UNIVERSITY OF SAO PAULO
SCHOOL OF ECONOMICS, BUSINESS AND ACCOUNTING

Value-Based Health Care in Brazil: a provider perspective

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Sao Paulo
2020

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Value-Based Health Care in Brazil: a provider perspective

Thesis submitted to University of Sao Paulo, School of Economics, Business and Accounting as a graduation requirement for the Bachelor degree in Business Administration.

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Sao Paulo
2020

"Every hospital should follow every patient it treats, long enough to determine whether or not the treatment has been successful, and then to inquire, 'if not, why not' with a view to preventing similar failure in the future."

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ABSTRACT

NOBREGA, Lucas. **Value-Based Health Care in Brasil: a provider perspective.** Senior Thesis (Bachelor of Business Administration) - School of Economics, Business and Accounting. University of Sao Paulo. Sao Paulo. 2020.

This study aims to analyse what is the provider perspective on value-based health care in Brazil. Our objectives are: to assess providers' understanding of what value-based health care is, to understand how they are measuring it, to learn how they are implementing it, and to discover the challenges they are facing. The theoretical basis for this study relates to: 1. the definition of a value equation, that consider health outcomes that matter to patients over the cost of delivering the outcomes, 2. the establishment of Standard Sets that make benchmarking possible; and 3. an agenda with steps for implementation. The methodology used was a case study research on leading hospitals in Sao Paulo. Data was collected in semi-structured interviews with an established questionnaire with seven questions. As an exploratory interview, we interviewed four senior leaders from four different hospitals, asking them about their perspective on concepts and execution of value-based health care. The results show that these leading providers define value according to international literature, that they are dedicating time and energy to improve value measurements in their hospitals and that they are moving forward despite enormous challenges faced in this journey. We conclude with an optimistic view: the future landscape of health care delivery in Brazil seems to be full of opportunities and bent towards value.

Keywords: Value-Based Health Care. Outcome Measurements. Standard Sets.

SUMMARY

1. INTRODUCTION

Value-based health care is transforming health care around the globe. In Brazil, the value agenda is recently getting attention from health care providers, payers and health workers.

The Brazilian healthcare system represents 8% of GDP, divided between the public universal health care (3,8% of GDP) and the private sector (4,2% of GDP). The Brazilian GDP grows at a slower pace than healthcare costs (BRASIL, 2018). The universal healthcare system is called "Sistema Único de Saude" (SUS), and 75,9% of Brazilian depend exclusively on its services. The private health sector provides care to 24,1% of the population, most of them receive care through their employer's health plan contracts (AGÊNCIA NACIONAL DE SAÚDE SUPLEMENTAR, 2020).

In the USA, the government drives innovation in health care delivery through the Centers for Medicare & Medicaid Services (CMS), demanding new approaches and establishing the standard for payments and value-based health care delivery. In Brazil, currently there is no "CMS like" institution driving innovation. In this regard, new forms of care delivery depend on the initiative from providers and payers.

There are a myriad of different forms to deliver value-based health care, which may pose challenges on how to contract, implement and measure value. In order to implement new ways to deliver care, payers and providers should be prone to innovation and risk, as first movers in the value agenda.

In this study we have interviewed senior leadership from private hospitals in Brazil to map their willingness to invest in a new stream of revenue based in value-based health care. We accessed their understanding of what value-based health care is and how they are implementing it. In this study we did not assess how they are getting paid for it, due to its early stage development in Brazil.

1.1 OBJECTIVE

The objective of this study is to access value-based health care in the lenses of senior hospital leadership in Brazil, especially regarding:

i. their current understanding of value-based health care;
ii. their willingness on how to measure value in health care;
iii. their actions on how to implement it;
iv. and challenges they are facing in transitioning to a healthcare system based in value.

1.2 RELEVANCE

Costs in health care tend to increase at a rate higher than GDP in most countries posing challenges to its sustainability. Cost containment measures per se, however, risk the quality and access to the health care services provided.

In order to promote efficiency in the healthcare system, competition on value promises better outcomes with diminished expenses. The reengineering of a health care system around the patient's health outcomes, over the full cycle of care, and adjusted per cost of delivering the outcomes is a framework to the creation of a sustainable healthcare system.

In the following chapters you will find:

- **Chapter 1:** an introduction to the subject;
- **Chapter 2:** the fundamentals of value-based health care, with a brief description of the concepts and definitions based on the literature;
- **Chapter 3:** the methods used in the interviews and data collection;
- **Chapter 4:** the results obtained;
- **Chapter 5:** a brief discussion on the results from the interviews;
- **Chapter 6:** some conclusions and insights that can be drawn from this work;
- **Chapter 7:** references from the literature used in this study;
- **Chapter 8:** an appendix with the materials used in the interviews and the complete translated transcription of each interview.

2. FUNDAMENTALS

We will start this chapter introducing value-based health care according to the definition found in the literature. After that we will introduce ways to measure value in health care, examples of implementation in an organization and the importance of senior leadership in the execution of value-based health care. We will finish presenting the current interest on and challenges in value-based health care in Brazil.

2.1 DEFINITION - WHAT VALUE IN HEALTH CARE IS

2.1.1 PORTER - TEISBERG DEFINITION OF VALUE

Michael Porter defined value in health care for the medical community in his 2010 perspective article in the New England Journal of Medicine entitled "What is value in health care?":

> "value [is] defined as the health outcomes achieved per dollar spent."
> (PORTER, 2010)

This definition is based on his book co-authored with Elizabeth Olmsted Teisberg "Redefining Health Care: Creating Value-Based Competition on Results". In this book they defended that health care should be transformed to a value-based competition on results, in which all health care players can benefit. The Figure 1 shows the eight principles for a value-based competition according to the authors.

Figure 1
Reference: (PORTER, 2006)

According to Porter and Teisberg (2006):

> "The right objective for health care is to increase value for patients, which is the quality of patient outcomes relative to the dollars expended. Minimizing costs is simply the wrong goal, and will lead to counterproductive results. Eliminating waste and unnecessary services is beneficial, but cost savings must arise from true efficiencies, not from cost shifting, restricting care (rationing), or reducing quality. Every policy and practice in health care must be tested against the objective of patient value." (PORTER; TEISBERG, 2006)

From this perspective we can identify a change in focus from the provider and payer of care to its recipient, the patient, who is the central part in value-based health care. The overarching goal of health care delivery becomes achieving high value for the patient over the full circle of care.

> "Value - neither an abstract ideal nor a code word for cost reduction - should define the framework for performance improvement in health care. Rigorous, disciplined measurement and improvement of value is the best way to drive system progress. Yet value in health care remains largely unmeasured and misunderstood." (PORTER, 2010)

Value considered as the patients' outcomes per dollar spent over the full circle of care can be analyzed as an equation:

> "Outcomes, the numerator of the value equation, are inherently condition-specific and multidimensional. For any medical condition, no single outcome captures the results of care. Cost, the equation's denominator, refers to the total costs of the full cycle of care for the patient's medical condition, not the cost of individual services. To reduce cost, the best approach is often to spend more on some services to reduce the need for others" (PORTER, 2010)

The concept that outcomes should be condition specific and multidimensional over the circle of care adds a longitudinal approach to care in which payers and providers should address and measure care over time. It transforms the business of care and the calculation of the return on investment from the traditional fee-for-service payment model to a value-based model.

In the fee-for-service payment the health care provider is paid according to each particular service provided, essentially being rewarded by the volume and quantity of services, regardless the outcomes (HEALTH INSURANCE, 2020). This system makes it easier to calculate the return on investment for each service provided based on the billing from the payers compared to the costs of the service. However, this payment system brings inefficiencies and diverges from value for the patient:

> "Fee-for-service payment encourages over-servicing for those who can afford to pay or whose costs are met from pooled funds (e.g. taxes and insurance), and underservicing for those who cannot pay" (WHO – WORLD HEALTH ORGANIZATION, 2010)

Value-based payments on the other hand challenges the way we measure patient outcomes and costs over the full circle of care. Providers must transform their billing and costs systems from departments and billing units in order to measure them longitudinally over the full care circle over which value is provided to each patient. Yet challenging to measure and implement, value-based health care drives competition and services to the right direction, to the value for the patient.

2.1.2 DONABEDIAN FRAMEWORK

Avedis Donabedian developed a framework to quality assessment in health care based on a triad of structure, process and outcome (AYAIAN; MARKEL, 2016):

> "Structure —Structure denotes the attributes of the settings in which care occurs. This includes the attributes of material resources (such as facilities, equipment, and money), of human resources (such as the number and qualifications of personnel), and of organizational structure (such as medical staff organization, methods of peer review, and methods of reimbursement).
> Process —Process denotes what is actually done in giving and receiving care. It includes the patient's activities in seeking care and carrying it out as well as the practitioner's activities in making a diagnosis and recommending or implementing treatment.
> Outcome —Outcome denotes the effects of care on the health status of patients and populations. Improvements in the patient's knowledge and salutary changes in the patient's behavior are included under a broad definition of health status, and so is the degree of the patient's satisfaction with care." (DONABEDIAN, 1988)

Donabedian describes an interrelationship between the elements in his triad:

> "This three-part approach to quality assessment is possible only because good structure increases the likelihood of good process, and good process increases the likelihood of a good outcome. It is necessary, therefore, to have established such a relationship before any particular component of structure, process, or outcome can be used to assess quality. The activity of quality assessment is not itself designed to establish the presence of these relationships. There must be preexisting knowledge of the linkage between structure and process, and between process and outcome, before quality assessment can be undertaken." (DONABEDIAN, 1988)

Donabedian described a broader approach to quality measurement beyond the management of the disease, which incorporated assessments of prevention, diagnosis, rehabilitation, coordination, patient-doctor relationship, economic efficiency and societal

values (DONABEDIAN, 1988) This broader approach is seen in Figure 2, which shows "levels at which quality may be assessed"

Figure 2

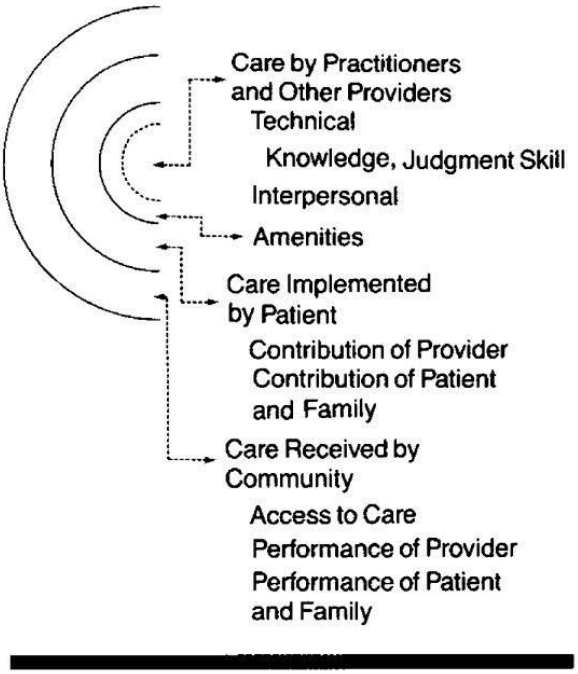


Fig 1.—Levels at which quality may be assessed.

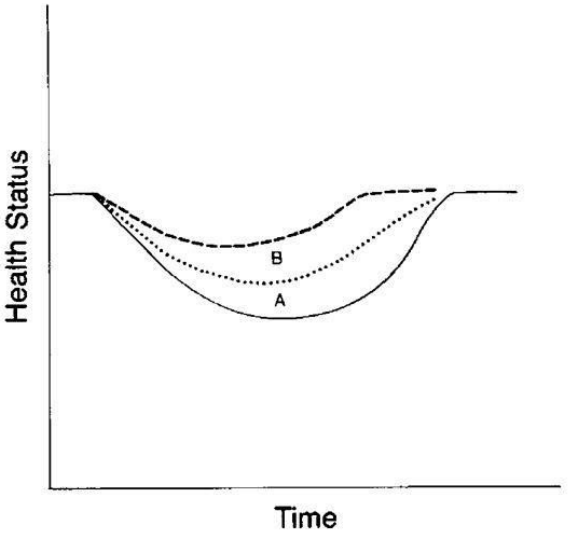


Fig 2.—Graphical presentation of effectiveness (in a self-limiting disease). Solid line indicates course of illness without care; dotted line, course of illness with care to be assessed; and dashed line, course of illness with "best" care. Effectiveness equals A/(A + B).

Reference: (DONABEDIAN, 1988)

In Figure 2 above it is shown a graphical representation of effectiveness, which is evaluated through the patient health status over time, showing the importance of the provision of the "best" care available.

This framework used by Donabedian can be considered the basis for the focus on patient-centered outcomes and value-based health care (AYAIAN; MARKEL, 2016).

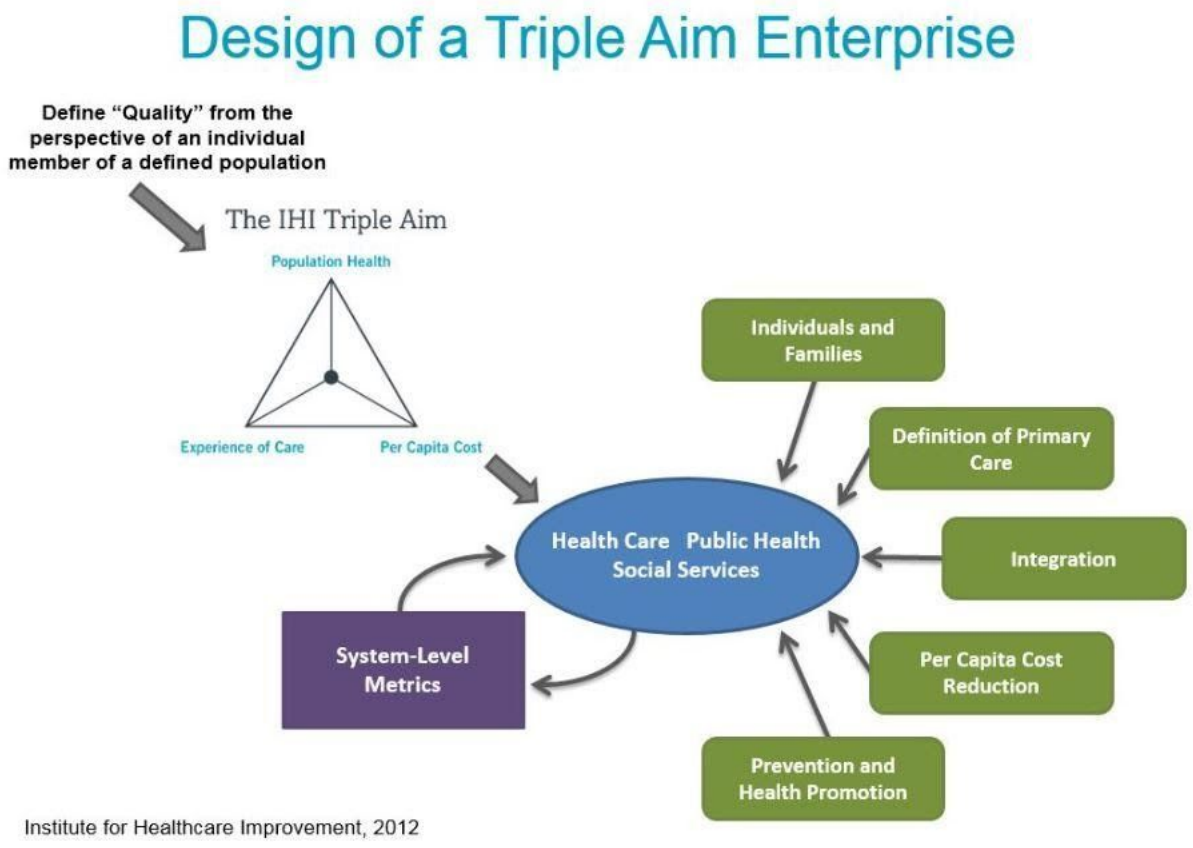
2.1.3 THOMAS W. NOLAN AND JOHN WHITTINGTON - IHI TRIPLE AIM DEFINITION

Thomas W. Nolan and John Whittington, members of Institute for Health Care Improvement (IHI) faculty defined a framework for organizations and communities to optimize health for individuals and populations known as Triple Aims: improving the experience of care, improving the health of populations, and reducing per capita costs of health care (BERWICK; NOLAN; WHITTINGTON, 2008).

Nolan and Whittington IHI framework considered the Triple Aims as interdependent goals. Achieving the triple aim is an exercise of balance subject to specified policy constraints (e.g. promise of equity), a constant pursuit to avoid the conflict of interest between the rational common interest and the individual interests (BERWICK; NOLAN; WHITTINGTON, 2008).

In Figure 3 there is the triple aim framework as it is applied to an enterprise:

Figure 3

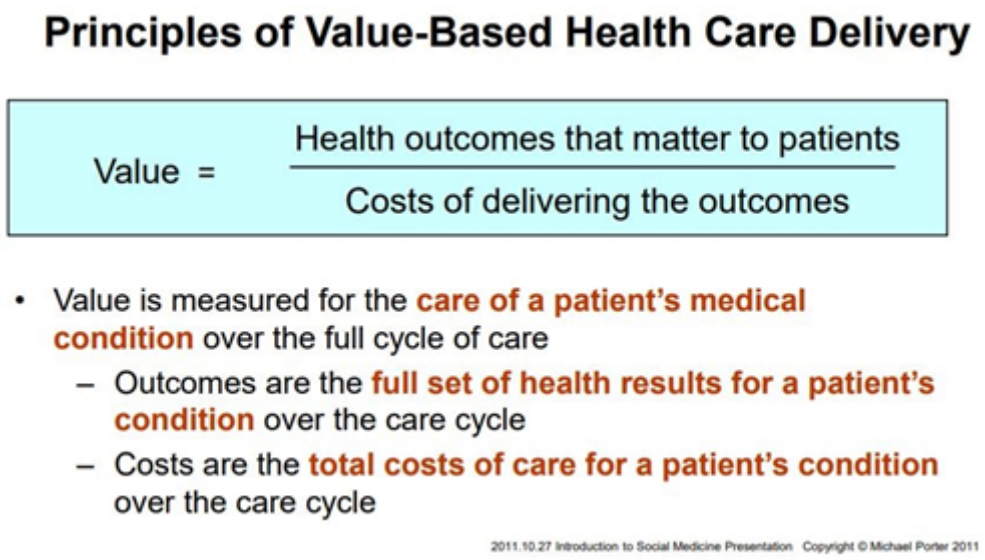


Reference: (BERWICK; NOLAN; WHITTINGTON, 2008)

2.2 HOW TO MEASURE VALUE IN HEALTH CARE - THE VALUE EQUATION

Michael Porter and Elizabeth Teisberg introduced the framework of value-based health care as an equation with "value" being equal to the division of "health outcomes that matter to the patient" by the "costs of delivering the outcomes". As shown in Figure 4 value derives from the patient perspective over the full circle of care around his medical condition.

Figure 4



Reference: (PORTER, 2013)

According to this definition, focus on results (outcomes) and cost measurements is more important than processes or inputs mensuration:

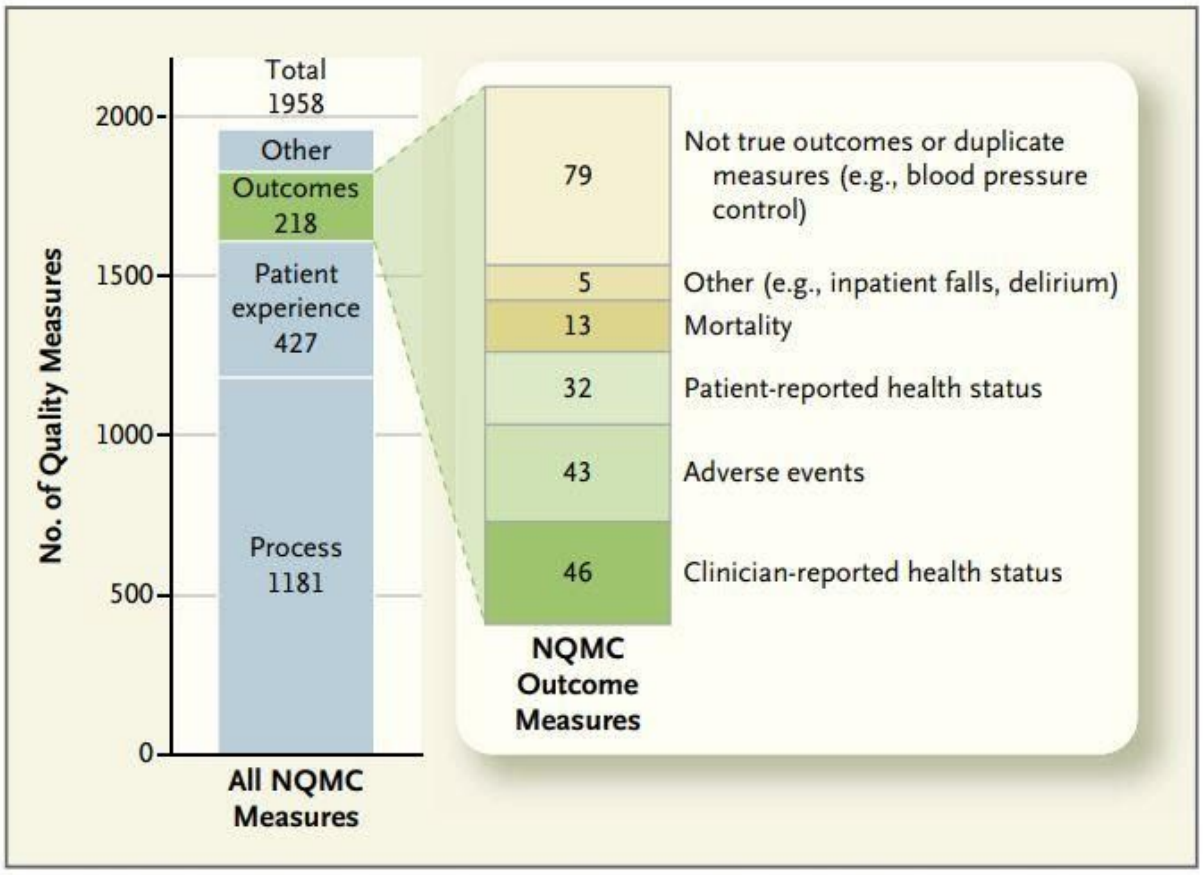
> "Since value depends on results, not inputs, value in health care is measured by the outcomes achieved, not the volume of services delivered, and shifting focus from volume to value is a central challenge. Nor is value measured by the process of care used; process measurement and improvement are important tactics but are no substitutes for measuring outcomes and costs".(PORTER, 2010)

Transitioning from process and quality measurements to outcomes measurement is a challenge in health care, however the experience in other fields shows the importance of this endeavor:

> "Experience in other fields suggests that systematic outcomes measurement is the sine qua non of value improvement. It is also essential to all true value-based reimbursement models being discussed or implemented in health care. The lack of outcomes measurement has slowed down reimbursement reform and led to hesitancy among health care providers to embrace accountability for results." (PORTER; LARSSON; LEE, 2016)

In health care, quality measurements are abundant and often defined as compliance to evidence-based medicine and protocols rather than improvement in outcomes. As shown in Figure 5 quality indicators in the National Quality Measures Clearinghouse express the lack of outcomes measurements: from the total 1958 quality indicators, 218 are supposed to be outcome measurements but only 139 (7%) are real outcomes, as 79 are duplicate measures or not true outcomes. (PORTER; LARSSON; LEE, 2016)

Figure 5



Categories of Quality Measures Listed in the National Quality Measures Clearinghouse (NQMC).

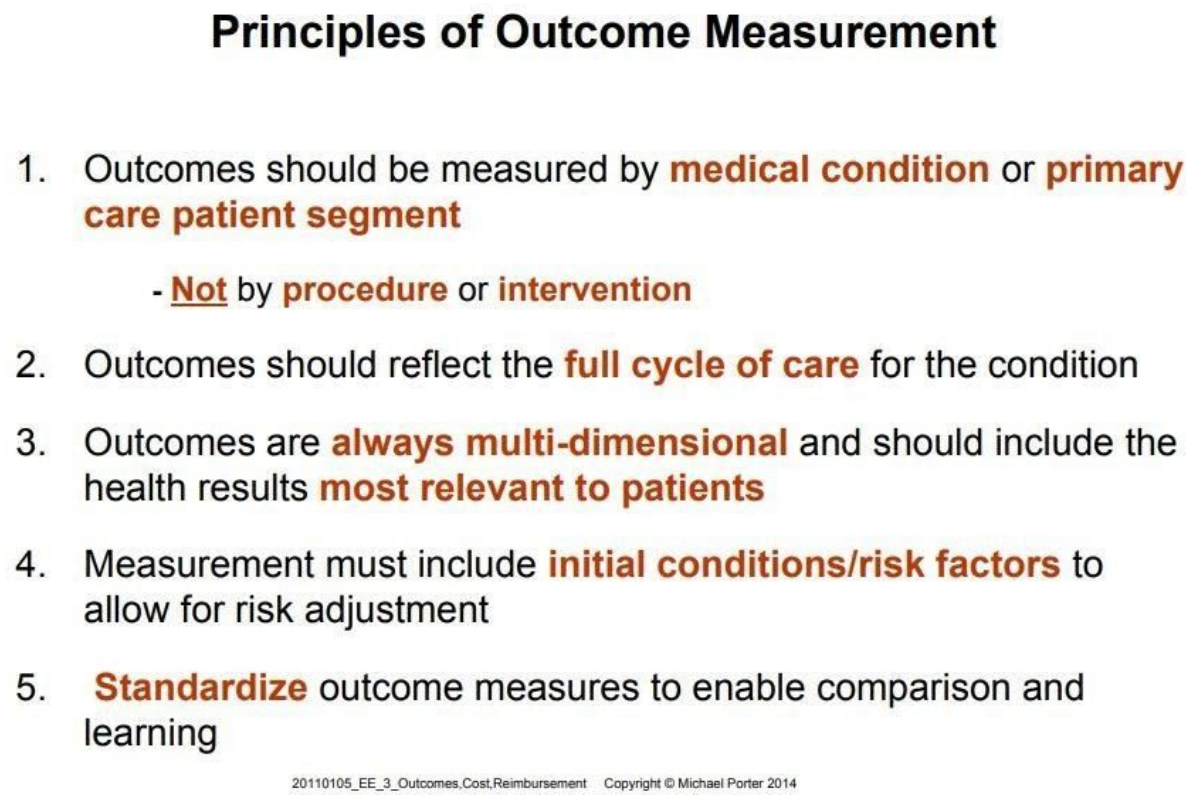
Reference: (PORTER; LARSSON; LEE, 2016)

The paradigm of inputs and process measurements should give way to output and results measurements in order to value-based health care to work.

2.2.1 HOW TO MEASURE HEALTH OUTCOMES

According to Michael Porter, outcomes measurement has five principles that should be respected in practice, they are shown in detail in Figure 6. In summary these principles are about measuring outcomes in a standardized manner, by medical condition over the full cycle of care, as multidimensional variables relevant to patients (PORTER, 2014).

Figure 6



Reference: (PORTER, 2014)

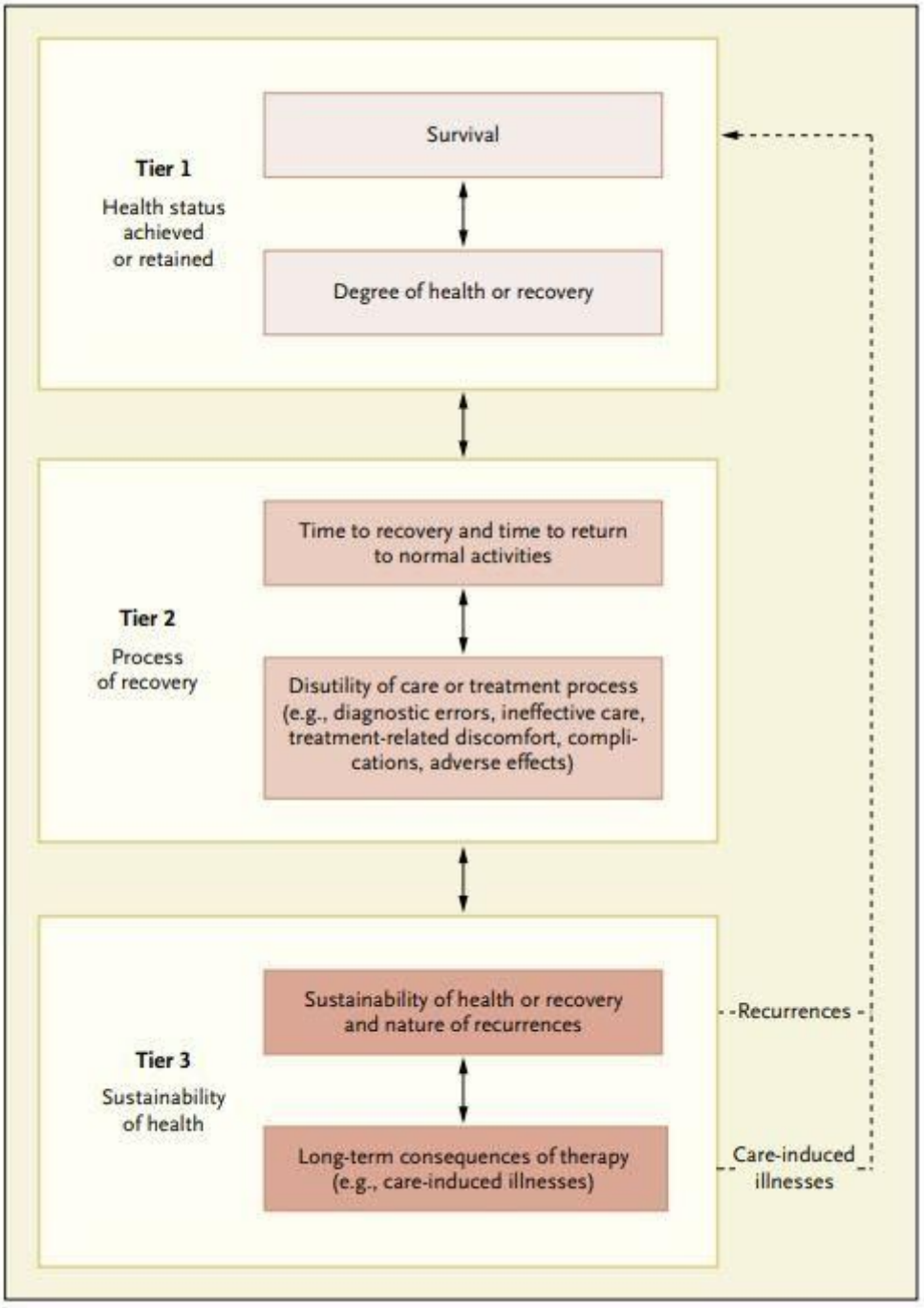
These principles pave the journey to real outcome measurement. They set the discussion apart from the traditional fragmented, isolated, process focused, biased and variable measurements that are common practice in the current organizational structure and information systems in health care.

It is understandable that providers tend to measure what they control and can easily quantify. However, transitioning to measuring what matters for outcomes and in extension, what matters for the patients, is a needed effort, rewarded with a path to clinical improvement through the measurement of value.

> "The primary purpose of measuring outcomes is really to inform clinicians of how to improve". (PORTER, 2012).

Each medical condition should have its own set of outcome measurements and they can be arrayed in a three-tiered hierarchy: tier 1 related to the health status that is achieved or retained; tier 2 related to the recovery process and tier 3 related to the sustainability of health . seen in the Figure 7, each tier has two levels that details its distinct outcomes dimensions.

Figure 7



Reference: (PORTER, 2010)

Ideally any measurement effort should start with one outcome dimension in each level or, at least one in each tier. As experience and available data infrastructure grow more outcome dimensions can be added to the measurements.

> "Measuring, reporting, and comparing outcomes are perhaps the most important steps toward rapidly improving outcomes and making good choices about reducing costs." (PORTER, 2010)

In order to measure outcomes, there are at least four steps: 1. definition of outcomes; 2. data collection; 3. data compilation and analysis; and 4. comparison and improvement (PORTER, 2014).

2.2.1.1 DEFINITION OF OUTCOMES

For a provider or practitioner to start measuring outcomes, the first step is to define the outcomes to be measured. The effort should include physicians, quality managers and professionals that are knowledgeable not only about the medical condition of interest but also about outcome measurements. Ideally the group should arrive on consensus and include patients in the process (PORTER, 2014).

Developing outcomes that can be compared on national and international level proves to be a challenging attempt. However, the ICHOM initiative and BMJ Outcomes solve these challenges as long as it provides standard sets for specified conditions.

2.2.1.1.1 ICHOM AND BMJ OUTCOMES

The International Consortium for Health Outcomes Measurement (ICHOM) is an initiative to promote standardized outcomes measurements. ICHOM was created by Michael Porter, Stefan Larsson and Professor Martin Ingvar in 2012 "to unlock the potential of value-based health care by defining global standard sets of outcome measures that really matter to patients for the most relevant medical conditions and by driving adoption and reporting of these measures worldwide." (ICHOM, 2017)

> "At ICHOM, we wanted to solve two problems. First, measurement of outcomes is usually performed at the procedure level (e.g., spine surgery, prostatectomy or heart catheter). We believe outcomes should be measured on the level of a patient's medical condition (e.g., back pain, localized prostate cancer, or coronary artery disease) for the full care cycle, making it possible to compare treatment options and inform patients about treatment choices. Second, very few international standards exist that recommend what measures of success should be systematically tracked." (ICHOM, 2017)

In practice, ICHOM provides Standard Sets of outcomes for the most common medical conditions.

The BMJ Outcomes is a similar initiative created in 2015 by the BMJ in partnership with The Dutch National Health Care Institute (NHCI) and CZ (a Dutch health insurance company).

> "BMJ Outcomes is a global initiative that aims to improve the value of health care interventions by accelerating the development and use of robust outcome measures that matter to patients." (BMJ Outcomes Inaugural collection outcomes.bmj.com APRIL 2015)

2.2.1.1.2 ICHOM STANDARD SETS

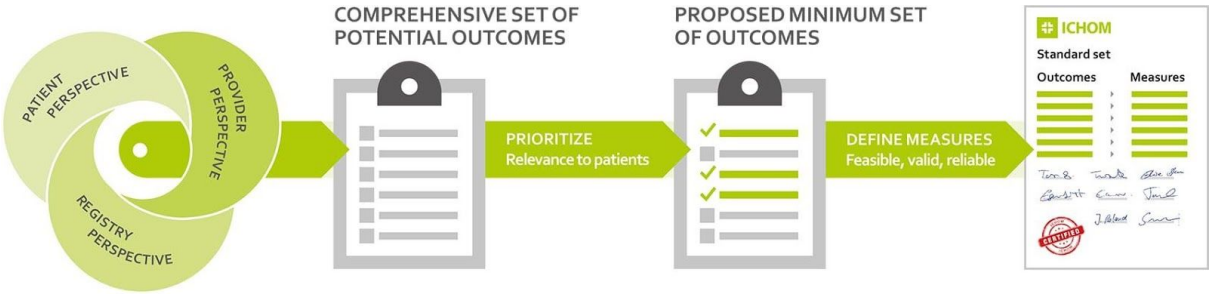
In this study we will focus our attention on ICHOM standard sets because they are used by an active community (ICHOM connect), have been implemented worldwide and are provided free of charge on the internet for all practitioners and providers willing to start measuring outcomes.

The ICHOM initiative sets the standard for outcomes measurement across borders, outlining a minimum set of parameters for measurement.

> "The International Consortium for Health Outcomes Measurement has convened groups of experts on specific conditions, together with patient representatives, to outline minimum standard outcome sets and risk factors using a structured process." (PORTER; LARSSON; LEE, 2016)

The integration of patient, provider and registry perspective into the creation of each standard set is shown in Figure 8.

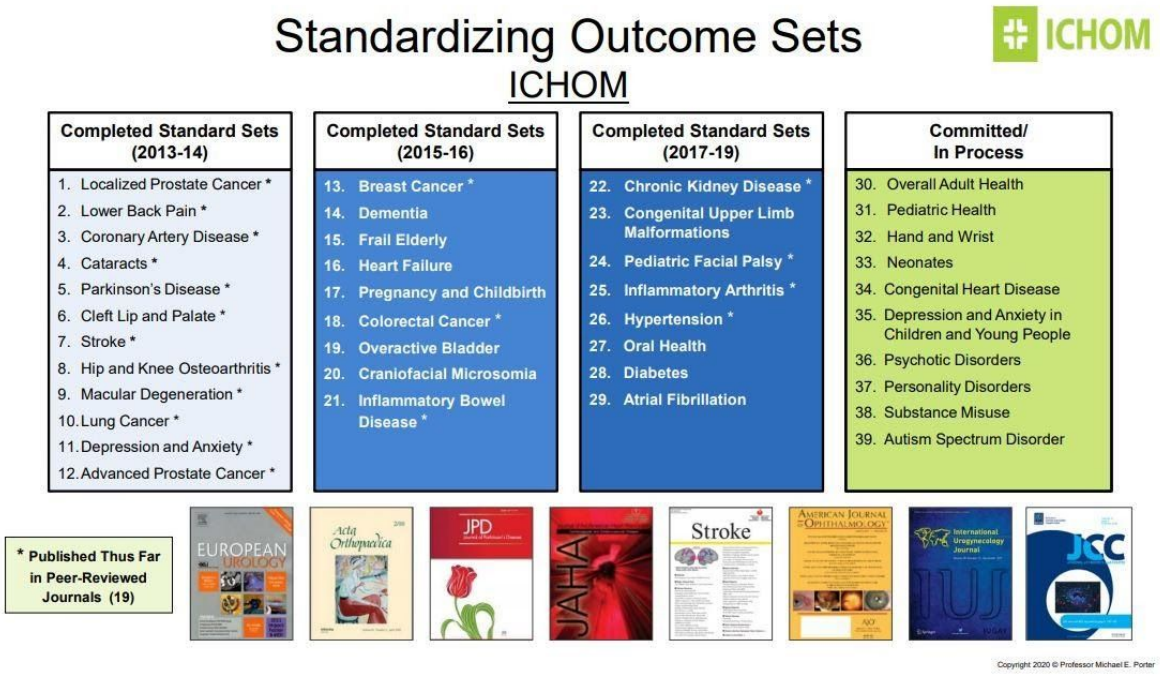
Figure 8



Reference: (ICHOM, 2017)

Currently ICHOM provides more than 28 Standard Sets covering different conditions for specific patient populations ranging from atrial fibrillation, hip and knee osteoarthritis to diabetes and stroke. Figure 9 shows a detailed list of ICHOM standard sets.

Figure 9



Reference: (PORTER, 2020)

As an example on how to measure health outcomes, we will introduce the "Hip and Knee Osteoarthritis Standard Set".

2.2.1.1.2.1 HIP AND KNEE OSTEOARTHRITIS STANDARD SET

If we take hip and knee osteoarthritis as an example, we can find a "Hip & Knee Osteoarthritis standard set" at ICHOM website (https://connect.ichom.org/standard-sets/).

Figure 10

Reference: (ICHOM, 2020)

This specific standard set had leadership of Dr. Patricia Franklin, Professor of Orthopedics and Physical Rehabilitation at the University of Massachusetts Medical School in Worcester and had contributions from physicians from Australia, Canada, Indonesia, Morocco, Netherlands, New Zealand, Saudi Arabia, Sweden, United Kingdom and United States. (ICHOM, 2020)

The Standard Set covers "all patients seeking treatment for osteoarthritis of the hip or knee, whether surgical or non-surgical" and treatment approaches as non-surgical (lifestyle intervention, patient education, physiotherapy, walking aid or orthosis, topical and oral medication, intra-articular injection) and surgical (osteotomy, joint replacement, other forms of surgical treatment) (ICHOM, 2020)

The standard set has detailed orientation on measurements, divided into three groups of variables: 1. Case-Mix Variables (demographic factors, baseline clinical status and case-mix factors); 2. Treatment variables; and 3. Outcomes (patient-reported health status, acute complications of treatment). Details shown in Figures 11, 12 and 13.

Figure 11

ICHOM Standard Set for Hip & Knee Osteoarthritis

Case-Mix Variables

Patient Population	Measure	Supporting Information	Timing	Data Source
Demographic Factors				
All patients	Date of birth	N/A	Baseline	Patient-reported
	Patient sex	Sex at birth		
	Education level	Level of education completed		
Baseline Clinical Status				
All patients	Joint specific history	History or finding of trauma or injury, congenital or developmental disorders, or other joint disorders in the hips or knees	Baseline	Clinical or administrative data
	Joint specific surgical history	History of previous surgery on hips or knees		
Case-Mix Factors				
All patients	Body mass index	Height and weight	Baseline; Annually	Patient-reported or clinical data
	Living condition	Living alone, with family, or in a nursing home or other facility		Patient-reported
	Laterality of affected joint(s)	Indication of which joint(s) is(are) affected at baseline		
	History of surgery on the hip or knee	Patient reported history of previous surgery on hips or knees		
	Physical activity*	Physical activity		
	Tobacco smoking status	Use of cigarettes, cigars, or other tobacco products		
	Co-morbid conditions	Presence of: Cancer, depression, diabetes, disease of the nervous system, heart disease, hypertension, kidney disease, liver disease, lung disease, peripheral vascular disease, rheumatoid arthritis or other arthritis, spinal disease		

Reference: (ICHOM, 2020)

Figure 12

Treatment Variables

Patient Population	Measure	Supporting Information	Timing	Data Source
All patients	Treatment progression	Indication of the treatments undergone for osteoarthritis in the past year	Baseline; Annually	Patient-reported
	Care utilization	Indication of the health care providers consulted for treatment of osteoarthritis in the past year		
Surgical patients	Date of procedure	N/A	Post-surgery	Clinical or administrative data
	Operative joint	Joint on which procedure was performed		
	Orthopedic procedure	Type of procedure		

Reference: (ICHOM, 2020)

Figure 13

Outcomes

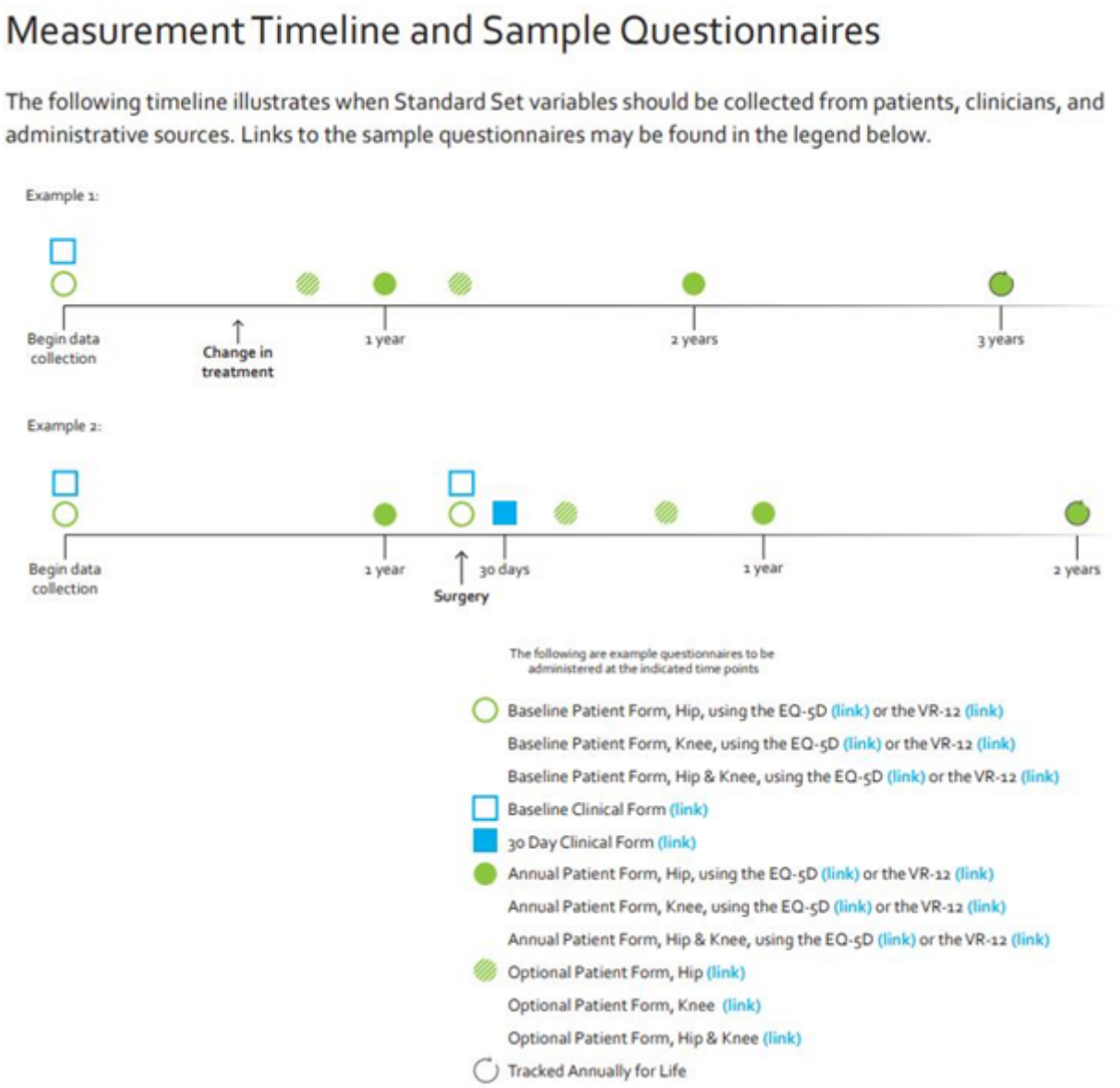
Patient Population	Measure	Supporting Information	Timing	Data Source
Patient-Reported Health Status				
All patients	Hip or knee functional status	Tracked via either the HOOS-PS or KOOS-PS	Baseline; Annually	Patient-reported
	Pain in the hips, knees, or lower back	Tracked via numeric or visual analog rating scales		
	Quality of life	Tracked via either the EQ-5D-3L, VR-12, or SF-12		
	Work status	Indication of patient's ability to work		
	Satisfaction with results	Patient's overall satisfaction with the results of their care		
Acute Complications of Treatment				
Surgical patients	Death	All cause 30-day mortality	Post-surgery	Administrative data
	Admissions	All cause 30-day readmissions		
	Reoperation	All reoperations	Continuous	Clinical or administrative data

HOOS-PS: Hip Disability and Osteoarthritis Outcome Score – Physical Function; KOOS-PS: Knee Injury and Osteoarthritis Outcome Score - Physical Function; EQ-5D-3L: EuroQol 5 Dimension 3 Levels; VR-12: Veterans RAND 12; SF-12: Short Form 12 Health Survey

Reference: (ICHOM, 2020)

This example above shows how detailed the standard sets are, and how they are structured to permite analysis according to case-mix and treatment variables. In terms of outcomes, it's important to note they are segmented in patient reported health status and acute complications of treatment, with their respective data source they can be patient-reported, clinical or administrative data. The Hip and Knee standard set also includes a systematized timeline for measurements, shown in Figure 14

Figure 14



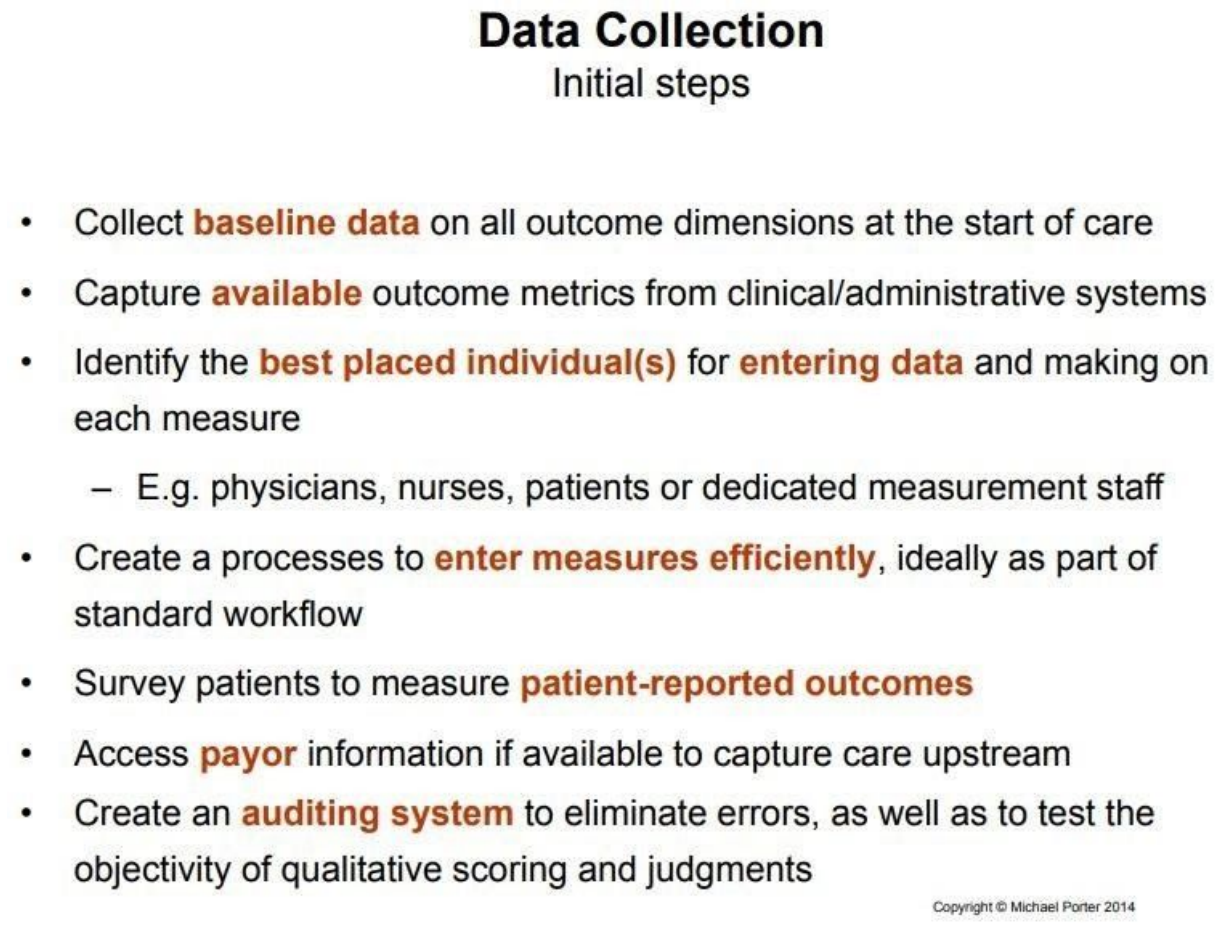
Reference: (ICHOM, 2020)

As it becomes clear by this example above, the ICHOM standard sets are a complete and standardized manner on “how to” and “when to” measure variables and outcomes over the full circle of care for each patient.

2.2.1.2 DATA COLLECTION

Health care providers are used to measure what they directly control or what is easily measured (PORTER, 2010). However, for structuring a data collection based in outcomes it's important to prepare, ideally following steps shown in Figure 15

Figure 15



Reference: (PORTER, 2014)

These steps were thought to guide outcome measurements; however, they can seem too detailed and challenging for a provider with limited resources willing to start. In this case, ICHOM (2017) suggests providers to start measurement, even in a limited manner:

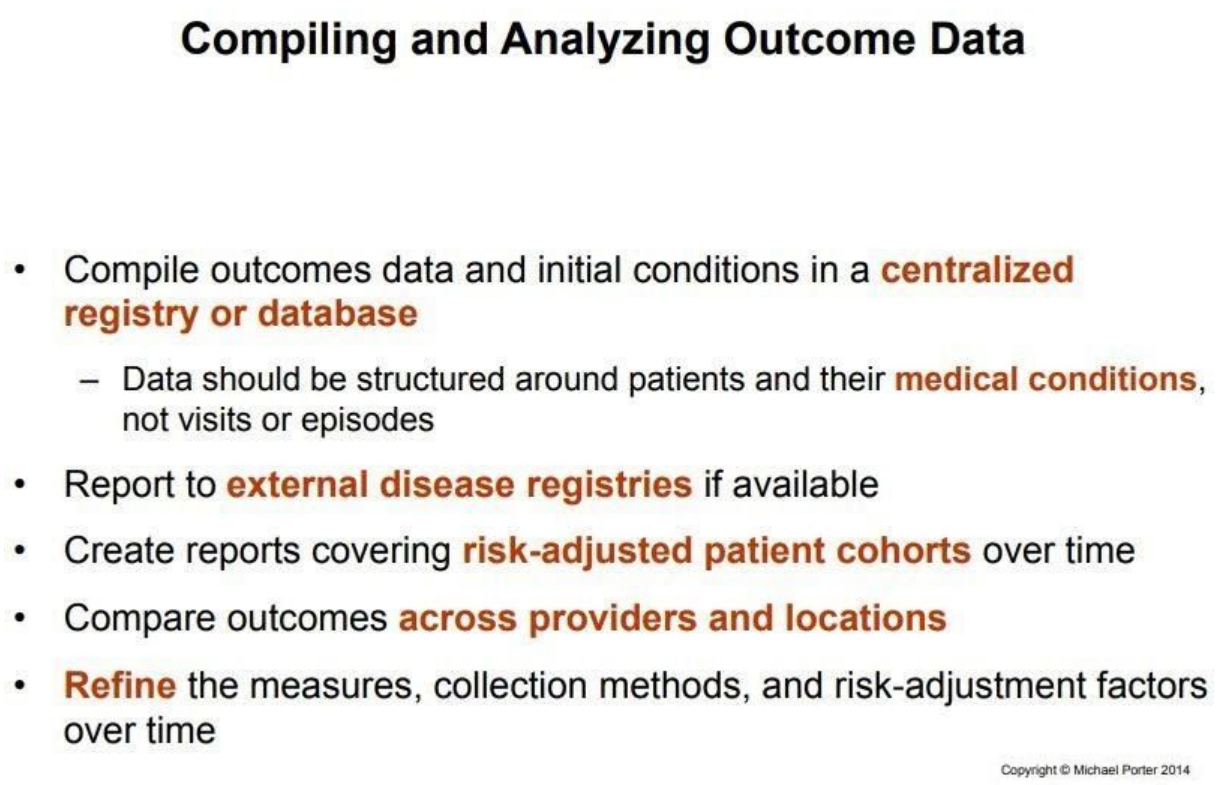
> "Start small: Any institution that wants to improve care by measuring outcomes can begin with a paper survey model. Many successful measurement tools exist for institutions of all shapes and sizes." (ICHOM, 2017)

2.2.1.3 DATA COMPILATION AND ANALYSIS

> "Streamline reports within the care process. Provide reports to clinical staff whenever they are needed. Balance simplicity and clarity with comprehensiveness. Make interpretation of reports simple. Ensure proper analysis and risk adjustment."
>
> (ICHOM, 2017)

In terms of data compilation and analysis, some principles are outlined in Figure 16, they are about centralizing, integrating and segmenting data in ways that help comparisons.

Figure 16

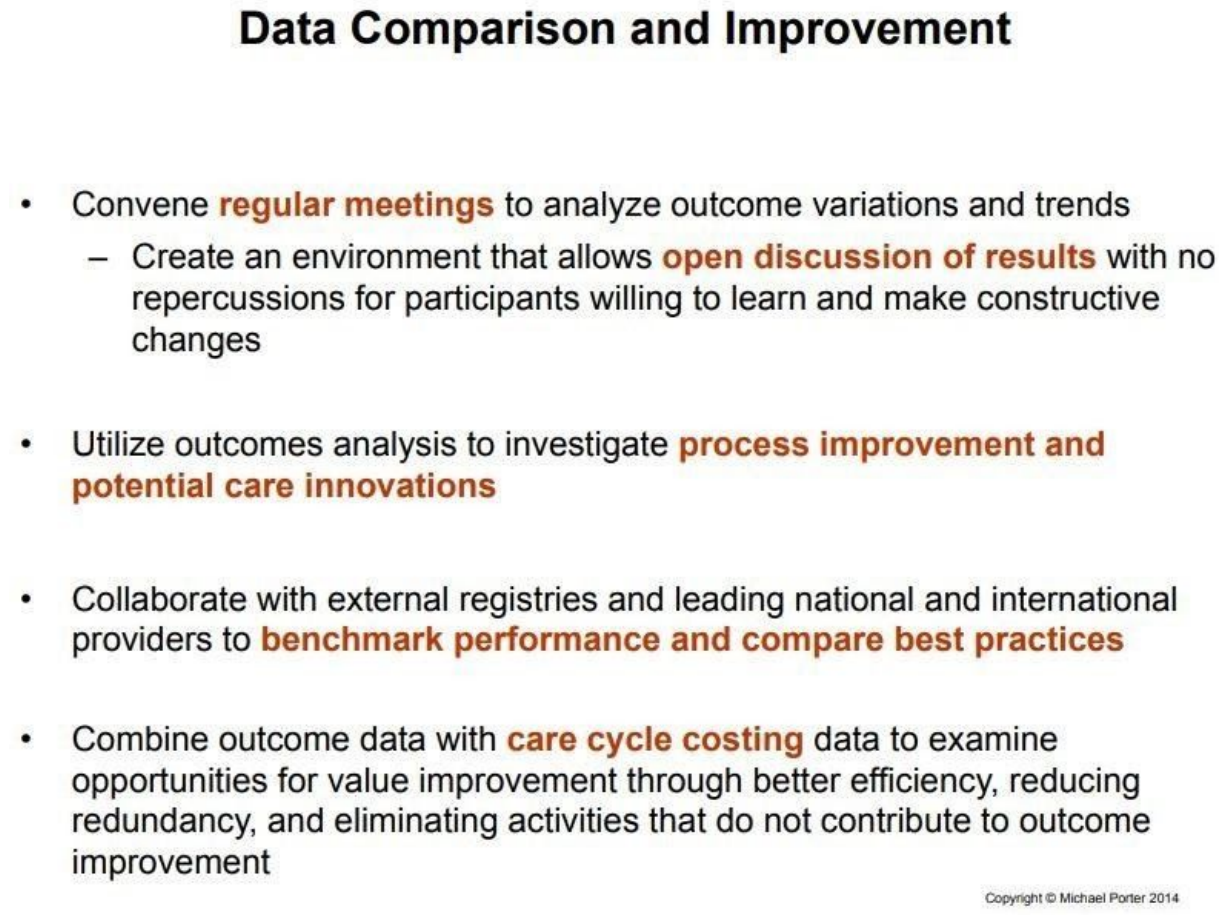


Reference: (PORTER, 2014)

2.2.1.4 COMPARISON AND IMPROVEMENT

Regarding the feedback loop for improvement, it's fundamental to establish regular meetings to foster improvement and innovation as well as benchmarking (Figure 17)

Figure 17



Reference: (PORTER, 2014)

2.2.2 HOW TO MEASURE COSTS

In order for a provider to start measuring costs, it's fundamental to choose a methodology to guarantee data standardization, transparency and continuity over time. The selected method has to overcome the challenges of cost measurement in health care, especially in regard to the common misconception in the health sector in which cost is usually confused with price. (PORTER, 2012) Ideally the cost methodology has to be linked to the operational activity and be used as a tool for performance improvement.

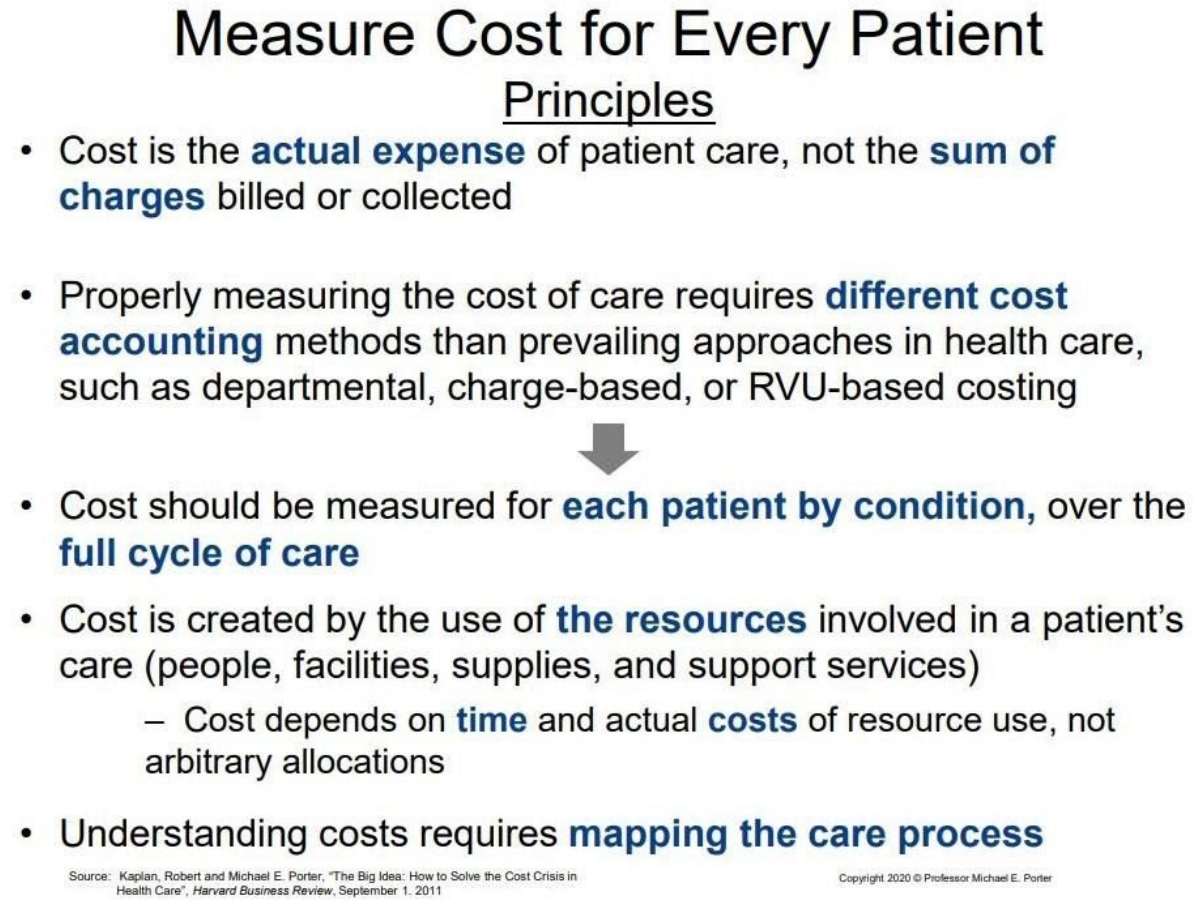
> The existing cost systems in health care impede clinician-driven cost reduction and process improvement initiatives. These systems rely on inaccurate and arbitrary cost allocations and provide little transparency to guide attempts by first-line care providers to understand and modify the true drivers of their costs (Kaplan et al, 2014& Porter, 2011).

Kaplan et al. (2014) proposes the use of time-driven activity-based costing (TDABC).

> TDABC enables providers to measure accurately the costs of treating patients for a specific medical condition across a full longitudinal care cycle. It uses two proven management tools: process mapping from industrial engineering, and activity-based costing from accounting. (KAPLAN et al., 2014) Using Time-Driven Activity Based Costing to Identify Value Improvement Opportunities in Health Care Robert S. Kaplan)

If we use this approach, we have two basic steps to implement it: 1. process mapping and 2. activity-based costing.

Figure 18

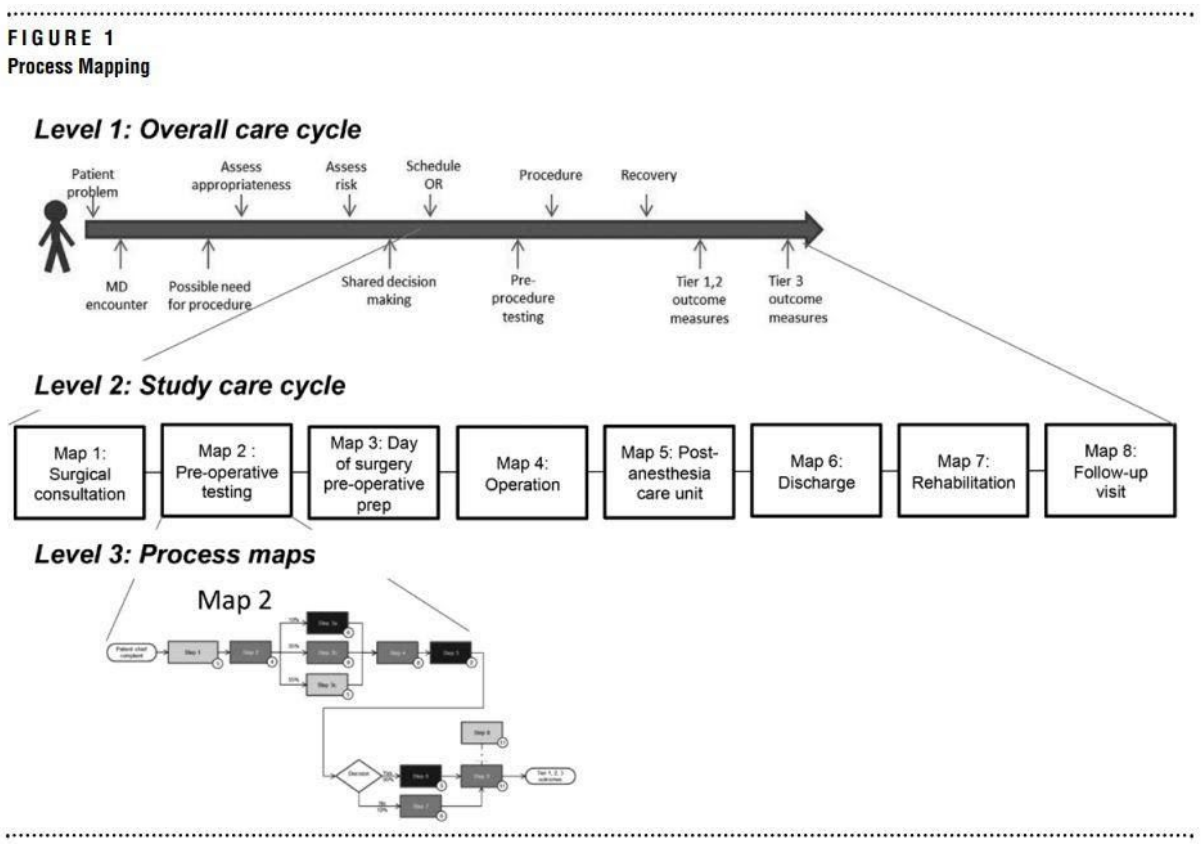


Reference: (PORTER, 2020)

The process-mapping component is guided by clinician teams who are knowledgeable about the patient journey in a specific condition. They start with a macro view of the process (Figure 19 levels 1 and 2) and then go to the administrative and clinical

processes involved (Figure 19 level 3), as well as resources and time consumed in each process steps.

Figure 19



Reference: (KAPLAN et al., 2014)

The activity-based costing component is structured by the finance staff. It is built using a dollar per minute capacity cost rate: in the numerator goes “the total cost the provider organization incurs to make each resource productive and available for the patient”, and in the denominator goes “the estimated total capacity, measured in hours or minutes during which each resource is available for productive work”. (KAPLAN et al., 2014)

To estimate each resource cost, we multiply the time spent in the use of the resource, times the dollar per minute capacity cost rate. We then get an estimated cost for each resource.

To calculate the cost of a process step, we should add the cost of the resources used in the process to the consumable supplies (medications, syringes, catheters, bandages, implants, etc.) used in this step.

The sum of the process step costs in the care circle is the estimate cost of the entire caring cycle:

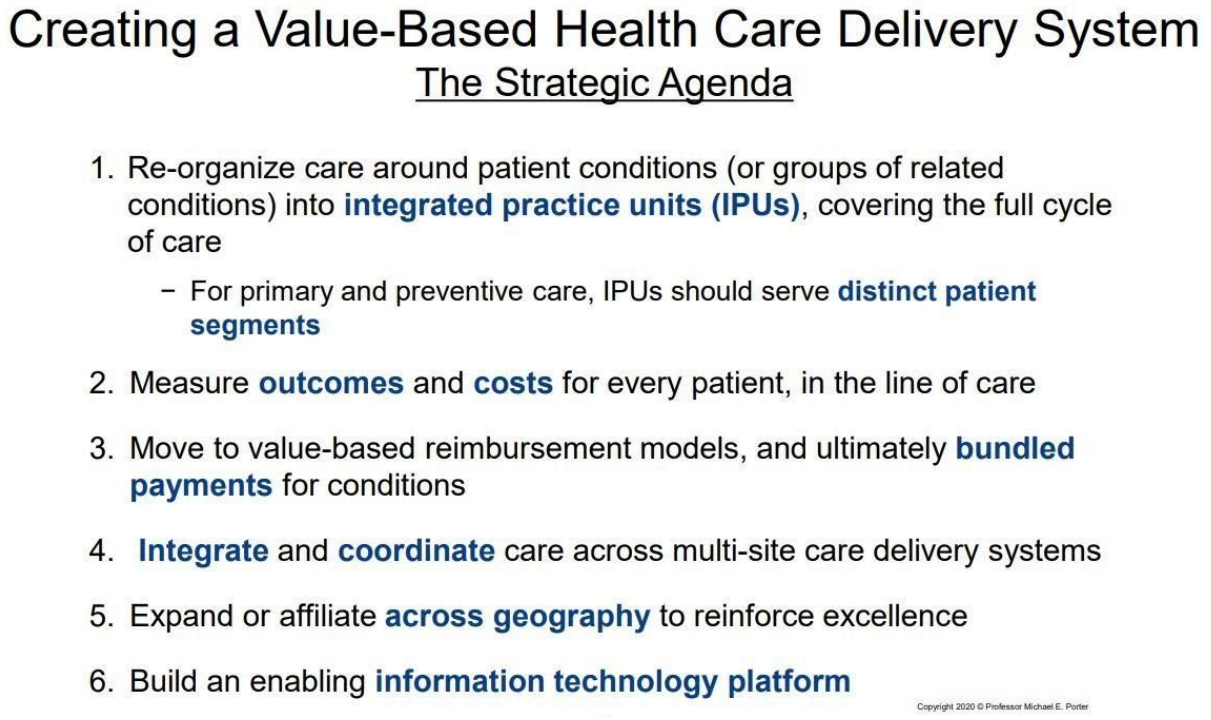
> "the TDABC estimate of the total cost of caring for the patient is the sum of all the process step costs over the entire care cycle." (KAPLAN et al., 2014)

2.3 HOW TO IMPLEMENT VALUE-BASED HEALTH CARE

2.3.1 THE VALUE AGENDA

According to Michael Porter, value-based health care can be implemented through a strategic agenda with six mutually reinforcing steps, shown in Figure 20

Figure 20



Reference: (PORTER, 2020)

The creation of integrated practice units (IPUs) permits the organization of care delivery around a medical condition, in which care is delivered by a dedicated team in a dedicated facility. The IPU takes responsibility for the full cycle of care, addressing complications and comorbidities related to a medical condition, and integrating patient education, engagement, adherence, follow up and prevention. In an IPU the patient is navigated through care by a clinical leader or care manager, and the clinical team accepts joint accountability for the outcomes and costs of care.

The outcome and cost measurement is done for every patient by medical condition and over the full cycle of care. In practical terms, ICHOM standard sets are the place for start outcome measurement and time-driven activity-based costing sheds light on the cost of both billable and non-billable activities (KAPLAN; WOLBERG, 2018).

The development of value-based reimbursement models is a fundamental step to subsidize transition from fee-for-service payments.

> "Changing how we pay for care is the strongest lever to remedy the bad incentives caused by fee-for-service payments. Bundled payments are the preferred VBHC payment method because they directly incentivize achieving better patient outcomes at lower cost." (KAPLAN; WOLBERG, 2018) Robert S. Kaplan and Harry Wolberg,

In bundled payments for example, the payer makes a single payment to cover all care related to the treatment of a specific medical condition over the full care cycle. This payment method creates freedom and accountability in the clinical team in the selection of the key resources and services that contribute most to good patient outcomes.

The efforts to integrate, coordinate, concentrate and allocate care across appropriate sites in order to create a system that is more than the sum of its parts is a step that enables smoothly patient navigation in the care delivery system. The core concepts here are: to define the scope of services; to concentrate volume in fewer locations; to choose the right location for each service; and to integrate care across locations (PORTER; LEE, 2013)

The expansion and affiliation across geography provide patients with better health outcomes as it permits selection of centers of excellence. And from a provider perspective it increases the volume of care delivered by each specialized IPU.

The building of an integrated information technology platform is fundamental to sustain the other steps in the value agenda. It moves the integration of IPUs, enables measurements and sparks new reimbursement approaches.

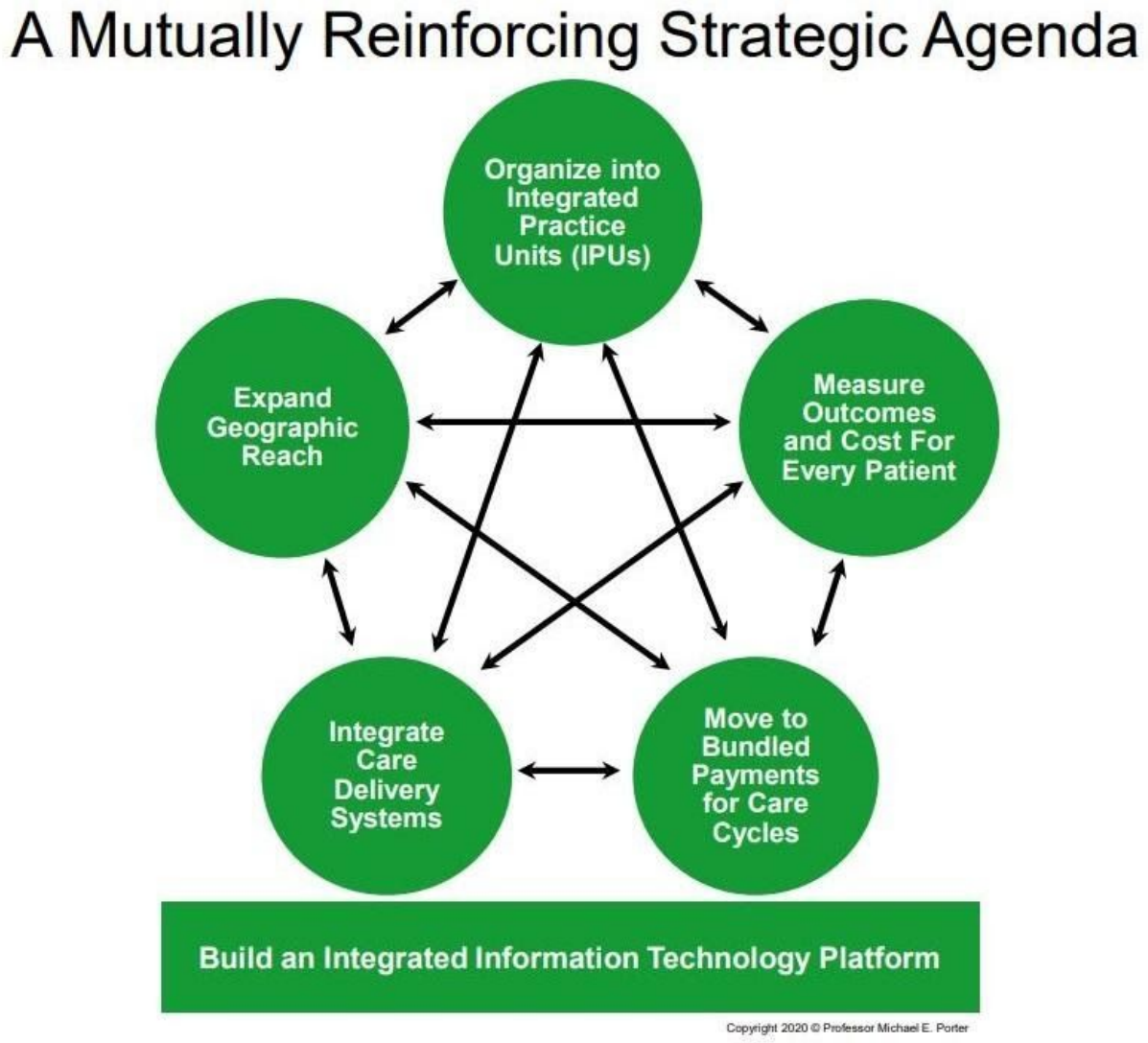
An integrated IT platform ties the parts of value-based delivery system and is based in the following principles: it is centered on patients; it uses common data definitions; it encompasses all types of patient data; the medical record is accessible to all parties involved in care; the system includes templates and expert systems for each medical condition; and the system architecture makes it easy to extract information. (PORTER; LEE, 2013)

> Implementing the value agenda is not a one-shot effort; it is an open-ended commitment. It is a journey that providers embark on, starting with the adoption of the goal of value, a culture of patients first, and the expectation of constant,

> measurable improvement. The journey requires strong leadership as well as a commitment to roll out all six value agenda components. For most providers, creating IPUs and measuring outcomes and costs should take the lead. (PORTER; LEE, 2013)

As described by Porter and Lee, implementing the mutually reinforcing strategic agenda (illustrated in Figure 21) is an organizational journey and not a one-shot isolated project. To embark in this journey, it is core to align with a new organizational goal: improving value for patients.

Figure 21



Reference: (PORTER, 2020)

2.3.2 ORGANIZATIONAL LEADERSHIP: DRIVING CHANGE AND PROCESS REENGINEERING

In order to implement the value agenda described above, it's necessary to promote a transformation in health care delivery. Any stakeholder can give the first steps towards value, ideally all stakeholder move in unison. However, providers play a central role:

> "All stakeholders in health care have essential roles to play. Yet providers must take center stage. Their boards and senior leadership teams must have the vision and the courage to commit to the value agenda, and the discipline to progress through the inevitable resistance and disruptions that will result. Clinicians must prioritize patients' needs and patient value over the desire to maintain their traditional autonomy and practice patterns." (PORTER; LEE, 2013)

As stated by Porter and Lee, providers must take center stage and its core that board and senior leadership teams embrace the value agenda, especially considering the short term risks involved in transitioning from the traditional fee-for-service to value-based reimbursement.

As an example of the importance of convincing the senior management in order for obtaining a successful implementation we can note that ICHOM proposes an implementation journey that starts with organizational engagement (outlined in Figure 22), a fundamental step towards outcome measurements. In other words, for the operational value processes to take place management need to engage.

Figure 22

Reference: (ICHOM, 2017)

According to ICHOM, after the implementation journey begins, organization is engaged and data is collected, measured and analyzed, there is the core step of driving change: to report data, act on data and disseminate best practices.

Driving change accelerates the pursuit of value: outcomes measurements work in a feedback loop in the reengineering of care processes towards increased value for patients. In other words, patient outcomes help clinicians and management reengineer the care process and improve health care delivery.

> "Reengineering involves redesigning the entire business process and related sub core processes and systems. It includes organizational redesign and restructuring as well. Reengineering is a culture change and an organization-wide effort. It will be only as successful as the leaders are in effecting cultural and organizational change. If the senior leaders are not on board or are openly feuding about the need for reengineering, changing the culture, or disagreeing about other issues, it will send mixed signals and employees will be hesitant to get on board—and rightfully so." (LARSON, 2016)

Jean Ann Larson in her book "Organizational and Process Reengineering Approaches for Health Care Transformation", proposes a methodology for reengineering and process redesign and how to make it work in health care. The methodology has 10 steps, from

conducting a process concerns analysis, through the use of project management techniques to the implementation of the ideal process, steps shown in Figure 23, taken from her book. (LARSON, 2016)

Figure 23

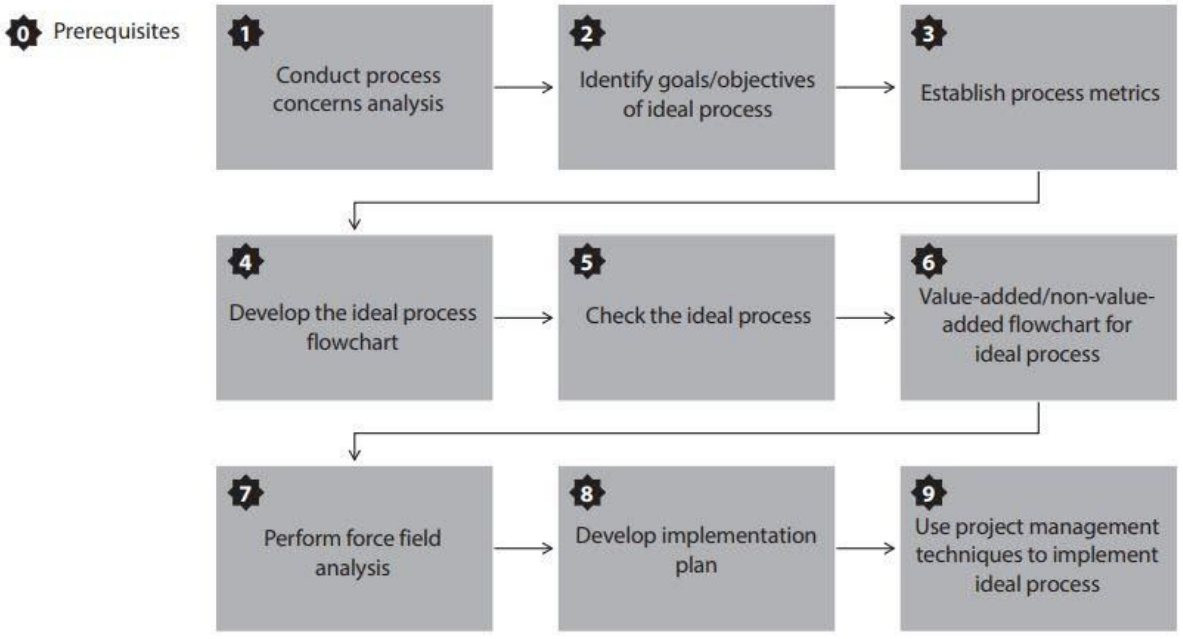


Figure 7.1 Reengineering roadmap overview.

Reference: (LARSON, 2016)

The methodology proposed in Jean Ann's book is detailed and hands-on, focused in health care. It is interesting to note that even though the book is focused on "how to implement" change, the author dedicates immense attention to setting the stage for reengineering and process design, change readiness for leaders, organizational change, roles and responsibilities. According to the author

> "Your primary goal as a senior executive in charge of the overall effort is to create the environment to help your teams get through the reengineering approach of redesigning how your organization cares for patients and serves the community." (LARSON, 2016)

2.4 CHALLENGES: FEE-FOR-SERVICE VS VBHC

Fee-for-service is the dominant method used to pay for health care in the United States and elsewhere.

> "Fee-for-service is a system that rewards providers for doing more, regardless of whether it improves outcomes. More procedures, more visits, and more tests means higher incomes for physicians and hospitals." (PORTER; TEISBERG, 2006)

> "Fee-for-service rewards the quantity but not the quality or efficiency of medical care. The most common alternative payment system today—fixed annual budgets for providers— is not much better, since the budgets are disconnected from the actual patient needs that arise during the year. Fixed budgets inevitably lead to long waits for non-emergency care and create pressure to increase budgets each year. We need a better way to pay for health care, one that rewards providers for delivering superior value to patients: that is, for achieving better health outcomes at lower cost. The move toward "value-based reimbursement" is accelerating, which is an encouraging trend. And the Centers for Medicare & Medicaid Services (CMS), to its credit, is leading the charge in the United States." (PORTER; KAPLAN, 2016)

In the United States, the centers for Medicare and Medicaid services (CMS) have an important role in driving providers into innovation on value-based health care.

> "Value-based programs reward health care providers with incentive payments for the quality of care they give to people with Medicare. These programs are part of our larger quality strategy to reform how health care is delivered and paid for." (CMS, 2020)

Historically, CMS evolved according to new legislations, creating different programs related to value-based health care. One example is the Bundled Payments for Care Improvement (BPCI):

> "The Bundled Payments for Care Improvement (BPCI) initiative was comprised of four broadly defined models of care, which linked payments for the multiple services beneficiaries received during an episode of care. Under the initiative, organizations entered into payment arrangements that included financial and performance accountability for episodes of care. These models aimed to increase quality and care coordination at a lower cost to Medicare." (CMS, 2020)

> "The BPCI has shown "a reduction in Medicare payments for major joint replacement of the lower extremity, however the impact of the BPCI on outcomes important to patients and physicians has not been thoroughly evaluated in the published literature". (MANICKAS-HILL; FEELEY; BOZIC, 2019)

The CMS and BPCI illustrate the importance of regulation and the payer influence in the healthcare system.

> "In the U.S., the Centers for Medicare & Medicaid Services has been a key driver of bundled payments through its Bundled Payments for Care Improvement and Comprehensive Care for Joint Replacement programs. Many commercial health plans now offer bundles as well, and large employers, such as Walmart, Lowe's, Boeing, GE, and The Washington State Health Care Authority have bundled payment contracts with Centers of Excellence, including Virginia Mason, Mayo Clinic, Cleveland Clinic and Geisinger" (KAPLAN; WOLBERG, 2018)

In the interview “New Marketplace Survey Transitioning Payment Models: Fee-for-Service to Value-Based Care” conducted in 2018, Thomas W. Feeley and Namita Seth Mohta (2018) asked executives, clinical leaders and clinicians about challenges in implementing value-based health care models.

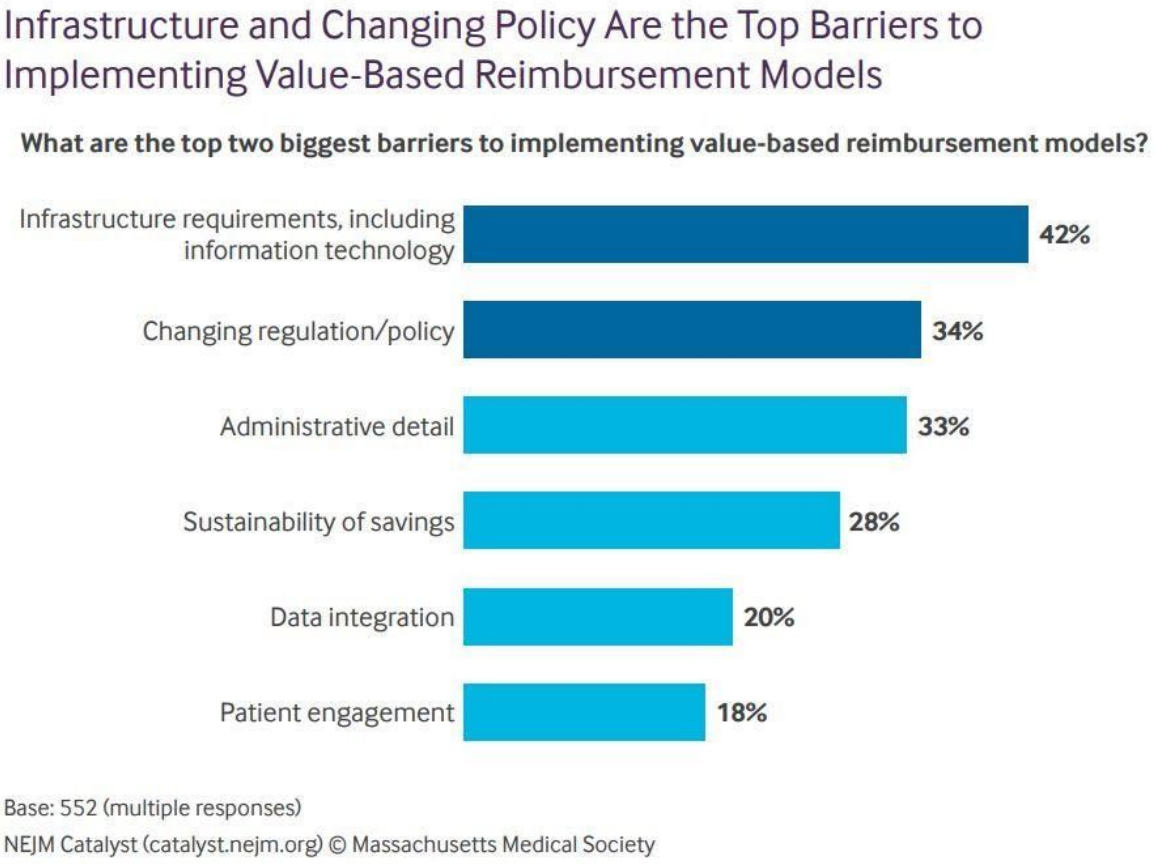
From the respondents, in terms of organization’s revenue the estimation is that 75% comes from fee-for-service and 25% comes from value-based reimbursement (Figure 24)

Figure 24

Reference: (FEELEY; MOHTA, 2018)

When asked what the top biggest barriers are to implementing value-based health care the main reasons are: 1. infrastructure requirements, including information technology, 2. changing regulation/policy and 3. administrative detail. (shown in Figure 25)

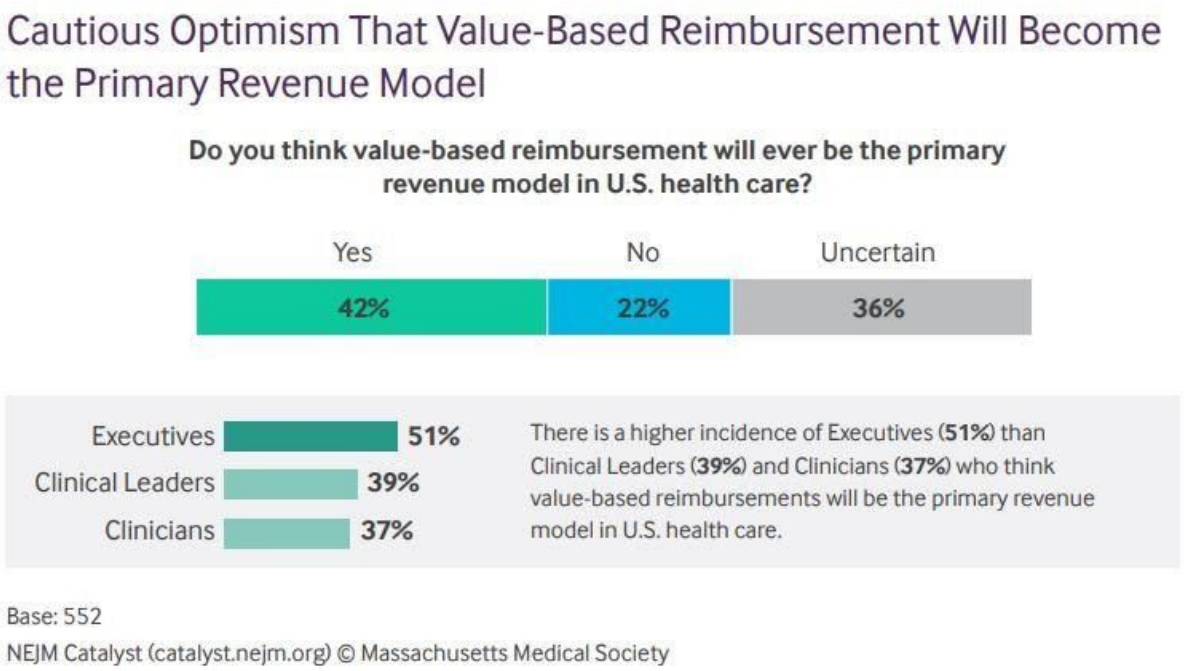
Figure 25



Reference: (FEELEY; MOHTA, 2018)

When asked about the future, 44% of the respondents think value-based reimbursement will be the primary revenue model in the US healthcare system. (Figure 26)

Figure 26



Reference: (FEELEY; MOHTA, 2018)

Fact is that value-based health care poses a challenge to current and competing revenue streams in a fee-for-service basis. In the current fee-for-service system, efficient care potentially means a decreased hospital revenue in the short term:

> The major barrier was the misaligned fee-for-service reimbursement system, which encouraged high-cost, potentially inefficient care. For example, in the Boston Children's pediatric plastic surgeons' experience, changing the patient's admission status from ICU to an alternative form of monitoring had significant coding and billing implications. Also, if task assignments shifted from physicians to mid-level providers or registered nurses, the provider's reimbursement could decrease. Thus, the existing fee-for service payment scheme proved to be a significant barrier for hospital leaders and clinicians to implement process changes that lowered payments by more than the immediate cost savings. (KAPLAN et al., 2014)

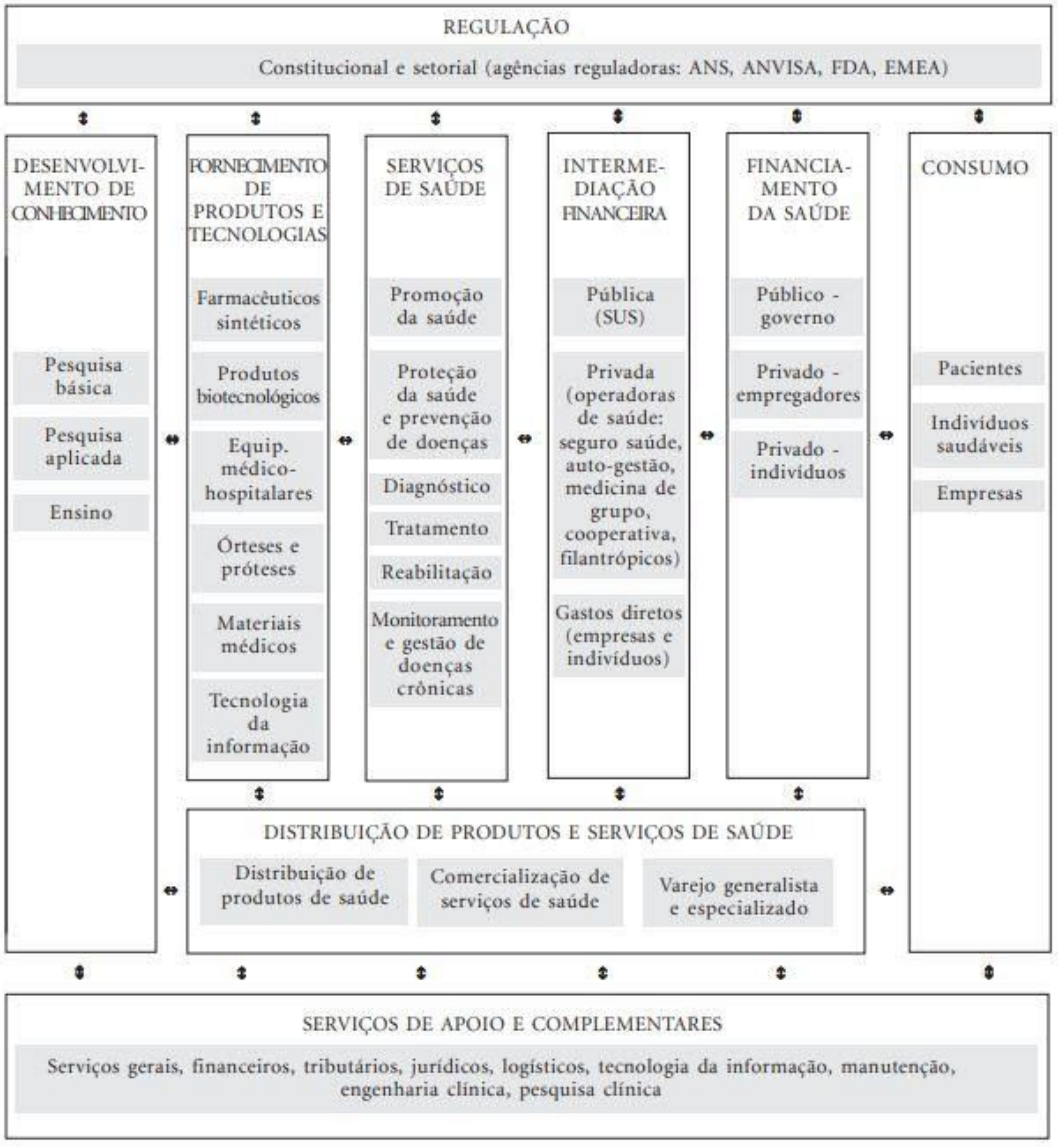
However challenging, it's important to remember the advantages of moving early to value-based health care:

> "Despite the barriers and challenges, some providers are moving rapidly to develop value-based strategies, realign their structures around practice units; integrate across the care cycle, collect, analyze, and disseminate results, and provide integrated care across geography. The more of these steps that are taken, the more rapidly value will rise because the steps are mutually reinforcing. Providers that move early will gain major benefits as they feed the virtuous cycle of health care delivery. Early movers will get a lead in establishing greater strategic focus and creating areas of excellence." (PORTER; TEISBERG, 2006, p. 227)

2.5 VALUE-BASED HEALTH CARE IN BRAZIL

According to Pedroso and Malik (2012) the Brazilian healthcare system can be better understood and studied through a framework of nine links: knowledge development; supply of products and technologies; health care services; financial intermediation; health care financing; health care consumption; regulation; distribution of health care products; and complementary and support services. These links are integrated through four flows in the value chain: knowledge and innovation; products and services; financial; and information.

Figure 27



Reference: (PEDROSO; MALIK, 2012)

In this model, fee-for-service and value-based health care can be understood as reimbursement systems in which the nine links are interconnected. Currently they are linked

by the fee-for-service glue: all four flows are working in the logic of volume and quantity of services. Value-based care preserves all nine links; however, it blends them in the delivery of outcomes and results.

Value-based health care is getting more attention over time in Brazil. Part of that interest is shown in an increased number of publications related to the subject and to events, as the recent congress “Value-Based Health Care: the role of hospital as a system aggregator” promoted by CONAHP (2020) in November 2019 in São Paulo.

The National Supplementary Health Agency (ANS) for example has written a guide to value-based reimbursement models adapted to the country and with detailed information about: fee-for-service, per diem payments, pay for performance, capitation, diagnosis related grouping, bundle payments. The guide brings suggestions in a big picture on how to drive new reimbursement models. (ANS, 2019)

In practice, some providers are using ICHOM to start outcome measurements. The National Agency of Private Hospitals (ANAHP) started in 2016 a program with 8 hospitals with one ICHOM standard set. In 2019 the initiative had 13 hospitals and two standard sets (heart failure and stroke). With this evolution, ANAHP was recognized as a leader in outcome measurements in Latin America. (ANAHP, 2020)

3. METHODS

In this chapter we introduce the methodology used in this study.

We based our scientific methodology in the case study research. According to Yin, "the distinctive need for case study research arises out of the desire to understand complex social phenomena. In brief, a case study allows investigators to focus on a 'case' and retain a holistic and real-world perspective [...] the case study is a prefered when examining contemporary events, but when relevant behaviors cannot be manipulated." (YIN, 2014)

Our study has an exploratory and qualitative nature, we selected leading hospitals in Sao Paulo, Brazil. The requirements were the hospital to be known for leading innovation and having high standards in health care delivery. We opted to restrict the geography to Sao Paulo in case any of the interviews had to be conducted in person due to interviewee preferences.

We sent an email to their CEO or Value Officer (in applicable cases), introducing myself and the current study, inviting them for an one hour online and private interview in Portuguese which would be kept anonymous and used only for academic purposes. We sent in the email invitation all the questions that would be asked during the interview, so the interviewee could prepare in advance. We also mentioned in the invitation that the recipient could indicate someone in the organization if necessary. We added a disclosure paragraph in the invitation. (please see Appendix)

We sent the email invitation for 8 leading hospitals (six private hospitals and two public hospitals). Five out of eight hospitals (four private and one public) replied and accepted the invitation. Two out of eight (two private hospitals) did answer the emails, but after multiple tentative agendas were not available for an interview before the deadlines of this study. One out of eight (one public hospital) did not answer the emails, we then tried a new contact by multiple emails and phone calls, unsuccessfully.

From the five hospitals that accepted the invitation, the interviews were scheduled for all of them. Two interviewees had to postpone the scheduled interview twice. One of the interviewees (from the public hospital) in the beginning of the interview had an emergency due to COVID pandemic and had to interrupt/cancel the interview.

As a matter of fact, in the end we were able to successfully interview four leaders from four different private hospitals in São Paulo, Brazil. The interviewees and hospital brief characterizations follow. We intentionally rounded the number of hospital beds and did not

add further information about the hospital and interviewees in the best of the efforts to keep anonymity.

Identification	Educational attainment	Management Position	Provider
Interviewee A	Medical Doctor, MSc, PhD	Value Office Coordinator	Hospital A
Interviewee B	Medical Doctor, PhD	President/CEO	Hospital B
Interviewee C	Medical Doctor, MBA	President/CEO	Hospital C
Interviewee D	Medical Doctor, MBA, PhD	Value Office Coordinator (former)	Hospital D

Identification	# Hospital Beds	Type
Hospital A	250 aprox.	private non-profit hospital
Hospital B	100 aprox.	private non-profit hospital
Hospital C	350 aprox.	private for profit hospital
Hospital D	500 aprox.	private non-profit hospital

All interviews were conducted online via videoconference, in Portuguese, in the months of November and December of 2020 according to the interviewees' availability. The duration of interviews ranged from 36 minutes to one hour and two minutes. The interviews were recorded in video and in audio with the consent of the interviewees, for posterior transcription and analysis, in an anonymous way, with the use restricted to this work and by the author of this study (please find complete transcriptions in Appendix).

Our interviews were individual and semi-structured. In fact we started with a structured set of seven questions and had different follow up questions specific to each interview. In other words, we kept the sequence of seven questions and asked them to all the participants, but we added different follow-up questions for each participant and according to their answers. During the interview a slide with the written version (both in Portuguese and English) of the structured question being asked was displayed. After that, the slide was taken off screen and subsequent questions were asked according to the interviewee's answers. (please see Appendix)

The seven questions were the following:

1. What is value-based health care?
2. How do you measure value in your organization?
3. How do you intend to (or currently) implement value-based health care in your organization?

4. In your view, what is the importance of organizational/executive leadership for implementing value-based health care?
5. In your view, what is the importance of process reengineering for implementing value-based health care?
6. What are the challenges for implementing value-based health care?
7. Would you like to add any comments or suggestions?

After the interview, we transcripted all the answers in Protuguese (original transcription), and blinded the text. For example: years, names, places were substituted for Year X, Name X, Place X; in our best effort to make it anonymous. After the blinding process we proceeded with the translation to English. The complete translated transcriptions can be found at the end of this work on the Appendix.

We analysed all the answers having in mind all the limitations and biases derived from interviews (YIN, 2014) and tried to conduct analysis with our best effort over the contemporary set of advancements in value-based health care.

As the author of this study I apologise in advance to the interviewees and to the reader for incorrections with the transcription, translation and blinding processes. Please attribute all errors, omissions and lack of clarity solely to the author of this study, not to the interviewees.

4. RESULTS

In this chapter we will analyze data collected in the interviews. Our analysis will follow the same sequence of questions used during the interviews. The results are divided into seven topics/questions.

Based on our judgment of relevance, we selected excerpts containing the main statements regarding the proposed topics. As a consequence, the paragraphs that follow contain bias derived from the author's perspective about the subject.

We are confident, however, that the complete interviewees' answers are the best resource for a complete understanding of their perspective. For this reason please find the complete transcription of each interview at the end of this study (English translation). Please attribute all transcription and translation errors and inaccuracies to the author of the study, not to the interviewees.

4.1 WHAT IS VALUE-BASED HEALTH CARE?

The value equation proposed by Porter and Teisberg was cited by all interviewees using different terminology but relating to its core concepts:

> "**The traditional value is equal to quality over cost, and then ICHOM "results that matter to the patient over the costs for delivering those results"** and there is now a colleague and our CEO who brings up the question of the relevance of care and patient experience. So in the numerator it turns out that this equation expands the relevance of care ("right care") plus the outcome that matters to the patient, plus the patient's experience over the appropriate cost, over the waste reduction."
>
> (Interviewee A)

> "Value-based health is basically the **delivery of the best result to the patient using the least amount of resources possible to deliver that result**. That is to say, that the delivery of health based on value must consider the **clinical outcomes that are important to the patient,** in dimensions of life that are relevant to him, taking into account the experience he/she has in his/her care journey. In this sense, it is important to also note in the concept of Value-Based Health the relevance of what is done to deliver the best clinical result to the patient and considering their best experience. And this is all related to what in this equation view **has in the denominator the amount of resources** adequate for the delivery of what I just described and which would be the numerator of this equation view."
>
> (Interviewee B)

> "How I see value today. And I'm going to take a lot of maybe who first coined this expression, which I think was Porter himself, that he says **it is a relationship between outcomes, and by outcomes we mean delivery of assistance, quality of assistance,** of assistance result and of patient experience, I think this is very important, **over costs**. So he makes this relationship, he makes this equation, and I think it's a lot out there that I think Value-Based Health Care. In the end, we have to increase this relationship, either by increasing the quality of delivery, increasing

> patient experience and satisfaction, or offering products with **better care outcomes or reducing the cost of this entire process**, of this entire chain. "
>
> (Interviewee C)

> "So what is Value-Based Health Care, it is a strategy that aims to transform the health system in order to maximize the value generated for patients and realign the competition that exists in the market today with the interests of generating value for the patient. This is Value-Based Health Care. **It is much more than simply measuring outcome and consequently measuring cost.** It is to redesign the care model, and to make it sustainable, to link the remuneration model that pays for these results."
>
> (Interviewee D)

The importance of having the focus on "the patient at the center of care" was highlighted. The concepts of appropriateness and efficiency appeared as part of value dimensions.

> "I think that the value in health brings a perspective of the idea already in 1993 from the Picker Institute, or 2001 from the Institute of Medicine, which says that **we should consider the preferences and needs and values of the patient in decision-making.** I am very interested in this area and what makes me believe in medicine a lot is that you have to give the patient more voice, so this is **what delighted me at Value-Based Health Care is that you listen to the patient and try to direct your business focused on the customer's needs**.... **value-based health is in fact you delivering what is best, doing the right thing, at the right time, at the right time, to the right person and at an appropriate cost**. I think it comes down to that, but always focusing on the vision that we rarely include within the business, which is the patient's view in fact."
>
> (Interviewee A)

> "I understand that value-based health is not a concept of expensive or cheap, it is a concept of **the best possible relationship to what is needed to be delivered to the patient**. So it has **a user/patient concept at the center, and it has the concept of the best delivery relationship for that person at the center.** As a result, it means the optimized efficiency of the system, that is, what is the best output in relation to the vision of what the result is obtained in relation to what is used as a resource. Briefly and conceptually this is it. And the consequence of all this is that we would then have systems that make better use of the available resources, with a better relationship between the outcome and the resource translating into waste reduction."
>
> (Interviewee B)

> "**Assistance result for me is how much health you are promoting for that person**. So I don't think there is a single metric to define, which is why, again, it is very difficult that each one ends up defining results in a way, but this could ultimately be since increased longevity, improved quality of life, absence of disease, improvement of chronic diseases, **countless metrics but with this concept of delivering more health.**"
>
> (Interviewee C)

The interviewees noted that value-based health care had multiple denominations and definitions.

> "It has several denominations."
>
> (Interviewee A)

> "The concept of health value is not new, but it is very difficult to implement. Even the definition itself has ended up taking on some faces over time."
>
> (Interviewee C)

One interviewee in particular noted that the terminology frequently used in Portuguese "Saúde Baseada em Valor" ("Value-Based Health" exact translation to English) when referring to "Value-Based Health Care" is not precise. Interviewee D suggested the use of the expression: "Assistência à Saúde Baseada em Valor".

> "So, first there is no such term "value-based health". Everything that has been written to date is about health care that delivers value, so that term is incorrect, if not it would be Health Based Care and it is not, it is Value Based Health Care, 'assistência a saúde baseada em valor'."
>
> (Interviewee D)

It is interesting to note that Interviewee D was the only one who identified the use of the term "value-based health" in Portuguese as inadequate.

4.2 HOW DO YOU MEASURE VALUE IN YOUR ORGANIZATION?

The ICHOM Standard Sets were cited as a resource for outcomes measurement by all interviewees measuring value. As well as Anahp ("Associação Nacional de Hospitais Privados"), a national association of private hospitals, was mentioned as a local reference for Standard Set standardization.

> **"We often use the ICHOM methodology, so we follow what is proposed by ICHOM a lot, because it is already something standardized and is something that is followed internationally.** There is also a critical analysis of what is there, I think we also understand that not everything is transported to the Brazilian reality and this has been discussed a lot at Anahp...we generally follow the ICHOM methodology, **we follow the Anahp notebooks**, which have these changes in relation to the ICHOM methodology"
>
> (Interviewee A)

> "a line of care that we have had for some time is Clinical Condition X, so this is something that can measure results, **we even participate in the ICHOM of Anahp, sending indicators, sending metrics**"
>
> (Interviewee C)

> **"Another important jump was in 2017 when we started looking at all the Standard Sets of 21 clinical conditions and we went to look at ICHOM and started to standardize the collection with ICHOM standards**. So it started with Clinical Condition X, **along with other Anahp hospitals, within the Anahp ICHOM project.** Then we moved on quickly, so even though Anahp continued with only Clinical Condition X, we have already started doing this for hip osteoarthritis, for knee osteoarthritis, for coronary artery disease...So the first change [after implementing a value office] was that we stopped measuring outcomes (PROs) using the local Standard Set and **we systematically started using ICHOM Standard Set, except for what did not exist."**
>
> (Interviewee D)

All interviewees were already measuring value to some extent, except Interviewee B, who is structuring the methodology for value measurement considering the strategic decisions of Hospital B.

> "At the moment, **we are structuring the methodology of measuring value in our hospital. We are at the beginning of a project, we are not measuring, but I can tell you the direction we are taking to measure value**...How are we structuring the value metric. First, pediatrics has particularities, the metric of value in pediatrics, it must also consider the parents, and not just the patient, who is the child. What we are doing is structuring our vision of a pediatric value office, **choosing a complex condition, developing Standard Set of outcome measures for that complex condition, and then assessing over time the relationship between clinical outcomes, family experience and the patient, and use of resources, based on health conditions in the longitudinal view.** So it is important that the value metric is directed to s**pecific conditions with measures of clinical outcomes that can be reproduced, that is, standardized,** with evaluation of the experience, how it is lived, and in a view that is beyond the episode of the procedure or hospitalization."
>
> (Interviewee B)

When international Standard Sets were not available for a specific medical condition of interest, interviewee A mentioned they developed a local Standard Set in Hospital A. Interviewee A even tried to propose a new Standard Set to be included in ICHOM but the validation requirements and costs made the effort unfeasible.

> "when we do not have this [ICHOM or Anaph] reference, we do a literature review, meet with a group of experts and create our own Standard Set...We discussed a project in vascular surgery, **we even discussed with ICHOM to propose a Standard Set in Vascular Surgery/Peripheral Arterial Vascular Disease, and the cost was very high. We had to pay the cost of developing the Standard Set, so it was unfeasible**. So it ends up being still very local. We do not follow all the steps of the ICHOM, so for example the phase of involving the patient, we have not yet arrived there, we are about to reach that stage, and there is no review as they do there, extensive literature review and such, it's not a systematic review of the subject as they do there, because we don't have it, we would even have the Research Institute, but today we don't have a team for it. **So it is a modified methodology, focused on bringing experts together for discussion."**
>
> (Interviewee A)

Regarding cost measurements, the interviewees mentioned they are still not able to measure cost using time driven activity based costing

> "we are still unable to make the value relation that I told you at the beginning, which is **how much value I deliver over cost.** We still can't do that. So I would say that we are still there, **we measure pieces of that equation, but we cannot put it together and say if the [value] equation that I told you in the beginning is really going up or down**... I can say that **we have some metrics that look at cost, again very much still focused on the bias of the acute illness event.**"
>
> (Interviewee C)

> "Regarding the cost, so far **there is still no project doing TDABC (time driven activity based costing), but the methodology used today there allows you to reach**... **the level of the services department."**
>
> (Interviewee D)

The overarching importance of measurements for improvement was stated by Interview A and D.

> **"First when you start measuring you start to understand what are the opportunities for improvement,** I always tell people that here at Hospital A we always thought that as Hospital A that we had the best door-to-balloon time in all of Brazil. And **when we started measuring it, this was some time ago, and when we start looking at ourselves in the mirror, we see that things are not quite like that.** The perception of those who are on a daily basis is very different than when you start to measure and compare."
>
> (Interviewee A)

> "This is a protocol that has been in place for many years, since 2005, which changed in 2013, even before the office, when I was Role X still, is that we started to report the data to the NCDR, which is the record of the American College of Cardiology, which is the record of heart attack and chest pain and is also published this last year in a European quality magazine in which we show that: **from the time we report, we start to compare ourselves with real-world data. Before, we were following goals, so the goal of the American Heart Association was under 90 minutes.** In fact, when we started in 2005 it was less than 120 minutes, so we were there around a hundred or so. Then there was a reduction to 90 minutes and we stayed at 86-87 minutes. **When we received the first report, comparing our performance with 1200 hospitals, we were shocked because the best of them were already in 56 minutes. And then when we received this report, we realized that we could be much more efficient.** And then we made a deal with our board and the general board, and then the bonus test for all doctors went down in that year to 78 minutes, the next year to 60 minutes. **In just over two years we were already in 56 minutes. So, the power of benchmarking,** this is what we published, I can send you publications later, we have exactly that, the first phase in which we can standardize the practice and monitor a drop in mortality and have an improvement in door-to-balloon time, and then when we start to compare with the real world and then the reduction really is very expressive and remains until today, we report until today to the NCDR records."
>
> (Interviewee D)

4.3 HOW DO YOU INTEND TO (OR CURRENTLY) IMPLEMENT VALUE-BASED HEALTH CARE IN YOUR ORGANIZATION?

The implementation of value-based health care showed to have particular characteristics in each hospital. We will present these specifics in sequence for each interviewee.

Interviewee A uses the ICHOM proposed steps for implementing outcome measurement.

> "**This is from ICHOM, the four phases of implementing an outcome measurement.** This is actually the initial phase, so these are our steps, for each Standard Set "
>
> (Interviewee A)

There are several steps followed in Hospital A: "leadership identification", "gap analysis", "mapping process", "data quality planning", "monitoring", "running a pilot and PDSAs", "launch/communication".

> "So we have **a feasibility phase in which we identify the leadership.** So every Standard Set, every clinical condition, has a medical leadership and some have a multiprofessional team involved, when there is a protocol that already has a multiprofessional team they enter. But in general we have a medical leadership, we review with the medical leader the entire Standard Set, identify if there is any critical issue with that Standard Set that needs to be resolved. Then, in preparation, we resolve these issues and begin to evaluate the questionnaire licenses, which some are paid for. In the planning phase we do **a "GAP Analysis", to determine what I collect today, because we already collected some things here**, what ICHOM recommends and how I am going to put it all together. The **"Mapping Process",** which is a very important phase, which is to try to identify where this patient is, for example low back pain, we saw that he/she entered the emergency room, entered the operating room and entered through rehabilitation. So what are the doors that we go after to get this patient. Build the databases, today they are all in Redcap, and do **a "Data Quality" planning for cutting data quality and reports**, today I have a data ability and data management and she does this data quality report. Then, in the **monitoring phase, we build a basic script, in fact I end up giving a class to the girls**, they are administrative assistants: what is, for example, coronary artery disease, coronary disease, how is angioplasty done, for they to understand the condition itself, for approaching the patient in an already calm way with knowledge of the condition. So there is training in this phase of this monitoring cell, and this is the main phase, which is **the pilot, that we run the PDSAs.** So, for example, the low back pain itself, we started to include the patient in the emergency room, but then we started to see that this patient in the emergency room with low back pain is a guy/girl who is not here, he/she is the young guy/girl who sometimes comes with very low back pain, which for him/her is not even important to follow, it is very acute, and the loyalty rate is very low. So we started to monitor only really surgical or physical therapy patients in rehabilitation. And then **we make a launch, we communicate with the clinical staff,** we make an official live event for the launch of this Standard Set. Then enters the measurement phase, once launched, the measurement of outcomes really starts, we are in a phase with slow improvements due to several CEO changes"
>
> (Interviewee A)

In terms of monitoring, Hospital A has the goal of having a dashboard for each standard set and specific reports to each patient.

> "**the idea is for every Standard Set to have a dashboard**, this is the model of chronic arterial disease...**at the patient level, we have an individual report per patient,** for delivery to the attending physician, today we do not deliver to the patient, this is under discussion, because it is information that belongs to the patient but we deliver it to the assistant physician."
>
> (Interviewee A)

Interviewee A cites the importance of translating monitored outcomes into improvements.

> **“In the management dashboards, in the management reports we end up looking for opportunities for improvement and, from there, developing improvement projects.** Then stroke, today there is an improvement project linked to the methodology of the Institute for Healthcare Improvement (IHI). I specialized in IHI, a specialist in improvement, and then, for example, the average length of stay, the length of hospital stay for stroke is longer than the average Anahp, it is one or two days longer, but it is longer still, so we have a project to improve the length of hospital stay, so it turns out that they are always linked to improvement projects in the area.”
>
> (Interviewee A)

In terms of having deals and commercial negotiation using value metrics, Interviewee A mentioned they are in an early stage.

> **“The commercial negotiation part is still very early**, today I just left a meeting of a possible ... we already had conversations with payers, few, we did not have concluded and we also had a change in management, I think that all this had an impact, the departure of the former CEO, there was a whole change in the management of the hospital, change of people, and now we are resuming conversations with the payers, so **there is one now that we are already proposing the bundle, but it hasn't really worked yet.”**
>
> (Interviewee A)

At Hospital B, Interviewee B is creating a value office and choosing “a strategic line of care”.

> **“We intend to start the journey of implementing value-based health by creating conditions to measure outcomes and assess the amount of resources needed to deliver those outcomes. This means, a structure with resources, which is a value office**, which means investment in that organizational structure, investment and organization of process and development of these standards, capacity also to evaluate the resources used. This implementation, as I said, begins with the choice of a strategic line of care. **We will then measure based on a strategic line of care that we have chosen to be relevant and which also has international publications on it.”**
>
> (Interviewee B)

There is no international Standard Set specific for the line of care Hospital B is choosing. Interviewee B mentioned the possibility of creating new standards based in ICHOM methodology.

> “At the moment, directly, for us there is none in pediatrics. For our strategic choice proposal, **there are Standard Sets of conditions and even about the general health in the child, but they are not applicable to our choice of emphasis at the moment.** One of the disadvantages of the option we made is that in terms of what we are going to measure, there may be no comparison. But on the other hand, I think that the journey of delivering value should be seen not as a hundred-meter run, but as a marathon. And you start **by measuring outcome and from there you can actually stimulate other institutions, maybe they can start measuring based on this standard.** So there is a disadvantage of not adopting an international standard, but there is also a choice of focus, which we believe overrides this disadvantage. Because we don't have international standards of what we want to do at the

> moment...Methodology is specific but it is based on what already exists for example in the ICHOM methodology."
>
> (Interviewee B)

Interviewee C mentioned the creation of protocols across different care units and services among hospitals affiliated to Hospital C.

> "What we have here is the following, we understand that it is almost like a matrix, where I would have service providers in the verticals and the creation of care lines horizontally, that is, **care lines permeate the care units**. **And when I talk about the care line, I'm talking about creating protocols:** how do I treat disease A, how do I treat disease B, how do I refer to disease C. So **we are working on the elaboration of these great lines, these great protocols, which again, would permeate various services,** and which would deliver a quantifiable, measurable result there. For this there is a medical leadership in each of the areas. Today we are working with some areas, we are working with the oncology front, we are working with the cardiology front, we are working with the orthopedics front and we are working with transplants and neuro is a fifth. **So in each of them we have a leadership, a medical reference, who works together with the nursing staff to create these great horizontal protocols**."
>
> (Interviewee C)

Interviewee C mentioned nursing protocols as part of the standardization process important to support independent physician practices.

> "We understand, that there are teams that are internal teams, that we have a little more chance to standardize, but there is the doctor who will be independent, so when I create a care line, I'm not necessarily talking about medical protocols, necessarily, I'm saying that in some cases **I can create a nursing care protocol, which will support the doctor who comes from outside, the doctor from the open clinical staff.** So the two models fit, mainly in a hospital like ours, which again is a hospital with an open clinical staff. I see it both ways."
>
> (Interviewee C)

Outcomes and processes are not systematically differentiated at Hospital C. However, Interviewee C sees the difference between processes and outcomes and thinks that the difference is also clear for Hospital C.

> "The patient does not feel, in the end for the patient is a single line. This is much more an internal classification of ours, an internal categorization of ours. **We don't actually differentiate what is an outcome and what is a process, in the end it is a great line of care**. But I don't think this is noticeable to the patient, he is seeing a doctor, and the doctor is browsing him, the nurse is helping him to navigate. **But they are different, yes they are, and I think for the institution I think it is very clear. And I think the institution sees a relationship**, of course, the lower the infection, the better the outcome, the shorter the average length of stay, the better the outcome, I think there is a relationship."
>
> (Interviewee C)

Interviewee D cites the creation of a strategic pilar as the first step to implementing value-based health care in Hospital D.

> "We needed to design a strategy, Value-Based Health Care is not an isolated initiative. It needs to be a strategy for the organization. So **I think the first step was a decision by the top leadership, by our presidency to create a strategic pillar within the organization's strategic plan**. Value-Based Health Care is a pillar as is 'Operational Efficiency'."
>
> (Interviewee D)

And the creation of a value office, with a dedicated data team and front line assistance workers.

> **"It was from there that we came across that publication by Kaplan that said that every hospital must have a value office. He had published it in 2015, and we were in 2016. So we started to study this and how we were going to assemble.** And it started to make a lot of sense for us to combine these areas into one area. We eliminated several levels of management, we no longer had an outcome manager, nor an epidemiology manager, and **we structured a value office in a Data Analytics / Data Science area and we were able to hire dedicated data analysts and scientists at the office, because if not you are always in the queue at Information Technology Department.** You can't build a BI while standing in line with the information technology team. We then got the BI platform, which is QlikView and Qlik Sense. So there was a cell, we already had in cardiology a program that we had hybrid doctors, not only doctors, but hybrid professionals, there was also a nurse, in which **you took someone who was on the front line and brought part of the his/her load time in the service, because I wanted to have this interaction with the front line workers.** So we had it in research and we had it in assistance. So what we did at the value office was also that, so I had a surgeon, there was a doctor specializing in VBHC, who was Doctor X who is doing a doctorate at Institute X, a project that we are doing in partnership. **We then created an area that had Data Analytics, had an intelligence area that helped us set up all of that, that had doctors, and that was already very connected with Data Analytics**. And there was the outcome cell in which we had around ten people making a large amount, more than a thousand patient calls a month to collect the outcomes."
>
> (Interviewee D)

Training staff in correct disease codification was a fundamental action cited by Interviewee D.

> "What we started to do to be able to build a BI that made sense was **to retrain the way they coded.** I'll give you a simple example: there was a time in the past that they had a goal that they had to code as many diagnoses as possible, that was a goal. So what ended up happening was that the infarction turned out as: one heart attack, two chest pains, three dyspnea, four sweats, so there was a lot of garbage code. And what we did was create algorithms so that they knew what to look for when coding….With that, **we were able to greatly amplify the use of DRG and risk adjustment at the base,** so I think the work that we did to structure, once a week we met with the coding to clear up all doubts and to standardize the coding process. **This was a radical change and increased our case mix, as we stopped losing diagnoses and comorbidities that were previously unnoticed.** There is an outcome, as I said, started doing this systematically by ICHOM and we started to build bundles using these elements. So we designed the bundles, the first one that was implemented was that of endometriosis."
>
> (Interviewee D)

4.4 IN YOUR VIEW, WHAT IS THE IMPORTANCE OF ORGANIZATIONAL LEADERSHIP FOR IMPLEMENTING VALUE-BASED HEALTH CARE?

All interviewees emphasized the fundamental importance of organizational leadership. Specially considering value-based health care as a top-down agenda, with the necessary integration of different departments and with the potential of changing the hospital economics.

> "I think it's the basis, because if you don't have the support of the leadership you can't even start the project… Because **we are going to work with clinical performance, medical performance, we have to bring the clinician closer, and this will have to come from a high level of leadership,** there is no way, the medical superintendence believing in the concept and we start to invest in cost, which it is a sensitive area of the institution. And then it has to be fully aligned, because there it is not only the value office that is acting, it is the value office, it is the commercial, it is the new business, it is a whole group within the institution that **if it does not come from the top leadership, and if this whole vision is not really discussed culturally, this change of vision, which we are used to, is not viable."**
>
> (Interviewee A)

> **"You cannot implement this agenda, which is a long-term agenda, without being a strategic decision and having strong sponsorship from the highest executive level.** So it is **a vision that depends on a strategic alignment at the highest level, which is the level of governance, of the board**, and which obviously can either be composed in a discussion that is both born in the board, as it can be proposed in an executive discussion that is taken to the board, and i**t doesn't happen if it doesn't have the direct involvement of the organization's top executive, with regard to funding and key executives to implement it.** This agenda is not, **this is not a bottom-up agenda, this is a top-down agenda**. But top-down with involvement, it does not happen if there is no engagement at the managerial and operational levels and, above all, the engagement of those key clinical staff resources to make the project possible."
>
> (Interviewee B)

> **"Total**, I think it starts from there because it starts to mess with the side, so, everything is part of the big strategy, and **if the strategy is bought and it is not embraced by the leaders it does not work. Because when we talk about value based, we are saying that, I think it ends up messing with others, with the hospital's economics.** So, when I start offering value based products, I start to accept a little more risk, more risk sharing with the payer. I begin to accept the concept of fixed price per procedure a little more. I begin to accept sharing and sharing more data. **So there is an important strategic change, because again, this affects the economics of the institution, that if top management is not bought it will hardly move forward.** I think that in many cases even this requires a long-term view. In many cases this change to value based means that in the first moment you may have a financial loss, but in the second and third moment this financial loss will be compensated for by better products, by better ties with the payer, with more customers, but I don't think that is, **I think it's a change in the model.** So maybe there is one ... **the leadership has to be very long, it has to be very aligned, because there may be a financial loss at first and this needs to be understood and this needs to be bought by the leadership**."
>
> (Interviewee C)

> **"Fundamental. I always say that you have to have a sponsor, in top leadership I mean**. There is no point in having a local sponsor or enthusiast who knows the VBHC, as was my case, you need to have support from the organization."
>
> (Interviewee D)

The high leadership commitment from the board/council is necessary because it is not an incremental change, it is a transformational change, "a new model of care delivery".

> "But when I talk about leadership, it's not just about management, in the end, who has to be very long and aligned is the highest level of that institution, so **I'm talking here about council, association, board, I'm talking about the highest level. Because this is strategic, again we are saying that more than a process change we are talking about strategic alignment, people need to understand that in the end we are implementing a new model of care delivery.**"
>
> (Interviewee C)

> "because **this is not an incremental change. It is not an improvement, it is a transformation of the way the health system and the provision of care are understood.** And when we look at change management, the strategies for implementing change, we know that having the support of top leadership is what ensures the sustainability of the project."
>
> (Interviewee D)

As a consequence, for the projects to prosper sustainably it is important to promote cultural change and have the board as guardian of the value agenda.

> "I think, changes in the leadership and that leadership building **the cultural basis for change to a new vision**, no matter how much the leadership is transitioned again, *the institution is already ready for the new concept,* I think that makes it easier for any independent leadership implementation in the future."
>
> (Interviewee A)

> "Anyway, **if the CEO changes, if the leader changes, if the principal changes, the project may be at risk. Unless the board is the guarantor.** So it depends, at the end of the day, when you talk about executive leadership, how that is on the board's agenda, if the organization has a board that has this type of attitude."
>
> (Interviewee B)

4.5 IN YOUR VIEW, WHAT IS THE IMPORTANCE OF PROCESS REENGINEERING FOR IMPLEMENTING VALUE-BASED HEALTH CARE?

The interviewees had different understandings about what process reengineering means. For this reason we will present the excerpts sequentially.

Interviewee A associated process reengineering with the Institute for Healthcare Improvement methodology.

> "We use it a lot, **if I can call it process reengineering, we use the Institute for Healthcare Improvement methodology a lot**, since I have a problem, we have a clear objective that is built, the indicators that we will monitor, many process and there is a small team work, normally multidisciplinary, in which **several PDSAs,**

> **guiding diagrams, all Ishikawa brainstorm methods are run to understand cause, and we build a guiding diagram with a generally defined project**."
>
> (Interviewee A)

Continuous improvement projects were mentioned as examples.

> "Today **we have twelve ongoing projects, institutional for improvement, determining nine months of resolution, delivery.** I am not going to tell everyone that not everyone has this frequency, but the main ones, we have a multidisciplinary discussion, for example, stroke, we meet every fifteen days to try **to discuss the indicators and improvement process, review of processes, others are monthly, always with a medical leader involved in that specialty.** We have a monthly meeting with the top leadership, with the quality medical superintendency **to discuss these indicators and we have a report, a monthly executive report now for institutional dissemination.** And now we already put in the institutional tools what the indicators are, now we have a WhatsApp group, with clinical staff."
>
> (Interviewee A)

Interviewed B asked for a contextualization of the term "process reengineering".

> "Please describe to me what you mean in this context with 'process reengineering' to see if I respond appropriately."
>
> (Interviewee B)

After being given a definition, interviewee B proposed a "feedback process, of continuous improvement" to describe "reengineering process", considering that the line of care is "based on the best evidence and best practice".

> **"The redesign of the line of care should take place within the feedback process, of continuous improvement that you can obtain from the moment you start measuring**, but you have a line of care that is defined there, that is drawn, you then in this line of care, it is pointing to outputs, you will start measuring. **You will 're-engineer' eventually depending on the PDCAs you are going to run.**.. I see **the line of care, it is based on the best evidence and best practice, period**. The rest comes later. The concept wears the optimized line of care, optimized based on the best evidence and the best experience, and not the concept defines the line of care, my view is like this...**The methodology of measuring value does not define the line of care** or the process of the line of care, what it does is, for example, **you will not change the way of treating heart failure because you will start measuring value in heart failure cardiac What you can do is to find elements that improve the heart failure treatment process**."
>
> (Interviewee B)

Interviewed C mentioned the importance of processes standardization.

> "I think it's important, we've talked about that a little. **I think that part of revisiting the protocols, when I talk about protocols are processes, in the end we are talking about processes.** I think there is this difficulty in hospitals with an open clinical staff, an additional difficulty, that not all processes are standardized. Precisely because they still depend on this large clinical staff that uses the hospital and they often end up depending on these professionals to bring patients, consequently they often end up making some exceptions, this is a fact, this is reality. But **I see very standardized processes in contrast, nursing processes, the processes of the entire**

> **multidisciplinary team around, the clinical pharmacy, I see many standardizable processes**...But going back to this reengineering issue, I think that process, **part of delivering value is in that, you standardize some processes.**"
>
> (Interviewee C)

The figure of a "health navigator" was added by Interviewee C, as the persona who is responsible to navigate the patient through the health care services and processes.

> **"I think that a fundamental figure to be able to give glue to this is the figure of the navigating nurse**, who in Brazil I don't know if there is a better term, but the nurse who will be looking horizontally, the health professional, let's call it this way, more than a navigating nurse, **the navigating health professional who will help the patient to navigate through those pre-established protocols. To help him/her navigate within the various services on the network, I think this figure is very important."**
>
> (Interviewee C)

The navigator could be a system or technology according to Interviewee C.

> "Take the figure of the nurse, I think some reference is important when navigating the patient, it may be ... there are numerous types of solutions. **The call center that will navigate the patient, the navigation inside the hospital is usually by the nurse,** maybe that's why I used that term, but **it is the person who will give and will ensure that the care interfaces among the various services offered are respected**. It is he/she who will ensure consistency, he/she will ensure that the patient actually goes to the right service at the right time, that there is no redundancy of effort, that there is no redundancy of unnecessary exams, redundancy of expenses, of inefficiencies. **So it is this professional that I think is very important in this process.** And then, again, this has several solutions, we are talking about professionals, but in the last instance **it could be done through computer algorithms, I don't know, apps, the payer's own systems, I don't know, countless possibilities.** But the fact that I have some intelligence navigating the patient so that he/she can use the resource at the right time in the right way I think is fundamental."
>
> (Interviewee C)

The navigator could potentially be outsourced.

> "I don't think it's bad to be outsourced, I think that in the end this is a strategy from institution to institution, there are institutions that would prefer to outsource because this is core in their strategy, there are institutions that might prefer to outsource, I don't see it as a cake recipe. But I personally think this is very core for any value based strategy… but I don't see any problem with outsourcing as long as there is clarity of deliverables and proposals."
>
> (Interviewee C)

Interviewed D contextualized process reengineering as related to "Lean", and highlighted the possible dangers in pure Lean or pure process reengineering, citing the example of Virginia Mason.

> **"It depends on what you call process reengineering.** If you are talking about Lean or the measures of ... **if we are thinking about understanding the processes and restructuring oriented towards value, I think there is always a role.** I do not

> believe in pure Lean, **I do not believe in a strategy focused solely and exclusively on process engineering**, because I think the look of the outcome is lost, of what is value for the patient. **There is a very strong focus on efficiency, and this within a high-risk organization like hospitals, we've seen what happened at Virginia Mason, they almost lost their accreditation with the system there."**
>
> (Interviewee D)

The integration between Lean and Value Based Health Care is clear for Interviewee D.

> "I believe that, for me, the relationship between Lean and Value Based Health Care is very clear. For me, Lean is a tool that favors the implementation of Value Based Health Care. Those who are purists on the Lean side say that just fix the process that the result comes. Who is a purist on the VBHC side says that just look at the result that the process is getting. They are both wrong, but the two of them working together I think it makes a lot of sense… For us to understand the value equation as waste reduction, there is no better methodology than understanding processes, mapping processes and eliminating waste. To the extent that this is not a risk to patient quality and safety. I think the two together are great tools, they work well together."
>
> (Interviewee D)

4.6 WHAT ARE THE CHALLENGES FOR IMPLEMENTING VALUE-BASED HEALTH CARE?

Interviewee A highlighted as main challenges: clinical staff engagement, information technology barriers, patient adherence and commercial negotiation.

> "One point is to reach the clinical staff, which sometimes some still see it in a slightly prejudiced way, "you are comparing me", they do not really understand the idea that it is to deliver a better result, that there is this spirit, it is to bring the clinical body, engaging the clinical staff, **I think that engaging the clinical staff is something that is not easy, it is a long work of convincing and understanding.** I think the big thing, maybe even bigger than the clinical staff, is **information technology, integrating, because today there is still a lot that is collected by hand,** we have a difficulty despite being a reputable organization, today we still have most things on paper...**information integration, database integration, information technology, having a dedicated data scientist, this data support that I think is the big challenge and at the same time is the big solution**. If we can have a solid base and have integration of all information systems, it will make everybody's job much easier. The **third challenge is patient loyalty**, today, almost 90% accepts phone calls very well, we are now trying chatbot, 40% email accepted, WhatsApp and chatbot, SMS was zero percent adherence, chatbot we are trying now with COVID, let's see, but it doesn't look like it will be the solution. And then the big question is human resources, if you consider that phone call is the best way and if I want to advance in new Standard Sets and expand this, how much human resources I need, then it is also a great challenge. For you to structure a value office and expand it, you end up, although the technology exists, sometimes you need human contact, and a large number of human resources end up being a limitation to the advancement of a project like this. And **another is the commercial issue, how much we are mature to develop**, I think Brazil is still crawling in front of other European and American initiatives, everyone is learning, I think it is, **we will be holding the risk and this lack of knowledge and results limits us a little in advancing faster in the implementation of Value Based Health Care in Brazil**."

(Interviewee A)

Interviewee B highlighted as main challenges: strategic choice/decision, implementation (priority, people, engagement, costs and investments), patient adherence, organizational culture. It is interesting to note that technology was not considered a major challenge.

> **"First challenge is the challenge of strategic choice,** that is, a challenge linked to governance bodies. **The second challenge is linked to implementation,** and within the implementation you have the chapter on executive capacity for that, you have the chapter on priority among the countless goals that any executive has. You have the chapter where you have the right people to implement. You have the chapter on culture and engagement at different levels, placing a great emphasis on the health care team and especially the clinical staff. And you have the chapter on costs and investments, in addition to those, and here I am including everything in costs and investments, in addition to those necessary for the specific structure of the development process of an organism that takes care of it, that measures, evaluates, feedback, discusses, feedback on what needs to be adjusted to improve value delivery over time. I think this systematics in general covers everything...you start from the beginning, you start with the strategic decision and you start with strong sponsorship, which is from this binomial executive-board, executive-down, and then the rest comes. So, in the operation, in the operationalization, a great weight relates to **the engagement of both patients and clinical staff.** The methodological part, on how to implement the measures, they have a challenge, but this challenge is much more operational, as you operationalize the value measure, which is linked to the organizational capacity and resources for you to invest. **I don't think there are major technological challenges or challenges related to how to measure the outcome itself, I think the challenge is less than, as long as you have resources, you have people.** Now, the **cultural challenge**, it cannot be underestimated. And the other challenge is: what do you do with it?"
>
> (Interviewee B)

Interviewee C highlighted as main challenges: organizational alignment, financial trade offs, people skills.

> "I think that first is the **organizational alignment,** I think we talked a little about it, the leadership at the highest level. Highest level is board, council, owner, partner, these people need to be very convinced and buy this strategy. I think the second point is, I think it is this trade off, I think there is a **trade off from short to long term, people need to be aware that maybe in the first moment this can bring a financial loss to earn more there in the future.** Especially when this is linked to new remuneration models, which are often forced by the payer. So I think there is an important point. So I see a lot of hospitals trying to implement value based solutions because the payer is forcing a bundle, it is forcing a capitation, it is forcing a, I don't know, a fixed budget model. And then the service provider, the hospital runs after value based, what we need to do, I don't know what. It may even work, but then, of course, there is a financial loss at first, but it needs to understand that in the end, there can be a lot of results in the end when it has a better product. So that's another point. I think the third point is this: people. We are talking about a very new concept in Brazil, even though there are a lot of people trying to do it, but I think it requires a different type of skill, it is a different management, it is a management that involves much more a horizontal look, the very profile of people, I think it requires people who are more flexible, people who have more adaptability, interpersonal relationships, **I think there is another set of skills here that a good value based manager needs to have."**

(Interviewee C)

Considering the market readiness, Interviewee C mentioned that the market is not mature but players are moving forward due to the healthcare system unsustainability.

> "No, **I don't think the market is mature, but I think everyone is taking the step**. **The payers because they can no longer stand the high claims ratio and medical inflation**. **And the providers because they are being pressured: it is either this or it is nothing.** So people are moving on both sides, I see today, and today I say in the last three years, a lot going on, a lot of cool, interesting, good projects. But these are projects, **we still don't have very consolidated value-based models.** So there is a lot of cool stuff coming up, maybe it needs a longer maturation time, so I say that the market is not yet mature, very different models, I am seeing very different models appearing on the market. But I am very optimistic, **I think it is one of the solutions for the system and I think it will happen, to a greater or lesser extent,** in a more crooked or less crooked way, but it will happen in the coming years. So, it is a market under construction… So there is a lot of cool stuff going on, **several capitation models being tested. Amil itself is testing the Adjustable Budget Payment model, which is a fixed budget. Several hospitals are going into this risk sharing line with more standardized products. You see these health techs now,** I don't know how much they are working with value based itself, but wanting to make a better navigation of the patient in the chain. So you get an Alice, a Sami, lots of cool projects, I think there's a lot of cool stuff going on. At least good pilots. How the market is going to evolve is a big question mark, but I think there are good projects on the radar."
>
> (Interviewee C)

Interviewee D highlighted as main challenges: misunderstanding of the concept and information technology barriers.

> "I think there are two that are the most important. The first is **the misunderstanding of what is value-based health care. I think it is the first obstacle, people do not study, do not understand exactly what the strategy is and then they end up failing to implement, or implementing things that are simply new business models and think they are implementing value-based health care.** So I think that first is a matter of education in VBHC. When you decide to do this you have to ... everyone has been trained in fee-for-service, the market and the status quo will try to take you back to fee-for-service. Therefore, you need to know the fundamental concepts, do not violate these fundamental concepts, do not understand what value is from the perspective of the payer, this is not value, this is money. We really have to understand how the system can be realigned to deliver value and health. Value for the patient is health. This is a point. The second point is **information, one will reinforce the other, so to the extent that you have information,** and I'm not just talking about technology. Technology is essential for us to have information at scale, but if I wanted to have information today, every project on the planet started with paper, pen and excel to collect the outcome. So it is possible to collect the outcome, it is just not possible to scale, without technology. But I think it is these things, integrating bases, the bases are extremely fragmented, it is not only assistance that is fragmented...so Value Based Health Care is about redesigning the care model to deliver value, ensuring that value is generated through information and having a remuneration model that supports this new care model. Education solves the new design of the model, but it does not guarantee implementation if it does not have information flowing continuously and consistently. So for me **these are two things, knowledge in VBHC and information that makes sense available. These are the two great difficulties that we have today, the rest is a consequence.**"
>
> (Interviewee D)

Interviewee D cited the three main misconceptions people have about value-based health care. First misconception: terminology and a biased business model approach.

> "First, there are several misconceptions. **Even the way people talk, it is not "value based health", health is an asset, it is defined by the World Health Organization.** This is in itself a value for the person. But Value Based Health Care is how much, when that person needs to activate the health system… the health system is only activated because at last ... a function that you are losing and you want to recover, or because you have a suffering that you want to relieve, whether physical or mental. When you activate the healthcare system, you expect this system to meet your expectations, this generates value at an appropriate cost. What happens is that we **often want to design backwards, people understand that Value Based Health Care, and here in Brazil this is very strong, is it a business model or it is a remuneration model. So they are beating their heads drawing a model and then they want to take that model and implement it in the current system.** And then they say that Value Based Health Care doesn't work. Value Based Health Care means understanding what the system does not serve today, where the value is being sold, redesigning the system based on the needs of the patient and the outcomes you want to achieve, and then designing a remuneration model that supports this care model, not the other way around. So what we hear today, and a large part of what has been done in seminars, education lectures that I am called to speak, **people want to discuss whether it is a bundle, whether it is capitation, whether it is global payment, this is not value-based health care, this is a business model.** What is the model that supports my primary care, what is the model that supports the new model in tertiary care? So it's not that, I even have a slide that I always post, which is: outcome based agreement (OBA) is a very simple concept, remuneration has to be linked to the outcome. Implementing this is not so easy, but the concept is simple. And people don't even understand this concept, they come with models ... I say ok, is it a value-based remuneration model? Where are you harnessing here that this worse outcome is reducing the gain or that this better outcome is increasing the gain for the provider? "Oh, it's not." So it's not a value-based remuneration model, it's that simple. It's not just because I said it's an outcome, it's not just because I measured the cost, it's not just because it is called bundle, that this is a value-based remuneration model. So for me this is the main thing."
>
> (Interviewee D)

Second misconception: the lack of importance to a new care model.

> **"The second is a lack of understanding that we first need a new care model. What is taking the value out of the system is not just the fee-for-service, because I could put pay for performance within the fee-for-service.** Elizabeth usually says that a lot in City X for us. Inertia is a powerful force especially when a lot of money is involved. So there is a lot of gain in this waste system, so understanding that the current care model has to change first so that we can generate value and create a remuneration model is a fundamental step. People do not have this understanding, this is very clear in the debates that I participate. And it's not just here, here and outside Brazil, too."
>
> (Interviewee D)

Third misconception: outcome measurements should be considered important by patients with that clinical condition, should be validated/standardized and should be actionable.

> "So this is a framework that we have used a lot, and we always select outcomes with some premises. Premise number one is that it is **indeed considered important for patients with that clinical condition.** And the **second point is that these outcomes have metrics if possible validated, not creating metrics that later do not allow comparison.** And **third and most important, that they are metrics that you can act on, that is, that they are "actionable".** Because it is another big misunderstanding: "I am already measuring the outcome of ICHOM, I measure value". It doesn't, what do you do with that result? In what way is this result used so that this patient actually benefits? So it has to be validated metrics preferably, unless they don't exist. They have to be metrics that are condition based and they must be actionable, you have to act on those metrics. When we look at the big cases, for example "Schön" case is part of the model that each center has an improvement cycle happening over the metrics every six months. So I really need to have improvement cycles as part of a VBHC project."
>
> (Interviewee D)

4.7 WOULD YOU LIKE TO ADD ANY COMMENTS OR SUGGESTIONS?

Interviewee A mentioned that society still does not know about value-based health care, that it is important to add the subject into the medical school curriculum and cited the effects of the COVID-19 pandemic as a catalyzer for advancements in value-based health care.

> "I think that still thinking about the challenges, in addition to these points there is also the question of the patient him/herself, how much we, I think **the value-based health care information has not yet arrived in society itself. So, we also as a provider, we are also responsible for informing society, that we are not eliminating anything**, because some understand that the payer that is cutting my benefit from this or that, is not quite that. The idea is that you direct these resources well and I also think that this is a great challenge. And as we move to another **key there in the Value Based Health Care which is the shared decision, to inform, to share, to be together, that this patient is really being heard, their needs, their values, their preferences.** How do we **take this to medical schools.** I don't know how it is today, but I think that this is also not on the agenda, in some schools it should be for sure, but within the graduation grid, you really need to share health decisions, I think this is one of Value Based Health Care's goals... I think that the pandemic at first brought uncertainty, and now looking at the pandemic longer, I think it is the moment. Because we start to see the misuse of health resources and there was a lot of things missing, poorly provisioned, poorly planned, this great waste of health, which could have been used in a better way, The proximity also with the Brazilian industry, which was very much at the mercy of the international industry, and the industry good or bad is a stakeholder within the concept. But **I think the pandemic ended up accelerating this type of discussion because we saw the poor investment in health and how it should be better sized. I think it will speed up, just like telemedicine, I think it will eventually speed up this discussion."**
>
> (Interviewee A)

Interviewee B suggested a third independent party to hold players accountable to best practices.

> "I think there are still some challenges, I think **a very important challenge for this to evolve is the security of comparability that it requires,** and this is a very big challenge that is like this, I am comparing orange with orange or am I comparing orange with banana? And what is the methodology, one thing that is important is the following, if I am measuring, is what I am measuring true? So an important issue that **I think, to accelerate all this development is to have a third party, independent third parties that come and evaluate if everything that is being done is in compliance and that result is true.** This one maybe get into the complementation that I would like to do. And from there, the agenda that I see with those who finance it, **the possible agenda is more of a risk sharing and gain sharing agenda than of better remuneration for what is done.** The vision I have is as follows, you have a pizza, if we understand that this pizza is not going to increase in size, let's discuss what each one eats from the piece of pizza."
>
> (Interviewee B)

Interviewee D commented about the big movement in Latin America, the need of using data for better care, the importance of a new assistance model and the need of education about value-based health care among professionals.

> "I think there is a movement going on in Latin America, big one. If we look at it today, 30% to 40% left the pure fee-for-service. They are experimenting with new models. What we notice is that a good part of the X hospitals that we worked in Country X have already measured outcomes at the patient level, Patient Reported Outcomes, but **less than 10% do anything with this data... I think that there is still little talk of the assistance model.** I think that what I would like to see happen in the coming months is that we take **a little look away from this being a business model, from this being merely a payment model, to understand that we need a new care model**. And that the payment model is part of this, but it is not the end for which the value strategy was designed. I welcome the expansion of Accountable Care Organizations in Brazil, because I think it balances these forces, but I think **health professionals still need to be educated. We need to make a big investment as an organization, organizations as a whole, so I'm talking about all stakeholders, provider, payer, industry, and this starts in medical schools."**
>
> (Interviewee D)

5. DISCUSSION

In this chapter our goal is to draw some brief observations that will allow us to have a glimpse of the provider perspective on value-based health care in Brazil. Our objective is to have some understanding of what value-based health care is in their view, what is their willingness to measure it, what actions they are taking to implement it and what the challenges in this journey are. We will shortly discuss the interviewee's answers to the seven questions of this study separately, in order to make it easier for us to address each topic. We would like to stimulate the reader to check the complete interviews at the end of this study in the Appendix.

5.1 DEFINING VALUE-BASED HEALTH CARE

All interviewees alluded to the Porter and Teisberg definition of value. They used different terminology, but all of them mentioned an "outcome/result" and a "cost" measurement as an integral part of the definition of value-based health care. It is interesting to note how present the "value equation" was in the minds of the interviewees, maybe because they are used to the topic or maybe due to the elegance of the formulation that summarizes challenging and multiple dimensions of health care.

All the interviewees mentioned the term "patient", "patient experience" or "value for the patient". Perhaps this is because they are prone to consider the focus on the patient as a core characteristic of value-based health care.

All of them mentioned the term "cost", "waste reduction" or "resources" when defining value. It is relevant to consider that they are aware of the importance of taking not just the output but also the inputs in the process of measuring value.

Some of the interviewees noted the importance of adding the concept of the pertinence of care ("the right care" as mentioned by Interviewee A) to this equation, in an attempt to recollect that in the case that the delivered care was not necessary, the value equation goes to zero.

Some interviewees (Interviewee A and C) noted that the nomenclature and definitions of value could be defined differently, but it is interesting to remember that they both recollected ICHOM and Porter/Teiberg as references for the traditional definition.

One of the interviewees (Interviewee D) defined "value-based health care as a strategy that aims to transform the health system" and "realign the competition that exists in the market today with the interests of generating value for the patient". This perhaps was the definition that was more aligned to the overarching goal of Porter and Teisberg strategic objectives.

One of the interviewees (Interviewee D) noted that the terms we generally use in Portuguese to refer to "Value-Based Health Care" ("Saúde Baseada em Valor") are imprecise. The expression is really an imprecise translation but is a term very frequently used by professionals, teachers and institutions. The term "Assistência à Saúde Baseada em Valor" is more adequate but rarely used. It is interesting to note that on a daily basis many professionals use the term in English or even "VBHC", maybe in an attempt to be more precise.

For the purpose of this study we believe that the terms relating to value-based health care used verbally during the interview were not confounded by the interviewees. Because, when asking each question we used the slide presentation with our seven written questions in Portuguese and English side by side.

5.2 VALUE MEASUREMENT

All interviewees that are currently measuring value in some dimension (Interviewee A, C and D) mentioned either ICHOM or Anahp as references on Standard Sets and outcome measurement. It is interesting to note that some of them mentioned they were part of the ICHOM-Anahp project on outcome measurement and benchmarking in Brazil. From that information we can think that independent hospital associations (as Anahp) have an importance in the dissemination on how to measure outcomes and costs. They mentioned Anahp in a positive way, suggesting that this association was a catalyzer for their own initiatives.

Interview B is structuring the methodology for starting outcome measurement in Hospital B, and is using a methodology based in ICHOM. Interview B mentioned that in some areas as Pediatrics it is important to adapt the outcome measurement to the family perceptions and experience.

One of the interviewees (interviewee A) mentioned that in case there is no ICHOM Standard Set for a condition of strategic interest, Hospital A creates a local Standard Set, considering it is unfeasible to validate it internationally due to the methodologic costs.

Some of the interviewees (Interviewees C and D) mentioned they are not able to measure costs using time-driven activity based costing, they either do not have the cost at the activity level or they have it for an episode/procedure and not for the full cycle of care. It is interesting to note that any one of the interviewees mentioned they have a detailed structure focused in time-driven activity based costing. Maybe because they are struggling with measuring the numerator of the value equation still.

Some interviewees (Interviewee A and D) stated the improvements that came as a consequence of process and outcome measurements. It is astonishing the improvements that come as a consequence of benchmarking. If health care has evolved tremendously over the years, despite being far from the measurements of what matters the most, imagine what can be accomplished in the future if we start measuring value.

5.3 VALUE IMPLEMENTATION

It is important to notice that even though all interviewees had similar definitions and ideas on what is value-based health care and how to measure it, each one described a different way on how to implement it. This is very interesting considering that in practical terms it is important to see how the professionals translate the theoretical concepts into an actionable plan.

Interviewee A mentioned that in Hospital A there is a detailed process for implementing outcome measurement based on ICHOM guidelines. How to show information is considered critical, especially using dashboards and individual reports for each patient. Interviewee A mentioned the use of the outcome measurements to guide continuous improvement projects in the hospital, specially using the Institute for Healthcare Improvement methodologies. The commercial negotiation however was mentioned to be in early stages. It is interesting to see how Hospital A is moving forward despite any commercial negotiation. As an example, the initiatives to develop local Standard Sets for medical conditions of interest not covered by ICHOM yet. This seems to be the rule for the four hospitals in this study.

Interviewee B was structuring a value office and brought the importance of the strategic definition of a specific care pathway/line of care. For the chosen pathway in Hospital B there is no ICHOM Standard Set yet. That means that there will be an effort to

develop a local standard. Interviewee B alerted about the pros and cons of this choice, specially concerning the impossibility of international benchmarking in the future, but considered it secondary due to the focus on an specific strategic pathway of interest for the hospital.

There is usually a strategic decision to be made: picking a condition that already has an ICHOM Standard Set established or focusing on the condition of highest interest in a hospital independently of available standards. This is a challenge that many providers might face, especially those who are interested in very specific medical conditions. Ideally the medical condition of interest has an ICHOM Standard Set. However, in case it has not, we comprehend the importance of focus and strategic decisions of each hospital, but we tend to believe that whenever possible it is preferable to wait for an International Standard Set to be established than to be first movers locally and loose benchmarking.

Interviewee C mentioned the creation of protocols and care lines across affiliated hospitals, permeating various services. Nursing protocols specifically were mentioned as important considering that the hospital has predominantly independent physicians. It is interesting to note that processes and outcomes were not differentiated in the protocols used in Hospital C, everything was considered as part of "a great line of care". In this case we tend to think it is important to be cautious about not confusing outcomes and process metrics. In order for a provider to measure value it is important to focus on outcomes that matter for the patient over the full cycle of care.

Interviewee D highlighted the importance of creating the strategic pilar as the first step in the implementation process and the creation of a value office. Then mentioned the importance of creating the information structure and a dedicated data science team for value measurements. The concept of bringing front line professionals to the value office is very interesting, especially considering the importance of alignment with the assistance. Of major impact is the coding training Interviewee D promoted in the value office. This might seem peripheral but is actually core. We are certain that correctly identifying risk factors is essential to stratify analysis in granular sub-groups of patients. In the end this will lead to the correct adjustments in the way care is delivered.

5.4 ORGANIZATIONAL/EXECUTIVE LEADERSHIP

All interviewees mentioned that high organizational leadership is fundamental for implementing value-based health care. It is important to note that interviewees referred to

board and council involvement specially. In other words, interviewees addressed the importance of C level leadership but sinalized it is important to have board, partner, owner commitment specially. They considered this to be a top-down agenda, that transforms the economics of the hospital and the way the provision of care is understood in the organization. That is probably the reason why they considered it as a long-term commitment that needs sponsorship from the board. **The interviewees suggested that high organizational leadership commitment is the main condition for implementing value-based health care.**

5.5 PROCESS REENGINEERING

It is interesting to note that the concept of process reengineering was not clear for any of the interviewees. They made confusion between process reengineering and continuous improvement. It is interesting to note that all of them mentioned to some extent that transformational changes are fundamental for implementing value-based health care. However they did not identify process reengineering as a tool for this transformation. They suggested that continuous improvement plays the role of transformation. Interviewees mentioned terms as Institute for Healthcare Improvement, Lean, PDSA, and similar methodologies in their answers.

One of the interviewees (Interviewee C) mentioned the importance of revisiting protocols and processes and highlighted the role played by a “health navigator”.

One of the interviewees (Interviewee D) explained the relationship between Lean and value-based health care.

We noted that interviewees seem to consider as a given that within a chosen care pathway the health professionals and processes were already aligned to evidence based medicine. As a consequence the processes were already “in place”. We hypothesize that this premise gives the interviewees the idea that processes are already in place in the hospital and that changes needed are only incremental.

5.6 IMPLEMENTATION CHALLENGES

All the interviewees identified important challenges.

Interviewee A identified: clinical staff engagement, information technology barriers, patient adherence, commercial negotiation.

Interviewee B identified: strategic choice/decision, implementation (priority, people, engagement, costs and investments), patient adherence, organizational culture. It is interesting to note that technology was not considered a major challenge by Interviewee B. We hypothesize that this is maybe related to the fact that Interviewee B is still structuring a plan to implement measurements in Hospital B and maybe is yet to face challenges regarding information technology. Or maybe because information technology issues were not taken to his/her appraisal in current and past experiences in implementing value-based health care.

Interview C identified: organizational alignment, financial trade offs, people skills, market readiness.

Interviewww D identified: misunderstanding of the concept and information technology barriers. Three main misunderstandings were mentioned: 1. terminology and a biased business model approach; 2. the lack of importance given to a new care model; 3. outcomes measurements should be considered important by patients with that clinical condition, should be validated/standardized and should be actionable.

Here in this topic we get to know how challenging it is the implementation of value-based health care. We hypothesize that this is due to the forces of inertia. The current fee-for-service payment system challenges in a daily basis the principles of value-based health care. The legacy of the system seems to challenge innovation. This let us thinking about the competitive advantages new companies/providers have. Potentially it is easier for a small provider to orient care delivery towards value than it is for a big provider.

5.7 COMMENTS AND SUGGESTIONS

The importance of having an open ended question at the end of this questionnaire is made clear by the quality of the suggestions/comments received.

Interviewee A highlighted the importance of the engagement with society. It is important to have the general public aware of the importance of value-based health care, especially a force to drive demand. We believe that people have an important role to play in asking for change in the healthcare system. The patients in special have a fundamental importance related to the adherence to outcome measurement surveys.

Interviewee B coomented on the importance of an independent third party with a compliance role, controlling and influencing the other players to comply with best practices. We believe the importance of an independent third party in core for the transparency of the

measurements, specially in advance stages in which payment models promote proporcionality between value and price paid for health care delivery.

Interviewee D commented on the importance of using the data to promote better care, the importance of a new assistance model and the need of education about value-based health care among professionals. We believe that value is measured to transform for the better the health care delivery, so it is fundamental that data from measurements is used in a feedback loop to transform it. We understand that new assistance models tend to emerge as a consequence of the competition on value for the patient. For this transformation to take place, we do believe it is necessary that health care professionals know the core concepts of value-based health care.

6. CONCLUSION

This study had the objective of shedding some light on the health care provider's perspective about value-based health care in Brazil. We approached this goal through the lenses of senior hospital leadership in São Paulo. We demonstrated that they had definitions and understandings aligned to the literature, that they were dedicating time and energy to improve value measurements in their hospitals and that they were moving forward despite enormous challenges faced in this journey.

Translating the value-based health care concepts into reality is an exercise that starts in the highest organizational leadership level. It starts with the board having a long term top-down strategic agenda aligned to value. The board needs to be committed to navigate economic trade offs. We discovered that the commercial and business landscape is not mature for value-based deals yet, it is a market under construction. We found ICHOM (internationally) and Anahp (nationally) as fundamental initiatives for standardardization and benchmarking. We identified the change for value-based health care as a transformational shift in the way care is delivered in hospitals, demanding cultural alignment and investments in data collection and analysis. We concluded that value-based health care literacy is important for health care professionals and for society as a way to pull demand. The value agenda should include front line workers in its execution, because value is created in health care delivery during the interaction with the patient at the center.

We hope this work adds to the current knowledge on the practice of value-based health care. Especially to the discussion on how to implement it in the real world. We expect this study will promote some reflection not just for those deeply interested in the subject, but mainly for those health care workers who deal with fee-for-service and the inefficiencies in their current practices on a daily base.

This study has many limitations, some of which are presented in the next paragraph. It is important to note that the results shown are limited to the interviewees experience and can not be generalized.

- **Interviewee selection:** the study had one interviewee per hospital, who was interested and responsible for internal value-based health care initiatives in the organization. It did not include leadership from other departments and operational workers.
- **Geography and Type of Organization:** all interviewees led private hospitals in São Paulo. There is a need for further investigation on how leaders in other

Brazilian geographies diverge and on how private and public hospitals are different in their relation to value-based health care.

- **One side perspective:** this work did not approach the patient perspective, who should be at the center of care, neither other players in the healthcare system (payers, suppliers, health plans, government).
- **Format:** all interviews were executed by video conference, potentially there was non verbal information that was lost in the process.

Considering the results from this study, as further investigation on the current practice of value-based health care we suggest an approach to the subject in a pragmatic sense: 1. that challenge the insights from this study; 2. that search for better models and better tools for implementation; 3. that earch on how business deals can be made preserving value-based health care core concepts; and 4. that investigate to what extent physician and health care workers benefit or not from it.

As a conclusion, I end up optimistic, believing that value-based health care has a tremendous potential of prospering and promises a future full of opportunities. I believe this study reflects well my interests both as a physician and as a future manager. As a physician I have always questioned myself about the need of patient follow-up in order to assess the evolution of his/her medical condition, having the patient always at the center of care. As a future manager I comprehend the importance of each strategic decision and its financial implications for the sustainability of a business project. I find myself as a personification of the value equation: in the numerator, I had the privilege of studying in a leading medical school in Brazil; in the denominator, I had the benefit of being a part of the greatest business school in the country. As a consequence, I find myself as a person who has the mission to convert all these gifts received from life into value for society.

In an homage to Ernest Amory Codman whose “end result system” paved a transformation in our understanding of health care and to Charles Darwin whose ideas about evolution changed the way we view life. I end this study combining Darwin’s “On The Origin of Species” final paragraph with Codman’s famous quote: “There is grandeur in this view of life, in which every patient should be followed long enough to have determined whether or not his/her condition has evolved”.

7. REFERENCES

AGÊNCIA NACIONAL EM SAÚDE SUPLEMENTAR. Informações em saúde suplementar: tabnet ANS. 2020. Disponível em < http://www.ans.gov.br/anstabnet/cgi-bin/dh?dados/tabnet_tx.def>. Accessed on: 6/29/2020

ANAHP. Programa de Desfechos Clínicos: o paciente é quem dita a regra do jogo. 2019. Available at: <https://www.anahp.com.br/noticias/noticias-anahp/programa-de-desfechos-clinicos-o-paciente-e-quem-dita-a-regra-do-jogo/>. Accessed on: 6/29/2020.

ANS. **Guia para Implementação de Modelos de Remuneração baseados em valor**. Rio de Janeiro, 2019. Available at:<http://www.ans.gov.br/images/Guia_-_Modelos_de_Remuneração_Baseados_em_Valor.pdf>. Accessed on: 6/29/2020.

AYANIAN, J. Z.; MARKEL, H. Donabedian's Lasting Framework for Health Care Quality. **New EnVALUEWHAT IS gland Journal of Medicine,** v. 375, n. 3, p. 205-207, 2016. Available at: < https://www-nejm-org.ez67.periodicos.capes.gov.br/doi/full/10.1056/NEJMp1605101 >. Accessed on: 6/29/2020.

BERWICK, D; NOLAN, W. T.; WHITTINGTON, J. The Triple Aim: Cares Health, And Cost. **Health Affairs,** v. 27, n. 3, p. 759-769, 2008. ISSN 0278-2715. Available at: < https://www.healthaffairs.org/doi/full/10.1377/hlthaff.27.3.759>. Accessed on: 6/29/2020

BRASIL. Aspectos fiscais da saúde no Brasil. Brasília: Secretaria do Tesouro Nacional. 2018. Available at: < www.tesouro.gov.br>. Accessed on: 6/29/2020

CMS. Available at: <https://www.cms.gov>. Accessed on: 6/29/2020.

CONAHP. Available at: <https://www.anahp.com.br/noticias/noticias-anahp/garanta-sua-presenca-no-conahp-2019-inscricoes-ja-estao-abertas/>. Accessed on: 6/29/2020.

DONABEDIAN, A. The Quality of Care: How Can It Be Assessed? **JAMA,** v. 260, n. 12, p. 1743-1748, 1988. ISSN 0098-7484. Available at: < https://doi-org.ez67.periodicos.capes.gov.br/10.1001/jama.1988.03410120089033 >. Accessed on: 6/29/2020.

FEELEY, T. W.; MOHTA, N. S. Transitioning payment models: fee-for-service to value-based care. 2018.

HEALTH INSURANCE. Available at: <https://www.healthinsurance.org/glossary/fee-for-service/>. Accessed on: 6/29/2020.

ICHOM. Available at: <https://connect.ichom.org/standard-sets/hip-knee-osteoarthritis/>. Accessed on: 6/29/2020.

ICHOM. **What matters most**: patient outcomes and the transformation of Health Care. Cambridge: ICHOM International Consortium for Health Outcomes Measurement, 2017. Available at: <https://ichom.org/files/books/ICHOM_Book.pdf>. Acesso em: 29 Jun. 2020

KAPLAN, R. S. et al. Using time-driven activity-based costing to identify value improvement opportunities in health care. **Journal of Healthcare Management**. 59, n. 6, p. 399+, 2014.

KAPLAN, R. S.; WOLBERG, H. Voices on value: What Is Value-Based Health Care?. **American Hospital Association**, 2018. Available at: <https://www.isc.hbs.edu/Documents/pdf/Voices-on-Value-Harvard-Business-School-Issue%201.pdf>. Accessed on: 6/29/2020.

LARSON, J. A. **Organizational and process reengineering**: approaches for health care transformation. Boca Raton: CRC Press, 2016.

MANICKAS-HILL, O.; FEELEY, T.; BOZIC, K. J. A Review of Bundled Payments in Total Joint Replacement. **JBJS Reviews**, 7, n. 11, p. e1, 2019.

PEDROSO, M. C.; MALIK, A. M. Cadeia de valor da saúde: um modelo para o sistema de saúde brasileiro. **Ciência & Saúde Coletiva**, v. 17, n. 10, p. 2757-2772, 2012.

PORTER, E. M.; KAPLAN, R. S. How to pay for Health Care. **Harvard Business Review**, Boston, pp.88–100, Jul. 2016. Available at: <https://hbr.org/2016/07/how-to-pay-for-health-care>. Accessed on: 6/29/2020.

PORTER, E. M.; LEE, T. H.The strategy that will fix Health Care. **Harvard Business Review**, Boston, pp.50–52, Oct. 2013. Available at: <https://hbr.org/2013/10/the-strategy-that-will-fix-health-care>. Accessed on: 6/29/2020.

PORTER, M. E. What Is Value in Health Care? **New England Journal of Medicine,** v. 363, n. 26, p. 2477-2481, 2010. Available at: < https://www-nejm-org.ez67.periodicos.capes.gov.br/doi/full/10.1056/NEJMp1011024 >. Accessed on: 6/29/2020

PORTER, M. E.; LARSSON, S.; LEE, T. H. Standardizing Patient Outcomes Measurement. **New England Journal of Medicine,** v. 374, n. 6, p. 504-506, 2016. Available at: < https://www-nejm-org.ez67.periodicos.capes.gov.br/doi/full/10.1056/NEJMp1511701 >. Accessed on: 6/29/2020

PORTER, M. E.; TEISBERG, E. O. **Redefining Health Care**: creating value-based competition on results. 1 ed. Boston: Harvard Business School Publishing, 2006.

PORTER, M. Michael Porter on "Value Based Health Care Delivery". **Youtube,** 20 mar 2012**.** Available at: <https://www.youtube.com/watch?v=DRkhppxZzL0&feature=youtu.be>. Accessed on: 6/29/2020.

PORTER, M. Outcome measurement. In: Presentation at Harvard Business School in 6th June 2014, Boston Harvard University, 2014. Disponível em <https://www.hbs.edu/faculty/Publication%20Files/Website_Outcomes%20Measurement_737ae94d-f1b3-48ed-a789-025766d63670.pdf>. Accessed on: 6/29/2020..

PORTER, M. Redefining Health Care in Latin America. In: Presentation at Harvard Business School on 4th Nov 2013, Boston. Harvard University, 2013. Disponível em <https://www.hbs.edu/faculty/Publication%20Files/2012%2010%2031_CMM_v2_Brazil%20Health%20Care_b3532092-df36-44a9-a87f-f77c8e50cfc6.pdf>. Accessed on: 6/29/2020..

PORTER, M. Value-based competition in Health Care. In: Presentation at Harvard Business School on 13th Oct 2006, Boston. Harvard University, 2006. Disponível em <https://www.hbs.edu/faculty/Publication%20Files/20061013%20LDI%2010122006%20-%20Final_78032d07-6359-4145-9ec8-17ef1dad2c82.pdf>. Accessed on: 6/29/2020.

PORTER, M. Value-Based Health Care Delivery: Core Concepts. In: Presentation at Harvard Business School on 15th Jan 2020, Boston. Harvard University, 2020. Disponível em <https://www.isc.hbs.edu/Documents/pdf/2020-intro-vbhc-porter.pdf>. Accessed on: 6/29/2020.

WHO – WORLD HEALTH ORGANIZATION. Health systems financing: the path to universal coverage. Geneva: WHO, 2010. Available at:https://www.who.int/whr/2010/en/. Accessed on: 6/29/2020

YIN, R. K. Getting started: How to know whether and when to use the case study as a research method. Los Angeles, CA, USA: SAGE, 2014.

8. APPENDIX

8.1.1 APPENDIX - EMAIL INVITE (ENGLISH)

Dear Dr. X,

Good morning. I'm a doctor and I'm finishing my second degree in Business at FEA-USP. I amd oing my final thesis on Value-Based Medicine. My thesis will be on "Value-Based Health Care in Brazil: a provider perspective" in preparation for the Porter course that I will be a part in January 2021.

Due to your leadership in the theme of Value Based Medicine in Brazil and at Hospital X, I would like to invite you to be one of the leaders interviewed for my graduation work. The purpose of the interview (conducted in Portuguese, privately and anonymously, via the internet/videoconference and with an estimated duration of one hour) is to answer six guiding questions:

1. What is value-based health care?

2. How do you measure value at your organization?

3. How do you intend to implement value-based health care in your organization?

4. In your view, what is the importance of organizational leadership for implementing value-based health care?

5. In your view, what is the importance of process reengineering for implementing value-based health care?

6. What are the challenges for implementing value-based health care?

I know that your schedule is extremely requested, so if you agree to be interviewed/be part of the study, I would like to make myself fully available to conduct the interview at any time of the day or night, during the week or on weekends, according to your availability. If you cannot participate for any personal/professional reason, I understand perfectly.

As a disclosure, I would like to remind you that I think about continuing to research on the topic of value-based medicine and to implement it in practice through startup/new projects.

I am entirely at your disposal for any questions, by this email and by (11) 9XXXX-XXXX.

Thank you in advance for your attention.

Thank you very much,

Lucas Nóbrega

8.1.2 APPENDIX - EMAIL INVITE (PORTUGUESE)

Prezado Dr. X ,

Bom dia. Sou médico e estou terminando minha segunda graduação em Administração na FEA-USP. Estou fazendo meu trabalho de conclusão de curso sobre Medicina Baseada em Valor. Meu TCC será sobre "Value-Based Health Care in Brazil: a provider perspective" em preparação para o curso do Porter que farei em Janeiro de 2021.

Devido a sua liderança no tema de Medicina Baseada em Valor no Brasil e no Hospital X, gostaria de convidar você para ser uma das lideranças entrevistadas para meu trabalho de conclusão de curso. O objetivo da entrevista (realizada em português, de modo privado e anônimo, pela internet/videoconferência e com duração prevista de uma hora) é o de responder a seis perguntas orientadoras:

1. What is value-based health care?

2. How do you measure value at your organization?

3. How do you intend to implement value-based health care in your organization?

4. In your view, what is the importance of organizational leadership for implementing value-based health care?

5. In your view, what is the importance of process reengineering for implementing value-based health care?

6. What are the challenges for implementing value-based health care?

Sei que sua agenda é extremamente solicitada, por isso, caso aceite ser entrevistada/fazer parte do estudo, gostaria de colocar-me inteiramente à disposição para realizar a entrevista a qualquer horário do dia ou da noite, durante a semana ou aos finais de semana, de acordo com sua disponibilidade. Caso não possa participar por algum motivo pessoal/profissional, entendo perfeitamente.

Como disclosure, gostaria de lembrar que penso em continuar a pesquisar sobre o tema de medicina baseada em valor e a implementar na prática através de startup/novos projetos.

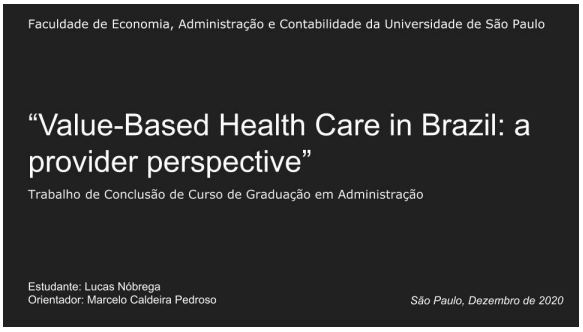
Fico inteiramente à disposição para quaisquer dúvidas, por este email e pelo (11)9XXX-XXXX.

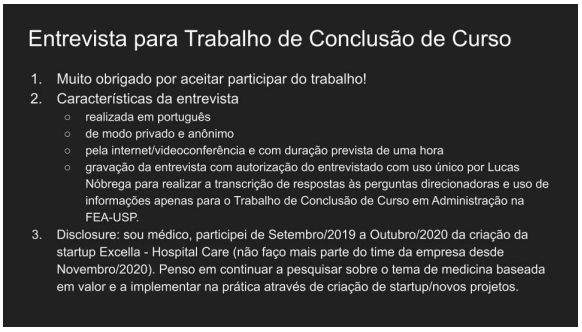
Agradeço antecipadamente pela atenção.

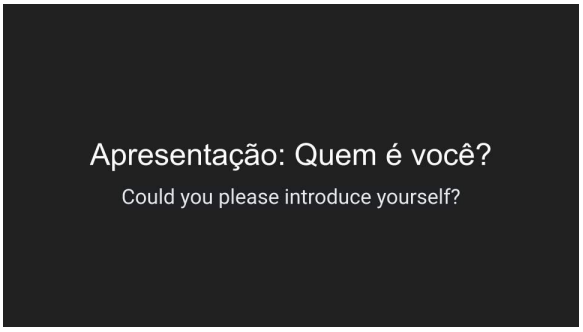
Muito obrigado,

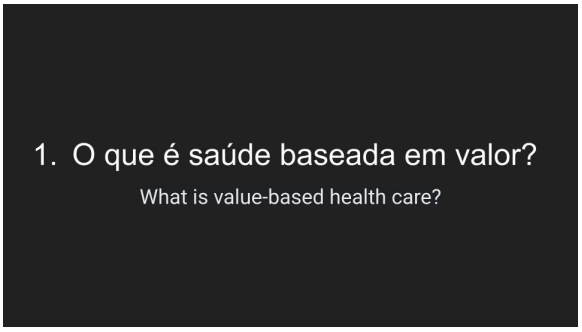
Lucas Nóbrega

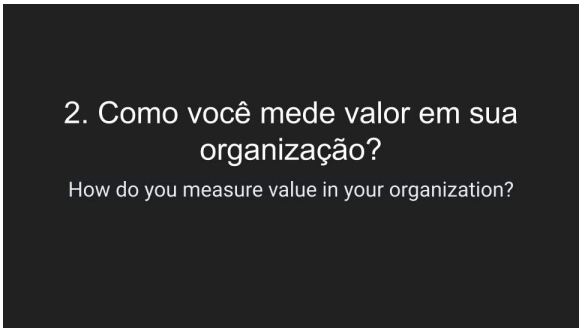
8.2 APPENDIX - QUESTION SLIDES

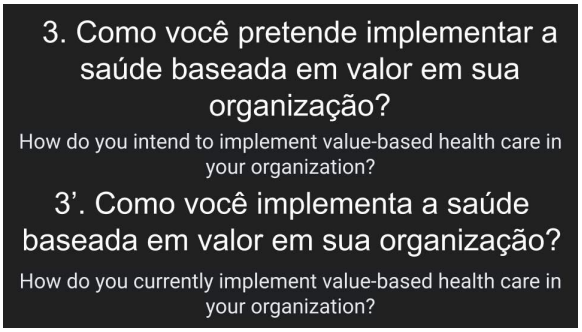


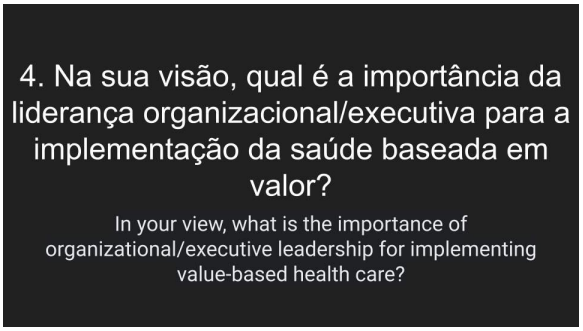


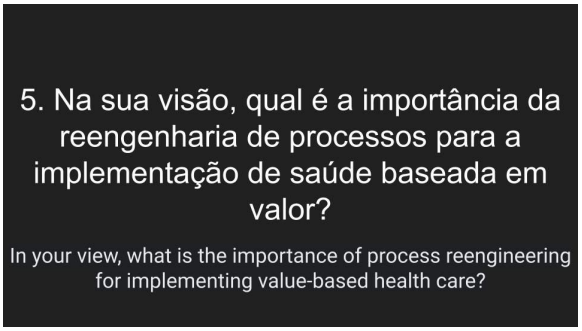












6. Quais são os desafios para implementar a saúde baseada em valor?

What are the challenges for implementing value-based health care?

7. Há alguma complementação ou sugestão que você gostaria de fazer?

Would you like to add any comments or suggestions?

Muito obrigado por sua colaboração!

Assim que o TCC estiver finalizado lhe enviarei cópia virtual.

8.3 APPENDIX - INTERVIEW A

Identification: Interviewee A
Institution: Hospital A

Captions:
Interviewer: italic and bold.
Interviewee: normal text.

1. All the questions should be in your perspective and in your experience, which you bring today, mainly thinking about the organization/company you are currently in. The first question then is: what is value-based health?

I heard a definition once, which was from Doctor X in Rio. He summed up: value-based health is efficiency, it equals efficiency. I found it very simplistic but at the same time it sums up a lot. Many people also focus on the issue of cost. Efficiency in delivering a quality product at the lowest possible cost, focusing on reducing waste. Yesterday I gave a class to a multiprofessional group, from Hospital A here to multiprofessional residents. And for me it goes further, I think that the value in health brings a perspective of the idea already in 1993 from the Picker Institute, or 2001 from the Institute of Medicine, which says that we should consider the preferences and needs and values of the patient in decision-making. I am very interested in this area and what makes me believe in medicine a lot is that you have to give the patient more voice, so this is what delighted me at Value Based Health Care is that you listen to the patient and try to direct your business focused on the customer's needs, even Doctor X discusses this customer view a lot, she thinks we should not consider the patient as a customer, because there is much more involved, than necessarily a need for a product that the customer search, but there are other things involved, it's really not the best definition. But I think that first of all we have to think about the numerator of the value equation, and this is something that Doctor X has always told me a lot about. I was always very concerned with the cost, and then asked Doctor X when will we start measuring the cost? What will the cost be? "Interviewee A the cost will come, we have to start looking at the numerator and deliver better results and obviously we will think about the reasonable cost, the best possible cost, and in the second moment we will start to polish it, and focus on what is wasteful or not. "

First when you start measuring you start to understand what are the opportunities for improvement, I always tell people that here at Hospital A we always thought that as Hospital A that we had the best door-to-balloon time in all of Brazil. And when we started measuring it, this was some time ago, and when we start looking at ourselves in the mirror, we see that things are not quite like that. The perception of those who are on a daily basis is very different than when you start to measure and compare. So, value, I think it is, value-based health is in fact you delivering what is best, doing the right thing, at the right time, at the right time, to the right person and at an appropriate cost. I think it comes down to that, but always focusing on the vision that we rarely include within the business, which is the patient's view in fact.

It has several denominations. The traditional value is equal to quality over cost, and then ICHOM "results that matter to the patient over the costs for delivering those results" and there is now a colleague and our CEO who brings up the question of the relevance of care and patient experience. So in the numerator it turns out that this equation expands the relevance of care ("right care") plus the outcome that matters to the patient, plus the patient's experience over the appropriate cost, over the waste reduction. So, if you deliver treatment unnecessarily, without indication, it also does not depend on the outcome and cost ratio, so the value is zero, so the question of the relevance of care is also fundamental within the value equation, as we start to incorporate within waste, the history of unjustified variation in health, how much can we avoid overuse, inappropriate use of health resources.

So, thinking about the term as you commented, it has several approaches, several definitions, several interpretations, but then if we were to delimit, I know that you limited in your explanation, but if you were to delimit again what is value to you, the is value-based health for you?

I think the relevance of care, I fit that definition a lot: value is equal to the pertinence of care, that is, doing the right thing, for the right patient, at the right time versus the outcomes, that is, the results that are delivered that matter to patients, about waste reduction, not the gross cost per se but waste reduction.

2. Excellent thank you. I will go to the next question, which is: how do you measure value in your organization?

We often use the ICHOM methodology, so we follow what is proposed by ICHOM a lot, because it is already something standardized and is something that is followed internationally. There is also a critical analysis of what is there, I think we also understand that not everything is transported to the Brazilian reality and this has been discussed a lot at Anahp, some Standard Sets we changed at Anahp with this vision, so for us it is important to record education status, it makes a difference to record income status, it makes a difference to understand the social aspects of this patient and the response to his/her illness. When there is no published Standard Set from ICHOM and it is a condition of interest within the institution, that is, of commercial interest or of assistance interest, as I participated in the working group, I understood the methodology, then we build our own Standard Set. Right now we have a project to change the aortic valve, we don't have the Standard Set for that, which is aortic stenosis. Then we looked, reviewed the literature, saw what was already out there, saw the information available, even for us to benchmark one record or another. So we discussed with a group of specialists and we are now closing a Standard Set for the exchange of the aortic valve by catheter. So what we will measure, not in the sense of having only benchmarking, but from that data I will be able to create improvement projects based on that, because at least I will have information about the complication rates and the long-term evolution of the disease. So in response, we generally follow the ICHOM methodology, we follow the Anahp notebooks, which have these changes in relation to the ICHOM methodology and when we do not have this reference we do a literature review, meet with a group of experts and create our own Standard Set.

One question: regarding this creation of the Standard Set, you normally use the same methodology as ICHOM, as you said you went through the whole process of validating the methodology, and also expose it to ICHOM or it ends up being something that is more local?

It becomes more local. We discussed a project in vascular surgery, we even discussed with ICHOM to propose a Standard Set in Vascular Surgery/Peripheral Arterial Vascular Disease, and the cost was very high. We had to pay the cost of developing the Standard Set, so it was unfeasible. So it ends up being still very local. We do not follow all the steps of the ICHOM, so for example the phase of involving the patient, we have not yet arrived there, we are about to reach that stage, and there is no review as they do there, extensive literature review and such, it's not a systematic review of the subject as they do there, because we don't have it, we would even have the Research Institute, but today we don't have a team for it. So it is a modified methodology, focused on bringing experts together for discussion.

When you have the Standard Set for that pathology / medical condition at ICHOM, do you use that Standard Set and extend that Standard Set to local particularities or do you also make substitutions?

In fact, we expand it to some other information that we think is necessary that is not in the Standard Set. A very interesting discussion, regarding heart failure itself, that I participated in ICHOM, when implementing it, we started to see that there in ICHOM the risk adjustment was age, sex and ejection fraction. When we start collecting and start to see various variations, we do, I think this is not enough, why don't we use a risk score already validated in the literature? And we brought ADHERE a risk score for heart failure that uses creatinine, admission blood pressure and admission urea and we will use this score (ADHERE) in addition to age as a risk score. So we end up having this critical view when we start to implement it and make a pilot. I think the problem with ICHOM, which could be improved within ICHOM, and we've already talked to them, is running a pilot. Because when we are planning it everything is beautiful and wonderful, which is like any research project, but when we run it a pilot is what we see what has to be changed in one area or another, the missing information. Maybe in ICHOM, which usually launches but does not implement it, and when you implement it you see a lot of barriers or missing information that we could collect. On the other hand, when there is no translation, and some tools do not have a translation into Portuguese, it is a big job of translation, validation, it is often a master's thesis, so we define that we will not collect, one or the other maybe, for example, a dyspnea scale, we saw the need to translate and validate.

[interruption of the interview by a call]

What was I going to say? And then we just had to capture chest pain and sometimes the patient did not have chest pain but he/she had shortness of breath, and the score captures shortness of breath, tiredness, and we said "this is worth it, this is what we need to have", and we are in the process of translation/validation. But in general, if there is no Portuguese translation and validation, and we end up not applying it, as a consequence what we lose is benchmarking, or if it is important we replace it with something, but most of the Standard Sets have a translation, it has not been a big problem, most of them already have it. For example, the elderly, on the contrary, they even have the translation, but the geriatrician here

said “I think that, for me, it is not significant, it is an extra job, there are many questionnaires, I will focus on this, this and this”, like this.

3. Perfect. I'll ask the next question because it has a lot to do with what we are entering now, which is then, it has two parts to ask, for those who do not apply and for those who already apply, so considering you and your organization already apply it will be this three line: how do you implement value-based health in your organization? So here this question has this idea of explaining how the execution is in practice, not only the conceptual part of how to measure but how to implement it, so I understand that you are already going into this detail, so that is the question.

Let me see if I can share with you. Can I share?

Please, I think you are already authorized, but I will check here.

Let me just open it then.

Just to see if I understood correctly, putting these two questions together: in general do you believe that you can maintain benchmarking in the sense of implementing ICHOM? I understand that there are some things that need validation, but how much is it specific to some conditions, does it end up being a little in all?

Most end up being ICHOM. The vast majority we end up using ICHOM. Only those that really do not have, if there is, we apply ICHOM. If not, we create ours. In general, the vast majority of conditions already have.

[slideshow start by interviewee]

This is from ICHOM, the four phases of implementing an outcome measurement. This is actually the initial phase, so these are our steps, for each Standard Set so we have a feasibility phase in which we identify the leadership. So every Standard Set, every clinical condition, has a medical leadership and some have a multiprofessional team involved, when there is a protocol that already has a multiprofessional team they enter. But in general we have a medical leadership, we review with the medical leader the entire Standard Set, identify if there is any critical issue with that Standard Set that needs to be resolved. Then, in preparation, we resolve these issues and begin to evaluate the questionnaire licenses, which some are paid for. In the planning phase we do a “GAP Analysis”, to determine what I collect today, because we already collected some things here, what ICHOM recommends and how I am going to put it all together. The “Mapping Process”, which is a very important phase, which is to try to identify where this patient is, for example low back pain, we saw that he/she entered the emergency room, entered the operating room and entered through rehabilitation. So what are the doors that we go after to get this patient. Build the databases, today they are all in Redcap, and do a “Data Quality” planning for cutting data quality and reports, today I have a data ability and data management and she does this data quality report. Then, in the monitoring phase, we build a basic script, in fact I end up giving a class to the girls, they are administrative assistants: what is, for example, coronary artery disease, coronary disease, how is angioplasty done, for they to understand the condition itself, for approaching the patient in an already calm way with knowledge of the condition. So there is training in this phase of this monitoring cell, and this is the main phase, which is the pilot, that we run the PDSAs. So, for example, the low back pain itself, we started to include the patient in the emergency room, but then we started to see that this patient in the emergency room with low back pain is a guy/girl

who is not here, he/she is the young guy/girl who sometimes comes with very low back pain, which for him/her is not even important to follow, it is very acute, and the loyalty rate is very low. So we started to monitor only really surgical or physical therapy patients in rehabilitation. And then we make a launch, we communicate with the clinical staff, we make an official live event for the launch of this Standard Set. Then enters the measurement phase, once launched, the measurement of outcomes really starts, we are in a phase with slow improvements due to several CEO changes, but the idea is for every Standard Set to have a dashboard, this is the model of chronic arterial disease. We started using "Shine", until Doctor X at Hospital X, who is from Information Technology at Hospital X, and helped us with the first dashboards in "Shine" and we had to move to PowerBI, anyway. This is still there, we are fighting a little to make it permanent. And at the patient level, we have an individual report per patient, for delivery to the attending physician, today we do not deliver to the patient, this is under discussion, because it is information that belongs to the patient but we deliver it to the assistant physician. In the management dashboards, in the management reports we end up looking for opportunities for improvement and, from there, developing improvement projects. Then stroke, today there is an improvement project linked to the methodology of the Institute for Healthcare Improvement (IHI). I specialized in IHI, a specialist in improvement, and then, for example, the average length of stay, the length of hospital stay for stroke is longer than the average Anahp, it is one or two days longer, but it is longer still, so we have a project to improve the length of hospital stay, so it turns out that they are always linked to improvement projects in the area. The commercial negotiation part is still very early, today I just left a meeting of a possible ... we already had conversations with payers, few, we did not have concluded and we also had a change in management, I think that all this had an impact, the departure of the former CEO, there was a whole change in the management of the hospital, change of people, and now we are resuming conversations with the payers, so there is one now that we are already proposing the bundle, but it hasn't really worked yet. But like this, we started to embed something different in the clinical staff, in the first survey we did with clinical staff of what is value-based health 20% knew, in the second survey two years later, which was last year, 80% had heard of it at least. And then we did some workshops, which were very interesting, that joined the commercial, in the same room, even in the COVID era, there were 20 people so we managed to gather in the auditorium: doctors, surgeons, board representative, commercial representative, business representative and there at the workshop the idea was to make a canvas and try to understand our customers, our value propositions, delivery, and show the assistance data that we have today and the continuation of this workshop is to collect / raise the cost part and show this cost to the team, and the doctor starts looking at how much he/she spends, how much he/she is also effective, what are his/her results, because most do not know, are here operating but do not know what are their results, so this is in a big wave in some specialties, to present the results to the clinician, whether the performance indicators, by team and now already in a phase of showing their cost per team, Orthoses, Prostheses and Special Materials, International Classification of Diseases (ICD) and hospital cost. So we are now in this more advanced phase.

That implementation structure that you showed which part is yours, what part is it of your organization, and what part is ICHOM or another methodology?

There's a lot of ICHOM, that we kind of translated and implemented and addapted for our reality, but this story of “Gap Analysis”, “Map Process”, this comes a lot from ICHOM. It's kind of a mix.

This part that you did, did you publish?

I need to publish, but I don’t have time, I’m dying to publish a case, something, even from COVID, I have a paper ready, we even presented it at Anahp, to publish, but I still haven’t had time for that.

4. Perfect, thanks for the explanation and the level of detail. Let me present the next question, which is: in your view, what is the importance of executive/organizational leadership for the implementation of value-based health?

I think it's the basis, because if you don't have the support of the leadership you can't even start the project. In the previous management we were not so close, but then the commercial superintendent was the one who ran the project, who really gave this gas to the project, and now the current CEO, he super understands and gives all the support and I think this helped to leverage the cost analysis issue, because we were focusing a lot at the beginning, which also needed to structure the information collection well, to structure the outcome measurement and the entire value office itself, but I think this gas in cost, this gas in commercial operation, it comes a lot for the support of the high leadership with this vision of value in health. Because we are going to work with clinical performance, medical performance, we have to bring the clinician closer, and this will have to come from a high level of leadership, there is no way, the medical superintendence believing in the concept and we start to invest in cost, which it is a sensitive area of the institution. And then it has to be fully aligned, because there it is not only the value office that is acting, it is the value office, it is the commercial, it is the new business, it is a whole group within the institution that if it does not come from the top leadership, and if this whole vision is not really discussed culturally, this change of vision, which we are used to, is not viable. So, for example, in the history of waste, we started designing some emergency room protocols based on Choosing Wisely and Appropriateness Criteria, simple basic: rhinosinusitis, clinical diagnosis, not doing a CT scan if uncomplicated rhinosinusitis, Choosing Wisely. When we put this to the emergency room group, “what do you mean, I'm going to order a CT scan, the patient asks us”. It was a resistance at first, but now we started to drop the indicator, because they saw that there was no just do not prescribe, it is the risk that you include for this patient from an unnecessary tomography, it is the flow that impacts everything in the emergency room, so the patient is there waiting, then he/she enters the unnecessary tomography, there is a stroke and the tomography is busy, when the flow was really needed. Then they start to see in a different way. And then, when they start to see the cost of it within the institution, then I think that another way, then, a team A spends less and with better results than my team that spends more, what can I change, what is it really waste or not? But trying to separate, what is more difficult I think in this whole analysis is that we measured the cost, team A had a better financial result than team B. Oh cool, at first, “wow, team A super good, it brought a very good financial return to the hospital ”, when we crossed with a clinical outcome, team A had longer hospital stays, higher rates of complications, greater use of devices, so team A is not

good. So marrying what is complicated and then we have to adjust to the DRG (diagnosis-related group), which today we are starting to turn to DRG, with an epidemiologist, it may also be that this patient NIH score was higher than in the other teams, and then we will have to start adjusting the risk and try to understand who really brings the best result and how to learn from this team, it is not comparing teams, it is like learning from this team and bring similar results.

An item that you commented on, thinking about leadership too, you commented that there was a transition of leaders, this is in the literature, it is known that when the leadership changes there is a cultural/organizational challenge, so I wish you could comment a little in your case how do you see this with the continuity of the projects?

I think, changes in the leadership and that leadership building the cultural basis for change to new vision, no matter how much the leadership is transitioned again, the institution is already ready for the new concept, I think that makes it easier for any independent leadership implementation in the future. So the most important thing is that the base, the assistance, and not only speaking of the clinical staff, but also of the multidisciplinary body, is accustomed to the concept and understanding the importance of implementing this concept. So I thought it was fantastic and fundamental to take the class yesterday for the multiprofessional residency, because these are the ones who are going to multiply, this is the new generation. We didn't learn that, I don't know about you now, but I didn't learn any of that in college, we were always fee-for-service, the more volume I do the better, the more I will earn. So bringing this to the young and new leaders, leaders in evidence, the people who are coming younger, and sometimes the mindset of the oldest are difficult to change, but if we change those who are there, those who they are perennial within the institution, I think this is easier to sustain the project.

Another item related to leadership, in the case of your organization's value office, is the outcome measurement part all done by you, in the value office, how do you do it?

Today we are a team of three people calling and one person as a data analyst. We have three others that are from clinical protocols but end up helping in some way, but calling patients there are only three. And it's super lean if you compare it to the other institutions, but we have been trying other ways, sending by email, sending by WhatsApp, chatbot. The telephone is always what is best received and the patient accepts more. But beyond here for example, in oncology it is the oncology team that accompanies the Standard Set for breast cancer, thet eam Program X that accompanies the Standard Set for the elderly and has the quality team where the protocols certified by JCI are, these the Quality Department follows, but everyone follows the ICHOM methodology, the value office supports and builds the database together, following the methodology, this part of the Gap Analysis, Map Process, this initial phase, but then after this process, today we have in addition to the value office these three areas: oncology, elderly (which is the elderly clinic that we have) and JCI certified programs.

Just to see if I understood correctly, in the execution, who controls the execution of the measurement is the organization itself, there is no external company, correct?

There is no external company. External company, now that we have discussed for data auditing, a certifier, an Ernest Young, to be able to start providing transparency for

information, to add it on to the website, to have an external audit seal, but the entire operation is internal to the organization.

5. ***Going to the next question, question five: in your view, what is the importance of process reengineering for the implementation of value-based health? So here on this issue, we are thinking more from the point of view that we have the results, whatever they may be, now I need to look at the process and change, I saw that there is a need for change, what is the importance of process reengineering, of the vision of studying process, organizational culture, culture of change, all within the scope of process reengineering to really be able to implement and execute value-based medicine?***

We use it a lot, if I can call it process reengineering, we use the Institute for Healthcare Improvement methodology a lot, since I have a problem, we have a clear objective that is built, the indicators that we will monitor, many process and there is a small team work, normally multidisciplinary, in which several PDSAs, guiding diagrams, all Ishikawa brainstorm methods are run to understand cause, and we build a guiding diagram with a generally defined project. Today we have twelve ongoing projects, institutional for improvement, determining nine months of resolution, delivery. I am not going to tell everyone that not everyone has this frequency, but the main ones, we have a multidisciplinary discussion, for example, stroke, we meet every fifteen days to try to discuss the indicators and improvement process, review of processes, others are monthly, always with a medical leader involved in that specialty. We have a monthly meeting with the top leadership, with the quality medical superintendency to discuss these indicators and we have a report, a monthly executive report now for institutional dissemination. And now we already put in the institutional tools what the indicators are, now we have a WhatsApp group, with clinical staff.

Thinking about that case that you talked about sinus/face tomography for rhinosinusitis, once you saw that a team A, B or C, one of them emerges as the biggest users and does not bring value to what has evidence, there is some process for approaching the doctor or is it something that is done in a way that speaks to the boss in that team, and he/she transmits within the team and changes his/her behavior accordingly?

It is feedback, we send the name of the doctor to the emergency room leadership, the date of realization and then he/she does this approach with the doctor, directs this action directly with the doctor who requested it and gives this feedback, this training. We have a group of protocols, which have all the doctors in the house, inpatient unit, intensive care unit and emergency room, which we release this report so that they too can access, but it is condensed, not individualized, today we have not yet managed to reach the level of reporting that individualized for each doctor, the clinical staff is independent, sometimes it becomes difficult, the idea is this, we evolve to a platform where he/she can access his/her own results. This is in a very report format. That dashboard that I showed you about hemodynamics, the idea is that you access the dashboard, that it can view all your data in comparison to the organization's internal benchmarking and if we have it in comparison to international benchmarking, and that it can reach the patient level, you enter the identifier number and have a report of your patient there within the platform. I just need an information technology team, but the information technology team is all involved in the electronic medical record now, this

is the dream of consumption, but I have not yet managed to put it into practice, but it is there as a project and I think it will evolve.

6. What are the challenges for implementing value-based health? We have already talked about several, but the idea here is to comment on those you think are the main ones, if you were to start over from scratch.

One point is to reach the clinical staff, which sometimes some still see it in a slightly prejudiced way, "you are comparing me", they do not really understand the idea that it is to deliver a better result, that there is this spirit, it is to bring the clinical body, engaging the clinical staff, I think that engaging the clinical staff is something that is not easy, it is a long work of convincing and understanding. I think the big thing, maybe even bigger than the clinical staff, is information technology, integrating, because today there is still a lot that is collected by hand, we have a difficulty despite being a reputable organization, today we still have most things on paper, we tried Totus [a proprietary electronic medical record system], it didn't work, ten years of Totus, it became another group, it didn't work, and now we're turning into Tasy [electronic medical record system]. Then it turns to Tasy but, like this, I'm still looking for people to at least structure the field in there to be able to pull [information], if not everything is going to continue in hand, there is no point in having an electronic medical record and having to search by hand. So this question of information integration, database integration, information technology, having a dedicated data scientist, this data support that I think is the big challenge and at the same time is the big solution. If we can have a solid base and have integration of all information systems, it will make everybody's job much easier. The third challenge is patient loyalty, today, almost 90% accepts phone calls very well, we are now trying chatbot, 40% email accepted, WhatsApp and chatbot, SMS was zero percent adherence, chatbot we are trying now with COVID, let's see, but it doesn't look like it will be the solution. And then the big question is human resources, if you consider that phone call is the best way and if I want to advance in new Standard Sets and expand this, how much human resources I need, then it is also a great challenge. For you to structure a value office and expand it, you end up, although the technology exists, sometimes you need human contact, and a large number of human resources end up being a limitation to the advancement of a project like this. And another is the commercial issue, how much we are mature to develop, I think Brazil is still crawling in front of other European and American initiatives, everyone is learning, I think it is, we will be holding the risk and this lack of knowledge and results limits us a little in advancing faster in the implementation of Value Based Health Care in Brazil. This approach, how well or badly we are culturally we are a little removed from the payers, the provider, and how important it is to be together, to be close, to be discussing, to be open, to be transparent, the question of transparency itself is fundamental and still there is a lack of international benchmarks. Although ICHOM builds a wonderful initiative, GLOBE has not yet turned into reality, so it has a beautiful initiative but in fact international benchmarking using ICHOM we do not have. There's an initiative for total knee arthroplasty for osteoarthritis, but it's kind of almost unique.

In the case that you commented on the call, the call rate is much higher than the others, is that the concept then?

We call and 80% to 90% receive it very well, 80% considering the loss rate. Those who we called and failed to contact, they are very rare. Those with successful call contact, there is 90% to 95% adhesion.

And who is calling is this value office, correct?

Or, for example, oncology, Program X.

But do they have a dedicated person there?

Yes, dedicated to that.

7. Do we have one last point, more to open for yourself, in the sense of whether there is any complement, suggestion or something that you would like to comment on?

I think that still thinking about the challenges, in addition to these points there is also the question of the patient himself, how much we, I think the value-based health care information has not yet arrived in society itself. So, the patient still sees this history of tomography a lot. And we were recently discussing COVID, CT scan for COVID for all patients with COVID, but even one of the bosses here said, "but the patient asks me and I as an infectologist cannot deny it" and then I say but you have to have discretion. So, we also as a provider, we are also responsible for informing society, that we are not eliminating anything, because some understand that the payer that is cutting my benefit from this or that, is not quite that. The idea is that you direct these resources well and I also think that this is a great challenge, as we bring this to society really within the concept. And as we inform. And as we move to another key there in the Value Based Health Care which is the shared decision, to inform, to share, to be together, that this patient is really being heard, their needs, their values, their preferences. How do we take this to medical schools. I don't know how it is today, but I think that this is also not on the agenda, in some schools it should be for sure, but within the graduation grid, you really need to share health decisions, I think this is one of Value Based Health Care's goals.

One last question, from your point of view, do you think it is still too early from the market point of view, or do you think it is the time to start? Because you are making a move as providers, but you think that you are well in that limit between the consumer/health plan/payer are already aware and you are providing or you are moving a lot before even and they are having to learn to engage?

I think it's kind of going together. Society maybe a little bit more behind schedule, I think we need to bring this more to society, but in relation to the payer it is going together. There is even a National Health Association document on performance-based payment models. I think that the pandemic at first brought uncertainty, and now looking at the pandemic longer, I think it is the moment. Because we start to see the misuse of health resources and there was a lot of things missing, poorly provisioned, poorly planned, this great waste of health, which could have been used in a better way, The proximity also with the Brazilian industry, which was very much at the mercy of the international industry, and the industry good or bad is a stakeholder within the concept. But I think the pandemic ended up accelerating this type of discussion because we saw the poor investment in health and how it should be better sized. I think it will speed up, just like telemedicine, I think it will eventually speed up this discussion.

Thank you very much for your availability, time and conversation. I still have some interviews to do and as soon as I have finished the work I will share it with you for your knowledge. Thank you very much.

8.4 APPENDIX - INTERVIEW B

Identification: Interviewee B
Institution: Hospital B

Captions:
Interviewer: italic and bold.
Interviewee: normal text.

1. Now going to the research questions, there are six questions and the final comments, so the first is: what is value-based health for you?

Value-based health is basically the delivery of the best result to the patient using the least amount of resources possible to deliver that result. That is to say, that the delivery of health based on value must consider the clinical outcomes that are important to the patient, in dimensions of life that are relevant to him, taking into account the experience he/she has in his/her care journey. In this sense, it is important to also note in the concept of Value-Based Health the relevance of what is done to deliver the best clinical result to the patient and considering their best experience. And this is all related to what in this equation view has in the denominator the amount of resources adequate for the delivery of what I just described and which would be the numerator of this equation view. I understand that value-based health is not a concept of expensive or cheap, it is a concept of the best possible relationship to what is needed to be delivered to the patient. So it has a user/patient concept at the center, and it has the concept of the best delivery relationship for that person at the center. As a result, it means the optimized efficiency of the system, that is, what is the best output in relation to the vision of what the result is obtained in relation to what is used as a resource. Briefly and conceptually this is it. And the consequence of all this is that we would then have systems that make better use of the available resources, with a better relationship between the outcome and the resource translating into waste reduction.

2. Excellent thank you. Moving on to the second question, which is related: how do you measure value in your organization today?

At the moment, we are structuring the methodology of measuring value in our hospital. We are at the beginning of a project, we are not measuring, but I can tell you the direction we are taking to measure value. I have previous experience, since I was Role X of Organization X, Role X of the council and introduced to Organization X the discussion of value and of structuring Organization X's clinical outcomes program, and in my passage through another hospital X, I was responsible for this program and for structuring the value office. So what I'm going to talk about here, starts with what I'm doing now, if necessary, we go into the past. How are we structuring the value metric. First, pediatrics has particularities, the metric of value in pediatrics, it must also consider the parents, and not just the patient, who is the child. What we are doing is structuring our vision of a pediatric value office, choosing a complex condition, developing Standard Set of outcome measures for that complex condition, and then

assessing over time the relationship between clinical outcomes, family experience and the patient, and use of resources, based on health conditions in the longitudinal view. So it is important that the value metric is directed to specific conditions with measures of clinical outcomes that can be reproduced, that is, standardized, with evaluation of the experience, how it is lived, and in a view that is beyond the episode of the procedure or hospitalization. I don't know if that answers your question.

3. Perfect, thanks. The next question has to do with how do you plan to implement value-based health in your organization? Here the idea would be more from an operational point of view, how to measure in detail?

We intend to start the journey of implementing value-based health by creating conditions to measure outcomes and assess the amount of resources needed to deliver those outcomes. This means, a structure with resources, which is a value office, which means investment in that organizational structure, investment and organization of process and development of these standards, capacity also to evaluate the resources used. This implementation, as I said, begins with the choice of a strategic line of care. We will then measure based on a strategic line of care that we have chosen to be relevant and which also has international publications on it.

In this case, there are obviously the particularities of Pediatrics, but do you use any international institution as a guide, for Standards or benchmarking?

Not specifically for that line, because it doesn't have. We have international publications, but there is no international consortium standard on this**.**

Regarding the use of ICHOM's Standard Sets, are there any that apply in this case, or really none at all?

At the moment, directly, for us there is none in pediatrics. For our strategic choice proposal, there are Standard Sets of conditions and even about the general health in the child, but they are not applicable to our choice of emphasis at the moment**.**

In this case, how specific is it, how do you see the ability to generate a Standard Set in the sense of comparability or benchmarking in relation to other institutions here in Brazil or abroad, how do you see it in the long term?

One of the disadvantages of the option we made is that in terms of what we are going to measure, there may be no comparison. But on the other hand, I think that the journey of delivering value should be seen not as a hundred-meter run, but as a marathon. And you start by measuring outcome and from there you can actually stimulate other institutions, maybe they can start measuring based on this standard. So there is a disadvantage of not adopting an international standard, but there is also a choice of focus, which we believe overrides this disadvantage. Because we don't have international standards of what we want to do at the moment.

Perfect, it makes perfect sense. Regarding the methodology in this specific case. Are you in the value office using any methodology that is already used elsewhere, or are you developing the methodology of the specific Standard Set?

Methodology is specific but it is based on what already exists for example in the ICHOM methodology.

4. Perfect, thanks. The fourth question is: in your view, what is the importance of organizational / executive leadership for the implementation of value-based health?

You cannot implement this agenda, which is a long-term agenda, without being a strategic decision and having strong sponsorship from the highest executive level. So it is a vision that depends on a strategic alignment at the highest level, which is the level of governance, of the board, and which obviously can either be composed in a discussion that is both born in the board, as it can be proposed in an executive discussion that is taken to the board, and it doesn't happen if it doesn't have the direct involvement of the organization's top executive, with regard to funding and key executives to implement it. This agenda is not, this is not a bottom-up agenda, this is a top-down agenda. But top-down with involvement, it does not happen if there is no engagement at the managerial and operational levels and, above all, the engagement of those key clinical staff resources to make the project possible.

I would also like to understand, regarding changes in this leadership, how do you see a way to keep the organization perennial, considering sometimes organizational leadership ends up changing.

This is a project continuity challenge. Anyway, if the CEO changes, if the leader changes, if the principal changes, the project may be at risk. Unless the board is the guarantor. So it depends, at the end of the day, when you talk about executive leadership, how that is on the board's agenda, if the organization has a board that has this type of attitude.

5. Perfect, thanks. The next question is, in your view, what is the importance of process reengineering or process redesign (we can give another name), for the implementation of value-based health?

Please describe to me what you mean in this context with "process reengineering" to see if I respond appropriately.

I understand here how the necessary changes to the specific care line, the creation of the line, the modification of the line, the integration of that line to whatever it is due to the measurement of the results, that is, to measure the output, having any problems in relationship ...

No, I think the following, you have a line of care. The line of care is, shall we say, the raw material that you will use to measure value, so I don't see it, like this. The redesign of the line of care should take place within the feedback process, of continuous improvement that you can obtain from the moment you start measuring, but you have a line of care that is defined there, that is drawn, you then in this line of care, it is pointing to outputs, you will start measuring. You will "re-engineer" eventually depending on the PDCAs you are going to run.

In the first time, when creating the line of care to measure processes, there is already a status quo at the hospital, at the provider, when the line is created, new concepts and

processes are sometimes introduced, so the process reengineering would be in the construction of the line. for the first time, who makes this change.

No, I don't see it like that. I see the line of care, it is based on the best evidence and best practice, period. The rest comes later. The concept wears the optimized line of care, optimized based on the best evidence and the best experience, and not the concept defines the line of care, my view is like this.

Okay, so if you can, in a nutshell then, how do you build the line of care to measure value based medicine/health?

The line of care you build and you define whether or not you want to measure value in that line of care, period. The methodology of measuring value does not define the line of care or the process of the line of care, what it does is, for example, you will not change the way of treating heart failure because you will start measuring value in heart failure cardiac What you can do is to find elements that improve the heart failure treatment process.

6. Perfect, thanks. In the next question, in your opinion, what are the challenges for implementing value-based health? I understand that this question is broad and has many challenges, but if you can list here the main ones that you identify.

First challenge is the challenge of strategic choice, that is, a challenge linked to governance bodies. The second challenge is linked to implementation, and within the implementation you have the chapter on executive capacity for that, you have the chapter on priority among the countless goals that any executive has. You have the chapter where you have the right people to implement. You have the chapter on culture and engagement at different levels, placing a great emphasis on the health care team and especially the clinical staff. And you have the chapter on costs and investments, in addition to those, and here I am including everything in costs and investments, in addition to those necessary for the specific structure of the development process of an organism that takes care of it, that measures, evaluates, feedback, discusses, feedback on what needs to be adjusted to improve value delivery over time. I think this systematics in general covers everything.

In your experience, which is quite wide of execution, do you have any that you would say are the most important of all or would they have equivalent weights?

No, they have weights depending on the stage you are in. So, you start from the beginning, you start with the strategic decision and you start with strong sponsorship, which is from this binomial executive-board, executive-down, and then the rest comes. So, in the operation, in the operationalization, a great weight relates to the engagement of both patients and clinical staff. The methodological part, on how to implement the measures, they have a challenge, but this challenge is much more operational, as you operationalize the value measure, which is linked to the organizational capacity and resources for you to invest. I don't think there are major technological challenges or challenges related to how to measure the outcome itself, I think the challenge is less than, as long as you have resources, you have people. Now, the cultural challenge, it cannot be underestimated. And the other challenge is: what do you do with it?

Perfect. Going into this area as well, somewhat related to the implementation question, you identify that it is worthwhile or one of the most viable strategies, it is the provider itself to make all measurements internally, develop all these capabilities of the line of care, or do it through partnerships or third parties?

It depends on your investment capacity and the scale you need. There are situations in which the service, part of the service is purchased in a pool, that is, from a provider that aggregates others, and therefore it can make part of this journey feasible, this can be interesting, but there are parts that will always be done inside the hospital or inside of that organization you're measuring. But the idea, it depends on the scale. For certain institutions, one of the challenges is scalability, you cannot implement this because the cost, the necessary structure, it is given and then it is very expensive. So it may be that for some organizations you have, for example, a pooled assistance call center, which measures outcome over the phone by contacting patients to various institutions may be a good thing. Technological tools that can be shared, may be a good one, but that does not eliminate that each one has to have its own structure in my own view, at least, this is how I see it.

And if I were to talk about the minimum structure, what is the minimum for the provider?

You have to have at least some things that allow you to measure the outcome while you are in, so there are things that are in-hospital and other outpatient measures, you have to have a minimum infrastructure to measure the in-hospital.

7. This question is the last one, do you have any complement or suggestion you would like to make?

No, unless you have a specific question, you can ask.

Currently, there is already an assembled structure in your hospital that can be visited, could you know the infrastructure?

No not yet.

How do you see the maturation in contractualization, do you think that now is the moment when you are evolving towards contractualization or is it something that is difficult and in the future only that you will be able to contract based on value?

What is value-based contracting? Is it earning better according to what you deliver? Is it?

That way, you will have some performance metrics, linked to the result for the patient and not necessarily hospital process metrics.

I think there are still some challenges, I think a very important challenge for this to evolve is the security of comparability that it requires, and this is a very big challenge that is like this, I am comparing orange with orange or am I comparing orange with banana? And what is the methodology, one thing that is important is the following, if I am measuring, is what I am measuring true? So an important issue that I think, to accelerate all this development is to have a third party, independent third parties that come and evaluate if everything that is being done is in compliance and that result is true. This one maybe get into the complementation that I would like to do. And from there, the agenda that I see with those who finance it, the possible agenda is more of a risk sharing and gain sharing agenda than of

better remuneration for what is done. The vision I have is as follows, you have a pizza, if we understand that this pizza is not going to increase in size, let's discuss what each one eats from the piece of pizza.

Perfect. Do you have any suggestions, I am going to take part in the course now, in the intensive week of Porter and Teisberg, do you have any suggestions for questions or is there anything worth asking?

In relation to your Harvard course, I think what you might be able to discuss is this issue, explore a little more, let's say, how does this become practical in terms of system sustainability and waste reduction? How does this really contribute to that, how can it really, in the world movement, really impact the amount of resources that are used in health, that is, spent per capita in different countries.

I thank you for your availability once again, thank you very much for your time, I know it is super scarce, so I would like to thank you. As soon as I finish the work with the other interviews I will make the link available to you and your team. Thank you very much for the availability. Thank you very much for your time.

8.5 APPENDIX - INTERVIEW C

Identification: Interviewee C
Institution: Hospital C

Caption:
Interviewer: italic and bold.
Interviewee: normal text.

1. So the first question of the work itself is: what is value-based health? In this case, whenever we refer to the organization or company we are referring to the hospital where you currently work.

The concept of health value is not new, but it is very difficult to implement. Even the definition itself has ended up taking on some faces over time. How I see value today. And I'm going to take a lot of maybe who first coined this expression, which I think was Porter himself, that he says it is a relationship between outcomes, and by outcomes we mean delivery of assistance, quality of assistance, of assistance result and of patient experience, I think this is very important, over costs. So he makes this relationship, he makes this equation, and I think it's a lot out there that I think Value Based Health Care. In the end, we have to increase this relationship, either by increasing the quality of delivery, increasing patient experience and satisfaction, or offering products with better care outcomes or reducing the cost of this entire process, of this entire chain.

And when you talk about assistance outcome, which is one of the terms you used, what do you understand?

Assistance result.

And what would "assistance result" be? I'm going into the detail just to try to get the definition for you.

Assistance result for me is how much health you are promoting for that person. So I don't think there is a single metric to define, which is why, again, it is very difficult that each one ends up defining results in a way, but this could ultimately be since increased longevity, improved quality of life, absence of disease, improvement of chronic diseases, countless metrics but with this concept of delivering more health.

2. The second question: how do you measure value in your organization?

I think that in general hospitals have a lot of difficulty in measuring value, because they can't go through the entire chain, they end up looking a lot at the acute event of the disease, the hospitalization event, so they already have a difficulty. Here in our organization, we are starting to organize to start measuring a little more, so, in fact, last year, for example, we launched an outpatient unit. There is precisely this concept of following up, looking at medium and long-term results, being able to understand if there were any late complications, but I think the first difficulty comes from there, of obtaining measurement metrics. Today,

now bringing it to the reality of our organization, I cannot say that we measure value. I can say that we have some metrics that look at cost, again very much still focused on the bias of the acute illness event, or we measure outcomes, results, within a perspective of line of care, which is something that we are starting to assemble now. So, I don't know, a line of care that we have had for some time is Clinical Condition X, so this is something that can measure results, we even participate in the ICHOM of Anahp, sending indicators, sending metrics, but we are still unable to make the value relation that I told you at the beginning, which is how much value I deliver over cost. We still can't do that. So I would say that we are still there, we measure pieces of that equation, but we cannot put it together and say if the [value] equation that I told you in the beginning is really going up or down.

Today, do you already have a pre-defined line of care in the hospital or is it still being structured?

There is a lot already structured, but there is a lot of structuring, and maybe there is more complexity because the hospital is part of a chain. There are more than X hospitals in the network, our hospital is one of them, and today the challenge we are trying to set up is a network that permeates hospitals. So we are talking about a line of care that permeates hospitals, so we are not necessarily talking about a line of care here in our hospital, we are working a lot in the network care line, which in our hospital would have a contact point. But in the end, this guy can go to an outpatient area of another hospital, a more ... primary care center in the network, so this is our challenge. That is why today, our concept of measuring value has changed a little. Today we do not believe that we measure value in a hospital, we believe that we measure value in the network.

Perfect. And yet at this point on how you measure value, you commented on ICHOM, do you use or intend to use the ICHOM Standard Set, did I understand correctly?

No, we only do this because we participate in a project with Anahp, but it is the specific case of Clinical Condition X, in the rest there is nothing addressed.

Would you have any alternative besides ICHOM, which you think or own, or was it not discussed in this detail?

We haven't reached that point yet. And then I'm talking again as a network. Because I am no longer talking about measuring value within the hospital, I am talking about within the network of hospitals, we should have some value measurements.

3. So in this next question, the third: how do you intend to implement value-based health in your organization? Here the idea, I know you just mentioned it, but the idea would be thinking about the most practical organizational part, how to translate this concept in relation to an action plan, how you intend to implement it from a strategic and operational point of view, if you already have a plan.

What we have here is the following, we understand that it is almost like a matrix, where I would have service providers in the verticals and the creation of care lines horizontally, that is, care lines permeate the care units. And when I talk about the care line, I'm talking about creating protocols: how do I treat disease A, how do I treat disease B, how do I refer to disease C. So we are working on the elaboration of these great lines, these great protocols, which again, would permeate various services, and which would deliver a quantifiable,

measurable result there. For this there is a medical leadership in each of the areas. Today we are working with some areas, we are working with the oncology front, we are working with the cardiology front, we are working with the orthopedics front and we are working with transplants and neuro is a fifth. So in each of them we have a leadership, a medical reference, who works together with the nursing staff to create these great horizontal protocols.

In these protocols, for me to understand, are doctors from the hospital's medical team or are they independent doctors?

So, I think the question is a good one, but the answer is not unique. This is what we understand, that there are teams that are internal teams, that we have a little more chance to standardize, but there is the doctor who will be independent, so when I create a care line, I'm not necessarily talking about medical protocols, necessarily, I'm saying that in some cases I can create a nursing care protocol, which will support the doctor who comes from outside, the doctor from the open clinical staff. So the two models fit, mainly in a hospital like ours, which again is a hospital with an open clinical staff. I see it both ways.

When we are talking about care or quality of care, we often have process metrics (infection rate, length of stay) that are procedural metrics that help a lot in the hospital's operations but they are not measures of the patient's clinical outcome as you defined at the beginning, of clinical outcome. So I wanted to understand, for example, when we are talking about these protocols and lines of care, do you think it is institutionally clear what is a process and what is an outcome for the patient?

The patient does not feel, in the end for the patient is a single line. This is much more an internal classification of ours, an internal categorization of ours. We don't actually differentiate what is an outcome and what is a process, in the end it is a great line of care. But I don't think this is noticeable to the patient, he is seeing a doctor, and the doctor is browsing him, the nurse is helping him to navigate. But they are different, yes they are, and I think for the institution I think it is very clear. And I think the institution sees a relationship, of course, the lower the infection, the better the outcome, the shorter the average length of stay, the better the outcome, I think there is a relationship.

4. Perfect. Thanks. Item four then: in your view, what is the importance of executive/organizational leadership for the implementation of value-based health? So here we are talking about the board and executive leadership team.

Total, I think it starts from there because it starts to mess with the side, so, everything is part of the big strategy, and if the strategy is bought and it is not embraced by the leaders it does not work. Because when we talk about value based, we are saying that, I think it ends up messing with others, with the hospital's economics. So, when I start offering value based products, I start to accept a little more risk, more risk sharing with the payer. I begin to accept the concept of fixed price per procedure a little more. I begin to accept sharing and sharing more data. So there is an important strategic change, because again, this affects the economics of the institution, that if top management is not bought it will hardly move forward. I think that in many cases even this requires a long-term view. In many cases this change to value based means that in the first moment you may have a financial loss, but in the second and third moment this financial loss will be compensated for by better products, by better ties with

the payer, with more customers, but I don't think that is, I think it's a change in the model. So maybe there is one ... the leadership has to be very long, it has to be very aligned, because there may be a financial loss at first and this needs to be understood and this needs to be bought by the leadership.

And here comes in I find a detail that is how you see the question, normally in the various hospitals the leaders have a mandate, an annual or quarterly mandate, and as you commented, the results of value-based medicine are long term, months to years. How do you see this compatibility?

I think this is a problem. This is one of the reasons why value based is not so widespread in Brazil. But when I talk about leadership, it's not just about management, in the end, who has to be very long and aligned is the highest level of that institution, so I'm talking here about council, association, board, I'm talking about the highest level. Because this is strategic, again we are saying that more than a process change we are talking about strategic alignment, people need to understand that in the end we are implementing a new model of care delivery.

And also thinking about maintaining it over time, with changes in management, with changes in management, how do you you see the pertinence, I know it has to do a little with organizational culture, with some other themes, but I would like to know what your vision is, like a change in a hospital, how to change leadership and keep value-based medicine and these long-term projects?

Sorry, I did not understand the question. You say an institution that changes direction because it changes…

Management, changing the management of a hospital, often happens, and these value-based medicine projects are usually long-term, so how to implement and maintain a long-term project since it has a fundamental importance of management, of executive leadership, if that executive leadership sometimes changes?

Sorry, failed, can you repeat for me? There was a crash here, you were ...

Sorry, I took my video off to make it easier. So we were talking about item three of implementation, in item four we talked about the importance of leadership. The mainly executive leadership of the organization, strategic level, managerial level often changes, there are changes in management over time, but the value-based medicine project is theoretically a project that has to continue for long periods, so I wanted to see how much you think this is a problem or not from an execution point of view? I don't know if I was clear now.

It was, and my reading is that, when I talk about strategic alignment, I think this is not at the management level, I think it has to go up. Management should not be ultimately responsible for the strategy. The strategy who guarantees is the board, who guarantees is the board, who guarantees is the association, I don't know, then it depends on the numerous formats of hospitals. And the management executes, the management is the executive, it is the one that will give life to the great strategy elaborated and validated by the major body. I think that whoever has to buy the project is the largest body.

Perfect. It's pretty clear now. Thanks.

5. Item five here: in your view, what is the importance of process reengineering for the implementation of value-based health? Here in this concept, process reengineering is like changes that have to be made or not in a line of care, to create that line of care, to create this standardization in which the value measurement will be made.

I think it's important, we've talked about that a little. I think that part of revisiting the protocols, when I talk about protocols are processes, in the end we are talking about processes. I think there is this difficulty in hospitals with an open clinical staff, an additional difficulty, that not all processes are standardized. Precisely because they still depend on this large clinical staff that uses the hospital and they often end up depending on these professionals to bring patients, consequently they often end up making some exceptions, this is a fact, this is reality. But I see very standardized processes in contrast, nursing processes, the processes of the entire multidisciplinary team around, the clinical pharmacy, I see many standardizable processes. We forgot to mention, when you told me about the leadership team, I think that a fundamental figure to be able to give glue to this is the figure of the navigating nurse, who in Brazil I don't know if there is a better term, but the nurse who will be looking horizontally, the health professional, let's call it this way, more than a navigating nurse, the navigating health professional who will help the patient to navigate through those pre-established protocols. To help him/her navigate within the various services on the network, I think this figure is very important. But going back to this reengineering issue, I think that process, part of delivering value is in that, you standardize some processes.

If you could comment a little more about the navigating nurse or this figure of the navigation professional, why do you think it is so important? I would like to understand in the context of value-based medicine.

Take the figure of the nurse, I think some reference is important when navigating the patient, it may be ... there are numerous types of solutions. The call center that will navigate the patient, the navigation inside the hospital is usually by the nurse, maybe that's why I used that term, but it is the person who will give and will ensure that the care interfaces among the various services offered are respected. It is he/she who will ensure consistency, he/she will ensure that the patient actually goes to the right service at the right time, that there is no redundancy of effort, that there is no redundancy of unnecessary exams, redundancy of expenses, of inefficiencies. So it is this professional that I think is very important in this process. And then, again, this has several solutions, we are talking about professionals, but in the last instance it could be done through computer algorithms, I don't know, apps, the payer's own systems, I don't know, countless possibilities. But the fact that I have some intelligence navigating the patient so that he/she can use the resource at the right time in the right way I think is fundamental.

Excellent, perfect. And in this line, as we are talking about process reengineering, thinking about patient navigation, as much about navigation as in the measurement of outcomes or processes, do you think it must be executed by the hospital or can it be outsourced?

Navigation itself?

Both of them. We can talk about navigation first and then the outcomes.

I don't think it's bad to be outsourced, I think that in the end this is a strategy from institution to institution, there are institutions that would prefer to outsource because this is

core in their strategy, there are institutions that might prefer to outsource, I don't see it as a cake recipe. But I personally think this is very core for any value based strategy.

In other words, to stay at the institution for measurement.

Yes, but I don't see any problem with outsourcing as long as there is clarity of deliverables and proposals.

6. Perfect. The sixth question then is: what are the challenges for implementing value-based health? I know that it is very broad and that there are several challenges, we have touched on several points, but if you could list those that you consider the most important.

I think that first is the organizational alignment, I think we talked a little about it, the leadership at the highest level. Highest level is board, council, owner, partner, these people need to be very convinced and buy this strategy. I think the second point is, I think it is this trade off, I think there is a trade off from short to long term, people need to be aware that maybe in the first moment this can bring a financial loss to earn more there in the future. Especially when this is linked to new remuneration models, which are often forced by the payer. So I think there is an important point. So I see a lot of hospitals trying to implement value based solutions because the payer is forcing a bundle, it is forcing a capitation, it is forcing a, I don't know, a fixed budget model. And then the service provider, the hospital runs after value based, what we need to do, I don't know what. It may even work, but then, of course, there is a financial loss at first, but it needs to understand that in the end, there can be a lot of results in the end when it has a better product. So that's another point. I think the third point is this: people. We are talking about a very new concept in Brazil, even though there are a lot of people trying to do it, but I think it requires a different type of skill, it is a different management, it is a management that involves much more a horizontal look, the very profile of people, I think it requires people who are more flexible, people who have more adaptability, interpersonal relationships, I think there is another set of skills here that a good value based manager needs to have. I even think there's a Korn Ferry publication about it, then take a look, I think they published something, I remember I read something, some article they had published talking about it. But I agree a lot. What else ... I think that is it, of great challenges. I think that's it.

Thinking about contracting in the sense of closing deals using value based health, do you think it is a movement that is mature enough now in our Brazilian market, it is something like you commented that it comes more from the paying source or that the provider itself can give the first step and is the market mature enough to take that first step?

No, I don't think the market is mature, but I think everyone is taking the step. The payers because they can no longer stand the high claims ratio and medical inflation. And the providers because they are being pressured: it is either this or it is nothing. So people are moving on both sides, I see today, and today I say in the last three years, a lot going on, a lot of cool, interesting, good projects. But these are projects, we still don't have very consolidated value-based models. So there is a lot of cool stuff coming up, maybe it needs a longer maturation time, so I say that the market is not yet mature, very different models, I am seeing very different models appearing on the market. But I am very optimistic, I think it is one of the solutions for the system and I think it will happen, to a greater or lesser extent, in a more

crooked or less crooked way, but it will happen in the coming years. So, it is a market under construction.

Do any of these projects or models that attract attention, or is there any benchmarking that is interesting and that you plan to use at a national level?

So, I am suspicious to speak, because I participated a lot in a Hospital X project, I led one of the units, so it is a project that I like a lot, I think it is a very different project in Brazil. At the time, we opened a hospital that basically had a fixed remuneration model for surgical procedures and that includes all kinds of complications, from the simplest to the most serious. We even covered the period of thirty days after discharge, anything that happened was the hospital's responsibility, the costs were within the bundle. So I think it was a super cool model, but maybe I'm a little biased, because this project I ended up leading this project there. But there is a lot of cool stuff going on like that, I can name a few, but I think I would be even a little unfair to name one and not the others. So there is a lot of cool stuff going on, several capitation models being tested. Amil itself is testing the Adjustable Budget Payment model, which is a fixed budget. Several hospitals are going into this risk sharing line with more standardized products. You see these health techs now, I don't know how much they are working with value based itself, but wanting to make a better navigation of the patient in the chain. So you get an Alice, a Sami, lots of cool projects, I think there's a lot of cool stuff going on. At least good pilots. How the market is going to evolve is a big question mark, but I think there are good projects on the radar.

7. Great. Thanks. The seventh and final question is: do you have any complements, any suggestions that you would like to make? Is there anyone who thinks that it is worth commenting on a specific topic that I did not address?

I think in general we talked a lot about challenges and opportunities. Is your search Brazil? Or are you going out?

This, the objective is to talk a little about providers, basically doing interviews with hospitals, with hospital leaders, and Brazil to show this step that we are here at the moment.

I don't think we talked, but I am available anyway. If you have any topic that you want to discuss later or talk about later, you send me an email and we will book. No problem at all. But in general I think we talked.

Thank you very much for the conversation. As soon as the interviews and the project are finished, I will send the link to you.

8.6 APPENDIX - INTERVIEW D

Identification: Interviewee D
Institution: Hospital D

Caption:
Interviewer: italic and bold.
Interviewee: normal text.

Dr., as part of the work, I would like to ask that whenever I speak about organization, I am referring to the phase you stayed in Hospital D. As you had a very active role linked to the Value Based Health Care cell, I would ask that whenever did the company and organization refer to the Hospital D period, all right?

It's all right.

1. The first question itself is: what is value-based health?

So, first there is no such term "value-based health". Everything that has been written to date is about health care that delivers value, so that term is incorrect, if not it would be Health Based Care and it is not, it is Value Based Health Care, value-based health care. So what is Value-Based Health Care, it is a strategy that aims to transform the health system in order to maximize the value generated for patients and realign the competition that exists in the market today with the interests of generating value for the patient . This is Value Based Health Care. It is much more than simply measuring outcome and consequently measuring cost. It is to redesign the care model, and to make it sustainable, to link the remuneration model that pays for these results.

2. Perfect, thanks. The next question is: how do you measure value in your organization?

There is a long-standing effort by Hospital D to measure outcomes. I think this has always been a great differential for the organization. In 2011, an outcome cell was set up, this cell began to collect the outcomes reported by patients (PROs) in various clinical conditions, and before that in 2005, when we launched the managed infarction protocol and the 2006 insufficiency managed protocol cardiac arrest, we already collected clinical outcomes, both mortality, complications, clinical outcomes. But it was in 2011 when it started to actually collect outcomes reported by patients by a dedicated outcome cell that kept looking at medical practice. Another important jump was in 2017 when we started looking at all the Standard Sets of 21 clinical conditions and we went to look at ICHOM and started to standardize the collection with ICHOM standards. So it started with Clinical Condition X, along with other Anahp hospitals, within the Anahp ICHOM project. Then we moved on quickly, so even though Anahp continued with only Clinical Condition X, we have already started doing this for hip osteoarthritis, for knee osteoarthritis, for coronary artery disease. Anyway, for several

other clinical conditions. I think those were the milestones. Regarding the cost, so far there is still no project doing TDABC (time-driven activity based costing), but the methodology used today there allows you to reach the level, it allowed in Year X, when we set up the value office, to reach the level of the services department. We needed to take a step and bring that to the level of the clinical condition. As it was not possible to create / change the costing system in a radical way, we started to create a separate column, which was what we called the PMO cost. What was the PMO cost: we brought to the BI all the visits charged to that patient and we looked at an episode of care that could be thirty, sixty, ninety, six months, a year, depending on the clinical condition and the timeline that we wanted to adopt. So we created, through BI, a logic in which we brought, if I had to assess the cost for example of an episode of hip osteoarthritis, I took the last two or three years, we never analyzed anything before starting the DRG, because everything had to be adjusted. Then from 2015 onwards, middle of 2015 onwards, and then we pulled the base of the financial system and brought everything at present cost, everything at present value and from there we paid at the level of clinical condition. So we were able to make costing at the level of the clinical condition, but not using the micro-costing by the TDABC model, because it was not possible, it was not implemented at the time.

As you commented, I wanted to understand what the changes were before and after, in relation to the measurement of value, of value office to be implemented. Has there been a change in the way of measuring value?

So, what changed then. The office started in Month X of Year X. In March of Year X we implemented the Standard Set of ICHOM. So the first change was that we stopped measuring outcomes (PROs) using the local Standard Set and we systematically started using ICHOM Standard Set, except for what did not exist. And we have implemented a methodology, of migrating, of advancing the cost, from the service department level to the level of the clinical condition or the episode of care. Those were the main changes.

And before the office, thinking that the initiative was quite early in 2005, even before the first book by Porter and Teisberg, do you measure through qualitative reports, was it due to medical conditions or were it more general hospital outcomes?

What we did in 2005 was to implement managed protocols for clinical conditions. What it means to be managed: in addition to defining the protocol that should be followed, we had continuous monitoring of 100% of cases of heart attack, and in 2006 of all cases of heart failure, during hospitalization. So it wasn't a complete care episode. At that time, we had indicators and we gave feedback to doctors almost in real time. So, for example, if the patient was hospitalized with no aspirin prescription, the nurse managing the case would contact the care team and understand why the patient had no aspirin prescribed. If it was forgetfulness, the doctor would prescribe it, if it was because he/she had a contraindication, the doctor had to report in medical records that the patient had a contraindication. So this managed protocol, if you look at my publications you will see the results of it already published, I think in Year X, of how we implemented all the steps of the protocol that involved a large involvement of the clinical staff, but also continuous monitoring. And one of the big changes that we made in the infarction protocol, is that until then, until 2005, the doctor made the decision. Whoever made the decision which strategy to follow in the treatment of acute infarction, was a decision

that was in the hands of those physicians on duty, was in the hands of the holder of the case. Therefore, a lot of time was wasted to be able to play the best strategy. And we designed a protocol in which, if the patient was in Unit X, where there is primary angioplasty, it was not to be wondering what the strategy was, the strategy in Unit X was primary angioplasty. If the patient was in our Unit Y, we would measure the delta T, time between moving the patient. So we had very clear criteria, delta T greater than one hour equals fibrinolysis displacement followed by rescue if necessary for Unit X. So, although there was no cardiologist 24 hours at Unit Y, there was a protocol in which the electrocardiogram was passed on to the cardiologist 24 hours in Unit X and he/she gave the "go" or "no go" to the angioplasty. This is a protocol that has been in place for many years, since 2005, which changed in 2013, even before the office, when I was Role X still, is that we started to report the data to the NCDR, which is the record of the American College of Cardiology, which is the record of heart attack and chest pain and is also published this last year in a European quality magazine in which we show that: from the time we report, we start to compare ourselves with real-world data. Before, we were following goals, so the goal of the American Heart Association was under 90 minutes. In fact, when we started in 2005 it was less than 120 minutes, so we were there around a hundred or so. Then there was a reduction to 90 minutes and we stayed at 86-87 minutes. When we received the first report, comparing our performance with 1200 hospitals, we were shocked because the best of them were already in 56 minutes. And then when we received this report, we realized that we could be much more efficient. And then we made a deal with our board and the general board, and then the bonus test for all doctors went down in that year to 78 minutes, the next year to 60 minutes. In just over two years we were already in 56 minutes. So, the power of benchmarking, this is what we published, I can send you publications later, we have exactly that, the first phase in which we can standardize the practice and monitor a drop in mortality and have an improvement in door-to-balloon time, and then when we start to compare with the real world and then the reduction really is very expressive and remains until today, we report until today to the NCDR records.

3. Perfect thank you. The next question then is: how did you implement value-based health in your organization? So here is a more concept of execution.

But first you need to change that value-based health term, because it bothers me a lot. We needed to design a strategy, Value Based Health Care is not an isolated initiative. It needs to be a strategy for the organization. So I think the first step was a decision by the top leadership, by our presidency to create a strategic pillar within the organization's strategic plan. Value Based Health Care is a pillar as is "Operational Efficiency", as there are several pillars in the organization. Value Based Health Care is a mainstay. How do I make this strategy tangible for the organization as a whole? This matched, when I left Role X of Specialty X to take over the medical practice of the hospital, all the health information came together, both epidemiology, outcomes, were independent managements. So just for you to understand, there was an outcome manager, there was an epidemiology manager, there was a health economics manager and coordinator and these were fragmented areas that did not talk to one another, that did not share a single base, there was no BI, everyone with your Excel spreadsheet. And in parallel, we needed to organize 10,000 doctors who were the clinical staff

of Hospital D, 87% of whom are self-employed, not contracted doctors. So it was a very large area, it had almost 200 people working in that area. And what happened to me at the time. it was when I had it, Doctor X and I, we had already organized part of cardiology, I brought Doctor X to help me think about what we were going to do in this new role. It was from there that we came across that publication by Kaplan that said that every hospital must have a value office. He had published it in 2015, and we were in 2016. So we started to study this and how we were going to assemble. And it started to make a lot of sense for us to combine these areas into one area. We eliminated several levels of management, we no longer had an outcome manager, nor an epidemiology manager, and we structured a value office in a Data Analytics / Data Science area and we were able to hire dedicated data analysts and scientists at the office, because if not you are always in the queue at Information Technology Department. You can't build a BI while standing in line with the information technology team. We then got the BI platform, which is QlikView and Qlik Sense. So there was a cell, we already had in cardiology a program that we had hybrid doctors, not only doctors, but hybrid professionals, there was also a nurse, in which you took someone who was on the front line and brought part of the his/her load time in the service, because I wanted to have this interaction with the front line workers. So we had it in research and we had it in assistance. So what we did at the value office was also that, so I had a surgeon, there was a doctor specializing in VBHC, who was Doctor X who is doing a doctorate at Institute X, a project that we are doing in partnership. We then created an area that had Data Analytics, had an intelligence area that helped us set up all of that, that had doctors, and that was already very connected with Data Analytics. And there was the outcome cell in which we had around ten people making a large amount, more than a thousand patient calls a month to collect the outcomes. And I brought the Medical Record Service (SAME) into that area. The medical record service was a matter of choice for me: either you have electronic medical records or you have SAME. You can't live with both. So I eliminated SAME and we brought what was coding and DRG into the office, and what was physical medical record went to the services area. So we eliminated this SAME story in the hospital and there was an area with twenty people who do coding. What we started to do to be able to build a BI that made sense was to retrain the way they coded. I'll give you a simple example: there was a time in the past that they had a goal that they had to code as many diagnoses as possible, that was a goal. So what ended up happening was that the infarction turned out as: one heart attack, two chest pains, three dyspnea, four sweats, so there was a lot of garbage code. And what we did was create algorithms so that they knew what to look for when coding. Example: if I am coding an atrial fibrillation, I need to search for elements of atrial fibrillation, when placing the TUSS code, it is no use just looking for a TUSS code; the “C” codes, which are the complication codes. So if there was an arrhythmia during the procedure, it cannot be just the arrhythmia code, it has to add the “C” code of complication related to the procedure for example. With that, we were able to greatly amplify the use of DRG and risk adjustment at the base, so I think the work that we did to structure, once a week we met with the coding to clear up all doubts and to standardize the coding process. This was a radical change and increased our case mix, as we stopped losing diagnoses and comorbidities that were previously unnoticed. There is an outcome, as I said, started doing this systematically by ICHOM and we started to build bundles using these

elements. So we designed the bundles, the first one that was implemented was that of endometriosis.

4. Perfect, excellent, thank you. The next question is number four so, I'm going to do it in English to maintain the nomenclature: in your view, what is the importance of organizational executive leadership for implementing value-based health care?

Fundamental. I always say that you have to have a sponsor, in top leadership I mean. There is no point in having a local sponsor or enthusiast who knows the VBHC, as was my case, you need to have support from the organization. And that is why it is so important when VBHC is defined as a strategic plan within Hospital D. Our great sponsor is the president, who is Doctor X, who is a Value Based Health Care enthusiast. And one of the things that I proposed and that worked was that we had a strategic VBHC committee inside the hospital, so once a month they were there: the PMO team, with the president, with the general director, with the hospital director, with the commercial area director and some specialty managers, neurology, cardiology, orthopedics, because this is not an incremental change. It is not an improvement, it is a transformation of the way the health system and the provision of care are understood. And when we look at change management, the strategies for implementing change, we know that having the support of top leadership is what ensures the sustainability of the project.

Just a complement to that question. How much is the organization's executive leadership, in terms of C levels/president, and how much is board/council, in your view?

There is no one without the other. Because my director needs this support from up there, and when you are going to make a transformation it has to be on top. For us, the president of the association goes beyond the general director. I don't know if you know what the organization is like there, but the assembly elects the president, and the president is responsible for the charitable society, it's not just the hospital, so the whole structure is below, he/she responds to the board. So here it is very imbricated, because having the support of the president ultimately means having the support of the largest leadership of the organization, because below him/her until he/she reaches the director of the hospital, there is still the general director, director of the hospital. I was in the fourth line of the hierarchy, I was below the director of the hospital.

5. Perfect thank you. The next question then: in your view what is the importance of process reengineering for implementing value-based health care?

It depends on what you call process reengineering. If you are talking about Lean or the measures of ... if we are thinking about understanding the processes and restructuring oriented towards value, I think there is always a role. I do not believe in pure Lean, I do not believe in a strategy focused solely and exclusively on process engineering, because I think the look of the outcome is lost, of what is value for the patient. There is a very strong focus on efficiency, and this within a high-risk organization like hospitals, we've seen what happened at Virginia Mason, they almost lost their accreditation with the system there. I believe that, for me, the

relationship between Lean and Value Based Health Care is very clear. For me, Lean is a tool that favors the implementation of Value Based Health Care. Those who are purists on the Lean side say that just fix the process that the result comes. Who is a purist on the VBHC side says that just look at the result that the process is getting. They are both wrong, but the two of them working together I think it makes a lot of sense.

For us to understand the value equation as waste reduction, there is no better methodology than understanding processes, mapping processes and eliminating waste. To the extent that this is not a risk to patient quality and safety. I think the two together are great tools, they work well together.

6. Perfect, thanks. The next question is question six: what are the challenges for implementing value-based health care? There are many, but here the suggestion is to list the main ones with all your experience.

I think there are two that are the most important. The first is the misunderstanding of what is value-based health care. I think it is the first obstacle, people do not study, do not understand exactly what the strategy is and then they end up failing to implement, or implementing things that are simply new business models and think they are implementing value-based health care. So I think that first is a matter of education in VBHC. When you decide to do this you have to ... everyone has been trained in fee-for-service, the market and the status quo will try to take you back to fee-for-service. Therefore, you need to know the fundamental concepts, do not violate these fundamental concepts, do not understand what value is from the perspective of the payer, this is not value, this is money. We really have to understand how the system can be realigned to deliver value and health. Value for the patient is health. This is a point. The second point is information, one will reinforce the other, so to the extent that you have information, and I'm not just talking about technology. Technology is essential for us to have information at scale, but if I wanted to have information today, every project on the planet started with paper, pen and excel to collect the outcome. So it is possible to collect the outcome, it is just not possible to scale, without technology. But I think it is these things, integrating bases, the bases are extremely fragmented, it is not only assistance that is fragmented. So Value Based Health Care is about redesigning the care model to deliver value, ensuring that value is generated through information and having a remuneration model that supports this new care model. Education solves the new design of the model, but it does not guarantee implementation if it does not have information flowing continuously and consistently. So for me these are two things, knowledge in VBHC and information that makes sense available. These are the two great difficulties that we have today, the rest is a consequence.

If you could once again comment on what are the main concepts that people misunderstand and that are essential to be implemented.

First, there are several misconceptions. Even the way people talk, it is not “value-based health”, health is an asset, it is defined by the World Health Organization. This is in itself a value for the person. But Value-Based Health Care is how much, when that person needs to activate the health system… the health system is only activated because at last ... a function

that you are losing and you want to recover, or because you have a suffering that you want to relieve, whether physical or mental. When you activate the healthcare system, you expect this system to meet your expectations, this generates value at an appropriate cost. What happens is that we often want to design backwards, people understand that Value-Based Health Care, and here in Brazil this is very strong, is it a business model or it is a remuneration model. So they are beating their heads drawing a model and then they want to take that model and implement it in the current system. And then they say that Value-Based Health Care doesn't work. Value-Based Health Care means understanding what the system does not serve today, where the value is being sold, redesigning the system based on the needs of the patient and the outcomes you want to achieve, and then designing a remuneration model that supports this care model, not the other way around. So what we hear today, and a large part of what has been done in seminars, education lectures that I am called to speak, people want to discuss whether it is a bundle, whether it is capitation, whether it is global payment, this is not value-based health care, this is a business model. What is the model that supports my primary care, what is the model that supports the new model in tertiary care? So it's not that, I even have a slide that I always post, which is: outcome based agreement (OBA) is a very simple concept, remuneration has to be linked to the outcome. Implementing this is not so easy, but the concept is simple. And people don't even understand this concept, they come with models ... I say ok, is it a value-based remuneration model? Where are you harnessing here that this worse outcome is reducing the gain or that this better outcome is increasing the gain for the provider? "Oh, it's not." So it's not a value-based remuneration model, it's that simple. It's not just because I said it's an outcome, it's not just because I measured the cost, it's not just because it is called bundle, that this is a value-based remuneration model. So for me this is the main thing.

The second is a lack of understanding that we first need a new care model. What is taking the value out of the system is not just the fee-for-service, because I could put pay for performance within the fee-for-service. Elizabeth usually says that a lot in City X for us. Inertia is a powerful force especially when a lot of money is involved. So there is a lot of gain in this waste system, so understanding that the current care model has to change first so that we can generate value and create a remuneration model is a fundamental step. People do not have this understanding, this is very clear in the debates that I participate. And it's not just here, here and outside Brazil, too.

If I can ask one more question, regarding the methodology of using outcome measurement, then looking at that classic equation, in the numerator, how do you understand that it is appropriate to measure outcome, any specific methodology or not?

I think we always have to remember that the outcome is specific to the clinical condition and that it is multidimensional. There will not be a single outcome that will measure the delivery of value. We have used in City X the methodology that Elizabeth uses which is “capability, comfort, and calm” in which we look at capacity/functionality, we look at comfort, which is a level of suffering and we look at how calm it is, integrated and coordinated model delivered to the patient different from the chaos that is his/her life of fighting against the system. He/she has to fight cancer and the system. So this is a framework

that we have used a lot, and we always select outcomes with some premises. Premise number one is that it is indeed considered important for patients with that clinical condition. And the second point is that these outcomes have metrics if possible validated, not creating metrics that later do not allow comparison. And third and most important, that they are metrics that you can act on, that is, that they are "actionable". Because it is another big misunderstanding: "I am already measuring the outcome of ICHOM, I measure value". It doesn't, what do you do with that result? In what way is this result used so that this patient actually benefits? So it has to be validated metrics preferably, unless they don't exist. They have to be metrics that are condition based and they must be actionable, you have to act on those metrics. When we look at the big cases, for example "Schön" case is part of the model that each center has an improvement cycle happening over the metrics every six months. So I really need to have improvement cycles as part of a VBHC project.

7. Perfect. There is one last slide, which is: are there any complements or suggestions you would like to make? We are in our time, but I would like to open it to you again in this last one.

I think there is a movement going on in Latin America, big one. If we look at it today, 30% to 40% left the pure fee-for-service. They are experimenting with new models. What we notice is that a good part of the X hospitals that we worked in Country X have already measured outcomes at the patient level, Patient Reported Outcomes, but less than 10% do anything with this data. So there is an experiment, the market is very dynamic, but it is no longer possible to return to what it was before. So I am optimistic in the sense that there is a movement happening in the market as a whole, Brazil leading this in Latin America in a very strong way. I see players like Hospital D creating, when we set up the Country X value office, there were several other offices in the sequence, so hospitals that are leaders, they have this role, they have this tradition of the outcome measurement, but I think that there is still little talk of the assistance model. I think that what I would like to see happen in the coming months is that we take a little look away from this being a business model, from this being merely a payment model, to understand that we need a new care model . And that the payment model is part of this, but it is not the end for which the value strategy was designed. It is what sustains the strategy, but we need perhaps think less as providers and more as what is really important for the patient, to redesign care. And I think there is a very positive movement, which is the growth of primary care. Porter himself in 2013 launched that VBHC paper in primary care, which I think is when he rescues this idea of taking the look only of the disease and looking at population health. I welcome the expansion of Accountable Care Organizations in Brazil, because I think it balances these forces, but I think health professionals still need to be educated. We need to make a big investment as an organization, organizations as a whole, so I'm talking about all stakeholders, provider, payer, industry, and this starts in medical schools. Team X is going to publish a paper now, there are 3,000 medical students who answered a question about VBHC and only 14% had any contact with this topic during college, and the vast majority of them were self-taught, or came across an article or were in some course. So I think it has an important role in educating current and future professionals so that we can win at least this first part, which is the understanding of what VBHC is. And

this will help to design these strategies and we will understand how the doctor needs to be measured. These are questions that we have to learn there since the beginning of college.

We are in our time, thank you very much for participating. Thank you very much for the kindness of your time, I am very grateful. Once I have the CBT done, I will forward it to you. Thank you very much.