

ANALYSIS PROVIDES VALUE



Hospital-acquired infections are a huge problem¹. In 2015 SSI estimated that up to **60,000** patients a year acquire a nosocomial infection during their hospital stay. Some of these patients pass away. The four most common types of infections are urinary tract infections, pneumonia, infected wounds and sepsis. These infections represent a challenge for patient safety.

The introduction of the common Danish medical card, which shows a patient's medication history, is one of the first steps on the road to collecting and using medical data. We need to utilize data and enhance our knowledge of the effects and the side effects of medication – and this is fully within our reach.

We have the technology to ensure that individual doctors planning to prescribe a medication are familiar with the risk of side effects for a particular patient before they write the prescription. In principle, this would prevent unintentional harm, by either allowing the doctor to prescribe a different medication or by keeping a closer eye on the treatment.

Today it is possible to monitor whether prescriptions have been picked up at the pharmacy by patients after they are discharged, allowing us to predict the risk of readmission within the first few months.

If all of the available systems and opportunities are taken advantage of and we proactively respond to data,

we can improve the health of patients while avoiding unnecessary medication costs and hospitalizations.

Accidental incidents are defined as previously known or unknown events or errors that are not due to patients' illnesses and are either harmful to patients or subject them to a risk of injury. Exacerbation, injury, or mortality directly related to the patient's condition is therefore not considered to be an accidental incident.

The objective in monitoring accidental incidents is to support patient safety by collecting, analyzing and disseminating information about them in order to promote systematic learning on the subject both within the healthcare sector and in other related sectors.

A Danish hospital has developed a tool that can determine the incidence of hospital-acquired infections all the way down to the level of an individual patient². This means clinical supervisors can now monitor their efforts and devote more attention to interventions that are effective.

¹ <http://www.ssi.dk/Aktuelt/Nyheder/2015/2015%202%20epinyt%209%20haiba.aspx>

² Lillebælt Hospital Denmark



“An accidental incident can, e.g., be a hospital-acquired infection, an ulcer, or the administration of the wrong medicine

The challenge is that we do not know the true number of such infections or always know their causes. For this reason, initiatives to fight hospital-acquired infections have been unfocused.

The new monitoring system, which enables analysis and supervision, can change this since we not only use our own patient registries and databases, but also text analysis technology on both structured and unstructured data – e.g. patient medical records. The system allows doctors to analyze causal links at the level of the individual patient and learn from them in order to implement effective preventative measures going forward.

Monitoring data can be presented to hospital administrators so it can be packaged with a wealth of other administrative information on the regional management information portal.

It's a good example of how the collection of data, combined with specially developed tools, can put new knowledge in the hands of clinicians and healthcare administrators in order to benefit future patients on a personal level.

Data-driven management has also yielded positive results at psychiatric institutions in reducing the use of

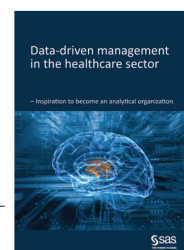
both restraint and medication. Some of these results are due to improved workflow and procedures³. There is also data indicating that data-driven management can help reduce the number of readmissions – a significant challenge faced by the Danish healthcare system.

Another looming issue in the Danish healthcare system is patients failing to show up for appointments – this costs the community lots of money. Analyzing data on no-shows can help us predict which patients are least likely to show up for their appointments. The first step could be to group patients according to the risk that they do not show up for appointments and then create predictive models estimating no-shows on both the hospital level and the department level.

A data-driven hospital may be located right around the corner. There are many examples where hospital administrators who incorporate data analysis – preferably the analysis of Big Data – see improved quality, efficiency and patient satisfaction. This focus on analysis can also aid in the transformation toward a patient-centered hospital and provide both caregivers and patients with the peace-of-mind that the patients

In the Danish healthcare system, quality improvement measures are often introduced without any ongoing assessment of the overall effects

³ The requirement originated from politics and an addendum was later added to the 2014 Finanslovsavtalen [The Budget Act Agreement] that the use of restraints in psychiatric institutions should be halved by the year 2020.



are being treated and examined purposefully and effectively instead of haphazardly.

Today, it is feasible to implement tried-and-true management tools that, based on the data of a specific hospital or department, can measure anything from sick days to activities and staff productivity. Likewise, it is possible at, e.g., management meetings to discuss solutions based on actual charts and statistics in order to foster and maintain a culture of improvement that benefits both patients and caregivers.

Cross-sectoral transfers and cohesive patient care cycles

As a patient in the healthcare system, it is only natural to expect a cohesive patient care process, and today we are not there yet. As of today, we're not there yet. Poorly functioning transitions between individual healthcare sectors result in low quality services, unsatisfied patients, reduced quality of life, and high expenditures with a negative effect on our overall economy. This needs to be changed. In many places in Denmark, large hospitals are being built with a significant reduction in the number of beds and an increased focus on outpatient activities.

- Are we ready for this new approach?
- Are we capable of deciding which patients should be followed and which should be discharged?



Article from "Data-driven management in healthcare – inspiration for a change", published by SAS Institute, 2017. Read the entire report here: www.sas.com/nordic/healthcarereport

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Data is crucially needed to answer these questions while simultaneously serving as an important tool allowing us to carry out risk assessments and discourage hospital readmissions.

How can a hospital organize data-driven management in the best possible way?

Transforming a hospital into an analytical organization is a challenge, but it is not difficult from a technological standpoint. It is all about management, strategic decision-making and corporate culture and requires longer-term targeted initiatives. A viable approach can be to set up, e.g., IT partnerships with private stakeholders or to systematically work on IT innovation.

Success with data-driven management requires the right skills. A good piece of advice is for the Board of Directors to hire consultants with analytical and Big Data skills to run the projects so the full potential can be exploited. The objective is to obtain both efficiency and quality in patient care with a smooth flow of patients and high patient satisfaction, listening to feedback from patients and employees in order to provide responsive, contiguous services.

If all systems are utilized and data is used proactively, you can achieve both efficiency and quality and provide patients with better, more cost-effective health services, avoiding unnecessary expenditures and hospitalizations.

Example

The Danish hospital, Lillebælt Hospital has developed a solution whose objective is to help reduce hospital-acquired infections. Developed as a hospital-based application, it will now be rolled out in all of the hospitals in the Southern Denmark region.

The solution analyzes data on an aggregate, regional, hospital, department, and individual patient level and supports the treatment of hospitalized patients. It includes algorithms for:

- Urinary tract infections
- Pneumonia
- Wound infections
- Sepsis

These are the four most common causes of hospital-acquired infections.

The solution is based on available structured as well as unstructured data, automatically retrieved from physician and nursing notes. It provides hospital and department administrators with the opportunity to monitor the development of hospital-acquired infections via historical summary and trend reports on a hospital, department and section level.

Department managers as well as quality assurance and hygiene teams can investigate the causes of an infection in detail. The system allows you to see which events in the patient's medical record caused the model to flag a hospital-acquired infection. This provides valuable information, facilitating the launch of initiatives and action plans for improving patient safety and reducing healthcare costs in the community.

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