Evaluating the outcomes of complex nursing initiatives: Insights from the CANO/ACIO National Strategy for Chemotherapy Administration Project

by Sally Thorne, Laura Rashleigh, Tracy Truant, Renée Hartzell, and Maurene McQuestion

ABSTRACT
Because nursing interventions are typically complex and dynamic, evaluating their impact upon care and care systems is a notoriously daunting challenge. Nursing organizations seeking to evaluate the impact of their efforts are frequently frustrated by the gap between the evaluation research ideal and their available resources. In this paper, we describe a practical and manageable process developed to address such an evaluation challenge. Using a three-step inquiry approach, supported by modest organizational funding and a realistic level of voluntary member time, we were able to generate a meaningful understanding of intersecting outcomes arising from the implementation of CANO/ACIO’s National Strategy for Chemotherapy Administration. On the basis of our experience, we see considerable merit in both process and outcomes of this form of targeted evaluation.

ABOUT THE AUTHORS
Sally Thorne, RN, PhD, Professor, University of British Columbia School of Nursing, Vancouver, BC
Phone: 604-822-7482; Fax: 604-822-7446
Corresponding author: Sally.thorne@nursing.ubc.ca

Laura Rashleigh, RN, BScN, CON(C), Educator, De Souza Institute, Toronto, ON
Phone: 416-581-7884; Fax: 416-946-4580

Tracy Truant, RN, MSN, PhD(c), Doctoral Student, University of British Columbia School of Nursing, Vancouver, BC
Phone: 604-827-2160

Renée Hartzell, RN, BScN, CON(C), Clinical Staff Nurse, Ambulatory Care, Centre de santé et de services sociaux de Chicoutimi, Chicoutimi, QC
Phone: 613-888-3063

Maurene McQuestion, RN, BA, BScN, MSc, CON(C), Clinical Nurse Specialist, Head & Neck Program, Princess Margaret Hospital, Toronto, ON
Phone: 416-946-4501 ext. 5420; Fax: 416-946-4585
DOI: 10.5737/236880762511116

Finding feasible and appropriate ways to evaluate whether or not it has made a difference is among the most complex challenges associated with any nursing innovation. In a dynamic and changing health care world, being able to document impact determines whether an innovation will succeed or fail. Because of this, nurses face significant pressure to find meaningful ways to address the evaluation imperative, not only in finding the time and resources required to conduct an evaluation, but also in identifying a feasible methodology.

In this paper, we describe an evaluation methodology we developed for the CANO/ACIO National Strategy for Chemotherapy Administration. This strategic initiative was designed to enhance the level of nursing practice across the system, and we wanted to find a way to understand its impact. In describing this example, we hope to shed light on the nature of these evaluative complexities, document our efforts to enact a manageable and informative evaluation process within limited means, and offer encouragement to other nursing groups faced with similar questions about the enormity of the evaluation challenge.

UNDE RSTANDING THE EVALUAT ION CHALLENGE

The most familiar model of outcomes assessment in health care is the clinical trial. It offers a rigorous and elegant method for drawing strong conclusions as to cause and effect under certain circumstances. However, it is rarely applicable beyond the narrow confines of the simple single cause and effect relationship that can be inferred from observations of a dependent variable, such as would be the case with a pharmaceutical intervention (Campbell et al., 2000). To produce convincing results, the clinical trial requires that potentially confounding factors are well understood, measured and controlled, that there is evidence in favour of causal pathways linking the intervention and outcomes, as well as against other pathways exerting the observed effect, and that the effect sizes are large (Bonell et al., 2011). According to Paterson and colleagues (Paterson, Baarts, Launso, & Verhoef, 2009), our ideas about evaluation are strongly influenced by the “outcome concept” arising from the profound influence that clinical trial methodology has had on our understandings of what constitutes good science. These authors propose that an emphasis on refining measures for use in clinical trials has distracted scholars from paying equal
attention to the nature and influence of the outcomes concept and its underlying assumptions. In some instances, for example, inappropriate attempts to conduct clinical trials to evaluate complex phenomena have led to highly misleading conclusions (Kostaska, 2004). Because outcomes assessment, in a much broader sense, is an essential element in understanding whether and under what conditions changes in health occur in conjunction with interventions at all levels, a robust critical analysis of the field is urgently needed.

In conducting a population-based systematic assessment of mental health outcomes in one region of Australia, Trauer (1998) drew early attention to what he interpreted as a rapidly increasing pressure for formalized outcomes evaluation to justify expenditures on system sectors such as mental health practice. In an era of rising health care costs and reimbursement limitations by third party payers, he recognized an unprecedented demand for quantified outcome measures that could be directly aligned with market-driven demands. This led him to reflect on some of the generalizable difficulties with outcome measurement in a complex field such as mental health. For example, he noted the inevitable problem with determining whether or not observed effects were intervention-dependent and, if they were related to the intervention, whether the relationship was associated with structures or processes. He also noted that even when group-level effects were detected, they might not be indicative of all individuals within that group. In the mental health context, for example, effects could be realized at the level of patient and/or significant other, be pure or mixed in valence, be restorative or be preventative of further functional decline. Because of this, he reasoned that effective outcomes evaluation in the context of complex systems would have to consider both direct and indirect measures, include both objective and subjective elements of phenomena, address significant time points, as well as fixed intervals, consider both global and specific indices, and be both descriptive and prescriptive. Thus, when we appreciate the nature of what this kind of complex evaluation entails, we come to appreciate why questions about ideal measures become unanswerable.

Similarly, much of what we deal with in nursing is best understood as occurring within a context of complexity. Unlike simple single interventions, for which the quantitative science community may offer acceptable methods, complex interventions are built up from a multiplicity of components, many of which may act both independently and interdependently, include elements of both process and function, require accommodation for multiple meanings and interpretations, and involve consideration of longer term impacts (Campbell et al., 2007). Thus, when we consider the kinds of system-level adjustments that are associated with many nursing interventions, we can clearly see that new and very different kinds of approaches to evaluation will be required. Non-randomized trials may play some role in helping to inform our understanding under certain circumstances. However, it is important that we exert caution and generally limit this approach to those rare situations when interventions are demonstrably acceptable and feasible, and where evidence suggests little potential for harm (Bonell et al., 2011). We also recognize that evaluation implies added complexity when the intent of an intervention is to integrate it within that evolving system of care (Atun, de Jongh, Secci, Ohiri, & Adeyi, 2010). Such interventions often become events within the history of systems, leading to the evolution of new structures of interaction and shared meaning. They influence “evolving networks of person-time-place interaction, changing relationships, displacing existing activities and redistributing and transforming resources” (Hawe, Sheill, & Riley, 2009, p. 267). Understandably, trying to refine the knowledge base that will demonstrate the unique contribution the discipline makes within this complexity of influences to meeting patient needs has become a fundamental challenge for nursing (Sidani & Braden, 2011).

An evolving body of literature takes up these complexities and is providing direction for those seeking to evaluate interventions within systems. In this context, there is considerable discussion of the opportunities inherent in the mixed methods approach as a general strategy through which it becomes possible to shed meaningful light upon more phenomena than would an approach reliant on simple and singular measures (Celik, Abma, Klinge, & Widdershoven, 2012). According to Verhoef and colleagues (2005), because individual components of most systems are “inseparable, complementary and synergistic,” neither qualitative nor quantitative methods alone can “capture the meaning, process and outcomes of these interventions” (p. 206). In contexts where the well-defined aspect that constitutes the intervention represents only a small part of a more complex practice, a somewhat participatory approach to evaluation may be advisable. Such an approach allows for consideration of nuances of the local milieu, as part of the broader social context within which they are entwined (Potvin & Goldberg, 2012). Finally, in that complex interventions pertain to dynamic systems, the optimal approach will always involve evaluation approaches that would allow for continuous and systematic feedback (Catwell & Sheikh, 2009).

In the real world, with few widely accepted and tested approaches available, and working under the typical constraints of time, available data, and budget, considerable creativity is required to enact these participatory, mixed methods, and interactive approaches (Bamberger, Rugh, & Mabry, 2012). Many nursing groups that launch important initiatives struggle to find appropriate, feasible, and meaningful ways to evaluate them. They recognize the complexity of nurse-sensitive outcomes measurement, and they understand that the resources required to mount these major projects are well beyond the reach of most clinical teams. Further, within the increasingly uncertain health research funding environment in most jurisdictions, it becomes impossible to align evaluation funding with project rollout schedules. Further, in the broader scheme of funding priorities, quality assessment initiatives are often seen as low priority. Because of these significant barriers, far too many impressive practice-based nursing
A THREE-PHASED EVALUATION INITIATIVE

As a voluntary member-driven association of primarily practicing oncology nurses, CANO/ACIO realized that it was not well positioned to enact a major initiative in evaluation research. Relatively few nurse researchers in Canada currently possess the skill set to lead research that does justice to nurse-sensitive outcomes (Doran, Mildon, & Clarke, 2011; VandeVelde-Coke et al., 2012) and, indeed, the science associated with correlating complex variables such as nursing skill level with actual patient outcomes is still quite nascent globally (Aiken et al., in press). Thus, it sought a manageable approach that could be enacted in a timely manner with minimal resources and, yet, serve as a meaningful mechanism through which to consider its evaluation questions.

As a result, a small voluntary working group, under the leadership of the newly developed CANO/ACIO Director-at-Large for Research position, was formed to develop a “quick and dirty” (as opposed to slow and arduous) approach to a participatory mixed methods evaluation initiative with the potential for an ongoing feedback mechanism. It considered the evaluation challenges in the context of the nature of the intervention, the capacity of the organization with respect to implementation and evaluation, and the available options that would reflect an appreciation for the regional, jurisdictional and contextual diversities that are associated with the practice of chemotherapy administration and care by oncology nurses in Canada. From these deliberations, a three-phased approach was developed and implemented.

BACKGROUND TO THE NATIONAL STRATEGY FOR CHEMOTHERAPY ADMINISTRATION (NSCA) INITIATIVE

The NSCA was designed as a three-phased initiative toward the establishment of national chemotherapy standards, competencies, and educational resources for oncology nurses across Canada. Having first identified the need for such a project through a 2006 CANO/ACIO member survey and subsequently confirmed it in a 2009 national environmental scan (CANO/ACIO, 2009), a volunteer expert working committee was convened to develop and lead a special initiative that would provide organizations and oncology nurses with evidence-based standards and competencies toward optimizing cancer chemotherapy nursing practice nationally. The working committee used a combination of inductive and user-focused approaches to engage CANO/ACIO members and key stakeholders throughout the evolving process of envisioning, drafting and developing the appropriate standards and competencies for the intended purpose (CANO/ACIO, 2011a). These processes resulted in two core documents: the Standards and Competencies for Cancer Chemotherapy Nursing Practice (CANO/ACIO, 2011b) and a companion Toolkit (CANO/ACIO, 2011c). As an element of the original vision for this multi-phased large-scale initiative, was an evaluation component—something that would help the organization interpret the uptake of the standards and competencies, consider issues such as utilization, feasibility, strengths and gaps, and inform development of recommendations for long-term interpretation of the broader impact of articulating these kinds of frameworks on behalf of oncology nursing. However, the enormity of the challenge made it difficult to know how to proceed.

A NATIONAL ELECTRONIC SURVEY

Phase I involved an electronic survey developed by the working group and launched nationally over a six-week period. Using a publicly accessible no-cost online survey system, we designed a 16-item survey that was extensive enough to allow us to derive sufficient detail with respect to the questions asked, but still sufficiently constrained to allow busy oncology nurses to respond in less than 10 minutes.

Our survey questions focused on finding out who was currently using the standards and competencies document and toolkit and how they were being used. For those who acknowledged using them, we wanted to understand what their implementation process had looked like, which aspects they were using, and to what they attributed their implementation successes or failures. For those who had not used them, we wanted to understand whether they had plans to use them within their practice settings and whether they had encountered specific barriers to implementation. We also provided for open-ended items that invited suggestions for improvement.

Beyond our own members who might be more predisposed to supporting the uptake of an initiative that had been much discussed within the organization, we recruited survey participants from the wider community of specialist and generalist nurses involved with chemotherapy administration, both within the publicly funded cancer and health care systems and also in private chemotherapy clinics. We used all available networks, as well as social media to obtain as wide initiatives are never evaluated, and the results are not reported and shared. We are missing important opportunities to showcase what it is that the profession can contribute to the care of patients and the systems of health delivery.

It is within this context that we sought to develop and enact an evaluation of the outcome of the Canadian Association of Nurses in Oncology/Association canadienne des infirmières en oncologie (CANO/ACIO) national strategy for chemotherapy administration project. We believe we were able to identify a manageable and creative way to fulfill our evaluation aspirations within the challenging conditions of the times and generate meaningful insights about the process and impact of our intervention. Because we fully recognize the enormity of the evaluation challenge for our discipline, we have no illusions that our outcome evaluation project reflects a gold standard in such research. However, by interpreting the advantages, disadvantages, strengths and limits of using this approach, as we experienced it, we hope to provide a credible reference point for other nursing groups trying to find manageable and meaningful ways to interpret their own project outcomes and to share the knowledge they acquire as a result of that process with others.

BACKGROUND TO THE NATIONAL STRATEGY FOR CHEMOTHERAPY ADMINISTRATION (NSCA) INITIATIVE

The NSCA was designed as a three-phased initiative toward the establishment of national chemotherapy standards, competencies, and educational resources for oncology nurses across Canada. Having first identified the need for such a project through a 2006 CANO/ACIO member survey and subsequently confirmed it in a 2009 national environmental scan (CANO/ACIO, 2009), a volunteer expert working committee was convened to develop and lead a special initiative that would provide organizations and oncology nurses with evidence-based standards and competencies toward optimizing cancer chemotherapy nursing practice nationally. The working committee used a combination of inductive and user-focused approaches to engage CANO/ACIO members and key stakeholders throughout the evolving process of envisioning, drafting and developing the appropriate standards and competencies for the intended purpose (CANO/ACIO, 2011a). These processes resulted in two core documents: the Standards and Competencies for Cancer Chemotherapy Nursing Practice (CANO/ACIO, 2011b) and a companion Toolkit (CANO/ACIO, 2011c). As an element of the original vision for this multi-phased large-scale initiative, was an evaluation component—something that would help the organization interpret the uptake of the standards and competencies, consider issues such as utilization, feasibility, strengths and gaps, and inform development of recommendations for long-term interpretation of the broader impact of articulating these kinds of frameworks on behalf of oncology nursing. However, the enormity of the challenge made it difficult to know how to proceed.

A THREE-PHASED EVALUATION INITIATIVE

As a voluntary member-driven association of primarily practising oncology nurses, CANO/ACIO realized that it was not well positioned to enact a major initiative in evaluation research. Relatively few nurse researchers in Canada currently possess the skill set to lead research that does justice to nurse-sensitive outcomes (Doran, Mildon, & Clarke, 2011; VandeVelde-Coke et al., 2012) and, indeed, the science associated with correlating complex variables such as nursing skill level with actual patient outcomes is still quite nascent globally (Aiken et al., in press). Thus, it sought a manageable approach that could be enacted in a timely manner with minimal resources and, yet, serve as a meaningful mechanism through which to consider its evaluation questions.

As a result, a small voluntary working group, under the leadership of the newly developed CANO/ACIO Director-at-Large for Research position, was formed to develop a “quick and dirty” (as opposed to slow and arduous) approach to a participatory mixed methods evaluation initiative with the potential for an ongoing feedback mechanism. It considered the evaluation challenges in the context of the nature of the intervention, the capacity of the organization with respect to implementation and evaluation, and the available options that would reflect an appreciation for the regional, jurisdictional and contextual diversities that are associated with the practice of chemotherapy administration and care by oncology nurses in Canada. From these deliberations, a three-phased approach was developed and implemented.

NATIONAL ELECTRONIC SURVEY

Phase I involved an electronic survey developed by the working group and launched nationally over a six-week period. Using a publicly accessible no-cost online survey system, we designed a 16-item survey that was extensive enough to allow us to derive sufficient detail with respect to the questions asked, but still sufficiently constrained to allow busy oncology nurses to respond in less than 10 minutes.

Our survey questions focused on finding out who was currently using the standards and competencies document and toolkit and how they were being used. For those who acknowledged using them, we wanted to understand what their implementation process had looked like, which aspects they were using, and to what they attributed their implementation successes or failures. For those who had not used them, we wanted to understand whether they had plans to use them within their practice settings and whether they had encountered specific barriers to implementation. We also provided for open-ended items that invited suggestions for improvement.

Beyond our own members who might be more predisposed to supporting the uptake of an initiative that had been much discussed within the organization, we recruited survey participants from the wider community of specialist and generalist nurses involved with chemotherapy administration, both within the publicly funded cancer and health care systems and also in private chemotherapy clinics. We used all available networks, as well as social media to obtain as wide
In keeping with CANO/ACIO's bilingual commitment, we made the survey available in either English or French. Through this approach, we were able to obtain a response of 69 completed surveys (72% from CANO/ACIO members and 28% from non-members). We recognized that it was not possible to estimate with any degree of accuracy what the total number of nurses delivering cancer chemotherapy in Canada might entail.

Among those who responded to the survey, we learned that most (89%) were aware of the standards. Three quarters (75%) were using them in their own practice, and almost half (42%) reported that their organization had implemented them in some capacity. Among the challenges they identified with respect to implementation were time and inadequate knowledge as to how to translate standards and competencies within the context of their own specific setting. They described applying the accountability standard as a particularly useful guide to informing their own practice, and the toolkit as a way to develop standards and policies within their own organizations. These findings conveyed to us a very general sense of the range of uptake experiences across participants, but naturally left many remaining questions as to what those numbers really meant.

**QUALITATIVE INTERVIEW COMPONENT**

As a final item in our electronic survey, we had invited respondents to indicate whether they would be open to participating in a telephone qualitative interview. This second phase of our evaluation project was designed to drill down with more depth into the dynamics that explain whether or not a set of standards and competencies can find its way into the framework of organizational practice, and what the barriers and facilitators to that uptake look like in the everyday practice world. We structured these conversations around a loosely crafted interview guide designed to organize reflections on a range of implementation issues, but also encouraged participants to take the discussion wherever they felt there was relevance. Our primary aim in this aspect was to learn more about what the standards and competencies implementation looked like in their organization and how they would evaluate the current effectiveness of its uptake. We also explicitly sought to understand any gaps between the enthusiasm for individual nurses around engaging with these standards and their organization's capacity to enact them. Finally, we wanted to hear from these nurses their thoughts about the kinds of indicators in their settings that might contribute to their assessment of nursing quality. Fifteen respondents indicated a willingness to participate in a qualitative interview. However, within the four-week period available to conduct the interviews, we were only able to accommodate nine. These nine interviews (one in French, the remainder in English) involved participants from seven different provinces.

We analyzed the qualitative data concurrently and in conjunction with the survey data reports. Our process was explicitly informed by the understandings we had gleaned from the larger survey, expanding on the results thematically to develop an overall impression of common patterns and variations within the qualitative data. Working as a group, we considered the whole in relation to the parts and, ultimately, narrowed down our initial sets of meaning units into broader themes. While these themes may not have represented the perspective of every interview participant, they reflected ideas that arose across multiple interviews and were also reasonably represented to the extent that we could discern that within the survey group. Throughout this process, we not only moved between interviews, but also back and forth between the qualitative and quantitative findings, asking ourselves in our teleconference analysis sessions what they might mean, what seemed important, and how best to interpret it.

Among the gaps and challenges we were able to identify through this approach, we learned of the differential struggles with respect to resource support between large urban centres and rural/remote organizations, and differences between provinces. We gained considerable insight into the cost and time commitment associated with a standards implementation initiative within many settings. Beyond the will to do it, we were able to acknowledge the work of getting organized and creating an implementation team. We also learned of the importance of administrative and management endorsement in allowing nursing visions to come to fruition.

As a result of this process, we arrived at seven metathemes reflective of the preliminary themes from the combined survey and qualitative evaluation phases. These metathemes involved such aspects as quality nursing indicators, marketing awareness of tools, establishing a community of practice, engaging high-power stakeholders, and standardizing education to maintain competencies.

**VALIDATION WORKSHOP**

Phase three of our evaluation was an invitational workshop we developed and hosted at the CANO/ACIO Annual Conference in October 2012. Our goals for this aspect were to convene an expert panel that would review, reflect upon, and validate (or not) the preliminary results, allowing us to engage in further exploration of those seven metathemes and, if their relevance was confirmed, determine their priority order.

From an invitation list of about 50 oncology nursing leaders with expertise in chemotherapy, 33 participants attended the 90-minute validation workshop. The session began with a brief overview of the survey and interview findings, and quickly proceeded into a series of table group discussions using a “World Café” approach (Brown & Isaacs, 2005). Each table was assigned a designated host and one of the metatheme categories. Participants rotated through the tables, with each sequential dialogue addressing an added layer of analysis and interpretation with respect to the themes. As participants moved from table to table, considerations of interrelationships between various metatheme topics was also encouraged. As a final step, having engaged deeply in reflecting about the nature and context of each of the themes, participants confirmed that they were all highly relevant to the ongoing work of standards and competencies implementation.
and rated them according to priority. Prior to the close of the workshop, participants were invited to complete a written evaluation and we received 22 responses. From this third phase of the evaluation process, the summary notes from each of the table discussion, the priority charts created by the group, and the evaluation response data all became part of the data from which we could write a final report to our Board and members (Hartzell, Truant, Rashleigh, McQuestion, & Thorne, 2012). This final report has been essential in guiding future priorities of the organization.

**DISCUSSION**

From our perspective, this evaluation exercise became a worthwhile and highly informative component of the larger intervention initiative in which CANO/ACIO had invested. It was managed by a team of five busy professionals giving of their voluntary time over a period of about six months, and with minimal resources—a total of $15,000, primarily used to support a master’s prepared oncology nurse working on a contract basis, so that she could devote dedicated time over a 10-week period to coordinate the survey and qualitative data collection components, as well as some funding apportioned for transcription and translation. It allowed us to consider the evaluation problem from multiple perspectives and in a manner that maximally engaged members and stakeholders. It afforded us both the benefit of crossing jurisdictional and geographic divides to solicit input from the far reaches of our country and its diversity of systems, and it also allowed us to capitalize on a convenient opportunity associated with our national conference to tap the wisdom of experts in an active and participatory process. It built into our evaluation numerous opportunities for an ongoing feedback as the sustained implementation process evolves, including reconvening interested members in discussions in the context of ongoing annual conference sessions.

As a result of this process, we have identified in a more fulsome manner the nature and shape of some of the implementation challenges faced by oncology nurses in their real-world practice contexts. These insights have also oriented us to the need for additional tools and resources designed to explicitly support administrators in such projects, and have encouraged us to consider organizational incentives, such as recognition for employers who endorse and actively support standards and competencies uptake, and supporting the incorporation of standards into the various institutional accreditation criteria. We recognize that the world of cancer chemotherapy is dynamic and changing, and that there will always be new and evolving pressures upon administrations and organizations, as well as on practitioners. For this reason, we realize that the more full-blown evaluation process of which we had originally dreamed would not have provided us with the kind of iterative, interactive and dynamic information that we actually require in order to determine how best to sustain and support this initiative over time. Further, the evaluation process itself has engaged many more nurses along the way, many of whom have become champions for the cause by virtue of their engagement in one or more phases of this process.

Evaluation in the modern health care world certainly benefits from the highly technical and advanced methodologies that are allowing us to be able to mine data sets across populations and contexts and to answer new system-level questions. However, as those who deeply consider these kinds of issues remind us, the key to uptake of strategies in the context of complex interventions is an investment in networks (Best et al., 2003) and evaluation of that which really matters in health care in the broadest sense will always require systems-level thinking (Leischow et al., 2008; Snowden et al., 2012). For us, the meagre investment in evaluation has been rewarded multifold by enthusiasm, commitment, and connectivity within our organization and across the wider community of oncology nursing practice. CANO/ACIO members in other oncology specialty fields such as radiation and surgical oncology are considering developing and evaluating their own standards and competencies initiatives, using the template we have created for the development and evaluation of initiatives within our organization. We are convinced of the net benefit of having undertaken an evaluation—even as we recognize the improbability of answering the more fundamental question of how we might quantify the benefits of these standards for Canadian cancer patients. And we hope our model of evaluation will be sufficiently accessible and feasible to encourage other nursing groups to do the same!

**REFERENCES**


