

# Reducing Readmission Following Ambulatory Surgery -- Ripe for Payment Incentives? (or red herring?)

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# Support

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UCSF Phillip R. Lee Institute  
for Health Policy Studies

Thank you

# Agenda

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- Funding policy – incentives
- Inpatient readmissions
- ASC readmissions as a special case
- Results to date
- Preventable ... or not

# Funding policy – incentives

- Avoid rewarding unnecessary work
  - e.g. avoidable complications
- From a hospital funding perspective:
  - Change / transition is expensive
  - Improving quality may reduce care costs
  - Cost/payment reduction for hospitals
    - Rarely demonstrated
    - Recent evidence from Thedacare and others belie this



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# Inpatient readmissions are a problem

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- Post acute care readmission occurs often.
- Not a new phenomenon
- 22% of Medicare hospitalizations readmitted within 60 days (1974 -7 data; Anderson et al)

# Recent readmission studies

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- Recent studies indicate little progress
- 19.4% admissions followed by a preventable readmission within 6 months (1999 data; Friedman et al)
- 19.6% of acute hospital discharges readmitted within 30 days (2003-4 data; Jencks et al)
- 1.5% of all acute admissions treat direct complications of clinical care
- Flagged as a priority by MedPAC
- Medicare: non-payment for CHF readmissions



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Report to congress: reforming the delivery system, June 2008.  
Available at:  
[http://www.medpac.gov/documents/Jun08\\_EntireReport.pdf](http://www.medpac.gov/documents/Jun08_EntireReport.pdf)

# Readmission costs – significant

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- Anderson et al (1974-7), 24 per cent of Medicare inpatient expenditures (for 22% Medicare hospitalizations readmitted within 60 days)
- McNair et al (2006), 2.5% of acute inpatient funding for 1.5% of all acute admissions which treat direct complications of clinical care



# Why ASC readmissions

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- Previously studies looking at readmissions to treat complications of medical and surgical care (HAC & other)
- Many readmissions appeared to be post Ambulatory Surgery



What happens post AS admission?



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# Aim

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- Identify and characterize readmissions that arise immediately following AS care
- Start with HAC readmissions
- Explore other possibilities

And ...

- Can we determine *a priori* which are likely to be preventable?

# Why ASC readmissions are a special case

- Little information on ASC readmissions

ASC patients usually:

- Discharged within a few hours - no capacity for overnight care
- Any significant or arising complication results in transfer / IP readmission
- Costs of complications born by other providers



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# Method- 1

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- Retrospective cohort study
- California Office of Statewide Health Planning and Development data
- 2005-2008 acute inpatient and ambulatory care discharge datasets
- Data extracted on-site at OSHPD (Sacramento)

# Method – Why OSHPD data

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## ■ Includes:

- ASC and IP data (IP data for readmissions)
- SSN based record linkage number (RLN)
- Episode grouping for IP admissions (DRGs)
- Patient demographics,
- Up to 25 diagnosis & 25 procedure codes



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# Limitations

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- 90% of cases with valid SSN (incomplete record linkage)
- Principal diagnoses and procedures only requested in data use agreement
- No payer information in this data tranche

# Method – data exclusions

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- 99.88% ASC admissions have valid procedure
- 90.4% ASC admissions have valid SSN (linkable)
  - Although incomplete higher than inpatient SSN rate (76%)

# Method

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- Group ASC admissions to “Berenson-Eggers Type of Service” (BETOS) groups
- Compile all ASC and IP admissions
- Use the list of eligible ASC admissions to find IP and ASC readmissions



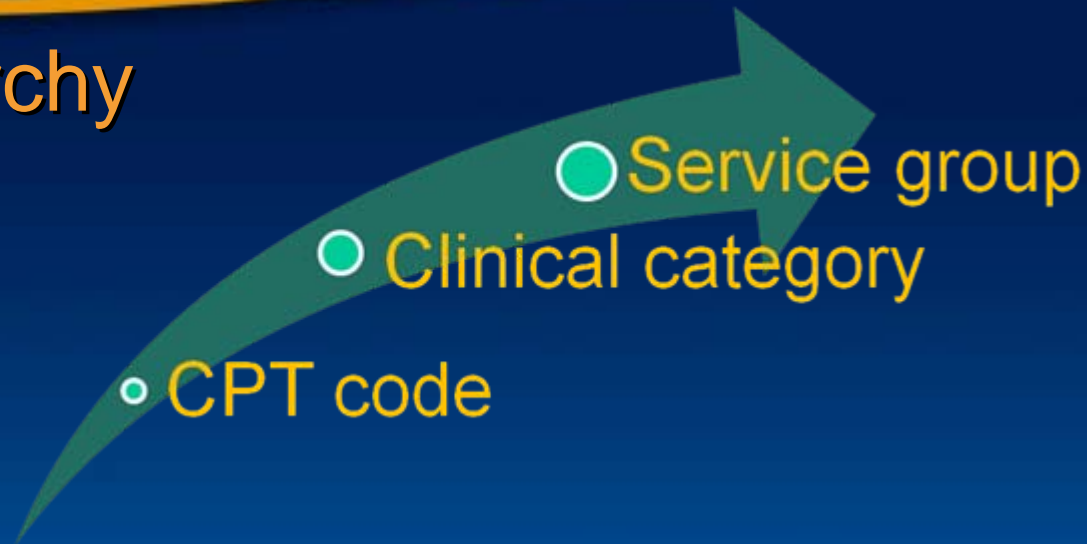
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# BETOS groupings

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## ■ Hierarchy



■ 106 clinical categories

■ Seven service groups



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# Results to date - data

- 93.5% of ASC admissions have a “procedure” as the principal procedure

BETOS Group	Total Cases	Proportion
Procedures	9,718,211	93.5%
Tests	419,187	4.0%
Imaging	196,580	1.9%
Evaluation and Management	23,571	0.2%
Exceptions/Unclassified	18,666	0.2%
No match	17,853	0.2%
Other	1,009	0.0%
Total	10,395,077	100.0%



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# Results to date, 2005-08

- The vast majority of readmissions (95.8%) follow a procedure

BETOS Group	Total	Readmit rate
Procedures	55,298	0.57%
Imaging	1,128	0.57%
Tests	641	0.15%
No match	421	2.36%
Evaluation and Management	123	0.52%
Exceptions/Unclassified	97	0.52%
Other	20	1.98%
Grand Total	57,728	0.56%



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# Analyses

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- Infection post major orthopedic procedure (similar to the non-payment for HAC policy)\*
- Infection post joint replacement
- Colonoscopy (deductive approach – for interest and discussion)

\* Other HACs are not relevant to AS care or are relatively infrequent “never” events



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# Infection post joint replacement

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## ■ Previous study (P4P 2010)

- Accounts for ~80% of HAC associated readmission costs
- Readmissions are within 60 days
- Readmission rate 8.45%

(1,073 readmissions (175 for osteomyelitis) for infection post joint replacement from 12,691 procedures)



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# Major orthopaedic (non-HR/TKR) admissions

## ASC Major Orthopedic 2005-08

Code	Description	ASC admissions
23412	Rotator cuff repair	15,379
25447	Trapezio-metacarpal arthroplasty	7,888
26123	Palmar fasciectomy	7,602
		...
Total – P3D	Major procedure, orthopedic - other	184,908

- Captures larger group of procedures than HAC definition

# Readmissions

Time Since Major Orthopedic Procedure Admission	ASC readmission	Inpatient readmission	Total
Sameday/Transfer	474	213	687
Less than 1 week	670	618	1288
1 week to 1 month	2147	1239	3386
1 to 3 months	6605	1815	8420
Total	9,896	3,885	13,781

- ~28% of readmissions are to hospitals
- ~68% of cases are admitted after 1 to 3 months
- ~7.5% of cases are readmitted within 3/12



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# Reason for readmission

ICD-9 code	Description	Number of readmits
V5401	Encounter for removal of internal fixation device	1,355
99859	Other postoperative infection	450
99678	Other complications due to other internal orthopedic device, implant, and graft	329
3540	Carpal tunnel syndrome	261
V5489	Other orthopedic aftercare	223
V7651	Special screening for malignant neoplasms of colon	206
99649	Other mechanical complication of other internal orthopedic device, implant, and graft	205

# Readmission for infection after major orthopaedic procedure

- 0.24% (450/184,908) readmitted for infection
- ~82% (368/450) readmissions to inpatient care
- ~90 readmissions per year
- Charge is available for 303 cases - \$40,770/readmission
- Unable to split Medicare/Non-Medicare
- Estimated Medicare payment reduction based on previous studies - ~\$4m Nationwide\*







# Ripe for funding incentive?



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# Expanding the policy?

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- Do other major orthopaedic procedures require readmission for infection at similar rates?



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# THR &TKR procedures in ASC's

## ASC Joint Procedures 2005-08

BETOS	Description	ASC admissions
P3B	Major procedure, orthopedic - Hip replacement	190
P3C	Major procedure, orthopedic - Knee replacement	837
Total		1027

- THR and TKR performed across 189 organizations.
- Vast majority are knee arthroplasties



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# THR & TKR readmissions for infection

Time Since Joint Procedure Admission	ASC readmission	Inpatient readmission	Total
Same day / Transfer	3	71	74
Less than 1 week	2	16	18
1 week to 1 month	7	16	23
1 to 3 months	24	21	45
Total	36	124	160

- ~7% (71/1027) of cases are transferred to hospital post-op
- ~75% of readmissions are to hospitals
- ~15% of cases are readmitted within 3/12



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# Reason for readmission (3 or more cases over 4 years)

ICD-9 code	Description	Number of readmits
71596	Osteoarthritis, unspecified whether generalized or localized, lower leg	81
71536	Osteoarthritis, localized, not specified whether primary or secondary, lower leg	33
71595	Osteoarthritis, unspecified whether generalized or localized, pelvic region and thigh	31
71535	Osteoarthritis, localized, not specified whether primary or secondary, pelvic region and thigh	20
99641	Mechanical loosening of prosthetic joint	6
99643	Broken prosthetic joint implant	5
73342	Aseptic necrosis of head and neck of femur	5
78659	Other chest pain	4
71516	Osteoarthritis, localized, primary, lower leg	4
99677	Other complications due to internal joint prosthesis	3
99642	Dislocation of prosthetic joint	3
71616	Traumatic arthropathy, lower leg	3
27801	Morbid obesity	3



# TKR/THR infection finding

- Current data: <1 inpatient readmission/yr to manage infection California-wide
- Readmissions searched by principal procedure and DRG (not shown)
  - Infection code past principal diagnosis?
- Much lower readmit rate than for other major orthopaedic procedures
  - Actual difference in infection rates?
- Ripe for funding incentive?



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# Deductive approach

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- More of a fishing expedition, albeit theoretically based
- Proposes a standard method for finding readmissions and assessing preventability
- Provides capacity to search outside “individual experience”



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# Focusing on procedures

## ■ Likelihood of any readmission following an AS admission for a procedure – **all causes**

Time Since Last Admission	Likelihood of Readmission		
	AS	Inpatient	Total
Day leave	0.01%	0.00%	0.01%
Sameday/Transfer	0.47%	0.10%	0.57%
Less than 1 week	1.39%	0.63%	2.02%
1 week to 1 month	3.58%	1.26%	4.84%
1 to 3 months	4.63%	1.77%	6.40%
3 to 6 months	3.60%	1.52%	5.13%
Grand Total	13.68%	5.28%	18.97%



# Same day readmission following a procedure

BETOS label	Readmissions
<b>P8D - Endoscopy - colonoscopy</b>	14,471
P8B - Endoscopy - upper gastrointestinal	6,113
P4B - Eye procedure - cataract removal/lens insertion	6,069
P4E - Eye procedure - other	4,257
P6B - Minor procedures - musculoskeletal	3,814
P5E - Ambulatory procedures - other	3,574
P1G - Major procedure - Other	3,260
P6C - Minor procedures - other (Medicare fee schedule)	2,168
P2F - Major procedure, cardiovascular-Other	1,982
P6A - Minor procedures - skin	1,766



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**NB: there are 2,011,389 colonoscopy procedures (valid SSN) between 2005-08**

# Same day post-colonoscopy readmission diagnoses

ICD-9 code	ICD-9 code description	Number of readmissions
2113	Benign neoplasm of colon	3044
V7651	Special screening for malignant neoplasms of colon	2752
56210	Diverticulosis of colon (without mention of hemorrhage)	1231
5693	Hemorrhage of rectum and anus	714
4550	Internal hemorrhoids without mention of complication	551
2114	Benign neoplasm of rectum and anal canal	244
78900	Abdominal pain, unspecified site	228
78799	Other symptoms involving digestive system	213
	Diaphragmatic hernia without mention of obstruction or	
5533	gangrene	193
78791	Diarrhea	182



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**Predominantly AS  
readmissions**

# Same day post-colonoscopy inpatient readmission diagnoses

ICD Dx code	ICD Dx code description	Number of readmits
	<b>Accidental puncture or laceration during a procedure, not elsewhere classified</b>	
9982		113
99811	<b>Hemorrhage complicating a procedure</b>	46
1533	Malignant neoplasm of sigmoid colon	43
56212	Diverticulosis of colon with hemorrhage	37
42731	Atrial fibrillation	30
1540	Malignant neoplasm of rectosigmoid junction	29
1536	Malignant neoplasm of ascending colon	27
56983	<b>Perforation of intestine</b>	23
	Digestive system complications, not elsewhere classified	
9974		23
1531	Malignant neoplasm of transverse colon	23
56211	Diverticulitis of colon (without mention of hemorrhage)	20

# I/P diagnoses for readmission within 1 week of colonoscopy

ICD Dx code	ICD Dx code description	Number of readmits
99811	<b>Hemorrhage complicating a procedure</b>	<b>514</b>
56211	Diverticulitis of colon (without mention of hemorrhage)	258
1533	Malignant neoplasm of sigmoid colon	229
1536	Malignant neoplasm of ascending colon	155
9982	<b>Accidental puncture or laceration during a procedure, not elsewhere classified</b>	<b>138</b>
V553	Attention to colostomy	132
1534	Malignant neoplasm of cecum	126
1540	Malignant neoplasm of rectosigmoid junction	115
1541	Malignant neoplasm of rectum	111
2113	Benign neoplasm of colon	108
41401	Coronary atherosclerosis of native coronary artery	101

# Funding based disincentive?

- Punctures: 274 (~70/yr California wide; Rate 1/ 7,340)
- Haemorrhages: 560 (190/yr California wide; Rate 1/ 3,590)
- Question 1
  - “Have we captured all of the cases?”
- Question 2
  - “Are these complications potentially preventable”



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# Complications and preventability

- Little comparative information
- Much variation between organisations (and individuals)
- Individuals - views based on their own experience and discussions with peers
- “Experts” rarely agree on preventability
- Clinically preventable varies over time



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Hayward RA. and Hofer TP (2001). "Estimating hospital deaths due to medical errors: preventability is in the eye of the reviewer." *Jama* **286**(4): 415-20.

Localio, AR, Weaver SL, et al. (1996). "Identifying adverse events caused by medical care: degree of physician agreement in a retrospective chart review." *Ann Intern Med* **125**(6): 457-64.

# Limitations of current funding policies

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- Wait for “star performers” to reveal themselves
- Methods of prevention are rarely explicitly documented (as part of policy)
- Prevention measures are not always replicable across organizations



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# Proactive strategy 1 – variation reduction

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- Assumes that outcomes are systematic (i.e. not randomly distributed)
- Looks for systematic differences between practices that influence outcomes

## Limitations for this work

- Most effective when data can be discussed
- Best with continuous variables (e.g. cost)

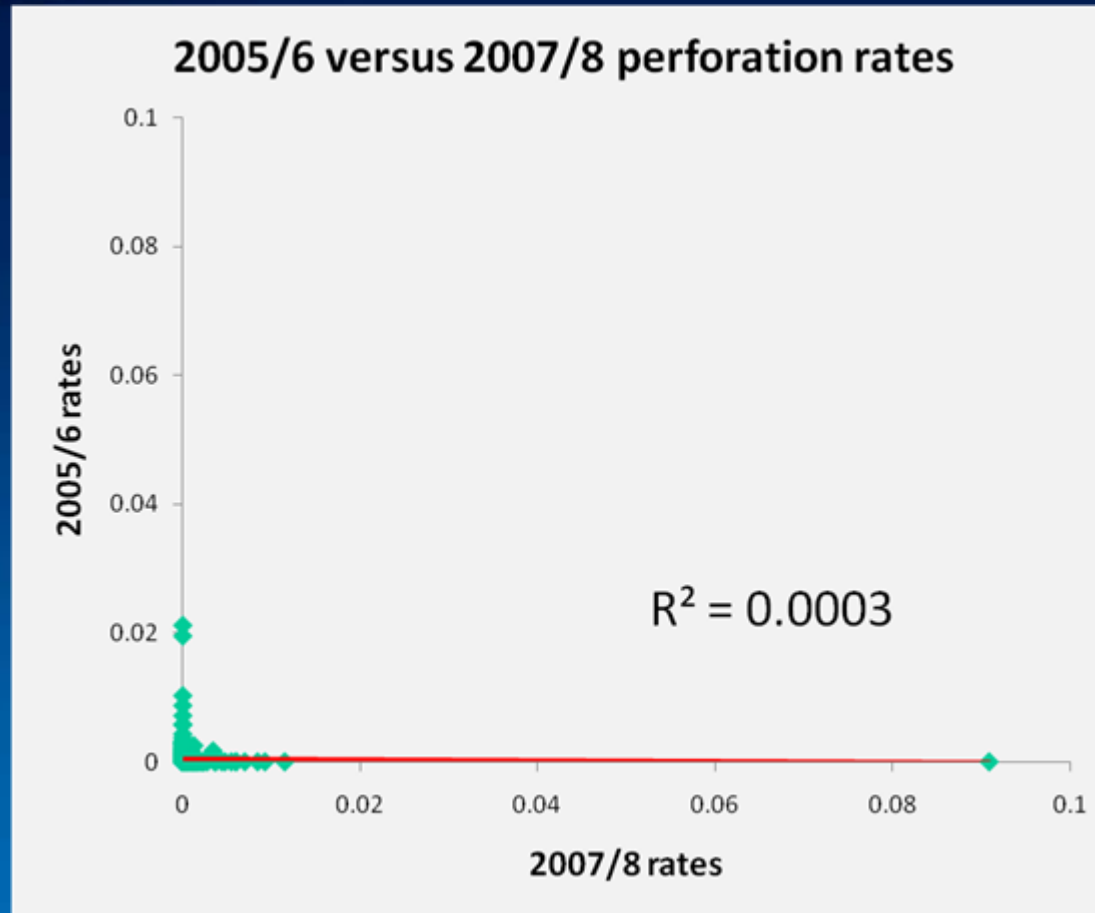


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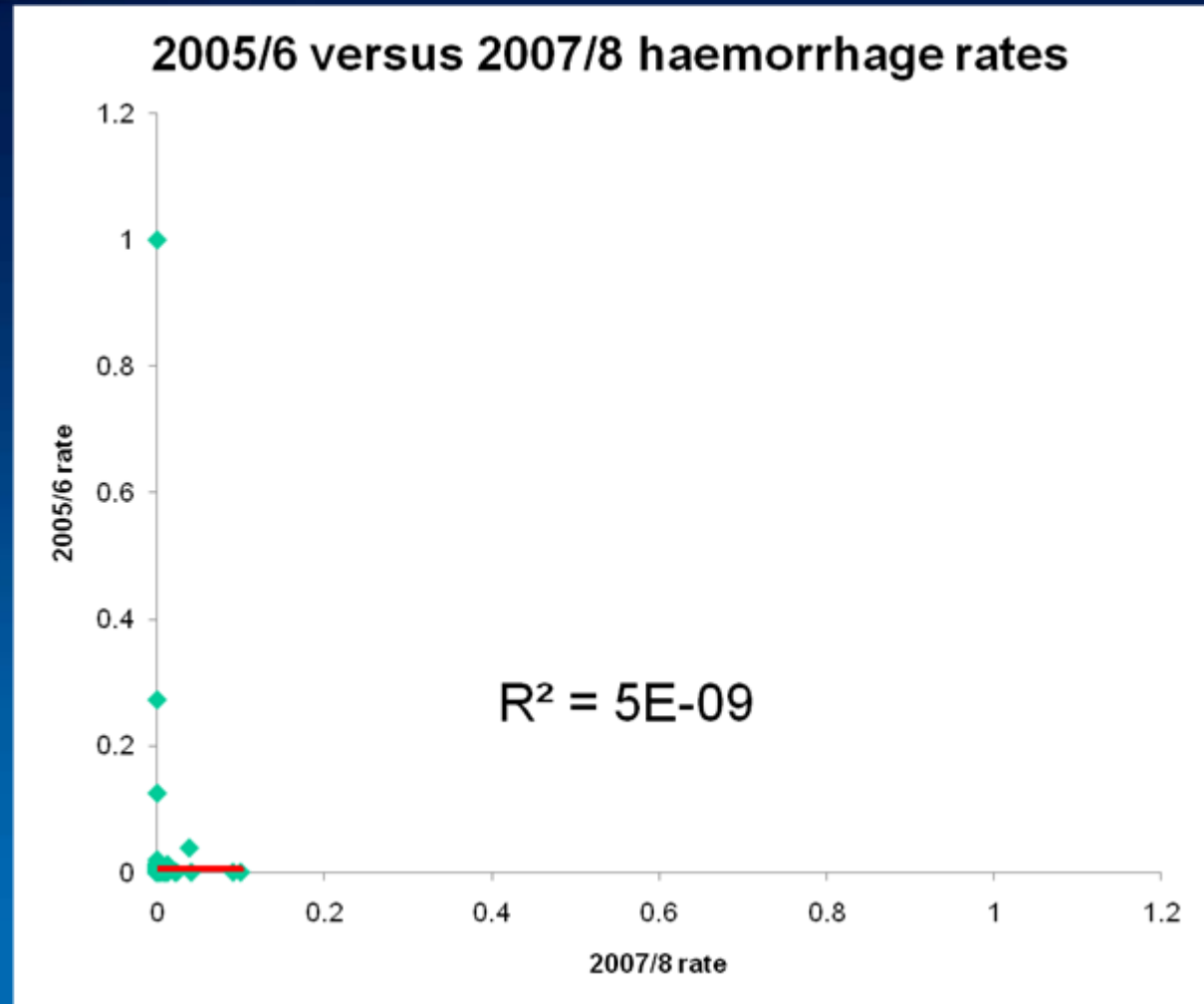
# Step 1 - is perforation randomly distributed?



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# Is haemorrhage randomly distributed?



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# Proactive strategy 2 – positive deviants

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- Use data and analyses to find “positive deviants” (star performers)
- Extract their secret
- Clinical review of intervention
- Pilot intervention at other organizations
- If the improvement can be replicated use a funding policy to drive adoption



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# Positive deviants?

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- Test each hospital (Diff of Props - shrunk estimates) against rest of state ( $p = 99.8$  level)
- In both cases – no positive deviant

# Modeling preventability summary

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- Neither method was effective in this scenario
- Utilisation for funding modeling purposes – problematic
- Will continue to develop this in the outcome improvement environment



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# Ripe for funding incentive (or red herrring)?

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- Strong case for non-payment for readmissions for infection following major orthopedic surgery
- No case identified to date for other incentives

# Acknowledgments

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# Thank you

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