

## Patient Flow Analytics: Business Intelligence to Stay Ahead of the Curve

### Summary:

It's an immutable fact of modern healthcare: Hospitals must do more with less. The advent of healthcare reform in the U.S. only serves to underscore this; with reimbursements soon being tied to performance, hospitals literally can't afford to perform poorly. A PricewaterhouseCoopers report projects that a 300-bed hospital with poor quality metrics could lose over \$1.3 million a year, starting in 2015<sup>1</sup>. Moreover, with performance results being posted online, losses could snowball due to the damage to a hospital's reputation.

At many hospitals, staff cuts and service rollbacks are no longer a viable means for cost savings. Some have bought into process improvement concepts like Six Sigma and Lean but do not have the data or the tools needed to inform these process improvement projects, or analyze results. However, there remains method to streamline flow, care for more patients and realize rapid revenue increases that has not yet been widely adopted by hospitals: operational business intelligence. Only the public sector has a lower business intelligence (BI) adoption rate<sup>2</sup>. The subset of patient flow management stands out in particular; it has long been known as a target for operational improvement, and it lends itself very well to the use of advanced analytics.

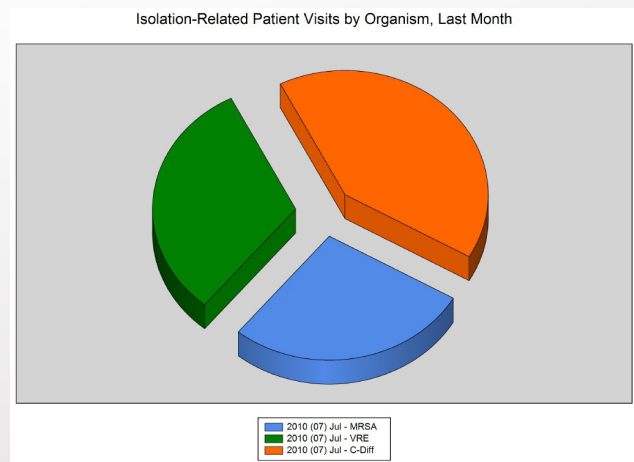
Robust BI solutions from professionals steeped in the patient flow continuum allow hospitals of all sizes to gain new perspectives on their patient flow data: the ability to see emerging trends and take action immediately; the ability to present complex, long-term historical information in easily digestible formats; the ability to project future needs. In short, proper BI allows hospitals to turn data into information – useful, actionable intelligence, which is what's needed for transformational change.

## Patient Flow: Data vs. Information

Several patient flow automation systems exist on the market today. While many of these provide a means to streamline core patient flow processes such as patient placement, bed management, transport and EVS, few provide the robust data needed to evaluate and monitor performance. Many of these solutions simply provide basic data – raw figures on where patients are and where they have been. Most systems do not provide a robust way to organize this data into actionable information. The standard, built-in reports available in these products are indeed useful; vital pieces of data can be located and tracked, which are well suited to the needs of operational managers for analysis. However, advanced analytics allow managers to drill down through the same data to quickly analyze trends and comparisons with a much smaller overhead of required work, turning the data into fuel for an engine of change.

A few examples can serve to illustrate how patient flow data can be employed to drive true change in the enterprise:

- **Admission and discharge analysis.** Efficient patient placement is paramount to good patient flow. BI allows for users not only to track general patient flow statistics, but to slice those statistics into user efficiency and system compliance numbers. By breaking down discharges by time of day as well as overall volume, hospitals can identify bottlenecks in the discharge process and use the information to drive for earlier discharges.
- **Patient Safety: Infection and isolation control.** At the current infection rate, a 500-bed hospital will experience 194 unnecessary deaths and \$28 million in unnecessary costs per year.<sup>3</sup> As readmissions due to hospital-acquired infections (HAIs) continue to increase, BI can contribute to the fight by tracking patients' movements and how their infection and isolation attributes change, then presenting it in a way that allows for targeted improvements in areas that are not managing HAIs well.



Turn patient flow data into useful information by organizing it into simple yet powerful visual representations.

## Client Success

*Methodist Hospital of San Antonio, Texas, has seen some dramatic results from the implementation of TeleTracking Business Analytics solutions. Methodist's Stone Oak facility has shown confirmed discharge compliance increase from 50% to 90% by installing the Patient Flow Dashboard™ in its administration office. Jesse Jawanda, Methodist's patient management analyst, said, "Being able to see the census of every unit and discipline in a facility has allowed nursing departments understand any type of delay that they might be seeing due to capacity issues within a given facility."*

- **Capacity Management: "Dead bed" time.** While patient flow software is excellent at telling users where patients *are*, it is often hard to find where patients *aren't*. By turning patient flow data on its head, BI can satisfy a core requirement of improving patient flow through identifying underused assets: capturing beds that are not being used and the spans of time in which they lie empty, therefore enabling hospitals to target patients more efficiently to those areas. Proactively acting on the information provided by a robust BI solution translates directly into better patient care and increased revenue.
- **Transport and housekeeping performance.** These vital departments have a profound effect on patient flow; patients can't occupy clean beds without efficient transportation and housekeeping, and flow can grind to a halt with inefficient departments. BI can track job times, but more importantly, can present long-term information on jobs by date, employee and geographical area, in an easily digestible format suitable for executives. BI can also power the live display of transport and housekeeping information, allowing for immediate action on staffing or job time issues.
- **Overall scorecard-based reporting.** BI can pull information from multiple sources simultaneously, allowing for easy, executive-level summaries of the most important patient flow statistics. Popular examples include length of stay analysis; early discharge metrics; discharge and transfer process compliance; totals for admissions and discharges; and transport and housekeeping turn times.

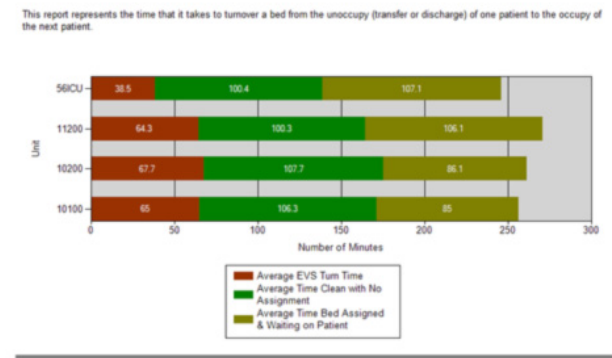
## Building a Patient Flow BI System

The above examples highlight several ways that BI can be used to address key operational challenges. But how do hospitals access and transform the immense amount of data needed into useful information? Business Intelligence systems typically require data to be pulled directly from key clinical and operational systems such as ADT, EMR, bed management, EDIS, ORIS, and others, then added to a data warehouse from which hospital managers and analysts can create reports or deliver real-time information via a dashboard. There are three primary approaches to developing a BI solution suitable for analyzing complex operational data: developing a homegrown system from commercially-available tools, enlisting the aid of a BI consultancy to develop the system, or deploying a purpose-built system tailored for operational analysis.

**Homegrown System.** Homegrown BI solutions rely on the IT staff of a hospital to identify and develop all of the systems and tools needed to extract, store, and present the data necessary for analysis. This approach tends to be highly resource-intensive, requiring professional-level developers, systems analysis and IT staff to work with operational leaders to understand the workflows and analyses they wish to perform, and designing a system to meet those needs. While the system is tailored to the specific needs of the hospital's users, it still requires close coordination with HIT vendors to ensure that the right data is being secured, and is being extracted without impact to production systems.

**BI Consultancy.** Enlisting the aid of a consulting organization can be a powerful way for hospital staff to bring in the needed expertise to deploy a BI solution. These organizations can leverage years of experience in deploying BI solutions. The downside to this approach tends to be the associated costs, lack of specific knowledge about the operational data itself, and a lengthy time to value. The costs for a full BI deployment of many systems can run into the millions<sup>4</sup>, and the domain knowledge of these organizations tend to focus on revenue cycle management or clinical informatics, as opposed to operational intelligence.

### Bed Turnover Analysis by Unit



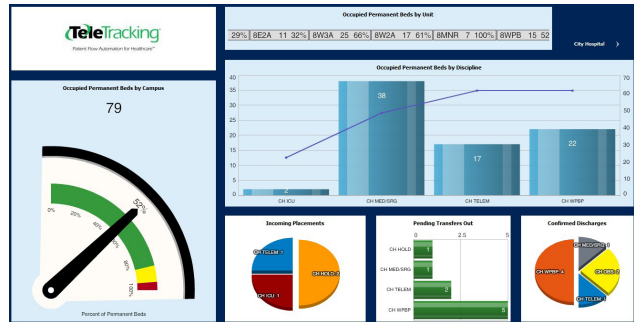
*In addition to finding out how long patients are waiting for beds, use TeleTracking business intelligence tools to discover how long beds are waiting for patients.*

**Purpose-Built BI.** A BI system specifically tailored for looking at operational data can be the fastest and most effective way to drive value quickly. These systems should be delivered by professionals skilled in addressing hospitals' technical and operational needs simultaneously. Further, these systems will have already been designed to extract the right data from key operational systems to allow hospital staff to focus on data analysis and process improvement, not system or database design. While IT support is needed for basic system maintenance, these BI solutions can often take advantage of existing IT infrastructure, greatly driving down costs in both planning and execution. This allows hospitals of all sizes to employ effective BI.



### BI with TeleTracking Business Analytics

TeleTracking Business Analytics offers best-of-breed BI systems that can turn data from your TeleTracking XT system and other operational and clinical systems into valuable, transformational information, and put it directly into the hands of hospital decision-makers. TeleTracking Business Analytics and Avanti Patient Flow Consulting professionals have deep experience with technology and patient flow improvement, allowing them to work with both technical and operational staff at hospitals. This ability allows Business Analytics to synthesize process and technology to create personalized packages of information while keeping the costs of hospital staff involvement and IT upkeep to an absolute minimum.



View patient flow information – census, incoming patients, outgoing patients – in real time throughout the day from anywhere in the hospital.

Access to this targeted expertise, combined with minimal to no hardware outlay and TeleTracking’s low implementation and customization costs, equals a short time to value and high ROI. Within a week, hospitals can begin to see the changing power of true BI at work: access to information both historical and immediate intelligence, working in concert to identify the hidden patterns and trends in the hospital facility or healthcare enterprise. TeleTracking, the leader in end-to-end workflow automation, provides hospitals with cost-effective business analytics solutions that transform the right data into key indicators and evidence trends which can drive strategic decisions for improving patient flow and accountability.

It is with this engine of change that hospitals can place themselves ahead of the game. By becoming smarter – by using information instead of data – they can increase patient throughput and revenue while maintaining high quality, preparing them for the standards of this new era of healthcare.

| Home Campus | Home Unit      | Data  | Month    |          |          |          | Year to Date |
|-------------|----------------|---|----------|----------|----------|----------|--------------|
|             |                |   | (06) Jun | (07) Jul | (08) Aug | (09) Sep |              |
| EAST CAMPUS | E 3N PEDS SURG | Number of Discharges                                    | 139      | 150      | 145      | 43       | 477          |
|             |                | Number of Discharges < 11 AM                            | 38       | 43       | 48       | 13       | 142          |
|             |                | Percent of Discharges < 11 AM                           | 27.3 %   | 28.7 %   | 33.1 %   | 30.2 %   | 29.8 %       |
|             |                | Pending Discharge Compliance                            | 47.5 %   | 22.7 %   | 25.5 %   | 41.9 %   | 32.5 %       |
|             |                | Confirmed Discharge Compliance                          | 30.2 %   | 42.0 %   | 35.9 %   | 37.2 %   | 36.3 %       |
|             |                | Average Time from Confirmed to Actual Discharge (hours) | 1.7      | 1.4      | 1.4      | 1.5      | 1.5          |
|             |                | E 3S SURG SPEC  | 224      | 235      | 212      | 54       | 725          |
| EAST CAMPUS | E 3S SURG SPEC | Number of Discharges                                    | 31       | 49       | 35       | 7        | 122          |
|             |                | Number of Discharges < 11 AM                            | 13.8 %   | 20.9 %   | 16.5 %   | 13.0 %   | 16.8 %       |
|             |                | Percent of Discharges < 11 AM                           | 4.0 %    | 0.9 %    | 22.6 %   | 16.7 %   | 9.4 %        |
|             |                | Pending Discharge Compliance                            | 10.3 %   | 2.6 %    | 9.0 %    | 5.6 %    | 7.0 %        |
|             |                | Confirmed Discharge Compliance                          | 1.5      | 0.1      | 2.0      | 1.5      | 1.5          |
|             |                | Average Time from Confirmed to Actual Discharge (hours) | 1.5      | 0.1      | 2.0      | 1.5      | 1.5          |

Drill down into data for a detailed look at major hospital operations like admission and discharge performance.

### About TeleTracking

For over two decades, TeleTracking Technologies has applied innovative, industry-leading logistics principles to hospitals and health systems to enhance patient flow, improve patient care, increase financial performance and gain competitive advantage. Along with its Avanti Patient Flow and Business Analytics divisions, TeleTracking designs and delivers an enterprise-wide platform that reduces overcrowding, cuts costs, generates revenue, fights the spread of infection, manages assets, accelerates patient transfers and provides business analytics for continual operational improvement and business development. The result is an end-to-end system that connects patient flow to patient care for better outcomes.

<sup>1</sup> PricewaterhouseCoopers (PWC) Top 10 health industry issues in 2010 report. <http://pwchealth.com/cgi-local/hregister.cgi?link=reg/top-ten-health-industry-issues-in-2010.pdf>

<sup>2</sup> Kelly, J. *BI Trends in Health Care: The Data Challenge*. [http://docs.media.bitpipe.com/io\\_25x/io\\_25912/item\\_402342/SHealthIT\\_Bizanalytics\\_final.pdf](http://docs.media.bitpipe.com/io_25x/io_25912/item_402342/SHealthIT_Bizanalytics_final.pdf)

<sup>3</sup> Sanzo, A., and Romano, L. *Overlooked and Under-Protected*. <http://www.teletracking.com/success/pdf/Overlooked%20and%20UnderProtected.pdf>

<sup>4</sup> Madsen, M. *Lowering the Cost of Business Intelligence with Open Source: A Comparison of Open Source and Traditional Vendor Costs*. <http://www.slideshare.net/oktopuslu/bi-comparison-of-open-source-and-traditional-vendor-4327259>