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Improving Patient Outcomes

How to define, measure, and increase a positive and reimbursable outcome for patient care

Introduction

Due to increasing cost pressure in the healthcare sector, established remuneration models for healthcare services are in transition around the world. Fees for performance and value-based systems are increasingly replacing fees for service. Major players – including Medicare and Medicaid in the U.S., the National Health Service in the U.K., the National Health Care Institute in the Netherlands, and several leading European university hospitals – have all made great strides in this area.¹ In Germany, the proposed Hospital Restructuring Act aims for a stronger correlation between remuneration and quality of treatment. In newly industrialized countries, where patients pay a large share of the treatment costs out of their own pockets, the quality of treatment plays a decisive role in choosing a hospital (in addition to price and access to care).

Hospital managers around the world face the challenge of improving patients' overall outcomes – and doing so cost effectively. Further, outcomes can be impacted by many factors, including overall patient health, safety, comfort, and satisfaction.

For both healthcare providers and payers, it can be difficult to establish and measure reliable, meaningful value-based metrics. However, this is the only way to quantify and compare results and make improvements where necessary. Binding, appropriate performance indicators are essential for the imple-



mentation of value-based healthcare systems. But even in traditional fee-for-service systems, it is important to optimize the quality of patient care.

Outcome metrics that are currently used, such as mortality or readmission rates, are often still too simplistic and require further development.

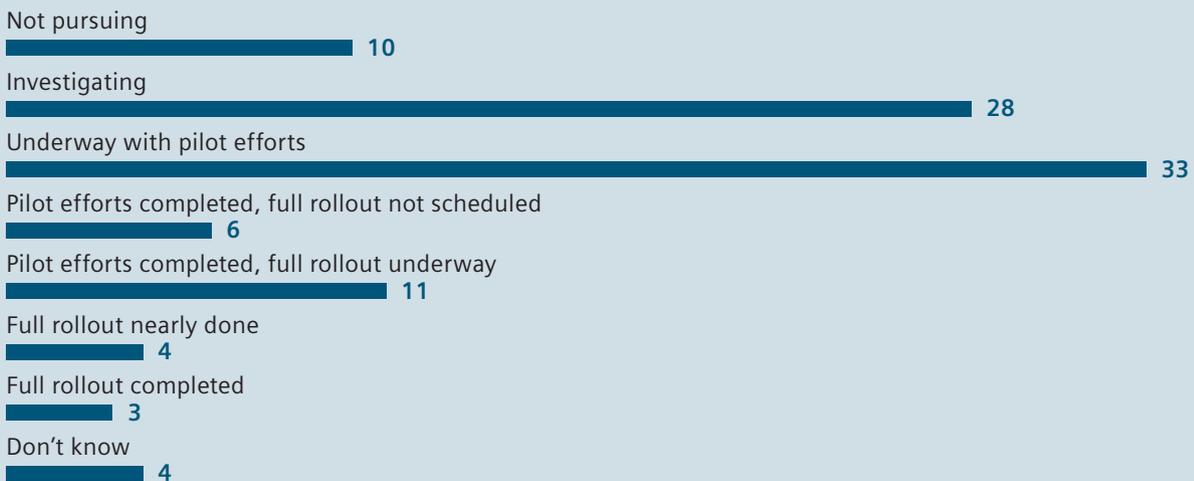
In fact, while the majority of care providers identify patient outcomes and value-based healthcare as primary concerns, many of them are still unable to roll out broad scale initiatives that support these objectives. For instance, most of the research and pilot projects conducted in the U.S. are on value-based care. Yet, less than 25 percent of U.S. healthcare leaders have completed successful pilots. In particular, nearly one third of providers cite uncertainty about the revenue stream as the no. 1 industry hurdle for the transition to value-based care.²

As part of the move toward value-based care, patient outcomes are increasingly coming into the spotlight, partly in connection with the trend toward population health management. Containing costs around population health management can be challenging since, in highly specialized healthcare systems, the responsibility for patients' health is spread to several links in the supply chain (e.g. general practitioners, specialists, outpatient therapists). Population health systems require excellent collaboration among all stakeholders.



Value-Based Care: Many Pursuing, Few are There (in %)

What is your organization's status regarding the transition from fee-for-service based care to value-based care?



Source: 2015 Healthleaders Media Industry Survey

» *Very few conventional metrics currently tracked by providers reflect actual health outcomes.* «

Diagnosis: Making Well-Informed Decisions

Every successful treatment and path to a positive patient outcome begins with a correct and timely diagnosis. Usually, when a patient goes to see a doctor, the first few minutes determine the subsequent treatment steps – directly influencing the success of the treatment, and its cost. This makes it all the more important to have a quick and reliable decision-making process for diagnosis. Otherwise, there is a risk of unsuccessful or incorrect treatment, services being performed that are not billable, and avoidable readmissions.

However, diagnosis itself can be a particularly complex challenge. There is potential for human error as well as errors arising from the system itself. Doctors can make cognitive errors, for example by fixing on a specific diagnosis too quickly and ignoring or misinterpreting contradictory data and information for too long. The system may cause diagnostic errors through loss of information, delays, or misunderstandings when forwarding information, both within a hospital and to external facilities providing subsequent treatment.

Dramatic system-related errors can arise, for example, in connection with diagnostic imaging if images don't match the medical question because of communication problems. Outdated equipment with inadequate image quality can also lead to misdiagnosis. Several studies demonstrate that images can be regularly misinterpreted. For instance, a study from the U.S. found that during a decade of receiving mammograms, more than half of cancer-free women were among those summoned back for more testing because of false-positive results, and about one in 12 were referred for a biopsy³.

Apparently, diagnostic errors are also relatively common in other areas. Research suggests that in the U.S., for example, diagnostic errors affect one in 20 patients annually, an estimated 12 million Americans each year.⁴ Moreover, diagnostic error is the leading cause of medical malpractice claims in the U.S. (almost 30%), and is estimated to cause 40,000 - 80,000 deaths annually.⁴



In Germany too, diagnostic error is among the most common causes of patient complaints. In 2014, the German Medical Association received around 13,700 patient complaints, of which more than one-fifth were for alleged misdiagnosis. In total, the evaluators attested to a treatment error in around 2,200 cases in 2014. One-third of them were caused by an incorrect diagnosis.⁵

As demanding as it is to identify and avoid diagnostic errors, it is well worth the effort, as this significantly improves patient outcome. Misdiagnosis can lead to unnecessary treatment for non-existing conditions or proper treatments initiated too late or not all. This impacts not only the patient but providers as well. Providers are increasingly facing the operational and economic consequences of incorrect medical care. For instance, when length of stays are unnecessarily long, medications are used incorrectly, or avoidable exams or operations are performed. The result is often a worsening of the patient's condition, readmissions, reduced efficiency, and, in the worst case, expensive legal battles.

In some cases, diagnostic errors can be caused by staff shortages, time pressure, and temporary overwork. The goal, of course, is to prevent these from happening. A modern software-based workforce management system can optimize the organization of in-house resources. Furthermore, powerful hospital information systems and innovative, user-friendly diagnostic tools can reduce errors

Proven Medical Errors in German Hospitals

A third of errors were caused by incorrect diagnosis

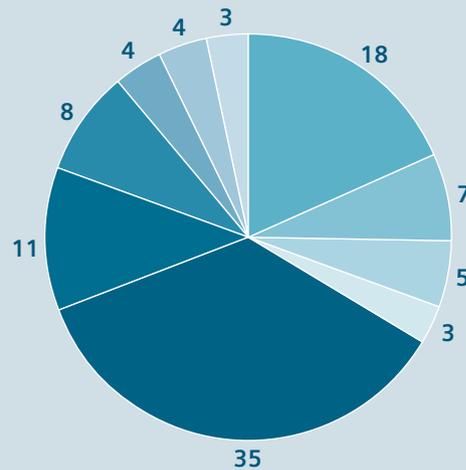
Most frequent errors in hospitals

Diagnosis:

- Imaging procedures (18%)
- Medical history/examination (7%)
- Laboratory/additional examinations (5%)
- General (3%)

Treatment:

- Surgical: implementation (35%)
- Postoperative therapy measures (11%)
- Indication (8%)
- Postoperative: Infection (4%)
- Drugs (4%)
- Surgical: choice of procedure (3%)



Source: Bundesärztekammer, Behandlungsfehlerstatistik 2014

and lead to faster diagnoses. Going forward, we can expect to see knowledge-based IT systems substantially supporting decision-making and quality assurance in diagnosis.

Efficient and Effective Treatment

Usually, the diagnostic procedure is followed by a treatment decision. In the interests of patient outcome, diagnosis and treatment should be considered two separate decision-making processes to be optimized because the initial diagnosis could be incorrect or incomplete. Secondly, even if the diagnosis is correct, there are often several possible therapeutic approaches. This is especially true when patients suffer from several diseases at the same time or from a rare or complex disorder. In the latter case, advances in diagnosis are often greater than in treatment. Across the EU, approximately 30 million people suffer from one of the up to 8,000 rare medical conditions currently known to science, where treatment options are often still insufficiently researched.⁶

For good treatment decisions, it is important to know all the options. These arise from one's knowledge of the individual medical condition, the patients themselves, and scientific findings. The Electronic Health Record (EHR) and a seamless flow of information between physicians and specialists, and science and technology, can play a crucial role.

The variety in treatment options and uncertainty of planning them is where patient outcomes and sensible resource allocation are at risk. The question is not just: »Is the treatment efficient?« but also: »Is the treatment effective, that is, does it lead to the desired outcome?« Powerful diagnostic imaging and modern laboratory equipment support the ongoing, near-time monitoring of treatment success – through to intraoperative guidance. Clinical monitoring will become more important to optimize patient outcome and maximize cost efficiencies.

However, many hospitals economize on modernization or delay purchasing expensive devices for diagnostic imaging. For many providers, increasing cost pressure can delay or even prevent adequate investment in diagnostic technology. This creates significant national differences in hospital equipment between richer and poorer countries.

This is shown, for instance, in the data on equipment stocks regularly surveyed by the COCIR, the European Trade Association representing the medical imaging, health ICT, and electromedical industries. The figures show that patients across Europe, especially in Eastern Europe, have very unequal access to MRs or CTs. Moreover, in many European countries, the installed base is the oldest it has ever been. For example, more than 60 percent of the CT scanners installed in Greece or Spain are more than five

years old, and around one-fifth of them have been in operation for ten years or longer.⁷

Improved Outcomes through Quantification

The quality of diagnosis, treatment decisions, and monitoring/management of the treatment significantly determine patient outcome (as described in the previous sections). But to hold their own in the increasing competition for patients, contracts with payers, and/or public resources, healthcare providers must also ensure that the results obtained are transparent. »Provider organizations understand that, without a change in their model of doing business, they can only hope to be the last iceberg to melt. Facing lower payment rates and potential loss of market share, they have no choice but to improve value and be able to prove it,« writes the U.S. economist Michael Porter in the Harvard Business Review.⁸

Although hospital managers have now recognized the need, in practice they often still lack suitable measurement methods. Most quality metrics do not gauge quality; rather, they are process measures that capture compliance with practice guidelines. Take, for example, the Healthcare Effectiveness Data and Information Set (HEDIS) that is used

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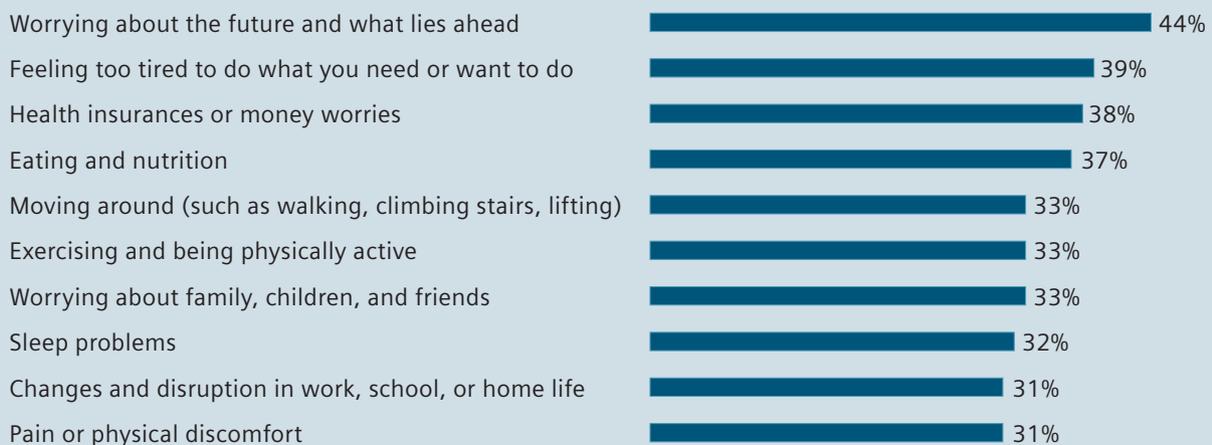
Michael Porter, Harvard Business School

by the vast majority of America’s health plans to measure performance of care. HEDIS scores consist entirely of process measures as well as easy-to-measure clinical indicators that fall well short of actual outcomes. For example, it covers data on immunizations, checkups, medication, or diagnostic procedures.⁹

Boston Consulting Group (BCG) consultants arrived at similar conclusions. »We can measure many things as we try to understand the quality and efficiency of healthcare,

Mismatch

What matters to breast cancer patients...



...is inadequately reflected by today’s measurements

- Mortality
- Complications
- Relapse
- Patient satisfaction
- Waiting times for diagnosis and treatment
- Preoperative diagnosis
- Tumor data
- Surgery technique

Source: BCG Perspectives, 2015

but very few conventional metrics currently tracked by providers reflect actual health outcomes», write the authors of a recent strategy paper.¹

The BCG authors in no way deny the importance of many hospitals metrics gathered worldwide: All of these conventional metrics play an important role in healthcare. They provide vital data and, when strongly correlated with outcomes, they ensure a powerful and balanced set of metrics, says the article. However, it also points out that it is important to recognize that when used in isolation, without an adequate focus on outcomes, such metrics can be misleading and prevent management and clinical teams from focusing on what really matters to patients.

»The only true measures of quality are the outcomes that matter to patients,« agrees management expert Michael Porter. Besides the mortality rate, this especially includes indicators about quality of life, functional ability, and emotional well-being. When those outcomes are collected and reported publicly, providers face tremendous pressure –

and strong incentives to improve and to adopt best practices, with resulting improvements in outcomes.⁸

One impressive example of this is the success rate over time of fertility clinics in the U.S. Since 1992, all clinics performing assisted reproductive technology (ART) procedures are obligated to provide their live birth rates and other metrics to the Centers for Disease Control (CDC). After the CDC began publicly reporting this data in 1997, improvements in the field were rapidly adopted, and success rates have steadily improved.¹⁰

To gain meaningful benchmarks, care providers should therefore actively engage patients in the collection of outcome data. Patient-Reported Outcome Measures (PROMS) are already being successfully used by various hospitals in the U.K. to improve patient outcome. The National Health Service (NHS) launched a corresponding project in 2009. PROMS are used to calculate the health gains after several forms of surgical treatment using preoperative and post-operative surveys. Patients undergoing surgery for four

Outcome Measurement and Reporting Drive Improvement of Outcomes

Percentage of Assisted Reproductive Technology (ART) cycles resulting in live birth (in women aged 35-37)



Source: Assisted Reproductive Technology (ART) Report-Database; Centers for Disease Control and Prevention

Improving Patient Outcome and Reducing Costs with Patient-Reported Outcome Measures (PROMS)

Starting point: Circle is a private healthcare provider that treats private and NHS patients. The company has various hospital locations across England, with one based in Bath (Circle Bath). In 2011, Circle Bath set up its own Enhanced Recovery Program and used PROMs to help shape the program.

Measures taken:

- Revising care pathways
- Standardizing implant and anesthetic protocols
- Providing patients with an extra physiotherapy appointment

Results: From 2011 onwards, Circle Bath has consistently reported health gains for primary knee replacements that are above the England average. Circle Bath has also been a positive outlier for primary hip replacements from 2012 onwards.

Value for money: Based on the changes in performance, it is possible to crudely assess that Circle Bath has been able to:

- Improve patient outcomes (effectiveness)
- Reduce implant costs and bed day costs (economy)
- Reduce average length of stay (efficiency)

common elective procedures (hip and knee replacement, varicose vein surgery, and groin hernia surgery) are asked to complete questionnaires before and after their operations to assess their improvement in health. The results are regularly evaluated and published.

In a study, Britain's Health and Social Care Information Centre (HSCIC) compiled a number of successful examples.¹¹ They show how hospitals have successfully used the PROMS data as a benchmark for their own quality measures. The Best Case Studies published by the HSCIC lead to the conclusion that standardization can greatly help improve patient outcome. At the same time, the case studies suggest that improved patient outcome does not necessarily have to be accompanied by higher costs, but can even improve profitability.

In Germany, the Martini-Klinik in Hamburg is a pioneer in measuring patient outcome and practicing continuous quality management. Founded in 2005, and with approximately 2,200 prostate cancer operations performed per year, the private specialist clinic claims it is now the world's largest prostate cancer center. Its scores are far above average in significant outcome indicators such as incontinence or erectile dysfunction.¹² Besides its specialization and the large number of operations performed, these scores are due also to a complete data documentation system, which records the results of all previously operated patients and enables analysis for quality management.

To manage this extensive data collection, the hospital employs a separate outcome study group consisting of two documentation assistants, two database technicians, and two research fellows. Every year, one research fellow is sent to a leading U.S. or Canadian cancer center for training in biostatistics and data analysis.¹² Before and after their treatment, patients complete a 13-page questionnaire as part of a quality of life survey for cancer patients (QLQ-C30), as well as the International Index of Erectile Function (IIEF-5) questionnaire to determine preoperative urinary and sexual function. Other surveys are carried out in the first three years after the treatment.

In 2013, the Martini-Klinik sent out 1,200 questionnaires a month. In addition to standard patient and clinical data such as lab and pathological results, co-morbidities, and detailed diagnostic and treatment data in the hospital's EMR (Electronic Medical Record). This data is incorporated into an ongoing, systematic improvement process. It is used by doctors in a strictly defined process for their own quality control.¹²

It is worth noting that about two-thirds of Martini-Klinik patients are statutory plan patients. In recent years, the private hospital has also negotiated integrated care plans with large health insurance companies (statutory health plans), under which it receives lower DRG payments than public hospitals, while at the same time committing to specific, above-average quality targets. Failure to meet these outcome targets could result in the loss of the treatment

Better Outcomes Due to Better Measurements

Outcome differences for prostate cancer care between German average and Martini-Klinik

Outcome	Average Germany	Martini-Klinik
Perforation of the intestine	1.7%	0.2%
Wound healing disturbance	1.7%	0.9%
Sepsis	2.5%	0.04%
Severe erectile dysfunction	75.5%	34.7%
Severe urinary incontinence	4.5%	0.4%
Full continence	56.7%	93.5%

contract. This illustrates how outcome measurements and improvements can be an important success factor in a traditional fee-for-service healthcare system.¹² To measure is to learn, believes the International Consortium for Health Outcomes Measurement (ICHOM)¹³. The not-for-profit organization has defined outcomes as the results people care about most when seeking treatment, including functional improvement and the ability to live normal, productive lives. Its founding members include BCG, the Harvard Business School and Sweden’s renowned Karolinska Institutet medical center in Stockholm.

The ICHOM defines and publishes international standards for measuring outcomes. It has already published twelve sets of standards for widespread global conditions including coronary artery disease, prostate cancer, lower back pain, depression, and Parkinson’s disease. Seven more are in development. The aim is to obtain international benchmarks: Data derived from standard, internationally accepted metrics allow care teams across geographies to learn from one another. Measuring and reporting outcome data allows caregivers around the world to evaluate their work using the universal »language of health outcomes.«¹³

Creating a Continuum of Care

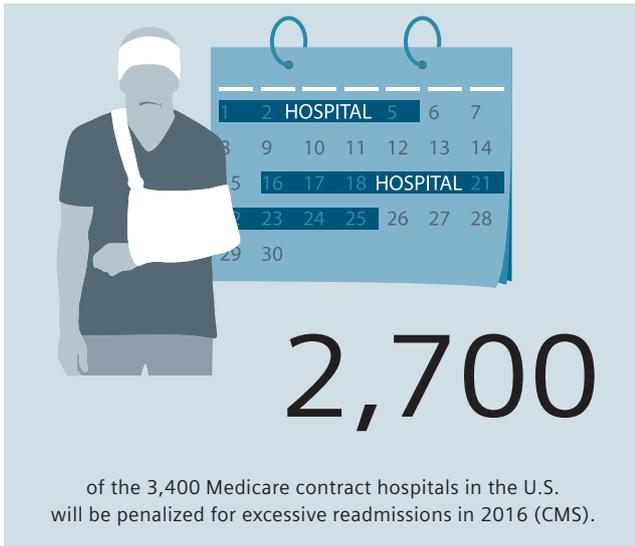
Especially in Western industrialized nations, the present-day healthcare organization is a highly sophisticated but fragmented collection of service providers. Previously, following a patient’s case often ended at the point of transfer

(to another provider/specialist) or discharge. Follow-up on the success of treatment rarely took place.

In view of rising costs, however, payers in many countries are increasingly seeking to make optimum use of available healthcare resources. To ensure more cost-effective healthcare, providers are examining the entire care continuum for improvements. By examining the overall patient journey, providers can potentially improve patient outcomes while reducing costs.

The Affordable Care Act (ACA) launched in the U.S. in 2010 under President Barack Obama provides vivid examples of how service providers are encouraged through financial incentives to continue making a positive contribution to patient outcome beyond the day of discharge. For instance, Medicare reduces provider compensation if patients are readmitted within 30 days of discharge. This affects every fifth Medicare patient – a staggering number of those treated. According to the Center for Medicare & Medicaid Services (CMS), approximately 2,700 of the 3,400 Medicare contract hospitals will have cuts totaling \$420 million in fiscal 2016 due to such readmissions.

The continuing trend toward managed care programs in the U.S. and other countries is also driving provider cooperation and alliances. Integrated healthcare delivery systems that encompass hospitals, physician groups, ambulatory clinics, and other provider facilities are on the rise. This is a positive development for patient outcome. After



Duplication of effort, delays, and inefficiency were almost inevitable. Worse yet: Since no one measured how long the process took or how much it cost, the quality of care could never improve.⁸

An example from the U.S. shows how service providers can tap a lot of dormant potential by taking an integrated approach.⁸ In 2005, the Virginia Mason Medical Center in Seattle launched an integrated, interdisciplinary »spine team,« which can be reached via a central phone number. Appointments are given at short notice – often the same day. After an initial evaluation by two fully qualified doctors, patients undergo various clearly defined diagnostic and treatment processes as required. Compared to other clinics, the medical center has since achieved significantly better results in patient-related outcome metrics such as sick days or physiotherapy units. At the same time, productivity has improved significantly. Over the past decade, the number of patients treated has increased from 1,400 per year to around 2,300, without having to add space or staff. Virginia Mason has increased its revenue by increasing productivity, rather than depending on more fee-for-service visits to drive revenue through unnecessary or duplicate tests and care.

all, other service sectors have long since adopted the principle of focusing on the customer and systematically aligning the organization to their needs to create a consistently positive customer journey.

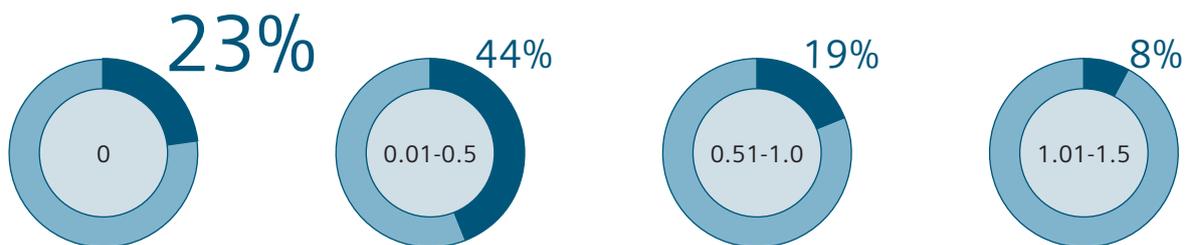
Until recently, the patient journey through the different participating healthcare facilities was not seamless. For example, a patient with back pain could start at very different points (GP, orthopedist, neurologist). A wide range of tests could be carried out at different points in time with various specialists recommending different treatments.

Engaged Patients Improve Outcome

Such an integrated approach cannot always be implemented at short notice. However, for healthcare providers, it is definitely worthwhile to at least examine how care is provided along the treatment chain and optimize it as needed. In particular, the GPs who care for patients after their discharge, but also the patients themselves, have a considerable influence on patient outcome.

Readmission Penalties Impact Revenue

Penalty for 30-day readmissions (in percent of relevant DRG payment): Only 23 percent of U.S. hospitals will escape cuts in 2016



Source: CMS

Addressing the Causes for Unsuccessful Hand-Offs

In a pilot project led by the Joint Commission Center for Transforming Healthcare, 10 renowned U.S. hospitals analyzed their hand-off communication vis-à-vis referring physicians and patients, and developed a set of guidelines on this basis. A number of hospitals that optimized their communication process using these guidelines have achieved impressive results, e.g. readmission rates down by as much as 50 percent or significantly shortened throughput times from the emergency department to the regular ward (inpatient unit).¹⁵

- Standardize critical content
- Hardwire within your system
- Allow opportunities to ask questions
- Reinforce quality and measurement
- Educate and coach

Survey and research results from the U.S. show that hand-off communication and the discharge process are sorely in need of improvement in many companies. For instance, in the latest annual U.S. national patient survey, the CAHPS Hospital Survey, 14 percent of respondents said they neither received any written information about what symptoms or health warning signs they should look for in the future, nor had conversations about the need for a follow-up appointment and with whom after their discharge.¹⁴

However, the patient's proven influence on his or her own outcome may be challenging in cases where service providers find it difficult to increase patient engagement. Socio economic factors such as low income, unemployment, and poor education can lead people to neglect their health and fail to follow their doctors' recommendations or keep appointments. Several studies from the U.S. actually show a link between high readmission rates and a hospital's catchment area. It indicates that hospitals in poor regions are disproportionately affected by readmission penalties.¹⁶ This once again shows how important it is to develop reliable and reasonable outcome measurements – not just for providers who are affected by severe cuts, but also to ensure patient care in more problematic areas.

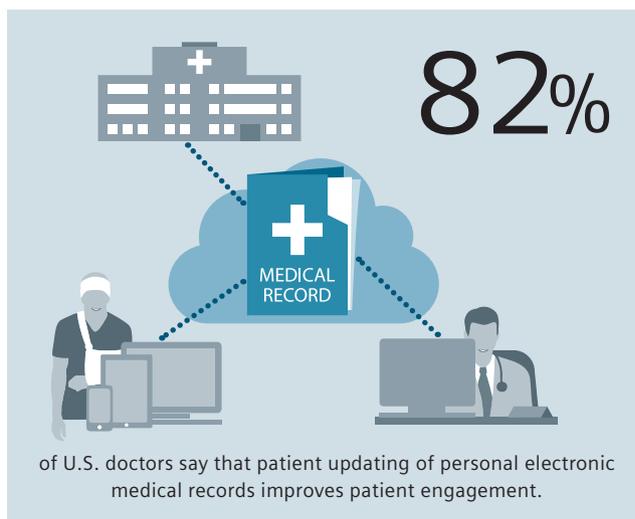
Smarter Data for Better Care

A well-managed IT infrastructure as well as mobile technology could help to smooth the patient pathway and enforce patient engagement. The Veterans Health Administration (VHA), the biggest integrated health network in the U.S.,

recently started using mobile resources like tablets and smartphone apps to help VA doctors and patients stay connected. Visit-based care is giving way to connected care. »I think of connected health as a wave that's just forming, and that will crest over the next decade,« says Booz Allen Senior Vice President Dr. Kevin Vigilante. The consultancy is supporting the VHA pilot project.¹⁷

In developed economies, some of the greatest benefits of connected care would result from improved treatment of chronic disease. Further, the greatest benefits of Internet of Things (IoT) applications could be in expanding delivery of healthcare services to the underserved, write the corporate consultants at McKinsey in a recent study.¹⁸ For example: With IoT-based mobile services, it can become possible to diagnose hypertension in rural China or help diabetics in India avoid complications. Permanent remote monitoring of patients via mobile apps, or perhaps even smart pills and implants in the future, could enable timely interventions and help patients consistently comply with prescribed treatments or motivate them to change their lifestyles for the sake of better outcomes.

The Electronic Health Records (EHR) that have been introduced in many countries also provide a shared platform for decision-making among patients and doctors. According to a recent survey by the consulting firm Accenture, more than half of all patients want to be able to access their data online.¹⁹ This would definitely be to the benefit of many doctors. A vast majority of U.S. doctors report that patient updating of personal electronic medical records improves patient engagement and satisfaction.²⁰ Healthcare providers who manage to create stronger ties to their patients and let them independently contribute to their patient journey can achieve better long-term patient outcomes.



In a nutshell

Patient Outcome Challenges in Healthcare

- 01 An accurate and quick diagnosis is an essential aspect of a positive patient outcome. It is the foundation for proper treatment decisions. IT plays a significant and growing role in processing diagnosis-relevant patient information in a comprehensive and purposeful way. Modern diagnostic exams help increase diagnostic quality, thereby reducing downstream costs resulting from misdiagnoses.
- 02 Treatment can be efficient without being effective and vice versa. Ensuring treatment is both efficient and effective is the hallmark of medically and economically successful healthcare providers. To achieve this, reliable clinical information from modern diagnostic exams and seamless communication for successful monitoring is indispensable.
- 03 To determine one's own position and the success of improvement measures, patient outcome must be clearly defined and reliably and transparently evaluated. True measures of quality reflect what matters to the patient.
- 04 The seamless flow of information along the treatment pathway is an essential component in the overall success of the treatment. Especially when it comes to hand-offs, there is often still room for improvement. It is key that hospital operators provide comprehensive, prioritized, and systematic information to subsequent treatment providers.
- 05 A more positive patient outcome can be expected if patients are actively involved in the treatment process. Clear, intelligible communication is the key to success.
- 06 Modern, connected IT as well as the use of mobile devices can contribute to enormous advances in diagnostics and treatment. This is especially true for regions of the world that are still medically underserved.

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Siemens Healthcare Headquarters

Siemens Healthcare GmbH

Henkestraße 127

91052 Erlangen

Germany

Phone: +49 9131 84-0

siemens.com/healthcare

Order No. A911M-0003-6C1-7600 | Printed in Germany | CC WP 3247 0116.5 | © Siemens Healthcare GmbH, 2016

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