Pharmacy Automation and Technology

How Population Health Management and Big Data Can Rock Your World

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Hospitals and health systems like yours have been aggressively pursuing a range of information systems over the last several decades. Cited goals are often efficiency, lower costs, better decisions, and better patient outcomes. But how do these systems purportedly lead to population-level improvements in care? In this column, we address the connections that are anticipated as well as challenges to be expected along the way.

Let's start with some definitions. *Population health management*, according to a leading outcomes management provider, is the “aggregation of patient data across multiple health information technology resources, the analysis of that data into a single, actionable patient record, and the actions through which care providers can improve both clinical and financial outcomes.”¹ While we like this definition because systems are used in a way that patient care is provided to individual patients, we think that the intelligence gained from each patient encounter can concurrently be applied throughout the continuum of care for any population being served. *Big data* is a buzzword in health care, even though other industries have been using the analysis of huge quantities of digitized data for many years. In health care, the rapid adoption of the electronic health record (EHR) provides an opportunity to finally having a real chance for improving health outcomes and controlling costs.

The definition of big data varies, but we will define it as the “ability to access and analyze information that holds the key to more efficient, higher-quality health care while significantly shortening the time between research and translation into practice.”² Big data is made possible because health care is now moving toward being a real digital enterprise to leverage the collective power of information. In our examination of health system technology devices that have been deployed for the last 10 years, we discovered that some had the ability to be networked

but many were not. The EHR can now be the data hub for providers while supporting care provision by consolidating and analyzing these digital warehouses of real-time data to discover trends and make predictions.

In a previous column, we described these processes as enterprise performance management. At a strategic level, a health system would generate critical success factors and key performance indicators that would lead to outcomes improvement. At an operational level, data would be gathered as a byproduct of rendering patient care to determine how well these indicators of success were being met. The system would generate e-mails to managers to give them feedback on any success factors assigned to them. Exception reports could include deficiencies, meeting of goals, and exceeding expectations. When best practices were identified within the enterprise, the methods being utilized to exceed expectations could then be used to address the problems experienced in units where expectations were not being met.

In our experience, niche industries are being generated by the inability of EHR vendors to address both the developmental needs to improve their core product for its primary purpose of patient care and to add all of the population health and data analysis capabilities required. Add to this the fact that the individuals who are needed at the health system level to work with data analysis are the same people that Google and Microsoft are recruiting as quickly as possible. Thus, entrepreneurs look at the needs of

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health care and bring the skills and expertise necessary to the task. The expectation is that the EHR vendors who are going to cooperate by providing the needed data will eventually wrap the capabilities of these consultants into the everyday functions found in their systems.

The complexity inherent in population health management is quite high. The data sources and their divergent information standards bring about the first challenge. Again, starting with a specific EHR, integration or interfaces must be established with any ambulatory electronic medical record being utilized by employed or affiliated providers. Each of these medical records could utilize one of 10 standards to include HL7, CCR, CCD, and so on that will need to be translated and normalized to be of any use for analysis. Next, we have separate computerized prescriber order entry systems, labs, imaging, health information exchanges, payers, and claims data. Each of these data sources must be integrated and normalized before they provide any real utility.

Now we need to talk about clinical decision support systems. As a provider, you are probably already aware of the problem we call *flag fatigue* where alerts and warnings interrupt your provision of care for your patients. The challenge for an enterprise decision support system will be to ensure that the right provider is involved in the appropriate intervention at the appropriate point in the care process in the appropriate facility for the appropriate patient at the appropriate time. Get your mind around this complexity. Now think about multidisciplinary care team coordination and communication. How are we going to know who did what, when, and how?

Alerts that are needed in population health management can also start when care gaps are identified. They can start when a patient steps on a digital scale that transmits a 10-lb weight gain due to heart

failure-related edema. The alert may take place because patient outreach is indicated and an assignment for this task must be made. Action may be needed due to a patient's entry in a notes section of a patient portal. Alerts may occur because quality reporting is either missing or the values entered have triggered the need for a response.

Right now, we're spending most of our time putting these data in and straddling the current reimbursement system that is so heavily based on fee-for-service care provision while preparing for anticipated, future ways of providing care. To understand how life will be different as these changes take place, look at those health systems that have already gone through significant population health management transitions and who use big data routinely to improve their operations.

We have been attending presentations by health systems that have started with the care provision of their own employees as a way to get some small population experience in the area and then moved on to larger populations they were able to attract. Just Google "population health management" and explore testimonials on how care provision has changed among these frontrunners. Some will definitely rock your world or at least give you a few "ah-ha" moments. We would enjoy hearing your comments and questions on this topic. You can reach Bill at felkebg@auburn.edu or Brent at foxbren@auburn.edu.

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