

# Using care pathways to improve health systems

Care pathways enable health systems (and other health care organizations) to make evidence-based decisions about where to focus improvement efforts.

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**One of the core missions of any health system** is to improve the health status of its population. To do this, it must take appropriate actions to prevent illness as well as to ensure the efficient delivery of high-quality primary, secondary, tertiary, and rehabilitative care. Selecting which interventions to prioritize can be difficult, however. It can be even more difficult to determine how to set up the health system to ensure that the appropriate interventions are delivered efficiently.

To address these problems, many leading health systems (and the payors and providers within them) are adopting a new approach based on care pathways to map the steps in a patient's journey through the entire health system. The pathways are organized by the stages of care (from prevention and primary care to acute care and rehabilitation) and include the full range of interventions that may be offered at each stage. Because the pathways are based on the best available clinical evidence, they enable health systems to determine the interventions' relative importance, prioritize how resources are allocated, and identify the outcome metrics that will help ensure optimal care delivery.

Some pathways focus on specific diseases, such as diabetes or coronary heart disease (CHD); these pathways include all treatments, from primary prevention to rehabilitative services, that may be offered to patients with those diseases. However, a care pathway can also cover a group of conditions with similar treatment requirements, such as chronic diseases, or even a phase of life (e.g., pregnancy); in these cases, the pathway maps the clinical steps taken at each stage of care. The pediatric care pathway, for example, includes routine vaccinations and other well-child services, primary and community care services for sick children, specialist

care for more severely ill children, and palliative care for the terminally ill.

Both types of care pathways rely heavily on clinical evidence. As a result, clinicians tend to find them intuitive to use. And because clinicians are intimately involved in the pathways' creation, they often become champions of the resulting recommendations for change.

In this article, we focus on the use of disease-specific care pathways. We describe why these pathways can be so valuable and outline how they are developed. In addition, we provide several case examples of how health systems have used disease-specific pathways to improve care quality, reduce costs, or both.

### **Why the pathway approach is useful**

To understand why the pathway approach can be so useful, consider a health system with a finite budget (realistically, any health system today) that wants to improve outcomes in CHD. Among the questions it might need to consider are these: Should it increase its investment in primary prevention or build more catheterization labs? If it opts for primary prevention, which strategies should it focus on first? Alternatively, if it decides to build cath labs, where should the labs be located, and what support services need to be in place to ensure that appropriate patients receive prompt treatment?

To answer such questions effectively, the health system must be able to identify all the interventions that can be used to prevent or treat CHD. The system must also know four things about each intervention: its efficacy, its cost, how and where it can best be delivered, and what services and structures must be in place to ensure optimal delivery. Data on efficacy and cost allow the system to determine which

interventions have the highest value — those that provide the greatest benefit (in terms of clinical outcomes) per unit of cost. The other two sets of information enable the system to determine how to deliver the prioritized interventions efficiently to appropriate patients.

Care pathways include all four of these sets of information; thus, they provide the breadth and depth of information needed for good decision-making. For example, they make it easier for health systems to make balanced trade-offs among competing priorities and to develop greater insights into where improvement efforts should be focused.

Care pathways are much more comprehensive than the tools that most health care organizations have traditionally relied on. For example, they provide greater depth than the evidence-based guidelines (sometimes called clinical pathways) that have been developed by various professional groups to describe best practices in care. Although these guidelines often offer enormous assistance to clinicians providing treatment to specific patients, they generally include little or no information about costs, optimal settings of care, or supporting services and structures. Thus, they provide only limited insights to health systems looking to define value or reconfigure service delivery.

### Case study: Using a care pathway to improve stroke care

Several years ago, the National Health Service (NHS) in London realized that stroke was placing a heavy burden on its population. More than 11,000 Londoners suffered strokes each year.<sup>1</sup> The death rate from stroke was higher in the greater London region than in surrounding areas of England, and there were significant differences in stroke prevalence and death rates within the city itself. NHS London therefore convened a panel of leading clinicians, who helped it map the stroke pathway to determine where it most needed to improve.

Results showed that there were considerable differences in the availability of rehabilitative services throughout the city. But by far the biggest problem London faced was that it had fallen behind other major cities — and much of the rest of England — in its ability to provide appropriate acute-care services for stroke patients. Few of its hospitals had the specialist staff and equipment needed to provide high-quality stroke care around the clock. Furthermore, most strokes occurred in London's outer boroughs, yet the hospitals with specialist services tended to be in the city's center. Consequently, only about half of London's stroke patients received treatment in a dedicated stroke unit.

NHS London therefore decided that its primary goal would be to reconfigure its acute-care stroke services. NHS London established eight hyper-acute stroke units (HASUs), which were strategically situated to ensure that all residents could get access to high-intensity care within 30 minutes.

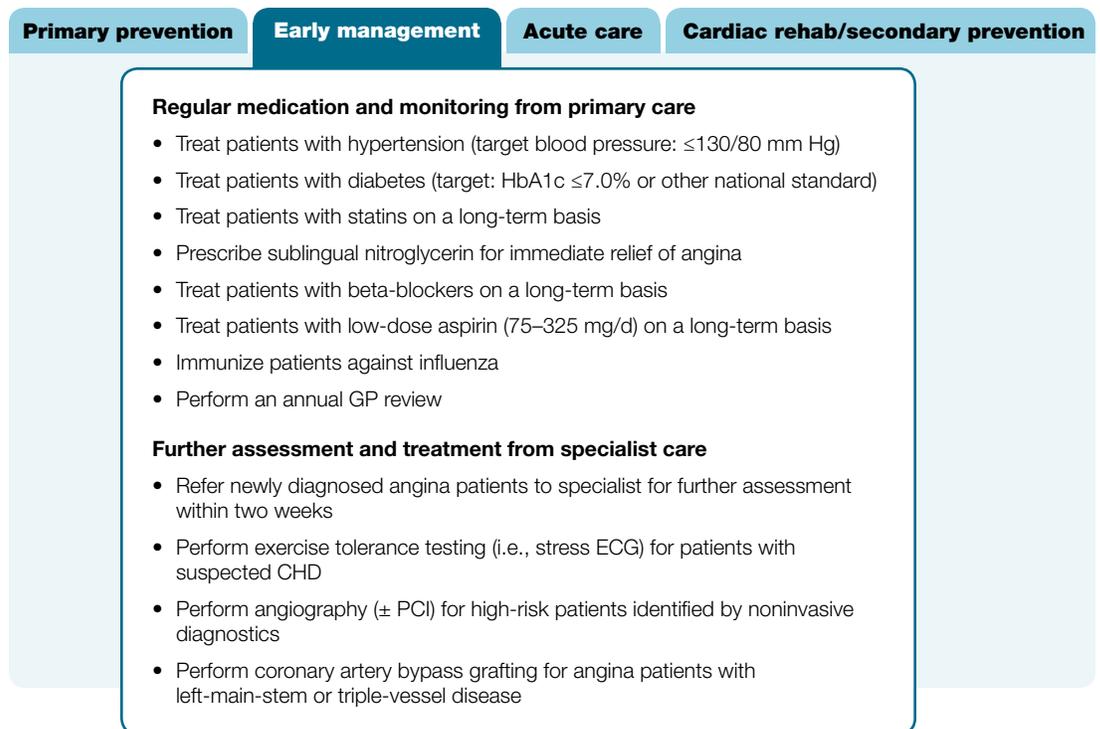
In addition, it set up a network of secondary stroke units in hospitals throughout London to provide post-acute care. Stroke patients would remain in the HASUs until their condition stabilized (typically, about three days); they would then be transferred to a secondary stroke unit for rehabilitation and ongoing treatment.

Results were dramatic, even within the first year. All eight of London's hospitals with HASUs now rank in the top quartile of English hospitals on stroke care. The percentage of London's stroke patients given thrombolysis has more than tripled, and in-hospital mortality rates among stroke patients have declined. Furthermore, the percentage of stroke survivors being tested for residual dysfunction within three days has risen significantly. Yet overall length of stay has decreased by about 20 percent.<sup>2</sup>

<sup>1</sup>Healthcare for London. London Stroke Strategy. 2008.

<sup>2</sup>Unpublished data obtained from NHS London. October 2010.

## Exhibit 1

**Best-practice interventions are mapped to each pathway stage (CHD example)**

CHD, coronary heart disease; ECG, electrocardiogram; GP, general practitioner; HbA1c, glycosylated hemoglobin (a measure of blood glucose control); PCI, percutaneous coronary intervention.

A few evidence-based guidelines focused on narrow slices of care delivery, such as the in-hospital management of acute myocardial infarction (AMI), do include some aspects of service configuration in their discussions. And some hospitals have taken cost and service configuration into account in their efforts to improve care delivery (for example, when attempting to optimize use of their emergency departments or operating rooms). However, efforts such as these deal with only a single part of the patient's journey; thus, they do not include the full range of information needed to clarify how different parts of a health system can best work together.

### Using a disease-specific pathway effectively

Three steps are required if a health system wants to use a disease-specific care pathway effectively. First, the system must assemble the fact base so that it can design the pathway and prioritize interventions. Second, it must determine when, where, and how the prioritized services can best be delivered. Third, it must identify which “enablers” should be in place — the supporting services and structures required to deliver the services efficiently. Taken together, this information allows the health system to determine what changes it needs to make, how those changes

### Case study: Using care pathways for multiple conditions

London's aim in developing its stroke pathway was not to reduce the cost of stroke care, but rather to improve the quality of that care as efficiently as possible. Germany has used care pathways both to improve care quality and to control costs.

A decade or so ago, the country discovered that about 80 percent of its health system's costs were being spent to provide care for only about 20 percent of its citizens, most of whom had chronic conditions. Germany also realized that there were wide variations in the care being delivered to patients with these conditions. To address both issues, it decided to change the way it funded its public payors, which together cover about 90 percent of the population. Germany gave the payors extra funding to encourage them to provide better care for patients with chronic conditions. But it also insisted that the payors offer disease management programs (DMPs) to patients with six very common conditions (asthma, breast cancer, coronary heart disease [CHD], chronic obstructive pulmonary disease [COPD], type 1 diabetes, and type 2 diabetes). Its goal was to increase adherence to best practices and contain costs.

The DMPs were based on care pathways built by panels of experts, who identified best practices for each condition. For many of the selected conditions, it became clear that

early management was crucial from both a clinical and an economic perspective; thus, the DMPs stipulated that all care would be coordinated by a single provider (usually, a general practitioner).

Although all public payors are required to offer DMPs, not all have been equally enthusiastic about doing so. Furthermore, patient enrollment in the programs is voluntary, and some experts have argued that voluntary participation has skewed the results achieved. Nevertheless, the initial results are promising. About 6.75 million Germans have enrolled since the first program (for type 2 diabetes) was launched.<sup>1</sup> A study of one large payor's type 2 diabetes DMP found that enrolled patients were less likely to suffer disease complications, had a lower mortality rate, and incurred lower health care costs.<sup>2</sup> A second large study found that patients in DMPs for type 2 diabetes, CHD, heart failure, or COPD experienced decreased hospital admission rates following program enrollment, whereas control patients had increased admission rates.<sup>3</sup> Other studies have also suggested that the DMPs help lower mortality rates.<sup>4</sup>

Not every payor has achieved equally strong results; however, most of the programs have demonstrated improvements in processes of care and patient satisfaction, and many are reporting better clinical outcomes.

should be implemented, and what timetable for implementation is realistic.

#### Assembling the fact base

The health system should begin by defining the appropriate stages of the pathway. For example, a number of approaches can be used to help patients lower their risk of CHD or stroke; thus, primary prevention is the first stage in the clinical pathways for those conditions. In contrast, comparatively little can be

done to lower a man's risk of prostate cancer. The first stage in the prostate cancer pathway, therefore, is detection.

The next step is to add the interventions that should be included within each stage (Exhibit 1). Best-practice interventions are identified from a detailed scan of clinical guidelines, the peer-reviewed literature, and expert opinion. For each intervention, the health system must determine the clinical benefits it provides, the strength of

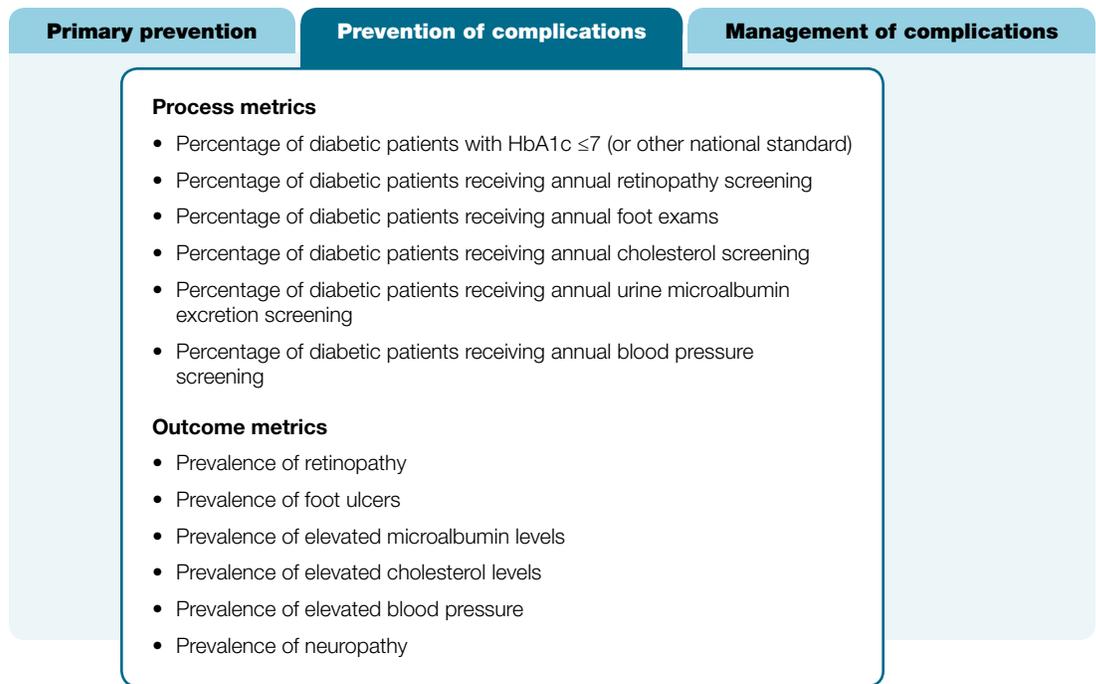
<sup>1</sup>Data released by the Bundesverwaltungsamt (German Federal Office of Administration). June 2011.

<sup>2</sup>Stock S et al. Germany diabetes management programs improve quality of care and curb costs. *Health Affairs*. 2010;12:2197-2205.

<sup>3</sup>Hamar B et al. The impact of a proactive chronic care management program on hospital admission rates in a German health insurance society. *Popul Health Manage*. 2010;13:339-345.

<sup>4</sup>*Versorgungs-Report 2011*. Wissenschaftliche Institut der AOK (Scientific Institute of the AOK). November 2010.

## Exhibit 2

**Process and outcome metrics assess health system performance (diabetes example)**

HbA1c, glycosylated hemoglobin (a measure of blood glucose control).

those benefits, the types of patients most likely to benefit, and the cost of achieving those results. It is this combination of data that makes the care pathway approach so helpful for health systems — the inclusion of both quality and cost dimensions enables practical decision-making.

It is important, however, that an intervention's benefits and costs be considered from two perspectives: what is theoretically possible and what actually occurs. For example, patient compliance with treatment is often higher in carefully controlled clinical trials than it is in the real world, and thus an intervention's benefits may be lower in actual practice than trial results suggest. Similarly, an intervention's

current delivery costs may be much higher than what could be achieved if services were reconfigured to improve efficiency. These types of differences should be taken into account when the pathway's interventions are being evaluated.

Another important step in assembling the fact base is to determine which clinical outcomes are most important to measure at each stage of the pathway. For example, the most important outcome metric for the primary prevention of the diabetes pathway is the incidence of new diabetes cases. The main outcome metric for the early management stage of CHD is the incidence of AMI or unstable angina.

### Case study: Using a diabetes care pathway to reallocate resources

Northamptonshire NHS grew concerned about rising diabetes prevalence in its region, especially given its existing problems with diabetes care. Many patients were not being offered appropriate early treatment, and thus the region's rate of diabetic complications was above the English average. Despite its high spending on diabetes care, patient satisfaction was low and the outcomes achieved were relatively poor. Northamptonshire therefore decided to review its diabetes pathway to better understand how it could reallocate resources to improve the quality of care delivery and the results achieved.

The region gathered prominent local clinicians, including diabetologists and general practitioners (GPs), to help it improve the pathway and determine what changes needed to be made. For example, the investigation made it clear that Northamptonshire was focusing too many of its efforts – and too much of its funding – on the acute-care management of diabetic complications. Too little emphasis was being given to the prevention of those complications.

To remedy this problem, Northamptonshire established a multidisciplinary team of clinicians, led by a diabetologist, to help GPs improve the care they deliver to diabetic and pre-diabetic patients. The diabetologist spends one day per week in GP practices, reviewing patients' files and

mentoring the GPs about how diabetes can better be managed, especially in its early stages. The diabetologist also helps the GPs better understand when disease progression warrants referral to a specialist.

In addition, Northamptonshire increased the capacity of its patient education classes to help people better manage their disease; it also increased its investments in mental health and podiatry services to provide better support for diabetic patients. In addition, it offered extra training to practice nurses to improve their ability to administer different forms of insulin and to teach patients how to administer insulin to themselves.

Initial results have been strong. In the first seven months alone, Northamptonshire saved £373 thousand in prescription costs, largely because effective generic drugs are being used more widely.<sup>1</sup> It is too soon yet to see a drop in the rate of complications (or the resulting need for hospitalization), but Northamptonshire anticipates that within a decade it may save up to £8 million annually, through decreased prescription costs and less spending on complications. More important, it believes that the changes it has implemented will significantly improve the quality of diabetes care it delivers and the health of its diabetic patients.

<sup>1</sup> Unpublished data obtained from NHS Northamptonshire, October 2010.

Supporting the outcome metrics are what we call process metrics – indicators of whether the right tests and treatments are being used in the appropriate patients (Exhibit 2). Together, the outcome and process metrics gauge overall health system performance. When these metrics are selected, it is important to focus on information that can be derived from routinely collected data. For example, diabetic patients are given drug therapy to control their blood glucose levels, as well as regular evaluations for foot ulcers, vision problems, and other signs of disease progression. Routine data

may not be sufficient to determine whether the right drug(s) have been prescribed but usually will reveal whether the appropriate evaluations have been conducted. Those checks can be used as process metrics for diabetes management.

Once the relevant outcome and process metrics have been determined, the health system should assess its performance on each one. In addition, it should identify whether there are any other factors driving the outcomes achieved so that it can determine where it will be best able to have

impact. For example, a health system has little control over ambient air pollution levels, a significant risk factor for asthma exacerbations. However, it can and should ensure that its asthma patients are given drug therapy so that their risk of an asthma attack is minimized. By identifying the factors driving outcomes that it can modify, the health system

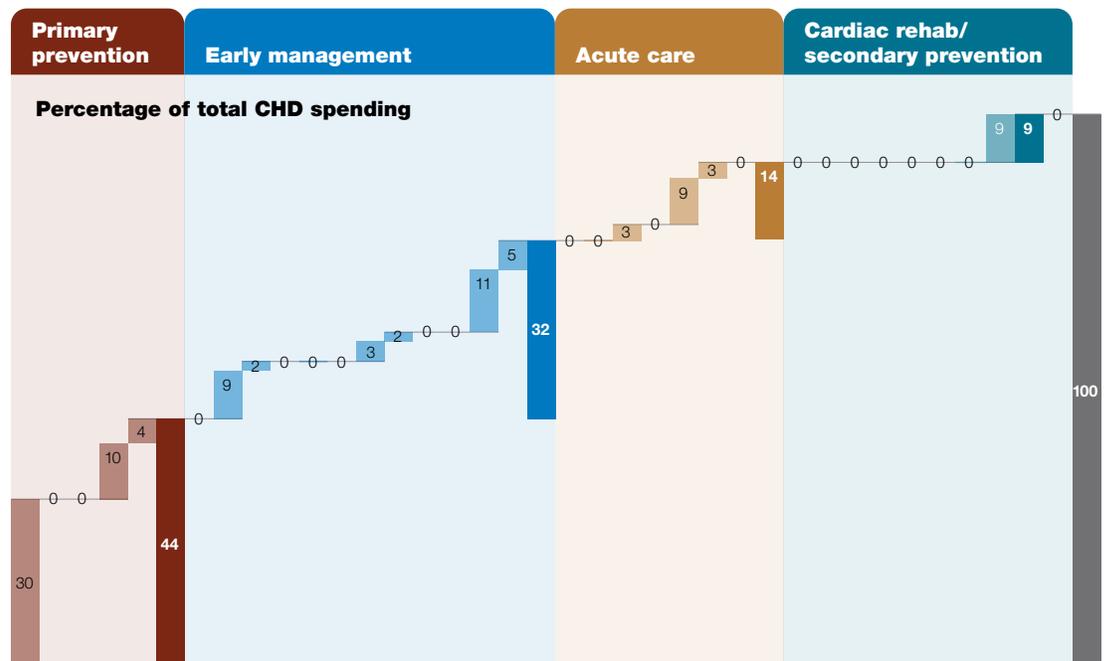
begins the process of determining which interventions should be prioritized.

#### Determining optimal service delivery

Once the fact base has been assembled, the health system can evaluate its performance in each stage and on each step. In some areas, the system may find that it is already following

### Exhibit 3

### A cost waterfall based on a care pathway helps clarify where money is being spent



CHD, coronary heart disease.

*Shown here is a cost waterfall depicting one health system's spending on its CHD pathway. The numbers in each of the bars represent the percentage of total CHD spending allocated to each step or stage in the pathway (the light-colored bars represent steps; the dark-colored bars are stages). This system's total spending on its CHD pathway was roughly equivalent (in purchasing-power parity) to US \$84 per person. Of this total, about \$37 was allocated to primary prevention; \$27, to early management; \$12, to acute care; and \$8, to rehabilitation and secondary prevention. This level of granular detail enabled the health system to determine whether some of its spending should be reallocated.*

**Case study:  
Using a CHD  
care pathway  
to compare  
health systems'  
performance**

Last year, four members of McKinsey's Health Systems Institute decided to join forces to investigate how well they were delivering CHD care and how they could improve in the future. They also wanted to learn from each other. Analyzing their CHD pathways helped them better understand what services they were delivering, what it was costing them to deliver those services, what outcomes they were achieving, and how their performance compared.

The four members – all regional health systems in developed countries – had set themselves a daunting task. Many of the metrics they decided to analyze (e.g., the percentage of acute myocardial infarction [AMI] patients assessed for cardiac rehabilitation) were not ones they routinely collected, and thus they had to find novel ways to dig the information out of their IT systems. In addition, they had to develop a method for making each member's data set comparable with the others. However, the insights they gained made the effort worthwhile.

All four health systems now have a much clearer idea of what services should be delivered at all stages of the pathway and what outcomes should be achieved. They also have a clearer idea of what they are spending at each stage. All four systems were surprised to realize, for example, how little they were spending on secondary prevention and rehabilitation in comparison with primary or acute care.

By comparing their performance, the health systems learned that their per-patient spending on common CHD drugs (e.g., statins and antihypertensives) differed markedly, often in ways that bore little correlation with outcomes. They also discovered that spending levels in other areas did not always correlate with results achieved.

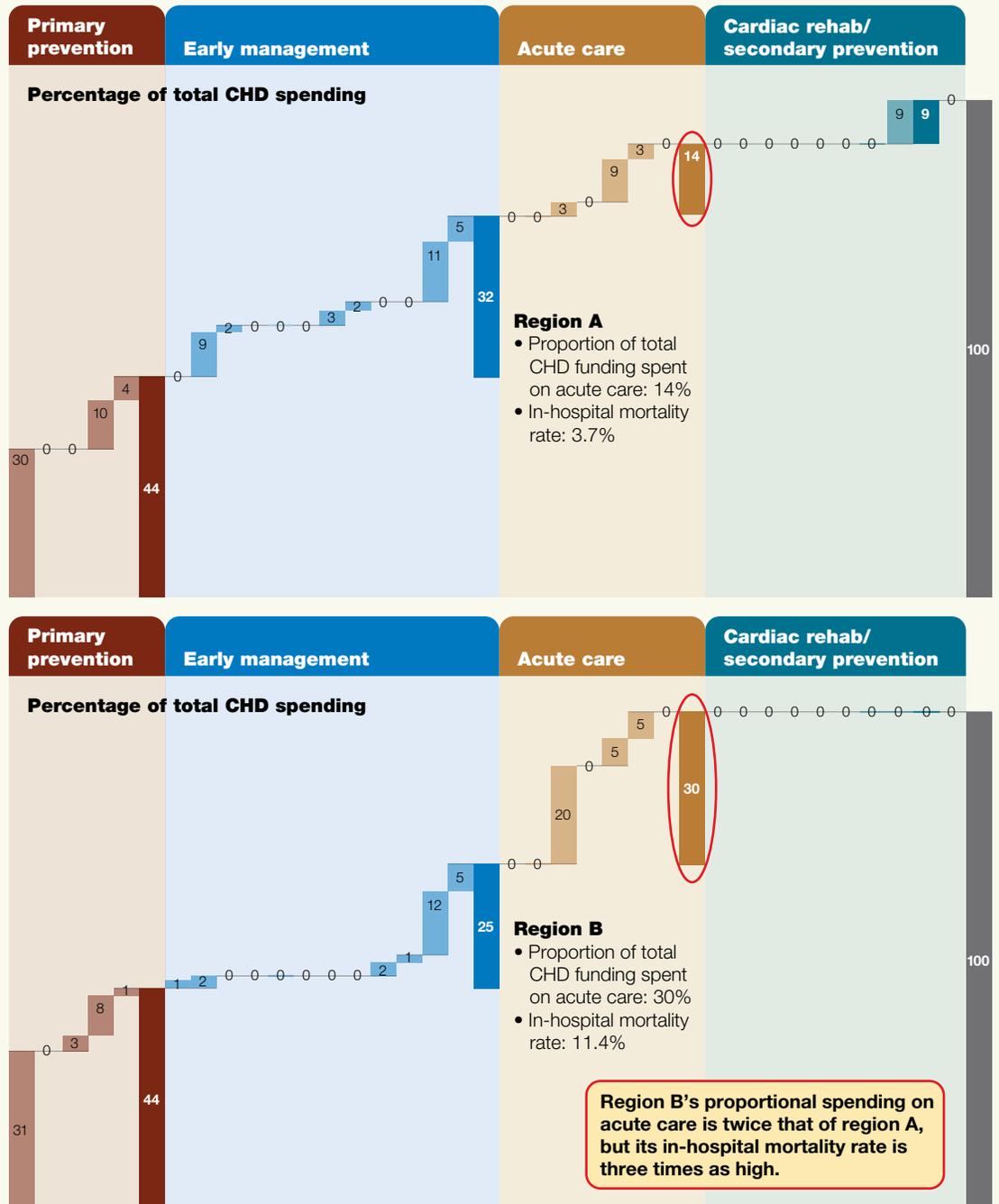
For example, the health system with the highest spending on acute care had the lowest inpatient survival rate following AMI (exhibit). On further analysis, it discovered that it had the lowest proportion of eligible patients receiving primary percutaneous coronary intervention (PCI), even though it devoted considerably more of its CHD spending to that procedure than any other system did.

Each of the health systems is using the findings in different ways to redesign CHD care delivery. For example, the system with the lowest PCI rate has decided to focus first on improving access to that procedure. Two other systems are concentrating on increasing their rehabilitation and secondary prevention efforts; they plan to support each other as they redesign services and then to compare the results they achieve. All of the systems are using the CHD pathway to better understand variations in care delivery and outcomes achieved within their own regions.

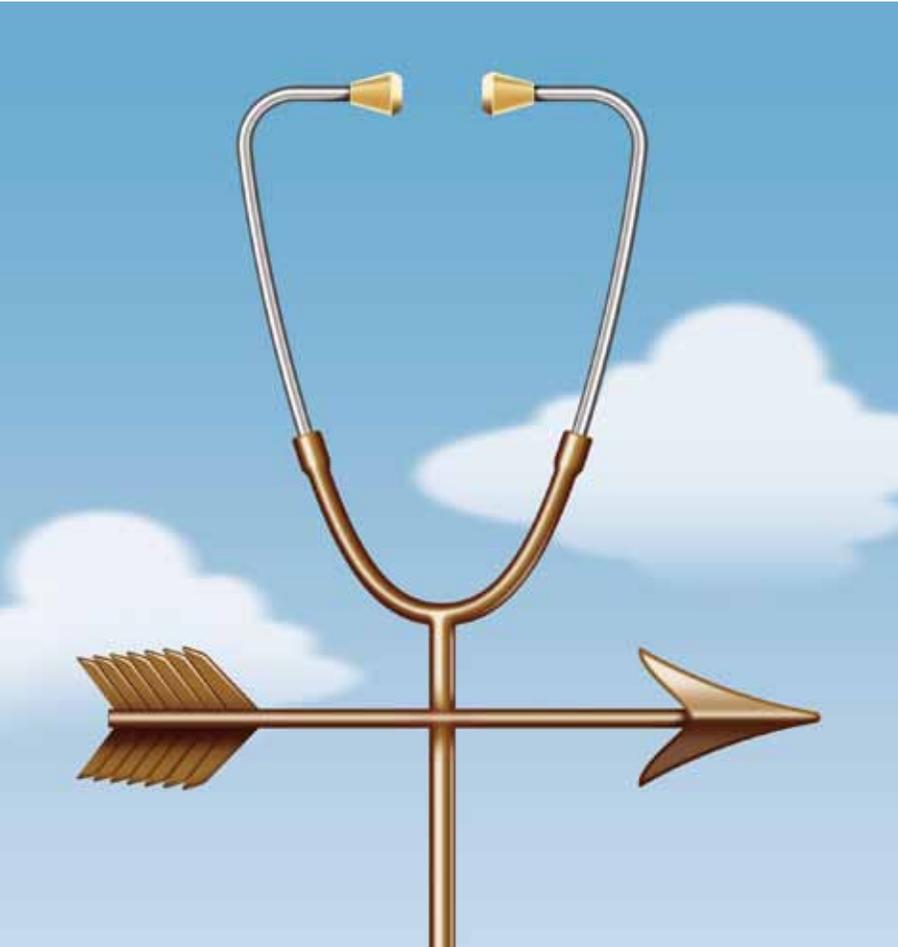
“All four health systems now have a much clearer idea of what services should be delivered at all stages of the pathway and what outcomes should be achieved. They also have a clearer idea of what they are spending at each stage.”

Exhibit

Spending differences do not always predict outcome differences



CHD, coronary heart disease.



best practices and achieving strong results.

In other areas, it may find that its outcomes are suboptimal. It must then begin to consider — based on the significance of the performance deficits and the cost of correcting those deficits — which areas to focus on first.

The care pathway provides additional help in this regard because it enables the system to objectively compare interventions to determine which ones have the greatest impact and which deliver the highest value. In this way, the system can develop insights into how it can best overcome its performance deficits. All too often,

we have seen health systems looking to improve performance create detailed lists of all the things they need to fix but then have no way to prioritize the necessary changes. A care pathway helps them avoid this risk because it allows them to make sound comparisons based on clinical evidence and financial insights.

Similarly, the clinical evidence base and financial data behind the pathway can help health systems determine when it may be appropriate to reconfigure services to achieve the goals they have set for themselves. In our experience, care pathways often reveal gaps in service delivery, especially during the hand-offs from one provider to another. A health system can use these insights to reconfigure services to minimize these gaps.

In addition, a care pathway can help the health system determine whether its spending on each stage of the pathway is appropriate (Exhibit 3). In some cases, a health system may discover that it is over-investing in certain forms of care and can transfer money into other areas (or reduce spending) without adversely affecting outcomes.

#### Identifying the appropriate enablers

In our experience, the health systems that have derived the greatest benefit from care pathways share several traits. These traits can be considered enablers of success.

First, clinicians must lead the pathway's development and implementation. Clinicians are in the best position to evaluate the clinical evidence, and their involvement builds support for the changes to care delivery. (In our experience, the absence of clinician involvement has derailed otherwise well-designed improvement projects.) The clinicians chosen to lead the

“Optimal use of a care pathway requires general practitioners, specialists, and other health professionals to work closely together (even if one clinician serves as the primary contact for each patient).”

project should be given capability-building training to improve their leadership skills. The health system may also find it useful to provide training for the other clinicians affected by the changes to increase their buy-in for the project.

Second, patients must be given information and education to ensure that they take appropriate advantage of the services the health system delivers. Education is especially important for chronic disease care pathways, such as those for CHD and diabetes, because it strongly influences whether patients are willing to adopt healthier behaviors, comply with treatment, and engage in other forms of self-care.

Third, the health system must invest in technology and information systems to help ease the flow of data among providers. For example, the system should find ways to make it easier for clinicians to access patient records through registries and other tools.

Fourth, the health system must ensure that it has sustained funding for both development and implementation of the pathway. In addition, it must consider whether incentives (e.g., pay-for-performance bonuses given to doctors or their practices) should be included in any service redesign to further encourage clinician support for the necessary changes.

Fifth, the health system must put in place an effective governance structure to make certain that there is clear, pathway-wide accountability for outcomes and costs. Optimal use of a care pathway requires general practitioners, specialists, and other health professionals to work closely together (even if one clinician serves as the primary contact for each patient). Without an effective governance structure, it can be difficult to maintain accountability as patients are transferred from provider to provider.



Today's economic environment makes it important that health systems produce the best possible outcomes while keeping costs under control. Care pathways can help them do that by enabling them to make evidence-based decisions about where to focus their improvement efforts. ○

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