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## **Chapter XI**

# **Moving to an Online Framework for Knowledge-Driven Healthcare**

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## **ABSTRACT**

*The acquisition of knowledge in healthcare is mostly piecemeal and irregular. Consequently, we believe that the integration of science and patient care into a seamless framework is the key to establishing widespread knowledge-based healthcare organizations. Over the last five years, we have developed a dynamic methodology that completes the full information cycle using a generic online framework that merges science with clinical practice over the continuum of care. Called Protocol Hypothesis Testing (PHT), the framework is an extremely flexible web-enabled system that provides authors (expert groups) with the ability to instantly modify the structure of the system to meet the changing needs of clinical practice and incremental knowledge generation. The fully relational, centralised approach caters to the diversity of local needs whilst providing a global focus. The PHT System:*

- *helps drive collaboration between clinicians, researchers, patients, and healthcare organizations to continually improve and use the latest and best evidence;*
- *interfaces between clinical practice and bio-technology research;*

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- *conducts randomised clinical trial research;*
- *centrally runs local clinical investigations and health service research;*
- *provides clinicians and patients with user-generated, decision-support algorithms and evidence-based summaries that are applicable to specific patients and their treatment choices;*
- *manages individual patient's information, automatically distributing information to where it is needed, and providing patients with probable paths their treatment may follow; and*
- *provides a process to explore improvements in cost-effectiveness.*

*In sum, the PHT system creates a centralised, seamless framework between research and clinical practice that is responsive to instant change based on hypothesis testing (science), data mining (exploration & thresholds) and expert opinion (authors) — all in the context of the needs of different diseases, clinical specialties and healthcare organisations.*

## INTRODUCTION

Knowledge is a critical resource in the provision of healthcare (Ayres and Clinton, 1997), guiding improvements to clinical decision-making, patient care, health outcomes, workforce quality, and organizational behaviour and structure. In this chapter, we have focused on knowledge acquisition associated with clinical decision-making, patient care and health outcomes. Improvement in these aspects of healthcare is based on our ability to generate and incorporate new knowledge into clinical practice, while maintaining existing sound clinical processes. In reality, the generation of knowledge is mostly piecemeal and irregular, and healthcare organizations are slow at incorporating this new knowledge (Phillips, 1998). Consequently, we believe that the integration of science and patient care into a single framework is the key to establishing widespread healthcare improvement. Current approaches tend not to support this integration, and are inadequate to cope with the rapid rate of change in health technology and advances in medical science (Rosser, 1999; McDonald, 2000; Malterud, 2001).

Over the last five years, we have been developing an online approach to integrate scientific investigation with decision-support methods and quality improvement processes (Shadbolt & Craft, 1998). This integration also incorporates the structure and processes of local healthcare organizations (*Figure 1*), while relying on a global, centralized IT design that operates on the Internet. Called Protocol Hypothesis Testing (PHT), it is a generic online framework that creates a seamless approach between research and clinical practice, completing the full information cycle to enhance our capacity to create, share and use knowledge.

At an organizational level, the model revolves round the literature, with the PHT approach supporting locally relevant research and the incorporation of new knowledge into clinical practice, creating a balance between external and internal information (Davies, 2001). This knowledge can be used in decision-making, and in organizational policy and planning. On the other hand, the global structure of the PHT framework allows organizations to belong to larger groups not bound by their institutional “walls,” enabling a natural process for sharing expertise and standardizing care.

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