

The marriage of evidence and narrative: scientific nurturance within clinical practice

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Abstract

Rationale, aims and objectives Published elaborations of evidence-based medicine (EBM) have failed to materially integrate the domains of interpersonal sensibility and relationship with tools intended to facilitate attention to biomedical research and knowledge within clinical practice. Furthermore, the elaboration of EBM skills has been confined to a narrow range of clinical research. As a result, crucial tools required to connect much clinically relevant research and practice remain hidden, and explorations of the deeper challenges faced by practitioners in their struggle to integrate sound science and shared clinical action remain elusive.

Methods We developed a model for scientifically informed, individualized, medical practice and learning that embraces the goals, resources and skills of EBM within a larger framework of practice defined by narrative process: 'attention', 'representation' and 'affiliation'. We drew from published elaborations of EBM, narrative medicine (NM) and the results of a project to develop tools for assessment of the cognitive skills embedded within a practice based EBM domain.

Results Within the resulting model, a tool of representation, whose components are Problem delineation, Actions, Choices and Targets, enables the clinical problem to be delineated and the patient and practitioner perspectives to be concretely defined with reference to four classes of clinical interaction: 'therapy', 'diagnosis', 'prognosis' and 'harm'. As a result, the 'information literacy' skills required to access, evaluate and apply clinical research using electronic resources are well defined but subordinated to shared appreciation of patient need. The model acknowledges the relevance of the full range and scope of scientifically derived medical knowledge.

Conclusion A model based on integration of NM and EBM can lead to instructional tools that integrate clinical epidemiological knowledge with enforced consideration of differing patient and practitioner perspectives. It also may inform avenues for qualitative research into the processes through which such differing perspectives can be productively identified and shared.

Case scenario

'I woke up with palpitations and chest pressure this morning. I just want to get it checked out, that's all.' This is how a 31-year-old construction worker, who has come to the emergency department during lunch break, describes his problem to a resident. You, the attending, have a reputation within your department for espousing the importance of both narrative and evidence-based skills in clinical practice. A resident determines that the patient has no significant past medical history but that his father died in his 50's of a 'massive heart attack'. The patient lives alone, has an unclear history of similar symptoms and has been drinking moderately since his girl friend left him 2 months ago. With some prodding, he

states that he occasionally takes a benzodiazepine, obtained from a friend, 'for sleep'. However, he stresses that, for now, he just wants his chest symptoms 'checked out'. The resident has suggested to the patient that, 'even though your EKG, vital signs and physical examination are normal, many of our attendings would order cardiac enzymes and recommend a comprehensive workup for acute coronary syndrome.' The facility has a clinical pathway for such patients. It reflects a thorough review of relevant guidelines and clinical evidence and their judicious adaptation to your institution's context and population.

The resident has sensed that there may be more beneath the surface of the patient's story than has been disclosed. You talk briefly with the patient before finalizing a plan and agree. To

reinforce the resident's reflective acumen, you suggest: 'When you write your note on this patient, include not only what you have told me about the problem as you have understood it, but also a bit about your reactions to him and your perceptions of his situation and perspective.' After doing this, the resident returns to the patient and now finds that he displays evidence of depression, with feelings of hopelessness and loss of interest in previously pleasurable activities. In the course of further discussions, the resident and attending find that their consideration of potentially useful clinical evidence has shifted from issues concerning low risk patients with cardiovascular symptoms [1,2] to those pertaining to substance-related chest pain [3] and quick screening for depression [4].

The above scenario illustrates how practitioners' understandings and interpretations of a patient's health care problems evolve over the course of even a single encounter, and how the resulting evolution may transform the relevance of information drawn from clinical research. Although the stakes are potentially high for our construction worker, his case is, perhaps, clinically uninteresting. In the course of an effort to integrate otherwise disparate aspects of routine clinical care, we have come to actively seek such clinically 'uninteresting' cases. We will draw from this one in the course of describing an integrated conceptual model of clinical practice.

The need for such a model is pressing. Critics of evidence-based medicine (EBM) perceive it as a rejection of the interpersonal aspects of clinical expertise and of the uniqueness of individual health needs [5,6]. Others long for a rebirth of medical humanism as an antidote to technologically driven health care [7]. Within the recent health care debate in the USA, spurred by reports of the continued gap between recommendations based on clinical evidence and clinical practice [8,9], spokespersons for health care reform have embraced EBM as the remedy for rising health care costs and even for the malpractice crisis [10]. The same sources look to comparative effectiveness research as the ultimate guide to cost-conscious use of resources [11]. Opposing political camps warn of 'death panels' and the 'rationing of care'. Within the resulting framework of debate, satisfying resolutions are elusive, and the result is divisiveness and fragmentation of perspectives.

Reflecting analogous fragmentation, EBM, which seeks to maximize the value of clinical research in informing patient care, and narrative medicine (NM), which utilizes story telling and writing to enhance practitioner appreciation of patient and relational perspectives, are characteristically taught as separate disciplines. The result is that both may be left behind as early clinical learners move on to the 'important' things, that is, the practical heuristics of patient care [8]. Within the time pressed framework of clinical training, learner practice is shaped by perceived behavioural norms, rather than by scientifically informed reflection [12,13].

Importantly, contentious dialogues do not come from within the ranks of EBM nor of NM. EBM advocates espouse incorporation of patient values and preferences into evidence-based decision making [14], while leading developers of NM have called for its integration with appropriate attention to for scientific criteria and evidence [15–17]. Already proposed, a marriage of NM and EBM only awaits the development of a conceptual framework capable of accommodating their integration for its consummation [18,19]. The purpose of this exposition is to elaborate the essential features of a model of clinical practice that integrates the agendas of EBM and of NM and to begin to explore its practical implications and utility. We will

concentrate on those aspects that bear on the shared delineation of clinical problems between patient and practitioner.

Antecedent ideas, initiatives and perspectives

The model being presented here reflects inputs from multiple perspectives. P. W., an emergency practitioner for 20 years prior to becoming an educator, sought to ground EBM in clinical practice. He collaborated with experts in educational measurement and design on a project to develop valid assessment tools for the EBM-related skills within the Accreditation Council for Graduate Medical Education's Practice Based Learning and Improvement competency. This led to a revised conceptualization of the EBM domain and defined a point of departure for the development of the model being described here [20].

Whereas EBM had heretofore been presented in the education literature as a cycle of 'information literacy' skills sets (asking clinical questions, performing searches of electronic databases, appraising relevant research reports and applying the information to decision making) [19], the reconceptualized construct subordinated those skill categories to the contrasting content of four classes of clinical interaction, 'therapy', 'diagnosis', 'prognosis' and 'harm' [20].

R. C., a founder of RM, pursued ever more differentiated descriptions of the relational realm of individualized care and of how narrative principles and pedagogies illuminate not only clinical decisions, but the understandings, now singular and mutual, of the meaning of illness and health and their impact on actions taken or declined. She sought to understand herself as a partner in a dyad that included the patient and ultimately redefined the practitioner as a participant, not simply a solo receiver or interpreter, of communications from the patient. To study her vision, she developed innovative tools for 'getting out of herself', including the use of witnesses [16] and written narratives. This led her to a concept of clinical practice as relational narrative, unfolding over time, and a construct called 'attention', 'representation' and 'affiliation' [21,22]. The latter formulation appeared to reach downward towards a realm of integrated and shared knowledge for action, just as the concept of clinical action referenced earlier seemed to reach upwards from the realm of information literacy (EBM).

S. A. S. attended, soon taught in, and then originated new international workshops in EBM alongside many of the individuals who developed it, all while engaging the philosophy of science to an extent not ordinarily expected of clinical epidemiologists [23]. Within the EBM workshop experiences, she observed individuals with contrasting perspectives and backgrounds deliberating and developing critical interpretations and conclusions regarding published research which evoked images of the renowned Brazilian educator Paulo Freire [24]. However, she was troubled by discontinuity and incoherence within the fabric of EBM as presented in those settings and in the EBM literature. She sought a reconciliation of these disparities [18].

The model

Figure 1 presents the essential features of the model. It is comprised of two domains, the *Relational field*, and the *Information literacy field*. They are represented within the figure as two

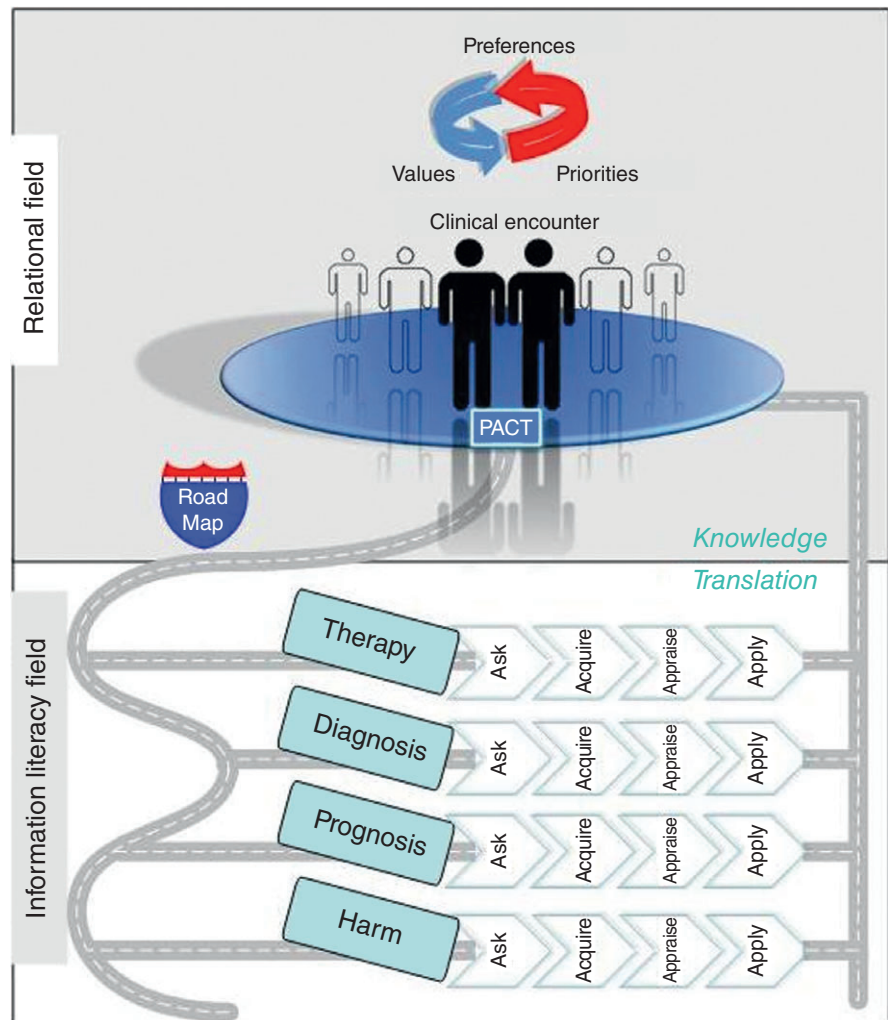


Figure 1 A visual representation of an integrated model of clinical practice in which the processes and content otherwise associated with evidence-based medicine are subordinated to needs and priorities generated within the interpersonal domain of clinical relationships, and the circumstances within which they are embedded.

orthogonal planes, reflecting their complex interrelationship. Clinical actions and interactions are generated within the upper plane. As part of that process, the integration of knowledge, information and evidence from sources internal and external to the clinical relationship takes place. The lower plane, subordinate to shared interpretations, decisions and actions, constitutes the 'source of scientific nutrients' through which the fruits of the upper plane are nourished.

Traversing the two planes is a pathway across which a practitioner is propelled by a construct called PACT (Problem delineation, Actions, Choices and Targets). PACT might be conceptualized as the 'visa card', or key, to the information literacy field. PACT unlocks the door to the Road Map, a comprehensive blueprint of the tasks and skills required to enrich the benefits of patient-practitioner interactions through the fruits of clinical research and scientific knowledge. The map facilitates acquisition and integration of external knowledge in such a way as to inform patient choices and understandings pertaining to health care needs. Successful traversal of the pathway leads the practitioner to a second transition, corresponding to the currently popular concept of 'knowledge translation' [25].

Returning to the relational field, the circular arrows acknowledge that the values, preferences and priorities of both patient and practitioner are at play. The balance between them is dynamic and subject to a process of mutual definition, interpretation, evolution and reinterpretation. These informants of interaction and decision are created jointly by both parties. The relational plane is populated by multiple figures, reflecting a process that is shaped by the individuals and circumstances within which health care relationships are embedded. These include patients' family members, friends and employers as well as all of the stakeholders to health care decisions, including payers, consultants, and administrators. For example, within our scenario, the resident and the construction worker are surrounded by circumstance and relationships that potentially shape their perspectives, choices and priorities. The emergency room resident is pressed by high patient volume in addition to the expectations of both patients and peers, and is also aware that 'many attendings' might pigeon hole the patient into a convenient structured care pathway. The patient, on lunch break, is also time pressed, and could be reluctant to engage in discussion of drug and alcohol use, lest his employer become aware and use it as an excuse for a lay off.

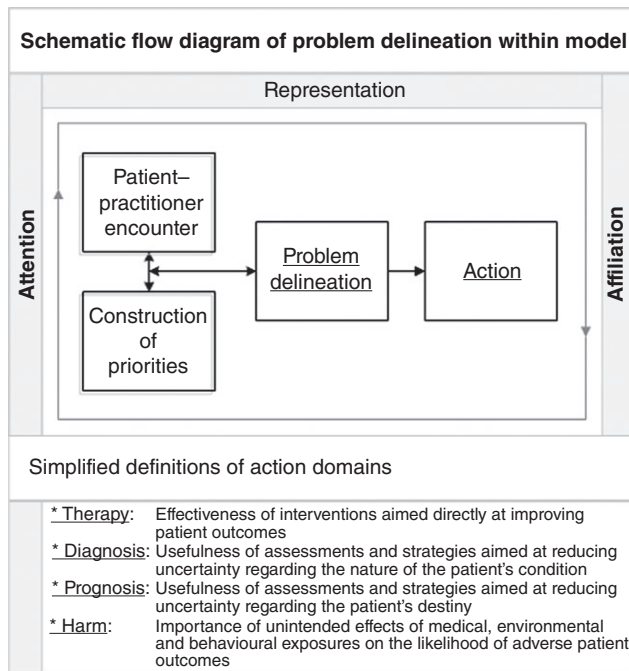


Figure 2 Illustrating the temporal sequence through which clinical problems are defined and explored by patients and their practitioners. Clinical action encompasses four well-defined domains, the simplified definitions of which are provided below the figure.

'PACT': the interface with external knowledge

PACT is the conceptual cornerstone of the entire model. It is a vehicle for delineating patients' problems and needs and for differentiating those needs in a form that maximizes the expertise of both patient and practitioner. It is comprised of a table of definitions of the clinical interaction classes embedded in narrative process. Figure 2 provides a simplified version of the definitions. The upper portion of Fig. 2 represents Charon's narrative process [21] as a sequence which may pertain to a single patient encounter or to an extended care relationship. In reality, all three phases are in play as a relationship between a patient and a practitioner evolves. The definitions in the lower portion of the figure (also simplified) complete the PACT construct. They go beyond antecedents in the EBM literature [26] by virtue of a common, patient centered, perspective and the avoidance of redundancy and overlap.

The complete PACT construct is represented in Fig. 3. The clinical interaction definitions are differentiated into subsidiary aspects of patient concern. The model reflects shared consideration of both actions and choices with respect to possible targets and goals. Patient-important outcomes [27] are embedded within those targets and encompass quality of life and the subjective consequences of choices and interactions. The content of the central matrix is simplified to emphasize the underlying symmetry of definitions within the construct. The footnoted modifiers are necessary to achieve complete comprehensiveness and exclusivity of the class definitions.

Describing the PACT process, on the left side of the figure, adjoining the 'attention' phase, a patient-practitioner encounter unfolds. The problem(s) are not at first delineated. The four clinical interaction classes may be considered to be 'bundled' together within each of the distinct patient and practitioner perspectives.

Why did our construction worker come to an emergency room? He stated: 'I just want to get (my palpitations and chest pressure) checked out, that's all.' Does he himself understand what he wants? Who is this person, what are his relations, his fears, his needs, his expectations? What actions best be taken on his behalf within the framework of the accessible health care system? What are the possible choices and targets? The PACT system allows us to approach these questions in a systematic way. The patient's expression of concern epitomizes a 'bundled', that is, undifferentiated, representation of need. For example, what does he mean by 'checked out'? Is he more worried that he may suddenly drop dead (prognosis), or that he has an underlying heart ailment (diagnosis)? He may sense that recent behavioural exposures are contributing to his symptoms (harm), and he may also wonder whether heart disease may be part of his destiny (prognosis). The meanings of the latter two possibilities may be very different in his mind. For example, if heart disease is not his destiny, he may be confident that 'all I need to do is cut back on the crack'. Elements of all of these potential concerns are embedded in the patient's latent understanding of his problem in ways that may not be clear to him, let alone to the evaluating practitioners. The potential usefulness of therapy may also be part of the patient's 'bundle'. However, it is not first and foremost, and he is not ready to consider that 'therapy' might constitute help with substance dependency or underlying depression.

The practitioners' contrasting perspective leads to a different ordering of emphases within the 'bundle'. Influenced by the experience of working with different attendings rotating through the emergency department, the resident is inclined to emphasize a diagnostic workup for acute coronary syndrome, quite apart from the likelihood of a bad outcome should the cardiovascular issue be ignored. However, the practitioners are also attentive to the likelihood that 'ruling out myocardial infarction', although perhaps appropriate, may ultimately be unlikely to help the patient with his health care problem. Nonetheless, within the practitioners' 'bundle' of potential actions and concerns, therapy and diagnosis command greater priority than they do within that of the construction worker, whose principal concerns may center more around issues of prognosis and harm (Box 1). As the scenario continues to unfold, these issues will further differentiate and their content and meaning, as well as their significance to both parties, will emerge. The PACT framework of definitions allows this process to be represented.

As a patient and a practitioner exercise 'attention' skills, priorities emerge within the still disparate perspectives. As the process moves to the right within the matrix, the reflective process of representation unfolds and priorities within the clinical domains emerge and differentiate. To the extent that the relational process results in a convergence of patient-practitioner perspectives, affiliation, which might be defined as the maximum possible concordance of values, priorities and concerns, leads to conjoint action. The form of the PACT matrix maximizes the efficiency of active reference to scientific knowledge.

		→ Representation			
		P	A	C	T
Patient-Practitioner Relationship and Practical Circumstances	Therapy*	Utility	Share consideration of a therapeutic intervention [§]	Share consideration of alternative or standard treatments	Revised [™] estimate of likelihood of clinical outcomes. [‡]
	Diagnosis*	Frequency	Share consideration of a set of signs and symptoms	No relevant choices	Estimate of likelihood of possible diagnoses.
		Performance	Share consideration of the performance of a diagnostic intervention [†]	Share consideration of a criterion assessment	Revised [™] estimate of patient's likelihood of the disease, condition or injury.
		Utility	Share consideration of the utility of a diagnostic intervention [†]	Share consideration of alternative assessments	Revised [™] estimate of likelihood of clinical [‡] or process of care outcomes.
	Prognosis*	Frequency	Share consideration of clinical outcomes over time	No relevant choices	Estimate of likelihood of clinical outcomes over time. [‡]
		Performance	Share consideration of the performance of a predictor or prognostic intervention ^{††}	No relevant choices	Estimate of effect of presence of one or more predictors on the likelihood of clinical outcomes. [‡]
		Utility	Share consideration of the utility of clinical use of prognostic information	Share consideration of alternatives or standard practice	Revised [™] estimate of the magnitude of benefits of clinical use or sharing of prognostic information on patient outcome.
	Harm*	Accidental	Share consideration of accidental harm due to a therapeutic, diagnostic or prognostic intervention	Share consideration of alternative or standard treatments	Revised [™] estimate of likelihood of adverse clinical outcomes. [‡]
		Incidental	Share consideration of incidental harm due to a behavioural or environmental exposure	Share consideration of alternative choices or exposures	Revised [™] estimate of likelihood of adverse clinical outcomes. [‡]

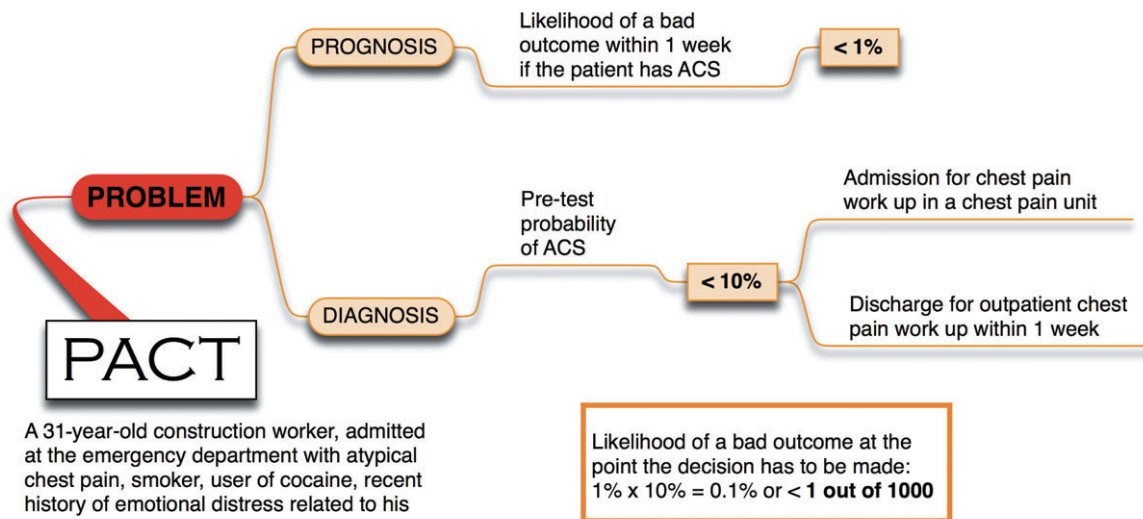
Figure 3 Clinical interaction classes defined within a narrative process model. **P**, Problem delineation; **A**, (Clinical) Actions; **C**, Choices; **T**, Targets. *Patient *may* have a disease, condition or injury. [§]Clinical, surgical or preventive. [†]Clinical assessment, diagnostic test, screening test or prediction rule. ^{††}One or more predictors of clinical outcome or prediction rule. [‡]Attributable to the disease, condition or injury. [‡]Attributable to the intervention but not to the patient disease, condition or injury for which the intervention is being recommended. [‡]Attributable to the behavioural or environmental exposure. [™]Relative to prognosis without the exposure or to probability in absence of results of assessment or testing.

Charon characterizes the beginning of a medical encounter as the ‘attention’ phase [21]. During this phase, the empathic practitioner seeks to emulate an empty vessel to be filled with the patient’s narrative, including both what is said and unsaid by the patient’s spoken word. However, tacit knowledge and experience necessarily play a crucial role. In our example, both practitioners suspect that there are more reasons for the patient to be experi-

encing the symptoms he describes than he has revealed. The attending draws on knowledge of disease, including the cardiac effects of cocaine and also the prognosis associated with such symptoms in the absence of underlying heart disease. She also draws on the experience of similar patients and their propensity to fall into drug and alcohol dependency under conditions of stress or other causes of depression. Finally, she tacitly receives

Box 1 An example a teaching instrument for conveying the model

The Figure below illustrates a tool, derived from the PACT (Problem delineation, Actions, Choices and Targets) construct, for demonstrating how differences in practitioner and patient perspective impact on routine health care decisions. Our construction worker has presented with chest symptoms and a concern regarding whether they might reflect an underlying heart problem. The practitioner initially interprets the clinical issue as detecting the presence or absence of acute coronary syndrome (ACS) as the cause of the patient’s symptoms and assigns a ‘diagnostic’ risk to that possibility. Reflecting a very different perspective, the construction worker is concerned about whether he is in danger of a bad event in the near future, that is, a ‘prognostic risk’. At the point that a decision regarding the urgency of a structured ACS workup is needed, the uncertainty regarding the prognostic risk is made up of two independent risks. Only if the patient actually has ACS is he at risk for a bad outcome from it. Hence, his prognostic risk is the likelihood that ACS is causing the symptoms multiplied by the likelihood that, if ACS is present, he will have a consequent bad short term outcome. The tool forces a user’s awareness that both risks must be taken into account if a true sharing of perspectives with the patient is to be approached. A literature search reveals that both risks are less than 10% [1,2]. The tool demonstrates that the actual risk to the patient at the point of decision is much smaller still. Hence, for clinical evidence to be validly inform a discussion between practitioner and patient, it would have to be filtered through consideration of these two perspectives, linked to two clinical domains, diagnosis and prognosis. In fact, the risk estimates used in the figure are not exactly ascertainable from the literature. An interactive form of this instructional tool allows the risk assignments used in the figure to be freely varied. The corresponding risk is then recalculated.



A 31-year-old construction worker, admitted at the emergency department with atypical chest pain, smoker, user of cocaine, recent history of emotional distress related to his girlfriend. They broke up 2 months ago. Admission EKG is normal. Father died from acute myocardial infarction in his 50's. Patient assessed as low risk for ACS.

Likelihood of a bad outcome at the point the decision has to be made:
 $1\% \times 10\% = 0.1\%$ or **< 1 out of 1000**

categories of what we might call ‘narrative evidence’ that lie outside of the verbal realm, such as the patient’s appearance, demeanour and facial expressions.

Can the acquisition and interpretation of tacit and explicit narrative evidence be taught, or is it simply a gift? The attending in our scenario sensed that the resident had perceived potential complexity lurking behind the patient’s deceptively straightforward complaint and, used the need for a clinical note to create a ‘writing assignment’. In doing so, the attending drew on a technique of ‘representation’ described in the NM literature [22]. According to Charon, ‘it is through writing that we can know’. Representation helps to delineate what our senses, intuition and tacit knowledge are saying and allows for the critical recognition of incoherencies. Through this process, the priorities born of the necessarily different perspectives of patient and practitioner can be discovered, concretized and examined. The resulting shared, or constructed [28], set of priorities do not need to become identical for the clinical relationship to prove fruitful.

PACT, including the embedded definitions of clinical action, may be seen as an independent tool of representation. As repre-

sentation unfolds within the PACT construct, the clinical classes become further differentiated to a point that different categories of outcome and consequence are defined. An important utility of PACT is that the format sets the stage for efficient queries of the biomedical literature seeking information from scientific research. This concretizes the ‘marriage’ of narrative and evidence-based medicine skills.

Affiliation, the third phase of the narrative process described by Charon [22], is not a guaranteed consequence of the earlier phases. It is expanded within PACT into a concept that encompasses the full spectrum of available actions and choices. The concept of affiliation that emerges from the framework we are describing is not inherently bound to any single model of patient–practitioner relationship, such as shared decision making [29]. However, it is nonetheless experienced by both parties as a convergence of priorities and perspectives. A threshold has been crossed such that the potential value of the relational aspects of care has been, at least in part, realized. To illustrate this we extend the venue of our hypothetical scenario to a follow-up visit:

The young construction worker has been referred to you, a primary care practitioner. After evaluating him, you perceive that his somatic symptoms might warrant some evaluation. You also believe that the patient's depressive symptoms are substantial, even though you do not perceive him to be acutely suicidal. You discuss these issues with him and try to explore his own perceptions of what he has been experiencing. He is still concerned about whether his symptoms reflect an underlying heart problem and mentions his father's death. You arrange for an appropriate cardiac screening workup and suggest that he follow up with you in a few weeks. When you see your patient the next time, after reassuring him that the tests are negative, you are surprised that he accepts referral for psychological and substance abuse counseling.

At this point, as a result not only of the evolution of a particular patient–practitioner relationship, but of a reflective process within the patient himself, a turning point has been reached. Concerns for underlying heart disease notwithstanding, he has independently moved in the direction of accepting that his developing dependency is part of his health care problem. The issue of ‘harm’ has been rendered distinct within his initially undifferentiated reaction to his symptoms and situation and is now linked to ‘therapy’. Hence, the PACT construct potentially helps us describe and understand the process that has unfolded.

The information literacy field

The pathway generated by PACT leads to the information literacy field, where the Road Map maximizes the efficient utilization of scientific evidence and knowledge to enrich the choices and understandings emerging from the relational process (Fig. 1). The relevant information skills [19,30] conform to the content traditionally taught as ‘evidence based medicine’ [31,32]. A full elaboration of the Road Map and of its distinguishing features will be presented elsewhere. One feature worthy of emphasis is that, by liberating the concepts of clinical action and interaction from the constraints of an epidemiological perspective [19,33], the Road Map embraces the full spectrum of clinical research, encompassing all relevant study designs, within a complete map of the tasks and skills pertaining to accessing and evaluating research relevant to clinical care.

Within the information literacy field, the interaction classes ‘therapy’, ‘diagnosis’, ‘prognosis’, ‘harm’, are transformed into categories of clinical questions linked to corresponding pathways for searching, selecting and evaluating relevant clinical evidence. A channel at the very bottom of the Information literacy field on Fig. 1 bypasses the clinical research pathways. Among other things, it may be considered to represent the ‘interpretive pathway’ traversing the information acquisition process. Included within this pathway are practitioners’ knowledge of clinical medicine, both tacit and explicit, as well as their knowledge of the relational dimensions of care, including their assessments of a patient at hand, also both tacit and explicit. It is through this portal that the results of explicit queries of current clinical research are filtered and interpreted, a process that takes place on the afferent limb of the field.

The integrated model

As the fruits of the information literacy field converge back on the boundary that separates it from the relational field, an integrative

process is consummated. We have used the term ‘knowledge translation’ to denote this process, a concept that has come into vogue with the emergence of implementation research and concern for the widening gap between the apparent fruits of clinical research and clinical practice [34]. Recent concern for the implication of linearity and unidirectionality embodied in the term has led to a quest for alternatives, such as ‘knowledge translation and exchange’ [35]. Within the context of our model, knowledge, or ‘evidence’, ‘assimilation’ might constitute an even more satisfying description.

The entire model, including both relational and information literacy fields, is to be understood as a complex dynamic process. The processes within each field unfold continuously and simultaneously. Metaphorically, the interactions between the relational and the information literacy fields might be compared to those between a developing fetus, the placental villi, and the maternal circulation and physiology. The developing clinical relationships, aimed at affiliated action, are ‘nourished’ through complex sharing of ‘nutrients’ (new explicit and tacit knowledge and information) and the elimination of ‘waste’ (outdated information and revised premises of interpretation).

From the monadic perspective of the practitioner, scientific knowledge, as well as knowledge born of experience, informs the initial assessment of the patient (attention) as well as the revised assessments that result from reflection (representation). The fruits of information literacy skills, already applied in connection with previous patient encounters, pervade a practitioner’s awareness and inform actions within the relational realm prior to embarking on new inquiries.

However, from the dyadic perspective within which our proposed model is based, the evolving and expanding relationship between patient and practitioner is embryonic. Hence, the information literacy field, in its placental role, serves to cleanse, purify, and also to nourish and enrich the context-bound sensibilities that characterize the relational field, the ever evolving, living, and mutually nurturing realm of day to day health care of individuals.

Discussion

The model we have presented is driven by the PACT construct, a set of uniquely and comprehensively defined classes of clinical interaction denoted by the familiar terms ‘therapy’, ‘diagnosis’, ‘prognosis’ and ‘harm’, all embedded within a concept of interactional and interpretive process derived from narrative medicine. Within that process, the PACT categories begin as differently weighted aspects of a single health care concern, then differentiate into components that define shared priorities, and ultimately generate the basis of specific queries of potentially informative scientific knowledge and evidence.

Assisted by an experienced biomedical resource specialist, we performed extensive and multifaceted literature searches looking for precedents for the definitions of the four PACT components, and for the concept of problem delineation. We were unable to find discussions of these terms and concepts outside of the EBM and epidemiological literature [2,36–38]. Such sources have heretofore treated these categories as means of classifying a narrow range of study designs, rather than elaborated domains of clinical action and experience [19].

Sestini has identified inadequate emphasis on the process through which a clinical problem is recognized and defined within the EBM literature [39]. Otherwise, scientific discussions of problem delineation are confined to education literature on scientific methodology [40], and, within the field of medical education, problem-based learning and related approaches [41,42]. These applications have not addressed the content of, nor have they sought a model for, scientifically informed practice.

We are aware of an affinity between many aspects of our model formulation and the social constructivist movement in philosophy [43] and education [24]. We are particularly interested in Varela's discussion of representation [43] and in Freire's elaborations of 'critical problematization' [24]. These affinities have been preliminarily identified elsewhere [18].

Model building emerged in the wake of the pilot announcement of EBM as a prescription for clinical practice and teaching [44]. Attempts to develop a satisfying model embodying the precepts and goals of EBM have proved elusive [19,45]. The Boolean representations of Haynes *et al.* [46,47] do not go beyond the prescription that patient values and preferences be respected by practitioners in the course of evidence-based decision making. We believe that the relationship between the upper and lower fields within our model fulfills a necessary pre-requisite for integration: the realm of scientific information, including that derived from clinical research, no matter how crucial to the wisdom of medicine, must be understood as subordinate to the process through which health care relationships are formed and thrive. We also make note that the model goes beyond the framework of 'decision making' and actively acknowledges those aspects of clinical care that pertain to health and healing.

At the outset of this discussion, we asserted its relevance to burning issues of clinical practice, teaching, and the health care system. The efficient use of resources in an expanding, technology rich, health care system requires more than endorsement of interventions of proven effectiveness in population-based studies. Rather, 'appropriateness' must insist upon valid identification and representation of the actual health care problems and needs of individual patients. Whether or not the patient in our scenario warranted an acute cardiac workup, there is abundant evidence that 'medical necessity' is importantly dependent on practitioner priorities. A recent large trial of effectiveness of acute chest pain units, compared to standard evaluation, in an array of hospitals in the UK found no improvement in targeted process outcomes but did observe a four fold increase in the likelihood of chest pain being identified as the dominant clinical problem within the intervention centers [48]. Although many factors might have played a role, at least part of the observed increase was likely attributable to the effect of availability of the structured pathway on practitioner propensity to identify chest pain evaluation as the immediate medical necessity. Such a bias within the process of defining individual patients' problems is likely to inflate the costs of health care not only by leading to unnecessary services but also by ignoring or delaying the valid shared recognition of patients' actual health care problems.

The model we are describing has several limitations. Firstly, the process of developing instructional tools required to make it fully operational and teachable is in the early phases of development. Box 1 provides an example of such a tool. Elements of the model, including the Road Map, have been used in international work-

shops over the past 3 years and have been perceived by learners to constitute valuable guides to understanding the role of such skills within the broad framework of patient care.

Similarly, the usefulness of the model as a tool for qualitative research inquiries into the patient-practitioner relational and deliberative process remains to be demonstrated. We believe that an advantage of the model over previous attempts is that it, and specifically the PACT construct, directly suggests such a potential.

A perceived limitation that we have encountered on occasion is that the model is overly complex. We acknowledge that it goes substantially beyond earlier attempts in its elaboration of detail. However, we are drawn to an oft repeated observation of Albert Einstein:

Things should be made as simple as possible, but not any simpler.

Fully cognizant that acronyms, replete within the literature of EBM, are not universally adored, we have considered entitling our model of integrated care 'Scientifically Informed Medical Practice and Learning', without intending the term 'medical' to imply exclusivity of discipline. Such an appellation is advantaged by what we perceive as the necessary relationship between the realms of clinical research and clinical practice and also by acknowledging the potential ramifications on both practice and education.

Finally, we hasten to emphasize that we have developed our model out of an effort to integrate narrative and evidence-based domains. We are not ready to assert that this model is capable of subsuming the full dimensionality of patient care, nor of the many skills requisite to maximizing clinical excellence and effectiveness.

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