Clinical Intelligence

By Roni H. Amiel

Transparency can yield a significant improvements in clinical operational and financial performance.
The US health care system is the most costly in the world, accounting for 17% of the gross domestic

Product with estimated growth of approximately 20% by 2020. Whether providers, payers, or patients, we are faced with the challenge of exploiting the increasingly available data to engender actionable erudition that apprises decision making.

The clinical transformation mandated by the federal government to manage care programs and efficient healthcare delivery models, is driving organizations to achieve clinical operations through the combination of innovative practices and analytics that support them. Organizations are changing from a cost based model to a proactive care delivery.

Business intelligence, as applicable to clinical medicine, is clinical intelligence. Business intelligence can be described as the process of enhancing data into information and then into knowledge. Data is numbers, words, images, etc., accepted as they stand. Information is simply any message the sender chooses to create. Knowledge is an appreciation of the possession of interconnected details which, in isolation, are of lesser value.

Data leads to information or knowledge that in turn leads to intelligence. Clinical intelligence is what clinicians employ to treat their patients. This is based on knowledge gathered from a variety of sources like medical education, journals, books, patients, peers, etc. They all supply both; information as well as data. During patient workups, loads of data are collected that are an analyzed and matched up with the knowledge that the clinician’s possess. Intelligence allows for accurate prediction of the possible consequences of the information that the data analyses provide.

If the implementation of an EMR can be thought of as the first leg of the peregrination and clinical intelligence capabilities profiled here as the second, what will the next leg of this voyage

look like? Targeting three emerging disciplines is the first step towards establishing the building blocks for Clinical Intelligence:

Evidence-predicated fixates on the conscientious, explicit, and judicious utilization of the current best clinical evidence available to develop medical practices that support the efficacy of medical diagnostic and treatment decisions by integrating clinical expertise with the latest available research findings.
Protocol-based translates the guidelines developed through evidence-predicated medicine into operational clinical practice in the form of protocols, communicated in one of the following or all; alerts, prompts, online clinical reference documentation, and standardized, order sets.
Personalized allow you to utilize detailed information about patient's medical record data to guide a caregiver in the administration of a medication, therapy, or other preventative measure that is especially suited to those individuals and the circumstances of their medical condition at the time the therapy is administered.
At the heart of any clinical intelligence program you will find that the underlining goals are two; delivering actionable alerts and timely corrective actions at the time of awareness. Arguably, we shouldn't discount the value from improvements in the areas of; process, quality, and workflow.

The majority of CI (Clinical Intelligence) programs deployed are offering retrospective capabilities on the outcome. Two examples I can offer where I led successful, pervasive, actionable and real-time solutions to aid with decision making, hand off communication are in: Wound Care Management: and Vent Weaning Management.

In both program similar symptoms were observed; clinicians were reporting on clinical conditions in the EMR in random places, missing the dedicated fields in the guided protocols, as results notifications to the various teams to follow up was never generated and the handoff communications was inadequate.

Working with the clinicians collaboratively, applying intelligence technology the EMR for those clinical conditions anywhere in the patient records was monitored, and in return once a condition was detected it was reported notifications pushed to selected teams in two ways; HIPAA secure emails and dedicated patient portal. Detecting these patterns and allowing clinicians to personalize the information on these patients drove several returns on the investment:

1. Timely response to clinical conditions upon awareness.
2. Improved Patient care, clinical outcome and data transparency.
3. Hand off communication and team involvement improved dramatically.
4. Overall documentation compliance rate was increased by clinicians.
5. Clinicians validated prime drivers affecting quality of care through Clinical intelligence.

As with an EMR, the deployment of Clinical Intelligence Program in a hospital is a journey, not a destination! Those organizations that consider this journey I recommend the following:

1. Ensure alignment between the metrics and the hospital strategic and tactical planning goals.
2. Define and agree on your metrics first: does it measuring effectiveness and provide

An important insight?

1. Think big, but start small. Target broader scales that set the tone for subsequent metric.
2. Link the data, operational workflow and management structure to facilitate appropriate corrective action.
3. Know your data sources; don't expect that the operational and transaction systems will offer the full insight. Instead establish a unified data structure to supplement.
4. Incent the participants and reward improvements.
5. Do not make information contingent on the availability of all source data, otherwise delays will undermine the support of line managers who are relying on the timely availability of the information to take corrective action.
6. Ensure auditability of source data.
7. To maximize data quality, implement a metadata management process that adheres to the 4Cs: Centralization, Collaboration, Consistency and Controls.
8. As always: Patient satisfaction feedback is essential component of this project.

From the outset and throughout the process of developing the analytics roadmap, a careful balance Between needs and value must be maintained. In this context, the term value refers to the balance of Cost and benefit reaped by the enterprise in deploying and maintaining an analytics program.

The pronounced need to use IT to transform healthcare is widely recognized in both medicine and Information systems clearly, the capability of EHR is more than just digitalizing patient records. It is also about the new opportunities that come along with digitalization. I believe that EMR-based healthcare analytics for clinical decision-making is an integral part of meaningful use and that this seminal work should spur the extant research and practice toward this direction.