Hospital Medicine Maturity Framework: Proposing a Novel Framework for Defining Stages of Hospital Medicine in Canada

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The Case

St. Elsewhere is a 130-bed hospital with a catchment area of 50,000 people, providing all basic services (medicine, surgery, obstetrics, complex care and emergency medicine) to its surrounding community. Until 1999, all in-patient care was provided by a group of 20 family physicians who maintained a full spectrum of practice, with specialists playing a supportive role. However, by the end of 1999, five physicians had retired from active practice. While the community was able to recruit new family doctors, all new recruits had young families and preferred to limit their practices to ambulatory care. As a result, the remaining physicians created a "doctor of the day" program to provide care for their patients and for a growing number of "unattached" patients. The program was largely successful for the first few years of its operation; but by 2005, three more physicians had either retired or limited their practices to outpatient settings. With a complex patient population, the remaining 12 family physicians found it increasingly difficult to maintain the program. The hospital tried to enhance support for physicians by recruiting more specialists, but these efforts were by and large unsuccessful. By 2006, the impending resignation of half of the group had resulted in a crisis of in-patient care delivery for the organization.

Background and Introduction

Hospitalist programs are establishing themselves in many Canadian jurisdictions. Since many family physicians are increasingly limiting their practices to outpatient settings, hospitalist programs have been developed to fill the gap in in-patient care resulting from the exodus of primary care practitioners out of healthcare organizations (Day and MacMillan 2001; Sullivan 2000). Subsequently, since the early programs were described in 1999 (Kermode-Scott 1999), there has been an exponential increase in the number of hospitalist programs across Canada (Canadian Society of Hospital Medicine 2008). While hospitalists in some parts of the country are in early stages of developing their programs, others have been evolving theirs for over a decade (Abenhaim et al. 2000; Kermode-Scott 1999). Despite the common label of "hospitalist" or "hospital medicine" programs (which we use interchangeably in this article), significant variations exist in program design between community and academic hospitals, and rural and urban settings.

In the United States, various "generations" of hospitalist programs have been described (Murphy 2000). Additionally, Wachter (1999) previously described various stages for the evolution of the broader hospital care delivery models. However, there is a paucity of such descriptions addressing the Canadian

hospital medicine landscape. Given that the healthcare systems between the two countries are significantly different, it is questionable whether the evolution of hospitalist models described in the United States can be readily applied in the Canadian setting. Indeed, some differences between hospitalist models in the two countries have been previously described (Soong et al. 2009) that illustrate the underlying differences between the two healthcare systems. For example, in the United States general internists provide the majority of primary care, whereas in Canada the majority of primary care practitioners are from a family medicine background. This difference explains why in the Unites States most hospitalists are general internists, while in Canada most hospitalists come from a family medicine background. Similarly, in the United States most hospital medicine programs are either directly employed by the healthcare institution or are contracted out as "for-profit" hospitalist corporations. The relationship between hospitals and hospitalists in Canada is much more nuanced, stemming from the way credentialing processes, financial compensation mechanisms and the dynamic relationship between many stakeholders (governments, third party payers, physician associations and hospitals) have evolved over the years.

In this article, we propose a conceptual framework for defining stages of development and maturity of hospitalist programs in the Canadian healthcare context. In developing this framework, we have not only relied on personal experience as practising hospitalists and healthcare consultants, but we have also consulted with leaders of hospital medicine across Canada. There is a paucity of objective published data for validating the model (e.g., in determining the cut-off points for various proposed stages). As such, we have relied on experience in defining these characteristics. Despite these limitations, we hope this framework is a first step in encouraging additional debate on this issue, and a springboard for further research into the potential effectiveness of the hospitalist model within the Canadian healthcare system.

Wachter's Stages of Hospital Medicine and the Canadian Hospitalist Landscape

Wachter (1999) has outlined the development of hospital medicine in the United States and described four stages for its growth. In the first stage, hospital care is provided by primary care practitioners who continue to look after their own patients both in and out of the hospital. Until recently, this model has also been predominant in Canada, where family physicians and general practitioners provide a continuum of care to their patients that includes both ambulatory and hospital care. This model is still the primary mechanism for hospital care in many rural and smaller Canadian communities but is rapidly becoming more difficult to sustain as physician demographics change.

In the second stage, primary care practitioners come together to form formalized groups, and individuals "rotate" through periods of in-patient care coverage. While the "hospital primary care practitioner" is available in the hospital, other members of the group are freed up to continue to operate their offices. Similar groups have also developed in Canada, with "doctor of the day" programs that allow individuals to be available to look after unattached patients, as well as formal call groups to share on-call responsibilities. More recently, many Canadian provinces have created new models of primary care, such as the primary care networks in Alberta (Primary Care Initiative 2010) and family health teams in Ontario (Ministry of Health and Long-Term Care 2002). Some of these collectives have created formal in-patient programs, in which physicians rotate through the hospital in a manner similar to that described by Wachter.

In the third and fourth stages, formal hospitalist programs are developed, and primary care physicians hand over their patients to the hospitalist either on a voluntary basis (the third stage) or as mandated by the healthcare organization (the fourth stage). In both of these stages, dedicated hospitalists are expected to not only provide patient care but develop specialized knowledge of acute medical conditions and participate in the operation of the hospital through involvement in committees and quality improvement initiatives. In the Canadian context, hospitals have no formal authority to "mandate" practising family physicians to hand over their patients to hospitalist programs. Therefore, primary care physicians can continue to look after their patients in hospitals if they choose to provide in-patient care. In this context, Wachter's third and fourth stages can be thought of as a combined category in the Canadian setting.

A Proposed Canadian Hospital Medicine Maturity Framework

The current framework aims to define a number of stages for in-patient medicine in Canada, and further describes generations of "hospitalist programs" and their defining characteristics (Table 1). While these stages are described along a maturity curve with increasing "complexity" in their design and operation, this does not mean that one stage is considered to be inherently better than the previous. Unlike the situation in the United States, where studies have shown hospitalist programs result in improved resource use (Peterson 2009), very little is known about the effectiveness of the hospitalist model in the Canadian healthcare setting. For example, in one study from British Columbia, the implementation of a hospital medicine program resulted in improvements in lengths of stay and resource use (McGowan and Nightingale 2003). However, the majority of the data from various hospitalist programs are unpublished and anecdotal in nature. Similarly, there are some data on quality of care provided by hospitalists in the United States (Peterson 2009). We have not been able to find any such studies in Canada. As a result, our framework does not

TABLE 1.

Canadian hospital medicine maturity framework as proposed by Hospitalist Consulting Solutions Inc

	Pre-hospitalist Stage (Similar to Wachter Stage One)	Partial Hospitalist Stage (Similar to Wachter Stage Two)	Hospitalist Stage (Similar to Wachter Stages Three and Four)		
			First Generation	Second Generation	Third Generation
Program description	Community-based family doctors providing in-patient care, no or minimal formal group structure, may or may not have shared call responsibilities	Community-based family doctors working in formalized group, providing in-patient care on a rotational basis at regular or predefined intervals	Primarily hospital-based physicians, various specialties (family medicine, internal medicine, pediatrics), may still do some non-in-patient work (office, ER, surgical assist etc.), majority recruited from pool of community PCPs	Primarily hospital-based physicians, various specialties (family medicine, internal medicine, pediatrics), minimal non-in-patient care, mostly recruited from outside of the community	Primarily hospital-based physicians, various specialties (family medicine, internal medicine, pediatrics), minimal or no outpatient care, some or many recruited from hospitalist fellowship programs
Volume of hospital services per physician (as % of total physician work)*	<10	<10	25–50	50–75	75–100
Volume of program census (as % of total medicine beds)†	NA	<10	<25	25–50	>50
Number of FTEs in program‡	NA	NA	<5	5–10	>10
Coverage model	NA	Variable	Daytime and weekend, overnight for admitted patients only (no admissions)	Daytime and weekend, overnight for admitted patients only	24/7/365, including admissions from ER and other transfers
Governance structure	NA	Scheduler function only, no accountability mechanisms	Formal leader, program/section within existing department, informal performance reviews	Formal leader with protected time, program/section within existing department, formal performance reviews	Formal leader (department chief), recognized Department of Hospital Medicine, formal review process, distributed leadership (with multiple members taking on various roles)
Technology use	NA	Variable	Scheduling programs, minimal use of other technologies	Scheduling programs, internal communication mechanisms; use of other tools may be variable	Scheduling programs, internal communication mechanisms, formal hand-off software/ e-discharge, workload monitoring models
Scope of practice	Low-risk medical patients, ALC	Low-risk medical patients, ALC	Low-risk medical patients, ALC	Medicine patients, ALC, some co-management,	Medicine patients, ALC, co-management, practice specialization (e.g., oncology, rehabilitation, follow-up clinics)

TABLE 1. Continued

	Pre-hospitalist Stage (Similar to Wachter Stage One)	Partial Hospitalist Stage (Similar to Wachter Stage Two)	Hospitalist Stage (Similar to Wachter Stages Three and Four)		
			First Generation	Second Generation	Third Generation
Value-added benefits	NA; some may teach residents/medical students	NA; some may teach residents/medical students	NA; some may teach residents/medical students	Some committee work, teaching	Extensive committee involvement, initiation and leadership of QI programs, teaching (undergraduate and graduate programs, hospital medicine fellowship), research
Compensation mechanism	FFS, no relationship with hospitals	FFS or mixed funding, no relationship with hospitals	Straight salary/ stipends (per diem or hourly) or mixed funding	Salary, group contracts, AFP or mixed funding	Salary, group contract, AFP, pay-for-performance or mixed funding

AFP = alternative funding plan; ALC = alternative level of care; ER = emergency room; FFS = fee-for-service; FTE = full-time equivalent; NA = not applicable; QI = quality improvement; PCP = primary care practitioner.
*This is the amount of time physicians spend delivering in-patient care as a percentage of their total clinical workload. The definition is based on Wachter's original definition of a hospitalist as a practitioner who spends at least 25% of his or her clinical work delivering in-patient care. There is no consensus definition of who constitutes a hospitalist in the Canadian context.
†This is the size of the hospitalist program's census as a percentage of the total "medical" beds available in the hospital. This number excludes non-medical beds (e.g., complex continuing care, surgical etc.), although increasingly programs are providing concurrent care for such patients.
‡This number is not adjusted for the size of the program as measured by hospital or census size. The reason is that while some smaller programs (with a few FTEs) could still achieve higher levels of sophistication, many aspects of third-generation hospitalist programs require a minimum "critical mass" of practitioners.

propose that in Canada the hospitalist stage necessarily results in better care than the traditional pre-hospitalist stage. Indeed, the inherent discontinuity of care in hospital medicine has been cited as one of the drawbacks of this model of care (Wachter 1999). Further research is needed to study the potential differences in resource use, quality of care and cost containment between hospital medicine programs and the traditional care delivery models.

Stages of Hospital Medicine in Canada

In our framework, we have described three stages for the development of hospital medicine in the Canadian context: the pre-hospitalist stage, the partial hospitalist stage and the hospitalist stage. In the pre-hospitalist stage, family physicians and general practitioners provide hospital care to their patients on an individual basis. While the credentialing requirements of the hospital may require the physician to be part of a department, each person is on-call for his or her patient roster and works independently of others. On any given day, the individual physician may have a few patients in the hospital, but the overall volume of in-patient care compared with the total services provided across all settings is small. Moreover, the physician has no financial relationship with the hospital and is also not likely to be involved in any of its operational aspects. This is the pre-dominant model of hospital care delivery in many institutions and is similar to Wachter's first stage.

In the partial hospitalist stage, community physicians come together to form groups that at a minimum share call responsibilities and at a maximum develop a program of hospital-based rotations for their pooled patient populations. There may be a basic governance structure (e.g., one person responsible for scheduling rotations), but by and large no formal accountabilities exist. While the physicians may have a sizable patient load during their hospital-based rotation, the overall volume of in-patient services as a percentage of total individual workload is still small and the physicians continue to remain financially independent of the organization with little or no additional responsibilities beyond patient care. This is similar to Wachter's second stage, and examples include in-hospital care programs developed by some primary care networks in parts of Alberta.

In the hospitalist stage, formal groups are deliberately developed to provide in-patient care in the healthcare organization and to manage the growing number of unattached patients admitted to hospitals. In these programs, physicians spend a significant proportion of their time providing in-patient care on a rotational basis. They operate under the direction of a program lead and have clear policies around scheduling and transfer of care and descriptions of roles and responsibilities. Moreover, such programs have formal financial arrangements with their institutions and may depend on them for part or all of their compensation. As mentioned previously, most Canadian hospitalist programs that fit in this category meet the criteria described by Wachter for third and fourth stages of hospital medicine development.

Generations of Canadian Hospitalist Programs

Within the hospitalist stage, we have identified three generations of hospitalist programs distinguished based on various operational characteristics. There is a trend toward more complexity in the design and operations of such programs, and a hospital medicine program may move from one stage to another over time.

First-Generation Programs

First-generation hospitalist programs are primarily developed in response to an increasing gap in in-patient coverage brought about by a decrease in the number of community-based physicians (and subspecialists) who are willing to continue providing care as the most responsible physician (MRP). In many cases, such programs are the first manifestation of a hospital medicine program that, in the right context and with the ongoing support of the hospital's leadership, may mature into the second and third generations.

The physicians who are recruited into the first-generation programs primarily come from the local community of physicians already involved with the organization. Although these physicians decide to focus their main practices on in-patient care, many still continue to work in other clinical settings such as emergency departments and ambulatory care clinics. Despite this, hospital care comprises at least 25% of their workload, which is the cut-off proposed by Wachter to define a hospitalist (Wachter 1999).

While the first-generation programs have a formal program lead and other formalized operations (e.g., clear schedules, semi-structured performance reviews and formal contracts with the hospital), they tend to remain small in the number of full-time equivalent (FTE) members and in the overall volume of patients cared for by the program. They may also lack formal support structures such as dedicated administrative and billing support staff. In many such programs, nighttime coverage is extended only to patients already admitted to the hospitalist group and excludes emergency department admissions during evenings and nights. In these programs, admitting responsibilities may altogether be delegated to other physician groups in the hospital (e.g., general internist "consultants" or emergency physicians who admit patients to hospitalist physicians but are not formally part of the hospitalist program).

Second-Generation Programs

Compared with first-generation programs, second-generation programs are larger and provide a higher volume of in-patient care. There may also be differences in the scope of practice, with such programs accepting responsibility for significantly more medically and socially complex patients. Additionally, some co-management schemes may develop with other physician groups for select patient populations. While these programs continue to rely on local physician pools for staffing, many have also recruited members from outside of the community (e.g., direct recruitment from residency programs), and the physicians spend a greater portion of their time providing in-patient care, with very little work in other settings.

More importantly, second and first-generation programs differ in the amount of involvement of hospitalists in non-clinical activities (such as participation in hospital committees, formal educational programs and support for various organizational initiatives). There is a higher degree of "value-added" activities by second-generation programs. In this generation, programs may also rely more heavily on various technological tools, such as formalized billing software (and dedicated billing agents), workload management tools and variable use of tools for transfer of care management and patient record keeping.

Third-Generation Programs

Third-generation programs show a significant degree of complexity and maturity in their design, internal operations and clinical activities. Moreover, third-generation programs show the ability to experiment with novel funding mechanisms (e.g., pay-for-performance), patient care delivery models (e.g., outpatient follow-up clinics or outreach programs) and systemic quality improvement projects. This is facilitated by a more interdependent relationship between the hospitalist group and the healthcare institution.

Third-generation programs show a high degree of distributed leadership in their design. While they continue to benefit from a formal program leader (with dedicated administrative time), they have a higher degree of delegation of responsibility to other members of the group. In these programs, various aspects may be the responsibility of different members, such as a dedicated scheduler, educational coordinator and quality officer. In addition, third-generation programs use various information technology tools for maintaining their schedules, internal communication, transfer of care and workload management.

What distinguishes third-generation programs from other generations is their integration into hospital governance structure and operations. Compared with previous generations, these programs are an integral part of the hospital's operations and can be viewed as major facilitators of enhanced operations (e.g., patient flow) and quality improvement and patient safety initiatives.

Potential Applications of the Framework

Our framework has a number of potential applications by policy makers, leaders of healthcare organizations and physician groups. The hospitalist model in Canada has developed as a response to the crisis of unattached patients presenting to hospitals, which is in turn a result of a number of major shifts in the broader healthcare system (Day and MacMillan

2001; Sullivan 2000), including fewer physicians in Canada (Chan 2002), the decline of primary care as a career option for new medical graduates (Scott et al. 2009), changes in the expectations of family physicians (Day and MacMillan 2001), a demographic shift toward a higher proportion of female physicians and an older workforce (Chan 2002) and a clear trend toward subspecialization in family medicine and more focused practice patterns (Glazer 2007). It is unlikely that these trends will reverse in the near future, and in our opinion the healthcare system will continue to face an ongoing challenge of in-patient care delivery in the absence of hospitalist programs.

There is a growing awareness among policy makers that many healthcare institutions rely on hospital medicine programs for their in-patient care delivery systems. For example, in Alberta, the government has supported the growth and ongoing development of hospitalist programs by funding alternate relationship plans, as well as partial hospitalist initiatives by primary care networks. In Ontario, the Ministry of Health and Long-Term Care has also undertaken a number of reviews to study the hospitalist model, explore funding mechanisms and identify hospital medicine practitioners. Some aspects of this work have been presented at hospitalist conferences (Bell 2010, January; Coke 2010, September). The 2009 MRP Expert Panel has identified four patterns of MRP care providers (Bell 2010, January): intensive MRP, intermittent MRP, clinical teaching units and community-based physicians. The framework that we have presented has the potential to help refine the characteristics of these various groups of MRP providers and can be used as a blueprint for the development of a common definition for hospital medicine programs and their practitioners. Using these definitions, alternative funding mechanisms that support the development and implementation of sustainable models can be explored through the engagement of relevant stakeholders.

Our framework can also be used by healthcare organizations looking at optimizing their in-patient care delivery models, as well as those that are looking to develop and implement hospitalist programs (see case example). These organizations can adopt the characteristics presented here as a template on which to base the design and operational requirements of their hospital medicine programs. Additionally, the framework provides a common language that allows hospitalist program leaders, hospital leadership and policy makers to compare, contrast and explore hospital medicine in all its variety across Canada.

Finally, our framework may be useful to physicians in their career choices, leadership ambitions and research efforts. The hospitalist model can provide new career opportunities for graduates of family medicine and internal medicine programs who look for ways of incorporating hospital-based care into their practices. This template may allow them to assess potential work opportunities in terms of their position on the proposed maturity curve, which can in turn provide them with a better assessment of leadership and career opportunities. Also, researchers may use the framework to explore potential differences in quality of care, cost and resource use between different stages or generations of hospital-based care delivery models.

Our Hospital Medicine Maturity Framework has a number of limitations. First, the categories described here are based on our personal and collaborative knowledge of the Canadian hospital medicine landscape, as well as our direct experience working with various hospitalist groups in different parts of the country. As a result, this framework may not be directly applicable to some healthcare environments where the resources and population characteristics place a certain degree of limitation on how hospital care can be organized and delivered (e.g., remote, rural areas). Secondly, the cut-off points used for various defining attributes lack well described objective data. This is in large part due to a paucity of published research assessing Canadian hospital medicine models. More research and better access to data will help refine the framework and enhance its utility.

Finally, the description of various stages and generations of hospital medicine programs in our framework is not designed to assign inherent value to these models: in the absence of research evidence demonstrating differences in quality of care and resource use, the framework does not allow for recommendations on which model to espouse. Indeed, we believe that the increasingly older population with higher levels of medical complexity is likely to require increasing levels of healthcare services. As such, our healthcare systems will need to draw on all potential resources in order to meet this high demand. An inclusive approach by policy makers that supports all the stages of hospital medicine described in the model will be necessary. In this case, the framework allows policy makers to understand the characteristics of various stages of hospital care delivery, and provides a blueprint for what we believe are the necessary elements for categorizing a given hospitalist program into a particular generation. The decision to choose which system to implement in a healthcare setting will have to take into account local resources, local demands and health system capacities.

Conclusions

Despite the continuing growth of hospital medicine programs in Canada, little is known about how they are organized and the various characteristics that separate mature programs from those that are just being developed. In this article, we propose an overall framework for the growth of hospital-based patient care and define three generations of hospitalist programs. Through this framework, policy makers (e.g., hospital leadership, funding agencies and medical associations) can define and differentiate groups of physicians who provide MRP care and explore novel funding mechanisms for each model. Moreover, organizations that are looking to develop hospital medicine programs in response to challenges they face in the delivery of in-patient care

can use this framework to identify requirements for program design and operations. Finally, the framework may help practitioners and researchers focus their clinical and scientific efforts in the study and delivery of patient care, healthcare resource use and resource allocation.

The Case Revisited

Using the framework presented here, and taking into account local factors including human resources, physician supply, organizational culture and patient expectations, the hospital and community physicians identified the implementation of a first-generation hospitalist program as a potential solution to the in-patient care crisis facing the organization. Using the framework, they were able to identify the core elements required for a successful first-generation program. This resulted in the skeleton of what the program could look like. Working with their physicians, the organization was able to study objective data (e.g., daily admission numbers, census, lengths of stay and alternative level of care numbers) to derive an approximate measure of the workload involved. Using readily available national data and an agreed-upon definition of FTE, the hospital was able to determine that on any given day two FTEs were required to look after in-patients. This information was then used to refine a scheduling model that took into account requirements for call coverage, vacation time and continuous educational activities. This analysis indicated that in order to have two physicians working in the hospital on any given day, the program required a pool of five or more physicians. This allowed the organization to develop a recruitment strategy, and two new full-time hospitalists were recruited to the organization. The 12 physicians in the community agreed to collectively provide coverage for the remaining positions required and to participate in a call group for evening and overnight coverage. The implementation of this first-generation program resulted in consistent patient care coverage, enhanced satisfaction for staff and community physicians and opportunities for the development of continuous quality improvement projects. HQ

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