

Mapping New Theoretical and Methodological Terrain for Knowledge Translation:
Contributions from Critical Realism & the Arts

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Abstract

Background: Clinical practice guidelines have been a popular tool for the improvement of health care through the implementation of evidence from systematic research. Yet it is increasingly clear that knowledge alone is insufficient to change practice. Knowledge translation initiatives falter when they neglect social environments, and fail to engage potential adopters to critically reflect on existing and proposed practices and strategies for sustaining change.

Discussion: This paper presents a novel knowledge translation framework, CRARUM, that combines critical realism and arts-based methodologies in order to optimize interventions to local practice settings, and disseminate evidence in a way that captures the imagination of practitioners, and engages them in critical thought. Arts-based methodologies nurture sympathy, and foster self-reflection on the ways in which contextual/cultural factors influence and shape clinical practice, and how these factors facilitate or impede change efforts. Critical realism facilitates understanding of clinical settings by providing insight into its structures, powers, generative mechanisms, and tendencies. Combined within the CRARUM framework, these methodologies enable successful embedding of interventions, and promote greater impact and sustainability.

Summary: CRARUM has the potential to make an important contribution to the science of implementation research by addressing the complexities of social environments, and engaging potential adopters to critically reflect on existing and proposed practices and strategies for sustaining change.

Background

In recent years, knowledge translation (KT) and evidence-based medicine have gained currency in health research through their emphasis on the importance of moving “knowledge off the shelves and into practice, making it relevant and accessible to practitioners and patients” [1, p. 869]. The identification and use of best evidence through careful and rigorous clinical trials research and standardized application is increasingly emphasized by the governments of Canada (Canadian Institutes of Health Research Act), the US (Agency for Healthcare Research Quality), UK (National Health Service Centre for Reviews and Dissemination), and Australia (National Institute of Clinical Studies) primarily due to concerns about cost-containment, quality improvement, and accountability [2].

For the past two decades, clinical practice guidelines, an instrument of evidence-based medicine [3], have been a popular tool for the implementation of best clinical evidence from systematic research to improve the quality of health care. The belief was that these guidelines would provide a foundation for clinical action, and improve clinician practice by assisting in decision making. However, it is now widely understood that guidelines do not automatically change practice simply by establishing a knowledge base for practitioners [4]. That “evidence does not recommend its own interpretation” [5, p. 96] is increasingly apparent given the gap between research that has contributed to guideline development and guideline implementation intervention [6]. That clinical decisions may vary across patient cases even when conditions remain the same has received increasing attention [7]. This variation is regarded as a problem by some insofar as it poses a threat to standardization [8]. Others, however, go further, underscoring the limitations of the normative evidence-based mindset that perceives clinical practice as “an activity that simply attaches research to a local worksite” [9, p. 1064], a perspective that

overlooks differences between settings in resources, and established routines and cultural practices that create inevitable yet not necessarily undesirable variations in practice [10]. Still others have taken issue with ways in which evidence-based medicine valorizes certain forms of scientific evidence as superior to the professional wisdom of experienced clinicians [11]. It is not our intention here to resolve the debate about evidence-based medicine. Rather, we wish to problematize KT by advocating a more creative and imaginative approach to translating evidence-based innovations into the everyday world of clinical engagement. We emphasize the importance of facilitating critical reflection by potential adopters regarding the contingencies of their own practice settings that have the greatest bearing on practice.

Contrary to the view that best evidence can be disseminated across time and place and can achieve planned clinical behaviour change with reasonably predictable outcomes, we align ourselves with those who argue that contextual interests, infrastructures, and procedures are implicated in the adaptation of research to local uses [9, 12]. The implication is that if science is to inform action and to achieve effective therapeutic outcomes, it must address *how* interventions will work in particular practice settings [4].

In response to the complexities of research transfer and innovation adoption, theory has been identified as a tool for developing strategies to promote the integration of research findings into practice [13, 14]. Despite notable consensus that the use of theory is crucial in the design and evaluation of implementation research [15], it is rarely and most often ineffectively used [13, 14]. Critics suggest existing implementation frameworks rest on the assumption that the progression of research into practice occurs in a sequential, linear and orderly way [16, 17] which misses the “messy world of practice” [16, p. 256], and the complex interrelationships between potential adopters, the practice environment, and the intervention. Few frameworks

adopt a holistic approach that considers all aspects of the process of research use and its impact on health outcomes [18]. The Ottawa Model of Research Use (OMRU, see Figure 1) [18] is an exception as it both specifies key elements of the KT process and asserts an interconnection between these elements. An additional strength of OMRU is its attention to identifying, describing, and assessing the practice environment and its influences, which can facilitate and/or impede the process of research transfer and use.

The Key Elements of OMRU

Logan and Graham [18] developed the OMRU framework for policymakers, administrators, and managers seeking to increase the use of health research by practitioners as well as for researchers interested in studying the process by which research becomes integrated into practice. Integral to OMRU is the systematic process of assessing, monitoring, and evaluating the practice environment, potential adopters, the innovation, transfer strategies, evidence use, and innovation outcomes. These data serve four functions: a) to identify potential barriers and supports to research use related to the practice environment, potential adopters, and the evidence-based innovation; b) to provide direction for selecting and tailoring transfer strategies to overcome identified barriers and to enhance the supports; c) to monitor the progress of the transfer effort; and d) to evaluate the actual use of the evidence-based innovation and its impact on outcomes of interest. Both qualitative and quantitative methods are suggested for assessing and monitoring, but only quantitative methods are suggested for evaluating outcomes.

OMRU suggests that the best approach to implementation of research evidence rests with identifying factors and processes in the practice environment that promote and/or impede the adoption of research, and optimizing the intervention and adoption strategies by minimizing barriers and maximizing supports in particular settings. A defining characteristic of OMRU is

that it provides a broad comprehensive framework to direct the study and implementation of complex interventions. It has been successfully used to promote the use and application of research in a variety of clinical areas such as neonatal intensive care [19], tertiary hospital care [20], ulcer care [21], and nurse call centres [22].

Notwithstanding its significant strengths, the model suffers from particular oversights. First, while OMRU asserts an interconnection between the elements of the process of research utilization, there is no theory embedded within the model to explicate how these elements are interconnected, nor how these interconnections facilitate or impede research transfer and use. Such absence of attention to the complexities of power relations is troubling. Second, only quantitative methods are endorsed for the evaluation of the use of the evidence-based innovation and its impact on outcomes of interest. Finally, OMRU overlooks the arts as an effective translation strategy with educational potential to foster critical awareness, engage adopters to envision new possibilities, and effect change.

We seek to remedy the limitations of OMRU through our creation of Critical Realism and the Arts Research Utilization Model (CRARUM, see Figure 2). CRARUM is a KT framework that combines critical realism and arts-based methodologies to achieve the following: 1) address the complexities of practice as a meaning-making activity; 2) optimize interventions for local circumstances; 3) target crucial factors in the organizational context that influence behaviour; 4) disseminate evidence in a way that captures the imagination of practitioners and engages them in critical thought; and 5) facilitate the achievement of best practice in health care settings. In the discussion that follows we first explore the contribution that critical realism makes to program development and program evaluation. Critical realism is a perspective that can illuminate mechanisms embedded in clinical settings and interventions, and perhaps most importantly,

those mechanisms triggered or suppressed by elements of the intervention itself. It is a theoretical base that will help to support the choice and development of intervention as well as the interpretation of implementation study results. Next, we advocate the use of the arts as a key KT feature to enable tangible and lasting practice change. The arts engage audiences to critically reflect on the extent to which contextual/cultural factors influence and shape their understandings, assumptions, and practices, as well as how these influences facilitate or impede change efforts.

Discussion

A Critical Realist Approach to Unpacking the Influence of Context

Most KT initiatives in the health care field are interventions designed to change some element of routine practice or to introduce new practices. Recognizing the diversity of new health care spaces [23, 24], and that health promotion initiatives may include social, environmental and political interventions, the World Health Organization has endorsed a ‘settings approach’ which targets macro factors that influence and shape practice in order to render settings more health-enhancing [25, 26].

Uptake may be increased by aligning interventions with the social environments in which behaviours are shaped, altered or maintained [4, 15, 27]. Yet relatively few theoretical and conceptual tools have been developed for teasing out which aspects of context matter most in intervention design and program evaluation. Critical realism furnishes a sophisticated understanding of context. In critical realism, a distinction is made between the *real* (underlying nature and causal powers of objects/agents), the *actual* (what happens if/when those powers are activated), and the *empirical* (what is experienced/observed) [28, 29]. Drawing on the work of Bhaskar [30], critical realist scholars suggest that social phenomena are animated by ‘generative

mechanisms' whose causal properties may or may not be activated, depending on circumstance [29, 31, 32]. Further, it is noted that mechanisms can coincide under real world conditions to produce *emergent properties* contingent in time and space, properties which are irreducible to those of their constituents [28]. The notion of contingency contrasts with positivist notions of universal logical necessity (natural laws, generalizable truths) by highlighting the uncertain nature of phenomena (i.e. that propositions may hold true only under certain circumstances). Mechanisms do not imply regularity, determinism, or predestination since they may not always be triggered. In the domain of the actual, there are many mechanisms concurrently active where some reinforce one another, and others frustrate the manifestations of each other. In this sense, it can only be said that a certain object *tends* to act or behave in a certain way [33]. Danermark et al. [33, p.56] use the example of a match to illustrate the notion of tendency. The object (match) has within it the causal power for fire, but ignition requires this power be triggered by agential mechanisms through the act of striking, as well as by mechanisms of nature including sufficient oxygen, dry conditions, etc. Irrespective of an agent's intent, numerous combinations of mechanisms may influence whether the causal power (fire) will manifest itself in the realm of the empirical.

Thus for critical realists, explanatory power derives not from counting the co-presence of observable phenomena and inferring causation on the basis of empirical co-occurrence, but from "identifying causal mechanisms and how they work, and discovering if they have been activated and under what conditions" [28, p. 14]. Consequently, context becomes redefined as the interrelationship between real and emergent or possible properties of structures and agents:

The (local) mix of conditions and events (social agents, objects and interactions) which characterize open systems, and whose unique confluence in time and space selectively activates (triggers, blocks or modifies) causal powers (mechanisms) in a chain of

reactions that may result in very different outcomes depending on the dynamic interplay of conditions and mechanisms over time and space [34].

It is our contention that this redefinition will help to illuminate aspects of context that, if addressed, can facilitate successful embedding of interventions in settings, thereby ensuring greater impact and sustainability. In its illumination of these aspects of context, critical realism is a perspective that is equally pertinent to program evaluation. Proponents of critical realist evaluation [35, 36] have argued that the central question is not so much *whether* certain interventions work in a generalizable way, but what *will* work with *these* stakeholders/actors in *this* setting at *this* time. This shifts the focus of evaluation of interventions from a program-based view of what works to causal pathways [37]. From a critical realist perspective, opening the “black box” [32] of implementation is necessary to better understand the nature of the initiative, the need for refinement, and the factors important for replication [38], the capacities of agents [39], as well as their relational expressions or manifestations.

For critical realists, agential capacity is not innate or static, but *relational*. It is activated in the mobilization of various forms of capital: social, cultural, and material/economic [40]. Power is exercised in relation to others who are likely to mobilize stocks of capital and resources in order to promote their own interests. Those with more or better knowledge, money, social connections, ‘credibility’, and stronger social skills often prevail. These stocks of capital are not randomly assigned but follow time-honoured cleavages of race, gender and social class, suggesting that social structures (including institutional practices, policies and regulations, cultural norms) play a role in the systematic and predictable (re)production of inequalities amongst social groups. This “indebtedness of agency to structure”, as Scambler [41, p. 37] terms it, underscores the dialectical relationship that exists between the two: human action is enabled

and constrained by power inequities, but this action, in turn, reproduces or transforms those structures of power [42].

Power relations may be ubiquitous, but they manifest in different ways in different settings, in part because other mechanisms are also at play which may be local manifestations of much broader processes (e.g. gender and race relations, management-labour relations). Contemporary neoliberal ‘logics’ of management practice (concerned primarily with profitability, cost reduction, cost-per case efficiency, and standardization) must figure prominently in any such discussion. This kind of managerialism [43] seeks to parse healthcare into discrete tasks that can be measured easily with written standards pertaining to how much time can be spent on a given task and how it should be done [44]. The measure of care lies with the physical task rather than the quality of human interaction and, as a consequence, the relationship between the care provider and recipient is not always quintessentially one of caring unless those most closely involved make a point of making it so [45].

Thus interventions aimed at ‘humanizing’ care must acknowledge that such interventions intersect powerfully with other dynamics (racism, classism, labour-management relations, staff burn-out, decision latitude, service delivery trends, atomization of the nuclear family leading to loss of proximal family members, etc.) in ways that, by virtue of the underlying causal powers at play, have the ability to either enhance or undermine change initiatives. Critical realism proffers a view of evidence-based practice that concentrates on an elaboration of mechanisms and the logic of causation rather than a program-based view of what works in terms of research-manipulated interventions and independent outcome measures alone. It is an approach to implementation evaluation (also referred to as formative evaluation) [38] that, when combined with outcomes evaluation, creates a powerful “hybrid style approach for implementation

research” [38, p. S2] which provides a clearer direction for action because the decision maker not only has knowledge of the outcomes but also what produced the observed outcomes (or lack of outcomes).

Recovering Agency: An Agenda for Active Engagement

More is at stake here than an exhortation to be mindful of context as a kind of general backdrop for interventions. In seeking to understand how these factors/mechanisms play out in this setting, with these agents, at this time, we must also take account of how reflexive agents perceive, negotiate, unwittingly reinforce or selectively resist the effects of these broader trends and influences in the context of their own life biographies, socialization, and the micro-social context of peer relations in the workplace. While some critical realists seek to explicate the political economy of health [41, 46], others have emphasized the decisive role that agency continues to play [39, 47], seeking to articulate how “structural relations of gender, class, race, or age are activated, resisted, or reproduced during encounters with the healthcare system” [42, p. E64], for example, by practitioners (or patients) mobilizing their own stocks of capital in particular settings and contexts [42].

KT strategies that seek to impose pre-packaged understandings that ignore lived experiences and interpretations risk irrelevance or active resistance insofar as they fail to capture the imagination and engagement of key stakeholders in the process of change. The implications go well beyond a call for qualitative research to help ‘tweak’ interventions to better fit local settings. Diverse disciplines, practices and literatures have identified this problematic of *engagement* (the need for it, and how to do it) as a central issue for a myriad of professional practices. From health promotion to health services research, and from practice development to participatory research and communities of practice, the issue is how to work skillfully with

practitioners to catalyze a deepening of social insight and visioning about existing practice, and the identification of strategies for bringing about tangible and sustainable transitions in practice settings [48]. Taking agency seriously means finding ways to work with practitioners to help them understand their situation, examine their values, identify barriers and opportunities for change, implement solutions, and evaluate the results while never losing sight of the ways in which generative mechanisms operate to constrain and/or enable change in particular settings. This requires a more sophisticated approach to engagement and dialogue that draws in and works with the whole person in his or her ‘multiple literacies’ [49]. This is where the arts, as a medium for reaching and engaging others, can be particularly powerful in overcoming the limitations of traditional didactic, text-based approaches to practice change.

Staging the Data for Research Transfer

There can be considerable leeway for evidence to be (mis)interpreted, resisted, adapted, and even dismissed by potential adopters [5]. It is therefore imperative that when bringing evidence-based innovations to practice and encouraging their adoption, use is made of approaches that facilitate interpretation by engaging potential adopters as beings capable of reflecting critically on their own assumptions, and on the relationship between context and their practice [12]. KT strategies have ranged, for the most part, from passive unplanned efforts (diffusion, e.g. publication of research findings), to targeting and tailoring the evidence and the message for a particular audience (dissemination, e.g. direct mailing), to systematic efforts to encourage adoption of the evidence (implementation, e.g. use of incentives and sanctions) [50]. However, the limitations of traditional approaches to research dissemination (e.g. journals, guidelines, etc.) and to the implementation of best evidence are increasingly recognized [51, 52]. Research indicates that KT is more successful when it consists of interactive educational

interventions [51], and yet OMRU neglects the arts as a KT strategy that has enormous interactive, emancipatory and educational potential. This is an omission that can be remedied by incorporating into our model (CRARUM) the arts, which lend themselves particularly well to activating the imagination, encouraging critical reflection and change.

Within the context of medical education, Charon et al. [53] assert that literature (e.g. fiction, poetry, plays) helps clinicians attend to the human dimension of medicine, to understand patients' experiences of sickness, to recognize the clinician's role in alleviating suffering, and to appreciate the power of the patient-clinician relationship. Drama has a uniquely compelling emotional quality that engages audiences on both an affective and cognitive level about human values such as respect, dignity, the value of relationships; this emotional quality is central to the success of educational interventions for medical training [54, 55].

Literature and theatrical performance are increasingly being used as a means to humanize medical education [56] because of their reliance on the imagination. The importance of the imagination to allow and encourage sympathetic connection with others, precisely what is so powerfully activated by literature and theatre, is also affirmed by philosophical insight, notably that of Hume [57], Smith [58], and recently Nussbaum [59]. Nussbaum argues that with imagination it is possible to "think what it might be like to be in the shoes of a person different from oneself, to be an intelligent reader of that person's story, and to understand the emotions and wishes and desires that someone so placed might have" [60, pp. 10-11]. Dramatic performance is particularly effective in engaging the imagination and fostering sympathy because it privileges the phenomenological complexity of life and thus has the advantage of drawing the observer into a particular social and cultural world with all its textures, sounds, gestures, and movements [61]. In contrast to textualism, which flattens out "the flux of human

relationships, the ways meanings are created intersubjectively as well as intertextually, embodied in gestures as well as in words...” [Jackson quoted in 62, p. 188], performance privileges lived experience.

Dramatic performances have been successful in helping practitioners and medical trainees reflect on the care they provide and increase their understanding of patient care issues [54, 55, 63]. For example, post-performance evaluations of a research-based play about personhood in Alzheimer’s disease [2] found experienced nursing and allied health professionals acquired a new level of understanding of the expressiveness of persons with cognitive impairment. Research-based drama, in communicating research findings more directly and effectively to health professionals, can change attitudes, and in so doing, holds the potential to change practice [63].

Improvisational theatre developed out of the political-theatrical mandate of Augusto Boal, a Brazilian theater director, writer, and theorist, is an important form of theatre that is influencing the way social and health scientists are incorporating drama into their research [64, 65]. Boal’s Forum Theatre is a method of teaching people who are not actors how to recognize oppression in their lives and how to possibly transform the conditions that create their oppression. The theatrical goal is to engage those who are disempowered and to create ways to liberate the disenfranchised [66]. A one-act play or short scenes are performed for an audience, followed by an identical presentation in which audience members are encouraged to stop the scene(s) and physically replace the main character when they feel inspired to enact an alternative approach that they feel might result in a more favourable outcome [67]. Forum Theatre is highly interactive, imaginative, and its self-empowering processes of dialogue help foster critical thinking about the lived reality of the participants, the root causes of the situation, solutions to

these problems, and change. The collaborative process is intended to address the need for participants to step outside “the apparently solid ‘matrix’ of ‘this time in this place’ and collectively de-codify the ‘myth of fixed reality’ – engendering hope for transformation” [67, p. 642]. Attitudes, beliefs, conflicts, failures, successes, and aspirations are shared, and emerging from this process is a vision of how things could be different [64, 65]. Mienczakowski [65], for example, has used elements of Boal’s Forum Theatre techniques in ethnographic performance projects about schizophrenia and persons who are alcohol dependent. His use of these techniques was intended to “provide emancipatory opportunities and insights for both health informants and health professionals” [65, p. 360].

Art, as a method of communicating social knowledge, is powerful, evocative, complex, and dialogical. It privileges “the *experience* of knowledge” [68, p. 39, original emphasis], the communicative act of life as it is lived. As such art offers the potential to foster critical awareness, to facilitate understanding, and nurture sympathy, precisely what is arguably the precondition for transformation of health care.

Moving from theory to practice

How would CRARUM, the model we are advancing in this paper, help to guide users in successfully implementing evidence into health care settings? Following the logic of critical realism, as a necessary first step, qualitative and quantitative methods of data collection can serve to identify causal generative mechanisms to care provision within the targeted site for practice change. These data can inform an understanding of current practice of individual practitioners, contradictions between what is espoused about practice and the reality of practice, and existing barriers to effective practice. These data elucidate the social, cultural and material conditions under which practice occurs enabling the intervention to be introduced in a manner

that is most relevant and meaningful to health care practitioners within their care setting. Insofar as organizational hierarchies limit practice change, engaging administrators can help ascertain whether certain interventions will work with particular stakeholders. Ensuring that the practice environment is supportive of the desired change is a precondition to effective transformation [16, 69, 70].

Critical realism can assist researchers in effectively aligning interventions with the social environments in which change efforts are undertaken. However, tailoring interventions to better fit local settings alone is insufficient to achieve optimal care settings. The arts provide an innovative approach to the challenge of engaging practitioners to imagine new possibilities for more humanistic care giving practices by helping practitioners to see, for example, the humanity of their care recipients [2]. The use of drama can raise critical awareness of taken-for-granted assumptions about standard care practices, and effect change through reflection on the nexus of personal assumptions, staff behaviour, and organizational policy [72]. In so doing, it can facilitate the development and implementation of an agenda for change that derives from the critical awareness of stakeholders themselves [12].

Critical realist evaluation of the intervention takes into account both the process and context of change. This entails an exploration of outcomes (e.g. non-pharmacological approach to behavioural management in dementia care) but also the conditions that were present to enable those outcomes (e.g. administration support for person-centred care). Qualitative and quantitative data collection can inform understanding of what happened/did not happen within the study relative to the intervention, and what factors in the setting influenced the observed degree of adoption of the approach to person-centred care. Thus, in addition to answering whether the

intervention works, the evaluation facilitates understanding of why it worked, for whom, and in what circumstances.

Summary

Knowledge translation, which is central to evidence-based medicine, has been identified as the most important contemporary initiative committed to reshaping biomedical reasoning and practice [9]. While the move to establish scientific research as a fundamental ground of medical decision making has had an enthusiastic reception, it has also generated considerable debate [9, 11, 37, 73]. Critics have focused on the separation that evidence-based medicine creates between research and practice-based settings and the one-way linear model of the relationship between the two that is characteristic of evidence-based medicine [37]. Indeed, built into the evidence-based movement is the assumption that the clinician can take guidelines, themselves generated from systematic reviews involving culling and ranking of evidence judged to be the best from experimenter-manipulated controlled trials, and translate them into the ‘messy’ realities of clinical engagement [37]. It is our contention that KT initiatives falter when they are not aligned with the social environments in which the behaviours targeted for change are shaped or maintained. Another limitation of KT initiatives is their failure to engage potential adopters of the innovation in critical reflection about practice, the relevance and meaning of innovation in the context of their practice, and, the identification of strategies for bringing about meaningful change in practice settings.

Given the inescapably interpretive dimension of evidence [5], and the complexity of health care settings [25, 26] we advance a new KT framework (which we have called CRARUM) that overcomes many of the limitations of the OMRU model. In its emphasis on arts-based methodologies, CRARUM underscores the importance of engaging potential adopters as beings

capable of reflecting critically on their own assumptions, and on the relationship between their practice and its context. Central to this critical reflection amongst practitioners is an examination of the relevance and application of the evidence-based innovation in relation to other political, strategic, contextual, and stakeholder considerations. We have embedded critical realism in the framework to shed light on the structures, powers, generative mechanisms and tendencies that characterize clinical settings. We have argued that these data will not only help successfully embed interventions in settings, thereby ensuring greater impact and sustainability, but also generate understanding of how and why interventions work (or fail) in a particular setting including the actual degree of adoption, and the extent to which the adoption occurred as intended [38].

Given the ascendancy of KT, CRARUM has the potential to make an important contribution to implementation research. Clegg [37] makes a compelling argument for how critical realism, with its underlying themes of critique and emancipation, can offer a distinctive approach to the debate about evidence-based practice. We go a step further by combining critical realism and arts-based methodologies in a way that enables agency to take centre stage and to reclaim KT for critique and emancipation.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

PK and BP developed the CRARUM framework. PK is the lead author and co-ordinator of the paper. BP was involved in drafting the manuscript and revising it for inclusion of critically important intellectual content. Both PK and BP read and approved the final draft of the manuscript.

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Figure 1: The Ottawa Model of Research Use (OMRU)

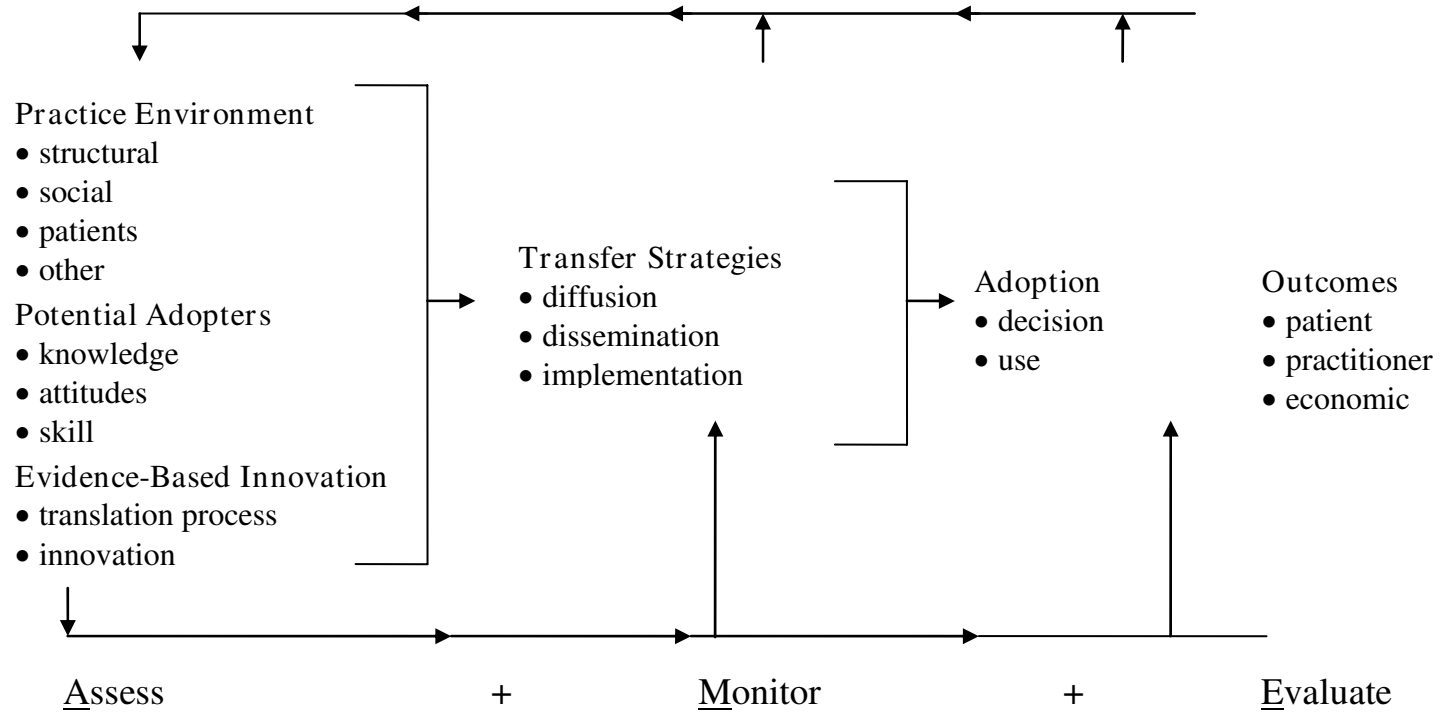
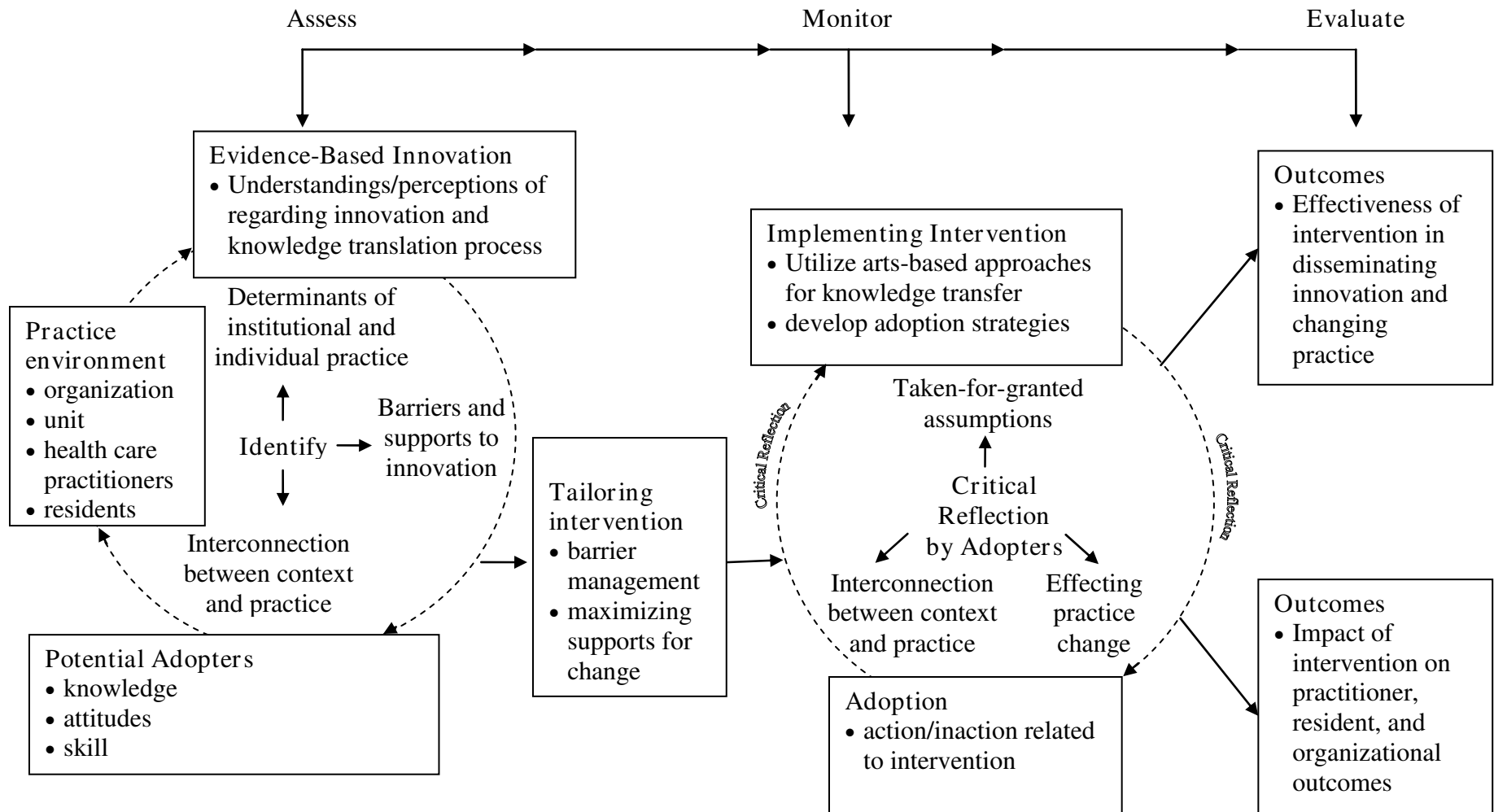


Figure 2: Critical Realism & the Arts Research Utilization Model (CRARUM)



Adapted from the Ottawa Model of Research Use (OMRU)

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