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HEALTHCARE & LIFE SCIENCES

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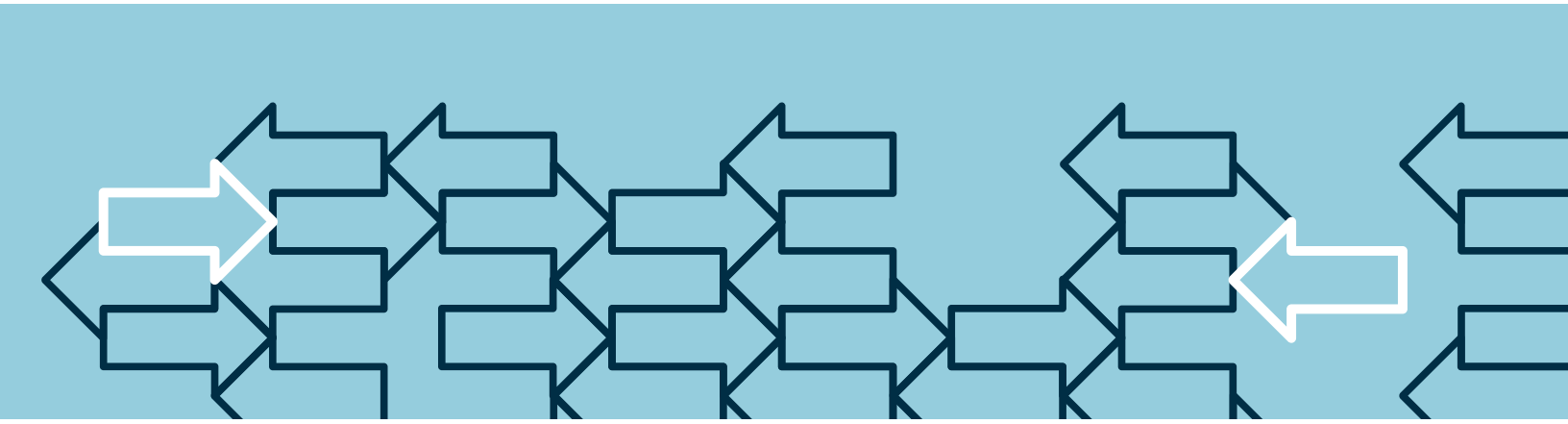
# Using big data in healthcare: Start small to drive results

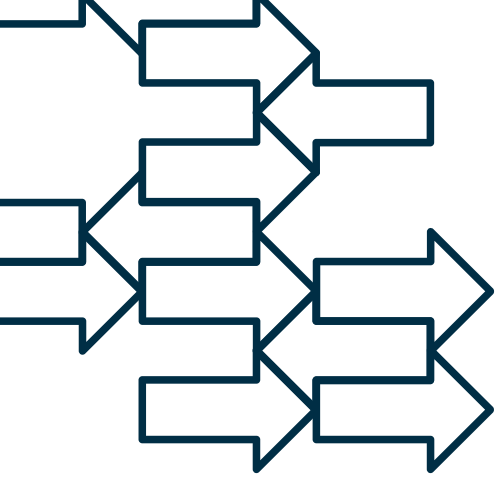


For healthcare providers today, survival is often the first item on the agenda. As costs keep rising, operating margins keep shrinking. According to **Moody's,** for example, average operating margins at US public hospitals dropped from 3.4% in 2014 to 2.7% in 2016.

When confronted with the new realities of US healthcare, many providers launch full-scale transformation efforts to address everything from cost-savings and treatment protocols to public health management and changing organizational cultures. In many cases, the sheer size of the endeavor is too huge for time-strapped healthcare professionals to make much progress. As a result, it often loses much of its steam after only a few months.

Data is one of the biggest roadblocks. Providers have information systems that capture clinical and operational data to support individual patient encounters and assure accurate billing. But that body of data is so vast and fragmented that providers have an extremely difficult time gleaning useful insights from it.

Electronic medical records also pose analytical challenges. They put clinical data into a single source database record that replaces the traditional paper file. However, much of the data is maintained in memo fields in the form of written notes (unstructured data) from physicians and nurses, which is also very difficult to analyze and use to create physician scorecards and other rankings. Providers will also have more access to big data emanating from wearable devices and patient care monitoring devices. If easily accessible and actionable, this data can be powerful during routine physicals and to identify early warning signs of potentially dangerous conditions.



By starting with something relatively small and manageable, teams should be able to score quick hits that go straight to the bottom line.

The end game is to bring all of this data together so healthcare providers can develop a holistic view of their operations and patient populations. Once they gain that perspective, providers will be poised to reap the rewards of a new environment that demands cost reductions while maintaining and increasing the quality of care.

Where to start? Well, we know from our experience that trying to boil the ocean isn't where to begin. Instead, healthcare providers need to start small, reap the gains, and then systematically move forward.

## STARTING SMALL IN THE OR

Given the daunting challenges, not all US healthcare providers have cost reduction initiatives in place. Many of those that do have set fairly modest goals, some as low as 1%.

But if organizations start with manageable efforts, they can usually achieve much stronger results. Consider, for example, the operating room (OR) of a large urban hospital where surgeries are a key revenue stream. However, OR revenue is below what it should be and is causing profitability concerns. Bottlenecks throughout the process increase wait time and reduce the number of patients that can be treated. If that is not enough, the hospital's data is voluminous and stored in multiple systems, even though gathering it could be a straightforward exercise, since they know what they need and where it is.

If this hospital has sufficient resources, with a reasonable effort, they could examine all the process data over a two-year period—for example, when a patient's operation started, when anesthesia began, when the first incision was made, when the procedure was finished, when the patient went to the post care unit and when he or she returned to the patient room.

The hospital team could then analyze the actual time intervals for each process step and compare them to benchmarks. This could help them discover that communication problems are the root cause of process steps that take too long (which often is the case, in our experience). For example, if a patient is ready to go to post-operative care but transport isn't receiving timely notification, the patient will have to wait in the OR, delaying the start of the next procedure.

To fix the problems, the hospital could install a communication system detailing where all patients are at any given time and when each employee needs to take their respective actions to keep the patient flow moving. For example, in analyzing and improving the flow of patients, an organization we worked with was able to increase its case load by 10% with the small additional cost of a communication system.

The hospital also could use the data to improve scheduling, by leveraging historical insights and building improved predictive models. For example, hospital leaders could see the average amount of time each physician spends to perform a given procedure and what might be the expected time for the procedure in the next few days or weeks. That would allow the OR team to schedule much more accurately.

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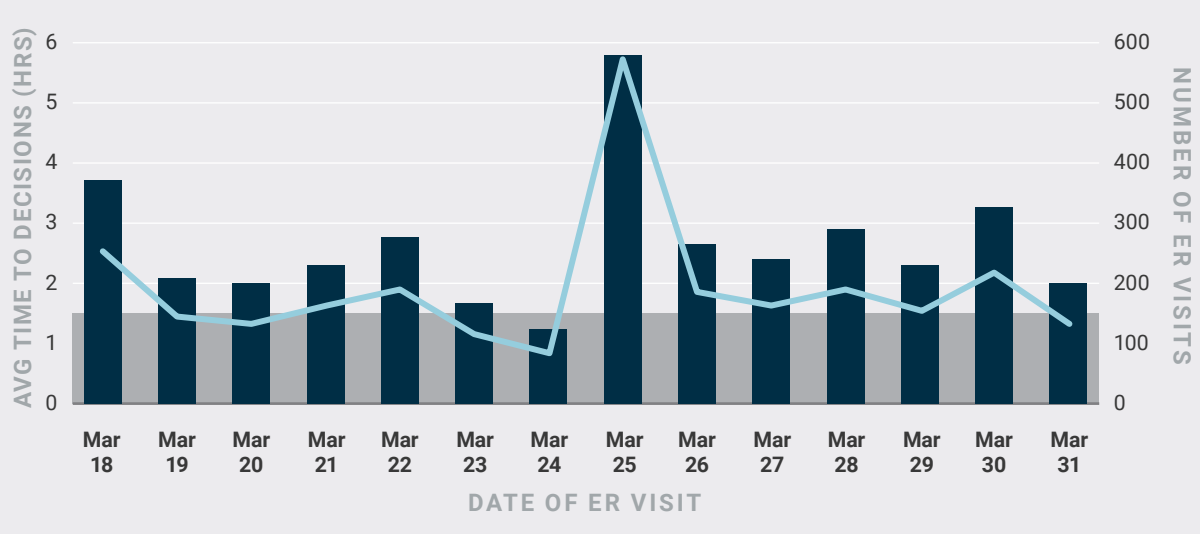
**FIGURE 1:** SAMPLING OF ER VISITS OVER TWO WEEKS




Source: Illustrative example based on fictional data, representing what could be done with ER data

## IMPROVING PATIENT FLOW IN THE EMERGENCY DEPARTMENT

The emergency department (ED) has a similar dynamic and opportunity. They are essentially custom job environments where traditional methods of quality control, cost accounting, and industrial engineering (which primarily addresses repetitive processes) don't offer much benefit. However, emergency rooms still struggle with patient wait times such as time to triage, waiting to be seen, waiting for tests, and being admitted or discharged.

Again, hospitals have considerable timestamp data that can be straightforward to collect and analyze. For example, data tied to billing systems clock everything from time of arrival and registration to time of physician interaction and time of discharge.

By mapping out the processes, ED professionals can identify sources of delay and inefficient uses of resources. The hospital can start building basic analytical models to predict ED load and assessment. With those insights, patients can be triaged more efficiently, generating better service ratings and reducing ED crowding.

Healthcare providers can also use the data to create a simple new customer service KPI called 'time to decision.' The customer service KPI would measure the optimal process from arrival to physician interaction. It would ensure that patients are seen quickly by the right clinician resources who are aware of the patient's situation. Providers opting for such a KPI must be sure their benchmarks and follow-up on variation is 100%. That could avoid—and often prevent—any legal issues that arise due to wait times.

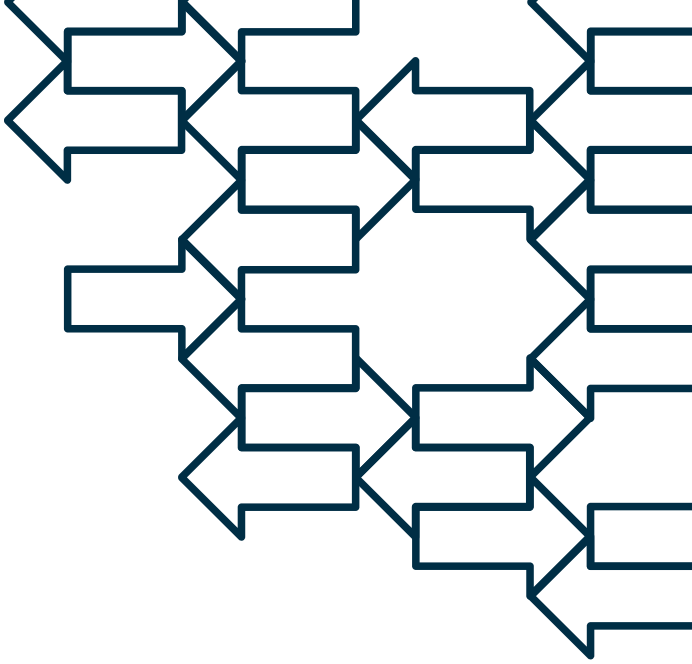
## BILLING AND COLLECTING MORE SMOOTHLY

As providers know, billing is a critical and complex process. It requires the accurate completion of more than 30 activities before the provider can submit a bill and collect payment.

Provider systems and databases have metrics for each of these activities, including total cost to collect, reimbursement rate by payer and denial rate by payer. Once consolidated and mapped to the patient journey, healthcare providers can identify significant opportunities for efficiencies that improve net revenue. For example, payment integrity and auditing review processes mandated by payers and governance authorities add considerable burdens to billing and administrative personnel. They must respond to daily queries about payment accuracy and these responses can waste time and also result in denied claims and/or delayed payments.

## THE PATH FORWARD

Starting small can produce quick wins. Those wins can improve communication and coordination between various stakeholders, lower costs, or increase revenue and drive support for additional projects, resources, and capital spending.



Eventually, companies will be able to leverage the latest analytics technologies and learning algorithms, and providers can map patient journeys and identify patterns that can optimize various business processes. A tactical revenue improvement focus on the emergency department, operating room, and/or billing department represent potential quick wins. The goal is higher patient satisfaction, more complete clinical documentation, and quality care provided at lower costs.

In the future, a more collaborative, transparent and secure view into each patient's health through blockchains will further revolutionize patient care quality while lowering costs with an end-to-end mapping of the patient journey. To get there, healthcare providers should only bite off as much as they can chew and then use those successes as part of a step-wise progression and the basis for moving forward. **A**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