Physician Executive Council

Using the Perioperative Surgical Home to Improve Joint Replacement

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Physician Executive Council

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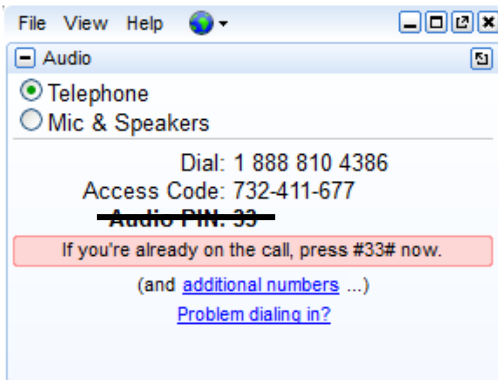

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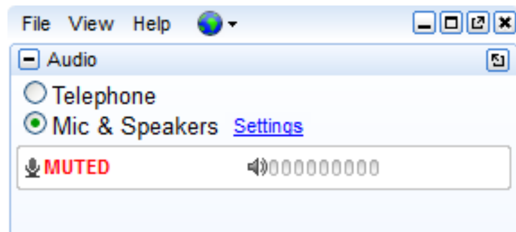

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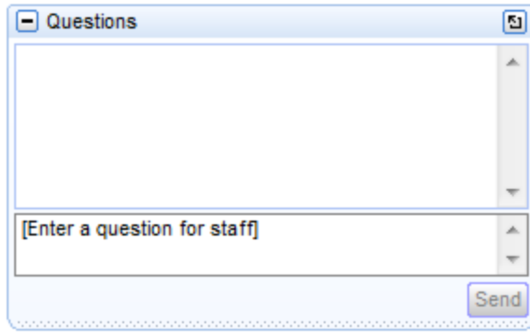

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Using the Perioperative Surgical Home to Improve Joint Replacement

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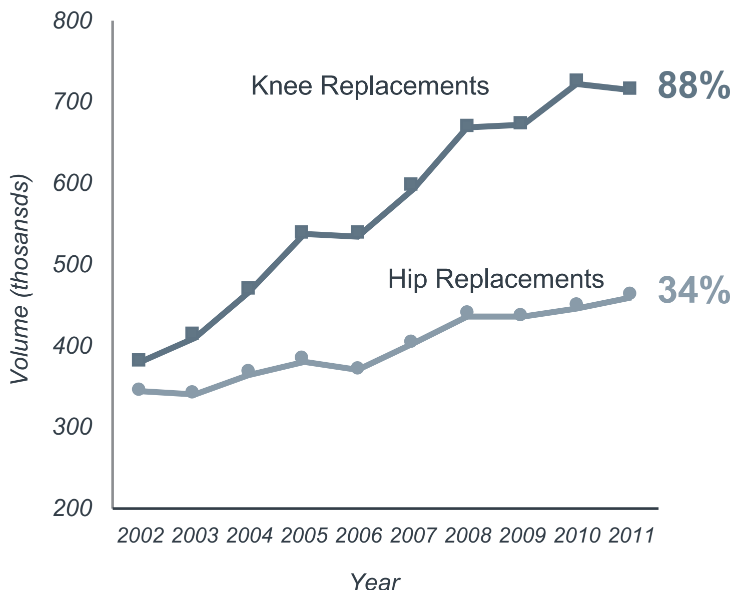
Increasing Threat to Joint Replacement Profitability

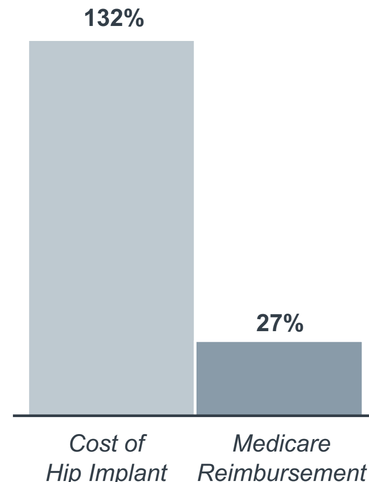
Need to Contain Costs for High-Volume Procedures

Orthopedic Procedures Growing Rapidly



Procedure Costs Outpace Medicare Reimbursement Rates

Growth Rates, 1991-2008



Source: HCUP Nationwide Inpatient Sample (NIS); Wilson NA, et al., “Hip and Knee Implants: Current Trends and Policy Considerations,” *Health Affairs (Millwood)*, 27 (2008): 1587–1598; Physician Executive Council interviews and analysis.

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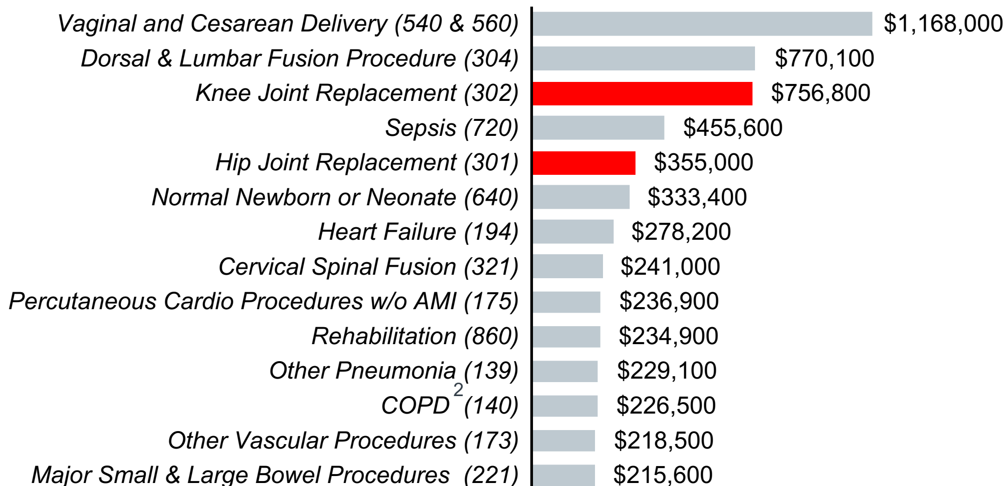
Prioritizing Care Variation in Joint Replacement

Potential Hospital-wide Charge Savings by Reducing Variation in Common DRGs[1]



1) DRG = Diagnosis Related Group. Our analyses use 3M APR-DRG grouper methodology. Cases are severity adjusted, and only compared to similar cases in the same facility.
2) Chronic obstructive pulmonary disease.

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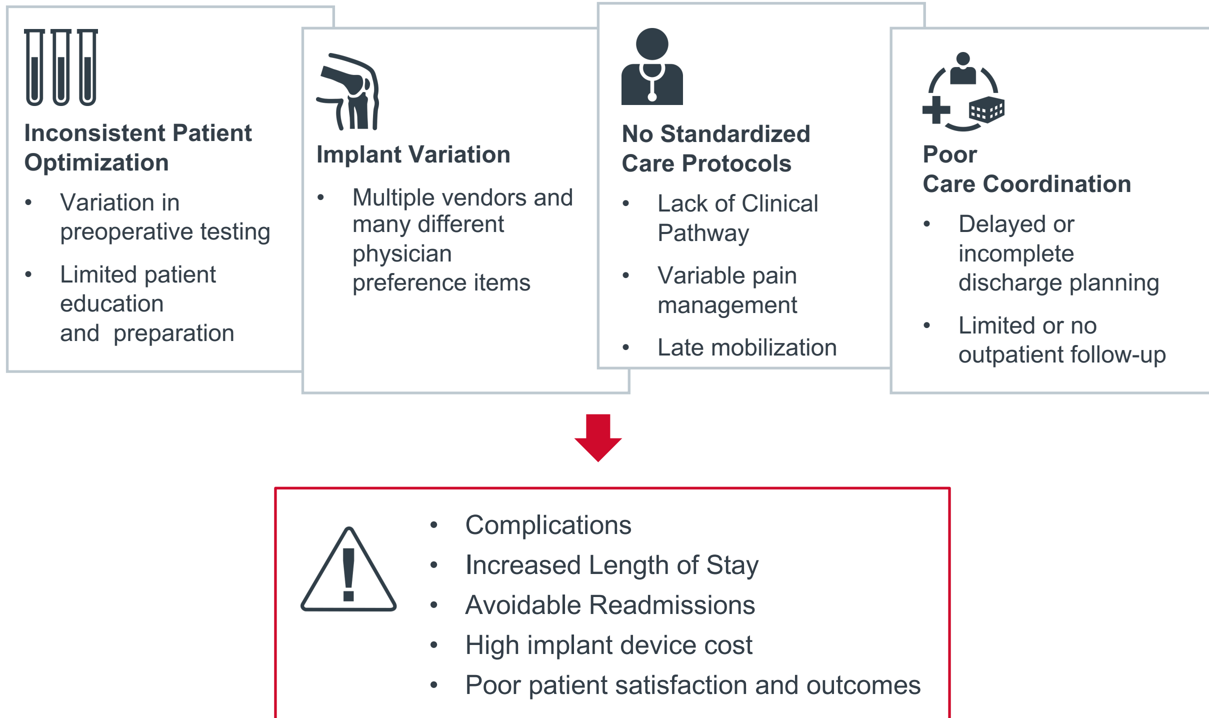
Source: Crimson Continuum of Care data and analysis; Physician Executive Council interviews and analysis.

Common Sources of Joint Replacement Variation



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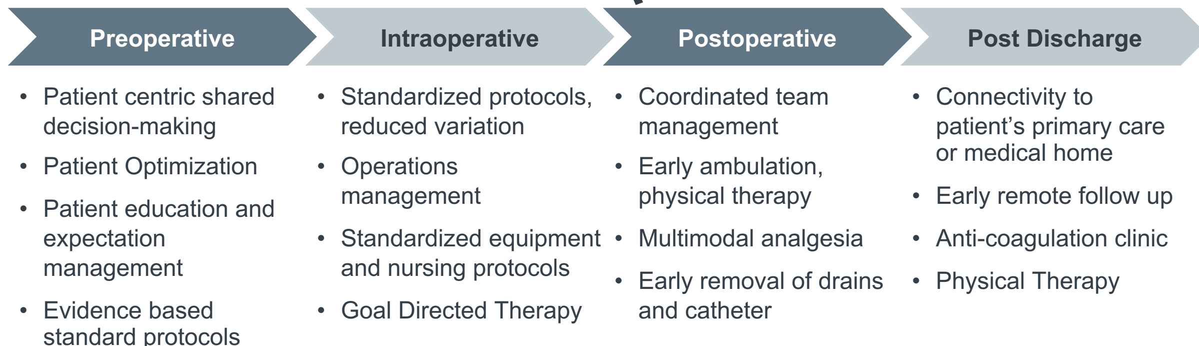
Source: Physician Executive Council interviews and analysis.

Introducing the Perioperative Surgical Home (PSH)

Perioperative Surgical Home Leadership

Quality Improvement Database



Supported By Decision Support | Case Management | IT[1] | Pharmacy | Blood Bank | Dietary | Human Resources | Patient Education | Physical Therapy

Large ROI

1) Information Technology
2) Physical Therapy

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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Physician Leadership Critical to PSH Implementation

An Overview of Joint Surgical Home Implementation at UC Irvine Health

Physician-led Pilot

October 2012–October 2013

- Recruited new orthopedic surgeon interested in surgical home model
- Physicians piloted joint surgical home for a year to demonstrate results, gained broader buy-in

Full Implementation

October 2013–October 2014

- Formed multidisciplinary teams care teams to develop standardized care pathways
- IT team implemented clinical protocols in EHR and created data mart

Expansion

October 2014–Present

- Implementing surgical home model beyond orthopedics
- Neurosurgery expansion March 2015
- Urology expansion

Case in Brief: University of California at Irvine Health

- 411-bed academic medical center located in Orange, California
- In 2012, Department of Anesthesiology and Perioperative Care partnered with Department of Orthopedics to implement a Joint Replacement Surgical Home
- Perioperative Surgical Home expanded to Urology in 2014, continued expansion to Neurosurgery in 2015

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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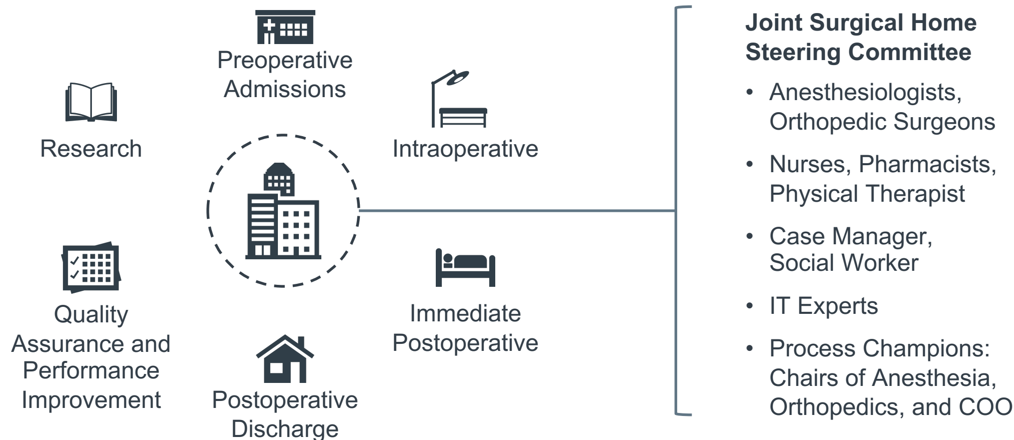
The Joint Surgical Home Implementation Team

Six Working Groups Established at May 2012 Offsite Meeting



All team leaders received LEAN Six Sigma training, as UC Irvine Health also launched a LEAN initiative at the same time.

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Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

Developing and Implementing a Standard Pathway

Build Consensus and Standardization May 2012 – October 2012

Working Groups

Working group reviews literature and adopts care protocols based on clear evidence

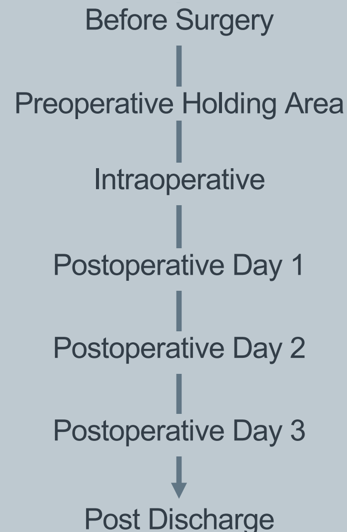
Working group determines care protocols where evidence is lacking based on team consensus

Team reviews value stream map (LEAN Six Sigma) to ensure pathway efficiency

Care Pathway Development

Steering Committee

- Oversees all working groups
- Met weekly during implementation phase (May-Oct 2012)
- Quarterly once operational



Source: Garson L, et al., "Implementation of Total Joint Replacement-Focused Perioperative Surgical Home: A Management Case Report," *Anesthesia & Analgesia,* 118, no. 5 (2014): 1081-1089; UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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Optimizing Patients Prior to Surgery

Preoperative Pathway of the Joint Replacement Home

Modifying the Existing Perioperative Clinic

Existing Perioperative Clinic: Clearance → **New Joint Surgical Home: Optimization**

Existing Perioperative Clinic: Clearance

- Written educational materials and classes optional for patients
- No protocols for preoperative testing, leading to waste or poorly prepared patients
- Discharge planning delayed until patient is admitted to the hospital
- No standardized order sets for preoperative care

New Joint Surgical Home: Optimization

- Mandatory classes educate patients on postop expectations and healing, smoking cessation and exercise
- Standardized laboratory, ECG, MRSA swab, anemia management protocols
- Patients prepared for discharge before admission
- Standardized orders for VTE[1] prophylaxis, multimodal pain regimens initiated

Variable Care

Highly Standardized Care

1) Venous thromboembolism

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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Standardizing Care in the Operating Room

Intraoperative Phase of the Joint Replacement Home

Key Elements

Anesthesia Care Standardization

- Standardized anesthesia protocols
- Standardized fluid management
- Anesthesia Total Joint-PSH intraoperative team (5 faculty) assigned to all PSH cases

Surgical Care Standardization

- Updated physician preference provide standardization within each orthopedic surgeon's practice
- Workflow standardization also used to eliminate other inefficiency
- Limited device standardization (single vendor for most implants and prosthesis)

Looking Beyond Device Standardization

"The joint home is about much more than standardizing implants. Our experience suggests that significant ROI comes from optimizing the patient, clinical pathways, and coordinating pre and post operative care."

Dr. Zeev Kain, UC Irvine Health

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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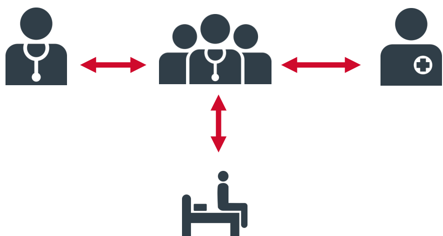
Coordinating Postoperative Care

Perioperative Surgical Home Team Ensures Adherence While Coordinating Care



- Care coordinated by Perioperative Surgical Home (PSH) provider team[1]
- PSH team closely monitors patients for adherence to protocol, oversees patient care
- Orthopedic surgeons contacted by cell phone for joint decision making when needed

Standardized Postoperative Care Pathway

- Protocols emphasize early mobility in the first 24 hours:
  - All patients receive two physical therapy sessions
  - All patients are weight bearing
- Multimodal pain management protocols emphasize oral medication and opioid avoidance
- Early intervention protocols when care deviates from planned recovery goals
- Discharge readiness

1) At UC Irvine Health, the postoperative coordination provider team consisted of a senior anesthesia resident and the anesthesiology faculty. However, other implementations of the model have successfully used intensivists, hospitalists, or advanced practitioners.

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Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

Postoperative Care Coordination Increases Mobility

Overview of the Post Discharge Pathway

Standardized Recovery Plan

- Prior to discharge, patients receive a personal recovery plan including physical therapy schedules, ambulation goals, and medication reconciliation
- Confirmation that all at-home equipment (cane, walker, etc.) were ordered and delivered

Anti-coagulation Clinic

- 2-3 days post discharge, patients visit anti-coagulation clinic to ensure anticoagulant levels are appropriate

Patient Follow Up

- Follow up nursing call one week post discharge to assess compliance and satisfaction
- Two orthopedic clinic visits (two weeks and then three months postdischarge)
- Optional weekly telemedicine visits for the first month, then monthly until nine months postoperative

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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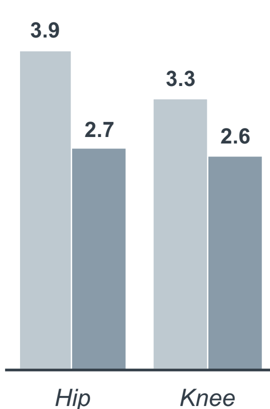
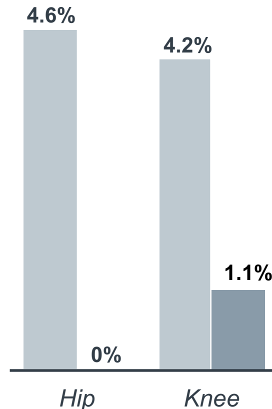
Joint Replacement Home Improves Quality

Early Results from UC Irvine Health

Average Length of Stay



30-Day Readmissions Rate



National Average | UC Irvine Health

Other Quality Outcomes

0% Major complications

0% Intraoperative blood transfusions

9.8% Postoperative transfusions (Hip)

4.2% Postoperative transfusions (Knee)

Sources: Garson L, et al., "Implementation of Total Joint Replacement-Focused Perioperative Surgical Home: A Management Case Report," *Anesthesia & Analgesia,* 118, no. 5 (2014): 1081-1089; Steiner C, et al., HCUP Projections: Mobility/Orthopedic Procedures 2003 to 2012. 2012. Accessed: http://www.hcup-us.ahrq.gov/reports/projections/2012-03.pdf; UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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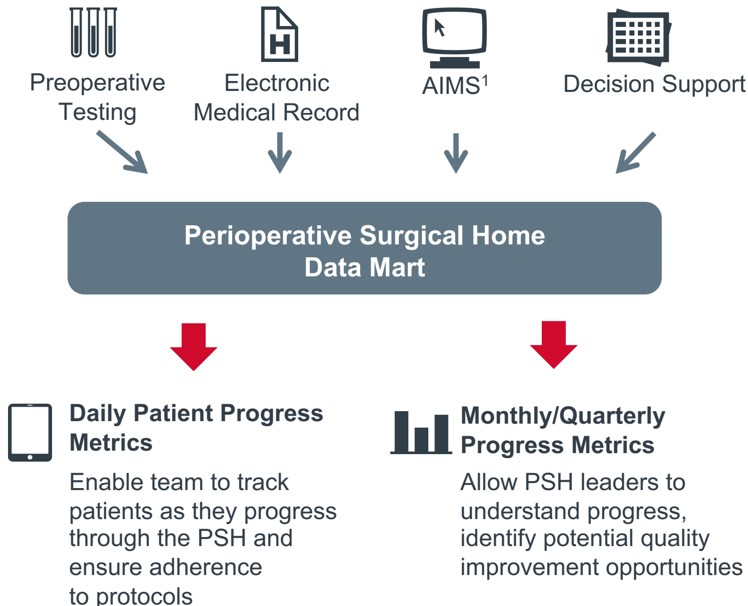
Information Technology Critical for Success

Aligning Disparate Data Sources to Improve Patient Care

How Metrics Are Collected



Daily Patient Progress Metrics

Enable team to track patients as they progress through the PSH and ensure adherence to protocols

Monthly/Quarterly Progress Metrics

Allow PSH leaders to understand progress, identify potential quality improvement opportunities

Example Metrics

Clinical Process Measures

- Cancellation within 24 hours of planned procedure
- Lowest post-op hemoglobin level

Safety Outcome Measures

- Calculation of frailty index
- Incidence of surgical infection

Access a full list of metrics from the UC Irvine Health Joint Replacement Home in the appendix

1) Anesthesia Information Management System

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Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

Scaling the Perioperative Surgical Home Broadly

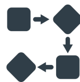
Resources Required for Expansion

UC Irvine Health's Model: Integrated the preoperative and postoperative clinic for greater coordination.

Additional Hires

Nurse Practitioner

Also conducts postoperative rounds, supporting postoperative pathway



Project Coordinator
Supports data integration and other project supports

Quality Improvement Specialist
Black belt in LEAN Six Sigma, enables continued improvement and expansion of care pathways to different surgical areas

Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

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Ongoing Challenges and Early Solutions

Ongoing Challenges	Potential Solutions

Scaling Up Postoperative Care
Anesthesiology team handles postoperative patient management, but not enough scale to cover all surgical patients.

Support by Nurse Practitioners
Anesthesiologist provides oversight to dedicated PSH nurse practitioner.

Support from Critical Care Medicine
University of Alabama scaled up postoperative care by using CCM teams.

Financial Models
Limited financial incentives for physician support and time investment

Pursuit of Alternative Payment Models
Bundled payments, gainsharing, or incentives from third-party payers are all potential options.

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Source: UC Irvine Health, Orange, CA; Physician Executive Council interviews and analysis.

Advice for Implementing a PSH

Lessons Learned from Dr. Kain

1. **Gain and maintain buy-in from stakeholders from the start.**
   Earlier attempts to launch a joint home failed due to skepticism and resistance from key stakeholders. Start with a smaller pilot if needed.
2. **Information technology support is critical.**
   Implementing agreed clinical protocols requires EHR integration to be effective. Similarly, sharing patient records across the surgical episode is critical to facilitate cross-episode coordination.
3. **Start with a surgery that is amenable to standardization.**
   Standardizing joint replacement is much easier than trauma surgery, for example, which is inherently unpredictable.
4. **Financial constraints are a barrier.**
   The extra time required to participate isn't reimbursable, although shifting to value based care models may make it easier to justify the time commitment.

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Source: UC Irvine Health, Otrange, CA; Physician Executive Council interviews and analysis.

Taking it Back to Your Organization

Key Questions for Health System Leaders

?

1. What does the opportunity look like for our organization?
   - What is our current joint replacement average length of stay?
   - What percentage of patients receive blood transfusions?
   - What is our joint replacement readmissions rate?

2. Do we have physician buy-in, or a willing physician champion? If so, could we create a pilot?

3. Do we have existing perioperative surgical clinic resources that could be engaged to support this mode?

4. Can we secure adequate support from information technology and quality improvement teams to enable implementation?

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Source: Physician Executive Council interviews and analysis.

Questions?

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Thank You!

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Appendix

Perioperative Surgical Home (PSH) Metrics

- Sample metrics to measure performance of the PSH in 5 domains
  - Clinical process
  - Safety outcomes
  - Financial (internal efficacy and economic outcomes)
  - Patient-centered outcomes

Clinical Process Measures Domain

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Patient name	Cancellation within 24 hours of planned procedure	Timing of antibiotic discontinuation	Date discharge summary completed
Patient contact info	Date if surgery	Surgical site issues	Date primary care provider is contacted
Primary care provider contact info	Anesthesia team members	Lowest post-op hemoglobin level	Date of 2- to 3- day post-discharge phone call
Surgeon	Type of anesthesia	Post-op transfusion	Date of surgical follow-up visit
Date of surgical evaluation	Actual procedure	Hemoglobin at time of discharge	Date of 30-day follow-up phone call
Date of planned procedure	Thromboembolism prophylaxis	Post-op pain management methods	Post-discharge pain scores
Planned procedure	Prophylactic antibiotic agent and timing	Post-op pain scores	Post-discharge complications
Date of anesthesia evaluation	Patient warming used	PONV scores	Readmission
Patient age, weight, height, BMI	Total fluids administered	Meets ambulation benchmarks	Reason for admission

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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Clinical Process Measures Domain (cont.)

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Pre-op pain scores	Blood loss	Meets nutritional benchmarks	Mortality
Opiate tolerance	Blood products administered	In-hospital complications or issues	
Coexisting diseases	Transfer to floor/tele/ICU	Return to O.R.	
Preop hemoglobin level		Discharge date	
ASA Class			
Risk index for PONV			
Risk index for post-op acute renal failure			
Risk index for post-op delirium			
Pre-op anemia therapy			
Nutrition education			
Physical Therapy education			

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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Safety Outcome Measures Domain

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Correct documentation of allergies and sensitivities	Incidence of correct antibiotic agent and timing	Incidence of surgical infections	Incidence of post-discharge complication
Documentation of airway management risk	Incidence of thromboembolism prophylaxis	Incidence of inadequate pain relief	Incidence of readmission
Calculation of frailty index	Incidence of appropriate temperature management	Incidence of prolonged PONV	Incidence of mortality
		Incidence of post-op pulmonary issues	
		Incidence of post-op acute renal failure	
		Incidence of post-op cognitive dysfunction	
		Incidence of other in-hospital issues	

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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Internal Efficiency Process Measures Domain

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Laboratory utilization	Time to pre-op area	Length of stay	Post-discharge prescriptions filled
Radiology utilization	Time of first patient in room	Time of discharge	
Consult utilization	Time in/out of O.R.	Laboratory utilization	
	Time of incision	Radiology utilization	
	Duration of room turnover	Consult utilization	
	Time out of post-anesthesia recovery		

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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Economic Outcomes Domain

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Pre-op laboratory costs	Intra-op fixed and variable direct costs	Daily hospital fixed and variable direct costs	Admission to skilled nursing facility
Pre-op radiological costs	Cost of intra-op blood products	Cost of post-op blood products	
Cost of other pre-op tests	Cost of O.R. equipment	Post-op laboratory costs	
Cost of pre-op consults	Cost of implants	Post-op radiological costs	
		Cost of other post-op assessments	
		Cost of post-op consults	

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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Patient-Centered Outcomes Domain

Examples

Pre-Op	Intra-Op	Post-Op	Post-Discharge
Shared decision-making for surgery	Satisfaction with the anesthesia plan and providers	Satisfaction with post-op pain management	Satisfaction with post-discharge pain management
		Satisfaction with the facility and nursing	Satisfaction with the surgeon
			Achievement of the desired level of health and function

Source: Schwid HA, Kain ZN, Dutton, RP, "The PSH: Clinical Safety, Internal Efficiency, Economic and Patient-Centered Metrics," *American Society of Anesthesiologists Newsletter*, 78, no. 10 (2014): 16-20. http://www.asahq.org/resources/publications/newsletter-articles/2014/october-2014/psh-clinical-safety-internal-efficiency

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