



# Streamlining Care for VOE in the Pediatric Emergency Department

## A Quality Improvement Initiative

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# Financial Disclosures

- I have none to disclose





# SCD Painful Episodes



- Most common reason for emergency department visits and hospital stays
- Significant impact on quality of life
  - Missed school – academic performance
  - Missed work for parents – loss of job
- Emergency department care
  - Pain not treated as emergency
  - Adolescents and adults: Can be treated as drug seekers, pain level questioned

# Pediatric ED at BMC



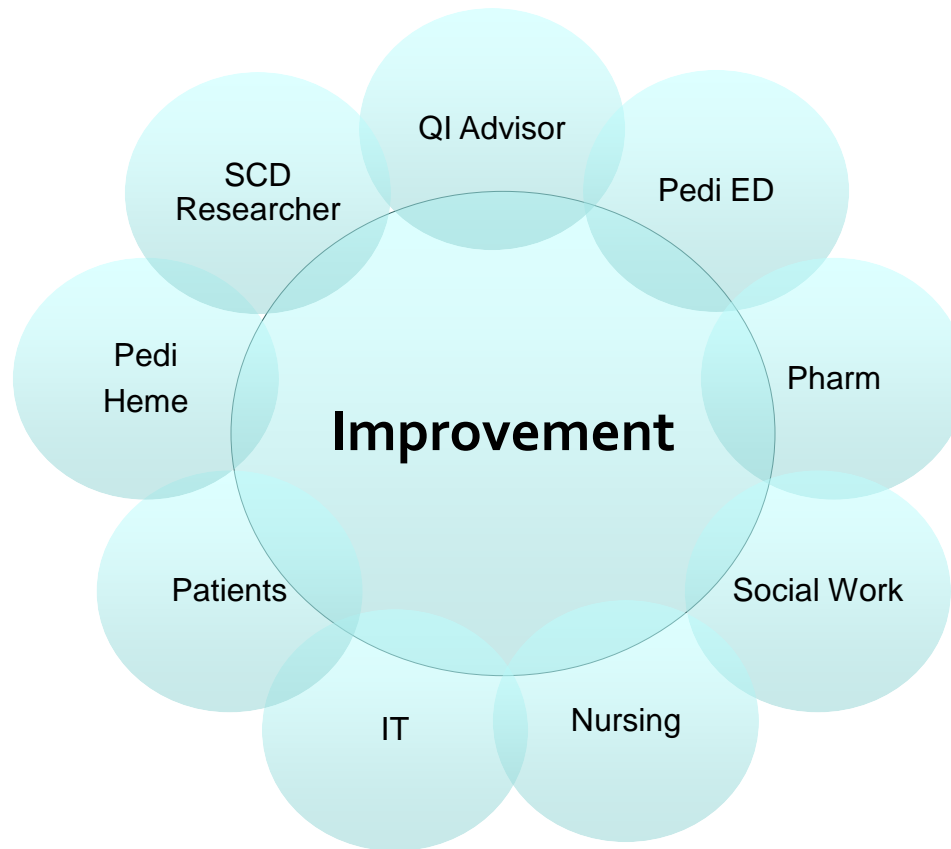
- Level 1 Trauma Center, 27,500 visits/yr
- Safety net hospital: >80% Medicaid
- Clinical Setting
  - 16-bed ED (no day hospital available)
  - RN Staff: 5 acute beds staffed by 1-2 nurses/shift
  - MD Staff: 1-2 Pediatric ED attendings, 1 fellow and 4-5 residents
- ~200 children with sickle cell disease

# Every system is perfectly designed to get the results it gets

-Paul Batalden



# Multidisciplinary Team





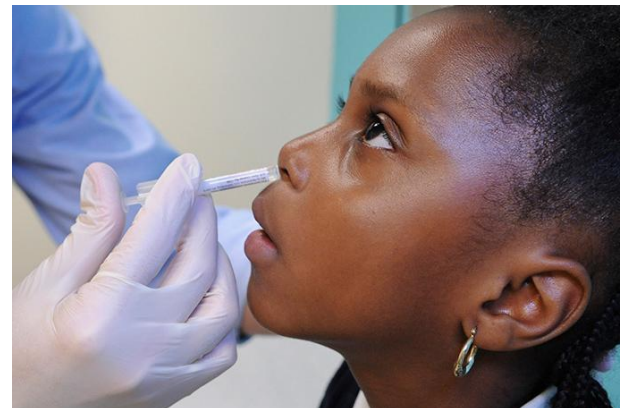
# Pre-intervention Data

- Patients were triaged and put in room in <10 minutes
- IV access can be problematic
  - Hard to give timely pain medicines
  - Most took oral pain medicines appropriately before coming to ED
- Time to 1<sup>st</sup> IV dose: **50 mins**
- Time to 2<sup>nd</sup> IV dose: **1 hr 45 mins**

# Step 1: Initial Pain Medicine

## ○ Intranasal Fentanyl

- Used in ED to control acute pain due to fractures, abscess drainage
- Onset 5-10 mins, lasts ~30 mins
- Can give 2 doses, 10 mins apart
- *Approved by BMC P&T Committee*





## Step 2: SCD Pain Protocol

- Standardize SCD acute pain care, like acute asthma care
  - Medications checked/re-checked quickly
  - Info on when, how often to provide
- Directs timely care to patient, minimizes disruption of ED flow



Place Patient Sticker Here

# Sickle Cell Patient with Pain?

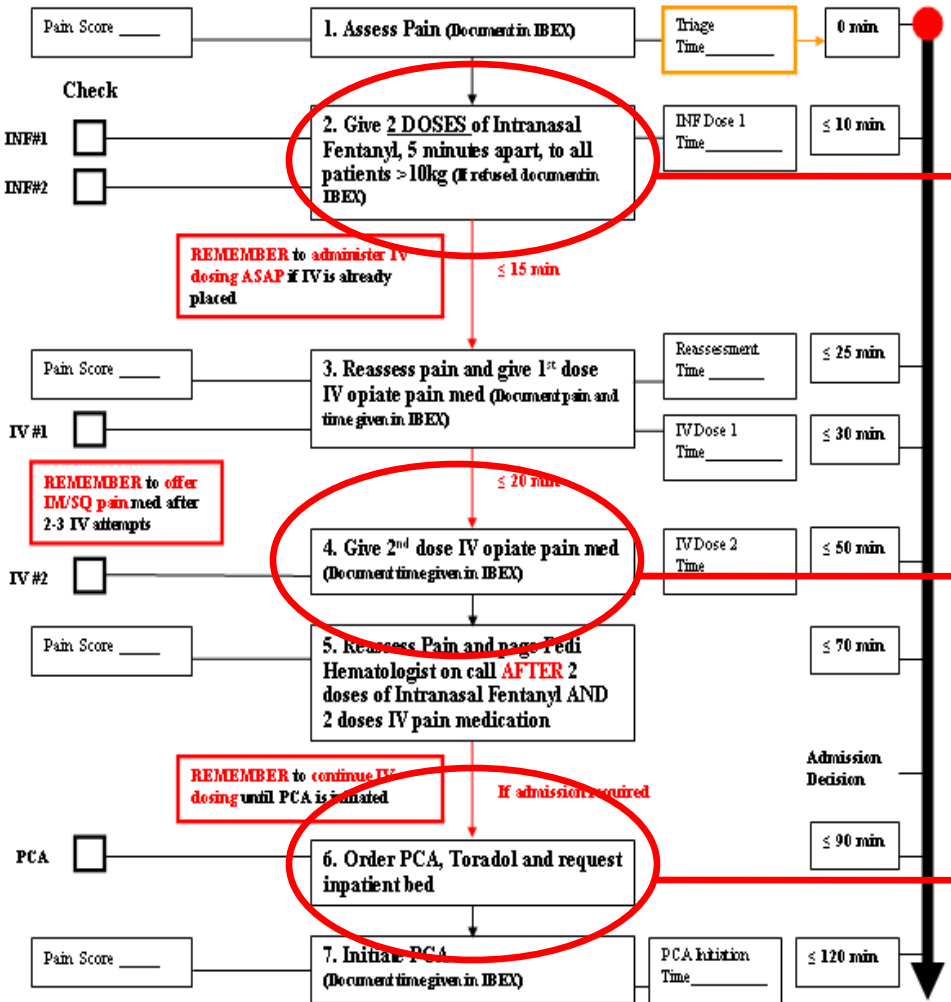
Last Updated 1/19/17

Use Excel spreadsheet for all dose calculations

## Moderate/Severe (Pain $\geq 5$ )

See Reverse for MILD pain

Time from Triage



2 doses IN Fentanyl

2 doses IV Opioid

To PCA/Admit or Oral/DC

Date of Visit: \_\_\_/\_\_\_/\_\_\_ Triage Time: \_\_\_\_\_  
 RN Print Name: \_\_\_\_\_  
 RN Signature: \_\_\_\_\_  
 MD Print Name: \_\_\_\_\_  
 MD Signature: \_\_\_\_\_

If Intranasal Fentanyl not given:  
 Refused  
 IV placed

Please help us learn reason(s) for delay:  
 Imaging  IV access  
 Other: \_\_\_\_\_

# Step 3: Pain Med Calculator

- Easy access: Located on Pedi ED Intranet page AND in EMR
- Enter patient's age and weight
  - Calculates IV, intranasal, PCA, oral doses
- Print out to be used by MD (order) and nurse (check dosing)



[ Place patient sticker here ]



**Sickle Cell Pain Medication Calculator**  
Complete Blue Cells (Weight and Age) to Calculate Dose

Enter Patient Weight (kg)	30
Enter Patient Age (yr)	10

**Enter Age and Weight**

**IntraNasal Fentanyl (not used in patients <10 kg)**

Dose	~1.5 mcg/kg; round to closest 10 mcg	0
Volume	50 mcg/mL	0

**For Moderate - Severe Pain (IV/IM/Subq)**

IV Morphine (mg)	0.1 mg/kg 10 mg MAX/Dose	0.0
IV Hydromorphone (mg)	0.015 mg/kg 1.2 mg MAX/Dose	0.0
IV Ketorolac (mg)	0.5 mg/kg <12 yr: 15mg MAX/Dose ≥12yr: 30 mg MAX/Dose	0

**PCA Orders**

	Morphine		Hydromorphone	
	Dosing	Dosage	Dosing	Dosage
Loading Dose mg/kg	0.05	0.0	0.008	0.0
Basal Rate (mg/kg/hr)	0.02 - 0.04 mg/kg/hr	0.0 - 0.0	0.003 - 0.007 mg/kg/hr	0.0 - 0.0
PCA Dose (mg/kg)	0.015 mg/kg	0.0	0.0025 mg/kg	0.0
Lockout Period (min)	≥ 6 min	6	≥ 6 min	6
One hr Limit	0.17 - 0.19 mg/kg/hr	0.0 - 0.0	0.028 - 0.032 mg/kg/hr	0.0 - 0.0

**Oral Medications**

**Short Acting Opioids**

<b>In ED, use: Oxycodone</b> (immediate release) 5 mg, 15 mg tab 5 mg/5 mL solution	0.1 – 0.2 mg/kg MAX 15 mg/dose	0.0 - 0.0
Morphine (immediate release) 15 mg, 30 mg tab 10 mg/5 mL solution	0.2 – 0.5 mg/kg MAX 60 mg/dose	0.0 - 0.0
Hydromorphone (Dilaudid®) 2 mg tab	0.03 – 0.08 mg/kg MAX 2 mg/dose	0.0 - 0.0

**Long Acting Opioid**  
(not commonly used in patients <50 kg, ck w/Heme)

Morphine (sustained release-MS Contin®) 15 mg, 30 mg, 60 mg SR tab	0.3 – 0.6 mg/kg MAX 60 mg/dose	0 - 0
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**Non-opioid Pain Medication**

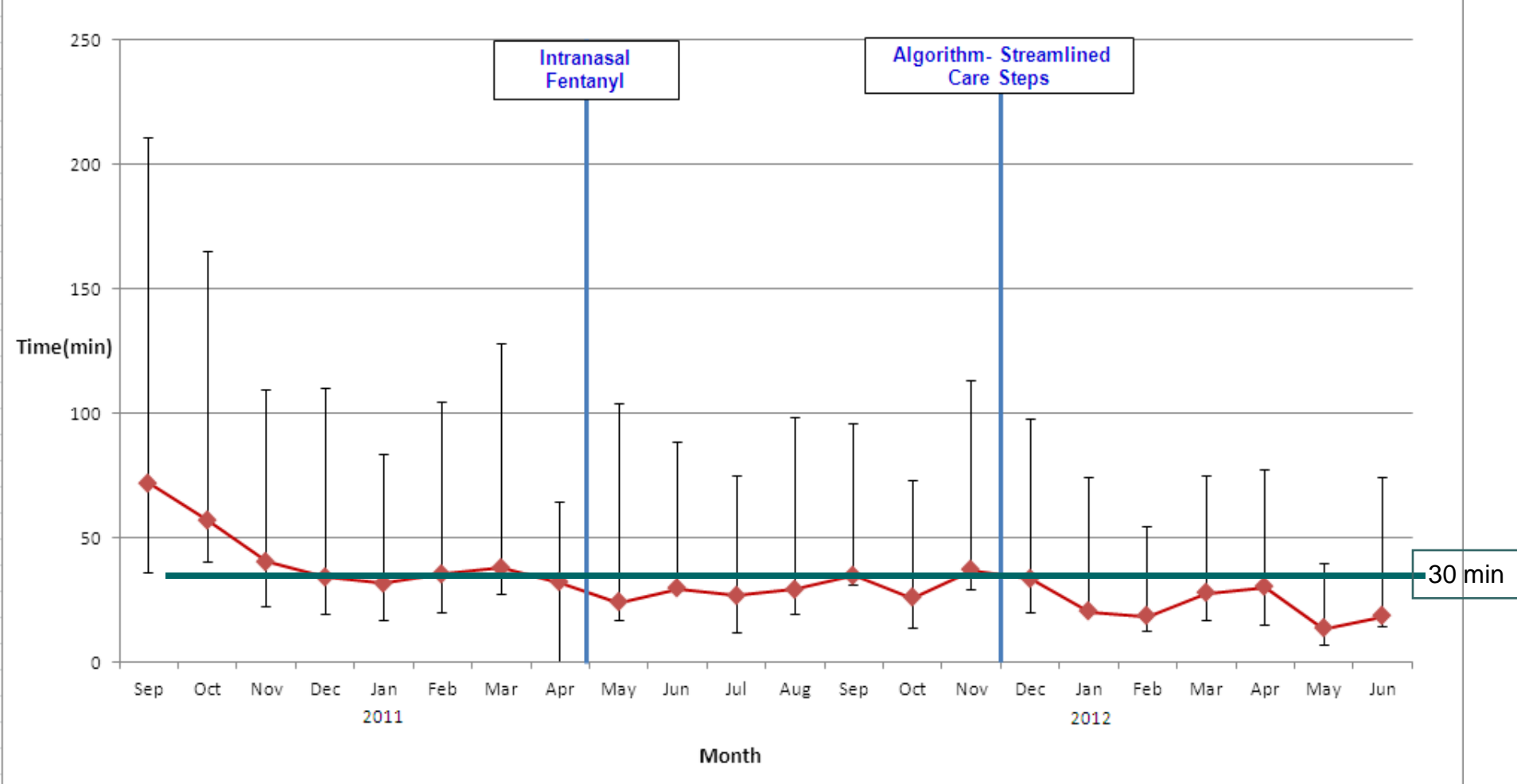
Ibuprofen 200 mg, 600 mg, 800 mg tab, 100 mg/5 mL solution	10 mg/kg MAX 800mg/dose	0
Acetaminophen 325 mg (only form avail. BMC), 500 mg tab 160 mg/5mL	15 mg/kg MAX 1000mg/dose	0

**All Doses Calculated**

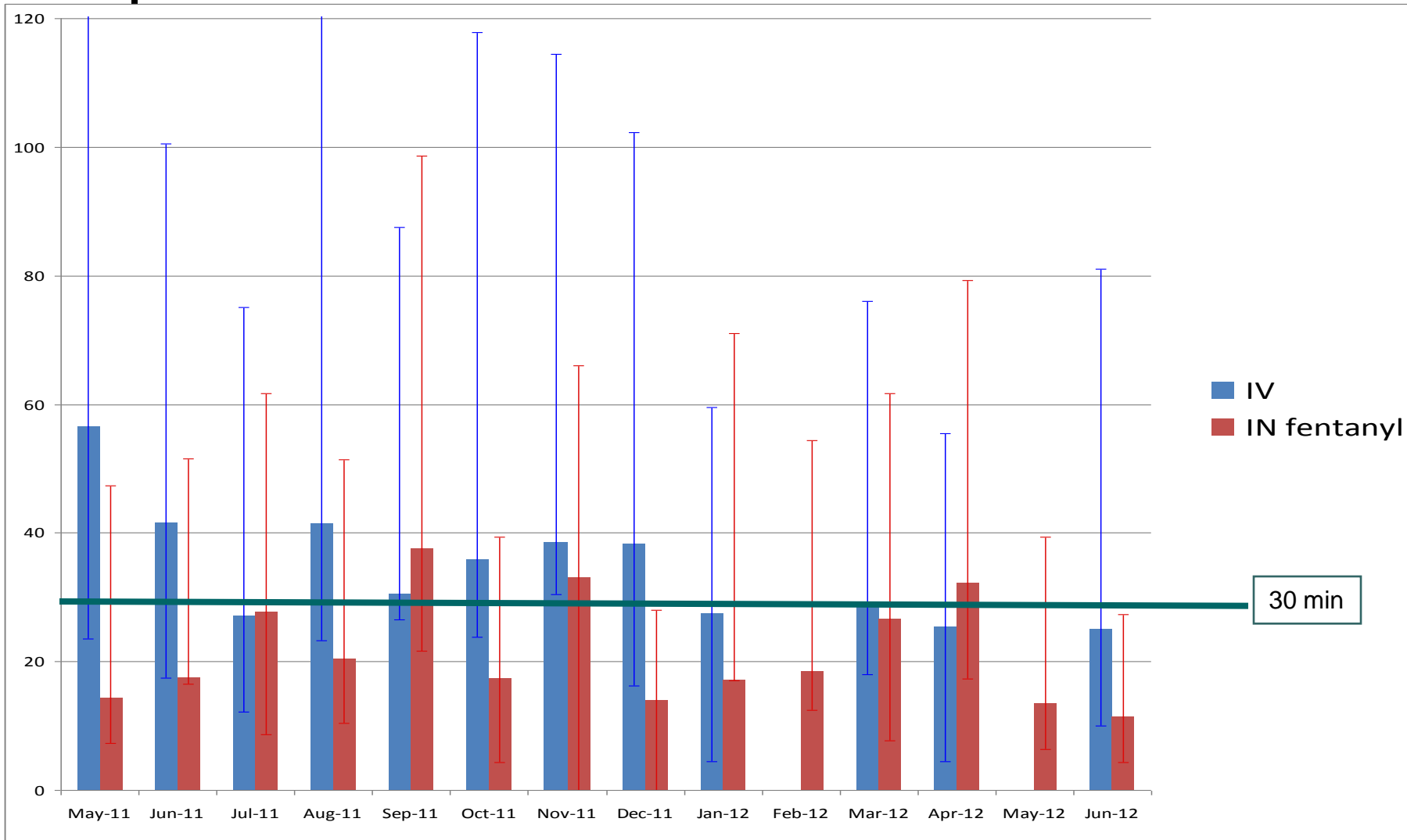
- IV
- Intramuscular
- Subcutaneous
- PCA
- Oral

# Time to First Opioid – IN or IV

Mean Time to First Parenteral Opioid Dose Sept 2010 - June 2012

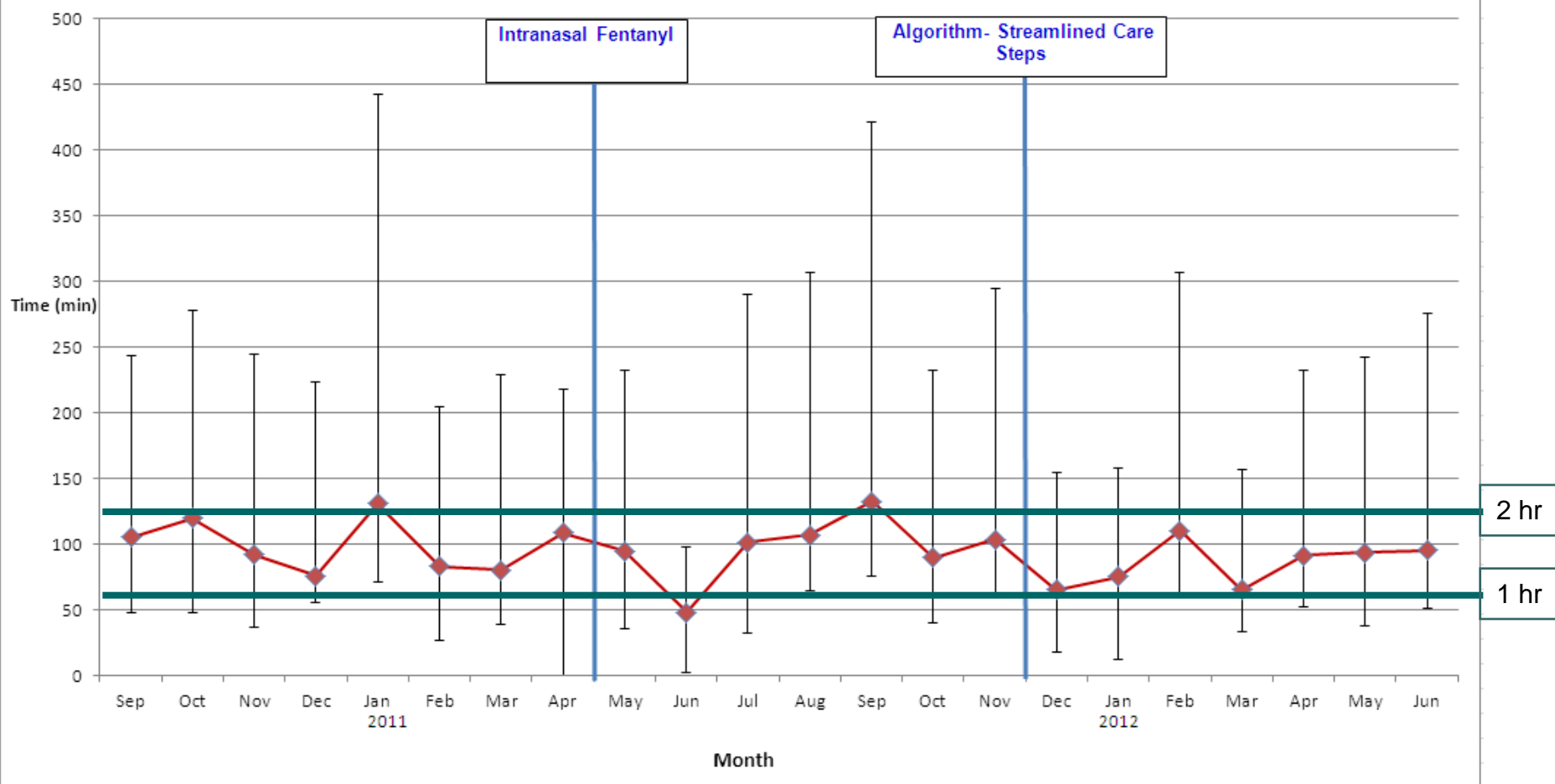


# Time to 1<sup>st</sup> Dose: IN vs. IV

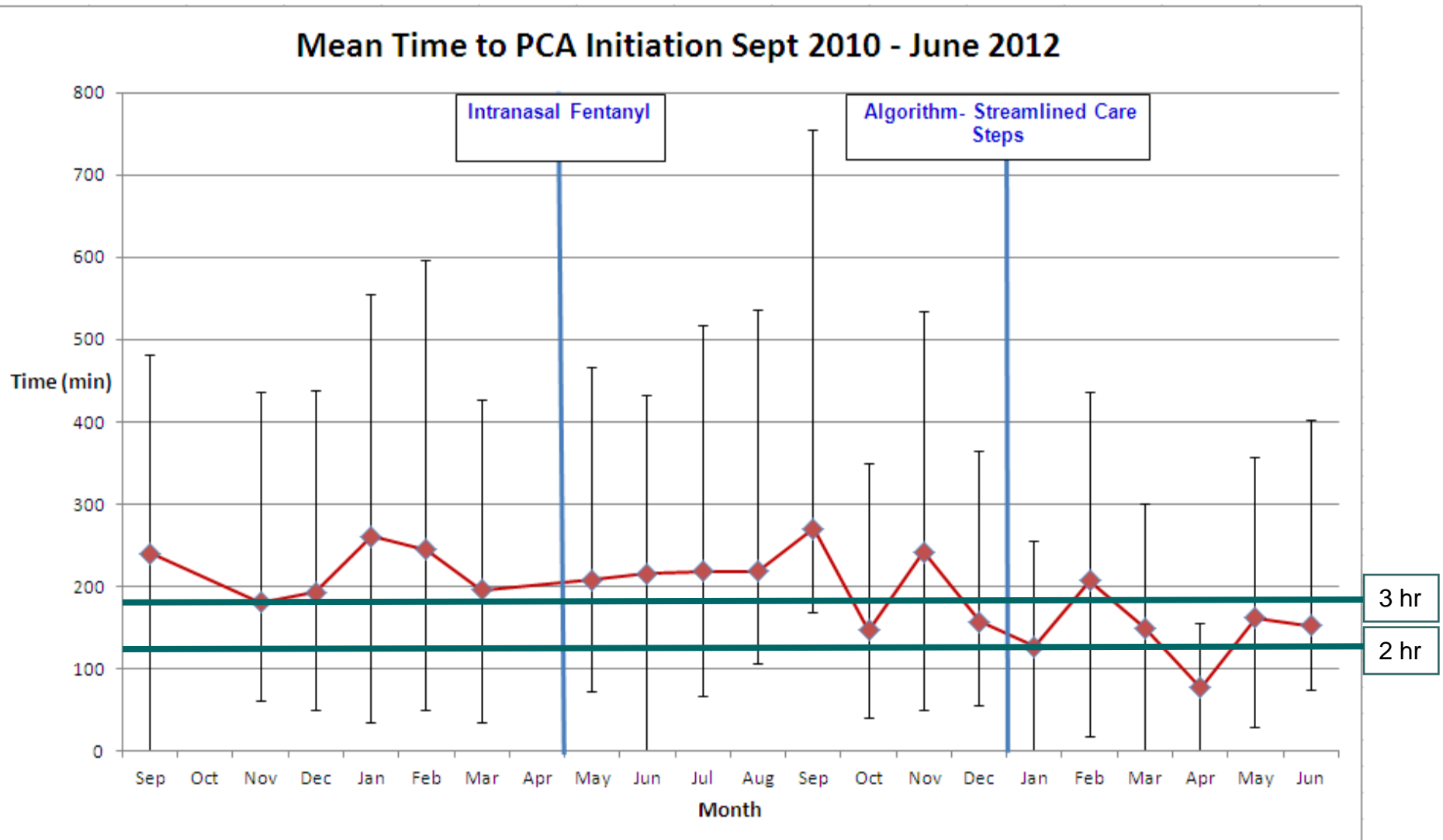


# Time to Second IV Dose

Mean Time to Second Opioid IV Dose Sept 2010 - June 2012



# Time to PCA Initiation







# Future Work

- Individualized vs. Standardized care
- Time to pain med vs. Time to pain control
- Patient experience and satisfaction
- Pediatric ED vs. Adult ED



# Thank you!

○ Questions?

