

Measuring Variability in Intraoperative Opioid Use via Opioid Equivalency Measures

Douglas A Colquhoun, MB ChB, MSc, MPH

T32 Research Fellow

Clinical Lecturer in Anesthesiology

Division of Critical Care Medicine

Department of Anesthesiology

University of Michigan Medical School

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Aim for today:

- 1) Review Opioid Equivalency Measures @ MPOG
- 2) Considering Variability Not Benchmarks
- 3) Implications For MPOG Research

Acknowledgement/Disclosure

- Development work lead by Dr Mike Burns, John Vandervest & Barong Shi
- Oral presentation tomorrow: “Perioperative Oral Morphine Equivalence for Anesthesia Procedures”
Dr Mike Burns et al
7:30 am – Moscone North, Room 20
- Funded in part by NIGMS T32 GM103730
(Colquhoun + Burns)



OPIOID EQUIVALENCY MEASURES @ MPOG

Opioid Equivalency: A Tale of 3 Hip Replacements

Case 1 Totals:
 Midazolam 2mg IV
 Fentanyl 50mcg IV
 Propofol 200mg IV
 Esmolol 30mg IV
 Hydromorphone 1mg IV
 Ondansetron 4mg IV
 Diphenhydramine 25mg IV

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 Propofol 200mg IV
 Esmolol 30mg IV
Hydromorphone 1mg IV
 Ondansetron 4mg IV
 Diphenhydramine 25mg IV

Case 2 Totals:
 Fentanyl 250mcg IV
 Propofol 120mg IV
 Dexmethasone 4mg IV
 Ondansetron 4mg IV

Case 2 Totals:
Fentanyl 250mcg IV
 Propofol 120mg IV
 Dexmethasone 4mg IV
Morphine 4mg IV
 Ondansetron 4mg IV

Case 3 Totals:
 Bupivacaine 0.75% 1.6ml
 Morphine 250mcg Spinal
 Diphenhydramine 25mg IV
 Dexmethasone 4mg IV
 Propofol 300mg IV

Case 3 Totals:
 Bupivacaine 0.75% 1.6ml
Morphine 250mcg Spinal
 Diphenhydramine 25mg IV
 Dexmethasone 4mg IV
 Propofol 300mg IV

Drug / Unit	Route	Conversion Factor
Fentanyl / mcg	IV	0.05
Morphine / mg	IV	2
Morphine / mcg	Spinal	0.04
Hydromorphone / mg	IV	20

Case	OME Total
1	22.5
2	20.5
3	10

Comparisons

- Compare Similar Cases: Limited by CPT Code “Buckets”
Not Exhaustive List of Cases
Focus on “High Volume” Cases
- Adjusting for Case Length: Reported based on Average Case Length
- Adjusting for Patient Factors: Reported based on 70kg patient

Opioid Equivalency Dashboard

CARDIAC

Average administration: Based on a 6.7 hour case and 70kg patient (mg morphine IV)

45 Average (all sites) 93

SPINE

Average administration: Based on a 3.3 hour case and 70kg patient (mg morphine IV)

15 Average (all sites) 21

UPPER ABDOMEN

Average administration: Based on a 3.1 hour case and 70kg patient (mg morphine IV)

19 Average (all sites) 25

LOWER ABDOMEN

Average administration: Based on a 2.7 hour case and 70kg patient (mg morphine IV)

16 Average (all sites) 23

HYSTERECTOMY

Average administration: Based on a 3.7 hour case and 70kg patient (mg morphine IV)

16 Average (all sites) 25

KNEE/POPLITEAL

Average administration: Based on a 2.5 hour case and 70kg patient (mg morphine IV)

9 Average (all sites) 13

HIP

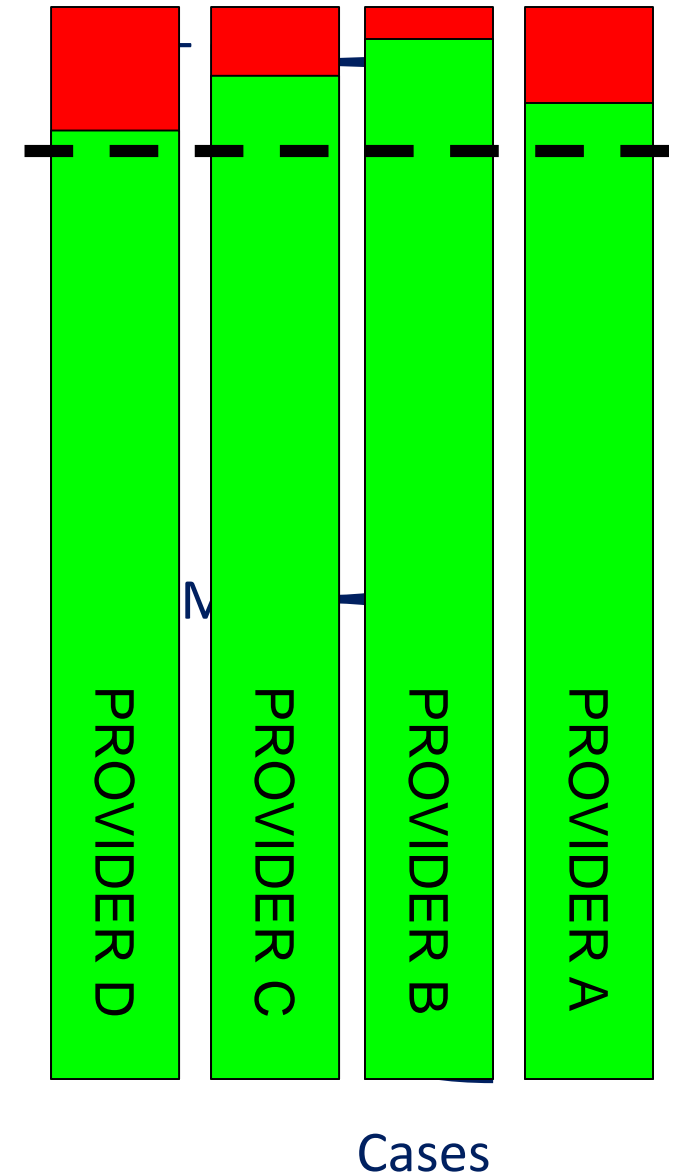
Average administration: Based on a 2.5 hour case and 70kg patient (mg morphine IV)

8 Average (all sites) 15

CONSIDERATION OF VARIABILITY NOT BINARY BENCHMARKS

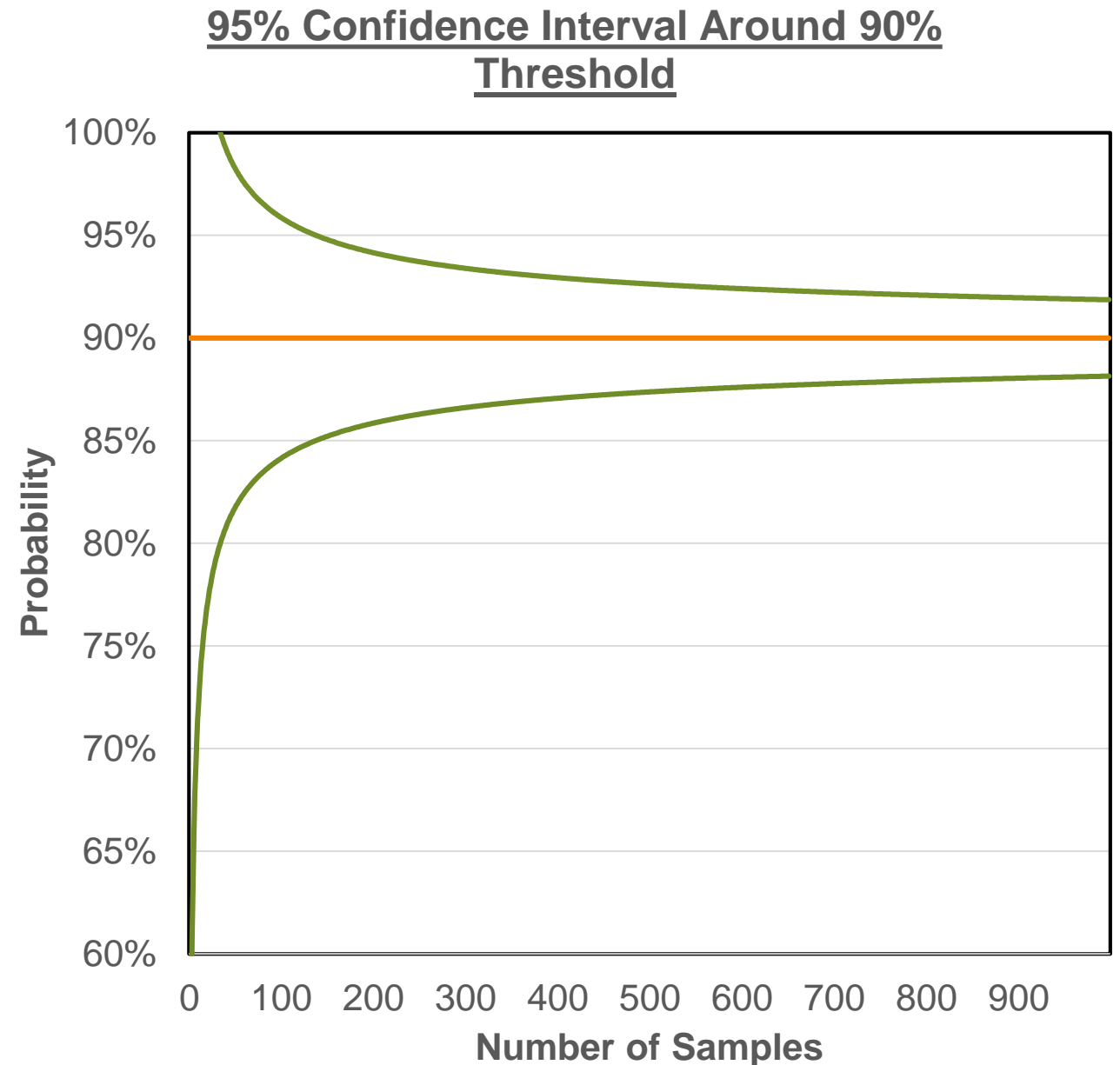
Our Current Measures

- Our threshold is typically 90%
- This allows 10% to be outlier cases:
 - Errors in documentation
 - “Edge cases” not factored into measure design
 - Exceptions to the “rule”
 - If cases fail... need to ask WHY?
 - Also non-standard factors
- All of these hypothetical providers MET THRESHOLD
 - We don’t make differentiations between them
 - Where is the opportunity to change our practice?




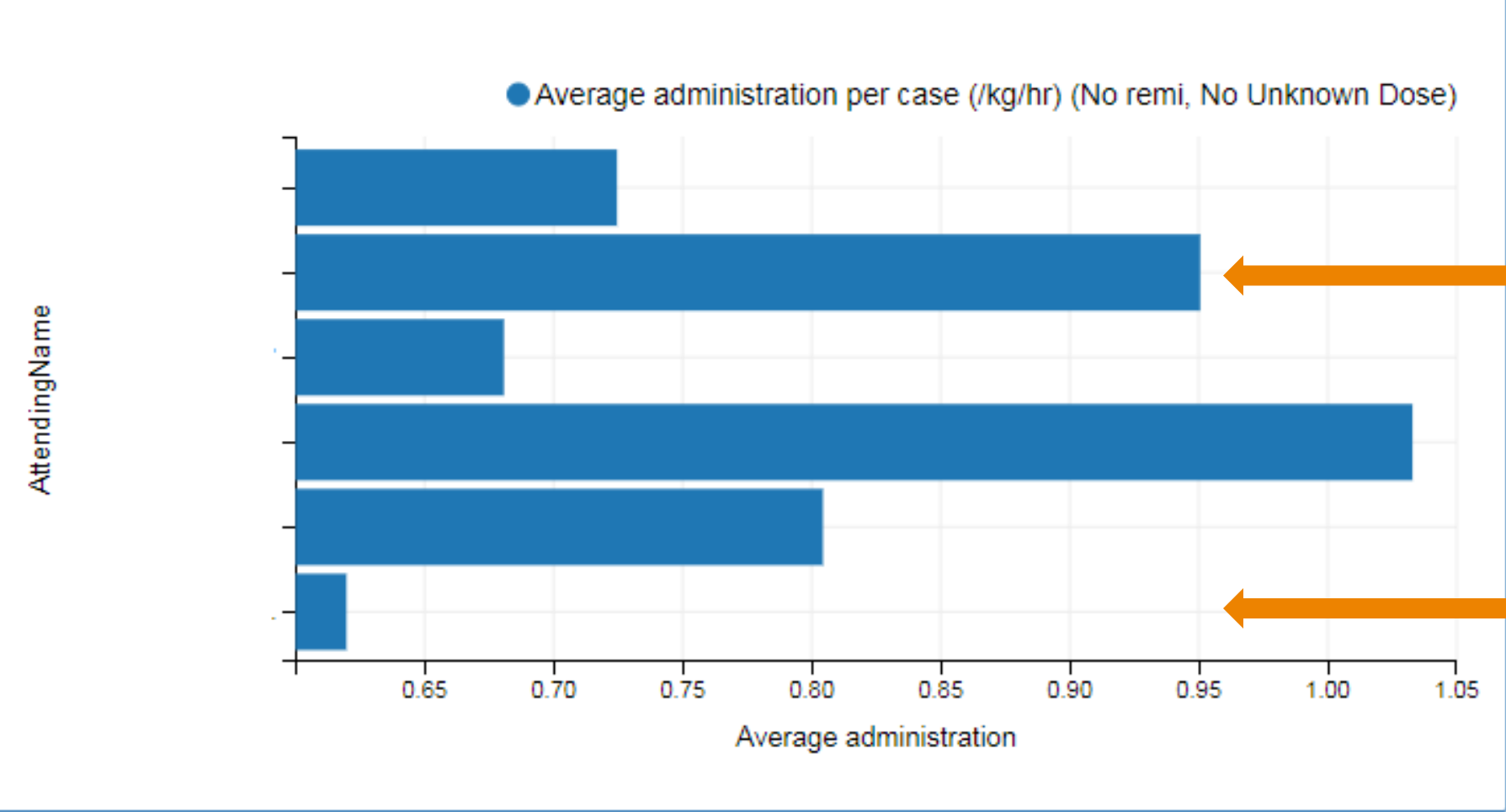
Current Context

- Many providers are reliably at or above threshold for many of our measures.
- Differences of 1-2% are not significant until VERY HIGH sample sizes encountered
- DECISION: Where to focus our quality management energy?

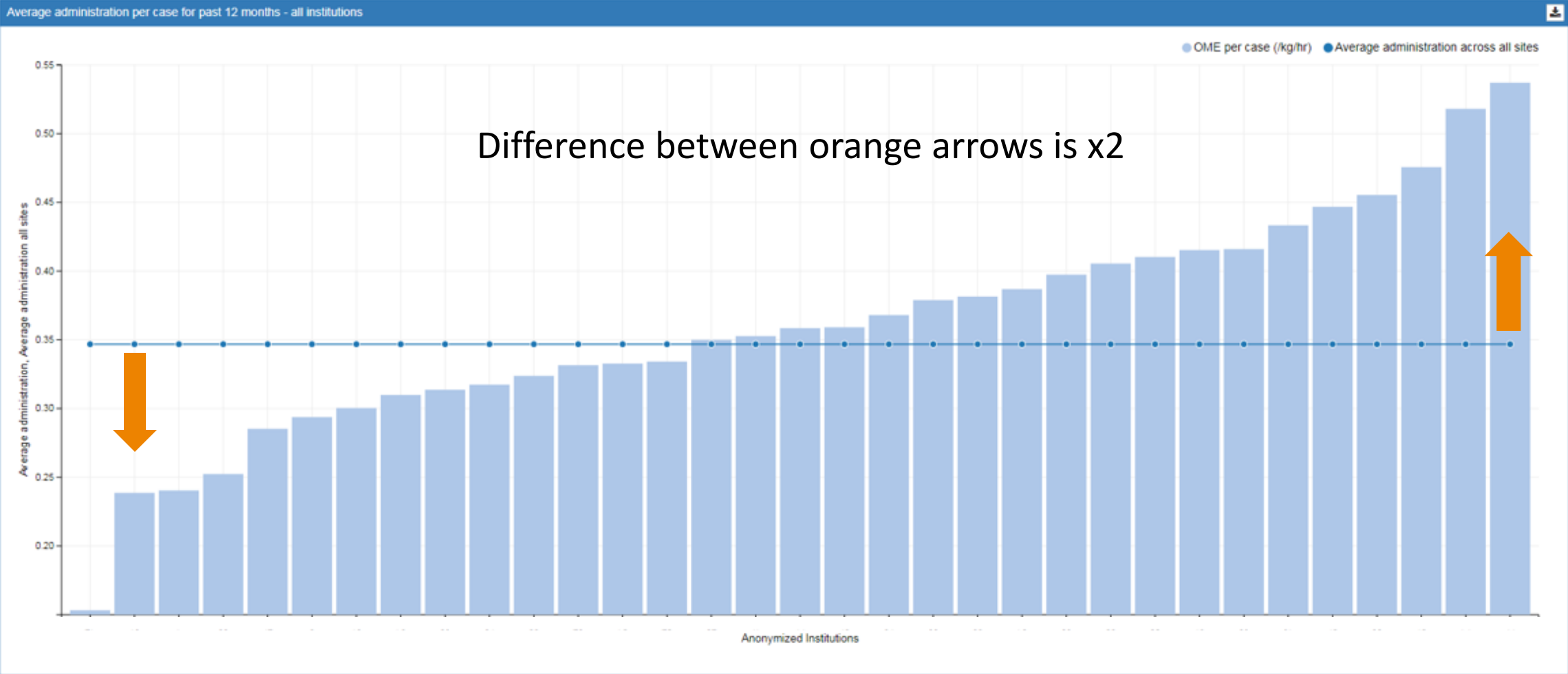


Dashboard: Within Institution Variability

Average administration (per case) - by attending - over past 12 months 



Dashboard: Between Institution Variability



IMPLICATIONS FOR MPOG RESEARCH

Limitations of OME

- OME is a clinical concept designed around cross substitution
- Route of administration makes a big difference in potency
- Drugs with very long or very short clinical half lives is poorly reflected
- All of this is dependent on accurate documentation at source

Building From This

- OMEs already in use as part of EOS study
- Research is demanding more sophisticated handling of our data
- OME is first of many of these equivalence measures:
 - Vasopressors
 - Local Anesthetics
- Goal is to build summary measures which are useful
 - What % of a case was an epidural in use for
 - What is the average MAC of anesthesia for a case

Thank you