



Outpatient Total Joint Arthroplasty: Key Protocols for Success

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Department of Orthopaedic Surgery

UF | College of Medicine
Department of Orthopaedic Surgery
and Sports Medicine
UNIVERSITY of FLORIDA



...or: Why Most Patients Can Have Outpatient Arthroplasty in 2022

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Disclosures

- Consultant for Smith&Nephew, Adler Orthopaedics
- No financial disclosures relevant to this talk



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Background - Length of stay after THR



2007 ERP →

- Primary surgery
- 1962 - 1969 30.8 days
- 1970 - 1979 18.0 days
- 1980 - 1989 15.6 days
- 1990 - 1999 13.2 days
- 2000 - 2009 9.6 days
- 2010 - 2016 5.8 days
- 2017 - 2018 3.6 days

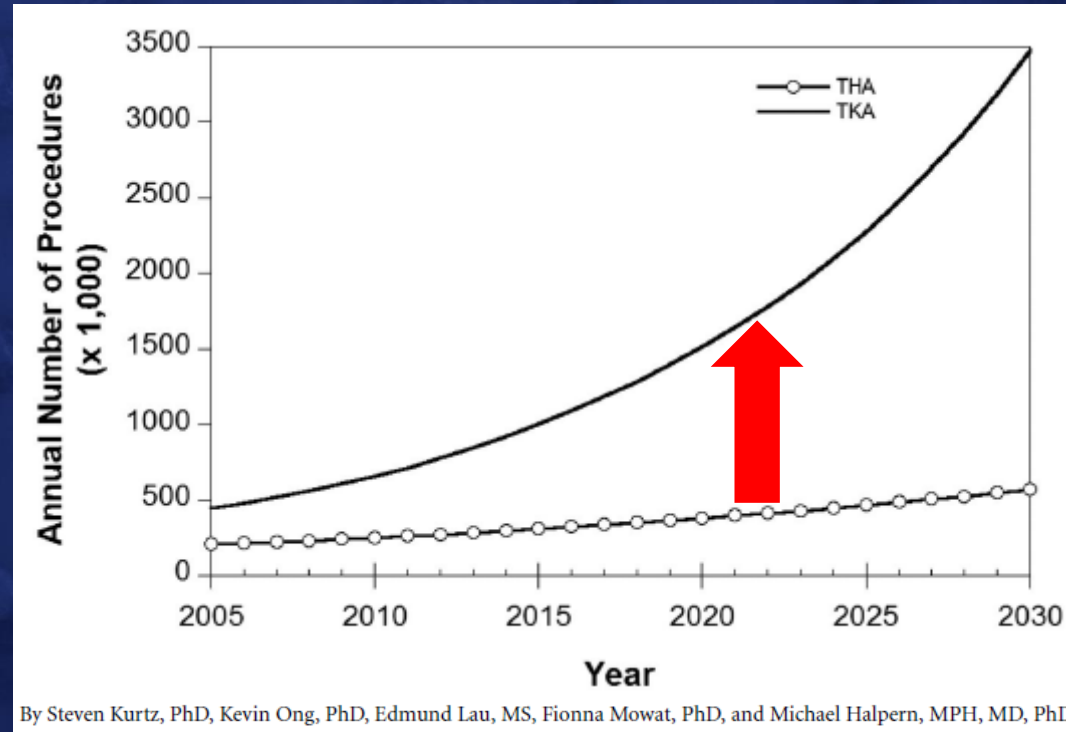
Before



Present



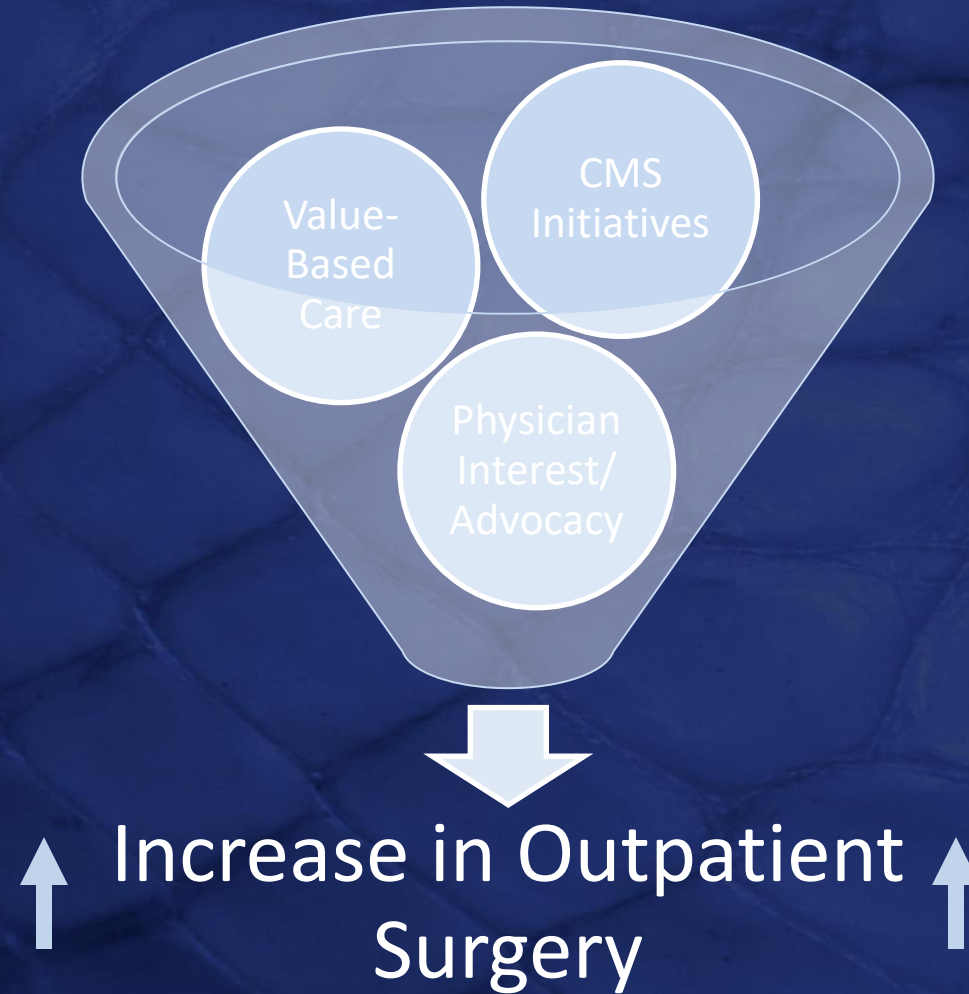
The problem...



By Steven Kurtz, PhD, Kevin Ong, PhD, Edmund Lau, MS, Fionna Mowat, PhD, and Michael Halpern, MPH, MD, PhD

J Bone Joint Surg Am. 2007;89:780-5 • doi:10.2106/JBJS.F.00222

The Evolution of Outpatient Arthroplasty



The Value Equation in Health Care



Highly relevant to all parties- patient, payers, institutions, physicians

Inpatient



**Hip & Knee Arthroplasty (FY 2017)
Commercial / Managed Care (DRG 470)**

Outpatient



Outpatient TJA allows more volume without more beds

What Has “Evolved”?

FACTOR

- Minimally invasive techniques
- TXA
- Multimodal pain protocols & regional anesthesia
- ERAS protocols
- Antithrombotic prophylaxis (ASA predominance)
- Telemedicine & communication

BENEFIT

- ✓ Tissue damage – Sx. time
- ✓ EBL and transfusion
- ✓ Pain control and secondary effects
- ✓ LOS, home discharge
- ✓ DVT, postop bleeding and no monitoring
- ✓ Follow-up

Transition to outpatient total hip and knee arthroplasty: experience at an academic tertiary care center

Hrishikesh C. Gogineni, MD ^{a, *}, Chancellor F. Gray, MD ^a, Hernan A. Prieto, MD ^a, Justin T. Deen, MD ^a, Andre P. Boezaart, MD, PhD ^{a, b}, Hari K. Parvataneni, MD ^a

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Arthroplasty Today 5 (2019) 100–105



Essential Elements of a Successful Program

- ✓ Patient Selection
- ✓ Standardized Protocols:
 - ✓ Universal Nasal Decolonization
 - ✓ Multimodal Pain Protocol (preemptive, Regional, PAI)
 - ✓ Nausea/ Vomiting Prevention
 - ✓ POUR
 - ✓ Perioperative Blood Management
 - ✓ ERAS
- ✓ Education (JREP)/ Expectation Management
- ✓ Communication, communication, communication
- ✓ Teamwork (Surgeons, Anesthesia, PAs, Nurses, PT, CM)
- ✓ Optimized Surgical Techniques

Patient Selection

- Multifactorial and critical
- **Patient activation**
 - Apprehensive is predictor of failure
- Family support
- Optimal physical and mental conditions
- ~~No chronic pain management/ major psychiatric disorders~~
- Medical risk stratification
 - Berger Criteria*
 - ASA I / II
 - OARA score?

Table 1
Inclusion criteria for outpatient protocol.

Surgical factors	Medical factors	Social factors
Primary THA or TKA	Age < 75 y	RAPT > 10
First/second case of the day	BMI < 35	Proximity to hospital
	No anemia, COPD, CHF	Private insurance
	No cirrhosis	
	No VTE history	
	No spinal stenosis	
	No BPH	
	No chronic narcotics	
	Surgeon discretion	

Gogineni H, Arthroplasty Today 2019

*Berger R, CORR 2009, JOA 2017

Outpatient Arthroplasty Risk Assessment (OARA) Score

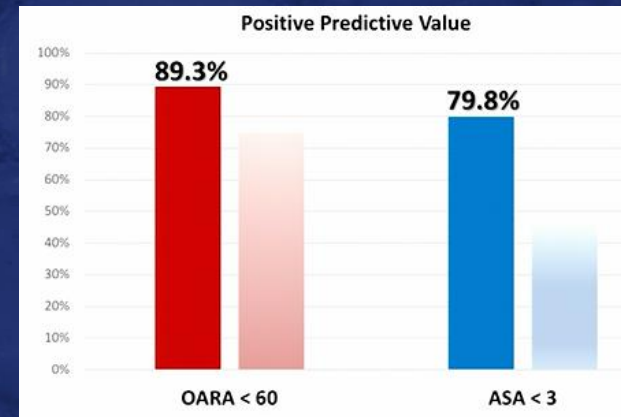
Safe Selection of Outpatient Joint Arthroplasty Patients With Medical Risk Stratification: the “Outpatient Arthroplasty Risk Assessment Score”

R. Michael Meneghini, MD ^{a,b,*}, Mary Ziemba-Davis ^b, Marshall K. Ishmael, BS ^b, Alexander L. Kuzma, MD ^c, Peter Caccavallo, MD, MS ^d
The Journal of Arthroplasty 32 (2017) 2325–2331

1. General Health (175 points)
2. Hematological (235 points)
3. Cardiac (310 points)
4. Endocrine (130 points)
5. GI (185 points)
6. NeuroPsych (155 points)
7. Renal (190 points)
8. Pulmonary (240 points)
9. Infectious Disease (60 points)

Working Risk Categories

- Low Risk / Appropriate: 0-59
- High Risk / Not Appropriate: ≥ 60



Patient Selection

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Gogineni H, Arthroplasty Today 2019

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Patient Selection

- Mu
- Pat
-
- Fan
- Opt
- No
- Me
-
-

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Inclusion criteria for outpatient protocol.

Surgical factors	Medical factors	Social factors
Primary THA or TKA First/second case of the day	Age < 75 y BMI < 35 No anemia, COPD, CHF No cirrhosis No VTE history No spinal stenosis No BPH No chronic narcotics Surgeon discretion	RAPT > 10 Proximity to hospital Private insurance

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- Mu
- Pat
-
- Fan
- Opt
- No
- Me
-
-

Table 1

Inclusion criteria for outpatient protocol.

Surgical factors	Medical factors	Social factors
Primary THA or TKA	Age < 75 y	RAPT > 8
First/second case of the day	BMI < 35	Proximity to hospital
	No anemia, COPD, CHF	Private insurance
	No cirrhosis	
	No VTE history	
	No spinal stenosis	
	No BPH	
	No chronic narcotics	
	Surgeon discretion	
	Patient desire/ motivation	

Arthroplasty Care Redesign Impacts the Predictive Accuracy of the Risk Assessment and Prediction Tool

Florian F. Dibra, MD *, Arnold J. Silverberg, MD, Terri Vasilopoulos, PhD,
Chancellor F. Gray, MD, Hari K. Parvataneni, MD, Hernan A. Prieto, MD

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The Journal of Arthroplasty 34 (2019) 2549–2554

Risk Assessment and Prediction Tool.		
Item	Value	Score
Age-group (y)	50-65	2
	66-75	1
	>75	0
Gender	Male	2
	Female	1
Ambulation (block = 200 m)	Two blocks or more	2
	1-2 Blocks	1
	Housebound	0
Walking aids	None	2
	Single-point stick	1
	Crutches/frame	0
Use of community support (home help, home nurse, meals on wheels)	None or 1 per week	1
	Two or more per week	0
Postoperative caregiver	Yes	3
	No	0

Patient preferred postoperative destination.

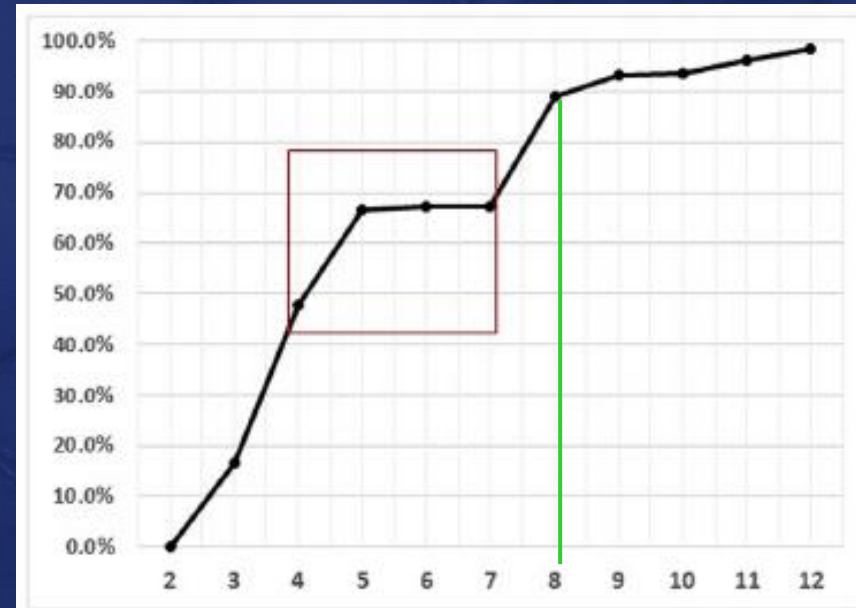


Fig. 2. Percentage of patients with home discharge for a given RAPT score.

- Score > 8: Home
- Score 4-8: Intermediate
- Score < 4: Rehab

Preop Visit

- Educational video – Joint Replacement Education Program (JREP)
- Preop Evaluation: Surgeon, Anesthesia, **ATC**, **Nurse navigator**
 - Status confirmation
 - Medication prescription (pain, Mupirocin, DVT etc)
 - DME (walker, TEDs, Iceman)
 - PROs, RAPT
 - Chlorhexidine soap
 - Labs (CBC, A1C, BMP, NO T&S)
 - Anesthetic evaluation
- Final instructions

OR

UFHealth
UNIVERSITY OF FLORIDA HEALTH

**Perioperative Pathway:
Outpatient Total Knee & Hip Arthroplasty**

Block Room & OR



- Intraoperative:
 - APS Anesthesiologist for procedure
 - Total intravenous anesthesia (TIVA) standard vs. chlorprocaine spinal (4-5mL of 1% chlorprocaine)
 - Ancef based on weight
 - Tranexamic acid IV 1gm at incision, 1gm at closure
 - Intraoperative IV agents (Decadron, Toradol, Tylenol, Zofen)
 - **Posterior Capsule Injection (THA)**
 - No Foley
 - TEDs (thigh high) / SCDs
 - Transferred to PACU on stretcher

TKA

- Adductor Canal Block (Single Shot vs Catheter)
- iPACK pre-op
- Intra-op
 - Surgeon periosteal injection
 - 0.25% bupivacaine (plain)
 - Multimodal analgesia

THA

- No pre-op block
- Intra-op
 - Surgeon injects three nerve distributions
 - Surgeon injects abductor/ TFL/ subq
 - Multimodal analgesia

PACU



Perioperative Pathway: Outpatient Total Knee & Hip Arthroplasty



PACU - Hour 0 to Hour 2

PACU:

- X-ray Images
- No PCA, Minimize narcotics
- < 2 hr stay unless medically indicated
- Family allowed to sit with patient right away
- Bladder scan per POUR protocol

PT/OT evaluation 45-90 mins after surgery:

- OOB to chair
- Ambulate in room (knee Immob)
- AROM, Bed exercises (Immob off)
- Transfer to Orthopaedic chair

Case management confirms discharge plan, home care and DME



Transition Area



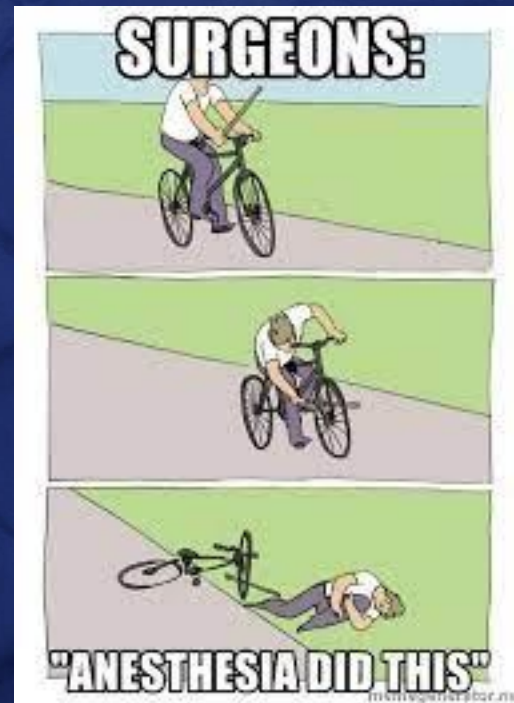
Perioperative Pathway: Outpatient Total Knee & Hip Arthroplasty



Transition Area - Hour 2 to Discharge (Discharge Goal Hour 4)

- PACU:
 - Transfer to transition area
 - Family sits with patient
 - Orthopaedic Chair
 - RN Education / Instructions
 - Meals in chair
 - Bladder scan per POUR protocol
 - 2nd dose Abx ~ 4 hrs after 1st (Rocephin preferred agent)
- Ortho:
 - Review DC Instructions, Precautions, Medications, Wound care, Follow-up etc
- APS:
 - Review nerve catheter, home pump and infusion instructions
- PT/OT:
 - Hospital to Street Clothes
 - Ambulate to Bathroom
 - Ambulate in Hallway
 - Review precautions, braces, walking aids, transfers, exercises
 - Transfer to car once DC criteria met

First: Know Thyself



Are You Adequately Resourced?

Key Needs (necessary and sufficient)

- Capable/ engaged surgeon(s)
 - Predictable and consistent surgical times (<~90 minutes)
 - EBLs within range (200-500mL)
- Capable/ engaged anesthesiologists
- PT/OT ready to invest
 - Able to see in PACU 2x over 1-3 hours
- Home Nursing
- Facility that is aligned

Facility Alignment

Arthroplasty Today 6 (2020) 231–235

Contents lists available at ScienceDirect

Arthroplasty Today

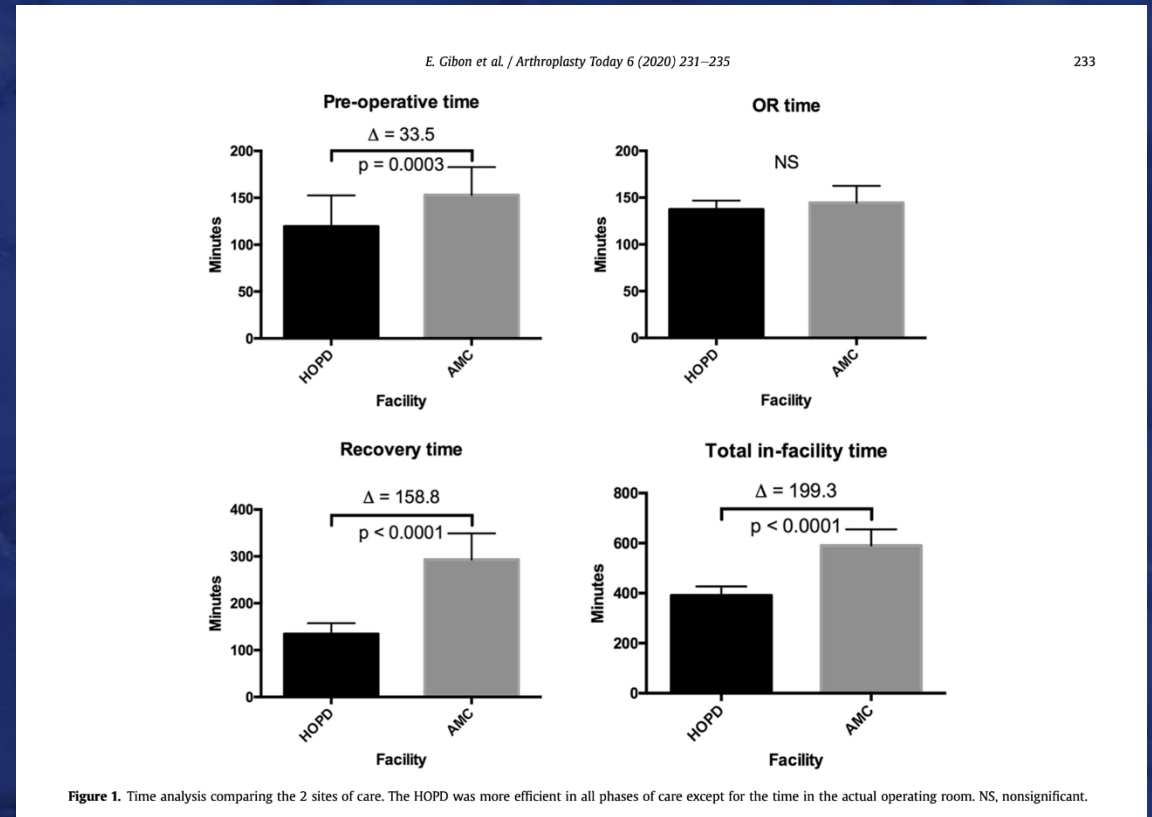
journal homepage: <http://www.arthroplastytoday.org/>

Original research

Outpatient total knee arthroplasty: is it economically feasible in the hospital setting?

Emmanuel Gibon, MD, PhD^{a,*}, Hari K. Parvataneni, MD^a, Hernan A. Prieto, MD^a, Lorrie L. Photos, MSM^b, William Z. Stone, MD^c, Chancellor F. Gray, MD^a

^a Department of Orthopaedic Surgery and Rehabilitation, University of Florida, Gainesville, FL, USA
^b Department of Quality Data Analysis, University of Florida, Gainesville, FL, USA
^c Orthopedic Specialists of Southwest Florida, Fort Myers, FL, USA



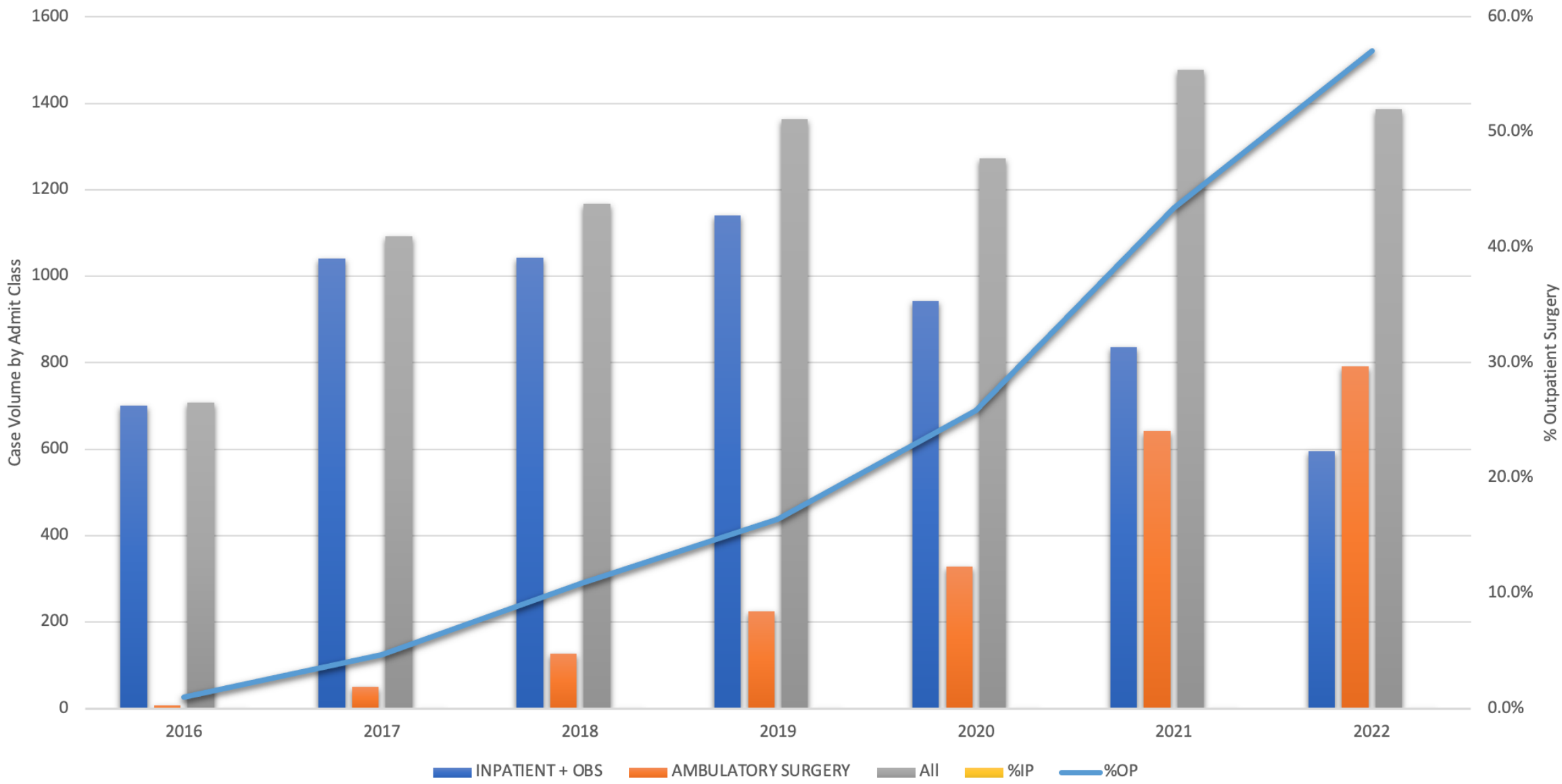
Post-operatively: Ortho

- Phone F/U (Nurse Navigator)
 - POD1, POD 5-7, POD 14 (THAs; TKAs seen in clinic on day 14)
- Pain, mobility, rehabilitation, wound status
- Facilitate management of medical issues
- Reduce unnecessary ER visits
- Follow-up 4 weeks, again 12 weeks

Post-operatively: Anesthesia

- Resident or Fellow calls POD 1 and POD 2 (TKAs only)
 - Assesses pain control and pump functionality (if home catheter)
 - Emphasizes mobility safety (leg brace if indicated)
 - Guides removal of home cath on day 2 or day 3

Primary TJA Admission Class by FY 2016-2022



Outcomes

- Success rate: 85% (currently > 95%)
- Failure causes:

Orthostatic hypotension

Urinary retention

Nausea

Dense Peripheral Nerve block (improved since transition to ACB and short acting spinal)

Pain

	Outpatients (n = 105)	Inpatients (n = 136)	P value
Age (years, mean)	57.3	53.9	.08
Body mass index (kg/m ² , mean)	30.03	30.55	.46
Length of stay (days, mean)	0.24	1.53	<.01
Readmission rate	0.95%	3.70%	.18
Complication rate	1.90%	2.90%	.61



ELSEVIER

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



Review

The Shift to Same-Day Outpatient Joint Arthroplasty: A Systematic Review



Jeffrey D. Hoffmann, MD ^a, Nicholas A. Kusnezov, MD ^a, John C. Dunn, MD ^a,
Nicholas J. Zarkadis, DO ^{a,*}, Gens P. Goodman, DO ^a, Richard A. Berger, MD ^b

^a Department of Orthopaedic Surgery and Rehabilitation, William Beaumont Army Medical Center, El Paso, Texas

^b Department of Orthopaedic Surgery, Rush University Medical Center, Chicago, Illinois

- Review of >1000 patients
- 95% successful same-day discharge
- 2% complication or readmission rate (most were MUAs)
 - 1 major complication
- 80-95% would have outpatient surgery again

Table 7

Summary of Combined Results.

Total Patients	Total Discharged	ER Visits Without Admission	Readmission Within 90 d	Reoperation or Revision Surgery	Minor Complications	Major Complications or Death
1009	955 (94.5%)	11 (1.15%)	9 (0.89%)	20 (1.98%)	13 (1.29%)	1 (0.10%)

ER, emergency room.

Quadruple Aims: The Essence of VBC

- Quadruple Aims:
- Health (patient or population)
- Care experience (patient-centered)
- Cost (to multiple stakeholders)
- Meaningful work



Catalyst

| Innovations in Care Delivery

CASE STUDY

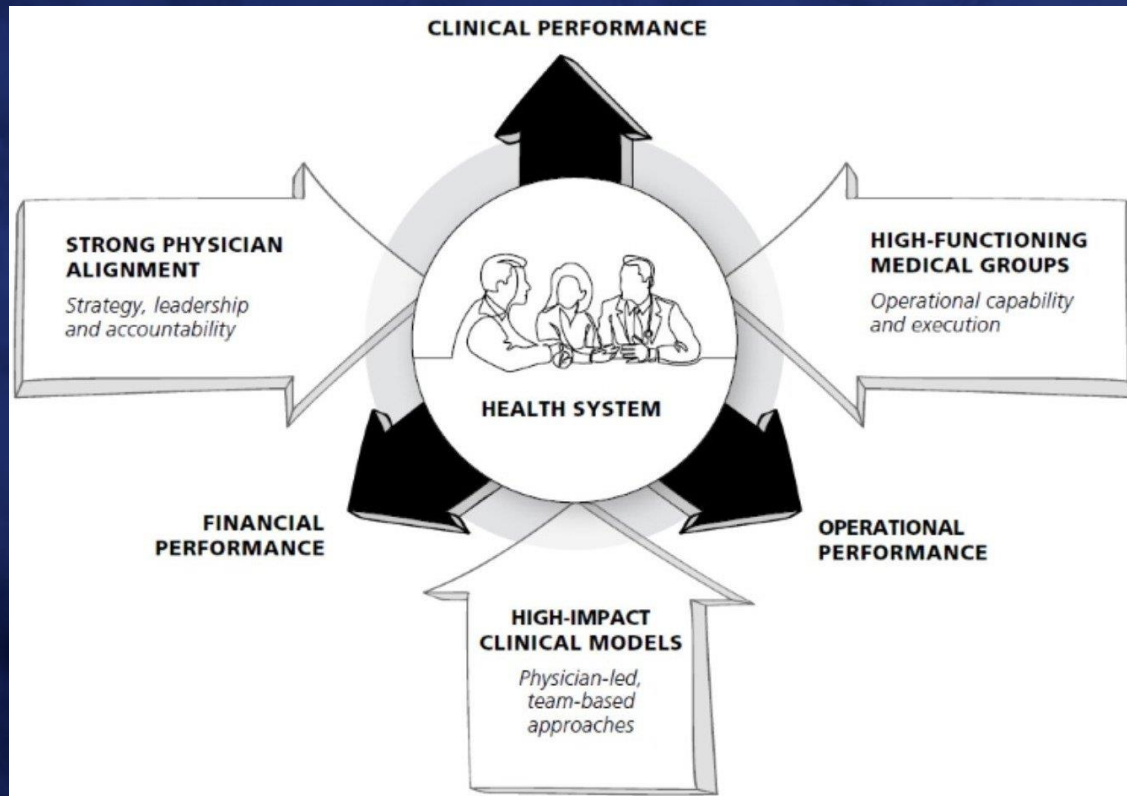
Same-Day Joint Replacement Care: Achieving the Quadruple Aim

Kate E. Koplan, MD, MPH, Elizabeth W. Paxton, PhD, MA, Jim Bellows, PhD, Violeta Rabrenovich, MHA, Jeff Convissar, MD, Margaret C. Wang, PhD, MPH, Christopher D. Grimsrud, MD, PhD, Ronald A. Navarro, MD

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DOI: 10.1056/CAT.20.0345

Value-Based Care: Aligning Goals



- Patients and physicians want the same things
 - Good outcomes
 - Cost effective care
 - Efficient/ reproducible care
- Outpatient arthroplasty meets these needs well

Additional Considerations

- Multi
- Sele
 - M
 - Pa
 - Su
- Simp
- Cons
- Alwa



Outpatient Total Joint Arthroplasty 2022: Key Protocols for Success (But... Most Everyone Can Have Outpatient Surgery)

Chancellor F. Gray



Thank
You