other for supply-side innovators.

The current approaches to health care management, outlined in the section above, are strategies for control. Both aim to reduce practice variation and increase quality and efficiency by constraining physician behavior – either through process specification or personal incentives. Neither alone explicitly supports individual, team, or
organizational learning. To manage for learning, not control, requires that standardization and customization be viewed not as alternatives to one another, but as compliments. They are not independent characteristics of the process of care but exist in relation to one another. Deviation from the routine, the “something unusual” observed by the anesthesiologist described above, depends on the existence of a well-recognized routine. Both are a prerequisite of learning, neither alone is sufficient. Individuals and organizations learn by confronting and making sense of deviations from the expected. Hence deviation from a care path is not an event that should occasion an insurance denial or a unit chief’s reprimand. Rather, it is an opportunity to learn about the individual and the system. To learn from such events, however, necessitates that the care of individual patients or classes of patient be planned prospectively - a kind of “routine experiment”. The outcomes of such planning - a standard treatment plan, a mechanism for identifying deviation from the plan and a facility for learning from that deviation - are all components of team and organization level learning. Of course for most acute conditions the health care system will always be in the position of reacting to an event. For chronic conditions however, the majority of medical care, prospective planning of care experiments is possible.

Viewing health care as a learning process has an important implication for those innovators aiming to sell into the health care process, too. The adoption of new technologies and processes requires behavior change by clinical staff. As we have seen, continuing medical education - in the context of either professional meetings or detailing by sales representatives - only targets one of the knowledge bases underlying care delivery. Where new technology adoption requires patient, team or organizational learning CME alone will be insufficient. These three constituents learn predominantly through structured experimentation and aggregated experience not the one way transfer of explicit information. To promote the adoption of innovations in these circumstances is not simply a matter of making new information and resources available through

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marketing and the supply chain. It means actively managing adoption by managing learning – the explicit development of the individual experiential and organizational knowledge bases upon which the optimal use of a new technology or process ultimately depends. The sheer volume of technological and service innovations will increasingly place the burden for this on the supplier not the adopting organization.

Finally, the learning process/nature of care as it is described here suggests an alternative role for patients. They are not simply passive recipients of the caregiver's attentions, but full and active members of the care delivery team. The success of a “care experiment” is predicated on the fidelity with which the treatment plan (which has derived from the care giver’s and patient’s decisions) is implemented. The learning process is exquisitely sensitive to the behavior of the patient, particularly in primary care where patients are the final implementers of so many decisions. Furthermore, in chronic conditions patients, too, appropriate much of the learning from their own care, and with experience may take on an ever increasing role in the team. Patient’s active participation is therefore essential if the team as a whole is to learn to optimally care for not just that particular patients but other like patients.

It is all too easy to castigate the US health care system; its complexity attests to the multiple obligations it is to satisfy, and its multiple models of practice, in their seeming contrast, imply that how care “should” be provided is by no means evident. We frequently hear that managed care has failed and that the system needs to be overhauled. Nonetheless, underlying the US and all health care delivery systems is something fundamental - something that all, even the simplest “systems,” encompass: an individual and a “medical agent” attempting to understand and treat the manifestation of disease in that individual. Everything flows from this core process - including the complexity we see so plainly today. By focusing, however, on what actually is implied by that interactive process between individual and agent, patient and care giver - what I call the nature of care - we see that it is predicated on learning. Each

party is learning about the disease and its manifestation “here,” in this person. Each party brings knowledge to the process, and that knowledge is experimented with as diagnosis and treatment are enacted. New information thereby arises, thereby increasing the knowledge of both parties, and improving their ability to undertake care in the future.

From “the system” perspective, knowledge about the disease and its manifestation in this, and multiple individuals refines and specifies applications of “general treatment” possibilities. From the medical agent perspective – clinicians and clinical teams - can be armed with more articulate patterns to refer to, while also being aware of the need to use these in further rounds of experimentation with individual patients. For individuals, knowing that they are being viewed as participants in a process that encourages their involvement can help in very real compliance issues; they need not be by definition passive recipients of care. In short, supporting care as a “learning process”, managing for learning not control, enables learning and improvement at all levels – thereby improving system performance without recourse to major system overhaul attempts that have failed in the past.

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