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Moving To An On-Line Measurement Framework For Knowledge-Driven Health Care.

Abstract

We have developed a new methodology that provides a unified on-line infrastructure to create, share and use knowledge over the continuum of health care. Called Protocol Hypothesis Testing (PHT), the single framework is an extremely flexible artificially intelligent web-enabled system that:

- interfaces between clinical practice and bio-technology research – a necessary step to ensure bio-technologies are optimally applied;
- conducts clinical trial research, including important phase IV trials that test the effectiveness of new treatments in everyday clinical practice;
- runs local clinical investigations and health service research, providing an opportunity for every patient and clinician to be part of a process to continually improve clinical practice;
- provides clinicians and patients with user generated decision support algorithms and evidence-based summaries of research findings that are directly applicable to specific patients and their treatment choices, including real time probabilities of health outcomes based on local treatment;
- manages individual patient's information across the continuum of care, automatically distributing relevant information to where it is needed, and providing patients with probable paths their treatment may follow over the course of their care;
- gives clinical application to guidelines by users of the system being able to convert them into decision support processes across health care sectors;
- supports collaboration beyond the walls of an institution; and
- provides a defined description of clinical practice to explore cost-effectiveness.

Currently, knowledge management initiatives in ehealth have attempted to make existing processes more efficient, replacing paper-based methods or better delivering existing electronic information. With the PHT system, we started from the perspective that for health to progress it needs a new approach to knowledge acquisition, and advances in IT should be an integral part of the methodology. Consequently, the PHT framework is not replacing an existing approach with improved IT, but rather creating a new integrated system (with many technical advances) where the complexity and sophisticated requirements are part of on-line technology.

Taking four years to build, the system blends with the chaos of local health systems while meeting the requirements of global scientific investigation and while providing valuable support to individual patient care. Furthermore, the knowledge engines within the system are responsive to rapid change and deal with patient, clinical and institutional variation. The system is designed so that studies are tailored to the needs of prospectively investigating specific patient groups - in terms of study design, measurement and analysis. This feature allows the PHT approach to produce real-time findings that have direct application to clinical practice and research.

We have been testing the system at The Canberra Hospital. We are now ready for a bigger web-hosted trial. A consortium is being established that includes hospitals, GPs, academics and clinical trial organisations.

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