Chile to California

Applying Lessons from Low Resource Environments to our Everyday Practice

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Adult Reconstruction Division
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Conflict of Interest

- The Journal of Arthroplasty: Editorial Board

Topics

- **The Chilean Public System:** a particular scenario for TJA
- **Disparity in TJA**: Understanding Underserved Populations
- **Underserved populations**: A perfect scenario for disruptive innovation
- **Technology Assessment** and Its Usefulness in Underserved Patients

Chile Demographics

- **Population:** 19.1 million people (as of 2023)
  - (17M Northern CA)
- **Urbanization:** 87% lives in urban areas. Santiago (the capital, 8M).
  - (89% Northern CA)
- **Education:** 98% of the population aged 15 and over are literate.


COVID +
262
261
COVID +
PRECAUCIÓN
POR GOTITAS
CAMBIOS DE POSICIÓN
PRECAUCIÓN
AEREA

Pandemics

I became the Chief of the Orthopaedic Department of Hospital of Maipu (20 surgeons)

600,000 people with a 7% living under the line of poverty

Current Concepts Review

Resuming Elective Orthopaedic Surgery During the COVID-19 Pandemic

Guidelines Developed by the International Consensus Group (ICM)

Parvizi, MD, FRCS, T. Gehrke, MD, C.A. Krueger, MD, E. Chisari, MD, M. Citak, MD, PhD, S. Van Onsem, MD, P
Valter, MBBS, PhD, the International Consensus Group (ICM) and Research Committee of the American Associatio
and Knee Surgeons (AAHKS)*

TJA in the Chilean Public System

Chilean Public Health System

- Chile has a hybrid healthcare system.
- 75% of the Chilean population received care in government-funded institutions (public system)
- The Chilean healthcare system faces challenges such as **long wait times**, **limited access to specialized care** in some areas, and **disparities in quality of care**.

What is the Chilean TJA situation in a globalized world?

Chile and US are both OECD members

- 37 countries comprise the Organization for Economic Co-operation and Development (OECD), in which democracies with market-based economies work together on policies that promote economic growth
- THA and TKA are 2 of the 16 surgical procedures that the OECD uses to evaluate healthcare utilization by its members

TJA in OECD countries

- **1.2% Annual Growth**
- **Procedures**
  1.8M in 2015 to 2.8M in 2050
- **Implants**
  184/100K in 2015 to 275/100K in 2050
- **Leading countries in terms of growing**
  Australia, Ireland, Norway, Switzerland
- **Chile was excluded from the Analysis**

Original Research Article

HIP International

HIP International
1–9
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DOI: 10.1177/1120700018757940
journals.sagepub.com/home/hpi
SAGE

Projections of hip arthroplasty in OECD countries up to 2050

Christof Pabinger[1], Harold Lothaller[2], Nicole Portner[3] and Alexander Geissler[4]

Abstract

Objective: The study aims to estimate the future demand of hip arthroplasty for OECD countries and to compare the results with earlier studies.

Design: Based on data availability and validity 20 countries out of the OECD sample have been selected for projection analysis. Using historic data (1995–2012) and multiple linear regression technics a projection model was designed by an iterative process considering different explanatory variables such as health care expenditure, age groups, and projection time frames.

Results: The utilisation of hip implants in OECD countries continues to grow by a compound annual growth rate (CAGR) of 1.2%, leading to an increase from 1.8 million per year in 2015 to 2.8 (2.6–2.9) in the year 2050. The mean utilisation rate (incidence) of hip implants will increase from 184 (143–312) to 275 (174–457) per 100.000 total population in the same time. Australia, Ireland, Norway, Switzerland and other countries will face a significant increase of utilisation of hip implants between +95% and +120% from 2015 to 2050.

Conclusions: Hip arthroplasty continues to rise significantly over the next 35 years. Therefore, some countries will face an exponential use of hip arthroplasty of additional 100% or more and thus challenges for their health care budgets. Revision burden will increase disproportionately. Thus, health technology assessment (HTA) for medical devices, longevity and quality control will become more relevant.

Keywords
Future demand, hip, projection, replacement, revision, utilisation rate

Date received: 12 February 2017; accepted: 2 October 2017

Introduction

Utilisation rates

During the past 2 decades, the majority of Organisation for Economic Co-operation and Development (OECD) countries have witnessed a significant increase in the utilisation of hip arthroplasty, albeit to a different extent.[1,2] Countries like Germany, the USA or Switzerland currently show rates that exceed 260 per 100,000 population, whereas other countries like Spain have rates below 100 per 100,000 population.

Population

Growing life expectancy over the last 3 decades[3] and growing utilisation rates[2,4] of hip arthroplasty will lead to an even higher utilisation rate of primary and revision hip arthroplasty in the future.

Growth rates

Albeit growth rates for the use of hip arthroplasty have continued to rise due to demographic and non-demographic factors in all age groups,[5] a much higher growth rate was reported in cross-country studies for patients aged 64 years

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Disparity in THA Access

HSS Journal®
Volume 20, Issue 2, May 2024, Pages 208-213

https://doi.org/10.1177/15563316231171865

Original Article

Total Hip Arthroplasty in Chile Is Characterized By Low Utilization Rates and Disparity in Access

Francisco Bengoa, MD [1], Alberto López, MD, MPH [2], Nicolás Rojas, MD [2], David Dabed, MD [2], and Claudio Diaz-Ledezma, MD [3]

Chile is 3.9 times below the OECD average

poverty levels influence access

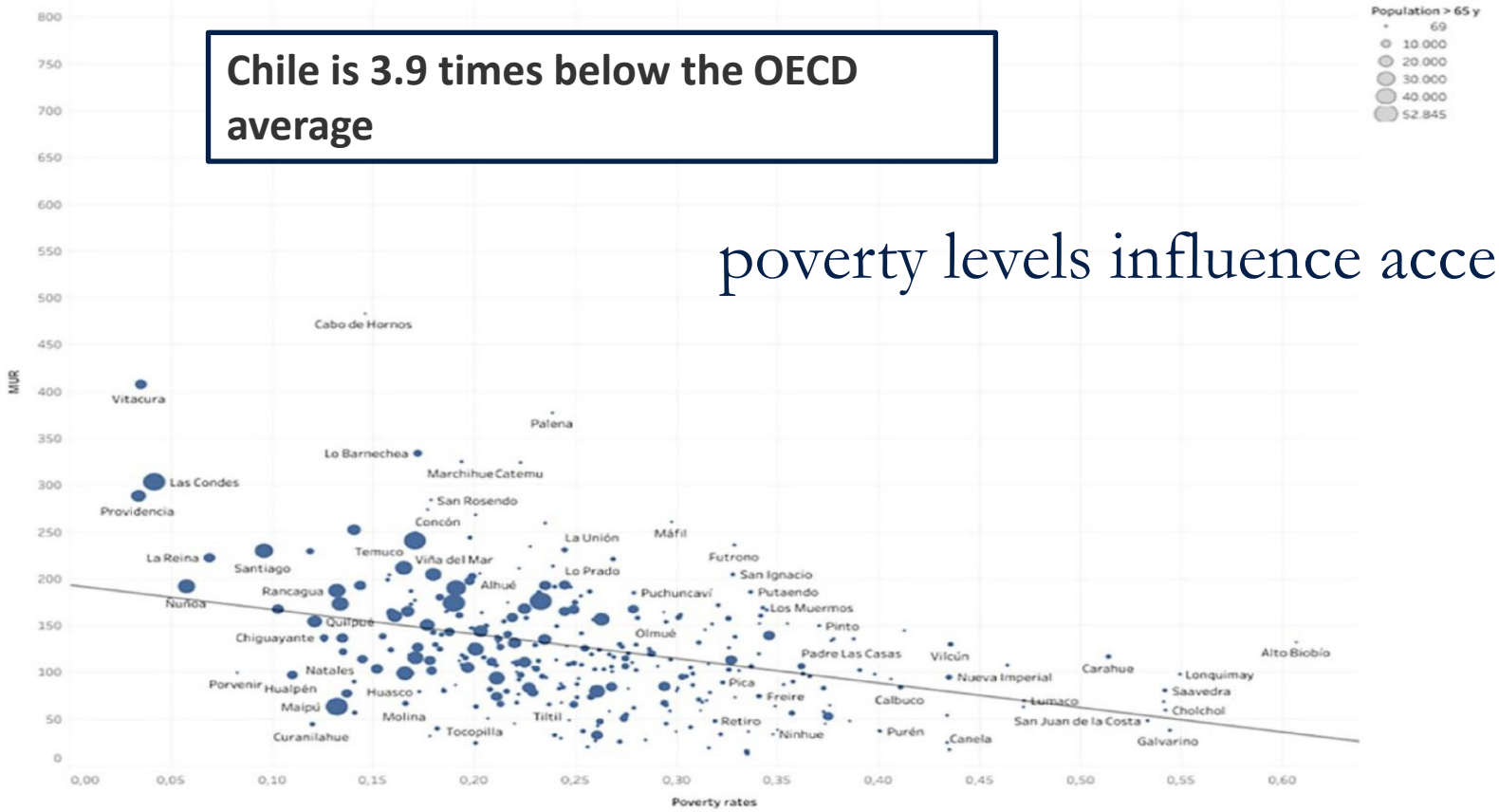
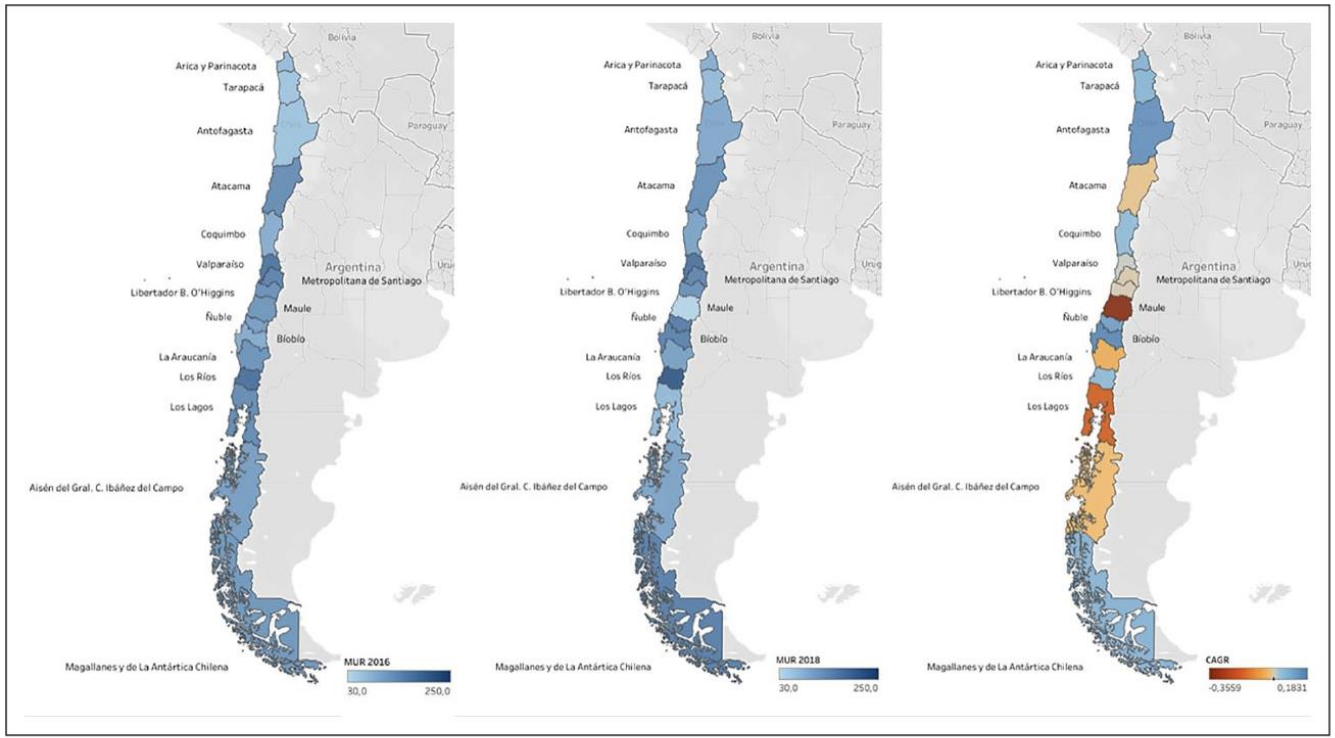


Fig. 2. MUR during the years 2016 to 2018 in different communes, according to poverty rates. The size of each circle shows the number of people over 65 years old living in that commune.

Geography influences access to THA



Regional MUR for 2016, 2018, and CAGR in the studied period.

Total Expenditure in Health

8% GDP

(9.5% average OECD)

USD 1,915 per cápita

(USD 4,069 average OECD)

Chile: Cost-effectiveness

Chile : 4,896–9,436 USD

vs

US: 24,283–40,112 USD

Woods, Value Health 2016

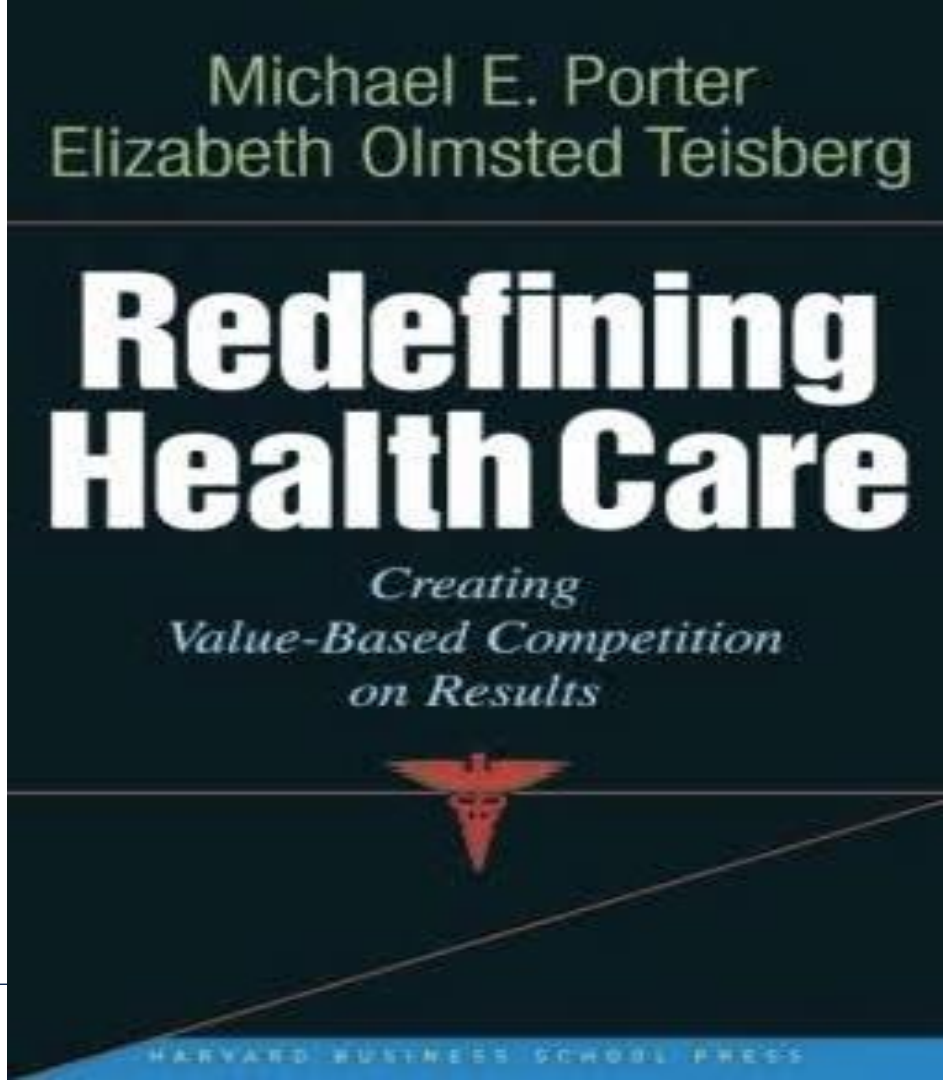
Value in Healthcare

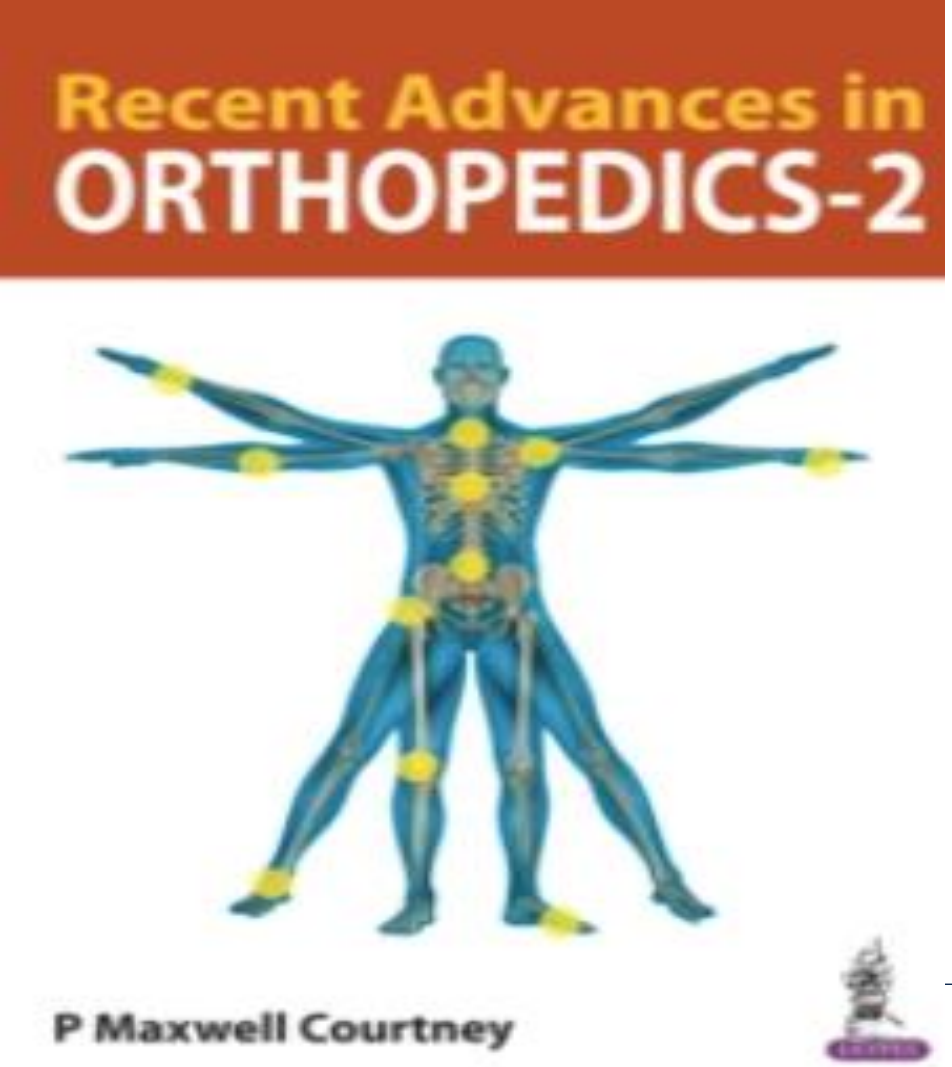
Value = Quality/ Cost

Porter, Redefining Healthcare 2007
Porter, NEJM 2009

HARVARD BUSINESS SCHOOL

Prof. Michael Porter





Chapter 17

What is new in hip arthroplasty—the South American perspective

Claudio Diaz-Ledezma, Ivan Radovic

I[illegible]ODUCTION

D[illegible] the last decade, most of the knowledge acquired in the field of total hip arthroplasty (T[illegible]comes from the experience and innovations developed in the United States, Europe a[illegible]a. High surgical volume, national registers,[1] clinical databases[2] as well as the p[illegible]ce of academic centers focused on clinical research and education[3,4] allow good-q[illegible] scientific production that helps to improve quality of care.

[illegible]outh America, particularly in Chile, we expect that our surgical volume will continue to[illegible] along with population's ageing. By 2030, 23.7% of people in Chile will be of 60 years a[illegible]er, the higher proportion among South Americans countries.[5] Considering that li[illegible] risk of THA may be as high as one in seven for women and one in 10 for men,[6] we h[illegible] improve the quality of patient care and control costs.

[illegible]is chapter, the most recent advances in THA are analyzed from the perspective o[illegible]h American surgeons practicing in a developing country (Chile). The emphasis [illegible]sed on new ideas to improve quality of care and the cost-effectiveness of our in[illegible]ntions.

VALUE-BASED ARTHROPLASTY: A VITAL CONCEPT IN DEVELOPING COUNTRIES

In a developing country like Chile, the threshold for a cost-effective health intervention is considerably low compared to, i.e. the United States. A recent publication shows that the *cost-effectiveness threshold range* in Chile is 4,896–9,436 USD versus 24,283–40,112 USD in the United States.[7] For that reason, we need a structured approach to analyze: (1) the actual impact of THA on patients' quality of life, and (2) the real monetary costs associated to the surgery. This type of tactic will give as an opportunity to overcome the lack of access to THA observed in most South American countries.

Since the inspirational publication of Professor Michael Porter and Elizabeth Teisberg, from the Harvard Business School,[8] there has been an increasing interest on the concept of value-based healthcare (VBHC). It comprises two variables to be evaluated in health-related interventions: (1) patient-reported outcome measurements,[9] and (2) costs.[10,11] According to Professor Porter, "value in healthcare is measured by the outcomes achieved—relative to the cost."[12]

The Chilean TJA reality in a globalized world:

- Disparity in an overall poor surgical access
- Small margin for being “cost-effective” and improve value

How to improve TJA quality of care in the Chilean underserved population?

Disparity is the concept to be understood when you are working with underserved populations in TJA

Agency for Healthcare Research and Quality

Healthcare disparities are differences in :

- access to or availability of medical facilities and services
- variation in rates of disease occurrence and disabilities between population groups defined by socioeconomic characteristics such as:
  - age, ethnicity, economic resources, or gender and populations identified geographically

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Key articles

- Disparities in orthopaedic surgical intervention
  - Nelson CL, JAAOS 2007
- Current Concepts in Orthopaedic Care Disparities
  - Pandya, JAAOS 2018

J. Racial and Ethnic Health Disparities (2017) 4:758–762
DOI 10.1007/s40615-016-0279-z

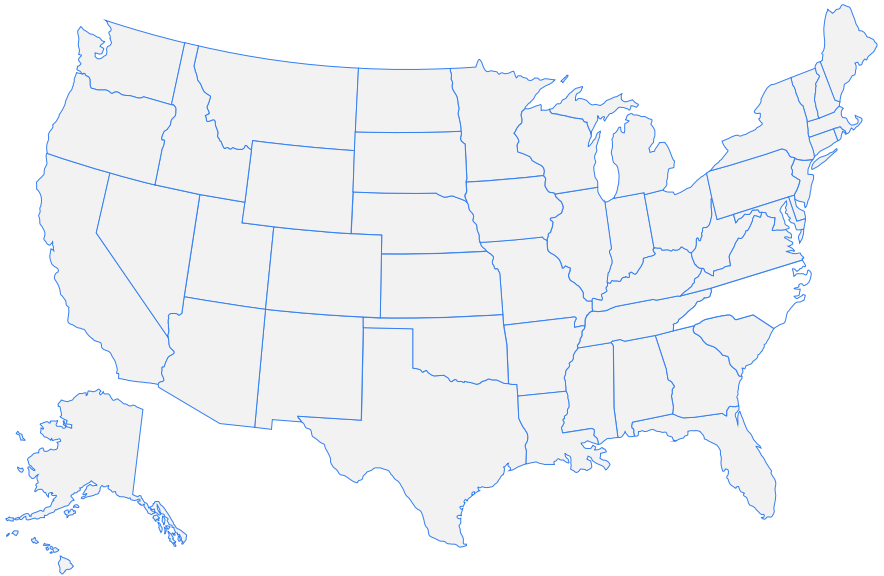
Perspectives of Orthopedic Surgeons on Racial/Ethnic Disparities in Care

Muyibat A. Adelani[1] · Mary I. O'Connor[2,3]

305 AOA members

50% see > ¼ minority patients

Only 35% of the surgeons
believe there is no difference in the way patients receive care



32% 

Type of insurance

22% 

Attitudes of the treating surgeon

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Disparities in TJA

Alvarez, JBJS Rev 2022

- Blacks, Hispanics, and Asians: Lower TJA utilization v/s Whites
- Blacks and Hispanics:
  - Lower expectations and familiarity with the procedures
  - Lower willingness to undergo surgery
  - Lower functionality at surgery and more comorbidities

Disparities in TJA

Alvarez, JBJS Rev 2022

- All minority patient groups are more likely to undergo TJA at low-quality, low-volume hospitals compared with White patients

Lesson 1:

A TJA patient belonging to an underserved population necessitates the surgical team's additional efforts to help the overcome the social, language, ethnic, among other barriers.

Underserved populations:
A scenario for disruptive innovation

4 Types of Innovation

HOW WELL IS THE PROBLEM DEFINED?	HOW WELL IS THE DOMAIN DEFINED?	
	Not well	Well
Well	**BREAKTHROUGH INNOVATION** Mavericks Skunk Works Open innovation/prizes	**SUSTAINING INNOVATION** Roadmapping R&D labs Design thinking Acquisitions
Not well	**BASIC RESEARCH** Research divisions Academic partnerships Journals and conferences	**DISRUPTIVE INNOVATION** VC model Innovation labs 15%/20% rule Lean launchpad

SOURCE GREG SATELL
FROM "THE 4 TYPES OF INNOVATION AND THE PROBLEMS THEY SOLVE," BY GREG SATELL, JUNE 2017

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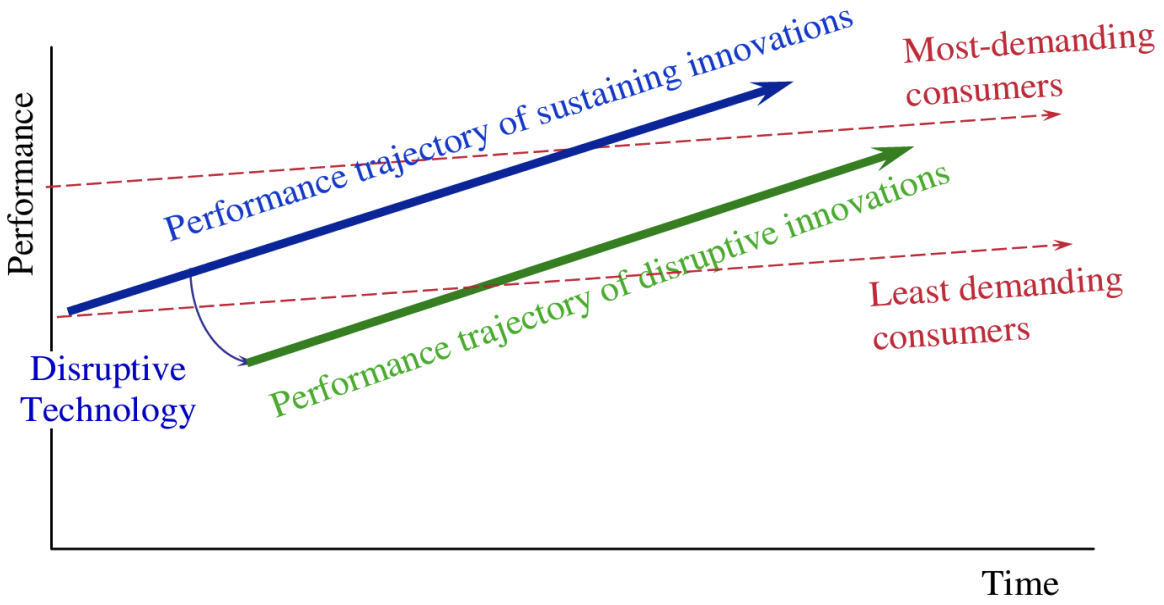
Opportunities for disruptive innovations

Underserved Population.

Hansen and Bozic, CORR 2009



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Outpatient TJA: The first formal SCDD in Chile

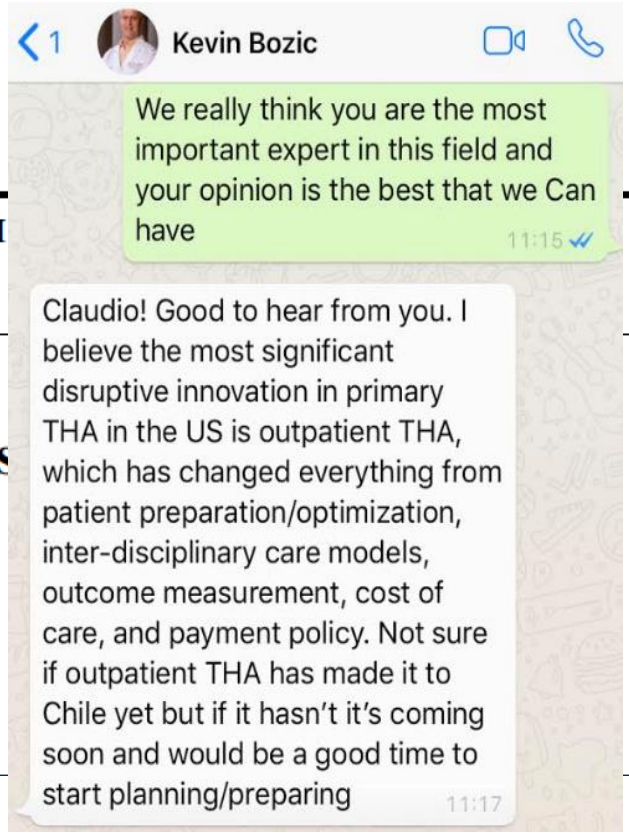
Clin Orthop Relat Res (2009) 467:2512–2520
DOI 10.1007/s11999-009-0865-z

SYMPOSIUM: ABJS CARL T. BRIGHTON WORKSH

IN ORTHOPAEDIC SURGERY

The Impact of Disruptive Innovations

Erik Hansen MD, Kevin J. Bozic MD, MBA



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Examples

Disruptive Innovations for Chile

Navigator Nurse

Overlapping surgeries

High-efficiency surgeries

Outpatient Surgery

Dorr's Mini-Posterior

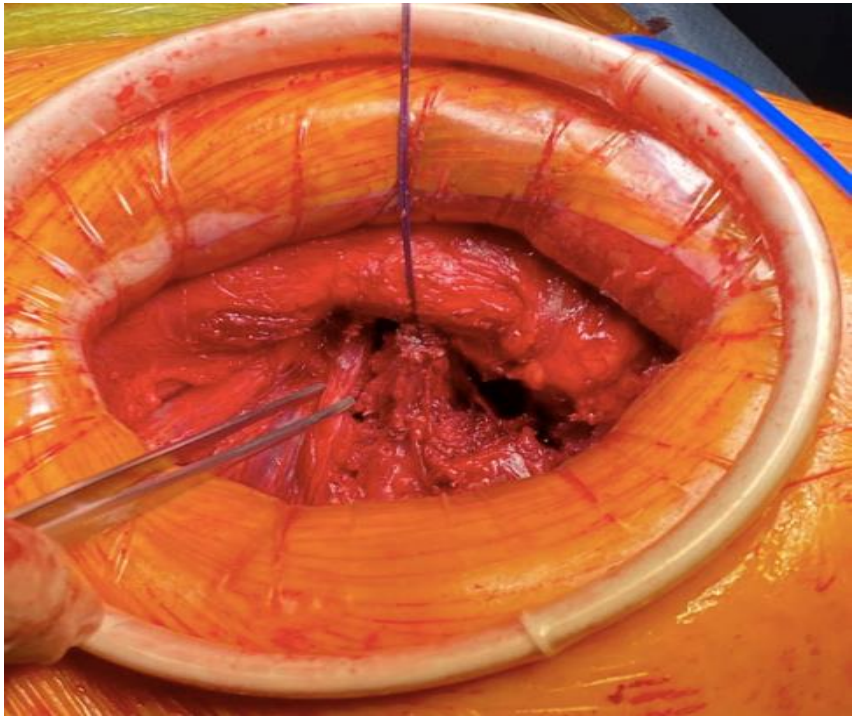
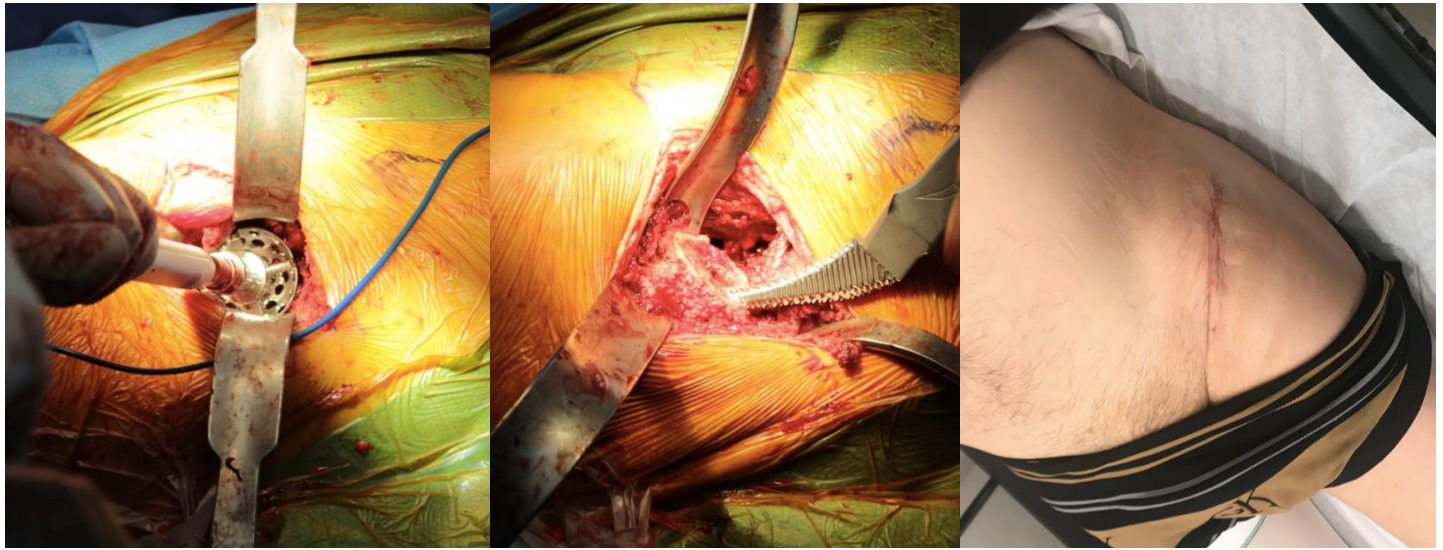


Foto de caso de Fractura de cuello femoral con ATC

Bikini DAA



Socialized Heathcare Enviroments

Why still in hospital after fast-track hip and knee arthroplasty?

Henrik Husted, Troels H Lunn, Anders Troelsen, Lissi Gaarn-Larsen, Billy B Kristensen, and Henrik Kehlet

Acta Orthopaedica 2011; 82 (6): 679–684
DOI 10.3109/17453674.2011.636682

Background and purpose Length of stay (LOS) following total hip and knee arthroplasty (THA and TKA) has been reduced to about 3 days in fast-track setups with functional discharge criteria. Earlier studies have identified patient characteristics predicting LOS, but little is known about specific reasons for being hospitalized following fast-track THA and TKA.

Patients and methods To determine clinical and logistical factors that keep patients in hospital for the first postoperative 24–72 hours, we performed a cohort study of consecutive, unselected patients undergoing unilateral primary THA (n = 98) or TKA (n = 109). Median length of stay was 2 days. Patients were operated with spinal anesthesia and received multimodal analgesia with paracetamol, a COX-2 inhibitor, and gabapentin—with opioid only on request. Fulfillment of functional discharge criteria was assessed twice daily and specified reasons for not allowing discharge were registered.

Results Pain, dizziness, and general weakness were the main clinical reasons for being hospitalized at 24 and 48 hours postoperatively while nausea, vomiting, confusion, and sedation delayed discharge to a minimal extent. Waiting for blood transfusion (when needed), for start of physiotherapy, and for postoperative radiographic examination delayed discharge in one fifth of the patients.

Interpretation Future efforts to enhance recovery and reduce length of stay after THA and TKA should focus on analgesia, prevention of orthostatism, and rapid recovery of muscle function.

Guest editorial

Should length of stay in hospital be the endpoint in arthroplasty?

This is, interestingly, one of the 10 most cited papers in the history of Acta after year 2000 (Husted et al. 2011). Interestingly, since length of stay (LOS) is not the most important parameter in arthroplasty: freedom of pain, normalized function and longevity are the ultimate goals. Why is then LOS of such interest? Hospital beds are a limited resource in many parts of the world, irrespective of payer system. LOS has therefore come under surveillance, to the degree that day care arthroplasty has become common in certain hospitals (Hartog et al. 2015). Remember that it is not more than 15 years ago since patients stayed in hospital for 1 to 2 weeks after total joint arthroplasty (TJA).

The study on 207 patients undergoing hip or knee arthroplasty registered 2 times a day whether fulfillment of each of the discharge criteria had been obtained, and detailed reason(s) for not being discharged. Husted et al. found that in a fast track system pain, dizziness, and general weakness were the main reasons for not being discharged after 24 and 48 hours in 80% of patients. Median LOS was 2 days, and 95% were discharged after 3 days. Waiting for blood transfusion, start of physiotherapy, and for postoperative radiographic examination delayed the discharge for 20%. The first factors can be seen as patient related, while the last ones are hospital factors. The hospital factors could be organizationally removed, while patient factors probably could not be changed. The authors had previously shown that readmissions were not increased by the fast-track system. The authors themselves concluded that the findings offered the possibility of safe reduction of LOS after fast-track hip or knee arthroplasty.

Now, nearly 10 years after its publication, it can be discussed whether being highly cited is equivalent to being an important scientific paper? The study was non-selective in including all patients scheduled for TJA in a 6 months period, thereby it was valid to all patients treated at Hvidovre hospital, and maybe to all patient in Denmark and Scandinavia. It was published in a period when LOS was rapidly decreasing due to implementation of fast-track surgery around the world. Husted et al. studied why some patients were in hospital while others had returned home, a topic which interested all researchers in hospital logistics and post-operative analgesia. The 176 citing papers are mostly on rapid recovery and analgesia. The study reached a peak with 18 citations in 2018. The most surprising citation was in pediatric urology, but also that study was on enhanced recovery after surgery (Haid et al. 2020).

Husted and Kehlet have been the pioneers in rapid recovery in Scandinavia, with numerous publications on analgesia (which is a prerequisite for rapid discharge), and recently outpatient total joint surgery (Gromov et al. 2019). The value of the 2011 paper has perhaps been mostly to pave the way for this unthought possibility just 15 years ago, leaving hospital with a new hip or knee the same day as you went in through the hospital doors.

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22
250
stryker

SCDD patients' selection

Table 2
OARA Score.

Comorbidity Areas	Possible Points
General medical	180
Hematological	325
Cardiac	385
Endocrine	165
Gastrointestinal	185
Neurologic/psychological	185
Renal/urology	220
Pulmonary	250
Infectious disease	65

OARA, Outpatient Arthroplasty Risk Assessment.

First License outside the US

Meneghini, JoA 2017

Diaz-Ledezma, AAOS Poster 2024

Implementation of an outpatient total knee arthroplasty program in underserved populations outside the US

Two groups were compared:

- *Post pandemic group*: 446 patients managed between 2020 and 2023 under a structured outpatient program (implemented during the COVID-19 pandemic). The
- *Control group:* 465 patients managed at the same hospital between 2016 and 2019, with no particular program for rapid recovery and early discharge.
- The condition of being underserved was defined as those patients with limited healthcare access, manifested by being on a surgical waiting list for more than six months.

RESULTS

- Both groups were comparable in age and DRG severity of illness index.
- When compared to the control group, the post-pandemic group presented:
- Shorter hospital stays (1.44 vs. 4.4 days, $p<0.01$)
- Significantly higher proportion of stays < 23 hours: 65% vs. 0%, $p>0.01$)
- Analyzing patients who participated in the postpandemic outpatient program, we observed that the rate of stays <23 hours significantly improved from 2019 (11%) to 2023 (98%) ($p<0.01$).
- The readmission rate was not statistically different between both groups (less than 2 percent in both groups)

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SCDD

- Pioneers in SouthAmerica

Perfect Inpatient Care Index (PICI)

Nº surgical admissions with no complications (90 days) with stays ≤ national average

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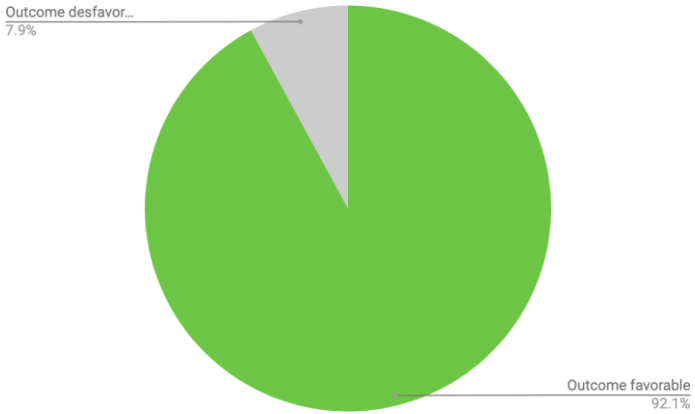
Total number of TJA in the same period

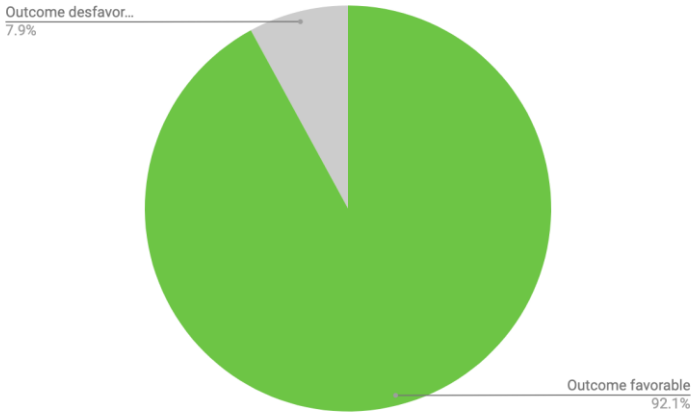
Hollenbeck, JBJS 2020

VALUE



- 92% “perfect admissions” for TJA

Value:



- 40% more value compared to the # private institution in our country

Lesson 2:

Innovations that may not be significant for the most demanding “markets” can produce a positive impact among underserved populations

Technology Assessment and Its Usefulness in Underserved Patients

Journal of Orthopaedic Experience & Innovation
Clinical, Economic, and Innovative Orthopaedic Experience

Spira, Bronwyn. 2022. "The Drive for Health Equity - The Need to Use Technology to Reduce Healthcare Disparities in Orthopedics." *Journal of Orthopaedic Experience & Innovation* 3 (2). https://doi.org/10.60118/001c.38908.

Editorial

The Drive for Health Equity - The Need to Use Technology to Reduce Healthcare Disparities in Orthopedics

Bronwyn Spira, MSc[1a]

[1] Force Therapeutics

Keywords: Health Equity, Health Access, Orthopedic Care, Virtual Tools, Digital Health, Health Disparities, Health Technology

https://doi.org/10.60118/001c.38908

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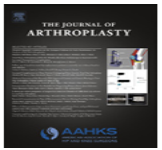

Health Policy and Economics

Disparities in Access to Robotic Knee Arthroplasty: A Geospatial Analysis

Check for updates

Nicholas J. Peterman, BS [a,*], Nicholas Pagani, MD [b], Rachel Mann, BS [a], Richard L. Li, BS [a], Jacob Gasienica, BS [a], Anant Naik, MD [a], Daniel Sun, MD [b]

[a] *Carle Illinois College of Medicine, University of Illinois Urbana-Champaign, Urbana, Illinois*
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Curr Rev Musculoskelet Med
DOI 10.1007/s12178-017-9407-6

ORTHOPAEDIC HEALTH POLICY (A MILLER, SECTION EDITOR)

Technology assessment and cost-effectiveness in orthopedics: how to measure outcomes and deliver value in a constantly changing healthcare environment

Jeremy M Burnham[1] · Fabien Meta[2] · Vincent Lizzio[2] · Eric C. Makhni[2] · Kevin J Bozic[3]

Medical Devices: Evidence and Research

Dovepress
open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Physician preference items: what factors matter to surgeons? Does the vendor matter?

Análisis de 97.305 casos del registro Americano reporte 2019 (excluyendo las 1352 muertes)				
	% DE FALLA EN LOS PRIMEROS 7 AÑOS	Comparacion	p	Significativo
Pinnacle / Corail Cementless	0.5% menos (0.3221% to 0.6791%)	versus Stryker Trident/Accolade	P < 0.0001	*
Pinnacle / Summit Cementless	0.21% menos (-0.0092% to 0.4203%)	versus Stryker Trident/Accolade	P = 0.0596	
Pinnacle / Tri-Lock Cementless	0.44% menos (0.2071% to 0.6553%)	versus Stryker Trident/Accolade	P = 0.0003	*
R3 / Anthology Cementless	0.14% menos (-0.1594% to 0.4042%)	versus Stryker Trident/Accolade	P = 0.3418	
Continuum / M/L Taper Cementless	0.68% más (0.3407% to 1.0630%)	versus Stryker Trident/Accolade	P < 0.0001	*
Pinnacle / Corail-Summit-TriLock	0.40% menos (0.2433% to 0.5646%)	versus Stryker Trident/Accolade	P < 0.0001	*
	1.08% menos (0.7608% to 1.4487%)	Versus Zimmer Continuum/ML Taper	P < 0.0001	*
	0.26% menos (0.0222% to 0.5409%)	versus S&N R3/ Anthology	P = 0.0312	*
Pinnacle/ Corail	0.29% menos (0.0949% to 0.4957%)	versus Pinnacle/ Summit	P = 0.0033	*
Pinnacle/Corail	0.06% menos (-0.1405% to 0.2802%)	versus Pinnacle/ Trilock	P = 0.5689	
Pinnacle/Trilock	0.23% menos (-0.0162% to 0.4679%)	versus Pinnacle/Summit	P = 0.0659	

Constructo	Casos	Fallas	% FALLA	Revisiones por cada 300 casos
Trident / Accolade II Cementless	27,915	378	1.4	4.1
Pinnacle / Corail Cementless	26,174	223	0.9	2.6
Pinnacle / Summit Cementless	16,601	189	1.1	3.4
Pinnacle / Tri-Lock Cementless	11,638	107	0.9	2.8
R3 / Anthology Cementless	7,892	96	1.2	3.6
Continuum / M/L Taper Cementless	7,085	143	2.0	6.1
Total	97,305	1136	1.2	3.5

65 yo or older in the AJRR

Femoral Stem	N Total	N Revised	1 Yr	Compared to BIC	5 Yrs	Compared to BIC
Accolade II	75,489	1,748	1.61 (1.52, 1.70)	Worse	2.48 (2.36, 2.6)	Worse
Corail	43,364	602	0.88 (0.80, 0.98)	Worse	1.37 (1.26, 1.49)	Worse
Actis DuoFix	37,496	311	0.70 (0.62, 0.79)	Not Different	0.95 (0.84, 1.06)	BIC
Summit	28,389	608	1.53 (1.39, 1.67)	Worse	2.12 (1.95, 2.30)	Worse
M/L Taper	22,245	684	1.98 (1.80, 2.17)	Worse	3.04 (2.81, 3.28)	Worse
Taperloc 133	22,243	415	1.39 (1.24, 1.55)	Worse	2.02 (1.83, 2.22)	Worse
Tri-Lock	18,301	343	1.12 (0.98, 1.28)	Worse	1.86 (1.67, 2.07)	Worse
Anthology	15,628	342	1.55 (1.37, 1.76)	Worse	2.26 (2.03, 2.52)	Worse
PolarStem	10,170	153	1.23 (1.03, 1.46)	Worse	1.69 (1.42, 2.00)	Worse
Taperloc 133 Microplasty	9,937	204	1.60 (1.36, 1.86)	Worse	2.06 (1.78, 2.36)	Worse
Overall Uncemented	360,467	7,471	1.42 (1.38, 1.46)	Worse	2.15 (2.10, 2.20)	Worse
BIC Cemented (Cstem)	985	9	0.62 (0.26, 1.30)	Not Different	1.05 (0.52, 1.95)	Not Different
Overall Cemented	18,030	337	1.19 (1.04, 1.36)	Worse	2.08 (1.86, 2.32)	Worse
Avenir-Muller 3	3,433	66	1.43 (1.07, 1.87)	Worse	1.94 (1.52, 2.46)	Worse
Insignia	2,235	9	0.40 (0.20, 0.74)	BIC	Unknown	Unknown

65 yo or older in the AJRR

Femoral Stem	N Total	N Revised	1 Yr	Compared to BIC	5 Yrs	Compared to BIC
Accolade II	75,489	1,748	1.61 (1.52, 1.70)	Worse	2.48 (2.36, 2.6)	Worse
Corail	43,364	602	0.88 (0.80, 0.98)	Worse	1.37 (1.26, 1.49)	Worse
Actis DuoFix	37,496	311	0.70 (0.62, 0.79)	Not Different	0.95 (0.84, 1.06)	BIC
Summit	28,389	608	1.53 (1.39, 1.67)	Worse	2.12 (1.95, 2.30)	Worse
M/L Taper	22,245	684	1.98 (1.80, 2.17)	Worse	3.04 (2.81, 3.28)	Worse
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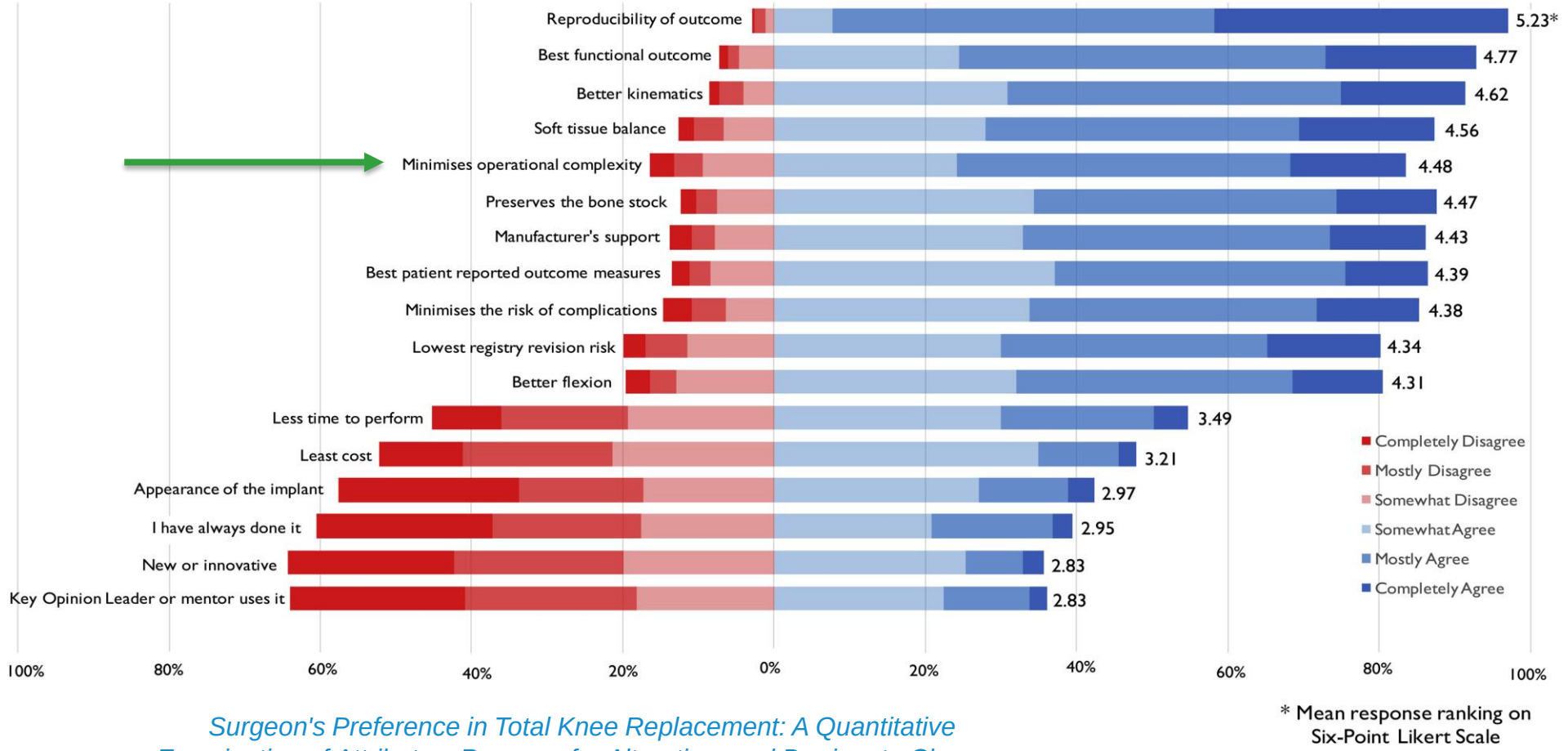


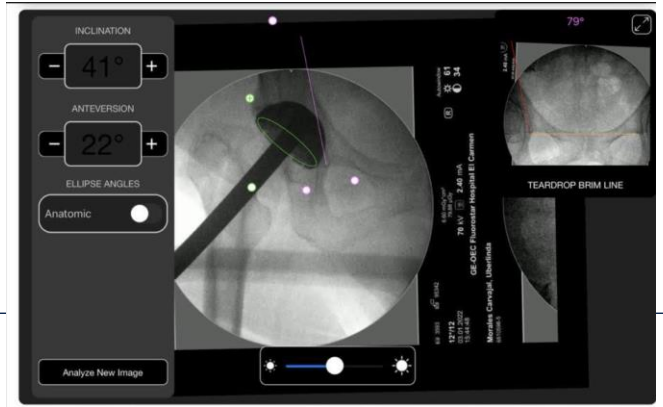
* Mean response ranking on Six-Point Likert Scale

Surgeon's Preference in Total Knee Replacement: A Quantitative Examination of Attributes, Reasons for Alteration, and Barriers to Change

The Journal of Arthroplasty 2017 322980-2989DOI: (10.1016/j.arth.2017.04.035)

Improvements introduced in Chile

- Preferred vendor alternative (both for hips and knees) Boylan, JBJS 2019
- Telerehabilitation (Platform from the UK…10 USD per month per surgeon)
- Traded the free introduction of Image cup navigator for my hospital by being their official trainer of DAA in Latin-America



ANTERIOR ADVANTAGE™

Standard Table

Surgical Technique

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Lesson 3:

Understanding your options is crucial when making informed technology decisions.

Ensure the product's features align with your patients’ priorities

Dr. Diaz, I would like to [redacted] thank you and your team once again for the "Over the Top" experience I just had with my hip replacement that you performed! From the time I arrived through pre-op, through anesthesia, of course you and your teams expertise in operation, then into post-op, the total care package was there! We just arrived home in Sacramento without any problem. I'll keep you posted on my progress and of course, I'll see you in a couple of weeks! Muchismo gracias para todo!!!!