July 26, 2022

Understanding Utilization Criteria for Orthopedic Implants

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Disclosures

- Kevin Brown is Independent Device Distributor and CEO and Founder of the Society for Medical Representative Advancement

- Jimmy Yancey has nothing to disclose

Note: This program may contain the mention of suppliers, brands, products, services or drugs presented in a case study or comparative format using evidence-based research. Such examples are intended for educational and informational purposes and should not be perceived as an endorsement of any particular supplier, brand, product, service or drug.

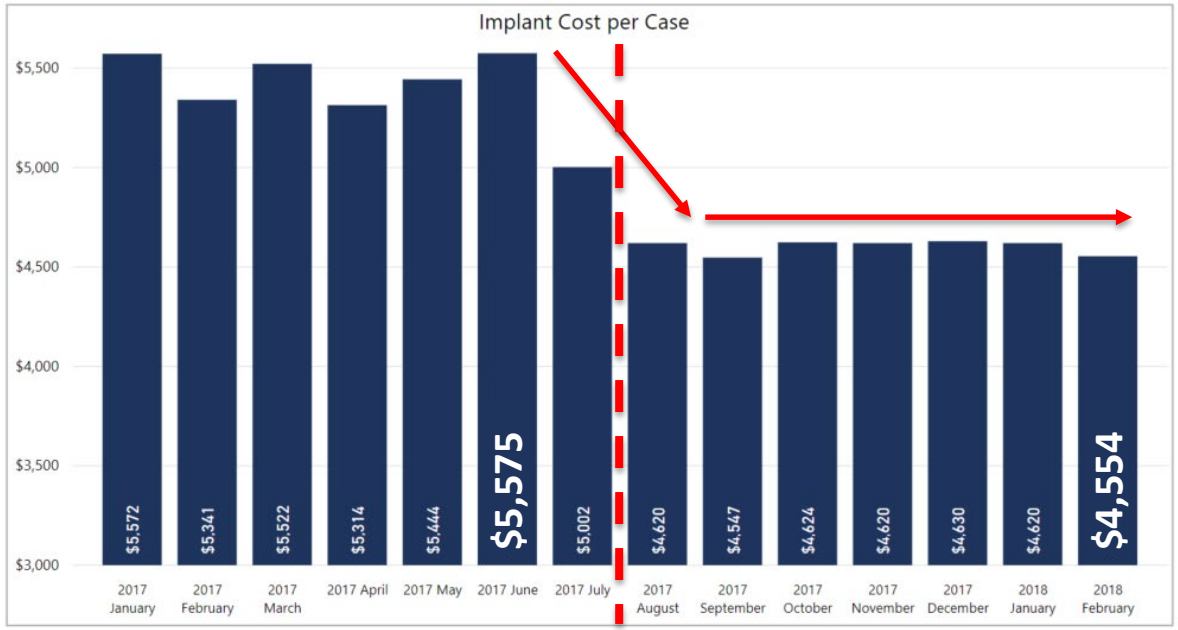
Learning Objectives

At the end of this session, participants should be able to:

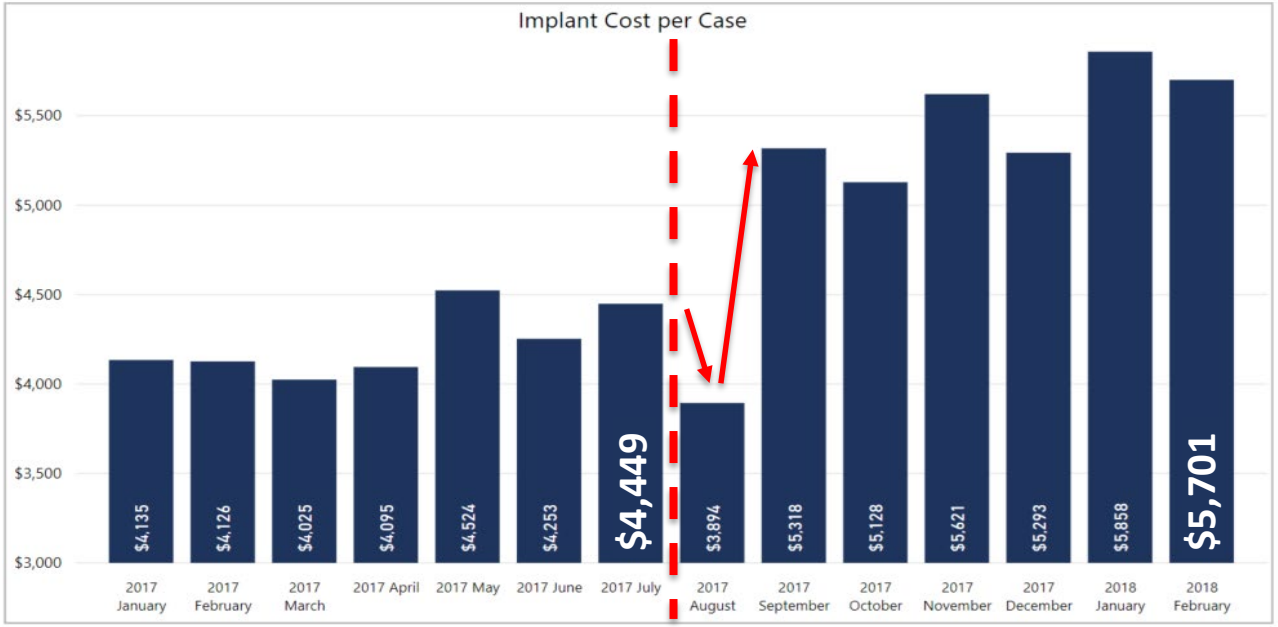
- Describe the basic components in total joint arthroplasty
- Explain the design rationale for why a surgeon chooses premium technology for some patients
- Recall potential utilization opportunities within their facilities and resources to reduce their cost per case

Utilization Monitoring to Prevent Savings Erosion Post-Contract Launch

Facility A
Average Cost of THA w/ MDM Sourcing & Utilization Monitoring



Facility B
Average Cost of THA w/ MDM Sourcing Only



- Continuous monitoring allows facilities to maintain case cost reductions achieved in sourcing
- Vendor knowledge of monitoring pre-empts abuse of on-contract premium products

- Without utilization monitoring, vendors can quickly erase cost savings by using on-contract premium products

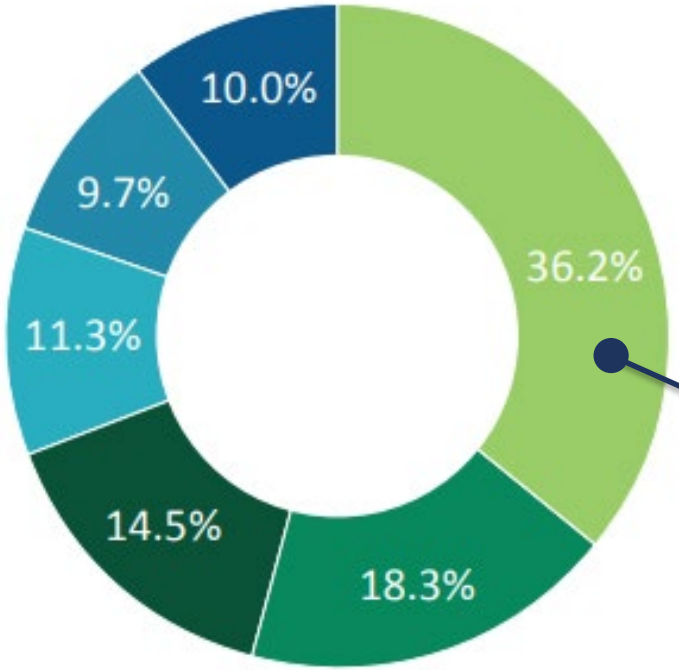
New Contracts Effective Date – Aug 2017

Source: HealthTrust, Inc. 2022. MDM Dashboard.

Industry Overview

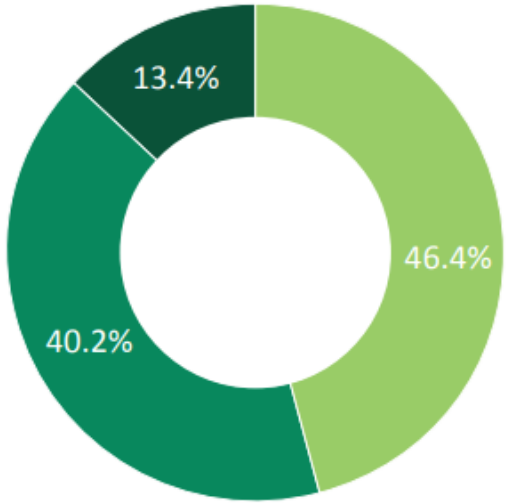
Industry Overview

Orthopedic Product Segments by 2021 Market Share ($Millions)



Joint Replacement	$19,424.8
Spine	$9,791.9
Trauma	$7,778.8
Sports Medicine	$6,046.7
Orthobiologics	$5,212.6
Other	$5,383.5

Joint Replacement Sales 2021 by Product Type ($Millions)

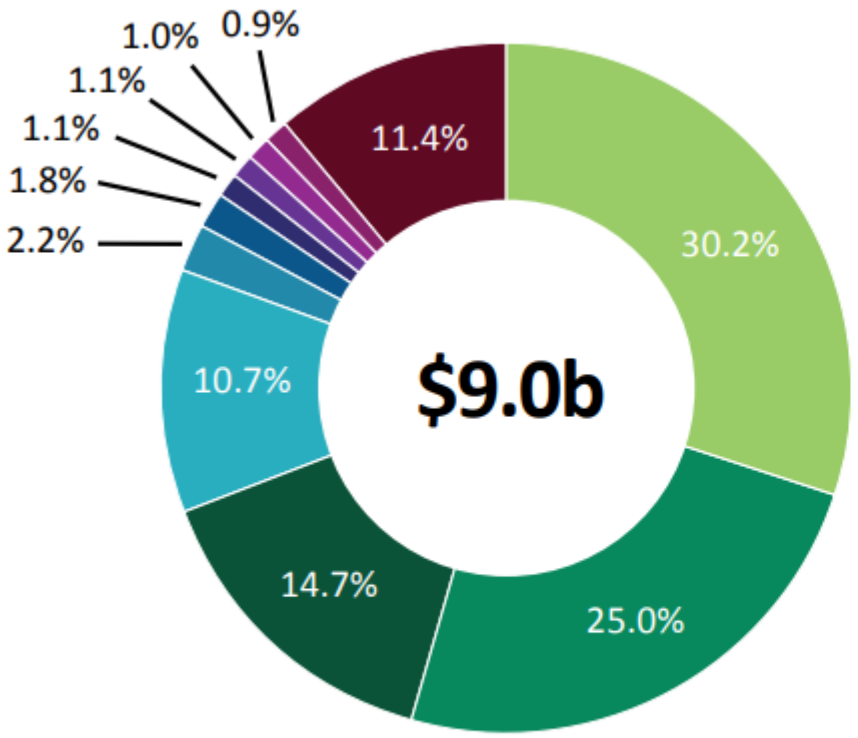


Knees	$9,020.3
Hips	$7,808.9
Extremities	$2,595.5

Source: ORTHOWORLD Inc.: https://www.orthoworld.com/wp-content/uploads/2022/06/THE-ORTHOPAEDIC-INDUSTRY-ANNUAL-REPORT-2022-v1.3.pdf

Industry Overview

Knee Replacement Market Share – 10 Largest Players & All Others ($Millions)

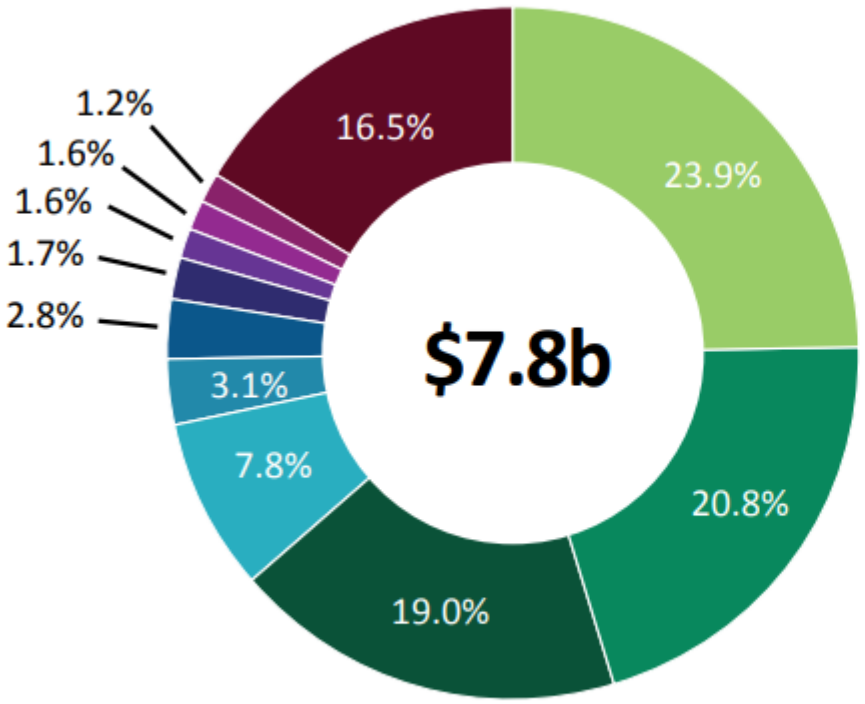


Zimmer Biomet	$2,720.2
Stryker	$2,252.6
DePuy Synthes	$1,325.1
Smith+Nephew	$968.0
Aesculap	$201.0
Medacta	$159.9
Conformis	$96.9
Exactech	$95.0
Corin	$87.5
MicroPort Orthopedics	$84.0
All Others	$1,030.1

Source: ORTHOWORLD Inc.: https://www.orthoworld.com/wp-content/uploads/2022/06/THE-ORTHOPAEDIC-INDUSTRY-ANNUAL-REPORT-2022-v1.3.pdf

Industry Overview

Hip Replacement Market Share – 10 Largest Players and All Others ($Millions)



Zimmer Biomet	$1,863.2
Stryker	$1,623.6
DePuy Synthes	$1,484.5
Smith+Nephew	$611.0
Aesculap	$243.0
Medacta	$218.7
KYOCERA	$133.2
DJO	$122.9
MicroPort Orthopedics	$122.0
Exactech	$97.0
All Others	$1,289.8

Source: ORTHOWORLD, Inc.: https://www.orthoworld.com/wp-content/uploads/2022/06/THE-ORTHOPAEDIC-INDUSTRY-ANNUAL-REPORT-2022-v1.3.pdf

Total Knee Arthroplasty

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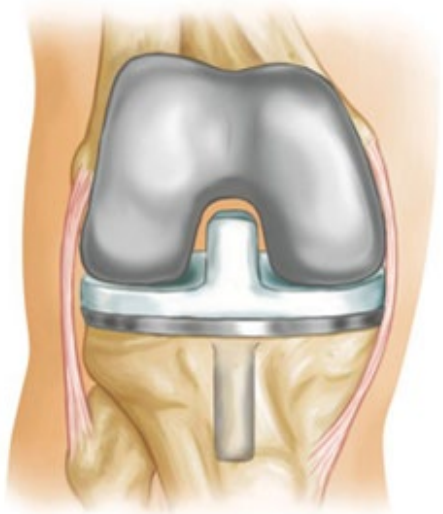
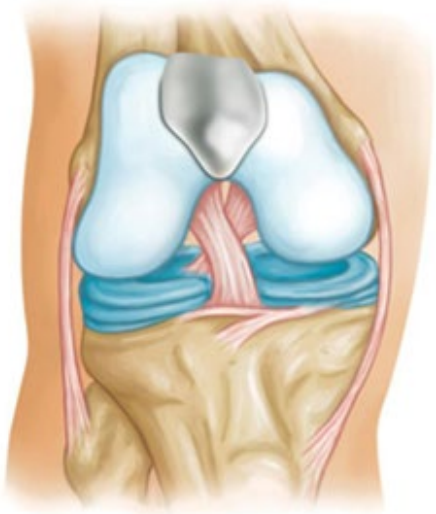
Why do they call it a “Total” Knee?

The knee has three compartments

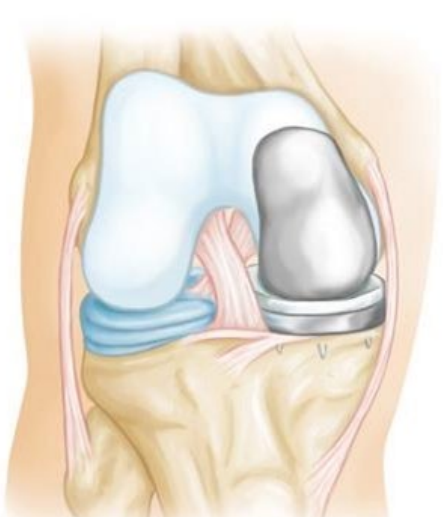
- Replace One? Uni or PFJ
- Replace all three? Total



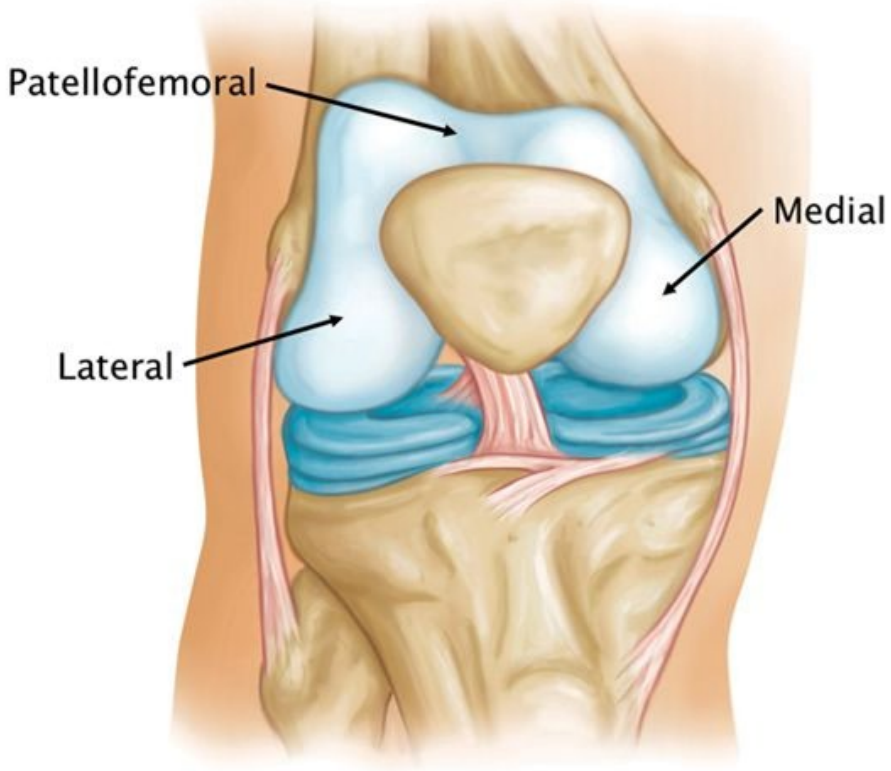
Total



Patellofemoral



Unicompartmental



Source: Orthopaedic Associates of Muskegon: https://www.oamkg.com/specialties/knee/partial-knee-replacement.html

Indications for Total Knee Arthroplasty…Pain, Pain & Pain!

Healthy Knee

Osteoarthritis

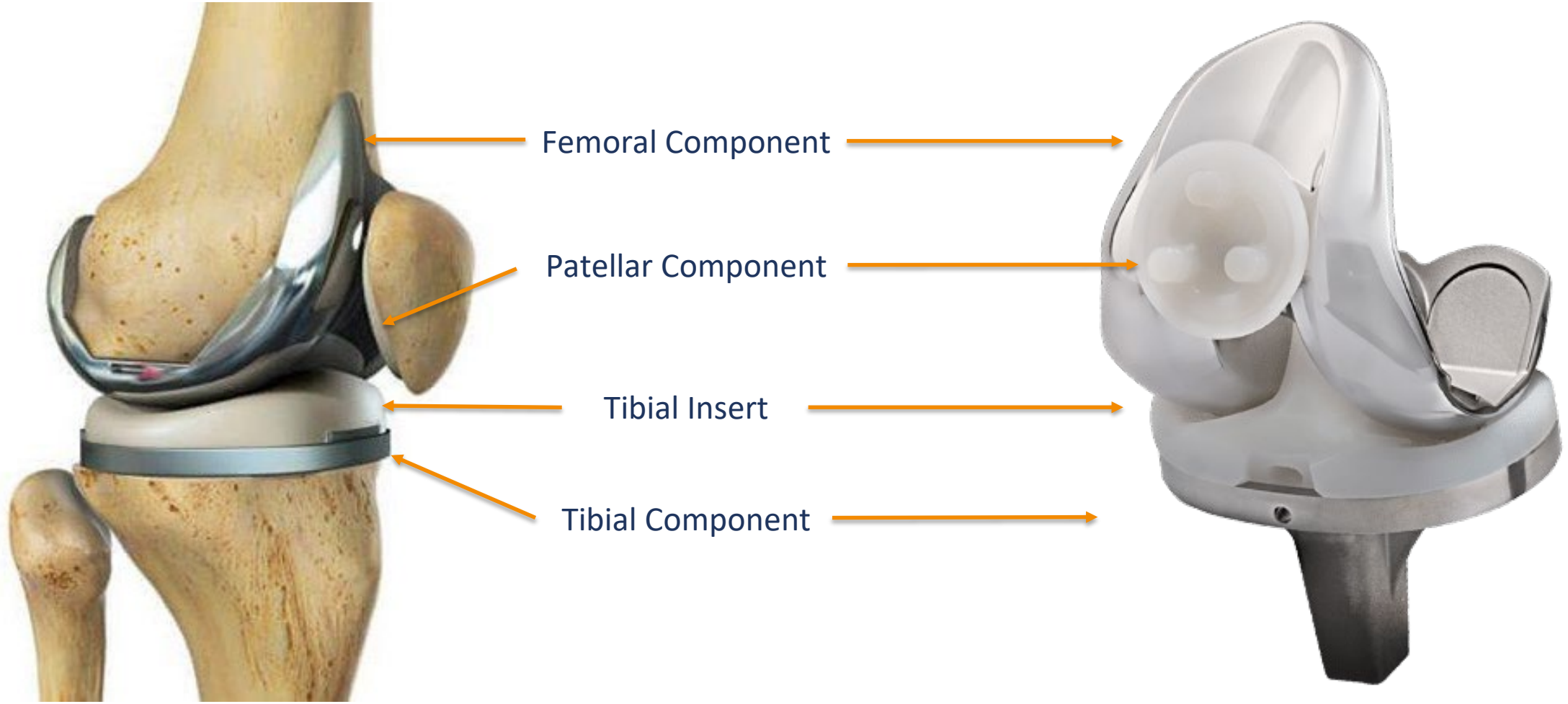
Rheumatoid Arthritis

Traumatic Arthritis

Avascular Necrosis

Sources: See References Slide

Total Knee Arthroplasty Components



Source: Medcraze, Inc. https://medcraze.com/procedure/joint-replacement-surgery/?doing_wp_cron=1655842360.2607390880584716796875 .
Exactech, Inc.: https://www.Exac.com

Primary Knee Components & Their Aliases

Femoral Component	Patellar Component	Tibial Insert	Tibial Component
Femur	Patella	Insert	Tibial Tray
	Patella Insert	Tibial Bearing	Tibia
	Dome	Polyethylene Insert	Tibial Baseplate
	Knee Cap	Poly	Baseplate
		Spacer	Platform
		Plastic	
		Bearing	
		Articular Surface	

Source: Exactech, Inc.: https://www.Exac.com

*Notable Trend: Cementless fixation was used in 14% of all TKA in 2020

Femoral Components

- Common Surface Materials:
  - Titanium (Usually “Gold” Coated)
  - Oxinium
  - Cobalt Chrome
- Types of Components:
  - Cemented
  - Cemented, High Flex
  - Metal Sensitive
  - Porous (Cementless)*
  - Porous (Cementless), High Flex
  - Revision

Sources:
Annual report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report.
Medcraze, Inc.: https://medcraze.com/procedure/joint-replacementsurgery/?doing_wp_cron=1655842360.2607390880584716796875

*Notable Trend: Cementless Fixation was used in 14% of all TKA in 2020

Tibial Components

- Common Materials:
  - Polyethylene
  - Trabecular Metal
  - Cobalt-Chrome
  - Titanium
- Types of Components
  - Cemented
  - Porous (Cementless)*
  - Ceramic
  - All Poly
  - Revision
  - Rotating Platform

Sources:
Annual report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report.
Medcraze, Inc.: https://medcraze.com/procedure/joint-replacementsurgery/?doing_wp_cron=1655842360.2607390880584716796875

Tibial Insert Components

Notable Trends:
- Vitamin-E Utilization has Tripled to 33.43% from 2012–2020
- XLPE Utilization has been cut in half to 22.23% from 2012–2020

- Common Materials
  - Polyethylene
  - Vitamin E
  - XLPE / Highly Crosslinked
- Common Types
  - CPS Constrained
  - Flex
  - Revision
  - Rotating Platform
  - PS/CR/UC/Sphere

Sources:
Annual report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report.
Medcraze, Inc.: https://medcraze.com/procedure/joint-replacementsurgery/?doing_wp_cron=1655842360.2607390880584716796875

Patellar Components

Notable Trend: Decrease in Patellar Resurfacing from 95.9% in 2012 to 90.4% in 2020

Components with Upcharges

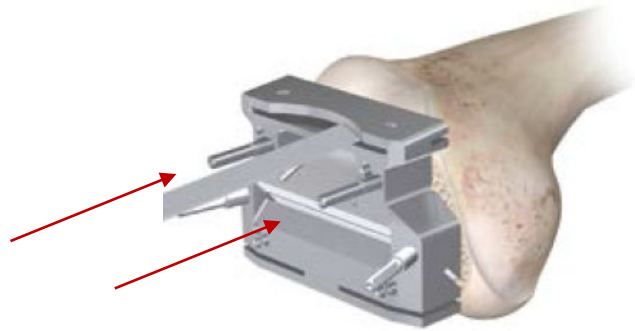
- Polyethylene
- Porous/Metal Backed (Cementless)
- TM
- Vitamin E
- XLPE

Sources:
Annual report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report.
Medcraze, Inc.: https://medcraze.com/procedure/joint-replacementsurgery/?doing_wp_cron=1655842360.2607390880584716796875

Miscellaneous Components

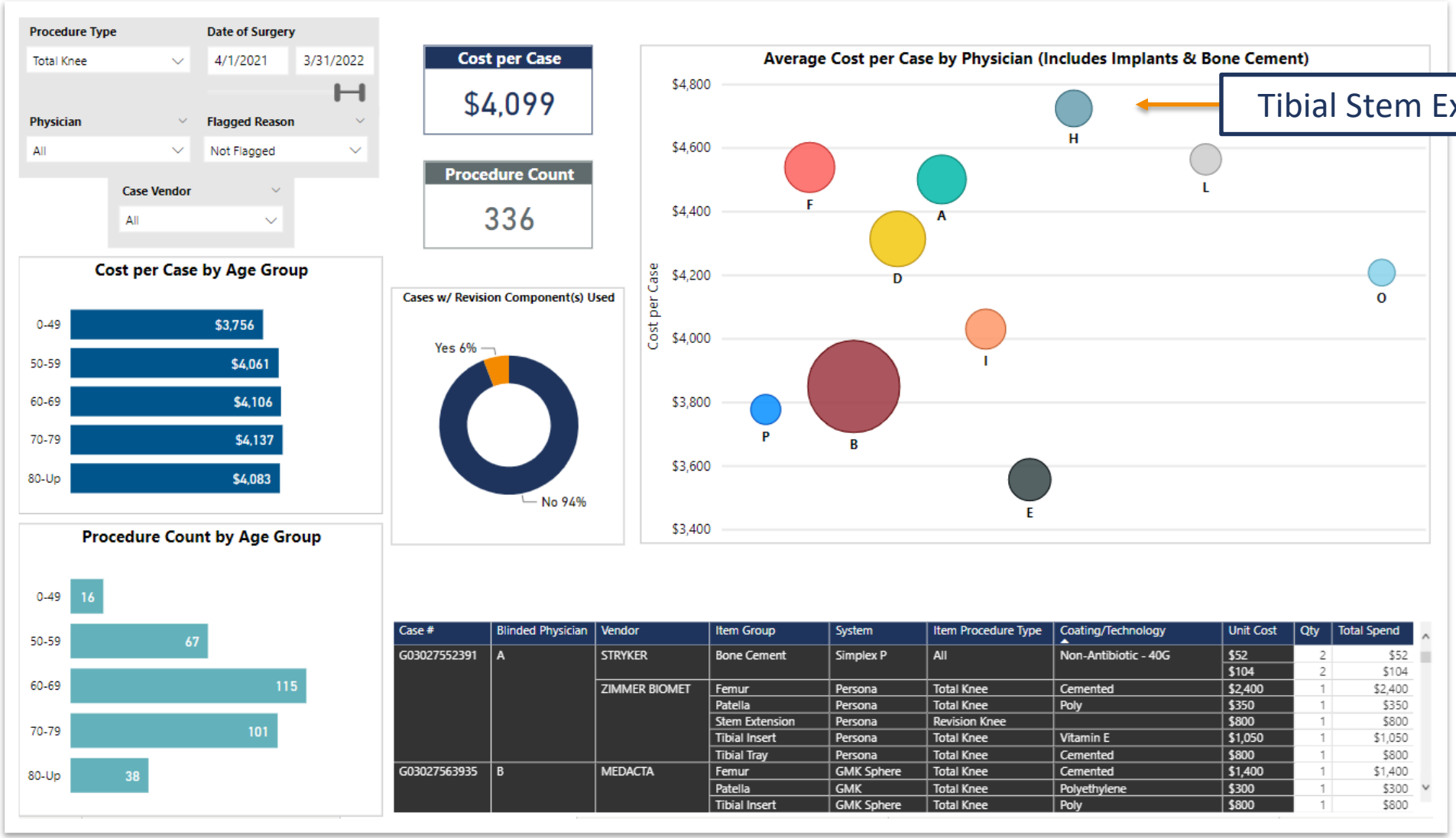
Components with Upcharges

- Stem Extension
- Femoral Lugs
- Fixation Pins
- Drill Bits
- Revision Components
  - Augments
  - Tibial Stem Extension
  - Femoral Stem Extension



Sources: OrthoCircle, Inc.: https://www.Orthocircle.com. Exatech, Inc.: https://www.Exac.com. Mendenahll Associates, Inc: https://www.curvolabs.com/

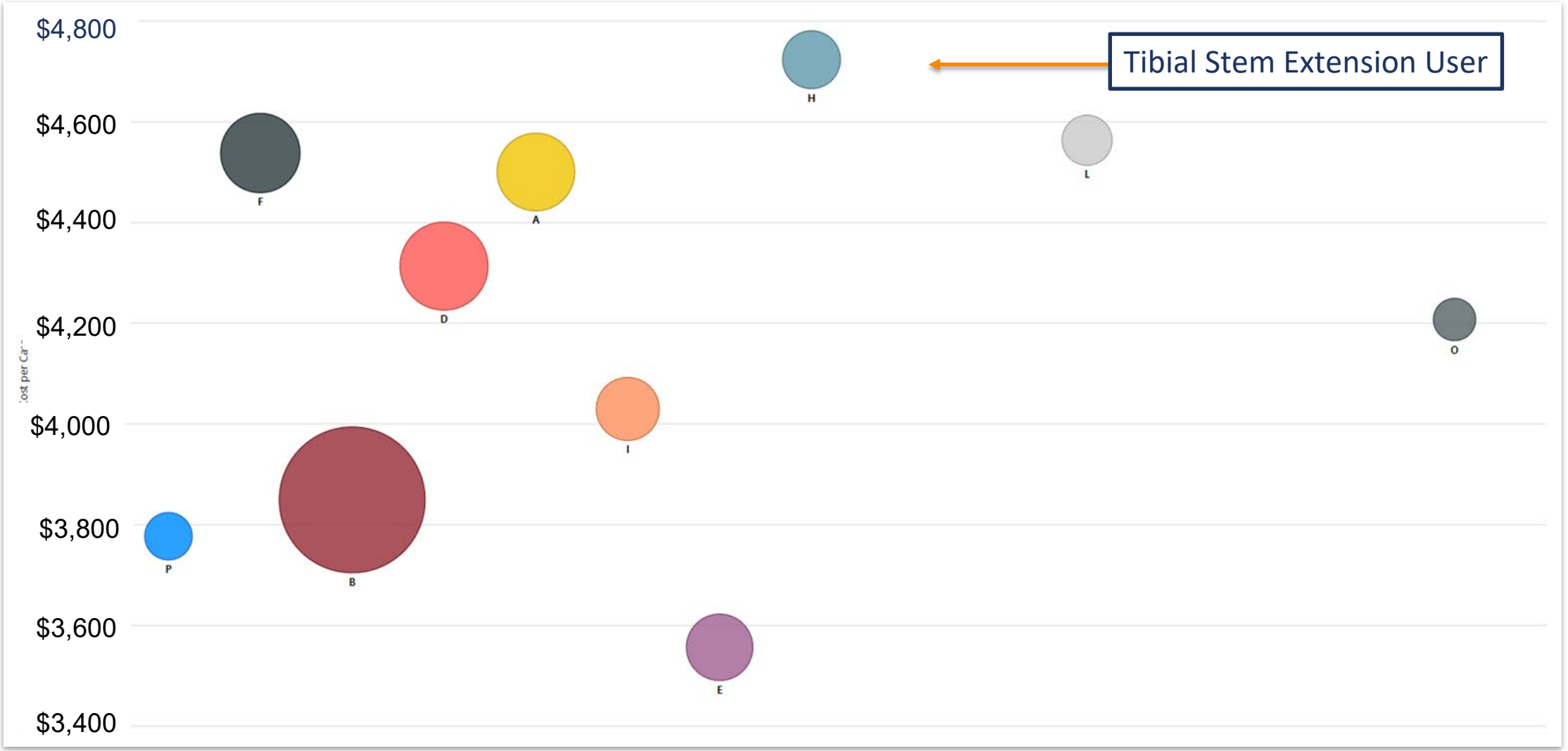
Physician Average Cost Per Case – Blinded



Case #	Blinded Physician	Vendor	Item Group	System	Item Procedure Type	Coating/Technology	Unit Cost	Qty	Total Spend
G03027552391	A	STRYKER	Bone Cement	Simplex P	All	Non-Antibiotic - 40G	$52	2	$52
							$104	2	$104
		ZIMMER BIOMET	Femur	Persona	Total Knee	Cemented	$2,400	1	$2,400
			Patella	Persona	Total Knee	Poly	$350	1	$350
			Stem Extension	Persona	Revision Knee		$800	1	$800
			Tibial Insert	Persona	Total Knee	Vitamin E	$1,050	1	$1,050
			Tibial Tray	Persona	Total Knee	Cemented	$800	1	$800
G03027563935	B	MEDACTA	Femur	GMK Sphere	Total Knee	Cemented	$1,400	1	$1,400
			Patella	GMK	Total Knee	Polyethylene	$300	1	$300
			Tibial Insert	GMK Sphere	Total Knee	Poly	$800	1	$800

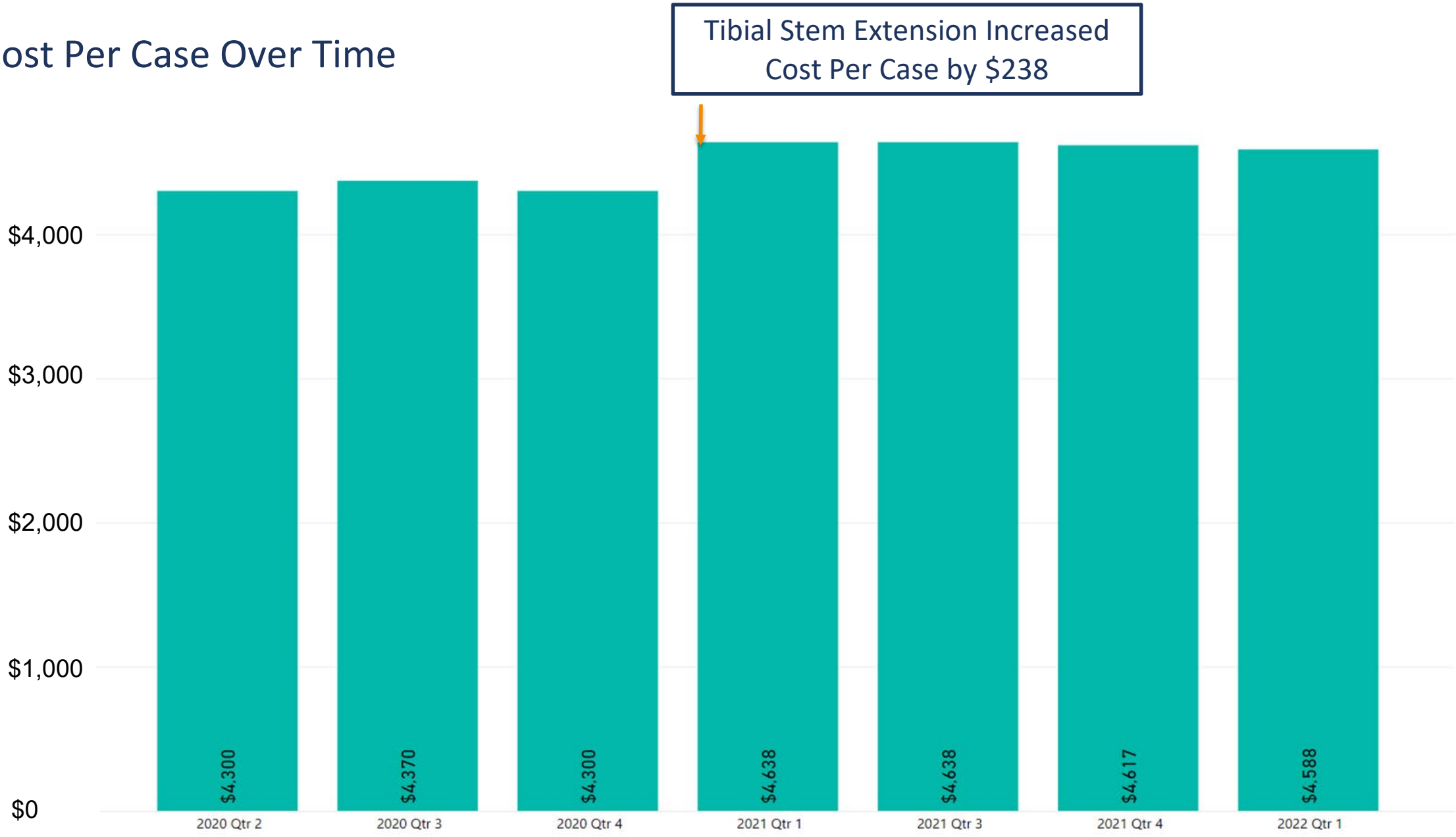
Source: HealthTrust, Inc. 2022. MDM Dashboard.

Physician Average Cost Per Case – Blinded



Source: HealthTrust, Inc. 2022. MDM Dashboard.

Cost Per Case Over Time



Source: HealthTrust, Inc. 2022. MDM Dashboard.

“Premium Technology” and the “Why”

- 30mm-40mm Tibia Stem extension
  -BMI <35, bone quality, implant design
- Poly additives (E-poly, AOX, Highly-Crosslinked)
  -Anti-oxidation, adds longevity
- Femoral Component Material (Oxinium, Gold)
  -Nickel allergy, wear characteristics, preference
- Ingrowth technology
  -Stable interface for younger patients, quicker case, training

Source: Adobe Inc.: https://stock.adobe.com/

Total Hip Arthroplasty

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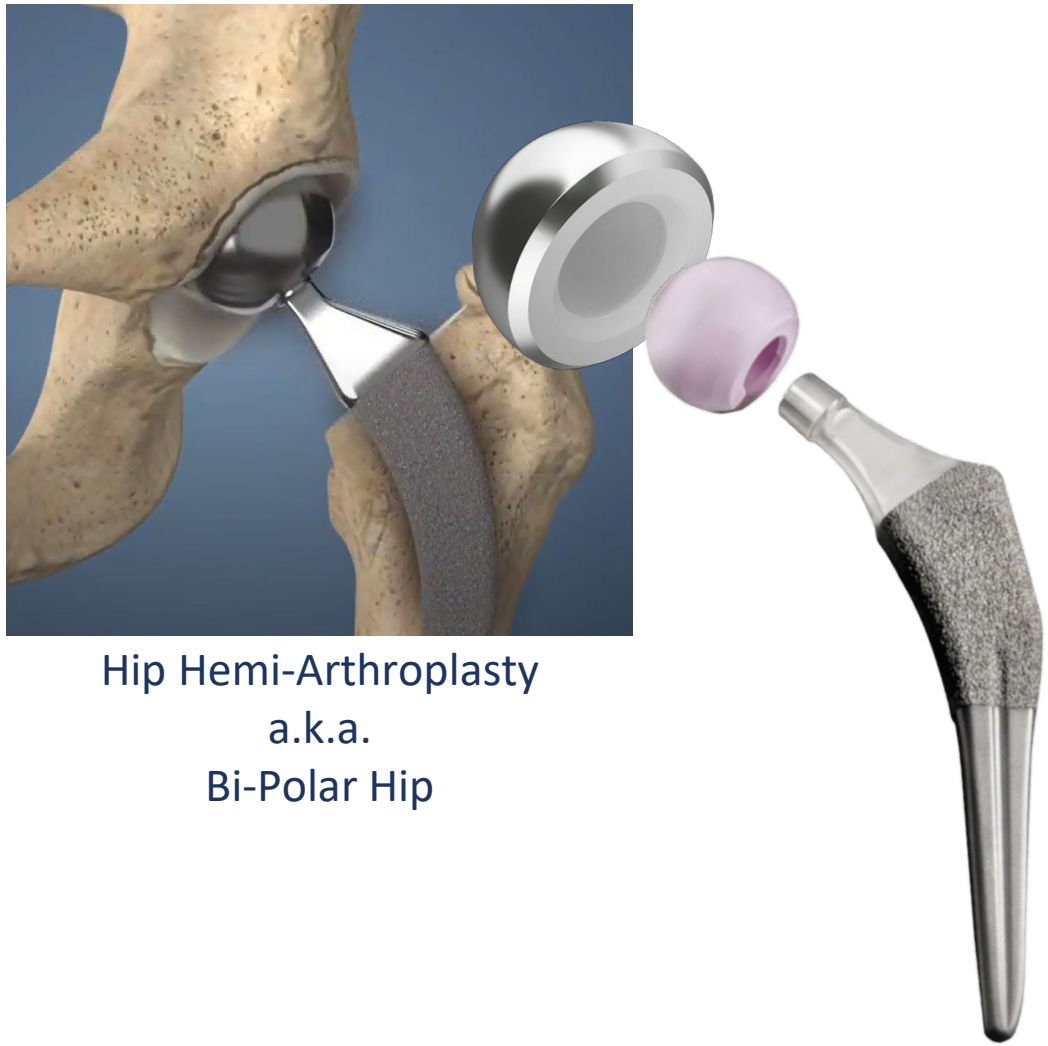
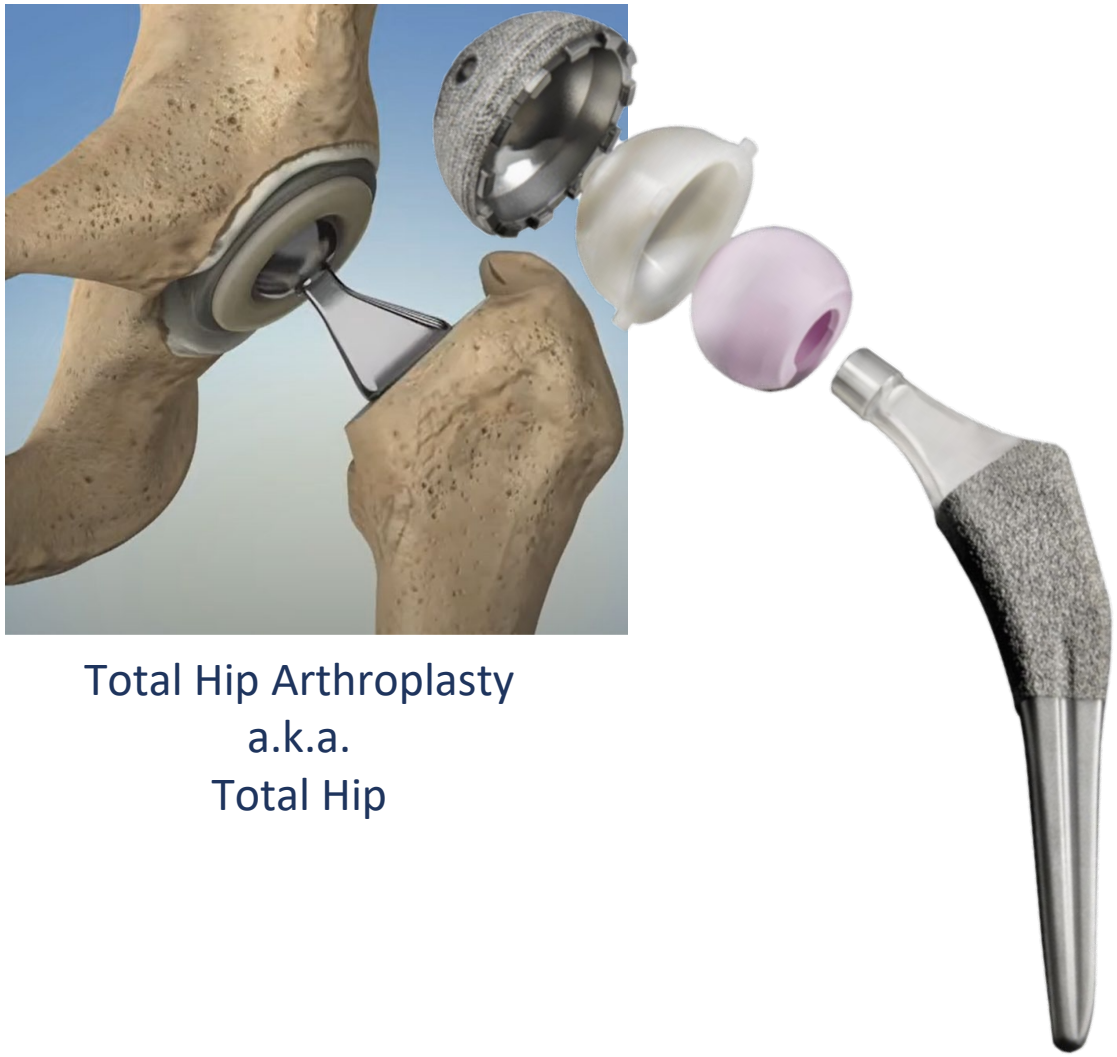
Why do they call it a “Total” Hip?



Hip Hemi-Arthroplasty
a.k.a.
Bi-Polar Hip



Total Hip Arthroplasty
a.k.a.
Total Hip

Source: Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Indications for Total Hip Arthroplasty… more pain.

Healthy Hip

Osteoarthritis

Rheumatoid Arthritis

Avascular Necrosis

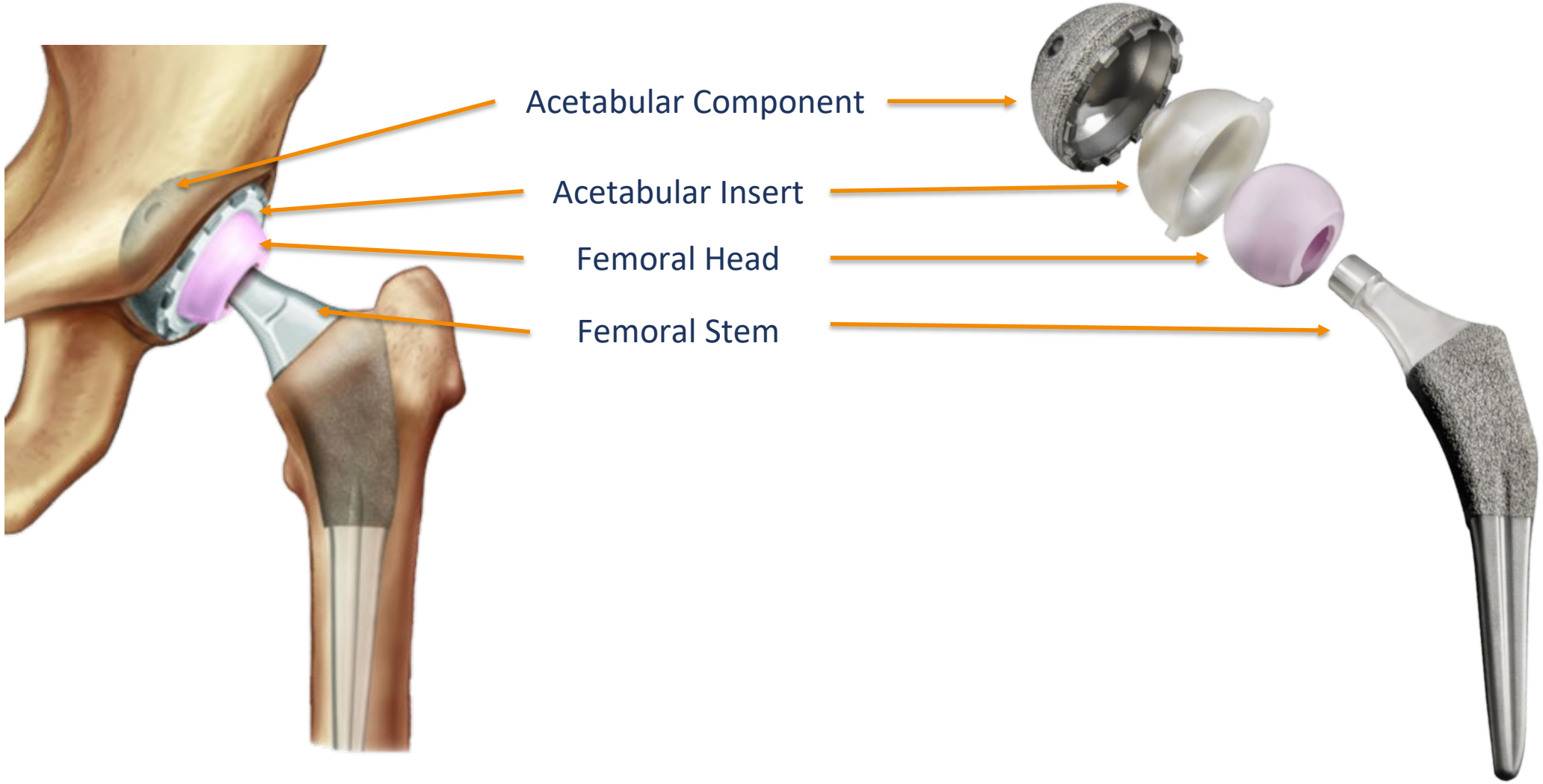
Acute Femoral Neck Fracture

Hip Dysplasia

Failed Surgery of Hip Fracture

Sources: See References Slide

Total Hip Arthroplasty Components



Source: Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Four Primary Hip Components & Their Aliases

Femoral Stem	Femoral Head	Acetabular Cup	Acetabular Insert
Femur	Head	Shell	Poly Insert
Blade	Biolox	Cluster Hole	Ceramic Insert
Wedge	Ball	Multi Hole	Dual Mobility
		Socket	Constrained Insert

Source: Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Femoral Stem

Notable Trends:

- Cemented Femoral Stem Fixation = 4.2% of All Elective Primary Total Hips from 2012–2020 (slight increase YoY)
- Significant Increase in Cemented Fixation with Advancing Age (34.2% in Patients Older than 90)

- Common Materials
  - Titanium
  - Cobalt Chrome

- Types of Components with Upcharges
  - Cemented
  - Porous
  - Porous HA Coated
  - Modular
  - Revision
  - Anti-Microbial Coming!

Sources: Annual Report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report. Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Femoral Head…Size Shouldn't Matter

Notable Trends:

- Ceramic Head Usage Excluding Dual Mobility Increased from 38.1% in 2012 to 71.1% in 2020
- Increased Utilization of Metal Heads in Elderly Patients

- Common Materials
  - Cobalt Chrome
  - Ceramic
  - Oxinium
- Types of Components
  - 28mm
  - 32mm
  - 36mm
  - >36mm

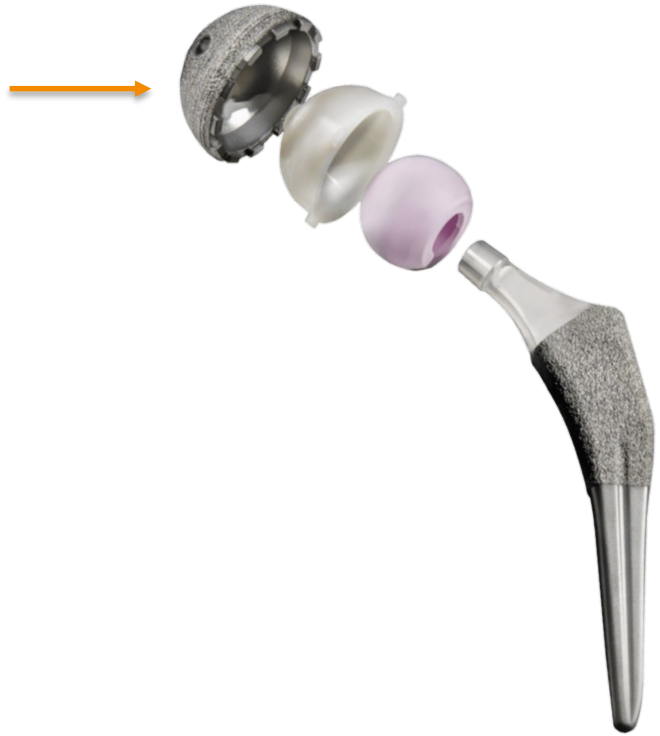
Sources: Annual Report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report. Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Acetabular Cup

"When the going gets rough,
the rough can get more expensive!"
Gription/OsseotTi/R3/TM/TriTanium

- Common Materials
  - Titanium
  - Cobalt-Chrome
  - Trabecular Metal

- Types of Components
  - Revision "Rough Variant"
  - Multi-Hole/Cluster/No-hole
  - HA Coated
  - DM Monolithic
  - Metal-on-Metal (Birmingham, Magnum)
  - Cemented all-poly



Sources: Annual Report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report. Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Acetabular Liner

Notable Trends:
- Dual Mobility National Usage 11.5% (doubled since 2013). Perception of Increased Stability and Reduced Risk of Dislocation
- XPLE utilization at 91.45% vs. Vitamin-E at 7.74% in 2020

- Common Materials
  - XLPE
  - Vitamin-E
  - Ceramic
  - Polyethylene
  - Cobalt-Chrome (DM)

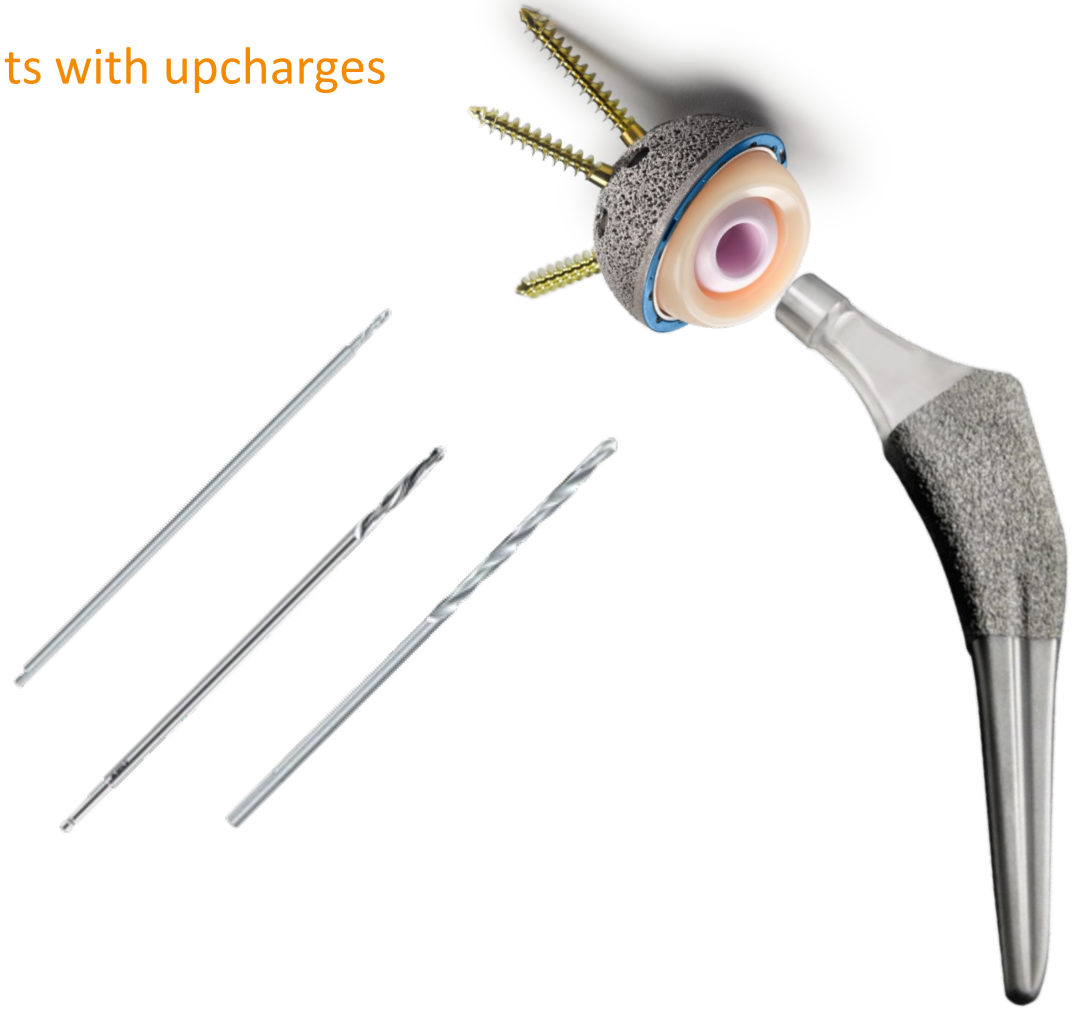
- Types of Components with Upcharges
  - Flat/Lipped Liner
  - Constrained
  - Modular Dual Mobility
  - Monolithic Dual Mobility

Sources: Annual Report (American Joint Replacement Registry Online): https://connect.registryapps.net/2021-ajrr-annual-report. Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

Misc. Components

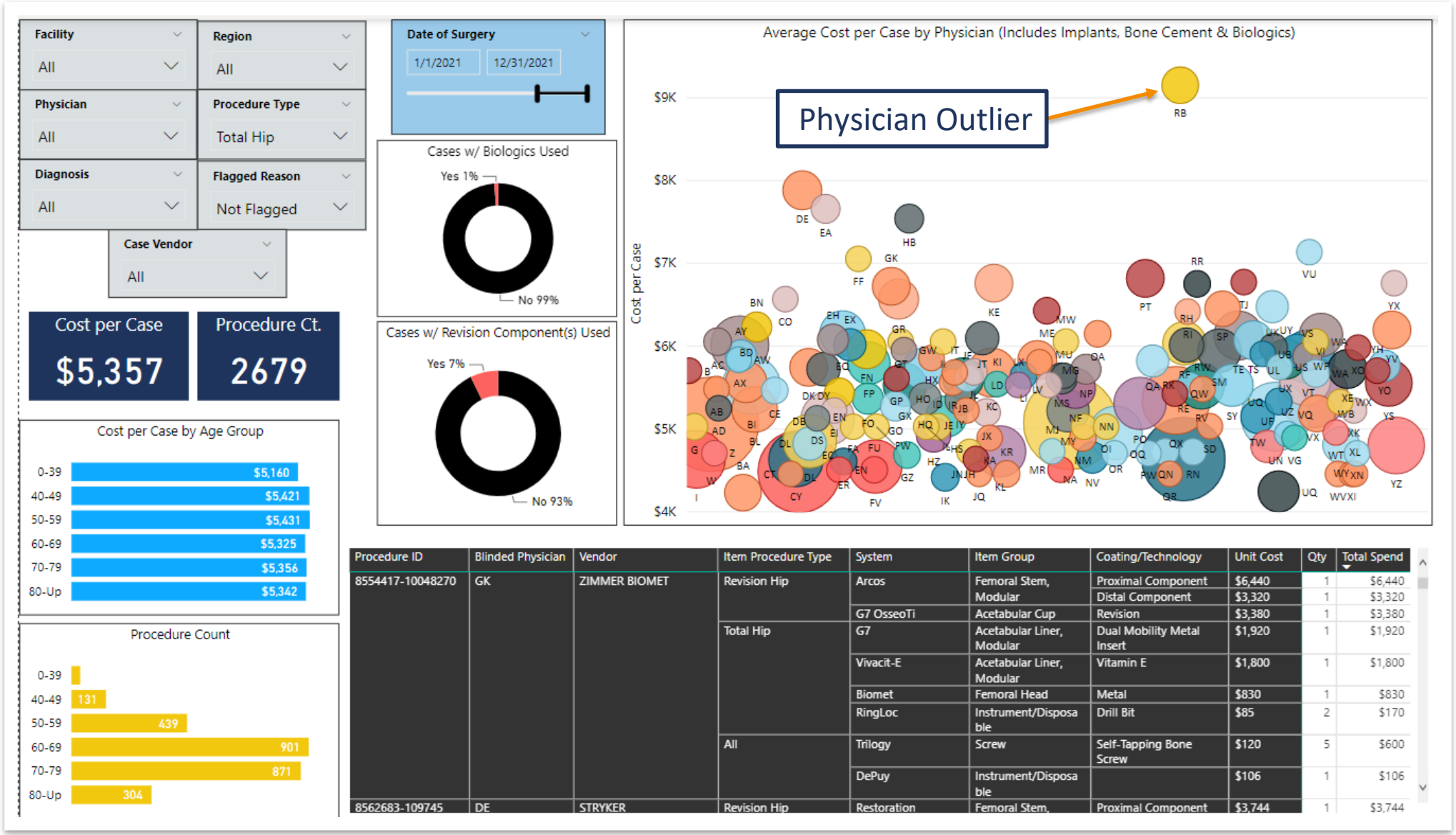
List types of components with upcharges

- Screws
- Drill bits



Source: Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/

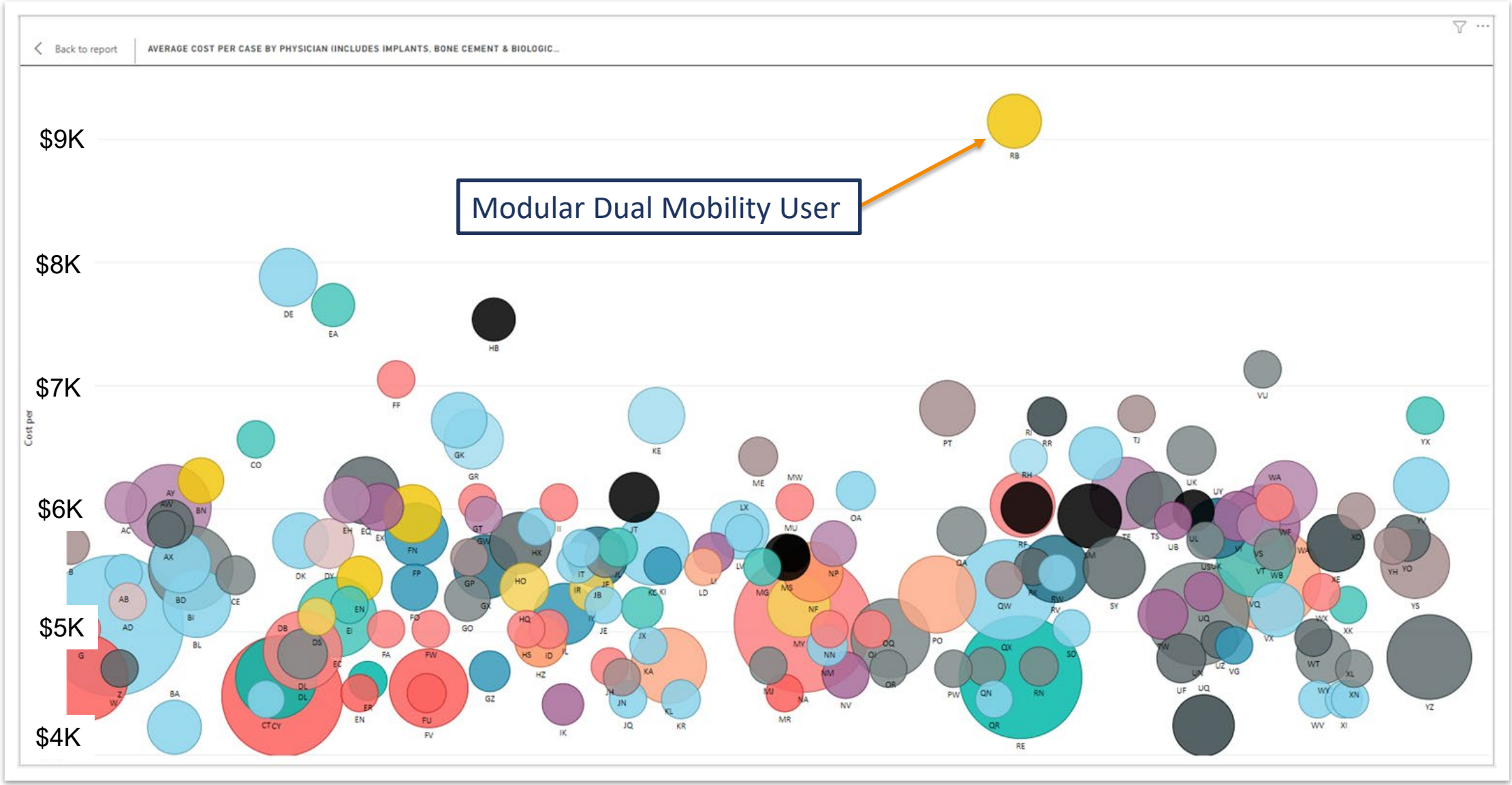
Physician Average Cost Per Case – Blinded



Procedure ID	Blinded Physician	Vendor	Item Procedure Type	System	Item Group	Coating/Technology	Unit Cost	Qty	Total Spend
8554417-10048270	GK	ZIMMER BIOMET	Revision Hip	Arcos	Femoral Stem, Modular	Proximal Component	$6,440	1	$6,440
						Distal Component	$3,320	1	$3,320
				G7 OsseoTi	Acetabular Cup	Revision	$3,380	1	$3,380
			Total Hip	G7	Acetabular Liner, Modular	Dual Mobility Metal Insert	$1,920	1	$1,920
				Vivacit-E	Acetabular Liner, Modular	Vitamin E	$1,800	1	$1,800
				Biomet	Femoral Head	Metal	$830	1	$830
				RingLoc	Instrument/Disposable	Drill Bit	$85	2	$170
			All	Trilogy	Screw	Self-Tapping Bone Screw	$120	5	$600
				DePuy	Instrument/Disposable		$106	1	$106
8562683-109745	DE	STRYKER	Revision Hip	Restoration	Femoral Stem,	Proximal Component	$3,744	1	$3,744

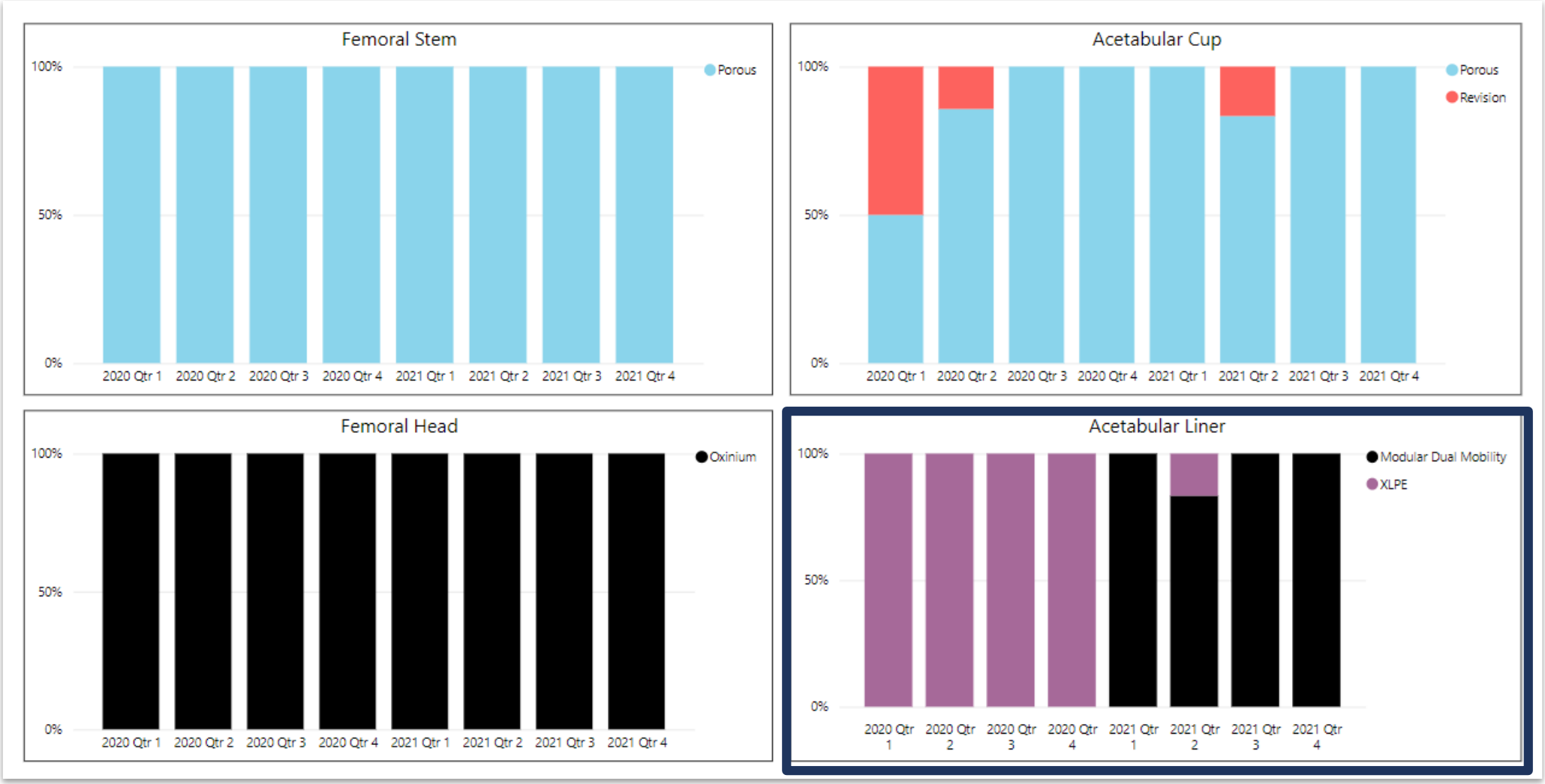
Source: HealthTrust, Inc. MDM Dashboard.

Physician Average Cost Per Case – Blinded



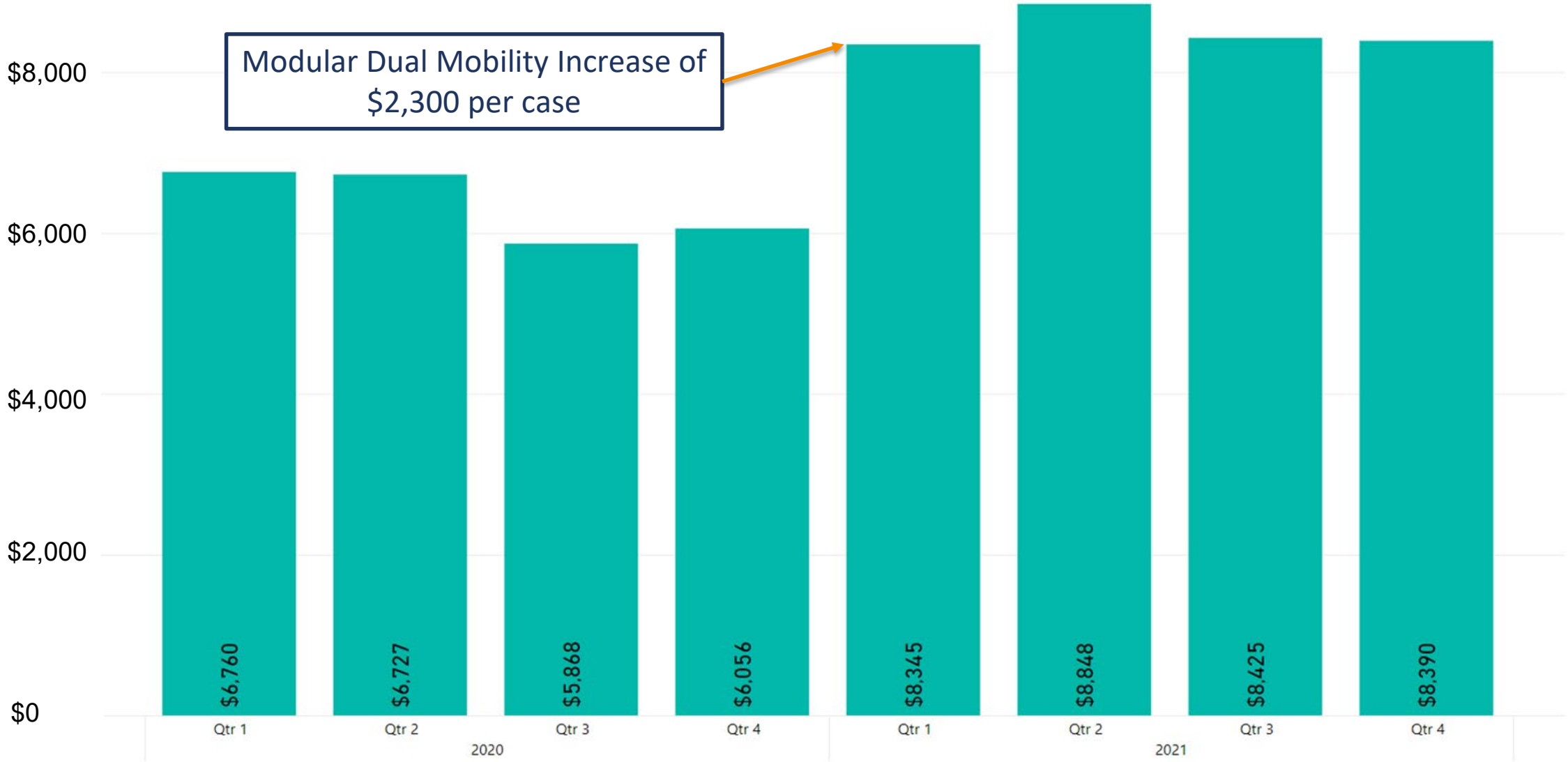
Source: HealthTrust, Inc. MDM Dashboard.

Technology Utilization Over Time (Physician RB from Previous Slide)



Source: HealthTrust, Inc. MDM Dashboard.

Cost Per Case Over Time



Source: HealthTrust, Inc. MDM Dashboard.

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“Premium Technology” and the “Why”

- Dual Mobility

  -More resistance to dislocation given pelvic-spinal, social issues
- Poly additives (E-poly, AOX, Highly-Crosslinked)

  -Anti-oxidation, adds longevity
- Stem Component Coating (Hydroxyapitite)

  -Enhances Ingrowth
- Rough Ingrowth technology (R3, Gription, TM, Tritanium)

  -Cup “sticks” better, resistant to shifting
- Ceramic Head (Biolox)

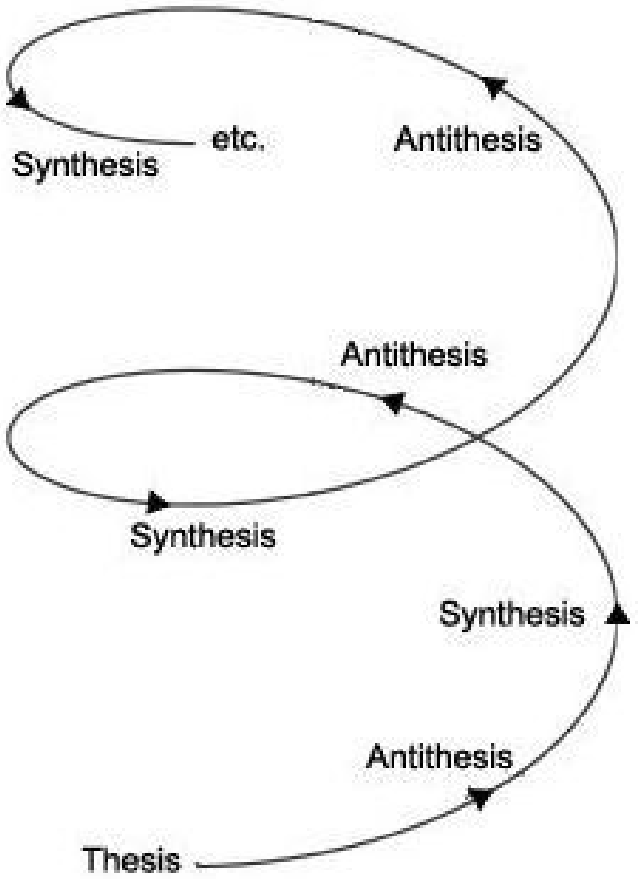
  -Eliminates taper corrosion, less wear for younger patients, preference
- Modular stems

  -More options to recreate native leg length, enhance stability

Source: Adobe, Inc.: https://stock.adobe.com/

Conclusion – Keep Your Eye Out

- Know Your Components
- No Upcharges for “Thesis”
- Know the Lingo
- Cap or Line item?
- Define “Revision” clearly
- Orthopedic Fixation Pins
- Upcharges on “Stubby” Tibial Stem
- Identify High Cost per Case Providers and Find Out Why
- “What’s something worth?”
- Define “Premium”
- Rep relationships are helpful, build out your team!
- No Charges for Thesis



Source: de Meij, P. (2016). Hegelian Dialectics as a Source of Inspiration for the Intelligence Community. *American Intelligence Journal*, *33*(1), 65–69: https://www.jstor.org/stable/26202167

“If Everyone Is Super, Then Nobody Is…”

Source: Exatech, Inc.: https://www.exac.com/patients/total-hip-replacement/hip-replacement-surgery/.
Mendenahll Associates, Inc: https://www.curvolabs.com/

References, Slide 10

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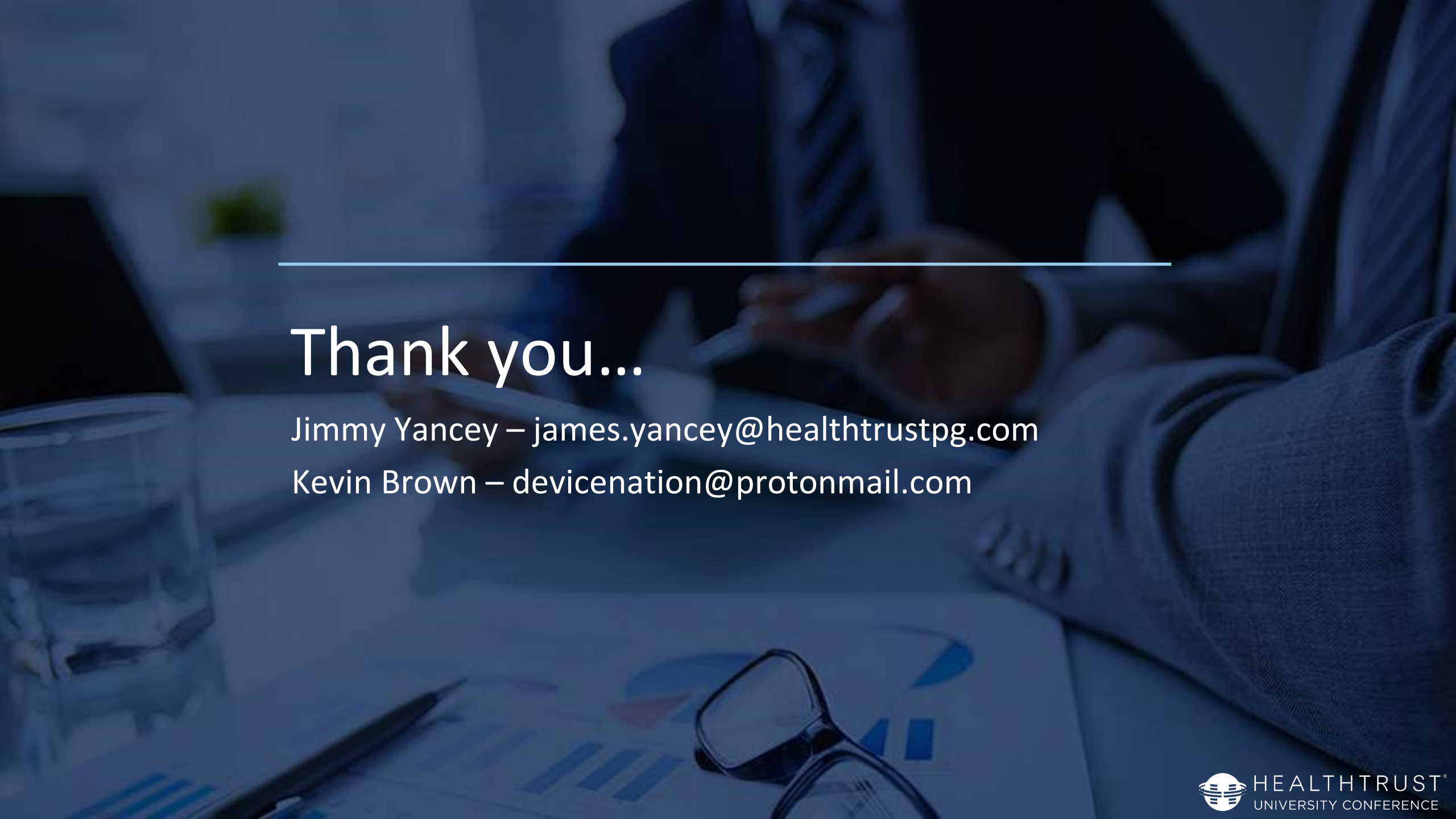

Thank you…

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