Healthcare**Transformers**

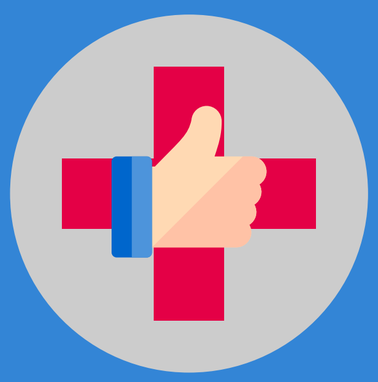
Roche

Value-based healthcare:

Patient-centric outcomes at the foundation of care

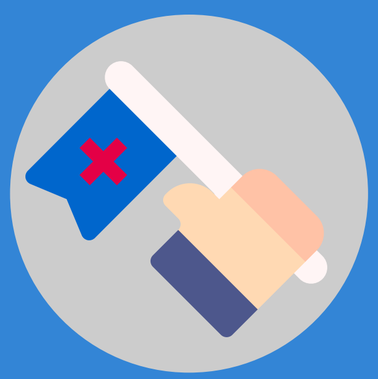
Insights for healthcare executives

What we aim to **answer**



What are the benefits of value-based healthcare (VBHC)?

What are the leading economic models in VBHC?



What is needed to implement VBHC?

What can we do to prepare for VBHC?

Contents

The need for change:

Principle drivers of value-based healthcare (VBHC)

THE UNSUSTAINABLE RISING COST OF HEALTHCARE

Traditionally, healthcare has been delivered and paid for based largely on a “fee-for-service” arrangement, with healthcare providers receiving compensation for services rendered or procedures conducted. Yet, over the last decades, this system that incentivizes providers on the volume and quantity of those services provided, has become unsustainable.

There has been an explosion of costs and healthcare spending has grown immensely. In the US in 1970, health spending totaled $74.1 billion USD. By 2019, that number was 6 times the spending in constant 2019 dollars.[1]

This increase in healthcare spending is not only visible in wealthy countries, but in middle and lower income countries as well, where healthcare expenditures have increased 6.3% and 7.8% per year, respectively, between 2000 and 2017.[2] During this time frame, the growth of health spending outpaced GDP in most fast-growing economies.[3]

The increase in healthcare spend may be attributed to various factors including better healthcare options in emerging markets[4], the use of newer and more expensive technologies[5], a growing elderly population[6] and an increase in complex chronic conditions[7]. However, the alarming expenditure on healthcare becomes untenable when one considers the amount of wasteful spending estimated in these numbers. According to a 2017 report from the Organization for Economic Cooperation and Development (OECD), at

least one-fifth of healthcare spending “makes no or minimal contribution to good health outcomes.”[8]

Some of the sources of this wasteful spending include remediating treatment errors, inappropriate or unnecessary emergency room visits, excessive antibiotic prescriptions, underuse of generic medicines, administrative processes that add no value, as well as fraud and corruption.[9] Furthermore, unnecessary treatments can be performed without complications, and thus remain undetected even though they do not improve the quality of life for patients.[10]

LACK OF CORRELATION BETWEEN HEALTHCARE SPEND AND PATIENT OUTCOMES

Despite the continuous increase in healthcare spending, this does not seem to correlate with improved care or health outcomes. For example, the US (with its fragmented, competitive private system) ranked first in the OECD for healthcare expenditure.[11] However, the US also ranked as having the lowest life expectancy, the highest suicide rates, the highest chronic disease burden, and an obesity rate that is two times higher than the OECD average. In addition, it has one of the highest number of hospitalizations from preventable causes and the highest rate of avoidable deaths.[12]

The contradictory relationship between healthcare spending and outcomes is also apparent outside the US. A study of 15 European Union members states showed that increasing healthcare spend had a positive effect on infant mortality, but a marginal effect on overall life expectancy.[13]

NON-STANDARDIZED OUTCOMES FOR PATIENTS

Where a patient lives or seeks treatment may also have a significant impact on the quality of healthcare they receive. For example, in Alberta, Canada, with a universal healthcare system in place, it has been shown that access to cardiac care differed between rural and urban residents, with a noted impact on outcomes: men in cities had a lower chance of death one year after a heart failure diagnosis; and urban patients in general had more doctor visits, fewer hospitalizations and fewer emergency room visits than their rural counterparts.[14]

Reducing the variation in outcomes based on location, facility or other factors can be encouraged by creating more standardized ways of measuring outcomes. Within a facility, HCPs can learn from standardized outcome measures to help improve care, while having standard international measures may help differing geographies learn from one another.[15]

UNDERSTANDING THE INEFFICIENCIES OF TRADITIONAL CARE MODELS AND DELIVERY

In 2006, a book entitled “Redefining Health Care: Creating Value-Based Competition on Results” by Michael Porter and Elizabeth Teisberg addressed this fundamental question vexing the healthcare sector – why, in spite of intense competition and high spending, was the US healthcare system failing?

According to their analysis, improving patient value was *not* the primary goal of those acting in the healthcare system, who were instead focused on reducing costs – specifically their own, short-term costs.[16]

Porter and Teisberg provided an intriguing hypothesis: in order to transform healthcare, it is necessary to redefine what the actors in healthcare are competing for. For them, that meant realigning competition with “value for patients”, with “value” here defined as “the health outcome per dollar of cost expended.”[17]

The core principles of value-based healthcare (VBHC) are laid out in this book. Since then, the concept of improving health and the delivery of healthcare by focusing on outcomes and the value for patients has been embraced around the world.

What if, instead of billing merely for time and resources related to excessive non-productive treatment, HCPs were compensated for making sure that the patient’s condition was improved or resolved? What if there was a care program in place that included consultation, diagnostic tests, and proper medications or treatments tailored to their personal medical profile and individual needs?

The goal of healthcare would shift from treating a condition to solving a patient’s needs. Payments could then be based on positive patient outcomes rather than on the quantity of procedures performed.

While fee-for-service models set prices for services rendered, regardless of the outcome, VBHC is a patient-centered approach to healthcare delivery focused on improving the health outcomes that matter most to patients across the entire cycle of care, while concurrently optimizing use of healthcare resources and cost to society.[18] It is a movement away from asking patients, “What is a matter with you?” to “What matters to you”.[19]

> *“Value-based health care is a means to restore health care to its original purpose, health”*
>
> **Christina Åkerman**, MD, PhD, EMBA
>
> Affiliate Faculty at Dell Medical School, University of Texas at Austin

The “value”

in VBHC models

IMPROVING HEALTH (THE ULTIMATE GOAL)

It is important that we don’t conflate VBHC with simple cost reduction or quality improvements that rest solely on clinical outcomes. While these are important factors, they are not the same as “value” in terms of focusing primarily on improving patient health outcomes throughout the entire patient journey.

Patient satisfaction, for example, is a critical component of modern healthcare, and has helped to bring a much-needed emphasis on the patient experience and ease of interaction with the health system. However, the essential purpose of healthcare is improving health, so the only true value in healthcare can be helping patients – and other factors such as cost, satisfaction and quality will follow suit.

Measuring the patient experience via patient-reported outcome measures (PROMs), in addition to outcome measures reported directly by clinicians, such as mortality rates or readmissions, has enabled health systems to increasingly build medical procedures around what truly matters to patients.[20] While what clinicians report about patients' health is of course crucial, more subjective dimensions of medical procedures – such as quality of life after interventions – are judged best by patients themselves.

MOVING TOWARDS PERSONALIZED HEALTHCARE

Intertwined in VBHC is the progression towards personalized or precision medicine. Thanks to the advancement of big data, the ability to derive insights from it, and scientific knowledge, we can better understand which specific patients would benefit most from a given treatment or therapy.

This means that, rather than casting a wide net, we could identify the right treatment for the right patient at the right time, allowing for more effective treatments. This would also lead to cost savings[21] and potentially a decrease in adverse effects.[22]

OPTIMIZING COSTS

Radically improving outcomes for patients means incentivizing the mechanisms that drive behavior, and therefore rethinking the way healthcare is delivered. Done correctly, a VBHC model would not only benefit patients, but also help optimize the cost of healthcare.

Focusing on outcomes must be the primary driver in VBHC, because costs represent all spending associated with the continuum of care: all direct costs in relation to the patient's treatment, as well as the use of resources before and after the actual treatment begins.[23]

By improving patients' health outcomes, value-based models may help reduce the compounding complexity and disease progression that drive the need for more care. In time, this may also reduce spending.

One example to support this is found by looking at the performance of individual Dutch diabetes clinics. Less than 30% of the pediatric type 1 diabetes population manages to reach the HbA1c (hemoglobin A1c) recommended target of less than 7.5% set by the International Society for Pediatric and Adolescent Diabetes (ISPAD).[24] However, for patients that are treated at Diabeter – a value-based, patient-centric clinic network that specializes in providing type 1 diabetes care for children and young adults – this number reaches 55%, with only 6% outside the target.[25]

Economically, the superior outcomes achieved at Diabeter led to less direct annual costs to type 1 diabetes patients. These savings (8.6%), were mainly due to a lower hospitalization rate compared to patients of other Dutch pediatric clinics.[26]

The more diabetes patients control their illness, the fewer may progress to kidney failure, blindness, and neuropathy. This could dramatically save healthcare costs as the need for more care to treat complex chronic diseases and disease worsening decreases.[27]

Extrapolate this to millions of healthcare interactions per day, and to the myriad of complex diseases or chronic conditions – cancer, cardiovascular diseases, neurological disorders – which require multiple therapies and interventions, and the cost savings are potentially enormous.

Challenges

for the implementation of VBHC

Many pages have been filled and words written about VBHC in the years since Porter and Teisberg first published their ideas. Yet, full implementation of VBHC in the real-world setting remains elusive. Why is this the case?

In a survey of 500 US healthcare executives conducted in late 2019 by Numerof & Associates, the “threat of financial loss” was identified as the biggest barrier in moving to a value-based model (about 20% of respondents).[28] Other oft-cited barriers highlighted by the survey included issues with systems like IT, tracking and management (15%), uncertainty about timing the transition (13%) and problems with modeling the cost of care (10%).[29]

Common challenges to VBHC

WHILE THE APPROACH TO DELIVERING VBHC MAY DIFFER, KEY CHALLENGES ACROSS HEALTHCARE SYSTEMS INCLUDE:

SHIFTING FROM FEE-FOR-SERVICE TO VBHC FUNDING MODELS

Fee-for-service still represents a significant portion of healthvcare payments. In the US, 39% of healthcare payments were fee-for-service in 2019. Another 25% were fee-for-service with a link to value.[30] The revenue this generates, plus the potential financial risk posed by value-based care models, remains a major barrier to wider VBHC adoption.[31]

DEFINING AND CREATING STANDARDIZED OUTCOME MEASURES

Outcomes data is critical to better understanding the actual healthcare activities undertaken, whether procedures, processes, structures, or systems.[32] However, defining what these measurable outcomes are, and defining a standard set of data against which to benchmark, remains a barrier to more widespread use of VBHC.

NEED FOR ROBUST DATA AND IT INFRASTRUCTURE

Patient outcomes can only be improved and paid for when there is sufficient data available. In order to successfully implement a VBHC system, a robust flow of data and the ability to analyze and derive information from it, is required.[33]

UNDERSTANDING COSTS THROUGHOUT THE PATIENT JOURNEY

Rather than charging a fee for a procedure or service, VBHC requires that patients and their conditions become the “unit of analysis for measuring costs and outcomes”.[34] To do so, however, means rethinking how patients are tracked, and following their sequence of care to design systems that assign costs accurately to each step. Current systems are generally not designed for this task.[35]

NEED FOR POLICIES AND A LEGAL FRAMEWORK THAT SUPPORTS VBHC

For successful implementation of VBHC, countries need an ecosystem of institutional and policy structures that support value-based approaches.[36] This is highlighted by early adopters of VBHC in countries such as the Netherlands, where the government works closely with external stakeholders to collect data about patient quality of life after a treatment to determine what constitutes good care, and to enable more shared decision-making.[37]

While challenging, these barriers are not insurmountable. Sweden, for example, is relatively advanced in its implementation of VBHC. This is helped by its longstanding egalitarian ideals, which help promote a progressive health system.[38] Though facing the same systemic threats (aging population, growth in chronic diseases) as other countries, Sweden uses its high-quality health registries and health records as a source for the data for outcomes measurement to underpin their continuous improvement in care delivery.[39]

Likewise, in the Netherlands, hospital groups are using VBHC to measurably improve patient outcomes.[40] By creating multidisciplinary teams to create the outcomes metrics and then rigorously implementing them via infrastructure and governance models, Santeon, a group of seven leading Dutch hospitals, has made remarkable progress in patient care. This is exemplified by reductions of nearly 30% in unnecessary inpatient stays and up to 74% in the rate of reoperation due to complications in breast cancer patients.[41]

KEY TAKEAWAYS:

- Increasing life expectancy accompanied by the rise of chronic diseases and unsustainable healthcare costs are driving the move towards VBHC
- VBHC puts patient wellbeing at the front and center, and makes payments contingent on achieving patient-centric health outcomes
- VBHC may not only improve patient outcomes, but also contribute to lowering healthcare costs
- The threat of financial loss and the need for standardized outcomes and robust data and IT infrastructure are among the common challenges limiting the uptake of VBHC models worldwide, however there are success stories

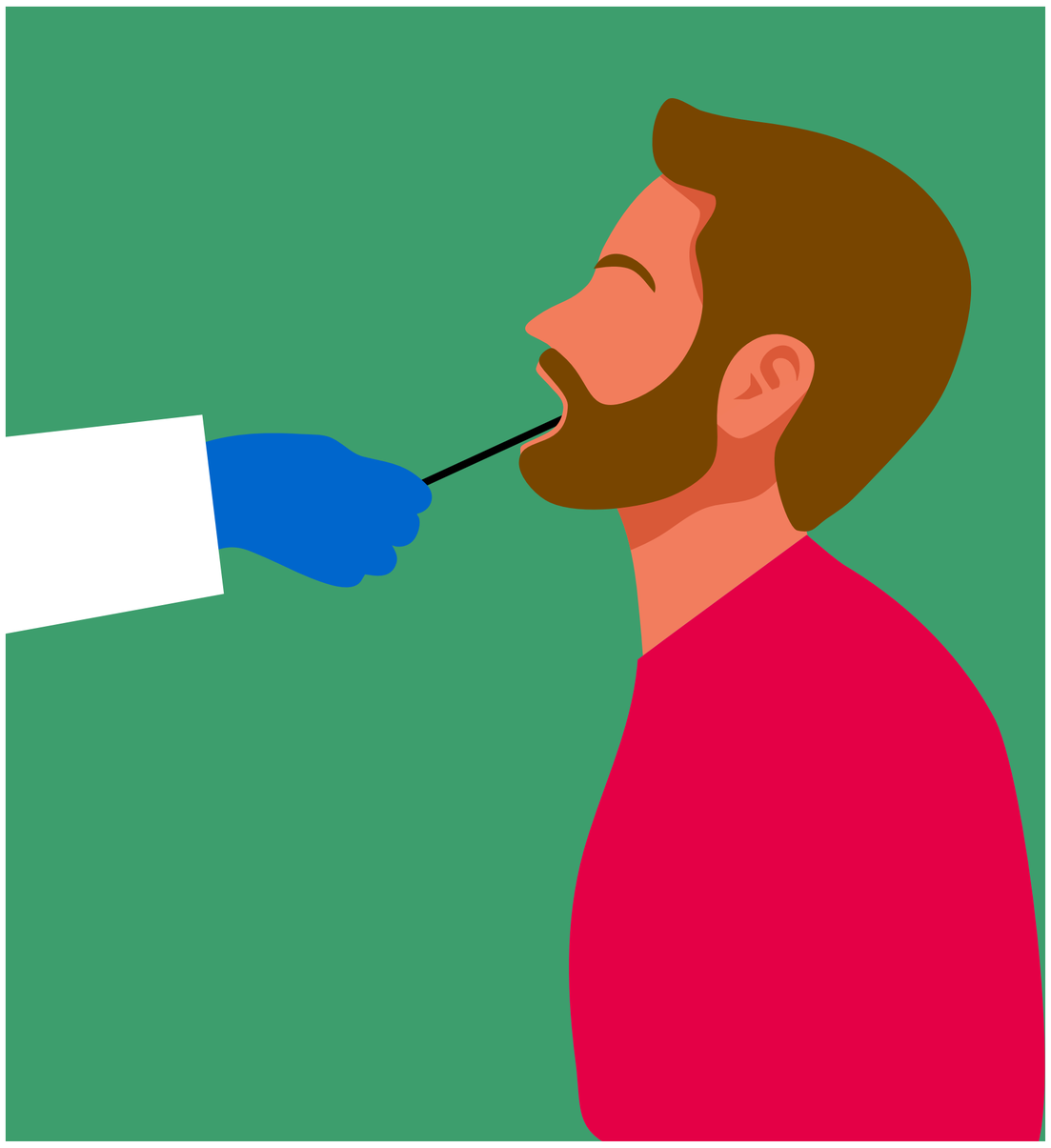
The role

of diagnostics in VBHC

Interestingly, while there is a strong movement to explore VBHC within the biopharmaceutical industry, the in-vitro diagnostics industry lags behind. Pricing remains almost entirely determined by the cost of performing the test in laboratories rather than by the value it brings.[42]

In vitro diagnostics (IVDs) already play a key role in today's healthcare system, influencing over 66% of clinical decision-making, while accounting for only about 2% of total healthcare spending[43]. Unlike treatments that have a direct outcome on patient health, diagnostics have an indirect outcome dependent on the action taken as a result of the test. However, they are a low risk and relatively low cost way to generate critical information to inform diagnosis, treatment and, eventually, outcomes. In this way, they can be a valuable resource for disease prevention, detection and management.

As seen throughout the COVID-19 pandemic, discussion of the "value" of diagnostic tests often revolves around their accuracy and their sensitivity. While these characteristics are critical to understanding the accuracy of the test results, they do nothing to establish the long-term value that using the test will bring to a patient or healthcare system[44,45]. Since tests are never used in isolation, they need to be evaluated on the testing strategy used, and on the quality and accuracy of decision-making by healthcare providers as a result of using the test;[46] including the ultimate impact on the health of patients.



In a value-based model, laboratories and manufacturers providing diagnostic tests will need to demonstrate how their tests can add value. This may mean providing ordering physicians with detailed interpretive comments for test values or helping to develop test ordering protocols to help healthcare providers select the most appropriate tests for a specific patient.[47] Designing protocols to help reduce unnecessary tests may also add value.[48]

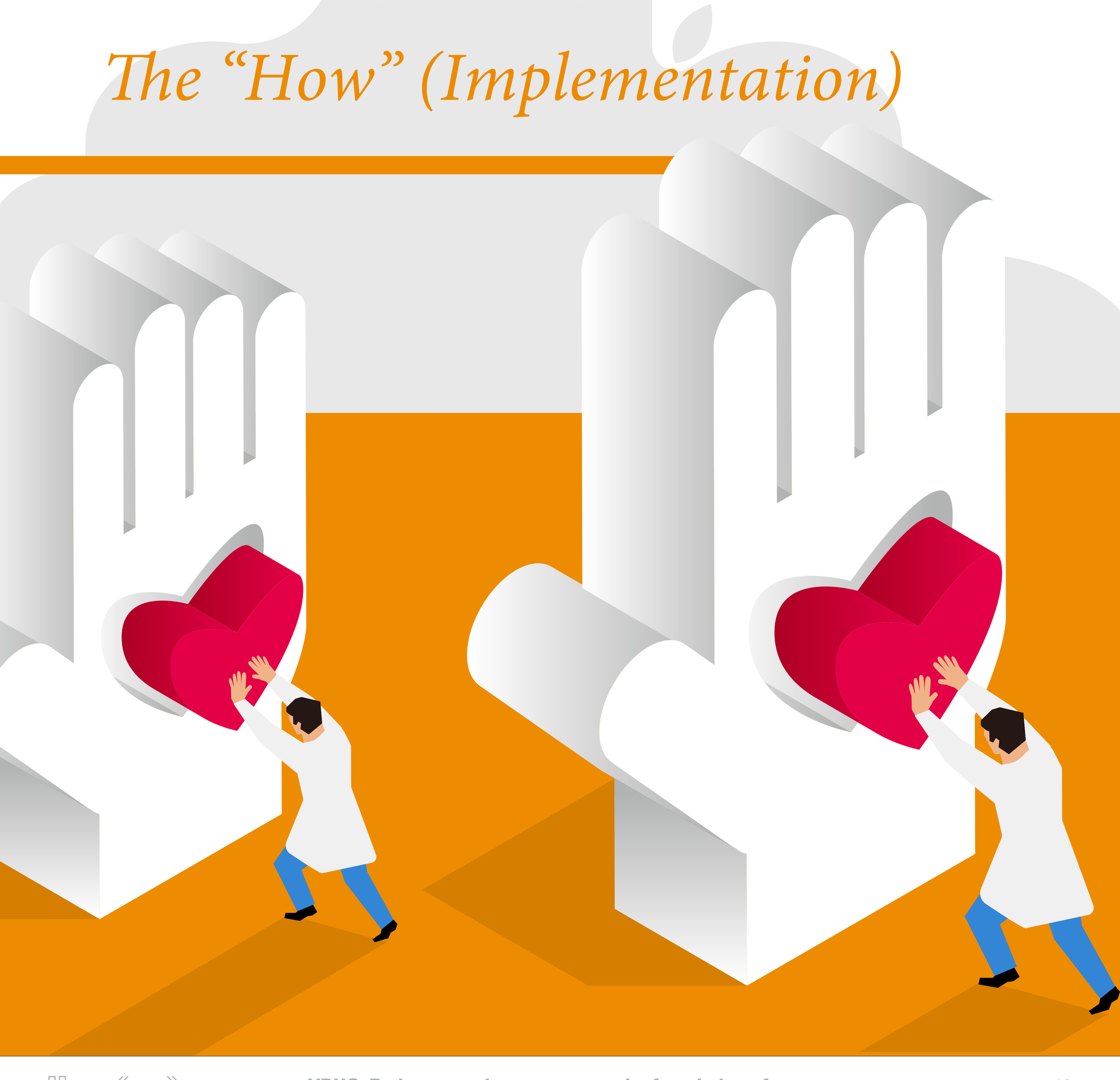
For instance, we know that diagnostic testing can help detect certain diseases at an earlier stage, allowing doctors to take earlier action against them, rather than waiting for more costly, and perhaps less successful, later interventions.[49] A study in Canada showed, for example, that the combined cost of screening individuals at high risk for lung cancer plus the cost of curative treatment was significantly lower than the cost of treating someone with advanced stage disease.[50] Here, we see a marriage of patient outcomes and economic factors coming together to demonstrate the powerful value that a diagnostic test could provide in a value-based system.

KEY TAKEAWAYS:

- Diagnostic tests can play a key role in implementing VBHC solutions as they can provide needed data to improve healthcare decision-making
- Tests are currently not reimbursed with patient value in mind, but rather on a fee-for-service basis, with little incentive for manufacturers to change the status quo
- Measuring the impact of diagnostic tests on ultimate patient outcomes will help better define the value of diagnostic tests to patients

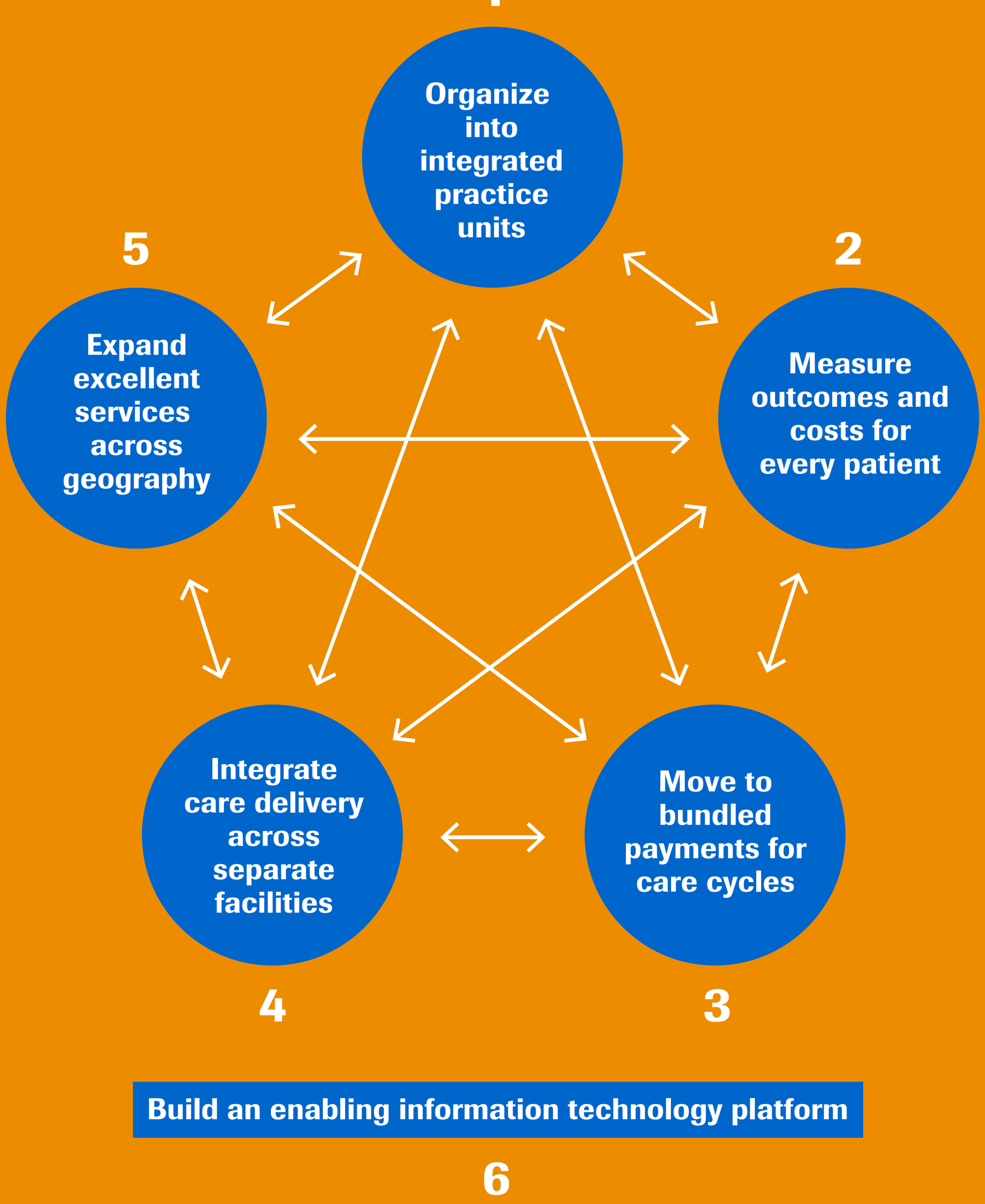
Operational considerations

The "How" (Implementation)



A STRATEGIC FRAMEWORK FOR VBHC IMPLEMENTATION

THE VALUE AGENDA[51]



Michael Porter and Elizabeth Teisberg developed a strategic, six-step framework for the implementation of VBHC called “the Value Agenda”.[51]

1) Organize into integrated practice units:

Any organization attempting to implement a VBHC model must understand the shared health needs of their patients.[52] This sounds obvious but healthcare systems today are generally not built around patient needs (such as “older people with chronic conditions”). Instead they tend to provide a specialty or service, such as a cardiology practice for example.[53] For a diabetes patient in a more traditional healthcare setting faced with a myriad of practitioners tending to their various needs, this translates to the patient being forced to “organize” their care on their own, something for which they are definitely not equipped.[54]

To achieve the comprehensive care required to deliver true VBHC outcomes, care teams must be integrated. Experts from a variety of disciplines need to form multidisciplinary teams that can provide specialized care or consultations.[55] By changing the way their services are organized, healthcare providers would be better able to more effectively and efficiently tend to patients with similar needs.

2) Measure outcomes & costs for every patient:

VBHC requires that outcomes are measured. Since care is grouped by condition or patient type in a VBHC model, teasing out critical outcome measures becomes a reasonable task. For example, important health outcomes for men facing prostate cancer surgery are generally quite similar. These include common impairments from the procedure such as incontinence, impotence, and depression, as well as time away from work for recovery. These dimensions can generally be captured in 3 to 5 measures, and used as a basis for value demonstration and continued improvement.[56]

The International Consortium for Health Outcomes Measurement (ICHOM), established in 2012, has helped to drive the creation of standard outcomes measure sets for 25 conditions. ICHOM standard data sets can be used to create a single, global measurable set of patient outcomes, helping to drive the adoption and reporting of these measures worldwide to create better value for all stakeholders.[57]

Patient reported outcome measures (PROMS) and patient reported experience measures (PREMS) also provide an important source of real-world data on how patients experienced the outcome of their care, and can help quantify whether or not the various health interventions had a demonstrable positive effect on the patient.[58]

3) Move to bundles payments for care cycles:

VBHC organizations need to move away from fee-for-service models towards more outcome-based models aimed to improve care processes, enhance patient experience, and create achievable benchmarks for improved outcomes.[59] With bundled payments, for example, reimbursement models shift toward paying for an entire cycle of care, rather than paying ad-hoc for different services provided to treat the same condition. The objective for this model is to encourage the coordination of care across providers and around the patient to optimize the procedures and services offered. This helps enable the achievement of positive patient outcomes more efficiently.[60,61]

4) Integrate care delivery across separate facilities:

It is imperative to define which care is best delivered at which locations. For example, complex medical conditions that require services such as surgical interventions, chemotherapy, and radiation therapy, should be handled in concentrated locations, driving more volume and expertise for these procedures with the aim to help improve outcomes. At the same time, other facilities can take on more routine services. One key aspect, however, is integration. These centers, with their various specializations, need to be linked together to ensure that outcomes are the same, no matter where a patient is treated.[63]

5) Expand excellent services across geography:

The healthcare system is often faced with people suffering from extremely complex conditions that require expertise and experience to best manage them. It is important in a value-based system to create centers of excellence that can help manage the totality of these complex patient cases.[64]

6) Build an enabling information technology platform:

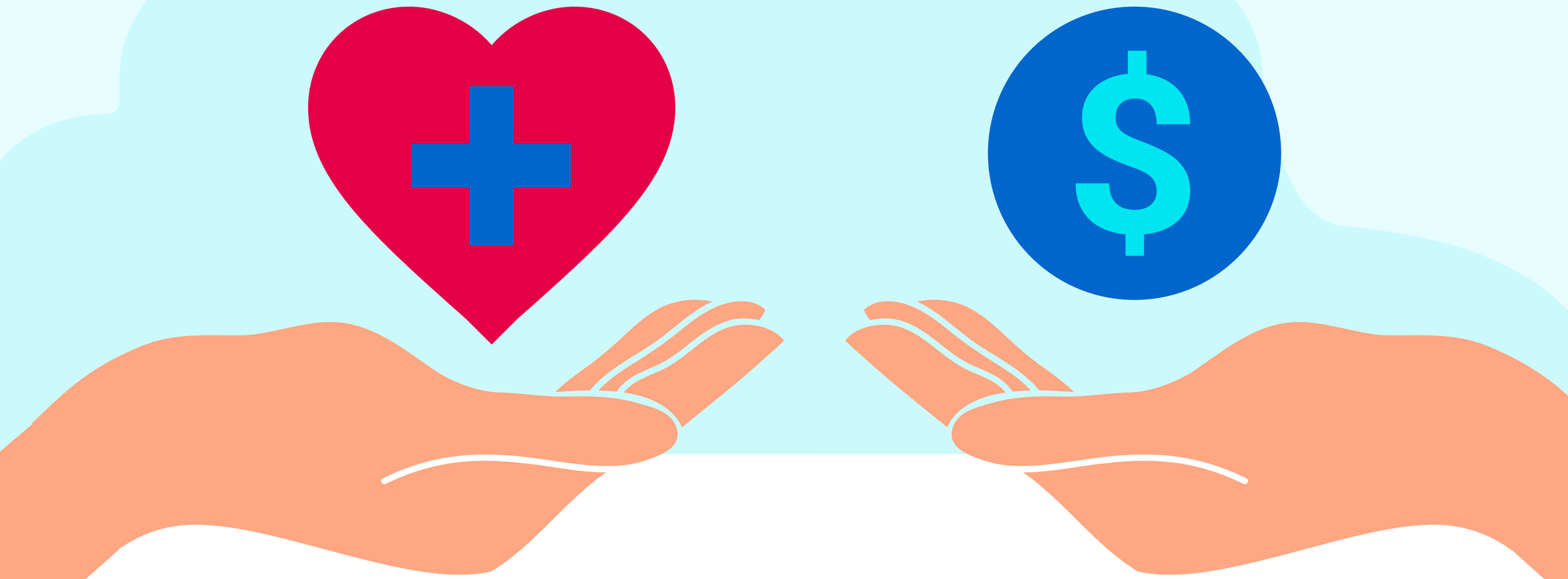
Technology is essential to successfully run a VBHC system. Data exchange needs to be seamless, quick, and reliable in order to ensure that all members of a care team have access to the full patient record along the entire continuum of care. Timely data availability helps guide the right decisions at the right time. Fragmented platforms that are not integrated and interoperable means that carers aren't able to access the EHRs needed to ensure the patient-centric care required.[65]

KEY TAKEAWAYS:

- Outcomes, including patient reported outcomes and experiences, must be measured to determine if value goals are being achieved, and to address any inefficiencies in the system
- To achieve VBHC, healthcare provision must be organized to more effectively and efficiently tend to patients with similar needs, while considering the entire patient journey
- Integrated digital solutions are needed to ensure data is smoothly and efficiently shared across the care teams
- The cost of care must be measured along the entire patient journey, and reimbursement should be aligned with the measurable impact(s) on patient outcome(s), not services provided.

The shift away

from fee-for-service reimbursement models



Under a VBHC scheme, there is the potential for higher quality outcomes and reduced spending over time and across healthcare delivery settings. Current economic models do not agree that higher quality automatically means higher cost.[66] In fact, if we look at computers as an example, they have steadily risen in quality over decades, while real costs have fallen.

How does this translate in healthcare? In the US, for example, about 2.6 million senior citizens are readmitted within 30 days of discharge, at a cost of more than $26 billion.[67] However, if the system were designed to help improve the preventable issues that drive many of these readmissions through an outcomes-based model, the systemic cost savings could be immense.

There are several possible reimbursement models that move away from the traditional fee-for-service models towards more outcome-based models aimed to improve care processes, enhance patient experience, and create achievable benchmarks for improved outcomes[68]

Provider-sponsored health plans: In provider-sponsored health plans (PSHPs), providers assume 100 percent of the risk by directly collecting insurance premiums from members and providing care. In this model, healthcare systems have full power to decide how patients are cared for. However, the cost of that power is significant because providers are essentially taking on the functions, and the risk, of an insurance company. The possible benefits, however, include financial rewards as reimbursement amounts increase, as well as increased market penetration and control over population health management.[69]

Pay-for-performance: Pay-for-performance offers financial incentives to providers for meeting quality of care objectives. This is typically achieved through adjustments to typical fee-for-service pricing. For example, payers may penalize providers who fail to meet performance thresholds.[70] These performance measures are often aligned with adherence to clinical best practices.[71]

Shared savings: This is a step-wise move from the fee-for-service model, where the provider and payer agree on a set of estimated medical costs. Under this model, providers would submit bills and claims as usual in the fee-for-service model, and following care delivery the payer would examine any savings generated. If these fall under the threshold set by the initial agreement, the provider would be eligible to share in a portion of the savings.[72]

Bundled Payments: Bundled payments represent a risk-adjusted payment for a full set of services over the cycle of care for a condition.[73] The price for the total of these services is determined in advance. Within the bundled payment scheme, any losses (as a result of overshooting the target cost) are assumed by the provider. However, they are also the beneficiary of any savings if they can keep costs contained.[74] Bundled payments therefore provide the economic incentive to keep costs down by optimizing the procedures and services offered, while still improving the outcome of the care provided.

The payment is contingent on achieving good condition-specific outcomes, and should be risk adjusted to motivate treating older and sicker patients with that condition.[75] The bundled payment price should also be set to provide a fair margin when the provider delivers effective and efficient care. Under a bundled payment contract, clinical teams have the freedom and accountability to choose the mix of resources and services that contribute most to good patient outcomes.[76]

The potential benefits of bundled payments impact everyone involved in the healthcare cycle. Patients receive better, more comprehensive care. Providers can earn profits by both bringing more patients to their service (via positive outcomes) and by efficiently delivering the care. Biopharmaceutical and diagnostic companies whose products demonstrate improved outcomes and cost savings will be welcomed into these systems. In addition, payers will be able to reduce expenditures as the cost of care goes down, while simultaneously improving care for large populations.[77]

Bundled payments seem poised to remain a commonly used payment method for VBHC[78] because they directly incentivize achieving better patient outcomes at a lower cost.

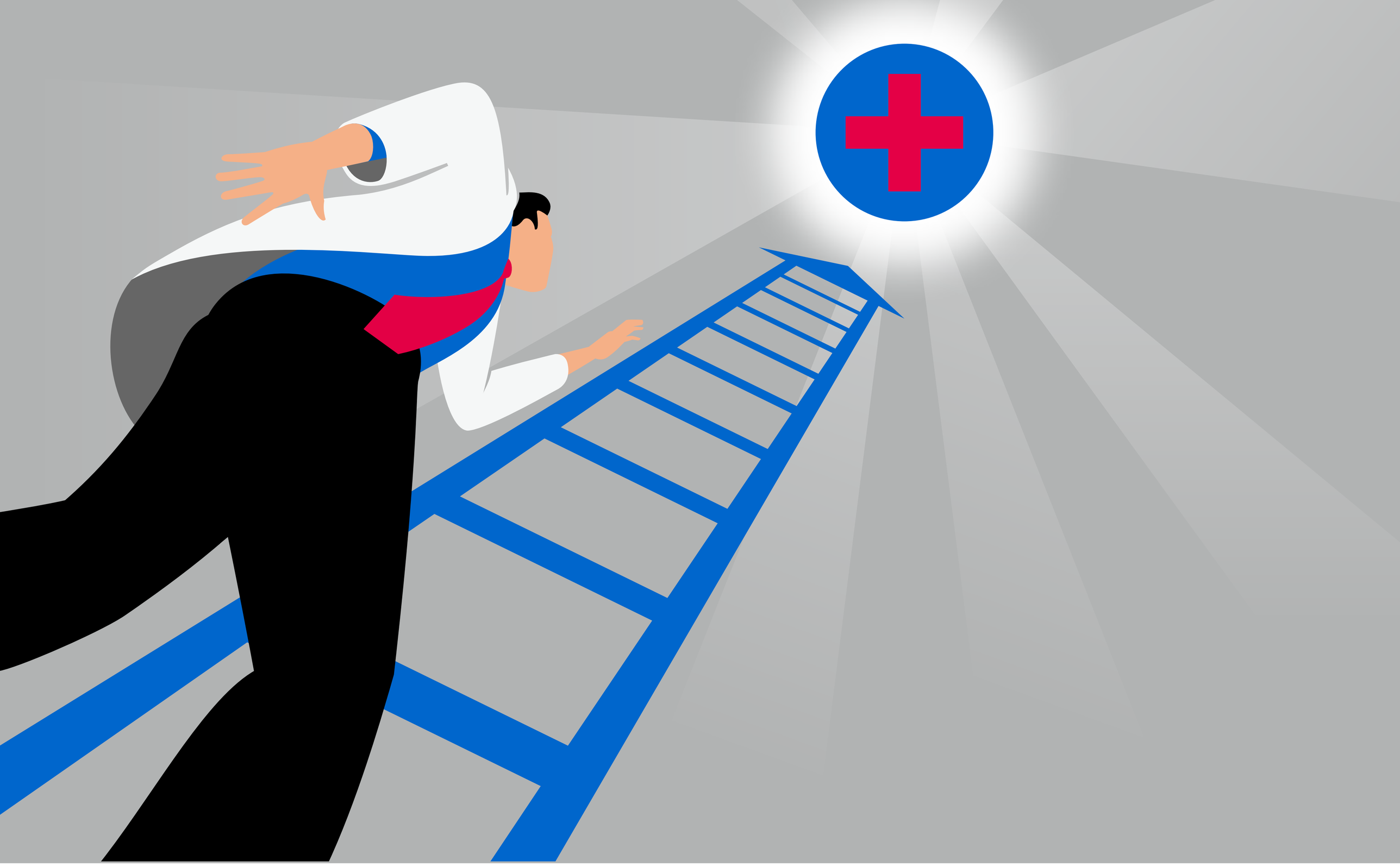
KEY TAKEAWAYS:

- The way healthcare is paid for in a value-based system is fundamentally different than in a fee-for-service system
- Alternative reimbursement models to fee-for-service include the PSHP, pay-for-performance, and shared-risk models
- The seemingly preferred reimbursement model for VBHC is bundled payments, which provide the economic incentive to keep costs down by optimizing services, while improving the outcome(s) of the care provided

Recommendations & Next Steps

What kind of impact can implementing a VBHC model make? While there is no single, national VBHC system in place at the moment, several studies have looked at regional or local attempts at implementing value-based care within differing existing healthcare systems, and their results.

Attempts to quantify the effect of value-based decision making in several examples worldwide showed that both improved outcomes and cost reductions were possible. In the US, the Memorial Healthcare System implemented a value-based model in its cardiac surgery



unit after noting several weaknesses in their current setup. After making a series of changes that aimed to improve outcomes, there were significant positive changes, including lower readmissions, complications and mortality. At the same time, the costs and length of hospital stay declined.[79]

Likewise, a retrospective study looked at the impact of value-based quality improvements for patients undergoing microvascular decompression. Comparing groups treated prior to quality interventions, the patients treated after these outcomes-based measures were implemented saw their outcomes improve, while costs declined 25%.[80]

Given these examples, and many more from diverse health systems around the world, establishing value-based care is not an unattainable utopia, but a realistic goal. However, it requires a clear framework to achieve, as outlined above.

According to Christina Åkerman, Affiliate Faculty at Dell Medical School, University of Texas at Austin, a physician and expert on VBHC, there are several steps that healthcare providers should be taking today to prepare for a VBHC future:[81]

1. Start focusing on the outcomes that matter most to patients with a specific medical condition or in a specific segment. Make sure your organization has this focus.

2. Standardize outcomes to know what to measure with what survey and at what time points. Make sure your entire organization is involved and educated on the transformation journey.

3. Invest in interoperable IT systems to capture the outcomes. Benchmark your results internally/externally and establish learning communities to share and learn.

4. Make sure that incentives and reimbursement are set up based on the outcomes.

Closing

Global healthcare faces a glaring contradiction: rising costs that do not consistently equate to better quality care. Reconciling the disconnect between healthcare spend and outcomes that matter most to patients means that we have to reexamine the lens through which our healthcare systems are built.

More and more, this means putting the patient and their health outcomes front and center. A VBHC model could provide the solution by improving patient outcomes throughout the continuum of care, while optimizing costs and resources.

Now is the time for all healthcare stakeholders – patients, providers, payers – to work together to make the shift towards VBHC. Now is the time to think about the value your organization offers to improve the outcomes for patients and to start asking patients, “what matters to you?”

As with any long-term and meaningful change, there will be challenges. Yet, through collaboration and shared learnings and best practice examples, the journey towards VBHC becomes achievable.

References

1. Kamal, R et al. (2020). How has U.S. spending on healthcare changed over time? Article available at https://www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time/#item-usspendingovertime_3 [Accessed May 2021]
2. World Health Organization. (2019) Global Spending on Health: A World in Transition. Page ix. Report available at https://www.who.int/health_financing/documents/health-expenditure-report-2019.pdf?ua=1 [Accessed May 2021]
3. World Health Organization. (2019) Global Spending on Health: A World in Transition. Page ix. Report available at https://www.who.int/health_financing/documents/health-expenditure-report-2019.pdf?ua=1 [Accessed May 2021]
4. Ehrbeck, T et al. (2010). McKinsey and Co. The Emerging Market in Health Innovation. Article available at https://healthcare.mckinsey.com/emerging-market-healthcare-innovation [Accessed May 2021]
5. Krishna Kumar, R. (2011) Ann Pediatr Cardiol. 2011 Jan-Jun; 4(1): 84–86. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3104544/ [Accessed May 2021]
6. Grande, R. (2020). 5 reasons Why Healthcare Costs are Rising. Available online at https://blog.definitivehc.com/5-reasons-why-healthcare-costs-are-rising [Accessed May 2021]
7. Grande, R. (2020). 5 reasons Why Healthcare Costs are Rising. Available online at https://blog.definitivehc.com/5-reasons-why-healthcare-costs-are-rising [Accessed May 2021]
8. OECD. (2017) Tackling Wasteful Spending on Health. Page 5. Report available at https://read.oecd-ilibrary.org/social-issues-migration-health/tackling-wasteful-spending-on-health_9789264266414-en#page5 [Accessed May 2021]
9. OECD. (2017) Tackling Wasteful Spending on Health. Page 13. Report available at https://read.oecd-ilibrary.org/social-issues-migration-health/tackling-wasteful-spending-on-health_9789264266414-en#page13 [Accessed May 2021]
10. EIT Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz. (2020) Available at https://eithealth.eu/wp-content/uploads/2020/06/Implementing-Value-Based-Healthcare-In-Europe.pdf [Accessed May 2021]
11. Lorenzoni, L et al. (2013). OECD Health-care expenditure and health policy in the USA versus other high-spending OECD countries. Available at https://www.oecd.org/unitedstates/health-in-united-states.htm [Accessed May 2021]
12. Tikkanen R et al. (2020) The Commonwealth Fund. U.S. Health Care from a Global Perspective, 2019: Higher Spending, Worse Outcomes? Available at https://www.commonwealthfund.org/publications/issue-briefs/2020/jan/us-health-care-global-perspective-2019 [Accessed May 2021]
13. Nixon J et al. (2006) The Relationship between Health Care Expenditure and Health Outcomes. The European Journal of Health Economics 7(1):7-18 Available at https://www.researchgate.net/publication/7344171_The_Relationship_between_Health_Care_Expenditure_and_Health_Outcomes [Accessed May 2021]
14. Gamble J-M et al. (2011). Circ Heart Fail. 2011 May;4(3):317-23. Available at https://pubmed.ncbi.nlm.nih.gov/21430285/ [Accessed May 2021]
15. ICHOM. Website available at https://www.ichom.org/why-measure-outcomes/ [Accessed May 2021]
16. Porter ME, Teisberg EO. (2006). Redefining Health Care: Creating Value-Based Competition on Results. Boston: Harvard Business School Press. Available at https://books.google.ch/books?hl=en&lr=&id=Kp5fCkAzzS8C&oi=fnd&pg=PR10&dq=Porter+ME,+Teisberg+EO.+Redefining+Health+Care:+Creating+Value-Based+Competition+on+Results.+Boston:+Harvard+Business+School+Press%3B+2006.&ots=V-sbLchsgy&sig=Z7aAUS-1GhdyASRnBTe-BhanBfc&redir_esc=y#v=onepage&q&f=false [Accessed May 2021]
17. Porter ME, Teisberg EO. (2006). Redefining Health Care: Creating Value-Based Competition on Results. Boston: Harvard Business School Press. Available at https://books.google.ch/books?hl=en&lr=&id=Kp5fCkAzzS8C&oi=fnd&pg=PR10&dq=Porter+ME,+Teisberg+EO.+Redefining+Health+Care:+Creating+Value-Based+Competition+on+Results.+Boston:+Harvard+Business+School+Press%3B+2006.&ots=V-sbLchsgy&sig=Z7aAUS-1GhdyASRnBTe-BhanBfc&redir_esc=y#v=onepage&q&f=false [Accessed May 2021]
18. NEJM Catalyst (2017). What Is Value-Based Healthcare? Article available at https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0558 [Accessed May 2021]
19. Akerman, C. (2020). Healthcare Transformers. Value-based health care: Why patient outcomes are the true north to achieve high-value care. Article available at https://healthcaretransformers.com/patient-experience/value-based-healthcare-delivery/ [Accessed May 2021]
20. Akerman, C. (2020). Healthcare Transformers. Value-based health care: Why patient outcomes are the true north to achieve high-value care. Article available at https://healthcaretransformers.com/patient-experience/value-based-healthcare-delivery/ [Accessed May 2021]
21. AJMC. (2021). Precision Medicine Could Yield Significant Cost Savings in RA Treatment. Article available at https://www.ajmc.com/view/precision-medicine-could-yield-significant-cost-savings-in-ra-treatment [Accessed May 2021]
22. Wilsdon, T et al.(2018). The benefits of personalised medicine to patients, society and healthcare systems. Report available at https://www.ebe-biopharma.eu/wp-content/uploads/2018/07/CRA-EBE-EFPIA-Benefits-of-PM-Final-Report-6-July-2018-STC.pdf [Accessed May 2021]
23. Johnson & Johnson. (2020). Website available at https://www.jnj.ch/our-businesses/what-is-value-based-healthcare [Accessed May 2021]
24. Deerberg-Wittram, J et al. (2016). Diabeter Value-based Healthcare Delivery in Diabetes. Report available at https://diabeter.nl/media/cms_page_media/130/Value%20Based%20Healthcare%20Diabeter%20White%20Paper.pdf [Accessed May 2021]
25. Deerberg-Wittram, J et al. (2016). Diabeter Value-based Healthcare Delivery in Diabetes. Report available at https://diabeter.nl/media/cms_page_media/130/Value%20Based%20Healthcare%20Diabeter%20White%20Paper.pdf [Accessed May 2021]
26. Deerberg-Wittram, J et al. (2016). Diabeter Value-based Healthcare Delivery in Diabetes. Report available at https://diabeter.nl/media/cms_page_media/130/Value%20Based%20Healthcare%20Diabeter%20White%20Paper.pdf [Accessed May 2021]
27. Teisberg, E et al. (2020) Academic Medicine: Volume 95 - Issue 5 - p 682-685. Available at https://journals.lww.com/academicmedicine/Fulltext/2020/05000/Defining_and_Implementing_V%20alue_Based_Health_Care_.14.aspx [Accessed May 2021]
28. Pifer, R. (2020). Healthcare Dive. Threat of financial loss main barrier to value-based model adoption: exec poll. Article available at https://www.healthcaredive.com/news/threat-of-financial-loss-main-barrier-to-value-based-model-adoption-exec-p/583800/ [Accessed May 2021]

References

29. Pifer, R. (2020). Healthcare Dive. Threat of financial loss main barrier to value-based model adoption: exec poll. Article available at https://www.healthcaredive.com/news/threat-of-financial-loss-main-barrier-to-value-based-model-adoption-exec-p/583800/ [Accessed May 2021]

30. Lapointe, J. (2020). Recycle Intelligence. Entering the Next Phase of Value-Based Care, Payment Reform. Article available at https://revcycleintelligence.com/features/entering-the-next-phase-of-value-based-care-payment-reform [Accessed May 2021]

31. Lapointe, J. (2020). Recycle Intelligence. Entering the Next Phase of Value-Based Care, Payment Reform. Article available at https://revcycleintelligence.com/features/entering-the-next-phase-of-value-based-care-payment-reform [Accessed May 2021]

32. ICHOM. Website available at https://www.ichom.org/why-measure-outcomes/ [Accessed May 2021]

33. Levy, V. (2020). Deloitte. Future for Value-based Healthcare. Article available at https://www2.deloitte.com/ch/en/pages/life-sciences-and-healthcare/articles/future-for-value-based-healthcare.html [Accessed May 2021]

34. Kaplan, R and Porter, M. (2011). Harvard Business Review. Article available at https://hbr.org/2011/09/how-to-solve-the-cost-crisis-in-health-care [Accessed May 2021]

35. Kaplan, R and Porter, M. (2011). Harvard Business Review. Article available at https://hbr.org/2011/09/how-to-solve-the-cost-crisis-in-health-care [Accessed May 2021]

36. The Economist Intelligence Unit (2016). Value-based healthcare: A global assessment. Report available at https://eiuperspectives.economist.com/sites/default/files/EIU_Medtronic_Findings-and-Methodology_1.pdf [Accessed May 2021]

37. Executive Insight (2019). Value-based healthcare: Time to get on board! Article available at https://www.executiveinsight.ch/en/insights/publications/value-based-healthcare-time-get-board [Accessed May 2021]

38. The Economist Intelligence Unit (2019). Value-based healthcare in Sweden: Reaching the next level. Report available at https://eiuperspectives.economist.com/sites/default/files/value-basedhealthcareinswedenreachingthenextlevel.pdf [Accessed May 2021]

39. The Economist Intelligence Unit (2019). Value-based healthcare in Sweden: Reaching the next level. Report available at https://eiuperspectives.economist.com/sites/default/files/value-basedhealthcareinswedenreachingthenextlevel.pdf [Accessed May 2021]

40. Boston Consulting Group. (2018). How Dutch Hospitals Make Value-Based Health Care Work. Article available at https://www.bcg.com/publications/2018/how-dutch-hospitals-make-value-based-health-care-work [Accessed May 2021]

41. Boston Consulting Group. (2018). How Dutch Hospitals Make Value-Based Health Care Work. Article available at https://www.bcg.com/publications/2018/how-dutch-hospitals-make-value-based-health-care-work [Accessed May 2021]

42. Executive Insight. Does Value Based Pricing have a role in diagnostics? Report available at https://www.executiveinsight.ch/en/insights/does-value-based-pricing-have-role-diagnostics [Accessed May 2021]

43. Rohr, U et al. (2016) PLoS One. 11(3): e0149856

44. Lord, S et al. (2006). Annals of Internal Medicine. Volume 144, Issue 11. Page: 850-855 Available at https://www.acpjournals.org/doi/10.7326/0003-4819-144-11-200606060-00011 [Accessed May 2021]

45. Akhmetov, I et al. (2015). EPMA Journal volume 6, Article number: 19. Available at https://link.springer.com/article/10.1186/s13167-015-0041-3 [Accessed May 2021]

46. Ferrante di Ruffano, L et al. (2012). BMJ 2012;344:e686. Available at https://www.bmj.com/content/344/bmj.e686 [Accessed May 2021]

47. AACC (2017). Position statement available at https://www.aacc.org/advocacy-and-outreach/position-statements/2017/advancing-value-based-healthcare-laboratory-medicines-essential-role [Accessed May 2021]

48. Paxton, A. (2018). CAP Today. Clin Lab 2.0: Add value, make patients better. Article available at https://www.captodayonline.com/clin-lab-2-0-add-value-make-patients-better-2/ [Accessed May 2021]

49. Rohr, U et al. (2016) PLoS One. 11(3): e0149856

50. Cressman, S et al. (2017). Journal of Thoracic Oncology Volume 12, Issue 8, Pages 1210-1222. Available at https://www.sciencedirect.com/science/article/pii/S1556086417303544 [Accessed May 2021]

51. Harvard Business School, Institute for Strategy and Competitiveness. (2019). Available at https://www.isc.hbs.edu/health-care/value-based-health-care/Pages/default.aspx [Accessed May 2021]

52. Teisberg, E et al. (2020). Acad Med. 95(5): 682–685. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185050/ [Accessed May 2021]

53. Teisberg, E et al. (2020). Acad Med. 95(5): 682–685. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185050/ [Accessed May 2021]

54. Teisberg, E et al. (2020). Acad Med. 95(5): 682–685. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185050/ [Accessed May 2021]

55. Teisberg, E et al. (2020). Acad Med. 95(5): 682–685. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185050/ [Accessed May 2021]

56. Teisberg, E et al. (2020). Acad Med. 95(5): 682–685. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185050/ [Accessed May 2021]

57. ICHOM. Website available at https://www.ichom.org/mission/ [Accessed May 2021]

58. Baumhauer, J et al. (2016). Value-based Healthcare: Patient-reported Outcomes in Clinical Decision Making. Clin Orthop Relat Res 474, 1375–1378. Available at https://link.springer.com/article/10.1007/s11999-016-4813-4 [Accessed May 2021]

59. Conrad, D. (2015). Health Serv Res. 50 Suppl 2(Suppl 2):2057-89 Available at https://pubmed.ncbi.nlm.nih.gov/26549041/ [Accessed May 2021]

60. Duke Fuqua School of Business. Healthcare Analytics Articles (2021). Value-Based Healthcare and the Role of Health Analytics. Article available at https://www.fuqua.duke.edu/programs/msqm-health-analytics/articles/value-based-healthcare-and-health-analytics/ [Accessed May 2021]

61. Porter, M (2009). n engl j med 361;2. Available at https://vbidcenter.org/wp-content/uploads/2014/11/A-Strategy-for-Health-Care-Reform-Towardd-a-Value-Based-System_NEJM_2009.pdf [Accessed May 2021]

62. Harvard Business School, Institute for Strategy and Competitiveness. (2019). Available at https://www.isc.hbs.edu/health-care/value-based-health-care/key-concepts/Pages/systems-integration.aspx [Accessed May 2021]

63. Harvard Business School, Institute for Strategy and Competitiveness. (2019). Available at https://www.isc.hbs.edu/health-care/value-based-health-care/key-concepts/Pages/systems-integration.aspx [Accessed May 2021]

64. Mjåset, C et al. (2020). NEJM Catalyst. Article available at https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0530 [Accessed May 2021]

65. Mjåset, C et al. (2020). NEJM Catalyst. Article available at https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0530 [Accessed May 2021]

References

66. Beaulieu, N et al. (2016). Health Affairs Blog. The Economics Of Paying For Value. Article available at https://www.healthaffairs.org/do/10.1377/hblog20160315.053935/full/ [Accessed May 2021]

67. Sebelius, K. (2013). Health Affairs Blog. Following The ACA. The Affordable Care Act At Three: Paying For Quality Saves Health Care Dollars. Available at https://www.healthaffairs.org/do/10.1377/hblog20130320.029408/full/ [Accessed May 2021]

68. Conrad, D. (2015). Health Serv Res. 50 Suppl 2(Suppl 2):2057-89 Available at https://pubmed.ncbi.nlm.nih.gov/26549041/ [Accessed May 2021]

69. Winfield, L. (2018). Healthcare Financial Management Association. Provider-Sponsored Health Plans: Cautions and Opportunities. Article available at https://www.hfma.org/topics/hfm/2018/april/60249.html [Accessed May 2021]

70. Duke Fuqua School of Business. Healthcare Analytics Articles (2021). Value-Based Healthcare and the Role of Health Analytics. Article available at https://www.fuqua.duke.edu/programs/msqm-health-analytics/articles/value-based-healthcare-and-health-analytics/ [Accessed May 2021]

71. James, J. (2012). Health Affairs. Health Policy Brief, Pay-for-Performance. Available at https://www.healthaffairs.org/do/10.1377/hpb20121011.90233/full/ [Accessed May 2021]

72. Gerhardt, W et al. (2015). Deloitte University Press. The road to value-based care: Your mileage may vary. Report available at https://www2.deloitte.com/content/dam/insights/us/articles/value-based-care-market-shift/DUP-1063_Value-based-care_vFINAL_5.11.15.pdf [Accessed May 2021]

73. Harvard Business School, Institute for Strategy and Competitiveness. (2019). Available at https://www.isc.hbs.edu/health-care/value-based-health-care/key-concepts/Pages/aligning-reimbursement-with-value.aspx [Accessed May 2021]

74. NEJM Catalyst (2018). Innovations in Care Delivery. Brief Article: What Are Bundled Payments? Available at https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0247 [Accessed May 2021]

75. Akerman, C (2021). Healthcare Transformers. Transforming towards VBHC and improving patient outcomes. Article available at https://healthcaretransformers.com/healthcare-business/vbhc-patient-outcomes/ [Accessed May 2021]

76. Kaplan, R et al. (2018). Voices on Value. Available at https://www.isc.hbs.edu/Documents/pdf/Voices-on-Value-Harvard-Business-School-Issue%201.pdf [Accessed May 2021]

77. Harvard Business School, Institute for Strategy and Competitiveness. (2019). Available at https://www.isc.hbs.edu/health-care/value-based-health-care/key-concepts/Pages/aligning-reimbursement-with-value.aspx [Accessed May 2021]

78. NEJM Catalyst (2018). Innovations in Care Delivery. Brief Article: What Are Bundled Payments? Available at https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0247 [Accessed May 2021]

79. Kirkpatrick, J et al. (2015). Southern surgical association article, Volume 220, ISSUE 4, P461-468. Available at https://www.journalacs.org/article/S1072-7515(15)00004-6/fulltext [Accessed May 2021]

80. McLaughlin, N. (2014). Journal of Neurosurgery. Volume 121: Issue 3: Pages 501-768. Article available at https://thejns.org/view/journals/j-neurosurg/121/3/article-p700.xml [Accessed May 2021]

81. Akerman, C. (2020). Healthcare Transformers. Value-based health care: Why patient outcomes are the true north to achieve high-value care. Article available at https://healthcaretransformers.com/patient-experience/value-based-healthcare-delivery/ [Accessed May 2021]

Published by
Roche Diagnostics International Ltd
6343 Rotkreuz
Switzerland

www.healthcaretransformers.com
www.roche.com