

**Title: Comparative Effectiveness and EMR Systems**

This research note looks at systemic roadblocks preventing EMR's from assessing comparative effectiveness.

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[See the author(s) background information on [Ashbec.com](#).]

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Issue Summary

EMR systems will not enable comparative effectiveness research. Treatment Optimization for Patient Safety (TOPS)[™] will.

Keywords

Healthcare reform
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EMR
TOPS[™]
Business Process Transformation
BPR
ERP
CPOE

Cost of Preventable Medical Error

According to the American Hospital Association, the average cost of a hospital stay in 2007 was approximately \$18,000. Assuming the Institute for Healthcare Improvement's estimate of the number of annual injuries is correct and that the cost of treating the injuries averages only half that of the average stay, we spend \$135 billion per year just fixing our mistakes. That does not take into account the economic damage caused by the premature deaths of the 100,000 Americans killed by preventable medical error every year.

Noise in the Data

Much of our hopes for healthcare cost reduction from the recent healthcare reform legislation hinges on improving comparative effectiveness research. Traditional EMR systems will capture some outcomes data. Unfortunately EMR systems do not contain detailed definitions of the treatment delivery process or individual treatment plans. They don't include process control mechanisms to ensure the treatment was delivered as planned and therefore can't determine if the resulting outcomes were a result of the treatment itself or medical error (preventable or otherwise). Based on input from their member organizations, the Institute for Healthcare Improvement has estimated that 40% of all hospital admissions result in some form of medical harm.¹ The implication is that 40% of the outcomes data will reflect the harm and not the planned treatment. The medical harm will presumably affect the patient's response to the treatment or mask the response to the treatment. EMR systems have no way of identifying which 40% of the data is biased. As a result, analysis of outcomes data from traditional EMR systems will be based on very poor data that could produce misleading results.

Eliminating the Noise

The solution is embodied in a patented approach called Treatment Optimization for Patient Safety (TOPS)[™]. TOPS[™] includes the use of standardized treatment regimens from which individualized treatment plans can be created. The system then uses these plans to create work plans for the caregivers, monitors the execution of those plans and monitors the patient's responses. Using process and quality control techniques similar to those used in manufacturing, treatment errors resulting in medical harm can either be prevented or at least identified. Over time, continuous process improvement techniques will be used to improve the standardized treatment regimens virtually

¹ See the Institute for Healthcare Improvement's web site at: <http://www.ihl.org/IHI/Programs/Campaign/Campaign.htm?TabId=1>.

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EMR Propagation

2007 hospital use of electronic health records:

- 11% fully implemented
- 57% partially implemented
- 32% not implemented

Source: American Hospital Association

Of hospitals with more than 500 beds, 23% consider their EHR systems fully implemented. "Fully implemented" and "partially implemented" were not defined. We can only hope that no one thinks they are done. That also implies that almost one third of US hospitals are more than 15 years behind the technological levels of other US industries.

eliminating preventable medical error. The outcomes database resulting from this monitoring will allow the comparative effectiveness analysis to be performed using unbiased data. Comparing two different treatment regimens for a given population with the same diagnosis would become straightforward. (For a full description of TOPS™, see the Ashbec website at <http://www.Ashbec.com>.)

A National or International Network

The system is planned to include a centralized database of standardized treatment regimens that would be licensed to TOPS™ users that would feed outcomes data back to the licensing organization.² As the number of participants increases, the degree to which we will be able to fine tune treatments will dramatically improve. For example, we may discover that a treatment regimen has a serious undesired outcome for that subset of the population that has a particular rare genetic variant. We might discover particular subsets of the population that are resistant to a disease for which there is no effective treatment. Improved treatment regimens would be propagated to hospitals through updates to the standardized treatment database.

The network would also communicate in the opposite direction in emergencies. TOPS™ could identify a problem with a particular type of medical device such as an infusion pump. The TOPS™ system would have knowledge of every affected patient in the system. Their physicians could be notified at electronic speeds. In hospitals with suitable RFID technology, TOPS™ could even physically locate the devices. TOPS™ would notify hospitals long before a recall was issued.

Conclusions

As currently planned, the widespread implementation of EMR systems will not result in a dramatic improvement in our current comparative effectiveness research capabilities. Only a system such as TOPS™ will have that effect. That raises the question of the effectiveness of investing in EMR systems. That is still a good investment. It will take two years before TOPS™ can go into production and it will be much faster to implement TOPS™ in hospitals that already have EMR systems. The key here is to recognize that it will be several years before we can dramatically reduce healthcare costs and that only a system such as TOPS™ can achieve those results.

² At the time of this writing, the university medical research facility associated with a top tier health system that would continually improve the treatment regimen database has not yet been selected or funded.