

### **Postoperative Pain** Profiles, **Analgesic Use**, and

### Transition to Chronic Pain and Excessive and Prolonged Opioid Use Patterns

<u>Kuck K</u>, <u>Naik BI</u>, <u>Saager L</u>, Avidan M, Aziz M, Bledsoe A, Boroda S, Brummett C, Cummings K, Domino KB, Durieux ME, Gaudet J, Johnson KB, Junkins S, Kheterpal S, Pace NL, Paganelli W, Posner K, Rijsdijk M, Shanks A, Stuart AR, Thomas DA, van Dijk J, Wanderer J, Zimmerman J





#### **Research Manager**



Ami Stuart, PhD

#### **Participating Site Pls**



Cleveland Clinic

Ken Cummings, MD







Bhiken I. Naik, MD



John Gaudet, MD





Karen B. Domino, MD



Chad Brummett, MD



Jon Wanderer, MD



Michael Avidan, MBBCh



Michael Aziz, MD



Bill Paganelli, MD, PhD



Donna-Ann Thomas, MD



#### Aim 1

Historical View of Intraoperative Pain Management

### Aim 2

<u>Survey</u> Patient and Pain Management Data Pre-Op Through Post-Discharge

### Aim 3

<u>Determine Factors</u> for Post-Discharge Pain Profiles and Opioid Consumption Patterns



#### **9 Million Cases**



#### **EXCLUDE**

- Age < 18 yrs
- Date of Surgery < 2012
- Date of Surgery > 2016

#### **4.58 Million Cases**



- missing values on surgery type, OME, sex
- excluded surgery (e.g., minor, outpatient)
- case duration > 10h
- institutions with < 10,000 cases

#### 2.27 Million Cases

• Institutions with missing years 2012 - 2016

### 1.13 Million Cases

AIM 1 (Historical Trends) -- Demographics





**1.13 Million Cases** 



#### Oral Morphine Equivalent (OME)

**Probability Density** 



6

AIM 1 (Historical Trends) -- Opioids by Race : DATA

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### Intra-Op Opioids (OME)

**BY RACE** 

(Data)



7



- Standardized OME (ug/kg)
- Age (years)
- Anesthesia Duration (min)
- Anesthesia Technique: Block, General, Neuraxial (counts)
- EmergencyStatus (count)
- Race (counts)
- Sex (counts)
- Remifentanil Infusion (Yes/No Count)
- NonOpioidAnalgesics (Count of Different Medications)
- AIM1 Year
- Type of Surgery

Searle, Speed et al. Population Marginal Means in the Linear Model: An Alternative to Least Squares Means. The American Statistician Vol 34(4) 1980

AIM 1 (Historical Trends) -- Opioids by Race : Linear Multivar Linear Regression











### # of Non-Opioids Administered Intra-Operatively



#### Intra-Op OME over Time



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## Aim 1

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#### 12 Participating Sites 1136 Enrolled Patients





#### **Pre-Op:** Persistent or Recurring Pain Over the Last 3 Months



BodyMap\_20180717.pdf











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### **Pre-Op: Are You Currently Using Pain Medication ?**

(Missing: 1.8%)





#### Three Months: Currently Taking Opioids





#### **Opioid Use at 3 Months**

vs Pain at Surgical Site



Aim 3 -- Risk Factors

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#### Three Months: Currently Taking Opioids

-- by Age --





#### Three Months: Currently Taking Opioids

-- by Intra-Op OME --



#### SUMMARY, NEXT STEPS

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AIM 1	INTRA-OP OME	• (↓) 20: • Differe • OME <sub>w</sub>
	INTRA-OP NON-OPIOIDS	<ul><li>Media</li><li>Consta</li></ul>

- 12 to 2017
- ent by Race
- <sub>/omen</sub> > OME<sub>Men</sub>
- n = 1
- ant 2012 to 2017

 65% Chronic Pain m **PRE-OP** Q 44% Take Pain Medication 2 AIMS THREE • 70% Still Take Opioids **MONTHS** 50% Without Pain Still Do

**Trends over Time By Institution** 

- **Missing Data by** Institution
- **Risk Factors**



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Thank you. Questions !