Harnessing Healthcare Data for Patient Flow

By Sandeep Green
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In recent years, we've been generating and collecting more healthcare data than ever, thanks to the federal government's investment of nearly $20 billion in the widespread adoption of health information technology. At present those records are used primarily to enhance the quality of individual patients' care. But there's another opportunity here: to optimize overall healthcare operations, including smoothing the flow of patients, which can dramatically improve care and enhance the patient experience.

Hospitals are typically overburdened on some days and underutilized on others, for reasons that are controllable but not easy to manage: doctors' preferences, patients' preferences, and the availability of particular facilities among them. That leads to peaks and valleys of patient flow. Research has shown that clinical staff overload during peaks is significantly correlated with increased rates of infection, readmission, and mortality. The peaks also lead to preventable delays at emergency rooms, doctors' visits, and various diagnostics and procedures.

Smoothing those peaks and valleys – and generating resulting improvements in care – is the work of healthcare optimization. To expedite that, additional electronic data is needed: data that enables providers to truly understand patient demand patterns, to know who needs access to what care and when, and to know how long that care will be needed.

In many healthcare settings, emergencies are a common source of backlog. Yet surprisingly, statistical analysis finds that the number of urgent demands for care in any delivery setting is relatively predictable and varies in a narrow range, short of major calamities.

Similarly, even though the dramatic negative impact of overload is well established, the system continues to schedule patients in peaks and valleys – primarily because disparate data systems do not communicate with each other. Each surgeon's schedule, for example, is typically developed independently, even though patient flow is heavily impacted by what number of surgeons have been deployed at what times.

To optimize healthcare operations, the right level of resources needs to be assigned to different types of demand and data needs to quantify those demand types. To know how many beds are needed in a particular hospital setting, for instance, one must know how long patients should be there, not how long they have been there; not when they left, but when they were ready to leave. There's an incredible opportunity to capture aggregate demand data which would improve the delivery of care overall.

The peaks and valleys of patient flow cause hospitals to build to the peaks. But often those peaks are unnecessary. Many of the backlogs at emergency rooms are the result of having no place to send patients who need to be admitted to the hospital, because an operating room or a bed on an appropriate floor is not available. The tendency, therefore, is to build more beds, more operating rooms, or more emergency rooms, to address the need. But as counter-intuitive as it may seem, overbuilding exacerbates the problem by further increasing the peaks and valleys rather than leveling them.

Smoothing the patient flow enables more timely access to the right services or providers, decreased delays in

receiving those services, and sufficient time for doctors and nurses to provide high-quality care. It also has extraordinary potential for savings for providers, because the construction cost of adding a new bed to a hospital is between $1 million and $3 million, depending on the region of the country; annual operating costs are another $250,000 or more.

Optimization can help providers avoid those costs while improving patient care and reducing the burden on otherwise overworked staff. With all of the pressures on healthcare providers, that's a very valuable opportunity which new data can facilitate.

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