

Designing for Sustainability

Seeking more Value from Spending and Improving Health Outcomes

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We will explore value-based initiatives' ability to strengthen sustainability, integrate care, and improve health outcomes

AGENDA

- 01 Introduction to Value
- 02 Hospital's Role in Value Initiatives
- 03 Understanding PROs
- 04 Incorporating PROs
- 05 Establishing a PROs Program



01 Introduction To Value

Publicly funded health care systems are striving to balance multiple goals while focusing on sustainability

HEALTH SYSTEM GOALS

ACCESSIBLE

Timely and convenient of accessing care

UNIVERSAL

Minimize inequities and disparities for all

ACCOUNTABLE

Transparent use of resources

EXCELLENCE

Safe, high-quality care provided

COST-EFFICIENT

Judicious investment and dis-investment decisions.

EFFECTIVE

Actions improve health and health outcomes



FOCUS ON SUSTAINABILITY

Understanding inputs, outputs and the impact of care on patients and their caregivers – individually and collectively – is central to governments' investments into the sustainability of their health systems.

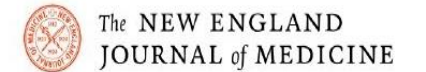
Acting on that information and improving care delivery is central to improving value.

How do we define value in healthcare?

VALUE EQUATION

$$\text{Value} = \frac{\text{Outcome}}{\text{Spending}}$$



What Is Value in Health Care?



Michael E. Porter, Ph.D.

In any field, improving performance and accountability depends on having a shared goal that unites the interests and activities of all stakeholders. In health care, however, stakeholders have myriad, often conflicting goals, including access to services, profitability, high quality, cost containment, safety, convenience, patient-centeredness, and satisfaction. Lack of clarity about goals has led to divergent approaches, gaming of the system, and slow progress in performance improvement. Achieving high value for patients must become the overarching goal of health care delivery, with value defined as the health outcomes achieved per dollar spent.¹ This goal is what matters for patients and unites . . .

High spending, variable utilization, & lagging performance have systems looking for another way

Stakeholders have own goals in the value equation

$$\text{Value} = \frac{\text{Outcome}}{\text{Spending}}$$

STAKEHOLDER GOALS

PATIENTS

Patients and caregivers generally share dimensions of value, and will weigh them differently

Access & wait time

Health outcomes

Communication & coordination

Out-of-pocket costs

Experience with care

PROVIDERS

Providers – including hospitals and associated physicians – are focused on providing necessary services to the community

Meet community demand with supply of services

Provide high quality care team

- Culture, Managing burnout
- Compensation
- Professional development

Coordination for appropriate referrals and transfers

GOVERNMENT FUNDERS

Funders are focused on how to use public funds to support citizens in living a healthy, productive life, by:

Appropriately matching supply and demand for healthcare, including

- Access to well-trained healthcare providers across specialties and settings
- Providing suitable infrastructure to deliver services

Supporting prevention of disease, in addition to treatment

Providing geographically-equitable access to services

Staying ahead of ever-evolving care innovations and breakthroughs

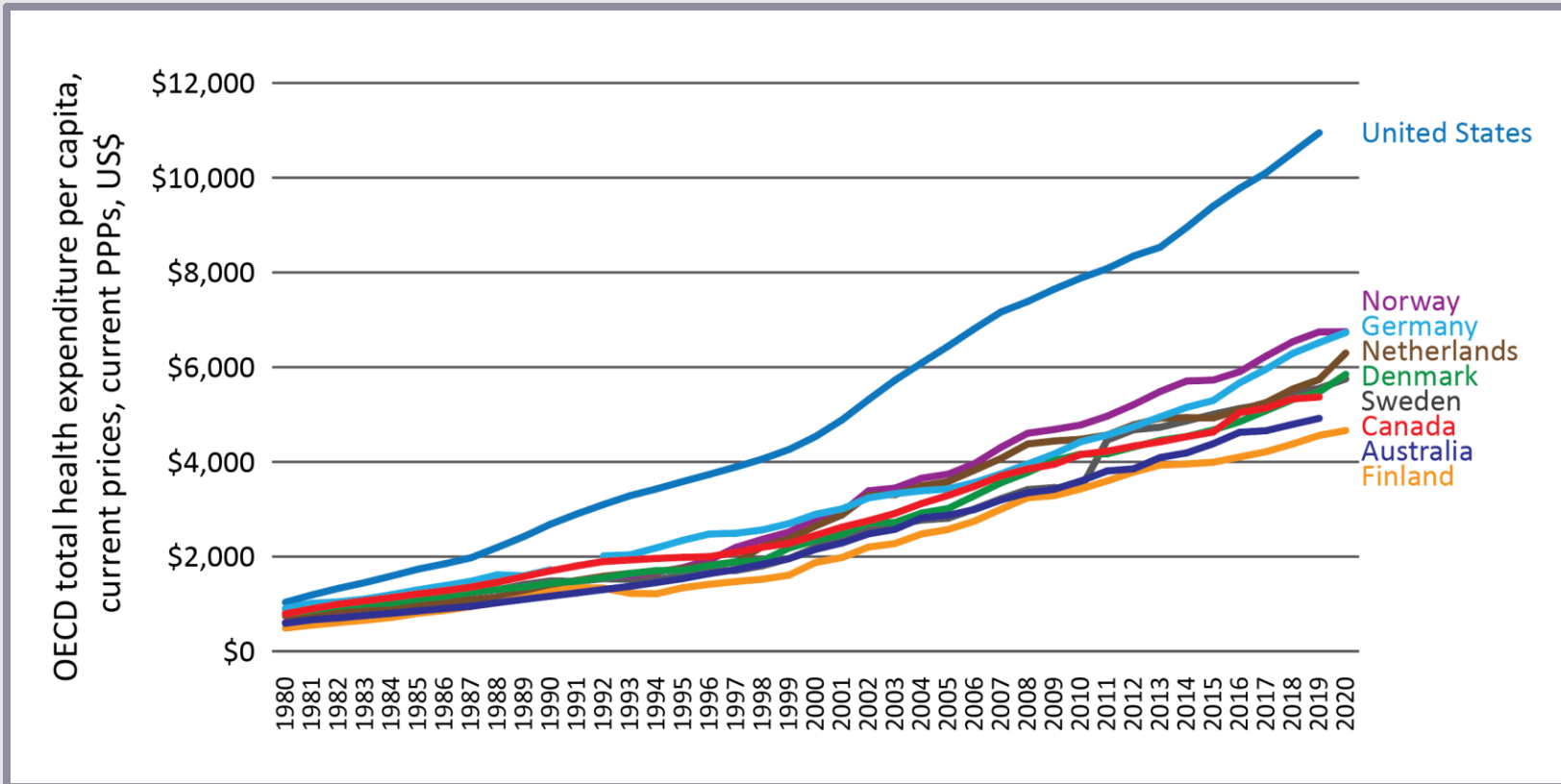
Ensuring sustainability, stewardship of public resources

Are there funding policies that can improve on volume-based policies?
Reduce fragmentation between sectors, better integrate care, and improve health outcomes?

Focus on value intensifies as health spend per capita, % of GDP, and % of public spend increases

$$\text{Value} = \frac{\text{Outcome}}{\text{Spending}}$$

Health spending per capita, OECD, 1980-2020



HEALTH EXPENSE

Healthcare spending as proportion of GDP, 2021

Canada	11.7%
Denmark	10.8%
Germany	12.8%
Norway	10.1%
Sweden	11.4%
UK	11.9%

Health care is almost 50% of public spending

Patient care is organized and funded in ways that do not support a comprehensive understanding of outcomes



HOSPITALS

Activity-based funding (case mix based funding)

- Limited incentive for relative effectiveness or increasing quality
- Limited alignment with population need or disparities in health

PHYSICIANS

Fee-for-service or salary

- Little alignment with hospital's mission or community's priorities
- No incentive for increasing effectiveness

MENTAL HEALTH CARE Unlinked with other sectors and possibly uninsured

HOME CARE Unlinked with hospital activity

$$\text{Value} = \frac{\text{Outcome}}{\text{Spending}}$$

However, we can measure outcomes within silos and observe variation

Variation in ICU use tied to hospital volume with financial implications

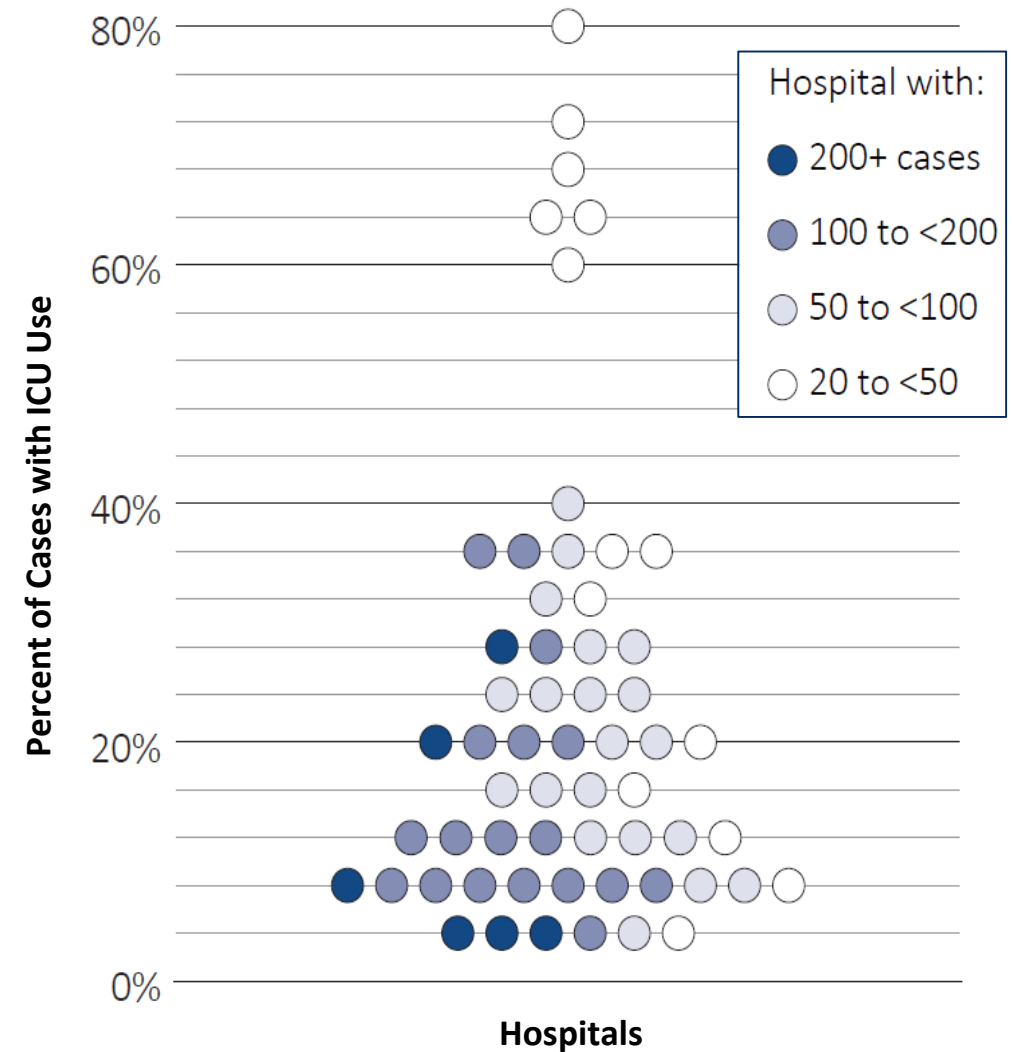
IMPLICATIONS

Hospitals with low volume more likely to admit to ICU following colorectal surgery

Per case rate increases if patient is admitted to intensive care

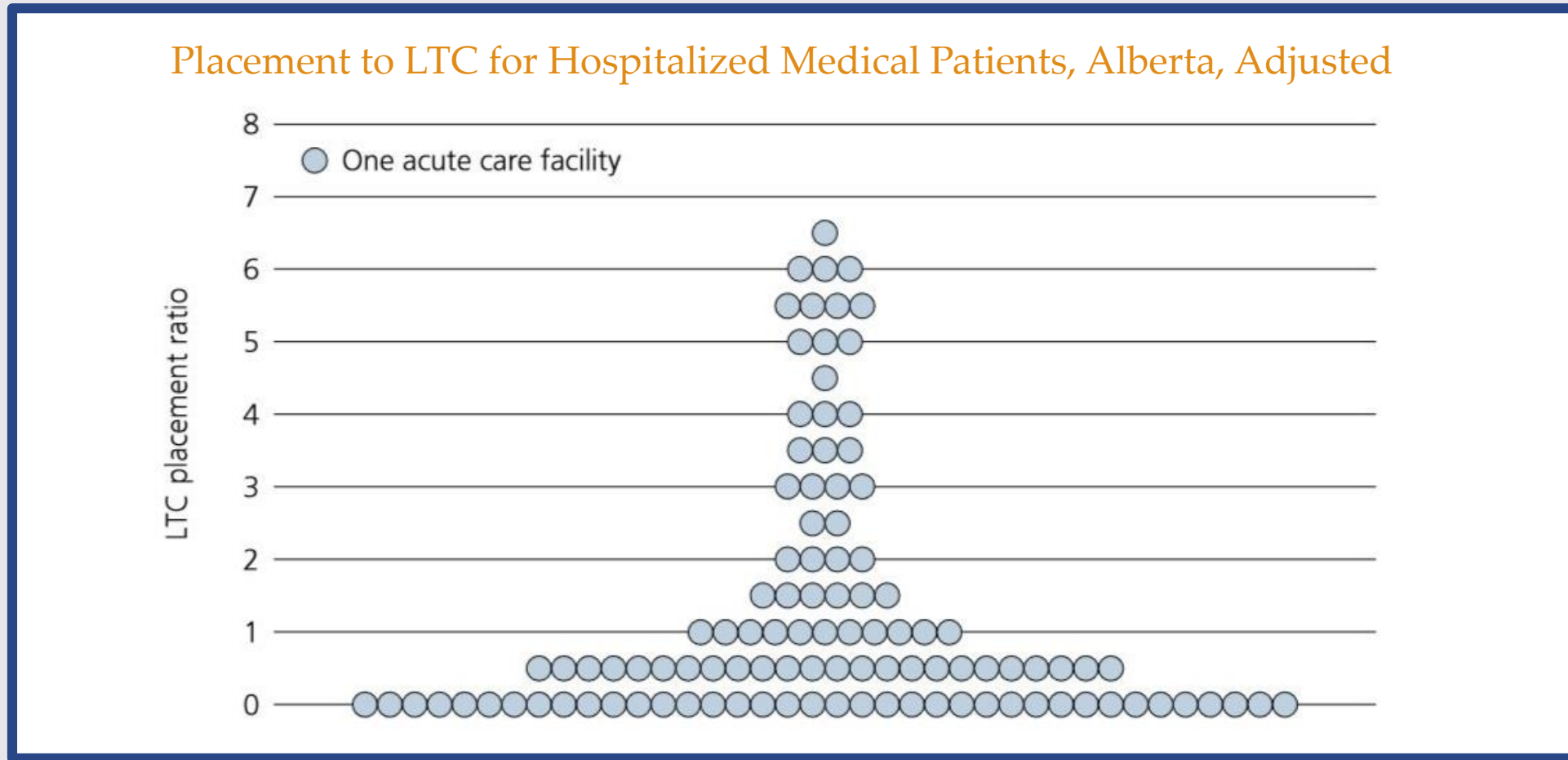
- ICU cost per day: \$3,592
- General cost per day: \$1,135

Colorectal Surgery Cases with ICU Use (2021, case mix adjusted)



Source: Cancer Care Ontario/Ontario Health, 2021

Long term care (LTC) placement for hospitalized medical patients varies greatly



Source: Sutherland et al.

US scholars have outlined dimensions of value that the US system should be moving toward

DIMENSIONS OF VALUE

Porter-Tiesberg outlined principles that would improve value generated in the US Healthcare system:

1. **Providers compete on outcomes** and reducing costs for insurers' dollars and patients
2. **Unrestricted competition** based on results
3. **Information widely available** on results and prices
4. **National competition**

Do these principles translate to European & Canadian Systems?

Some no...

- **Government is primary/sole insurer** and is not competing on price for patients via employers or open markets for insurance
- **Funds flow** makes regional and national competition difficult

Some yes...

- **Information on results** could be more widely available – and potentially even more easily
- **Opportunity to compete** on outcomes and reducing costs is still possible

Reforms to improve value generally fit into three categories

CATEGORIES OF REFORMS

PRIMARY CARE

Patient rostering

- Improving coordination of care
- Capitated payment made to physician (group)

Care pathways

- Goal to reduce unwarranted variation
- Measuring adherence

Expansion of 'gatekeeper' model

- Including advanced practitioners
- Incentives to reduce unnecessary referrals

Population health goals

- Financial bonuses for prevention (e.g., smoking cessation, screening goals)

CROSS-CONTINUUM

Bundled Payments

- Generally focused around a hospital stay
- Goal increase coordination and decrease spending while sharing savings with providers

Accountable Care Organizations (ACOs)

- Groups of providers focused on generated share savings or assumed risk for outcomes/spending

ADVANCED THERAPIES, MEDICAL PRODUCTS

Outcome-based payment (sub-type of P4P)

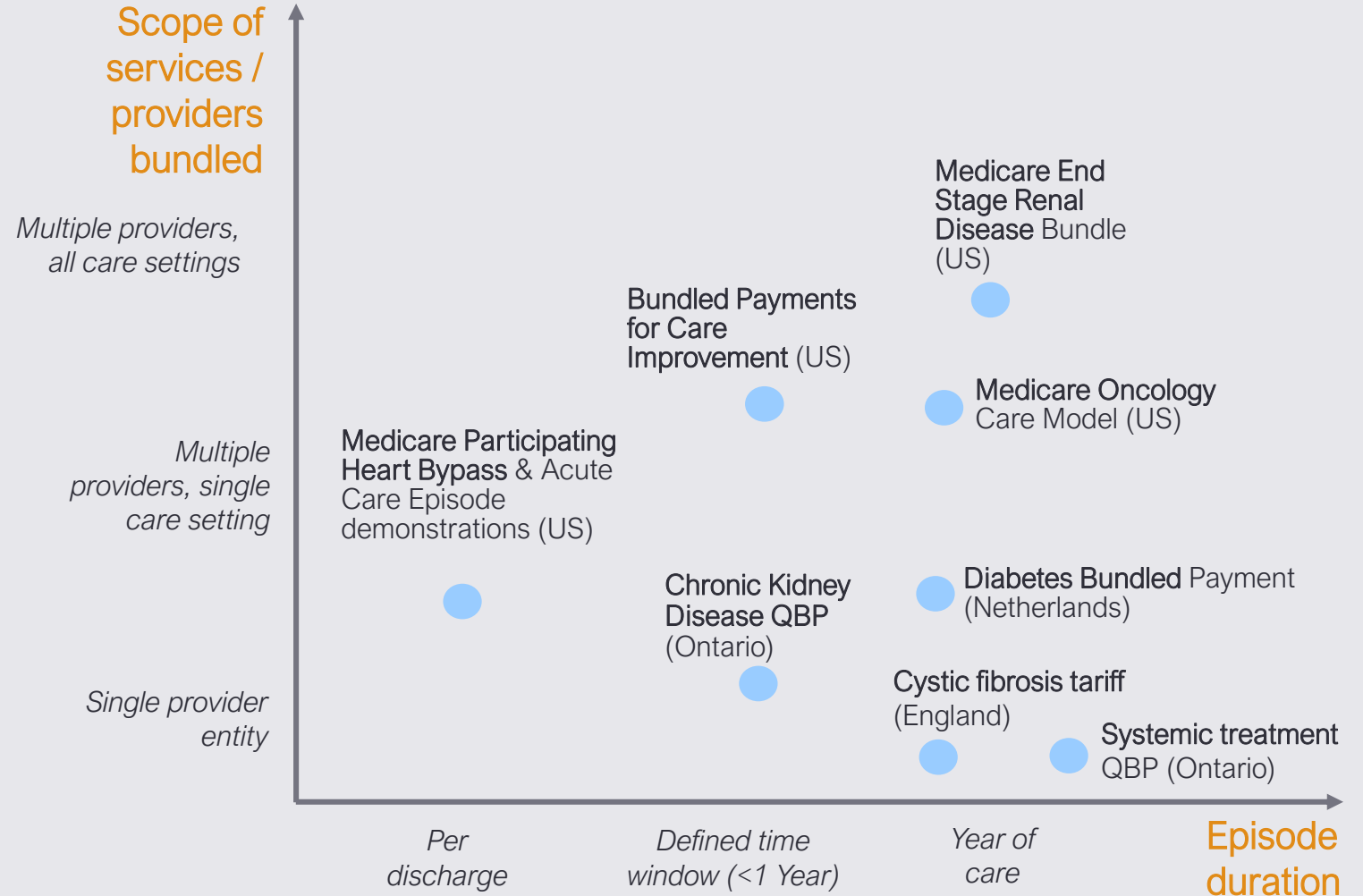
- Used for ultra-expensive drugs and therapies
- Individual-level effectiveness for payment

Each reform includes myriad variations to accomplish value goals.

Bundled payments - one form of value initiative - have proliferated as one means to improve value across the care continuum with varying durations and providers included

Payment Bundling by Scope & Duration

With examples from jurisdictional review



Adapted from Hellsten, E.

02

Hospital's Role in Data Collection to Understand Value





HOSPITAL'S ROLE IN VALUE

Hospitals continue to be the nexus of spending and an essential partner in improving value across the healthcare system

Hospital funding and data collection are integral to reforms

Activity-based funding laid the foundation for measuring costs, outcomes, and identifying insights to drive impact

FOUNDATION IN PLACE

COMMONLY USED

Most OECD countries use activity-based funding for acute hospitals, an approach that has resulted in processes for attributing hospital's costs to patients, identifying high needs and high-cost patients, as well as patients most at risk for readmission and functional decline.

MATURE IN COLLECTION

Discharge Summary routine data collected from patients' charts in place (e.g., ICD-10)

Cost Data systems integration of cost centre data which solidifies the routine generation of activity-based cost data

From activity-based funding data, measurement in hospital outcomes and value has evolved overtime

MEASURING HOSPITAL QUALITY

TRADITIONAL APPROACHES

NEWER APPROACHES

Activity-Based Funding Data

Backward-looking measures of case mix adjusted spending and cost-efficiency

Backward-looking measures of safety quality and cost-efficiency

Access measures as proxy of quality and experience

Clinical data sets: National Surgical Quality Improvement Program (NSQIP) to evaluate surgical outcomes

EXAMPLE
Length of stay, cost per weighted stay

EXAMPLE
Readmission rates, ED visits

EXAMPLE
Wait time

EXAMPLE
Observed / Expected Outcomes

However, gaps remain in measuring and understanding value

Moving forward, what data can support a more comprehensive understanding of value and inform funding?

NEW LENS FOR ASSESSING VALUE

QUESTIONS

How do we best spend our money to invest in 'health'?

How do we use data to inform those decisions?

CURRENT DATA

MEASURING HOSPITAL QUALITY

TRADITIONAL APPROACHES

Activity-Based Funding Data

<p>Backward-looking measures of case mix adjusted spending and cost-efficiency</p> <p>EXAMPLE Length of stay, cost per stay</p>	<p>Backward-looking measures of safety quality and cost-efficiency</p> <p>EXAMPLE Readmission rates, ED visits</p>	<p>Access measures as proxy of quality and experience</p> <p>EXAMPLE Wait time</p>	<p>Clinical data sets: National Surgical Quality Improvement Program (NSQIP) to evaluate surgical outcomes</p> <p>EXAMPLE Observed / Expected Outcomes</p>
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FOCUS ON IMPACT

Identify patients most likely to gain from surgery, therapies, or other interventions

Identify patients at risk of adverse events from prolonged delays to surgery (wait list)

Calculate the 'value' from surgery or other interventions in terms of cost per quality-adjusted life years

03

Understanding Patient-Reported Outcomes



Patient-reported outcomes bring a new approach, building on our current measurement systems

MEASURING HOSPITAL QUALITY

TRADITIONAL APPROACHES

NEWER APPROACHES

Activity-Based Funding Data

Backward-looking measures of case mix adjusted spending and cost-efficiency

Backward-looking measures of safety quality and cost-efficiency

Access measures as proxy of quality and experience

Clinical data sets. National Surgical Quality Improvement Program (NSQIP) to evaluate surgical outcomes

EXAMPLE
Length of stay, cost per weighted stay

EXAMPLE
Readmit rate, ED visits, length of stay

EXAMPLE
Wait time

EXAMPLE
Observed / Expected Outcomes

OUR FOCUS

Patient-reported outcomes (PRO)

Patients complete questionnaires regarding their health, symptoms, or quality of life to evaluate healthcare value

EXAMPLE
EQ-5D(5L)

EQ-5D(5L) is a PRO tool to measure health status and inform the calculation of “Quality Adjusted Life Years”

HEALTH STATUS TOOL: EQ-5D(5L)

COMPONENTS

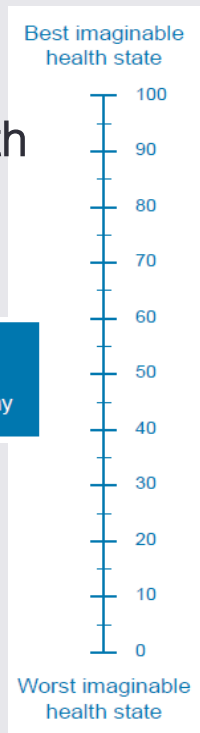
Five Domains Included

1. Mobility
2. Self-care
3. Usual activities
4. Pain and discomfort
5. Anxiety and depression



Overall Health Status

Your own state of health today



OUTPUT

Patients’ responses generate a weighted health state index value

1 – Perfect Health ↔ 0 – Dead

Index or “utility value” used for calculating Quality Adjusted Life Years (QALYs)

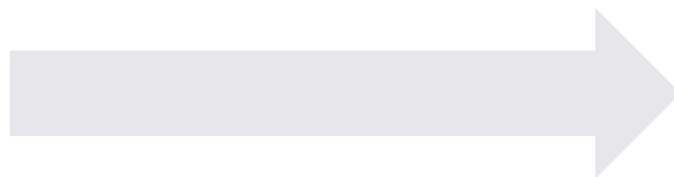
EuroQoL Group EuroQoL – a new facility for the measurement of health-related quality of life. *Health Policy*. 1990;16:199–208. doi: 10.1016/0168-8510(90)90421-9.

Insights from PROs is strengthened when linked to admin and case mix data, painting a more comprehensive picture of value

LINKING PROs TO ADMIN DATA

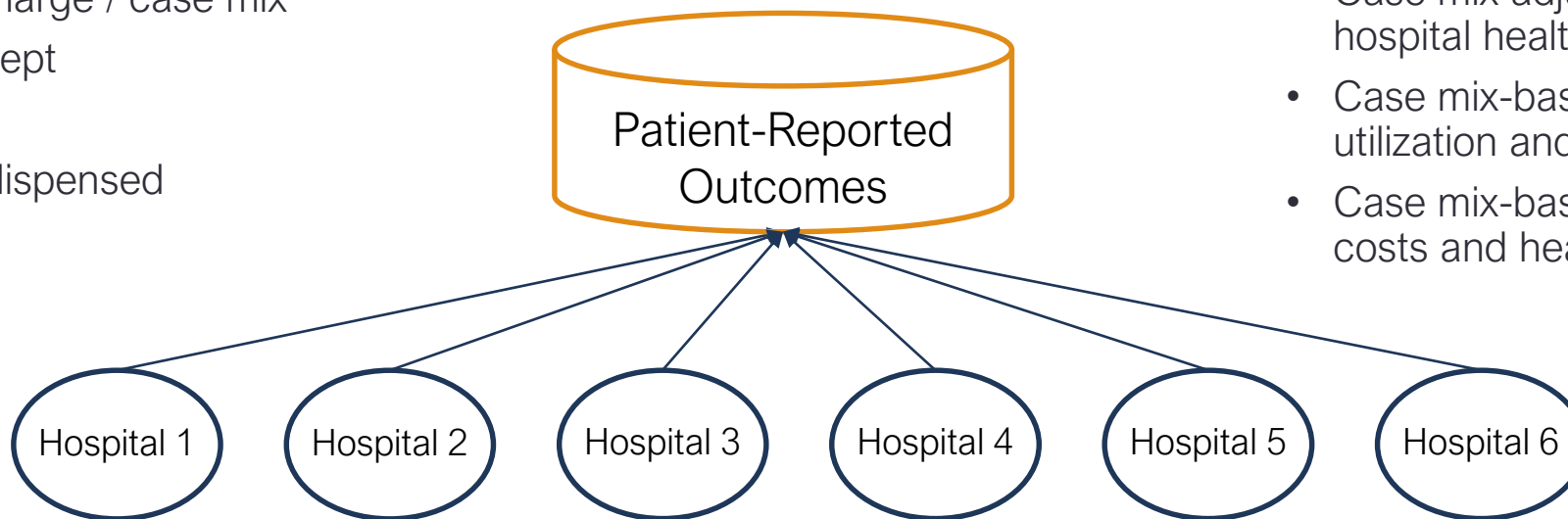
Value of patient-reported outcomes is magnified when we link with administrative data...

- Hospital discharge / case mix
- Emergency dept
- Primary care
- Community-dispensed prescriptions



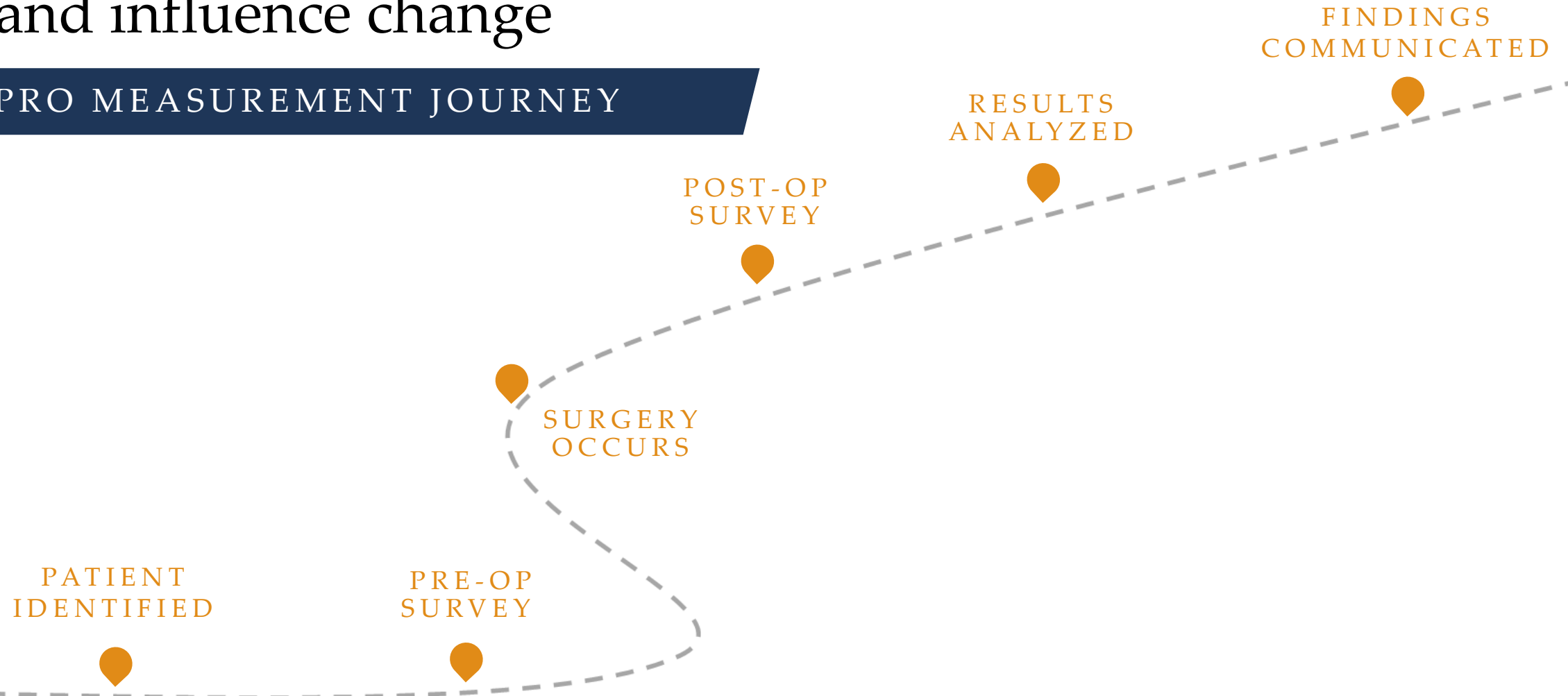
Allowing for...

- Case mix-based analyses of hospital outputs and health status
- Case mix adjusted between-hospital health outcomes
- Case mix-based post-discharge utilization and health
- Case mix-based analyses of costs and health outcomes



Patient-reported outcomes (PRO) measurement journey allows us to measure, communicate, and influence change

PRO MEASUREMENT JOURNEY



Patients are identified via surgical queue with no burden on operations

PRO MEASUREMENT JOURNEY

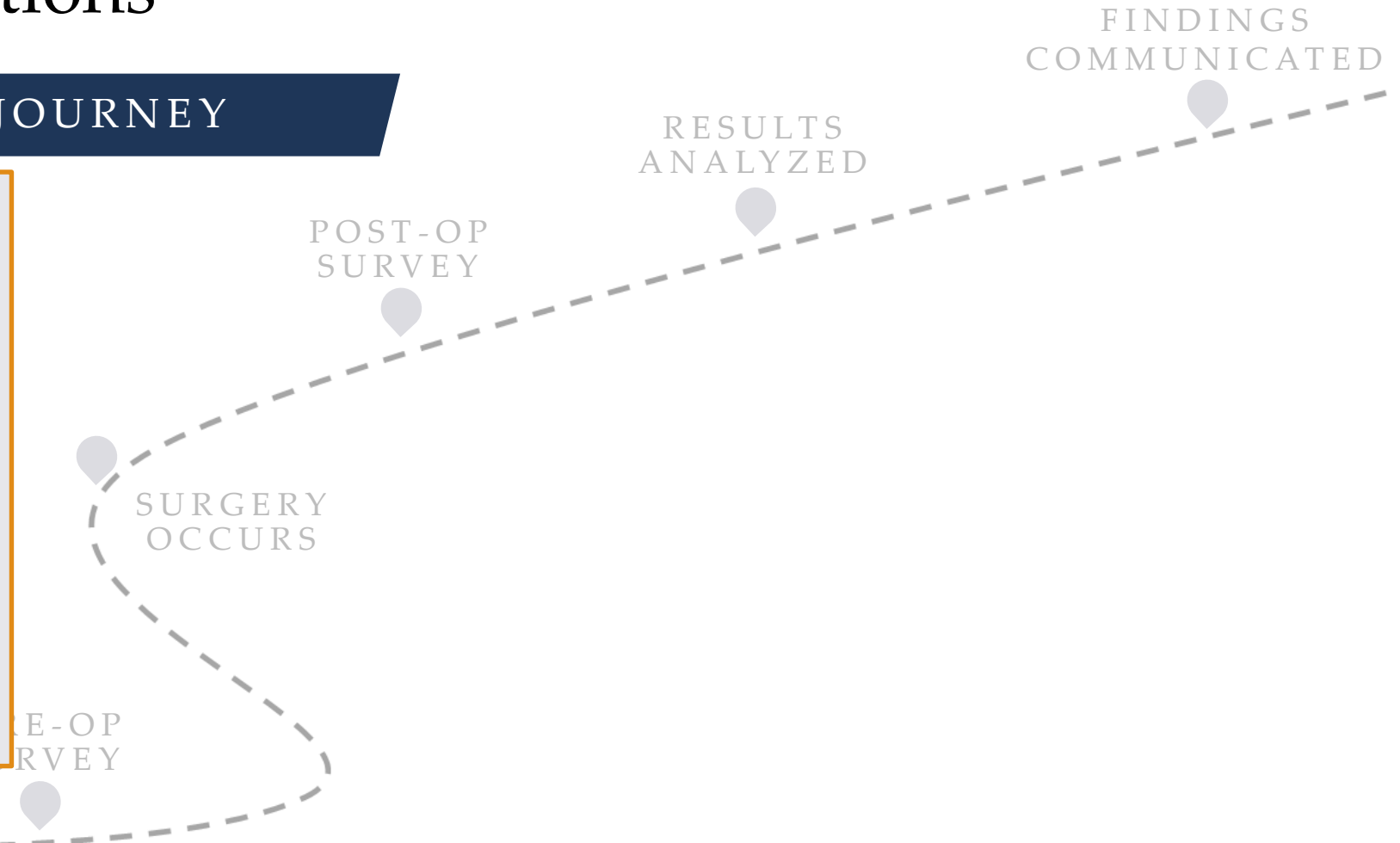
PARTICIPANTS IDENTIFIED

Access to new registrations on the surgical queue for all the region's hospitals

- Telephone, email and mail contact

No burden on existing systems

- Recruitment does not interrupt hospital or clinic workflow
- No resource requirements of hospital or surgeons' clinics



Measurement consists of core and condition-specific measures, conducted via paper or electronically

PRO MEASUREMENT JOURNEY

RESULTS
ANALYZED

FINDINGS
COMMUNICATED

PATIENT
IDENTIFIED

PRE-OP
SURVEY

PRE-OP SURVEY

What To Measure

Match PROs with the function / symptoms expected to change as a result of surgery

'Constellation' Approach

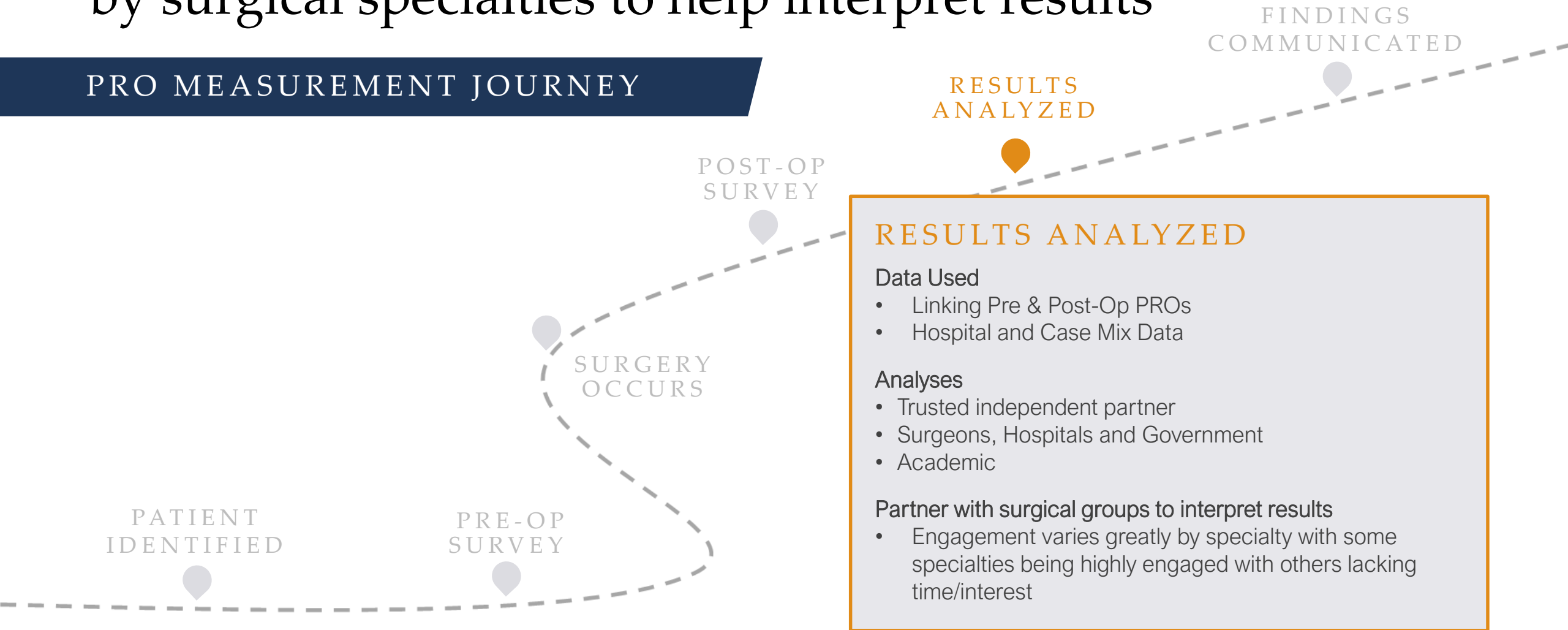
- 'Core' measures: health status, pain, depression, anxiety
- Condition-specific instruments: Symptoms/function of condition
- Decision confidence

How To Measure

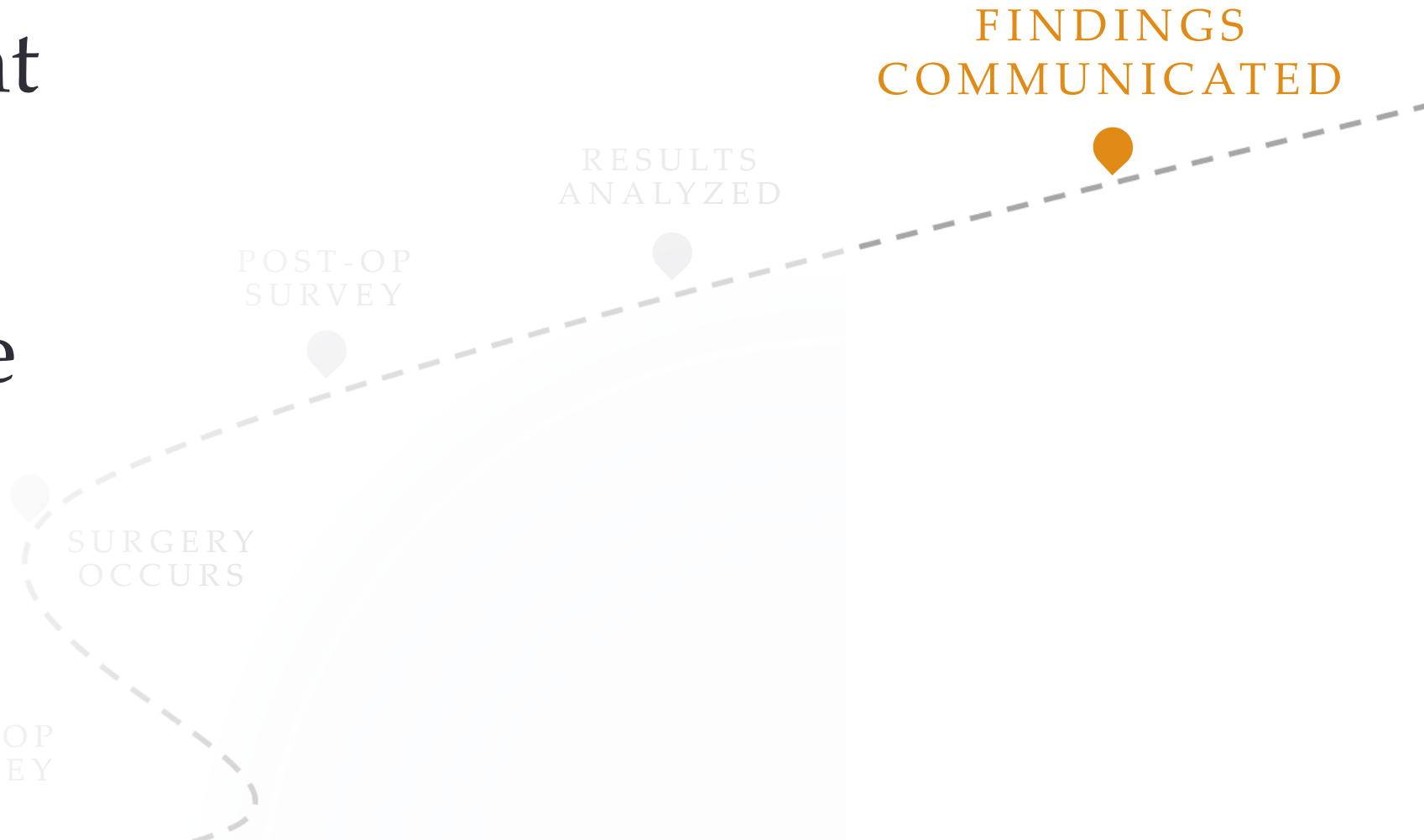
- Paper and electronic option available (patient choice)
 - Developed online PROs data collection front-end
 - Built backend for secure data storage and manual entry of paper
- Historically, paper was favored, especially among older patients
- Today, majority of patients prefer electronic

Pre- and post-op survey information is linked and reviewed by surgical specialties to help interpret results

PRO MEASUREMENT JOURNEY



Value of patient reported outcomes is in the changes we implement based on our findings



Changes to care protocols based on PRO information are already in place.

Understanding how factors like pain and depression affect outcomes have resulted in updated protocols

PRO MEASUREMENT JOURNEY

PREVIOUS APPROACH

For patients with depression, Colorectal surgeons were concerned about pre- and post-op. engagement needed for successful recovery

Pain was used to screen out patients for elective lower extremity orthopedic procedures

DATA INFORMED

Patient-Reported Outcome (PRO) data showed that depression and pain were not contra-indications for elective surgery

NEW PROTOCOLS

Clinical protocols are updated to incorporate findings

Patients with depression symptoms are no longer screened out

Patients with pain are referred to hospital pain program and then receive surgery

04

Incorporating Patient-Reported Outcomes into the Value Equation



PROs can add more specificity to capacity decisions for elective/planned surgery

WAIT LIST DECISION MAKING

FACTORS THAT INFLUENCE ELECTIVE SURGERY TIMING

Surgeon-capacity to perform procedures

OR availability, including capacity and scheduling

Position on wait list, generally using a “first in, first out” method

INCORPORATING PATIENT REPORTING OUTCOMES INTO DECISION MAKING

Patient-Reported Outcomes offer insight into:

- 1) Health status prior to surgery relative to other conditions, and
- 2) Average improvement in health status following surgery

ARISING QUESTIONS

Should decisions on wait list ordering, capacity allocation, and physician hiring be impacted by information on patient-reported outcomes?

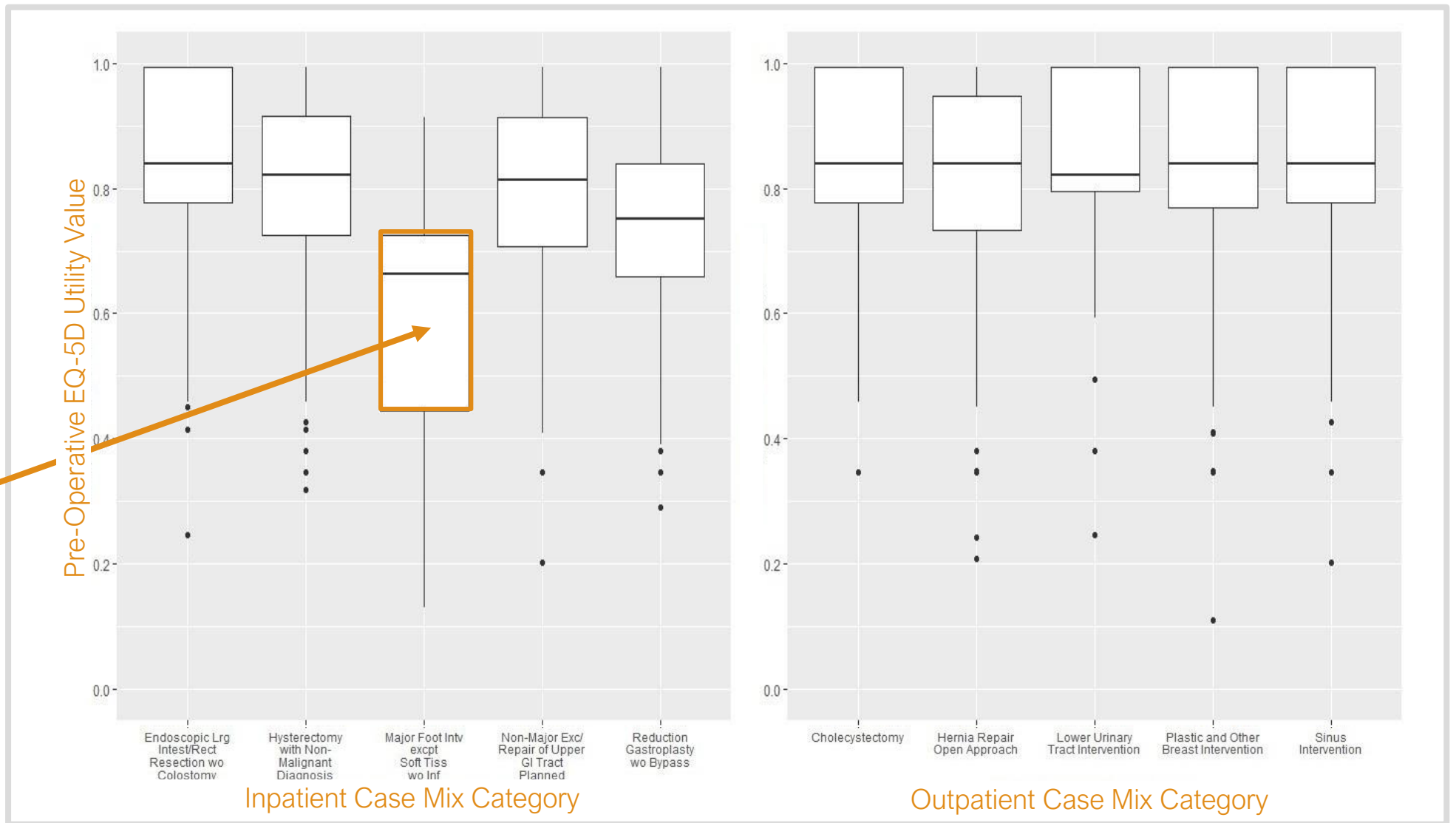
Should patients with lower health status be prioritized?

Or, patients with greatest gains from surgery be prioritized?

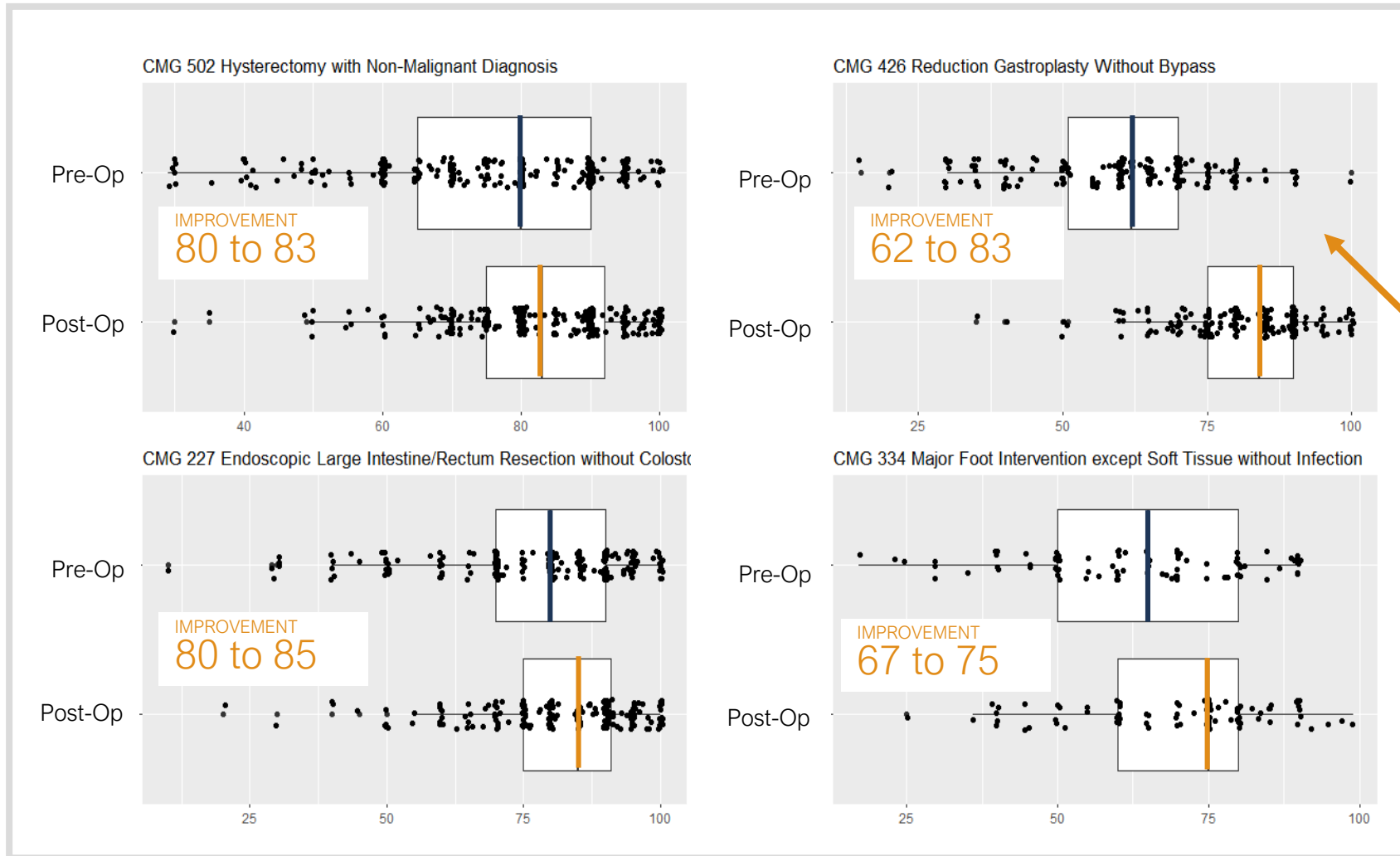
Health status pre-surgery varies by case mix category

EXAMPLE

Patients with ankle replacements / fusions have a significantly lower health status pre-surgery compared to other case mix categories



Variation also present in health gain within case mix groups



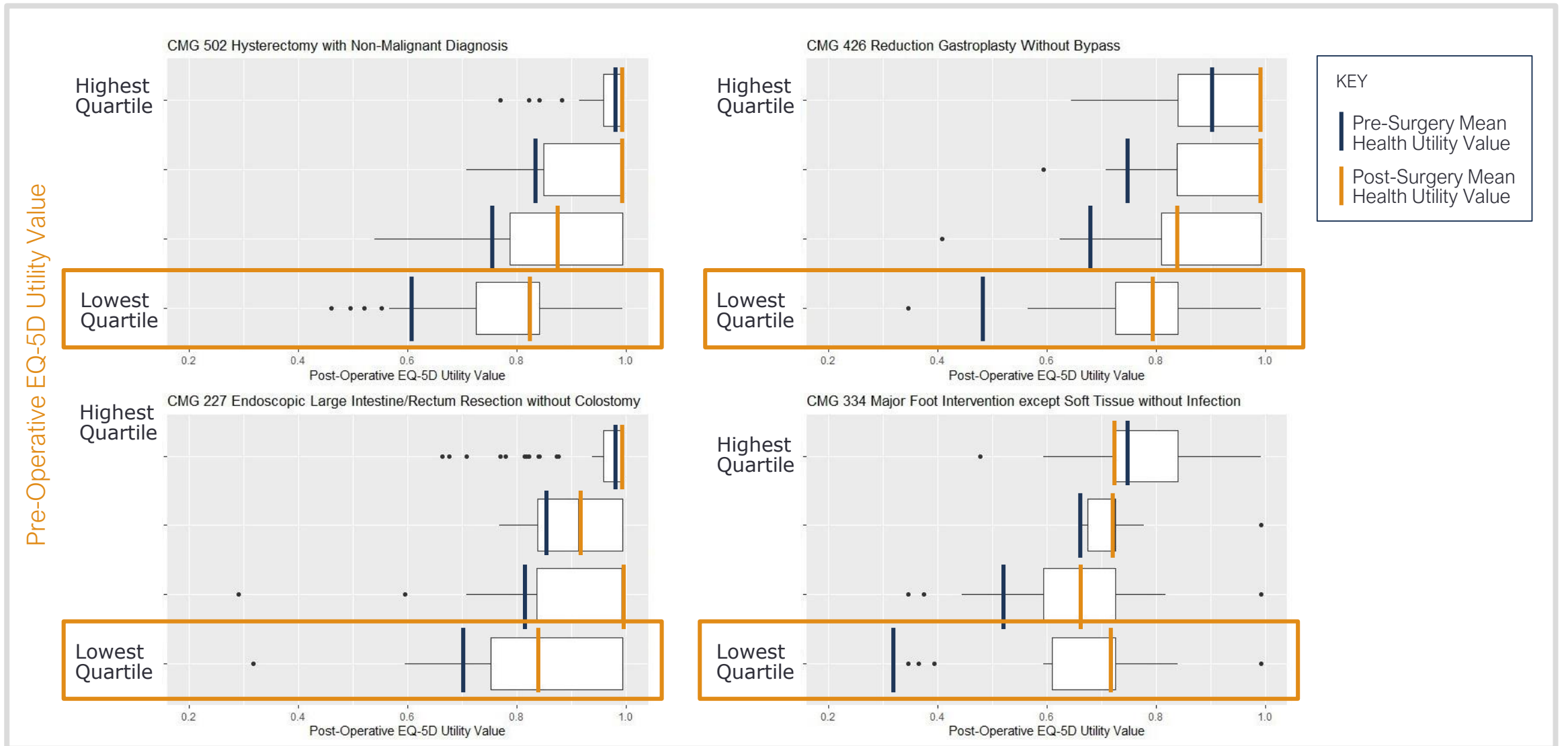
KEY

- Pre-Surgery Mean Health Utility Value
- Post-Surgery Mean Health Utility Value

EXAMPLE

Patients with Bariatric Surgery have significant gain in health compared to other case mix categories

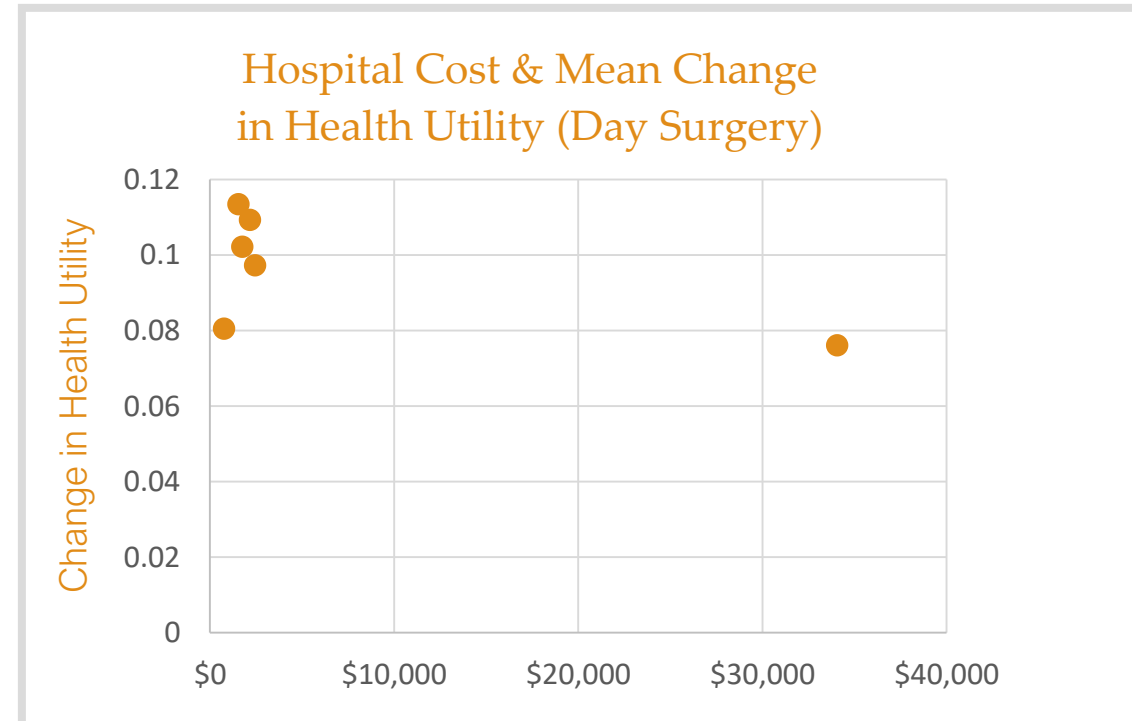
Patients with lowest pre-surgery health status improve most



Comparing cost and change in health status provides a new input to value equation (Day Surgery)

PROs DATA & COST

CACS	Case Mix Title/Description	Adult Hospital Cost (CAD)*	Mean (SD) Change in Health Utility
ENT Surgery			
C108	Sinus Intervention	\$1,754.46	0.1022 (0.1233)
C103	Major Ear Intervention	\$768.63	0.0805 (0.1377)
C102	Cochlear Implant	\$34,067.03	0.0761 (0.1006)
General Surgery			
C252	Hernia Repair Endo App	\$2,179.34	0.1093 (0.1149)
C253	Hernia Repair Open App	\$1,544.70	0.1135 (0.1306)
C282	Cholecystectomy	\$2,456.97	0.0973 (0.1170)

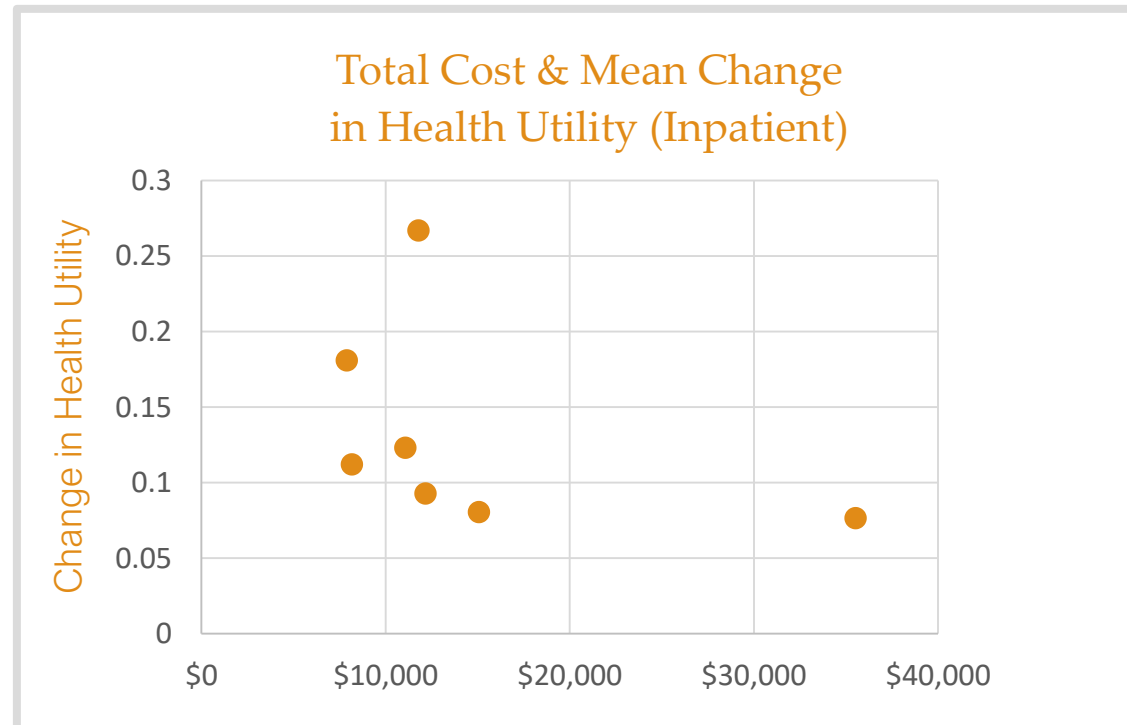


*Source: CACS_BASE_RIW_19_V1.0. Canadian Institute for Health Information (CIHI). Accessed Sept 19, 2022.
 B.C. Ministry of Health, Cost per Weighted Stay. Accessed Sept 19, 2022.

Comparing cost and change in health status provides a new input to value equation (Inpatient)

PROs DATA & COST

CMG+	Case Mix Title/Description	Total Cost	Mean Change in Health Utility
General Surgery			
221	Colostomy/Enterostomy	\$25,528	0.0764
223	Open Large Intestine/Rectum Resection without Colostomy, Planned	\$15,066	0.0805
227	Endoscopic Large Intestine/Rectum Resection without Colostomy	\$12,175	0.0927
228	Complex Hernia Repair	\$8,163	0.1120
Orthopaedic Surgery			
326	Shoulder Replacement	\$11,075	0.1231
327	Other Joint Replacement	\$11,780	0.2669
334	Major Foot Intervention except Soft Tissue without Infection	\$7,888	0.1809



*Cost Data Source: Patient Cost Estimator. Canadian Institute for Health Information (CIHI). Accessed Sept 19, 2022.

Patient-reported outcomes also provide insight into how surgeries can close the health disparities gap

PROs DATA & HEALTH DISPARITIES

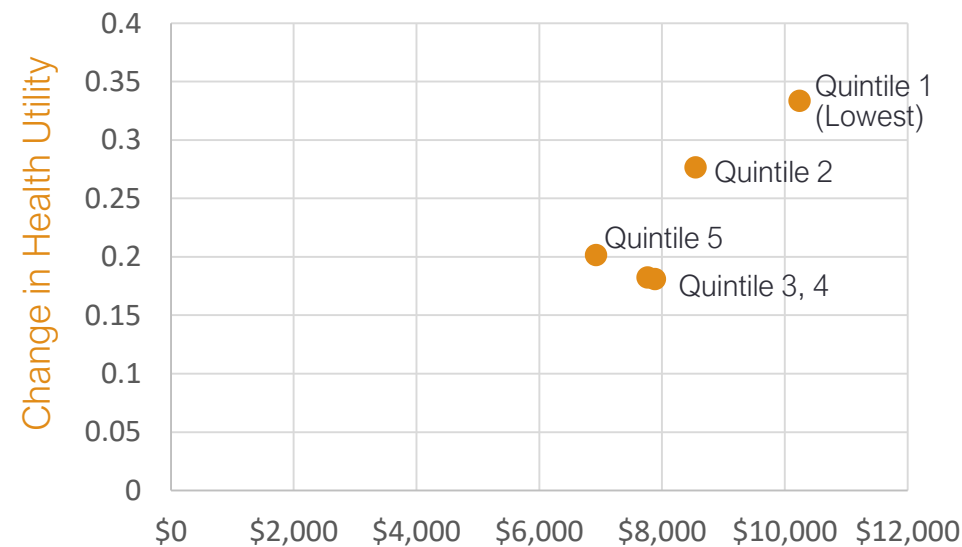
Ankle Replacements / Fusions By Socioeconomic Status

Socio-Economic Quintile	Total Cost	Mean Change in Health Utility Value
Quintile 1 (Lowest)	\$10,242	0.3334
Quintile 2	\$8,551	0.2765
Quintile 3	\$7,888	0.1809
Quintile 5	\$7,766	0.1824
Quintile 5 (Highest)	\$6,925	0.2012

TAKEAWAY

Patients with a lower socioeconomic status have greater gain in health utility following some surgeries

Total Cost & Mean Change in Health Status By Socio-Economic Quintile



*Cost Data Source: Patient Cost Estimator. Canadian Institute for Health Information (CIHI). Accessed Sept 19, 2022.

PROs data can also provide an input to understanding cost per quality-adjusted life year (QALY)

For example, we found that in **cholecystectomy**:
 The gain in patients' health relative to the cost of surgery was
\$2,102 / QALY

	Mean Gain in QALYs (SD)	Hospital, Specialist Cost (\$)	Cost per QALY (\$)
Cholecystectomy: Journal of Gastrointestinal Surgery. 2020. 26(4):1314-19			
Overall	1.7430 (1.9068)	3,663	2,102
Sex			
Male	1.6914 (1.9196)	4,115	2,183
Female	1.8850 (1.8907)	3,500	2,069
Age Category			
≤ 50	2.0958 (2.2147)	3,474	1,658
51 – 60	2.2545 (1.9264)	3,821	1,695
61 – 70	1.2206 (1.4552)	3,410	2,794
70 +	1.3458 (1.7737)	4,245	3,155
Hallux Valgus (Bunion): Foot and Ankle International. 2019. 40(3):336-342			
Overall	1.1193 (1.4447)	5,497	4,911
Sex			
Male	1.4822 (1.3849)	7,042	4,751
Female	1.0286 (1.4452)	5,111	4,969
Age Category			
≤ 50	1.5420 (2.0904)	6,503	4,217
51 – 60	0.6476 (0.9544)	4,808	7,424
61 – 70	1.5924 (1.4495)	5,774	3,626
70 +	0.7448 (0.8693)	5,399	7,249

05

Establishing a Patient-Reported Outcomes Program: *Canadian Example*



Multiple stakeholders required for successful PRO program

CLINICIANS

Program is built on the foundation of collaboration with surgical specialties. PRO data requires clinical expertise and interpretation to ensure the results are accurate and interpretable

Always looking for leaders in surgical and medical specialties - in addition to current surgical leaders, hospital leadership serve as champions for PROs

RESEARCHERS

Clear leadership regarding the value proposition of patient-reported **outcomes**. Involvement of stakeholders from among patient groups, surgical programs, hospital leadership, government and academics

Clinicians and other researchers regularly participate in studies of unique patient populations that are later published in peer-reviewed journals

GOVERNMENT

Team is engaged with government's Ministry of Health. Supporting Patient-Centred Measurement Working Committee, a group whose activities span measuring patient's outcomes and experiences.

Through participation and engagement with clinical programs in all hospitals, ensuring that efforts to measure patients' outcomes do not duplicate work of other clinical and research groups

FUNDERS

Program was initially designed, developed, and implemented with **series of grants from the Canadian Institutes of Health Research**; however, the program is no longer novel and now "established"

New direction: program has just expanded to long-term measurement of function and health for stroke and major cardiac surgery with support of health system and clinical champions

Initial program provides foundation for growth

FOUNDATION FOR GROWTH

PRIVACY

Privacy Impact Assessment (PIA) **in place** that spans the collection and reporting of PROs plus the activities associated with linking patients' PROs with population-based administrative and clinical data:

- Discharge Abstract Database
- Emergency Dept
- Home & Community Care
- Physician billings
- Pharmanet (drug)

COLLECTION

Software platform implemented that collects identifiable PROs in an electronic format or a hardcopy format, depending on the patient's preference.

Patients' PROs are linked with hospital case mix, emergency department, home & community care data.

DATA SECURITY

Patient identifying information **resides behind health system firewall** to comply with data security standards

Access to data is restricted to clinicians and researchers with a protocol in place for returning all PROs data to surgeons.

Current program is focusing on expansion opportunities

EXPANSION OPPORTUNITIES

ENABLE EMR ACCESS TO DATA

Integration of PROs with EMR (Cerner Powerchart), allowing clinicians to easily access PRO information on a familiar platform

EXPAND REACH

Expand collection and reporting to other diseases and patient-centred practice units, including medical conditions and chronic care

INCREASE UNDERSTANDING

Education and interpretation of PROs for surgeons and hospital managers

CONTINUE IMPACT

A new 'vital sign' - Using PROs data to improve value, access, and quality



Conclusion: Patient-reported outcomes are uncovering new ways to think about sustainability, value and case mix

TAKEAWAYS

VALUE PROPOSITION

Patient-reported outcomes (PRO) build on current data collection and funding mechanisms

PROs can illuminate which patients have the poorest health and largest gains, by:

- Case mix group
- Health index quartile
- Socioeconomic quintile

PROs + cost information/case mix data can be used to generate “Quality Adjusted Life Year” measures

POLICY QUESTIONS

PROs are able to generate new information that could be used to drive policy, funding, and allocation decisions, for instance:

Should PROs impact...

- How waitlists are managed?
- How many slots for physicians by specialty are available?
- How OR space and capacity is allocated?
- Reimbursement for procedures?

Discussion





THANK YOU

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