

Translation Through Argumentation in Medical Research and Physician-Citizenship

Gordon R. Mitchell · Kathleen M. McTigue

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Abstract While many "benchtop-to bedside" research pathways have been developed in "Type I" translational medicine, vehicles to facilitate "Type II" and "Type III" translation that convert scientific data into clinical and community interventions designed to improve the health of human populations remain elusive. Further, while a high percentage of physicians endorse the principle of citizen leadership, many have difficulty practicing it. This discrepancy has been attributed, in part, to lack of training and preparation for public advocacy, time limitation, and institutional resistance. As translational medicine and physician-citizenship implicate social, political, economic and cultural factors, both enterprises require "integrative" research strategies that blend insights from multiple fields of study, as well as rhetorical acumen in adapting messages to reach multiple audiences. This article considers how argumentation theory's epistemological flexibility, audience attentiveness, and heuristic qualities, combined with concepts from classical rhetoric, such as rhetorical invention, the synecdoche, and ethos, yield tools to facilitate translational medicine and enable physician-citizenship.

Keywords Physician's role · Professionalism · Citizenship · Communication · Rhetoric · Advocacy · Translational research · Argumentation · Interdisciplinarity

Definitions do more than describe; they "put into practice a special sort of social knowledge—a shared understanding among people about themselves, the objects of their world, and how they ought to use language" (Schiappa 2003, 3). Applied to the field of medicine, Edward Schiappa's insight on definitional dynamics reveals how historically contingent notions of medical practice have yielded various presumptions about physicians' social roles, as well as conceptions of how language enables them to perform those roles. As Judy Segal puts it, classifications "constitute

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G. R. Mitchell (✉)
Department of Communication, Clinical and Translational Science Institute, University of Pittsburgh,
Pittsburgh, PA, USA
e-mail: gordonm@pitt.edu

K. M. McTigue
Department of Medicine, University of Pittsburgh, Pittsburgh, PA, USA

an undergirding rhetoric, a set of constraints in terms of which a higher-level rhetoric takes place" (2005, 132). During the era of "monastic medicine" in the early Middle Ages, the prevailing definition of a physician reflected medicine's subordination to religious values and concerns, with the attendant belief that doctors were divinely-inspired healers whose prayers could hasten a patient's return to health (Park 1992, 65). Later, "barber-surgeons" came to be defined by the red and white poles that adorned their office fronts, with the colors signifying the physician's orientation as a practitioner of controlled blood-letting, where razors did most of the talking (Porter 2001, 76). More recently, efforts to institutionalize medical education have prompted moves to define physicians as members of a profession, such that "a social contract exists between medicine and the society that it serves and this contract is based on the concept of the profession" (Cruess 2004, 75). In contemporary times, shifting definitions of "the medical profession" continue to churn prevailing views about physicians' roles in society, as well as yield fresh theories about how language mediates the interface connecting medical professionals with the wider world.

Contemporaneously, the precarious state of the U.S. health care system continues to stimulate reflection on better ways to deliver high-quality, lower-cost care to more people. Medical science, in particular, has been looked to as a potential source of solutions in this regard. Indeed, the nation's strong medical research infrastructure has an impressive track record of achievement in basic science. But in raw form, scientific data confer little benefit to physicians, patients, and taxpayers. To achieve full practical impact, scientific findings must be converted, consistently and sustainably, into concrete interventions that improve health outcomes. Seeing a need for improvement in this challenge of converting growth of scientific knowledge into better quality health care, the U.S. medical establishment has developed major initiatives designed to promote evidence-based medicine (EBM) and translational research (Sackett 2000; Woolf 2008). In a related move, prominent leaders of the medical profession have called for a redoubled commitment to "physician-citizenship" through public advocacy and participation in the political process (Gardner 2009; Gruen, Pearson and Brennan 2004).

This essay explores how recent shifts in medicine's professional norms highlight the role of communication in enabling practicing physicians and clinician-researchers to satisfy their professional responsibilities and aspirations. Specifically, we focus on argumentation, a mode of human communication sometimes derided as warlike verbal jousting (Tannen 1999), yet whose more constructive and humane dimensions are increasingly being embraced by those in the health professions. Medicine's turn toward argumentation dovetails with related interdisciplinary movements in the subfields of doctor-patient communication, family communication, and health communication, where academic cross-pollination enriches medical practice and communication scholarship alike (Back, Arnold and Tulskey 2009; Galvin and Grill 2009). The following analysis explores how medicine's heightened attention to processes of critical thinking, translation and advocacy opens up comparable opportunities for argumentation scholarship. Considering EBM, translational research, and physician-citizenship in turn, we highlight how each initiative is premised on communication principles related to argumentation, then illustrate how these principles play out in concrete cases such as aspirin treatment for recurrent stroke victims, smoking cessation campaigns, and physician-driven antinuclear activism.

Evidence-based medicine and critical thinking

As "the hard art of soft science" (Jenicek 2006, 410), medicine faces a difficult juggling act. Its practitioners are expected to make decisions systematically, yet also adapt judgments to

fit local exigencies. In Segal's view, one aspect of this tension receives expression in a perennial dilemma facing physicians: "They are experts, *but* they are just people with opinions" (2005, 144). For much of human history, the medical profession sought to strike a balance between these twin objectives with a "practice makes perfect" approach. Physicians trained together, with the presumption that through multiple repetition of joint case management, senior doctors' practical wisdom and clinical insight would transfer to their more junior colleagues. For the most part, this direct instruction model has served medicine well. Yet the development of modern science, especially branches of inquiry directly related to medicine such as biology and chemistry, has prompted calls for "evidence-based" approaches that would bring scientific findings to bear more directly on medical practice.

The incorporation of objective, population-based evidence into western clinical care was initially advocated in prominent fashion by Pierre Louis (1787–1872), a Parisian physician who derived clinical insight from systematic patient observations (Best and Neuhauser 2005, 462–64; Rangachari 1997, 280–84; Sackett 2000). His pioneering work addressed the benefits and harms of the then-standard practice of blood-letting, by examining the features and outcomes of groups of patients (Morabia 2009, 1–5; Rangachari 1997). Louis' "numerical method" attracted numerous followers. Some of his students formed the Society for Medical Observation in Paris, others founded the Statistical Society in London, and another group helped establish the American Statistical society (Best and Neuhauser 2005). Yet Louis' approach remained controversial and did not gain a major foothold in the teaching and practice of medicine until much later (Rangachari 1997).

Public investment in health care research after World War II resulted in a surge in basic science that eventually yielded myriad randomized controlled trials but still left a gap between evidence and practice. As a result, by the early 1990s, there was a pressing need to understand which potential interventions work and how well (Levin 2001, 309–12). Stepping into this breach, a group of researchers at McMaster University launched a research program in 1992 under the banner "evidence-based medicine" (Guyatt 1992). Concurrently, a group of British researchers formed the Cochrane Collaboration, "to prepare, maintain and disseminate systematic reviews of the effects of health care interventions" (Levin 2001, 309–12). The new field of evidence-based medicine (EBM) gained traction rapidly, restructuring how clinical decision-making is taught and practiced across diverse disciplinary and geographic boundaries (Kennedy 1999; King 2005).

A search of the National Library of Medicine (NLM) database, focusing on "Evidence-Based Medicine" as a subject heading or keyword, shows a total of 35,205 articles meeting those search criteria, with a dramatic rise in published articles in the years between 1990 and 2008 (see Table 1). During this same time period, evidence-based medicine was widely accepted as an important part of medical education, with educational curricula developed throughout the process of medical training (Aiyer and Dorsch 2008; Dahm et al. 2009; West and McDonald 2008).

The McMaster group has worked extensively to promote evidence-based medicine as a key tool for clinical decision-making by publishing books (Sackett 2000) and convening workshops on teaching about evidence-based clinical practice (McMaster University 2009). Because the McMaster approach is considered the standard in a number of teaching hospitals, we draw from it here to briefly describe how EBM may be integrated with clinical practice.¹

¹ The following description of EBM is condensed from Sackett's *Evidence-Based Medicine*, the authoritative source on this issue.

Table 1 Results of a NLM search for articles focusing on Evidence-Based Medicine in selected years between 1990 and 2008. Search performed 5/24/2009

Year of Publication	Number of Articles
1990	0
1992	2
1994	12
1996	245
1998	1095
2000	1957
2002	2809
2004	3383
2006	4177
2008	4744

Using scientific evidence to guide clinical practice

At the outset, it is important to realize that evidence-based decision-making encompasses three key elements: the best research evidence; clinical expertise; and patient values. Much of the public discussion around EBM has focused on the first of these elements, which comprises a broad array of data spanning basic science research, patient-centered clinical trials, evaluation of diagnostic tests or prognostic markers, and the safety of therapeutic, rehabilitative and preventive regimens. In the EBM approach, these data should be integrated with the clinician's prior experiences and clinical skills, which allow him/her to identify a patient's health state, risks and benefits of potential interventions, and personal values. Those values – the unique preferences, concerns and expectations that a patient brings to each clinical encounter – comprise the third key component of an evidence-based clinical decision.

Once a clinical problem is identified, the EBM approach recommends that the clinician use it to develop an answerable clinical question, then track down the best evidence with which to answer that question. Just finding data is insufficient – the clinician should also critically appraise the evidence, assessing its validity, impact, and applicability to the patient in need. The critically appraised evidence is then integrated with the physician's clinical expertise and the patient's personal health state, values, and circumstances. Finally the physician should reflect on the process and consider possible ways to improve it the next time a similar question arises.

An important aspect of EBM is the recommendation that clinicians formally consider the quality of the evidence that they are incorporating into their decision-making process. Clinicians are asked to evaluate both the type of evidence (based on study design) and the methods used to carry out the specific study. Once relevant data are sorted by type, clinicians use the EBM hierarchy of evidence as a key to assign relative weights to the various types of data. For example, for therapeutic studies, expert opinion and background information on a topic are considered the lowest quality of evidence. Next are case reports regarding a single patient, then stronger observational study designs, and in the more preferred category, randomized controlled trials (so placed as the randomization step is designed to remove potential areas of bias). Finally, systematic reviews or meta-analyses assessing the entire literature on a

clinical topic are considered optimal in the choice of clinical evidence, and thus appear at the top of the EBM evidence hierarchy.

It is essential to note that study type is not the only feature involved in the assessment of evidence quality in EBM – clinicians are also asked to evaluate the specific features of an individual study (i.e., its internal validity), as well as assess the degree to which it applies to their patient (i.e., its external validity). Furthermore, the appropriate study design differs with the type of clinical question. For example, if the clinician faces a question on diagnosis and screening, the preferred evidence is drawn from cross-sectional studies comparing a new test with the best-established prior testing approach.

Argumentation and the EBM paradox

The integration of EBM into clinical practice during the 1990s prompted substantial discussion in medical circles and beyond, much of it concerning what Canadian sociologist Harley Dickinson calls the "EBM paradox" (1998, 73). According to Dickinson, this paradox arises from a tension between two key tenets of EBM: 1) The normative privileging of RCTs and systematic reviews as evidence gold standards; 2) The principle that a physician's clinical expertise serves as the ultimate authority for deciding whether and how practice guidelines should be applied to match an individual patient's clinical state. If, as Dickinson reasons, "information derived from RCTs and systematic reviews of RCTs is the 'gold standard' for making decisions about therapy then it is paradoxical to also maintain that such data must always be subordinated to clinical expertise in clinical treatment decisions" (73).

Resolution of this paradox demands theoretical finesse, an account of the clinical decision-making process that acknowledges the salience both of scientific evidence and clinical expertise, as well as heuristics for determining how these inputs fit together, especially in applied contexts where they appear to be in tension. In a bid to develop such heuristics, Dickinson turns to argumentation theory, drawing from the work of British philosopher Stephen Toulmin, Canadian argumentation scholar Douglas Walton and German critical theorist Jürgen Habermas. Noting that key aspects of clinical decision-making mirror the types of reasoning prominent in argumentative "informal logic," Dickinson sees opportunities here to answer some of EBM's detractors by drawing from argumentation theory.

In particular, Dickinson suggests that Toulmin's structural model of argument provides valuable heuristic resources for theorists and practitioners seeking useful answers to the EBM paradox. Formal logic has only limited utility in this regard because diagnostic decision-making tends not conform to the hypothetico-deductive or nomological-deductive models of reasoning.² However, by charting the clinical decision-making process in terms of Toulmin's data-warrant-claim structure (1958, 44–53),³ it becomes possible to distinguish and identify "warrant-using" data (e.g. clinical examinations, interviews and diagnostic tests) from "warrant-establishing" data (e.g. systematic research into therapeutic efficacy of standard medical treatments) (Dickinson 1998, 78). In Toulmin's theory, the relative soundness of arguments can be assessed by determining on what basis their warrants link

² On this point, Dickinson cites Patel, Evans and Kaufman's (1989) chapter, "A Cognitive Framework for Doctor-Patient Interaction."

³ Stephen Toulmin's *The Uses of Argument* (1958) develops a model for understanding argument patterns that avoids reduction of argumentative dimensions into categories of formal logic. See also Brockriede and Ehninger (1960).

supporting data to overarching claims. When applied to clinical decision-making, Dickinson says this insight yields purchase on the EBM paradox by providing for practitioners heuristics that facilitate sound abductive reasoning.

Around the time that Dickinson's article appeared, other conversations were taking place in Canada that would eventually strengthen EBM's link with argumentation theory. One particularly consequential, cross-disciplinary connection occurred at McMaster University, where Milos Jenicek and David Hitchcock developed a collaborative research program. In a 2005 textbook, *Evidence-Based Practice: Logic and Critical Thinking in Medicine* (published by the American Medical Association), Jenicek, professor of clinical epidemiology and biostatistics, and Hitchcock, professor of philosophy, developed a full-blown treatment of EBM as an argumentative process (Jenicek and Hitchcock 2005).

Two introductory statements punctuate *Evidence-Based Practice's* interdisciplinary character. In a "physician's foreword," Harvard professor of ambulatory care Suzanne Fletcher says that with publication of the text, "clinicians, as well as medical researchers and health planners, can understand better the worlds of 'critical thinking' and 'evidence-based medicine' and how they relate to classic philosophical thought" (2005, xv). In a "philosopher's foreword," renowned informal logician Robert Ennis applauds Jenicek and Hitchcock for their "pioneering detailed work," singling it out as one of a few rare works that pursue "explicit application" of critical thinking "in a field of study or practice" (2005, xiii).

The emphasis on critical thinking in *Evidence-Based Practice* reflects the mark of the Canadian school of argumentation scholarship, of which Hitchcock is a prominent member.⁴ Canadian informal logicians incorporate the pedagogical concept of critical thinking to elucidate how students and critics can operationalize Toulmin's essential insights about argument as an exercise in moving from data to claims using warrants. *Evidence-Based Practice* catalogs numerous instances where modes of medical practice, such as doctor-patient communication and the rendering of expert courtroom testimony, match up with patterns of reasoning in informal logic. For each of these instances, Jenicek and Hitchcock explicate how concepts and terms from their respective fields overlap, then use these points of overlap to generate critical thinking heuristics adapted specifically to the medical context.

For instance, Jenicek and Hitchcock point out that medical diagnoses and treatment decisions involve distinct types of human reasoning. A diagnosis begins with "premises," such as "the results of a clinical examination" and leads to a "conclusion that the patient does or does not have the disease under consideration." Likewise, "the conclusion of the diagnostic process becomes a premise leading to the conclusion that the patient should or should not be treated, and by which therapeutic maneuver, such as drugs, surgery, support and so on" (196). Since this pattern of reasoning closely resembles a categorical syllogism, Jenicek and Hitchcock propose that it can be profitably understood, practiced, and taught using theoretical concepts such as the Toulmin model of argument.

Given the strong tradition in Canadian informal logic scholarship of analyzing argumentation by focusing on fallacies, or errors in reasoning, it is not surprising that *Evidence-Based Practice* highlights how physicians attempting to execute the principles of EBM can make mistakes in reasoning. For example, Jenicek and Hitchcock warn against the *post hoc* fallacy (or fallacy of false cause) in diagnostic contexts (e.g. "an embolism was caused by a

⁴ See Hitchcock's (2005) edited volume, *The Uses of Argument: Proceedings of a Conference at McMaster University, 18–21 May 2005*; as well as his "The Significance of Informal Logic for Philosophy," published in the Canadian journal *Informal Logic* (Hitchcock 2000).

transoceanic flight, because the victim was well on boarding the plane"). They also point out how the *ad ignorantiam* fallacy (some statement must be true because there is no evidence to disprove it) can produce medical treatment errors (e.g. regarding untested alternative medicines, "nobody has proved they do not work, so they must!") (245). In *Evidence-Based Practice*, Jenicek and Hitchcock frame their preliminary work in this area by observing, "a more complete compilation of a numerically open-ended list of fallacies in medical reasoning must still be worked up" (56), a task that Jenicek would pursue in his next major monograph.

In a follow-up to *Evidence-Based Practice*, Jenicek published the sole-authored, *Fallacy-Free Reasoning in Medicine: Improving Communication and Decision Making in Research and Practice* (2008). Once again, this book used the Toulmin model of argument as a starting point for explaining medical reasoning from the vantage point of informal logic. But rather than isolating argumentative errors by relying exclusively on the catalog of classical Aristotelian fallacies (the so-called "standard model") Jenicek theorized a smorgasbord of fallacies with clever names never before featured prominently in argumentation literature.⁵ For example, the "three men make a tiger" fallacy occurs "if an unfounded premise is mentioned and repeated by many individuals, the premise will be erroneously accepted as the truth." Jenicek draws the name for this fallacy not from ancient Greek and Latin (as in the standard model), but from a Chinese proverb about reports of a loose tiger circulating in King Wei's capital city. According to the legend, King Wei remains skeptical of the first two reports about the loose tiger. But when a third civilian echoes the same report, the king changes his mind (erroneously, as it turns out). Jenicek sees parallel mistakes in medical reasoning, such as: "So many different authors recommend the benefits of repeated enemas that you should consider this procedure too" (124). For Jenicek, such a breakdown in critical thinking entails "any uncritical and nonsystematic review of the literature or other information proclaimed as truth because of its repetition and its indiscriminate uses" (124). Jenicek elaborates a whole menu of related, colorfully named fallacies in this vein, such as the "if-by-whiskey" fallacy (58),⁶ the "slothful induction" fallacy (101),⁷ and the "vague numberism" fallacy" (103).⁸

In introductory comments, Jenicek shares a hope that his monograph will contribute to "reducing errors in medicine" by promoting "fallacy-free clinical and community medicine reasoning and decision making in medical care and health care policy settings" (x, xix). This aim coincides with core tenets of EBM, since "even the best

⁵ On the "standard model" of argumentative fallacies, see Hamblin (1970).

⁶ If-by-whiskey fallacy: "Presentation of an issue in such a way that the recipient of the message can agree with both sides of the issue. This type of opinion presentation was originally used to reflect upon whether the legalization of whiskey consumption might be considered during the Prohibition years in the United States" (Jenicek 2008, 58). Medical counterpart: "If we consider morphine as an addictive substance leading to dependency, financial and social disruption of life, toxicity, and overdosing, we must ban it from use. If we find its use important as an analgesic of special interest in the treatment of myocardial infarction, pulmonary edema, dyspnea, and other problems in end-of-life care, we must support its availability and use" (Jenicek 2008, 58).

⁷ Slothful induction fallacy: "The proper conclusion is denied despite evidence to the contrary." Medical counterpart: "The patient we have just seen for his fifth work accident and ensuing injuries insists that this is just a coincidence (company's fault, his health, and so forth) and not his fault" (Jenicek 2008, 101).

⁸ Vague numberism fallacy: "Offering vague and often meaningless and exaggerating quantifications instead of real data." Medical counterpart: "A representative of a pharmaceutical company visiting a hospital says, 'We have worked on the development of this new drug for a number of years. We also assigned an unusual number of researchers to this project. The result, the new drug I am bringing to your attention today, is important for a number of reasons' (Jenicek 2008, 103).

evidence in the world of evidence-based medicine may be wasted in fallacious argumentation" (105).⁹

The previous section elucidated the origins and dynamics of EBM and detailed how argumentation theory has been deployed in an effort to refine the EBM approach. On their own, these developments should pique the interest of argumentation scholars, as EBM has quickly emerged as a dominant paradigm for medical decision-making in under two decades. The fact that two book-length studies blending EBM and argumentation have been published in the past several years speaks to the theoretical fecundity of argumentation as a research program with strong potential for trans-disciplinary cross-fertilization.

To date, the Canadian initiative to explicate EBM as a critical thinking exercise draws upon argument primarily as a decision-making process, a method of inquiry. Yet argument has also been theorized as a product, a concrete unit of thought designed to persuade audiences (Tindale 1999, 3–4). This caveat foregrounds how rather than being a static algorithm, EBM itself can be viewed as an argument product, one that can be packaged and deployed strategically to achieve rhetorical effects in particular contexts.¹⁰ The next section, which focuses on a distinct, yet related initiative in the medical profession, further reflects on how argument-as-process and argument-as-product operate in tandem.

Translational research

While evidence-based medicine made strides toward closing the gap between basic science research and clinical practice, the considerable extent of that gap became apparent throughout the 1990s. In 2003, the National Institutes of Health announced its Roadmap Initiative, with a goal of "defin[ing] a compelling, limited set of priorities that can be acted on and are essential to accelerate progress across the spectrum of the institute missions" (Zerhouni 2003). The Roadmap includes three themes:

- (1). New Pathways to Discovery, addressing the need to understand complex biological systems;
- (2). Research Teams of the Future, recognizing the need for researchers to move beyond their individual disciplines and explore new organizational models for team science; and
- (3). Reengineering the Clinical Research Enterprise, focusing on recasting the entire system of US clinical research.

⁹ Jenicek underscores this point by coining a new term (with help from internist G. Altbbaa), "argument-based medicine," to describe an approach to EBM made possible by integration of argumentation theory into modes of medical reasoning. According to Jenicek (2008), argument-based medicine is "the research and practice of medicine in which understanding and decisions in patient and population care are supported by and based on flawless arguments using the best research and practice evidence and experience as argumentation building blocks in a structured, fallacy-free manner of argumentation." Whether argument-based medicine can deliver on its promise to improve health outcomes in the medical context hinges on several factors, including whether medical professionals exhibit a similar degree of enthusiasm for learning fallacies, whether "fallacy free" reasoning actually reduces harmful medical errors, and the extent to which reduction in medical errors results in better overall quality care.

¹⁰ For example, Colleen Derkatch's "Method as Argument: Boundary Work in Evidence-Based Medicine" (2008) suggests that EBM's endorsement of RCTs as the "gold standard" of scientific evidence imbues medical research with an ethos of disinterestedness that can work to redefine the very terms of debates surrounding alternative medicine. For variations on this theme, see the other essays in *Social Epistemology's* special issue on "Evidence in Evidence-Based Medicine," especially Jason Grossman, "A Couple of Nasties Lurking in Evidence-Based Medicine" (2008).

As a part of this third theme, the NIH made the relatively new field of translational research a priority, allocating resources to promote training and develop a support structure for the field. The field of "translational medicine" focuses on the task of converting basic scientific data into practical applications that improve human health in applied settings (Lean et al. 2008, 863; see also Terpstra, Best, Abrams and Moor 2010, 513).¹¹ Zerhouni's successor at NIH, Francis Collins (quoted in Garnett 2009), identified "translation of NIH science into practice" as one of "five areas of special opportunity in the coming years." Collins' statement reaffirms the 2003 NIH Roadmap's emphasis on translational approaches.

Two types of translation

The NIH defines translational research by isolating two conveyor belts designed to bring basic science to applied contexts: "One is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans. The second area of translation concerns research aimed at enhancing the adoption of best practices in the community. Cost-effectiveness of prevention and treatment strategies is also an important part of translational science" (US NIH 2009). The Institute of Medicine isolates two "translational blocks" in the clinical research enterprise, which align with the two areas of translation (Type 1 or "T1," and Type 2 or "T2") described in the NIH definition. The first of these blocks (T1) hinders the transfer of new understandings of disease mechanisms gained in the laboratory into the development of new methods for diagnosis, therapy and prevention and their first testing in humans. The second (T2), blocks the translation of results from clinical studies into everyday clinical practice and health decision making. Dr. Stephen Woolf (2008) of Virginia Commonwealth University argues that while the second block has been historically overlooked, it is actually of critical importance. For example, most drugs and interventions produced by T1 research only marginally improve treatment efficacy. Furthermore, patients may benefit more (and more patients may benefit) if the health care system performed better in delivering existing treatments than in producing new ones. In addition, he points out that adequate investment in T2 is vital to fully salvage investments in T1 research (Woolf 2008).

Of note, T2 translation – which aligns closely with evidence-based medicine – includes both translation of knowledge into patient care (e.g., creating patient-specific evidence of clinical effectiveness, comparative effectiveness of different treatments, and the development of practice guidelines), as well as strategies to address more distal questions (e.g., how to reliably deliver evidence-based care to all patients in diverse health-care settings, in order to improve the health of both individuals and populations). Particularly in the area of obesity and diabetes prevention, the distal end of translation has increasingly focused on improving the health of the population, rather than specifically addressing individuals (patients) in contact with the health-care system (Marrero 2004).

While many "benchtop-to-bedside" research pathways have been developed in T1 translational medicine designed, for example, to bring drugs to market following advances in basic science, vehicles to facilitate T2 translation that convert scientific data into clinical and community interventions designed to improve the health of human populations have received less attention (Feldman 2008, 87–8). As these forms of translational medicine implicate social, political, economic and cultural factors, they require "integrative" research

¹¹ Terpstra, Best, Abrams and Moor (2010, 513) place this research approach in historical context: "A review of the knowledge translation (i.e. linking research to practice and policy) literature over the last 50 years suggests a paradigm shift in the way that health sciences and health sciences research are conducted and conceptualized."

strategies that use cross-disciplinary communication to blend insights from multiple fields of study (Mallonee, Fowler and Istre 2006, 357–9).

In this area of research, the centrifugal forces of professional specialization and horizontal knowledge diffusion scatter the pool upon which scholars and practitioners draw data. Simultaneously, centripetal forces oblige these same scholars and practitioners to synthesize vast sums of diverse information and render coherent arguments on complex and multifaceted issues. The task is different in kind from sheer information processing; it demands forms of communicative dexterity that enable translation of ideas across differences and facilitate cooperative work by interlocutors from heterogeneous backgrounds (see Stoklos et al. 2010, 491). Punctuating this point, “[Former NIH Director Elias Zerhouni] acknowledges that there is no ‘right’ model for translational research, but he is confident that the NIH will learn about the best ones by giving the CTSCs [Clinical and Translational Science Centers] the freedom to explore a diversity of approaches” (Butler 2008, 840–42). The communication challenges in play here may help account for the fact that scholars advocating for a translational research agenda suggest that “communication theory” inform efforts to implement the agenda (Woolf 2008).

Polloi Logoi and Synerchesthe

The challenge of using communication to deal with tensions borne from the push and pull of countervailing centrifugal and centripetal epistemologies has ancient roots. As John Poulakos points out, “older” Sophists such as Protagoras taught Greek students the value of *dissoi logoi*, or pulling apart complex questions by debating two sides of an issue (2004, 81–82; see also Sprague 2001). The few surviving fragments of Protagoras’ work suggest that his notion of *dissoi logoi* stood for the principle that “two accounts [*logoi*] are present about every ‘thing,’ opposed to each other” and further, that humans could “measure” the relative soundness of knowledge claims by engaging in give-and-take where parties would make the “weaker argument stronger” to activate the generative aspect of rhetorical practice, a key element of the sophistical tradition (Schiappa 1991, 100; 117–133; 103–116). One important wrinkle in this comparison, however, is the fact that while Protagoras’ *dissoi logoi* was dyadic in nature (two arguments opposing each other), manifold T2 translation projects tend to feature many-sided arguments—hence our adapted neologism *polloi logoi*.¹²

In the following generation, Isocrates would complement Protagoras’ centrifugal push with the pull of *synerchesthe*, a centripetal exercise of “coming together deliberately” to listen, respond, and form common social bonds (Haskins 1997, 88). Early in 4th-century B.C. Athens, democratic reforms and widespread citizen training in public speaking infused the political realm with new actors, opening up channels of participation and transforming governmental institutions. But as the century wore on, this centrifugal wave of populism, swelling amid deteriorating economic conditions, threatened to overwhelm the Athenian polity. It was against this cultural backdrop that Isocrates opened the West’s first professional school. The school’s curriculum reflected the strong influence of Protagorean *dissoi logoi*, but Isocrates embedded argumentation within *synerchesthe* (“coming together deliberately”), a broader concept that he used flexibly to express interlocking senses of 1) *inquiry*, as in groups convening to search for answers to common questions through discussion (Isocrates 1929d, 14, 76); 2) *deliberation*, with interlocutors gathering in a political setting to deliberate about proposed courses of action (Isocrates 1929b, 19; 1929c, 2, 9); and 3) *alliance formation*, a form of collective action typical at festivals (Isocrates 1929d, 146; 1928b, 81); or in the exchange of pledges that deepen social ties (Isocrates 1945, 45; 1928b, 43; 1928a, 40; see also Haskins 1997, 8; T. Poulakos 1997, 19).

¹² We are indebted to John Poulakos for this formulation.

Isocrates contrasted his *paideia* with the approach of earlier Sophists who taught eloquence as a neutral skill to be used for whatever ends students saw fit. Instead, Isocrates (1929a) highlighted the centripetal qualities of *synerchesthe* as an educational antidote to the increasingly selfish and fractious nature of Athenian politics. His aim was to produce citizens and leaders with broad-based knowledge of human affairs, along with the political vision and communicative ability to express that knowledge for the greater good of the *polis*. In short, Isocrates taught and practiced the art of using deliberation as a kind of translation medium, capable of engendering mutual understanding by bringing people and ideas together through cooperative argument.

T2 translational medicine represents precisely such an endeavor, as key leaders in the field have called for mobilization of multi-disciplinary research teams to surmount the scientific, political, and communicative challenges involved in translating the findings of basic science into improved community health outcomes. Interdisciplinary T2 research teams can theorize myriad ways to translate basic science into practical interventions designed to improve health outcomes for patients and community members. But coming to agreement on preferred strategies can prove challenging, especially for teams composed of scholars from disparate academic fields and research traditions. Argumentation can help clear this block in the translation pipeline. Once an inventory of possible interventions is catalogued, structured argumentation exercises can help researchers not only sort wheat from chaff but also drive collective group learning as advocates from different disciplines weigh in to test the evidence and reasoning supporting arguments for and against particular intervention strategies.

For instance, strong scientific data establish that smoking cessation is an important component of secondary prevention following myocardial infarction (Cooper et al. 2007). Yet translating these data into tangible improvements in health outcomes can be daunting. Interdisciplinary T2 research teams facing this challenge could use structured argumentation exercises to compare, for example, interventions designed to change clinical workflow patterns, such as physician referrals to smoking cessation counseling, versus interventions aimed at changing patient behavior directly through public service announcements targeted to reach recovering heart attack victims.

One common misconception is that argument always creates division. But argument can also bridge differences, by steering cooperative disputants to find common ground (Zarefsky 2010).¹³ When arguers are prompted to make transparent the reasoning and support

¹³ While the Canadian school of argumentation studies has a philosophical lineage, the older American tradition in argumentation draws nourishment from the taproot of forensics, specifically the applied activity of intercollegiate debating (see van Eemeren, Grootendorst, and Snoek Henkemans 2006, 193–196). In this respect, it is not surprising to see sophistic principles such as *dissoi logoi* and *synerchesthe* manifest prominently in the work of contemporary American argumentation theorists such as Zarefsky. Consider, for example, Zarefsky's (1976) notion of argumentation as "hypothesis testing," a view that sees argumentation as a "communication process in which people make, attack, and defend claims in order to gain the assent of others or to justify their own beliefs and acts." The kernel of Zarefsky's theory of hypothesis testing was outlined in an earlier paper, "A Reformulation of the Concept of Presumption" (1972; see also Zarefsky 1979). During the 1970s and 1980s, the heyday of intercollegiate debate's "paradigm wars," hypothesis testing had its share of adherents, some in the judging ranks who applied the paradigm as a tool for adjudication of individual contest rounds, and others in the debating ranks, who used the paradigm to justify certain argumentative strategies (e.g. multiple, conditional and contradictory negative counterplans). Lost in this process of reduction was Zarefsky's vision of academic debate as a vehicle to transport the theory and practice of argumentation to wider society. Hypothesis testing, in this wider frame, was a construct for establishing the gravitas and authority of forensics specialists in conversations about the nature of argumentation beyond the contest round setting. Here, Zarefsky's analogy linking debate to scientific hypothesis testing was not designed to show how debate itself was a scientific process, but rather to alert external audiences to the fact that academic debate, while deviating significantly from established patterns of scientific inquiry, features its own set of rigorous procedures for the testing of argumentative hypothesis (see Zarefsky 1980; Sillars and Zarefsky 1975; Goodnight 1980; Goodnight and Mitchell 2008).

underlying their competing claims, argumentation can facilitate interdisciplinary translation, revealing to experts how related concepts in their respective disciplinary nomenclature carry similar meaning. For smoking cessation research teams comprised of experts from fields such as nursing, business administration, economics, internal medicine, cardiology, and behavioral health, a common language can be a crucial tool enabling the translational research effort. Such a *lingua franca* not only facilitates understanding across disciplines, as we shall see next, but it can also help researchers isolate the most cogent terms that enable lay audiences to grasp key concepts.

Argumentation as a translation medium

It may be a stretch for those jaded by decades of verbal pyrotechnics commonly found in *Crossfire*-style political theater to grasp the notion that multi-sided argument can facilitate mutual learning across epistemological chasms. Since this is the load-bearing premise supporting Charles Willard's notion of "epistemics," at this point it may be useful to revisit his rationale for constructive argument as a bridging exercise. Here, it is important to stipulate that Willard's sense of argument stands in contrast to the vernacular notion of argument as mere quarreling or verbal jousting — what Isocrates (1928a, 6) called "wordy wrangling" and Jenicek (2008, 76–7) terms "pimping." Rather, Willard views argumentation as a "unique discourse event" that unfolds in the context of a "social relationship" between two or more people "sorting out what they construe to be incompatible positions" (1983, 20–1). As arguments develop, "they display epistemic structure more vividly than normal discourse, for they bring to the surface assumptions that would ordinarily remain submerged." This is because "argument etiquette permits challenges and demands for clarification and support, and these in turn yield more explicitness" (Willard 1996, 218).

As a structured "method" of inquiry, argument drives constructive interchange through a mechanism that Protagoras identified as crucial to *dissoi logoi*—that both sides of an argument *be taken into account* (Ehninger 1970; see also Ehninger and Brockriede 1972; Meiland 1989; Natanson 1965). This element contains a call to listen, to step outside one's settled perspective in an attempt to apprehend unfamiliar points of view. Argument generates "practice in making reflective judgments" while it "develops and disciplines the critical faculties," thereby developing agency in respect to making better decisions and communication "choices in the future" (Ehninger 1970, 102). One significant outcome of this recursive process is that the cycling aspect of argument stimulates interlocutors to reflect upon, and innovate in their language usage, "by virtue of their claims being articulated outside the confines of their original disciplinary discourses." Building on Willard's theory, Steve Fuller suggests that joint enactment of this process orients academic scholars to the challenge of interdisciplinary translation by "spawning" so-called pidgin languages, "which reinforced and extended over time could develop into an interdisciplinary lingua franca" (2000, 142; see also Fuller 1993, 44–8).

Certainly, this type of integrative scientific research has impressive historical precedents. For instance, physicist Erwin Schrödinger and biologist Theodosius Dobzhansky deployed inventive rhetorical devices and strategies to forge conceptual bridges connecting multiple scholarly audiences. Dobzhansky's clever use of topographical maps to visually depict mathematical population genetics helped biologists and geneticists reach common understandings that eventually yielded the "modern synthesis" of evolutionary biology. In a similar fashion, Schrödinger deployed "polysemy," a rhetorical strategy of designing texts to be read in multiple ways by different audiences, to inspire creative conversations between physicists and biologists that ultimately gave rise to the hybrid field of molecular biology (Ceccarelli 2001).

Yet where rhetorical critic Leah Ceccarelli (2001) finds in this genre of "inspirational interdisciplinarity" a recurrent feature that such prose is issued by scholarly giants with transcendent personas, today's translational medicine movement calls for institutionalization of translational research as a routine form of professional activity. Willard's point that "differences among individuals and discourses put a premium on translation" highlights how the term "translational medicine" here carries double meaning (1996, 309). Its metaphorical dimension describes the process of moving basic science down the conveyor belt to applied settings. But since this process requires integrative, cross-disciplinary collaboration, the enterprise necessarily also entails translation in the literal sense, the invention of shared languages capable of bridging disparate epistemic communities. The contributions of American argumentation scholars such as Willard and Zarefsky indicate that deliberative argumentation ("*synerchesthe*" and "*polloi logoi*" in the adapted sophisticated lexicon) has potential to serve as a valuable translation vehicle for this task.

Bridging lay and expert communities

The preceding discussion explored how contemporary forms of *polloi logoi* can facilitate translational communication between distinct fields of scholarly inquiry. What about translation across the expert-public boundary? One important finding from philosopher William Rehg's (2009) *Cogent Science in Context* is that these two translation challenges can be viewed as two sides of the same coin. Rehg elucidates this connection by reconstructing the notion of argument "cogency," especially as it relates to the evidentiary dimension of argumentative practice. He begins by noting that cogency is a promising "boundary concept," by virtue of the fact that it has a commonly accepted general meaning (roughly synonymous with the "strength or convincing quality of arguments"), and also possesses "the breadth and flexibility to cover a large territory of approaches to argument evaluation" (7). Rehg then proceeds to develop a tiered model of argument cogency that explains how scientific arguments exhibit merit at the three levels:

- *Content merit*: The degree to which the structure of an argument adheres to domain-specific topical and logical requirements (at a minimum having a premise and a conclusion).
- *Transactional merit*: The quality of dialogic exchange between parties conducting an argument (especially when the argument spans disciplinary boundaries).
- *Public merit*: The ability of the argument to appeal to a wider reasonable public that finds it relevant, thought-provoking, or convincing. (50–1)

Applied to T2 translational research, Rehg's theory of cogency calls attention to the relationships between an argument's content, transactional and public merits. These nuances are especially well suited to account for a key dynamic noted by Fuller, that when scientists from different fields gain opportunities for constructive inter-field argumentation,

Once provided with an incentive to interrogate each other's claims, the scientists themselves would be in a position to intensify the investigation, stripping away gratuitous jargon, overstatement and all-around obfuscation that might otherwise mystify non-experts. Thus, what originally appeared to be the incommensurable knowledge products of two disciplines—such as the theoretical benefits of a branch of physics and the practical benefits of a branch of biology—would be rendered comparable . . . Were disciplinary communities made to be routinely accountable to each other, then much of the aura of expertise and esoteric knowledge that continues to keep the public at a respectful distance from scientists would be removed. (Fuller 2000, 142)

In this vein, Rehg's theory of argument cogency provides one avenue for moving beyond the unidirectional, siloed model for translation, where a single expert field reaches out to an audience of citizens/policy-makers (see Fig. 1).

In contrast to this unidirectional model, the interdisciplinary transactions that facilitate translational research generate language that not only enables the sort of integrative research in the expert realm. Such "pidgin language," thanks to its "fungibility," has potential to bridge understanding between expert and lay audiences, as well (see Fig. 2).¹⁴

The curious case of aspirin helps concretize Rehg's concept of how deliberation in translational research can possibly generate cogent arguments with public merit. Gold-standard data establish that use of aspirin by patients who have previously experienced a stroke helps prevent recurrent strokes (Antithrombotic Trialists' Collaboration. 2002).¹⁵ Yet one study finds that this simple, inexpensive therapy is given only to 58% of eligible patients (McGlynn et al. 2003). This gap between evidence and practice reflects the presence of complex T2 translational blocks that account for why a health care system is unable to realize substantial health care gains when compelling science clearly shows the way for just under five cents a day.¹⁶ According to Stephen Woolf and Robert Johnson (2005), overcoming these barriers requires more than just publication of clinical guidelines recommending aspirin prescriptions for stroke patients. Rather, Woolf and Johnson hold that surmounting such translational blockages requires macro-level approaches to enhance communicative cooperation and facilitate information flows between health care professionals and civic partners (paralleling the "alliance formation" function of Isocratic *synerchesthe*).¹⁷

Woolf and Johnson's analysis points to the potential value of deliberative argument as a tool to facilitate translational strategies. In the aspirin case, one might imagine an interdisciplinary research team engaging in structured debate over the relative merits of competing approaches to overcome T2 translation blocks. To the extent that the team's *polloi logoi* would exhibit what Rehg calls strong "transactional merit" (interlocutors argue cooperatively, take risks, and air suppressed premises), the exercise would be primed to percolate cogent arguments with public merit. According to Rehg's (2009) theory, these cogent arguments would have potential to persuasively frame stroke prevention through aspirin treatment as a pressing and realistically achievable objective for wide audiences.¹⁸

A key tenet of T2 research is that the translation is a "two-way road" (Marincola 2003). Information should flow not only from expert teams to target populations, but in the other direction as well, with health providers, stakeholders and citizens providing feedback to

¹⁴ This dynamic brings to mind Isocrates' (1929b, 8) dictum, "the same arguments which we use in persuading others when we speak in public, we employ also when we deliberate in our own thoughts."

¹⁵ Aspirin can reduce stroke recurrence by as much as 23% (Antithrombotic Trialists' Collaboration 2002).

¹⁶ The *British Medical Journal's* "Collaborative Meta-analysis" concludes that low dose aspirin (75–150 mg daily) is an effective antiplatelet regimen for long-term use in stroke prevention. In May 2009, Walgreens' website advertised a bottle of 125 tablets of regular (325 mg) generic brand aspirin tablets for \$5.99 (each tablet costing approximately 4.8 cents).

¹⁷ Regarding aspirin treatment for recovering stroke victims, it should be noted that clinical judgment shapes implementation of clinical guidelines, and some physicians may decide not to prescribe aspirin because such treatment would be contraindicated for a particular patient.

¹⁸ As Willard (1996, 107) puts it, "each stage of translation from esoteric to exoteric requires new simplifications and metaphors." Notably, this inventional challenge differs in emphasis from the "fallacy-free" program of argument-based medicine outlined by Jenicek, where the focus lies on avoiding errors in reasoning, rather than production of cogent arguments to facilitate T2 translation. Nevertheless, this distinction should not be overdrawn, as it is easily possible to imagine the two approaches working in concert, just as Canadian and American argumentation scholars cooperate to elucidate multiple angles of argumentative phenomena at international conferences such as the one hosted serially by the University of Amsterdam's International Society for the Study of Argumentation.

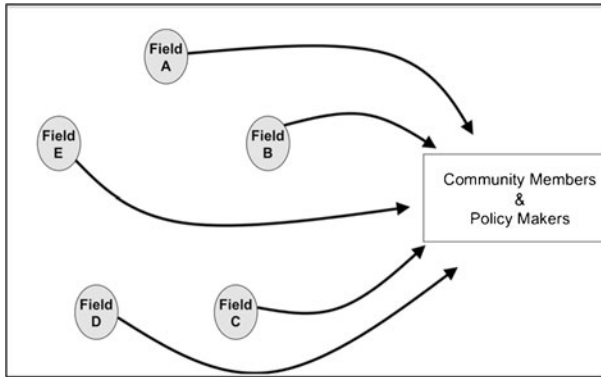


Fig. 1 Unidirectional model for translation of evidence from siloed expert fields to wider publics and policy makers

researchers in a recursive process. Research on deliberative design focuses on how practitioners can create communication channels for this purpose, linking experts with constituent audiences in two-way conversation (Gastil and Levine 2005).

For example, the success of translational efforts to fashion interventions aimed at promoting healthy lifestyles in local communities may hinge in part on the degree to which researchers are able to accurately appraise available community resources, understand cultural roots of particular eating patterns, and grasp economic tradeoffs entailed in proposed diet and exercise interventions. As these are precisely the sort of insights elicited from citizen juries, public debates, and deliberative opinion polls, T2 research teams are well positioned to take advantage of communication expertise in designing deliberative events tailored to help them overcome translational blocks.

Often, communication challenges are viewed through the lenses of advertising and marketing. But a business view lends only limited insight into how humans use language to facilitate collective learning, build common understanding, and overcome communication

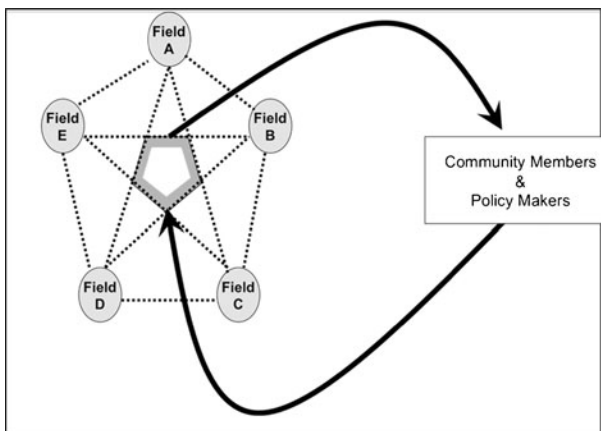


Fig. 2 Translation through *polloi logoi*. Argumentation between expert scholarly fields generates bridging language that supports cogent evidence. This facilitates integrative research and supports translation efforts designed to communicate findings to wider publics and policy-makers (adapted from Reh 2009)

barriers. Contemporary research in argumentation theory provides conceptual tools forged from ancient traditions and honed in contemporary applications. To the extent that translational blocks in the T2 research pipeline involve failures to communicate effectively, research methods that integrate a broad range of such communication tools can facilitate translation of basic science into improved health outcomes.

Physician-citizenship through public advocacy

Timothy Gardner's (2009) presidential address at the American Heart Association 2008 Scientific Sessions advanced a "rallying cry" for healthcare providers and scientists to embrace public roles as "citizen leaders" undertaking "advocacy efforts" to help define a "new period of activism" (2009). Gardner's call harmonizes with an earlier statement by Russell Gruen, Steven Pearson and Troyen Brennan who urged their peers in the medical professions to act on their ability to be "public witnesses" to socioeconomic determinants of patients' health and "provide the sort of information and professional authority that brings veracity and legitimacy to these concerns in public debate" (2004, 95). To illustrate modes of political engagement open to "physician-citizens," they cited examples such as:

- Raising public awareness about a health or social issue by discussing it with family and friends or participating in a public forum.
- Writing a letter, signing a petition, or participating in another form of public advocacy and lobbying.
- Encouraging a medical society to act on an issue that concerns the public's health.
- Organizing and forming a group for political advocacy. (97)

It is notable how these suggestions reflect the Isocratic theme of collective action through *synerchesthe*. Gruen, Pearson and Brennan emphasize how their call for political engagement by health care professionals is designed to transcend particular political ideologies and promote the common good through public deliberation: "We have framed public roles as issues of evidence and professionalism, not as matters of individual political persuasion" (98).¹⁹

For those health professionals already committed to public advocacy campaigns on issues ranging from firearm violence (Hunt 1996) to tuberculosis elimination (DuMelle 2000) to improving health care access for underserved patients (Schumann 2009), Gardner's address may well have provided a welcome measure of validation. Yet this response was surely not universal, as many doctors lack experience in public advocacy. Survey data indicate that a high percentage of physicians endorse the principle of citizen leadership yet find it difficult to put this sentiment into practice (Grande and Armstrong 2008; Gruen, Campbell and Blumenthal 2006). Lack of training and preparation for public advocacy is one obstacle. Physicians are taught how to communicate with patients in clinical settings but generally

¹⁹ "Physicians must realize that they also share goals in common with other members of the profession and that, although individual action is laudable, collective action is a hallmark of professionalism. Physician groups have been particularly effective agents of change in institutional issues, local community matters, legislative action, and much broader issues, such as civil and human rights, prevention of nuclear war, and the banning of landmines. These larger movements have shown physician advocacy to be most effective when it has a specific goal, a clear message, good supporting evidence, collective action, and participation in the political process" (Gruen, Pearson and Brennan 2004, 97). "Physicians should be reassured that even small actions can be influential, that political involvement is more than just voting in elections, and that these activities are important and admirable aspects of citizenship" (Gruen, Pearson and Brennan 2004, 97).

enjoy few opportunities to practice public speaking (Leach 2009). Time limitations also loom large with tight schedules yielding precious spare minutes for public engagement (Weimar 2008). And health professionals who work for large institutions with public affairs offices may encounter resistance when it comes to asserting their own voices in the public square (Wilson 2009).

For these reasons and more, physician-citizenship frequently remains an ambitious goal in search of practical means to achieve it. For millennia, scholars of communication have pondered how humans find ways to persuade audiences and deliberate in concert. Here, we consider how insight from the communication field can contribute practical strategies for overcoming obstacles that doctors face in realizing their aspirations to develop and assert political agency in ways that are consistent with their professional commitments and values.

The limitless horizon

The physician-citizen's public role has been defined as "advocacy for and participation in improving the aspects of communities that affect the health of individuals" (Gruen, Pearson and Brennan 2004, 94). Myriad socioeconomic and environmental factors, such as insurance availability and water pollution, go a long way toward determining the health status of individual patients. As such, it follows that physician-driven public engagement on these issues should be a matter of professional responsibility, not just personal choice. Yet so defined, "these responsibilities are open ended and in many ways limitless," making it challenging to isolate specific vectors of public engagement that both appropriate and practical (Gruen, Pearson and Brennan 2004, 96). This problem of the physician-citizen's limitless horizon of professional responsibility vexes practitioners and theorists attempting to develop frameworks to guide physicians' interpretation and execution of their public roles. Concepts from classical rhetoric, such as invention, the synecdoche, and ethos, can help explicate this challenge.

According to Aristotle (2006) the essence of the art of rhetoric is finding the available means of persuasion in any given situation. Resourceful speakers are good inventors, able to fashion tailor-made messages to fit specific occasions. Physicians confront this puzzle of rhetorical invention when they contemplate moving from interaction with obligatory audiences (e.g. patients and office colleagues) to broader audiences in "domains of professional aspiration" (e.g. engagement in the public arena) (Gruen, Pearson and Brennan 2004, 95).

The medical profession's public role in the U.S. antismoking movement is often cited as an illustration in this regard. First, an overwhelming majority of doctors themselves quit smoking and urged patients to follow suit when compelling evidence on the health harms of tobacco consumption emerged in the 1970s (Gardner 2009, 1840). From there, physicians extrapolated this message to wider audiences, eventually reaching policy making bodies, spurring anti-smoking legislation and helping empower the Food and Drug Administration to regulate the tobacco industry (Gruen, Pearson and Brennan 2004, 98).

A similar pattern of rhetorical invention is evident in the public activism by the International Physicians for the Prevention of Nuclear War (IPPNW). During the Cold War, that group's nuclear disarmament campaign began with the efforts of a small group of physicians to study the health effects of a nuclear attack on Boston, Massachusetts. From this local initiative, IPPNW activists moved on to engage international audiences in public advocacy campaigns that were ultimately recognized with the Nobel Peace Prize (Lown 2008).

The evolution of physician-driven public advocacy on smoking and nuclear disarmament can be understood through the lens of the synecdoche, a figure of classical rhetoric that enables speakers to invent persuasive appeals by playing off relationships between the

particular and the general, the microcosm and the macrocosm (Burke 1969, 507–508; Sloane 2001, 763–764). The synecdoche sheds light on how local initiatives launched in the domain of professional obligation carry latent seeds of broader public advocacy campaigns, as well as ways that macro-level public deliberation can be informed by related micro-level phenomena. The synecdoche's rhetorical utility flows from its flexibility, such that movement can occur from part to whole, or in the other direction, from whole to part.

As the IPPNW case illustrates, doctors found that their early focus on alerting New Englanders of the devastating health effects of a nuclear blast in Boston folded out into opportunities to discuss the nuclear arms race with international audiences, including the Soviet general public (Lown 2008). Likewise, in synecdochic fashion, physicians lobbying Congress to regulate the tobacco industry found that in the macrocosm of national policy debate, struggles to ban second-hand smoke in their own offices provided persuasive points of reference useful for anchoring their macro-level arguments (Gardner 2009).

The modern academic specialty of rhetorical criticism adapts classical concepts, such as the synecdoche, to analysis of contemporary public argument (Enos 2006). This research trajectory positions communication scholars as potential collaborative partners for physician-citizens interested in refining their public advocacy efforts. The possibilities for such inter-disciplinary collaboration are redoubled by communication's orientation as a "practical discipline," with many of its scholars subscribing to a definition of professional responsibility that mirrors the physician-citizen's commitment to share fruits of their intellectual labor with wider audiences (Craig 1989).

Professional ethos

The challenge of rhetorical invention, or finding the available means of persuasion, is only partly about isolating the right message and locating the proper audience to receive it. Aristotle (2006) also counseled citizens engaging in public advocacy to cultivate ethos, or credibility, in order to leverage their appeals. On this count, physician-citizens generally enjoy a generous measure of ethos their professional status affords them as public figures. Of course, professional ethos is not a static resource. It can wane if citizens perceive that the medical establishment does not "have its own house in order" (Gruen 2008, 684–5). Conversely, physicians may overstretch their professional ethos when they "extend the clinical authority that is conferred to them by patients to settings for which it is irrelevant" such as a legal contract dispute or argument about tax policy (Stoller 2009, 876–78).

The preceding considerations are especially salient for physicians striving to strike a proper balance between obligatory and aspirational dimensions of their professional lives. While physicians generally endorse the concept of public engagement, they tend to feel more comfortable with modes of advocacy that flow directly from their clinical care responsibilities (Gruen 2008). In the abstract, this notion of a bounded professional ethos would seem to offer a promising solution to the problem of physician-citizens overstretching the scope of their credibility. Yet the issue of terrorism illustrates how such distinct lines may not map so cleanly onto the messy world of politics.

Lightly secured civilian stocks of highly enriched uranium (HEU) are attractive theft targets for terrorists seeking nuclear weapons (Cirincione 2007). The medical profession contributes directly to this public health risk of nuclear terrorism, since 95% of the world's radiopharmaceuticals are generated from HEU (Williams and Ruff 2008). In light of this fact, some physicians exhort colleagues to undertake public advocacy campaigns designed to address this issue: "Clinicians are thus uniquely placed to advocate conversion to the use of LEU, while pressuring their imaging and isotope providers to end reliance on HEU,

thereby blocking one of the most vulnerable pathways to producing a 'terrorist bomb'" (Williams 2008).

A physician initiative to lobby other physicians to switch the type of uranium supplied to their practices resembles the movement to ban smoking in hospitals cited in Gardner's 2008 AHA address. Both campaigns focus on an issue with direct connection to physicians' professional lives, maximizing the extent to which advocates' expert credibility can be mobilized to sway audience opinion. Yet the picture grows more complex when the full scope of the ongoing anti-terrorism campaign is considered.

In addition to focusing on the clinical uranium issue, the Medical Association for the Prevention of War calls for "collective advocacy" to "help prevent a global nuclear pandemic" by pressuring nuclear-armed states to eliminate the 26,000 atomic weapons in their arsenals (Williams 2008). Are physicians qualified to speak as experts on the issue of nuclear disarmament? The Cold War example of IPPNW activism certainly shows how physicians, when personally impassioned about a topic, can achieve impressive policy change through public advocacy (Lown 2008).

Yet the physician's invocation of professional ethos in support of such political claims raises questions, especially in the context of multifaceted public issues such as nuclear policy, where health effects of nuclear blasts are but one component of a complex debate implicating international relations, economics, military doctrine, and even cultural values (Sagan and Waltz 2002). A cautious option for physician-citizens troubled by the prospect of overstressing their credibility in such cases would entail confining public advocacy efforts strictly to the domain of professional obligation, thereby sidestepping the complications associated with wading further afield into the public arena.

Although potentially reassuring for doctors, this approach deprives deliberating publics from hearing some of society's most vital voices contribute to public debates on pressing matters of civic concern. Full appreciation of this point requires one to realize the multiple forms such contributions can take. Certainly, physician-citizens can enrich public discussion of health-related issues by sharing their professional judgments on topic specific matters within their areas of expertise. And the historical record suggests that such efforts can be very effective, as cases such as IPPNW and anti-smoking activism attest. Such exemplars, especially as they inspire other physicians to pursue principled, evidence-based public advocacy, deserve acclaim. Yet it would be unfortunate to frame this mode of advocacy as the only option available for physicians considering public engagement. They can also enhance the quality of public deliberation by modeling shared decision-making, an approach to communication in the clinical setting that emphasizes values of listening, cooperative reasoning, and respect for the bounded nature of technical expertise (Kuehn 2009; Rimer et al. 2004).

By tapping into their professional ethos as shared decision making practitioners, physician-citizens may find a public voice with which they can speak on a wide range of topics, while remaining grounded to norms of the medical profession. Prevailing notions of political advocacy tend to position experts as actors bent on securing maximum audience adherence for their settled technical judgments. Yet as the tenets of shared decision-making make clear, it is not appropriate for physicians to assume such a didactic communicative posture when working with patients on questions that cannot be answered by recourse to scientific data alone.

Extrapolating this principle to the realm of public argument yields a conception of physician-citizenship that positions doctors as unique kinds of advocates, capable of contributing to civic deliberation in multiple respects. At the content level, their ideas may improve public understanding of a complex topic's technical dimensions. In terms of process, the physician-citizen's commitment to the principle of shared decision-making places these technical insights in a self-limiting frame that acknowledges the legitimacy of

different perspectives and invites others to join the discussion. Through the power of example, such contributions may help improve the quality of public discourse in a society rent by the polarizing effects of "enclave deliberation," where homogenous interlocutors interact to concretize settled perspectives and incubate extreme positions (Sunstein 2007; see also Baum and Groeling 2008).

Assessing the future prospects for physician advocacy, John Henning Schumann (2009, 1) suggests, "we have reached a watershed moment" marked by a profusion of new opportunities to participate in public dialogue. Since "no group is better situated to engage in the shifting landscape than academic physicians, particularly those of us who practice in primary care fields" (Schumann 2009), the time is ripe to explore inter-disciplinary collaborations that can connect health care professionals to university partners with resources and expertise in rhetoric and public argument.

Conclusion

The case report is a venerated form of professional communication used by clinicians to build on medical theory and practice, usually by sharing with peers an account of an unusual patient narrative encountered in the clinical setting (Hurwitz 2006). For physicians and clinician-researchers, the meaning of "making the case" is expanding as professional norms increasingly oblige medical professionals to engage broader audiences beyond their disciplinary peer groups. T2 translational research requires communication not only across disciplinary boundaries, but also across barriers that divide expert and public communities. Physician-citizenship calls upon medical professionals to engage in advocacy directed toward policy-making bodies and public spheres of deliberation.

While a high percentage of physicians endorse the principle of citizen leadership entailed in "making their case" to wider audiences, many have difficulty putting this principle into practice. This discrepancy has been attributed, in part, to lack of training and preparation for public advocacy, time limitation, and institutional resistance. Furthermore, action may be inhibited by a lack of clear boundaries to the physician-citizen's potential role in advocating for improvements to aspects of the community that impact health. Concepts from the rhetoric tradition, such as *dissoi logoi*, *synerchesthe*, rhetorical invention, the synecdoche, and rhetorical ethos, help explicate these challenges and suggest possible strategies for successfully surmounting them. Such pathways of future inquiry branch out from Segal's groundbreaking work, which demonstrates persuasively how analysis of health and medicine can be substantially enriched through use of "heuristic probes" drawn from basic principles of rhetorical theory, such as:

- Persuasion is contingent, fit to situation.
- Speakers construct and invoke their audiences.
- Speech genres, like speeches, are good places to look for values.
- Ambiguity is not a problem to be solved but a resource to be mined.
- Rhetoric per se only occurs where there is a contact of minds.
- The terms of a debate constrain what is possible to argue at all.
- The character of a speaker is a means of persuasion. (Segal 2005, 16–17)

Just as translational research in medicine is designed to be a "two-way road" enabling knowledge to traffic from expert to lay communities and back again, our analysis suggests how interdisciplinary exchange between medicine and argumentation can be mutually

informative for both fields. By adapting the principle of shared decision making to the public realm, physician-citizens can cultivate a middle voice that enables them to engage in public advocacy on multifaceted issues whose complexity warrants a holistic approach that invites deliberation across multiple perspectives. Such models of public advocacy are extremely valuable for argumentation scholars, who face the increasingly daunting challenge of theorizing productive modes of communicative interaction in a time where the fractious nature of public life prompts many citizens to retreat to the comfortable cocoons of deliberative enclaves. As it is "vital to role model physician advocacy as a core component of not only doctoring but of citizenship" (Schumann 2009) the stakes at play in the physician-citizenship challenge are considerable not only for the medical profession, but for the body politic as well.

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