Improving Cardiovascular Outcomes in Nova Scotia (ICONS): A Successful Public-Private Partnership in Primary Healthcare

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Abstract

Broadly defined, disease, or health management, is a focused application of resources to improve patient outcomes; its premise: things can be better. In particular, the gap between what best care could be, and what usual care is, can be reduced and, consequently, care and outcomes can be improved. This paper reviews the evolution of the partnership/measurement paradigm of disease management and considers its value in sustaining Canadian healthcare. Lessons from ICONS (Improving Cardiovascular Outcomes in Nova Scotia), a major public-private health partnership of physicians, nurses, pharmacists, patients and their advocacy groups, government and industry, are highlighted.

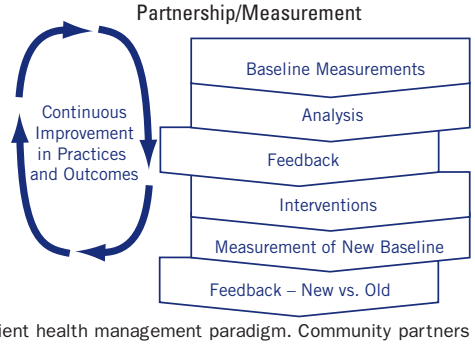
Launched in 1997, ICONS' proof-of-concept phase ended in 2002. Due to its positive impact on the cardiovascular health of the population and its integrated and accountable administrative processes, ICONS became an operational program of the Nova Scotia Department of Health. This successful community-based partnership represents a major achievement in organizational behaviour in the arena of primary healthcare. It supports optimal care as evidence-based and seamless, recognizing the patient as the nucleus. It should be considered for other disease states and constituencies where the goals are closing care gaps and delivering the best health to the most people at the best cost.

This paper outlines, from the partners' views, the background, rationale, key challenges and successes of the ICONS project. ICONS represents a case study of a successful, real-world community health initiative driven by measurement of practices and outcomes.

The Partnership: What Was It and How Did It Work?

The formula for patient health management involves two critical ingredients: partnership and repeated measurement and feedback (see Figure 1).

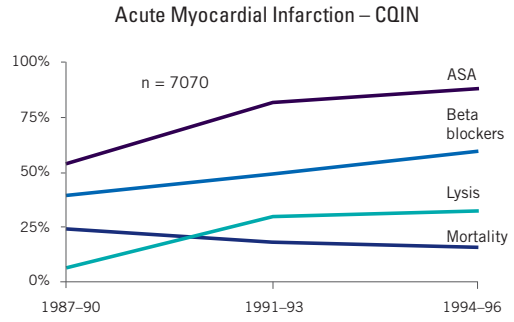
Figure 1: The PHM Paradigm



The patient health management paradigm. Community partners measure and feedback practice patterns and outcomes to produce a continuous quality improvement process. Adapted, with permission, from *Hospital Quarterly* (Montague et al. 1998).

A precursor of ICONS was the Clinical Quality Improvement Network (CQIN), a partnership of physicians, nurses, pharmacists and other professional health stakeholders from community and university hospitals across Canada (see Figure 2; CQIN 1996 and 1998; Montague et al. 1995). Another precursor partnership was the Nova Scotia Acute Myocardial Infarction Outcomes Monitoring Project of 1996. This study indicated Nova Scotia had a very high burden of cardiac disease, relative to other provinces, and demonstrated the power of many health centres working together to gather data that could guide future health policy (Nova Scotia AMI Outcomes Project 1996).

Figure 2: Medication Use and Mortality



Temporal changes in utilization of risk-reducing medical therapies and mortality among consecutive cohorts of older patients (> 65 years) with acute myocardial infarction at the CQIN hospitals 1987 to 1996. Adapted, with permission, from *Journal of the American Geriatrics Society* (McAlister et al 1999). ASA = acetylsalicylic acid; lysis=acute thrombolytic therapy.

The most unique characteristic of the ICONS partnership, distinguishing it from the earlier models, was its focus on a broad, community-based involvement and buy-in (see Appendix A). As well as providing the principal forum for the feedback of practice and outcomes data, stimulating future improvement, it enabled other vital population health issues and solutions to be identified, discussed and implemented across traditional geographic and operational boundaries. For example, one early finding was significant small-area variations in referral patterns for invasive investigations and therapies. This inequity in provision of tertiary care services was corrected by a subcommittee process of the ICONS Steering Committee, resulting in a province-wide triage of patient referrals.

The clinical core, and a large part of the community face, of the Steering Committee was a cardiologist or internist, a general practitioner, a community pharmacist and a nurse coordinator from each of the administrative health regions of Nova Scotia. In addition, members of the Cardiology Division of the Queen Elizabeth II Health Sciences Centre and investigators from Dalhousie University's College of Pharmacy and Faculty of Medicine, provided academic leadership to frame research questions and collect, analyze and disseminate the relevant data.

Beyond Partnership: What Worked Best?

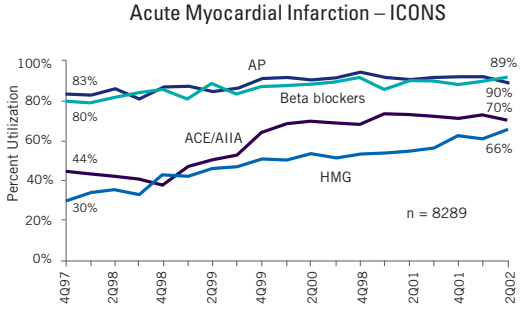
In brief, measurement and feedback worked best; and there was a lot to measure (Cox 1999). The targeted patient populations were those with acute ischemic syndromes (unstable angina/acute myocardial infarction), congestive heart failure and atrial fibrillation. From October 15, 1997, data regarding the in-hospital management of all patients admitted to all Nova Scotia acute care hospitals with these conditions were collected and reviewed. To date, over 60,000 hospital admissions have been abstracted, involving more than 34,000 unique patients. Moreover, 12,500 patients have consented to longitudinal study of demographic and social status, quality of life and clinical end points.

Charles Deutch, a Harvard educator, has said of partnerships: "We talk about them as if they were exhilarating, but they are usually exhausting and sometimes maddening. They have to focus relentlessly on results or they are likely to get lost attending to process." Measurement, in the partnership-measurement model of health management, minimizes undue process and provides a cornerstone of accountability for the most important clinical variables of practice and outcomes (Montague 2003).

The major practical impact on stakeholders of timely measurement and feedback of results is the production of a Hawthorne effect – a continuous improvement in real-world practice patterns (Montague et al. 1997). The incremental improvements in use of proven therapies for patients with acute ischemia in ICONS (see Figures 3 and 4) were very similar to those previously reported in CQIN (see Figure 2; McAlister et al. 1999; Montague et al. 1995), where the repeated measurement/feedback loop to the investigator stakeholders was also the primary intervention.

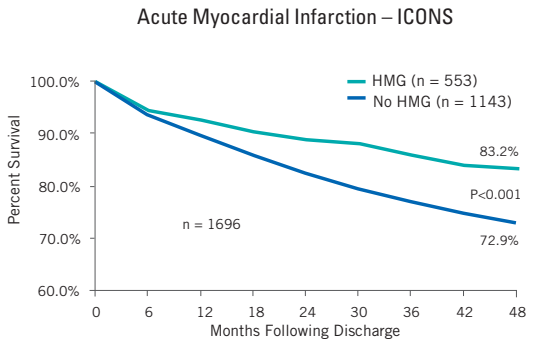
Another acclaimed tool in the sustenance of the partnership was regular communication via stakeholder newsletters. These

Figure 3: Medication Use



Temporal changes in utilization of proven medical therapies at discharge among consecutive cohorts of patients with acute myocardial infarction admitted to Nova Scotia hospitals 1997 to 2002. AP=anti-platelet therapy; ACE/AIIA=angiotensin-converting enzyme inhibitors/angiotensin receptor antagonists; HMG=lipid-lowering statin medications; Q=quarter of a year.

Figure 4: Mortality



Temporal differences in age and sex adjusted survival of consecutive patients with acute myocardial infarction admitted to Nova Scotia hospitals in 1997 and 1998, according to whether they received lipid-lowering medications. HMG=lipid-lowering statin medications.

were designed to highlight current areas of interest for all members of the ICONS team, from Chair to patient. Newsletters can be found at the ICONS website, www.icons.ns.ca, along with project findings and other information.

What Could Have Worked Better?

The principal administrative force of ICONS was its large Steering Committee. Operational development of this structure and its processes was challenging. While a large degree of pluralism was important in enhancing a sense of empowerment among the geographically and professionally diverse members of the Steering Committee, it had to be practically balanced by administrative leadership of the Executive Committee and the project office to optimize operational efficiency.

The partnership-measurement model of ICONS is one that supports a grassroots approach to continuous quality improvement. Variations from optimal care and the subsequent development of interventions to close these gaps were anticipated to be accomplished by the regional teams. However, expecting community-based clinicians to immediately perform well in previously uncharted territory was unrealistic. Recognition of this issue resulted in provision of concise summaries of available evidence supporting a change in prescribing behaviour. Only when armed with enhanced knowledge, in partnership with data on their own contemporary practices, were the regional teams effectively prepared to innovate.

The original five-year plan did not allow for complete solutions to all identified issues. For example, optimal continuity of care, especially from hospital to the community, remained elusive, as did optimal prescription and dosing of efficacious therapy (Pearson et al. 2001). Other issues not addressed to stakeholders' satisfaction were primary prevention, pre-symptomatic identification and targeted intervention of persons likely to be future high-risk cardiac patients.

The Government View

A key component of the design of ICONS as a research project was engaging the Department of Health as an original partner. This facilitated government understanding of the project's purpose and objectives in the short term, and meaningful buy-in in the long term. Moreover, it provided an avenue for communicating ongoing results, as opposed to the less viable, but more usual, method of presenting final results as a *fait accompli* in a risk-averse environment (Turner 2001).

The Steering Committee began making the case for sustainability to government well before the end of original funding, understanding the long decision cycle of large public institutions. By providing proof-of-concept in an area of strategic focus for the Department of Health (Nova Scotia Department of Health 2002–2003 Business Plan), ICONS facilitated the government's incorporation of disease management principles, structures and processes into an operational model of care.

Upon receiving approval for transition to a government-funded program, the key challenge became, and remains, to build on the successes of the original partners, while transforming it into an operational program with the formal involvement of other health system partners: district health authorities, community health boards, the Department of Health and other community-based providers and organizations.

In particular, government recognized, and wished to maintain: increased use of evidence-based therapies (see Figure 3), improved survival rates (see Figure 4), decreased readmissions, committed multidisciplinary teams, province-wide sharing of knowledge and quality and quantity of research publications–all of which demonstrate Nova Scotia's innovation in disease management.

To ensure sustainability within the health system as it goes forward, ICONS needs greater streamlining with existing operations, including: prioritized work and business plans aligned with, and adherent to, established budgets and performance measures; and broadened focus, including enhanced consideration of care providers' and administrators' needs. Specific activities envisaged: support of the Department of Health and the district health authorities in quality improvement/assurance measures via provision of data for evidence-based decision-making in policy and resource allocation; and linkages with other available data sets to provide comprehensive system views that foster expanded partnerships with community-based organizations.

There will likely be other strategic and operational issues negotiated in extending the success of ICONS, the study, to ICONS, the provincial disease-management program. However, the integration of ICONS partners and measurements into the planning cycles of government will enhance accountability, appropriateness and buy-in of governance decisions. The working relationships and trust built among

the community clinicians, the ICONS leadership and the Department of Health will continue to serve as the cornerstone for the continued success of this program as the province manages forward.

The Cardiologists' View

Participation in the ICONS study by cardiology specialists was motivated by a desire to show optimization of clinical outcomes for patients, accountability in use of healthcare resources and participation in an innovative research initiative.

The theme of quality improvement has become increasingly important in healthcare, particularly the notion that care can be improved through collaborative efforts informed by relevant measurements (Relman 1988; CQIN 1995, 1997, 1998; Montague 2003). At least four characteristics are essential to hospital-based quality improvement: shared goals, administrative support, strong physician leadership and credible data feedback (Bradley et al. 2001). ICONS offered all of these elements in a comprehensive, province-wide fashion.

Specialist and primary care physicians worked together with nurses, pharmacists, healthcare managers, policy-makers, patient advocacy groups and government to discuss processes of care and outcomes and developed strategy for their optimization. Credible data feedback was fundamental. Whenever practice or outcome data were interpreted as undesirable, or less than optimal, there ensued an inevitable early phase of denial, felt most keenly by the physician specialists who saw themselves as the local guarantors of quality care. Key to overcoming this discomfort was recognizing that data were collected locally. This community participation in data collection went a long way toward acceptance of the veracity of the findings and the establishment of commitments to improve.

Beyond closing therapeutic care gaps, three other issues contributed to continued commitment by cardiologists to the project. First was the ability to link improvements in care to improvements in outcomes (see Figures 2–4; Chan et al. 2002; LaRosa et al. 1999; CQIN 1996). Second was the insight, enabled by analysis of the pan-provincial data, to more equitably distribute diagnostic and therapeutic resources against regional disparities. Third, it became clear that, despite such process changes and their positive impact on outcomes, system-level deficiencies remained. There was a recognized need for a provincial cardiac program to coordinate cardiovascular policy, across the continuum of care from primary to

secondary prevention. The companion realization of its feasibility became a powerful inducement for many cardiologists to stay the course.

The Community Stakeholders' View

For community stakeholders ICONS provided a novel, homegrown, evidence-based model for cardiovascular disease management. The multidisciplinary team of four healthcare professionals – cardiologist/internist, family practitioner, community pharmacist and nurse coordinator – receiving and providing information through the Steering Committee, enabled the identification, development and implementation of appropriate local interventions directed at closing documented care gaps.

For study participants, health stakeholders and the general public, the study coordinator, most often an experienced nurse, became the face of the project, offering an available, knowledgeable point of contact. In the beginning, the coordinator worked with the other members of the clinical team in building the partnership: setting up the regional office; communicating the rationale and joining procedures to local hospitals, physicians and pharmacists; dispensing promotional materials; organizing and attending continuing professional education and public information events; recruiting patients; and implementing the data base. As ICONS evolved, the regional team, centred on the coordinator, became the principal facilitator for translating issues, such as lack of standard care, need for patient education and better hospital to community communication, into practical interventions, such as care maps, standard discharge orders and stakeholder newsletters.

The concept of asking for buy-in from community medical and pharmacist practitioners through local opinion leaders was perceived as innovative. It was a gratifying payback for everybody involved when they received regular feedback on local practices and outcomes, based on data that was rigorously collected in their own real-world setting. The sense of common purpose and camaraderie among the regional team members, derived from contributing to such a worthwhile goal as improving patients' health, created an overall feeling of reward on both personal and professional levels.

The Patients' View

Often, patients' and medical experts'/professionals' perceptions of the problem and solution for a disease are different. Patients want the problem and the treatment explained in simple, understandable language to gain their confidence. Patient education plays a large role and often needs repeating to have the most effective impact on patients' understanding. The Antigonish-Guysborough cardiac patient group has, for example, sponsored the same annual talk on heart disease and physical activity. The talks are well attended, often by the same people. Successful speakers keep in mind that not all heart patients, especially older ones from rural areas, have scientific mindsets and may not easily grasp graphic presentations and their significance to individual patients.

Patients are impressed when their concerns are looked after. Improved uniformity in drug therapies across the province, and shorter waiting periods for tertiary care services in areas distant from the QEII Health Sciences Centre, secondary to the ICONS processes, are appreciated by the patients and their primary caregivers.

All patients highly rated ICONS' intention to improve Nova Scotians' cardiovascular health. For the first time, there was an extensive study that, apart from medical therapies, gave weight to other factors, such as socioeconomic issues, age, gender and geography. Most patients felt pride in having an ICONS identity when they interfaced with the health system. Their sense of importance was enhanced within the system.

For example, there are several heart function clinics operating in Nova Scotia for the intensive management of cardiac outpatients. Educating and advising patients on diet, medication and physical activity on a one-to-one basis, as done in these clinics, reduces visits to hospitals and physicians' offices. Where these clinics are not yet operative, patients have expressed concern to regional health authorities, advocating they be initiated. The knowledge, confidence and necessity to advise policy-makers on such patient health issues is a positive outcome of ICONS.

The Private Partner's View

Investments in the discovery and optimal use of new drug technology are practical reflections of the quality-ladder model of innovation. They drive improved duration and quality of life and accompanying economic productivity (Montague et al. 2002). The nature and ubiquity of care gaps causes one to realize that proven therapies are, however, only part of the health solution – optimal disease management is required to ensure innovative therapies perform optimally.

ICONS, a public-private endeavor, demonstrates the feasibility of the partnership-measurement model of disease management. It closes care gaps and optimizes the social rate of return for proven therapies. Merck Frosst is proud to have been an integral part of this groundbreaking partnership. Contributing to improved outcomes for patients and their care providers remains a vital part of our ongoing mission.

Could ICONS Work Elsewhere? What Next?

From the beginning, ICONS' success was based on the right partnership mix: broad community input, spanning regions and multiple health disciplines and active government engagement. The ongoing process of repeated measurement and practices/outcomes feedback gave the partners the necessary platform and confidence for continuous quality improve-

ment. The grassroots, evidence-based, yet pluralistic, approach fostered empowerment and innovation among all stakeholders. With attention to these key success features, ICONS-like projects could certainly work in and for other places and diseases.

There are many possible evolutionary paths for the ICONS model. One compelling attraction is the development of programs that broaden the comprehensiveness of care to embrace a patient population with risk of several overarching diseases. Simultaneously, these programs can expand the concept of continuity of care: moving beyond coordination of hospital-to-home care by also including primary-prevention strategies. A diabetes program might offer one such opportunity. Adult-onset diabetes has a readily identifiable clinical population that shares high-risk for cardiovascular, brain and kidney diseases. The ability for pre-symptomatic molecular diagnosis of these patients enables efficient targeting for primary prevention.

The future awaits. Care and outcomes can be better still. HQ

Appendix A: ICONS Members and Affiliations

Regional Teams

Amherst
Highland View Regional Hospital
Drs. Gulshan Sawhney & Scott Bowen (R)
Dr. Murray McCrossin (C)
Beth Munroe & Dawn Fage (P)
Cheryl Smith (RC)

Antigonish
St. Martha's Regional Hospital
Dr. Graham Miles (R)
Dr. Bill Booth (C)
Ian MacKeigan (P)
Maria DeCoste (RC)

Bridgewater
South Shore Regional Hospital
Dr. Ron Hatheway (R)
Dr. Ewart Morse (C)
Mike Laffin (P)
Marlene Wheatley (RC)

Dartmouth
Dartmouth General Hospital
Dr. Dale McMahon (R)
Heather Creighton (P)
Carol Atkinson (Data Quality Coordinator)

Halifax
Queen Elizabeth II Health Sciences Centre
Dr. Iqbal Bata (R)
Dr. Kent Pottle (C)
Warren Meek (P)
Wilma Crowell (RC)

Kentville
Valley Regional Hospital
Dr. Michael O'Reilly (R)
Dr. Brian MacInnis (C)
Shelagh Campbell-Palmer (P)
Glenda O'Reilly (RC)

New Glasgow
Aberdeen Regional Hospital
Dr. Paul Seviour (R)
Dr. Colin Sutton (C)
Michelle MacDonald (P)
Kathy Saulnier (RC)

Sydney
Cape Breton Healthcare Complex
Dr. Robert Baillie (R)
Dr. Paul Murphy (C)
John McNeil (P)
Mary MacNeil, Claudette Taylor (RC)

Truro
Colchester Regional Hospital
Dr. Masis Perk (R)
Dr. Michael Murray (C)
Bob MacDonald (P)
Dara Lee MacDonald (RC)

Yarmouth
Western Regional Health Centre
Dr. Rajender Parkash (R)
Dr. David Webster (C)
Jim MacLeod (P)
Kelly Goudey (RC)

R=Regional Leader, C=Primary Care Physician, P=Pharmacist, RC=Research Coordinator

Executive:

Jafna Cox (Department of Medicine [Cardiology], Dalhousie University; Project Officer); David Johnstone (Department of Medicine [Cardiology], Dalhousie University; Project Chair); Brenda Ryan (Nova Scotia Department of Health; Deputy Project Chair); Sarah Kramer (Nova Scotia Department of Health; Deputy Project Chair); Bonnie Cochrane, (Department of Patient Health, Merck Frosst Canada Ltd.; Deputy Project Officer); Joanna Nemis-White (Department of Patient Health, Merck Frosst Canada Ltd.; Deputy Project Officer).

Patients/Patient Representatives:

Robert Fitzner (Patient); Joan Fraser (Heart and Stroke Foundation of Nova Scotia); Yogi Joshi (Consumers' Association of Nova Scotia); Valerie White (Senior Citizens' Secretariat).

Coordinating Centre:

Angela Mitchell-Lowery, Peter Hazelton (Manager of Operations); Jim Mathers (Data Analyst); Elizabeth Miguel (Administrative Assistant); Karl Roach, Lindsay Taylor and Tim Oben (Data Coordinators); Cindy Fiander, Brenda Preeper (Data Abstractors); Heather Merry (Veritas, Statistical Research Consulting, Halifax).

Dalhousie University:

Fred Burge, Wayne Putnam (Department of Family Medicine); Mike Allen (Continuing Medical Education); Gordon Flowerdew (Department of Community Health and Epidemiology); Ingrid Sketris (College of Pharmacy); Martin Gardner, Jonathan Howlett, Blair O'Neill and Malissa Wood (Cardiology); Greg Hirsch (Cardiac Surgery); David Anderson (Hematology).

QEII Health Sciences Centre:

Sandra Janes, Sandra Matheson and Karen MacRury-Sweet (Nursing); David Zitner (Quality Management).

Merck Frosst Canada Ltd.:

Gisèle Nakhlé, Kurt Ryan, Jeffery Sidel.

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