MNASCA
MN Ambulatory Surgery Center Association

2022

Supply Chain Management via Preference Card Optimization: A Practical Look

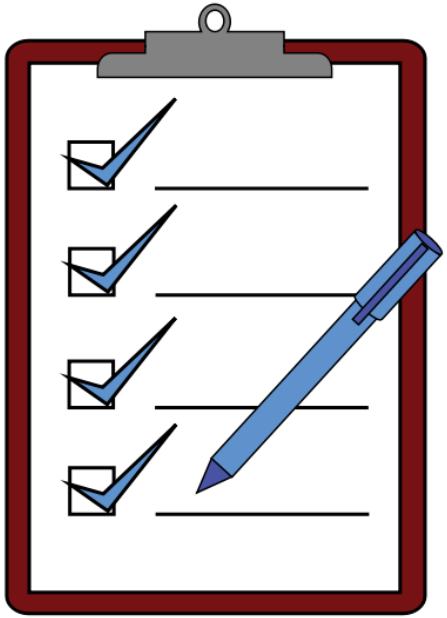
DOCSI

Disclosures

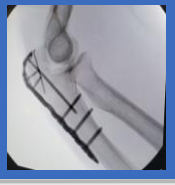
- Disclosures relevant to this presentation
  - Major Shareholder: DOCSI, Inc.

What we're going to do…

- Hopefully laugh a bit!
- Learn about the scope of preference card / supply chain related inefficiencies in the US procedural space
- Review evidence-based approaches to supply chain cost reduction through preference card optimization
- Take away some practical recommendations for accomplishing the above



A bit about my story…

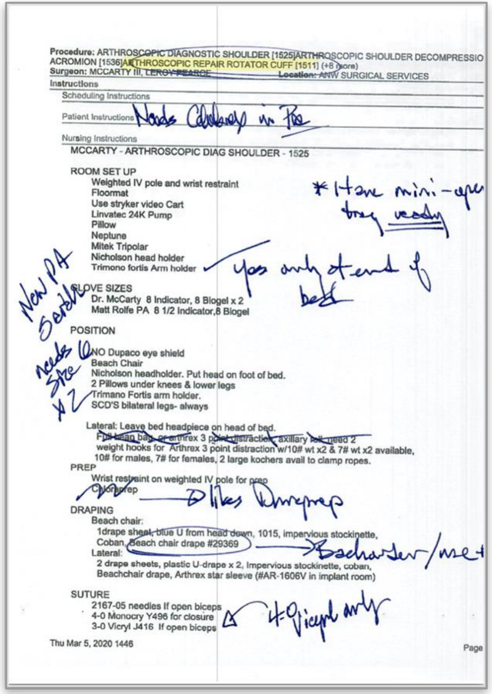


DUKE FUQUA SCHOOL OF BUSINESS

A bit about my story…

- But why is this orthopedic surgeon talking about preference cards?
  1. Frustration about not having what I needed
  2. Frustration about having what I didn't need
  3. Frustration about the $$$ of #'s 1. and 2.
  4. Frustration about staff stressing about #'s 1., 2. and 3.
- Basically, we often function in a system that doesn't work well for surgeons, OR staff or administrators

How expensive is this problem?



Procedure: ARTHROSCOPIC DIAGNOSTIC SHOULDER [1525]ARTHROSCOPIC SHOULDER DECOMPRESSIO ACROMION [1536]ARTHROSCOPIC REPAIR ROTATOR CUFF [1511] (+8 more)
Surgeon: MCCARTY III, ~~LEROY PEARCE~~ **Location:** ANW SURGICAL SERVICES

Instructions

Scheduling Instructions

Patient Instructions

Nursing Instructions

MCCARTY - ARTHROSCOPIC DIAG SHOULDER - 1525

ROOM SET UP
Weighted IV pole and wrist restraint
Floormat
Use stryker video Cart
Linvatec 24K Pump
Pillow
Neptune
Mitek Tripolar
Nicholson head holder
Trimono fortis Arm holder

GLOVE SIZES
Dr. McCarty 8 Indicator, 8 Biogel x 2
Matt Rolfe PA 8 1/2 Indicator,8 Biogel

POSITION
NO Dupaco eye shield
Beach Chair
Nicholson headholder. Put head on foot of bed.
2 Pillows under knees & lower legs
Trimano Fortis arm holder.
SCD'S bilateral legs- always

Lateral: Leave bed headpiece on head of bed.
~~Full bean bag or arthrex 3 point distraction, axillary roll, need 2~~
weight hooks for Arthrex 3 point distraction w/10# wt x2 & 7# wt x2 available,
10# for males, 7# for females, 2 large kochers avail to clamp ropes.

PREP
Wrist restraint on weighted IV pole for prep
~~Chloraprep~~

DRAPING
Beach chair:
1drape sheet, blue U from head down, 1015, impervious stockinette,
Coban, Beach chair drape #29369
Lateral:
2 drape sheets, plastic U-drape x 2, Impervious stockinette, coban,
Beachchair drape, Arthrex star sleeve (#AR-1606V in implant room)

SUTURE
2167-05 needles If open biceps
4-0 Monocry Y496 for closure
3-0 Vicryl J416 If open biceps

Thu Mar 5, 2020 1446

Page

*Have mini-open tray ready

4-0 Vicryl only

HealthLeaders
ANALYSIS

UNNECESSARY HOSPITAL SUPPLY CHAIN SPENDING REACHES $25.7B

BY JACK O'BRIEN | NOVEMBER 13, 2019

$5 Billion

Procedural Materials Waste

Inefficient Management of Surgeon Preference Items

causes significant

Material & Labor Expense

and

Missed Revenue Opportunities

Let's talk about cost for a bit…

- How focused should we be on cost containment?
  - It's not just a hospital problem
- Mean CPM (2014 USD)
  - $36.50
  - Implants excluded
  - Anesthesia, radiology, pathology and blood product cost centers excluded

Research

JAMA Surgery | Original Investigation

Understanding Costs of Care in the Operating Room

Christopher P. Childers, MD; Melinda Maggard-Gibbons, MD, MSHS

Invited Commentary

Supplemental content

IMPORTANCE Increasing value requires improving quality or decreasing costs. In surgery, estimates for the cost of 1 minute of operating room (OR) time vary widely. No benchmark exists for the cost of OR time, nor has there been a comprehensive assessment of what contributes to OR cost.

OBJECTIVES To calculate the cost of 1 minute of OR time, assess cost by setting and facility characteristics, and ascertain the proportion of costs that are direct and indirect.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional and longitudinal analysis examined annual financial disclosure documents from all comparable short-term general and specialty care hospitals in California from fiscal year (FY) 2005 to FY2014 (N = 3044; FY2014, n = 302). The analysis focused on 2 revenue centers: (1) surgery and recovery and (2) ambulatory surgery.

MAIN OUTCOMES AND MEASURES Mean cost of 1 minute of OR time, stratified by setting (inpatient vs ambulatory), teaching status, and hospital ownership. The proportion of cost attributable to indirect and direct expenses was identified; direct expenses were further divided into salary, benefits, supplies, and other direct expenses.

RESULTS In FY2014, a total of 175 of 302 facilities (57.9%) were not for profit, 78 (25.8%) were for profit, and 49 (16.2%) were government owned. Thirty facilities (9.9%) were teaching hospitals. The mean (SD) cost for 1 minute of OR time across California hospitals was $37.45 ($16.04) in the inpatient setting and $36.14 ($19.53) in the ambulatory setting ($P = .65$). There were no differences in mean expenditures when stratifying by ownership or teaching status except that teaching hospitals had lower mean (SD) expenditures than nonteaching hospitals in the inpatient setting ($29.88 [$9.06] vs $38.29 [$16.43]; $P = .006$). Direct expenses accounted for 54.6% of total expenses ($20.40 of $37.37) in the inpatient setting and 59.7% of total expenses ($20.90 of $35.39) in the ambulatory setting. Wages and benefits accounted for approximately two-thirds of direct expenses (inpatient, $14.00 of $20.40; ambulatory, $14.35 of $20.90), with nonbillable supplies accounting for less than 10% of total expenses (inpatient, $2.55 of $37.37; ambulatory, $3.33 of $35.39). From FY2005 to FY2014, expenses in the OR have increased faster than the consumer price index and medical consumer price index. Teaching hospitals had slower growth in costs than nonteaching hospitals. Over time, the proportion of expenses dedicated to indirect costs has increased, while the proportion attributable to salary and supplies has decreased.

CONCLUSIONS AND RELEVANCE The mean cost of OR time is $36 to $37 per minute, using financial data from California's short-term general and specialty hospitals in FY2014. These statewide data provide a generalizable benchmark for the value of OR time. Furthermore, understanding the composition of costs will allow those interested in value improvement to identify high-yield targets.

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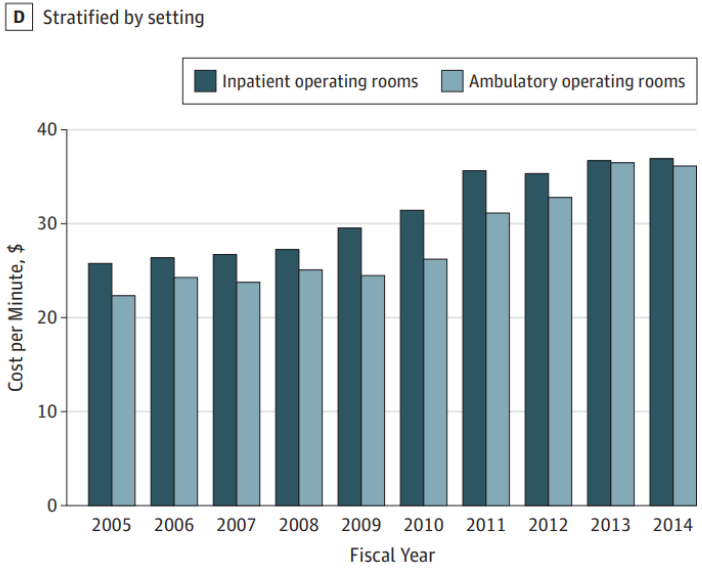
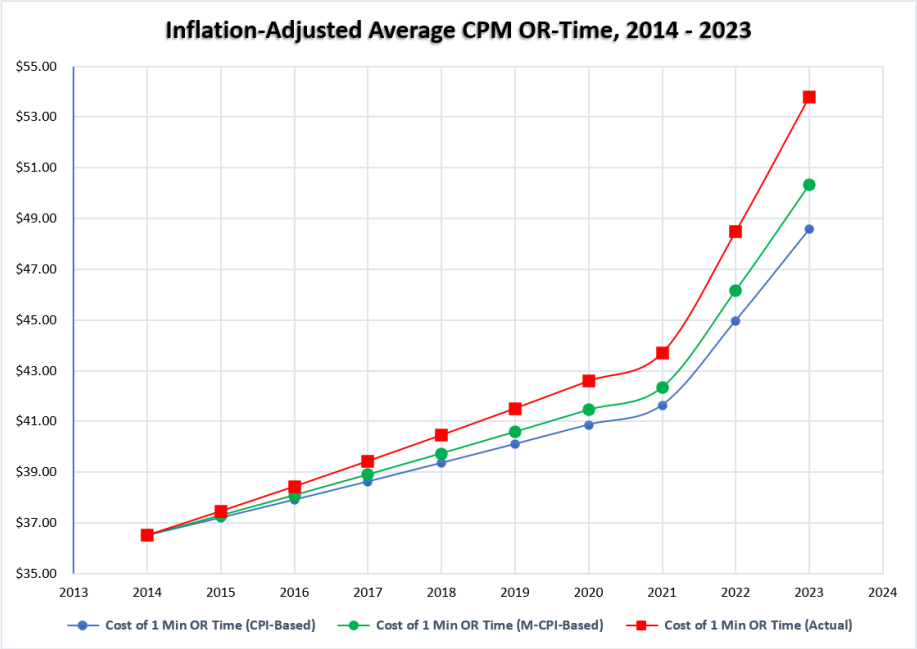
JAMA Surg. 2018;153(4):e176233. doi:10.1001/jamasurg.2017.6233
Published online February 28, 2018.



Ambulatory costs acceleration > hospital-based

Let's talk about cost for a bit…

- Cost breakdown of average CPM in ASC's
  - 60% direct expense (vs. 54% for hospitals)
    - 14% attributable to consumables / unbillable supplies
    - 65% attributable to labor
- But that was then…this is now…and the times they are a-changin'
  - Direct, variable expenses will continue to accelerate for the foreseeable future

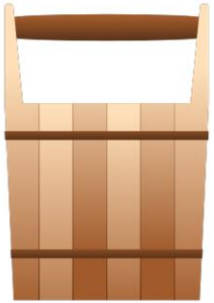


How broad is this problem?

It’s not just a supply chain issue…

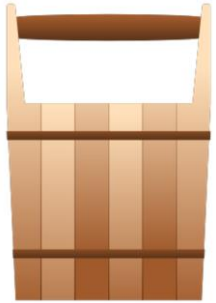
Supply expense

- Opened, not-used
- Excessive held
- PAR level inaccuracies



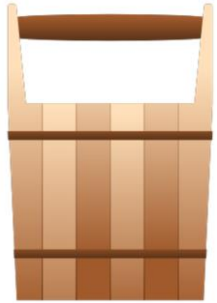
Clinical staff

- Excessive pick / restock
- Intraoperative “run for it”
- Stress / burnout / turnover

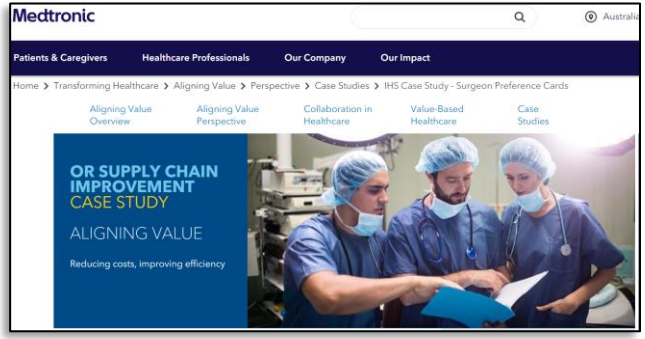


Clinical care

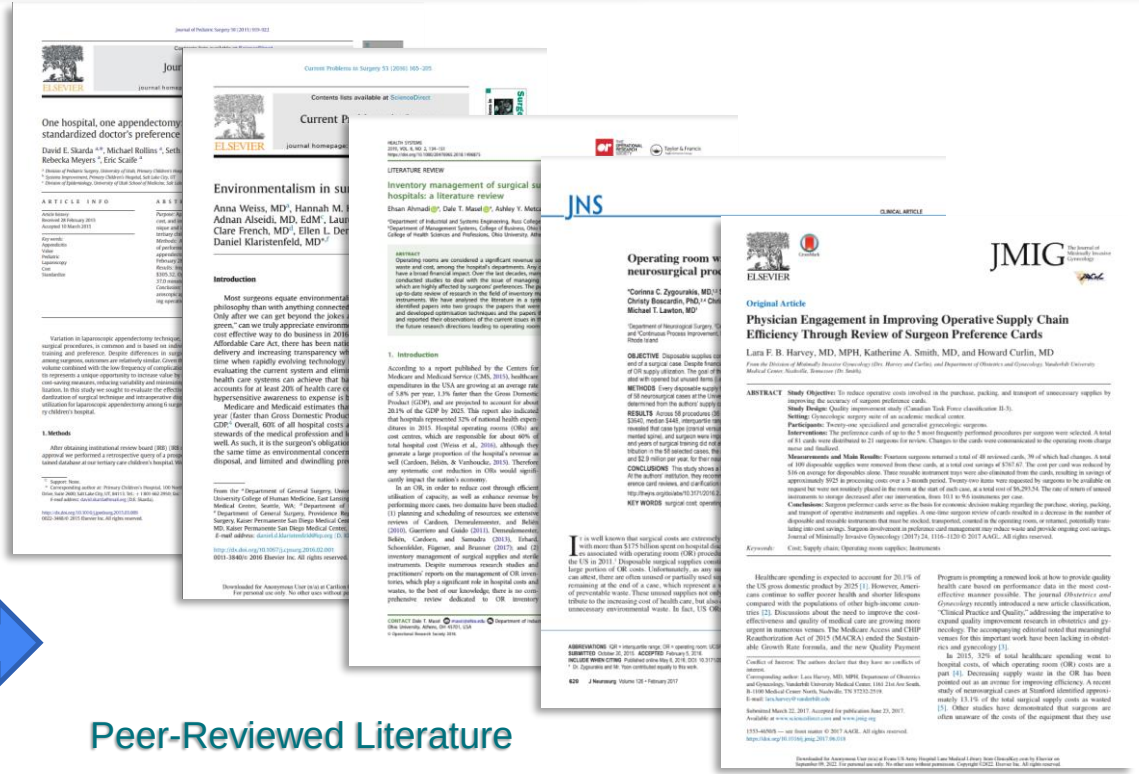
- Prolonged case times
- Increased SSI risk
- Missing, vital implants / disposables



Does preference item optimization work? You betcha.



Corporate Consulting



Peer-Reviewed Literature

Does preference item optimization work? You betcha.

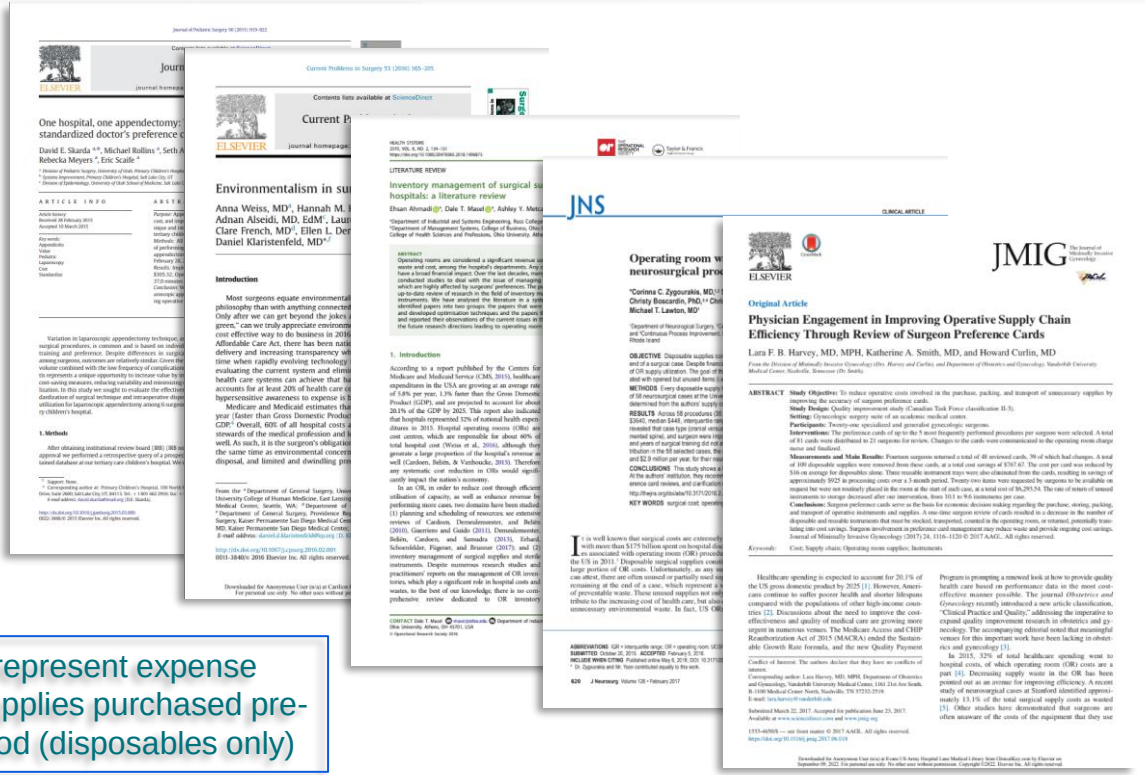
Mandatory, Standardized "Procedure Card": 67%

Optional, Standardized "Procedure Card": 32%

Utilization-Based Optimization: 9%-12%

Provider Review: 2-3%

Percentages represent expense reduction from supplies purchased pre- / post-study period (disposables only)

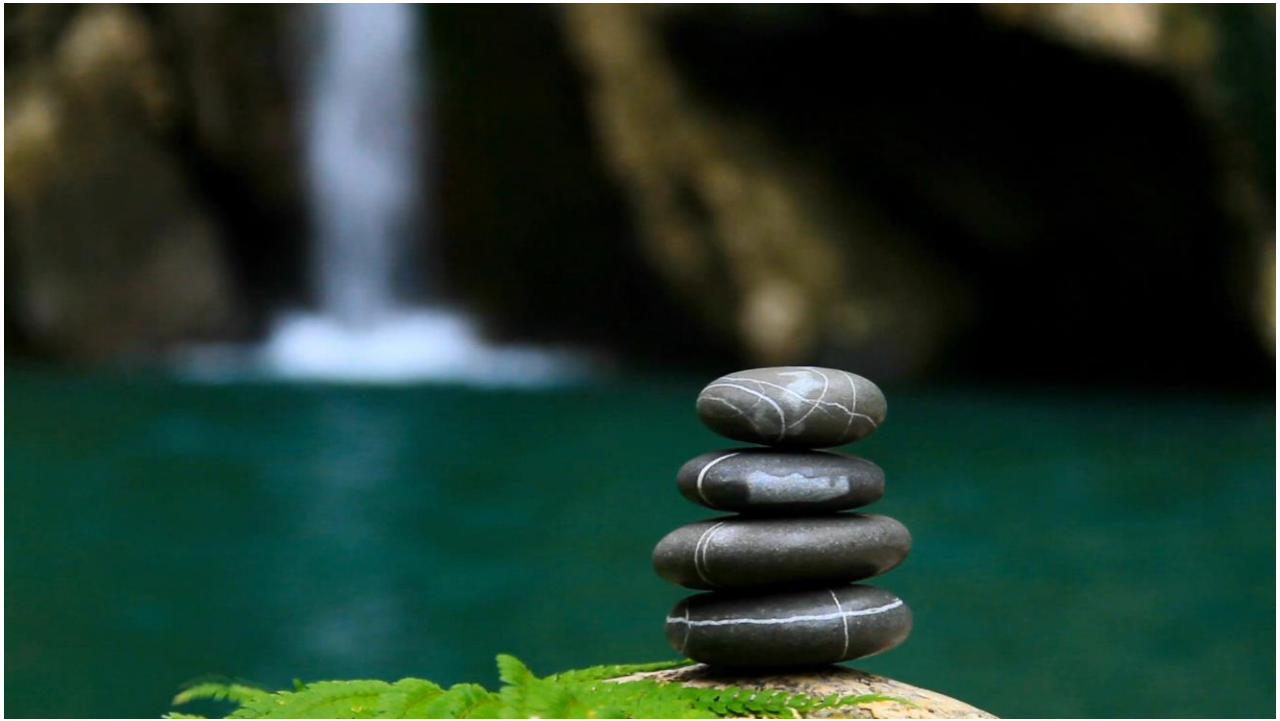


The Known Unknowns…

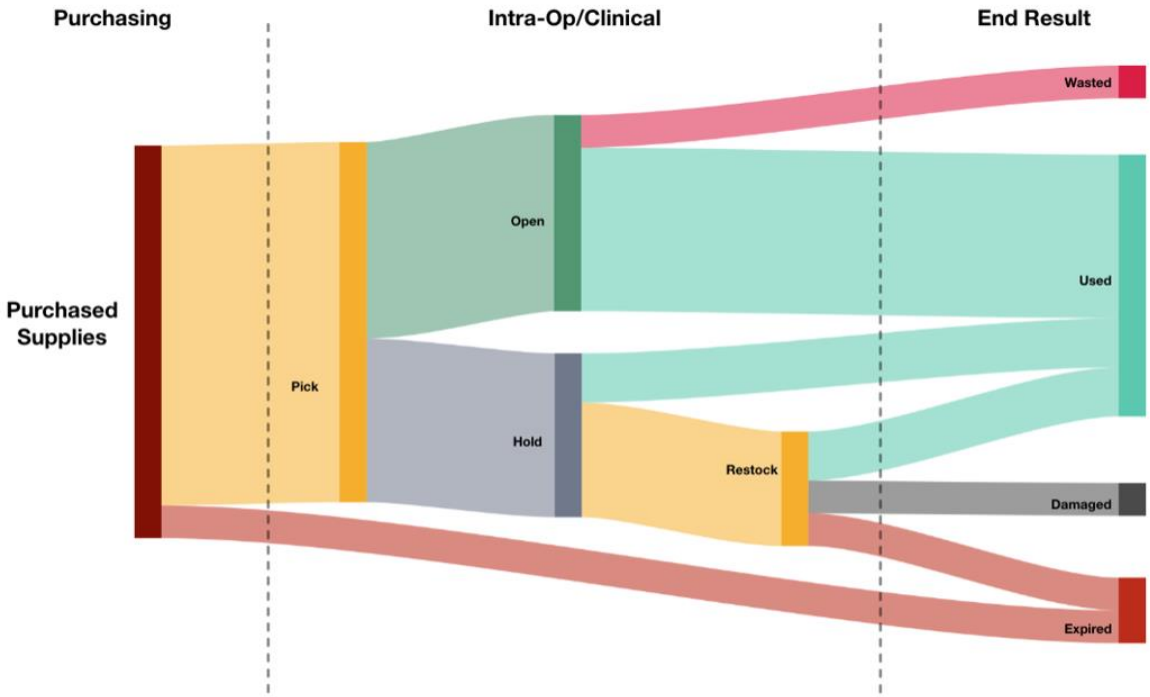
Case Pi ing

Indirect , but more

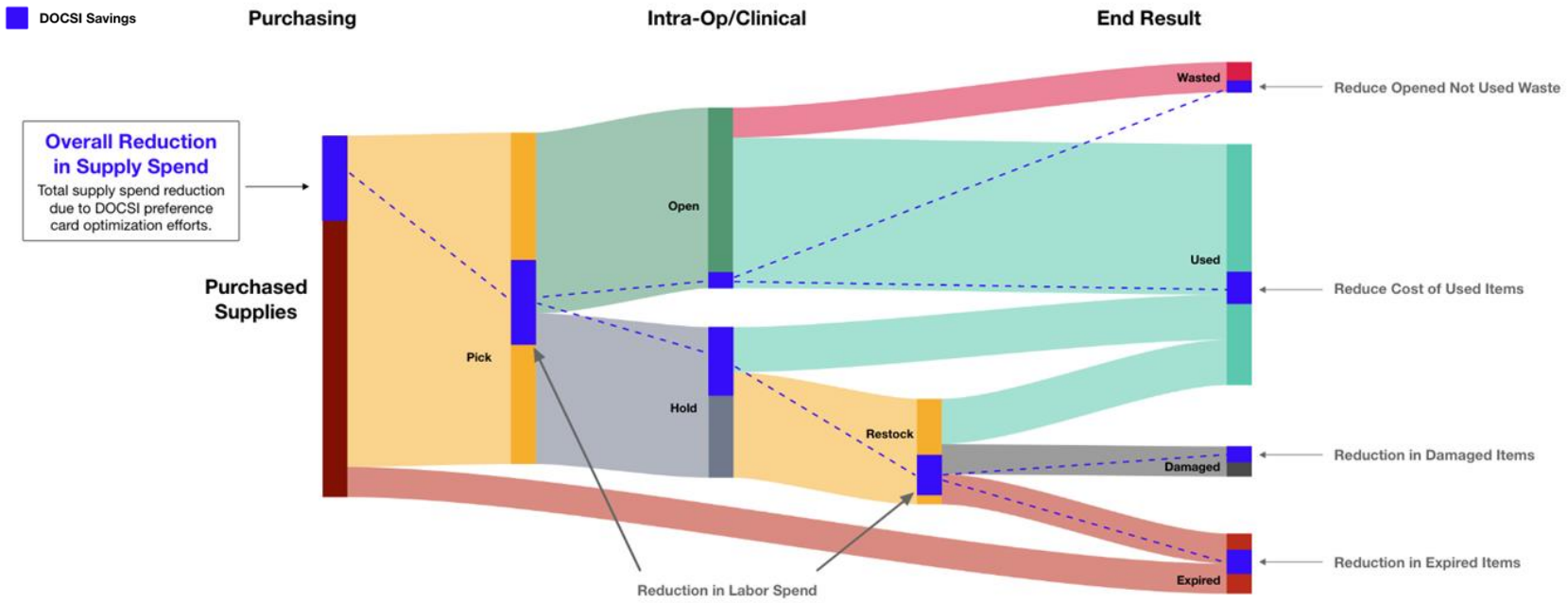
Take a deep breath…



A View of the Supply Spend Lifecycle



How We Target the Supply Spend Lifecycle



Impact Categories and Associated Cost-Drivers (I)

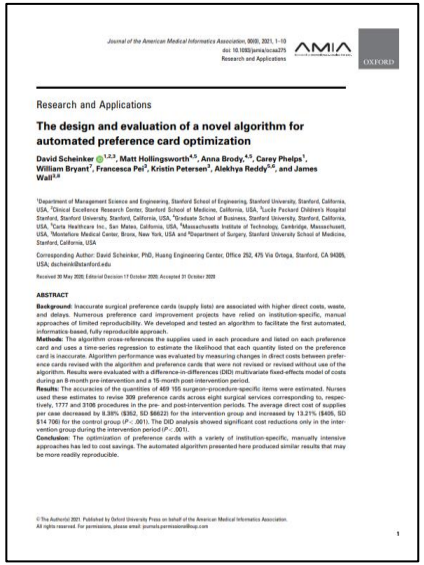
Absolute and/or relative reduction in card content

- Utilization-based optimization
- Standardization

Savings Type (Direct / Indirect)	Driver
Direct	Decrease in used/wasted item supply expense
Direct	Decrease in number of items damaged / lost during picking / restocking
Direct	Decrease in number of expired items / overstock
Indirect	Decrease in picking labor expense
Indirect	Decrease in restocking labor expense
Indirect	Decrease in case set-up time / case turnover time
Indirect	Decrease in Sterile Processing Expense for instruments and trays
Direct / Indirect	Improvement in accuracy and timeliness of procedural inventory **demand signal**
REVENUE	Potential revenue opportunity by facilitating increased case volume from decreased case set-up / turnover time

Impact Categories and Associated Cost-Drivers (I)

- Scheinker et al.
  - Time-series linear regression based on historical utilization data and current preference card status
  - Optimized open/held quantities
  - 8.4% savings on supplies (21.6% if control group deficit considered)
- Schmidt et al.
  - Elimination of all held items from pick list
  - 9.1% savings on supplies ($1.45M/year for one hospital)
  - No effect on time per case



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Research and Applications

AMIA OXFORD

Research and Applications

The design and evaluation of a novel algorithm for automated preference card optimization

David Scheinker [1,2,3], Matt Hollingsworth[4,5], Anna Brody,[4,5], Carey Phelps[1], William Bryant[1], Francesca Pei[6], Kristin Petersen[1], Alokhya Reddy[4,5], and James Wall[3,6]

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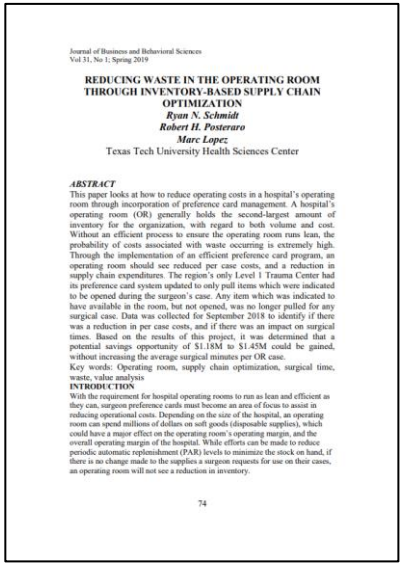
ABSTRACT

Background: Inaccurate surgical preference cards (supply lists) are associated with higher direct costs, waste, and delays. Numerous preference card improvement projects have relied on institution-specific, manual approaches of limited reproducibility. We developed and tested an algorithm to facilitate the first automated, informatics-based, fully reproducible approach.

Methods: The algorithm cross-references the supplies used in each procedure and listed on each preference card and uses a time-series regression to estimate the likelihood that each quantity listed on the preference card is inaccurate. Algorithm performance was evaluated by measuring changes in direct costs between preference cards revised with the algorithm and preference cards that were not revised or revised without use of the algorithm. Results were evaluated with a difference-in-differences (DiD) multivariate fixed-effects model of costs during an 8-month pre-intervention and a 15-month post-intervention period.

Results: The accuracies of the quantities of 469 155 surgeon-procedure-specific items were estimated. Nurses used these estimates to revise 309 preference cards across eight surgical services corresponding to, respectively, 1777 and 3106 procedures in the pre- and post-intervention periods. The average direct cost of supplies per case decreased by 8.38% ($362, SD $6622) for the intervention group and increased by 13.21% ($406, SD $14 706) for the control group ($P < .001$). The DiD analysis showed significant cost reductions only in the intervention group during the intervention period ($P < .001$).

Conclusion: The optimization of preference cards with a variety of institution-specific, manually intensive approaches has led to cost savings. The automated algorithm presented here produced similar results that may be more readily reproducible.



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REDUCING WASTE IN THE OPERATING ROOM THROUGH INVENTORY-BASED SUPPLY CHAIN OPTIMIZATION

Ryan N. Schmidt
Robert H. Posteraro
Marc Lopez
Texas Tech University Health Sciences Center

ABSTRACT

This paper looks at how to reduce operating costs in a hospital's operating room through incorporation of preference card management. A hospital's operating room (OR) generally holds the second-largest amount of inventory for the organization, with regard to both volume and cost. Without an efficient process to ensure the operating room runs lean, the probability of costs associated with waste occurring is extremely high. Through the implementation of an efficient preference card program, an operating room should see reduced per case costs, and a reduction in supply chain expenditures. The region's only Level 1 Trauma Center had its preference card system updated to only pull items which were indicated to be opened during the surgeon's case. Any item which was indicated to have available in the room, but not opened, was no longer pulled for any surgical case. Data was collected for September 2018 to identify if there was a reduction in per case costs, and if there was an impact on surgical times. Based on the results of this project, it was determined that a potential savings opportunity of $1.18M to $1.45M could be gained, without increasing the average surgical minutes per OR case.

Key words: Operating room, supply chain optimization, surgical time, waste, value analysis

INTRODUCTION

With the requirement for hospital operating rooms to run as lean and efficient as they can, surgeon preference cards must become an area of focus to assist in reducing operational costs. Depending on the size of the hospital, an operating room can spend millions of dollars on soft goods (disposable supplies), which could have a major effect on the operating room's operating margin, and the overall operating margin of the hospital. While efforts can be made to reduce periodic automatic replenishment (PAR) levels to minimize the stock on hand, if there is no change made to the supplies a surgeon requests for use on their cases, an operating room will not see a reduction in inventory.

DOCSI's Aggregate Card Carry Impact

12%

Card cost reduction
(across all pilot surgeons)

$268k / $2.19m

Annual card carry reduction

9,801

Fewer annual items picked

- Fewer supplies **purchased**
- Fewer SKUs **stored**
- Fewer items **expired**
- Fewer items **wasted**
- Fewer items **restocked**

Impact Categories and Associated Cost-Drivers (II)

Optimization of card content

- Item swaps
- Standardization

Savings Type (Direct / Indirect)	Driver
Direct	Transition to lower cost, alternative items
Direct	Reduction in overall SKU count/variation (lower total spend)
Direct / Indirect	Reduction in clinical variation – movement towards standardized card, the “procedure card”
REVENUE	Potential revenue opportunity via rebates achieved by hitting preferred manufacturer spend thresholds

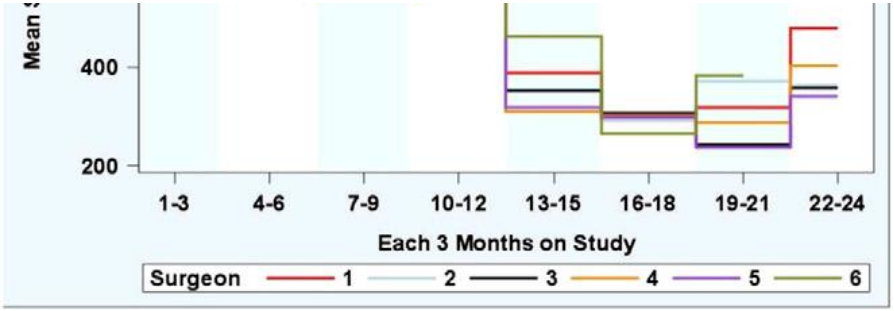
Impact Categories and Associated Cost-Drivers (II)

Table 2
Top consumable supply savings – utilization; cost per unit when used.

	T1	T2	Mean cost/case difference T1 - T2
Clip appliers	100%; $232.44	100%; $114.17	$118.27
Specimen bags	100%; $90.20	91%; $66.67	$34.34
Fascia closure devices	33%; $125.05	21%; $123.65	$15.78
Disposable scissor tip	64%; $41.46	37%; $40.71	$11.24
Endoscopic suction/irrigation	76%; $53.88	68%; $53.88	$4.05

T1 = 6 months prior to pick list, T2 = 6 months following creation of standardized pick list.

- Simon et al.
  - Creation of optional (universal) procedure card for laparoscopic cholecystectomy
  - 32% reduction in supply cost
  - Paired with incorporation of cost-weighted best alternative supplies



Impact Categories and Associated Cost-Drivers (III)

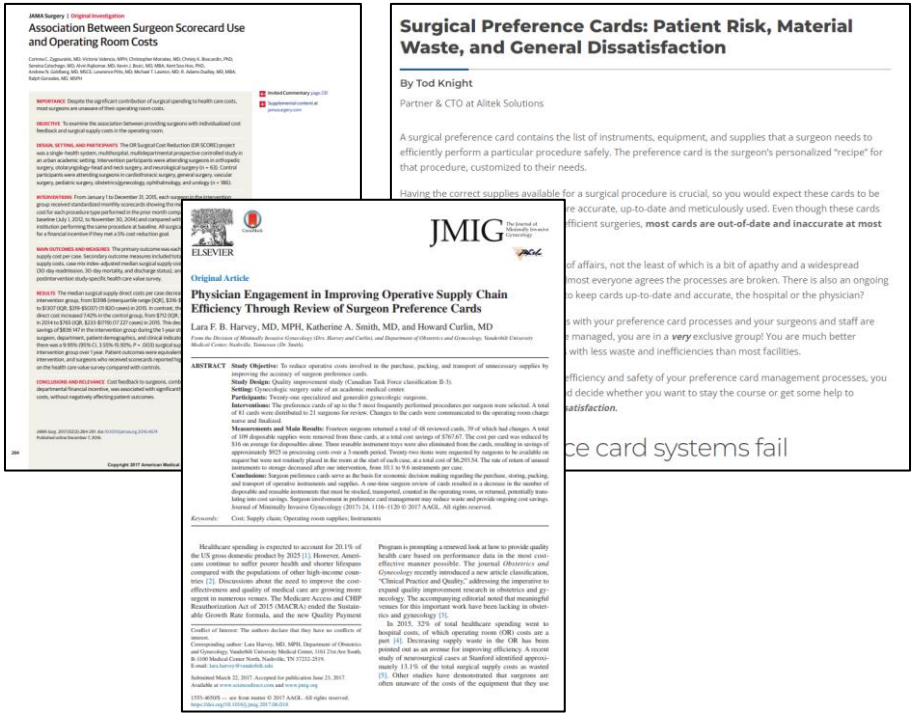
Optimization of Organizational Processes

- General improvement in OR efficiency
- Increased provider engagement and alignment
- Positive effect on staff morale

Savings Type (Direct / Indirect)	Driver
Direct / Indirect	General savings from increased physician engagement and process improvement iteration facilitated by digital (DOCSI) platform over manual review
Indirect	Improvement in operational workflows, morale, **retention**, etc., driven by increased staff satisfaction with simplified picking, restocking and general case preparation processes
REVENUE	Potential revenue opportunities via identification of items not accurately marked as used, and therefore not billed

Impact Categories and Associated Cost-Drivers (III)

- Harvey et al.
  - Simple surgeon review of preference cards (OB-GYN)
  - 3% reduction in surgical supply cost
  - Increased surgeon awareness
  - Increased staff satisfaction from reduction in reusable instrument picking, restocking, processing and transport
- Zygourakis et al.
  - 6.54% reduction in surgical supply cost (14% when control group deficit included)
  - Monthly scorecard-based, cost benchmarking performed
  - 5% cost reduction threshold set for financial incentive
  - 5.6x CoC ROI (i.e. “incentives work”)



Practical Recommendations

- Take an intentional approach to preference card optimization with defined, evidence-based goals (e.g. 5% total supply cost reduction)
- Implement utilization tracking
- Don’t be afraid to eliminate items
- Engage surgeons in efforts

One Approach | Journey Map

Providers

Facility recommendations reviewed by surgeons with site staff

Data Analysis

Stakeholder Alignment

Facility Team

Analyzes preference cards, case volumes and item usage

Identifies highest impact surgeons and cards

Site staff reviews and confirms recommendations with supply chain / procurement

Sustained Optimization Loop

Another Approach – Moving to the “Procedure Card” | Journey Map

Providers

Surgeon engagement-driven reconciliation to determine best procedure card

Data Analysis

Stakeholder Alignment

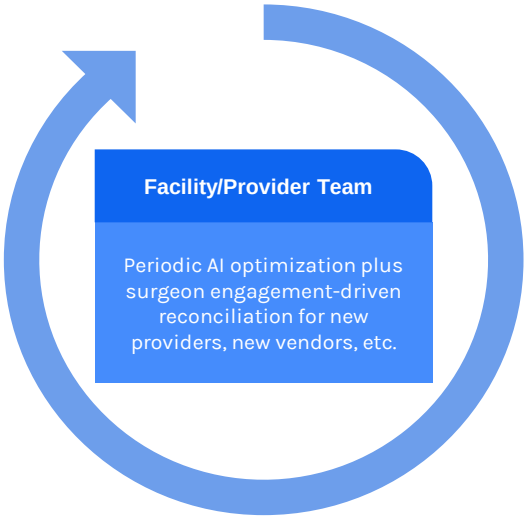
Facility Team

Index analysis to determine utilization-weighted items with variance per item

Reconciliation of utilization-weighted items with cost-weighted best alternatives to arrive at utility-weighted optimal solution

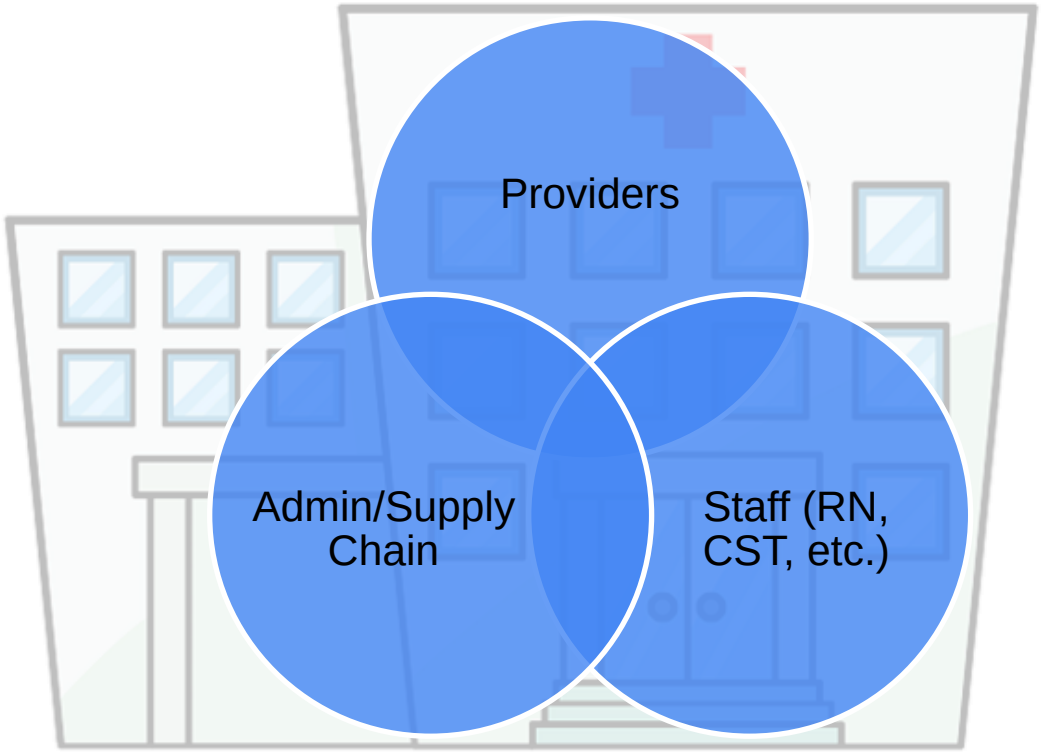
Procedure card implementation

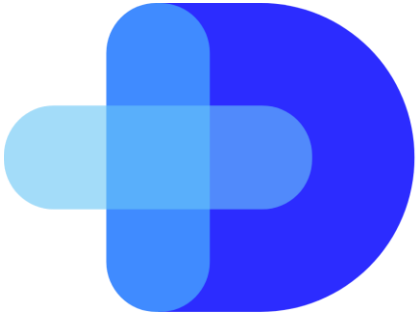
Post-hoc, AI-informed optimization of included/open/held quantities driven by utilization-data timer series regression



Sustained Optimization Loop

In the end it’s all about alignment…





DOCSI

Thank you!

L. Pearce McCarty, III MD, MBA

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