Principles of pain management

George Ulma, MD

IASP: Definition of Pain

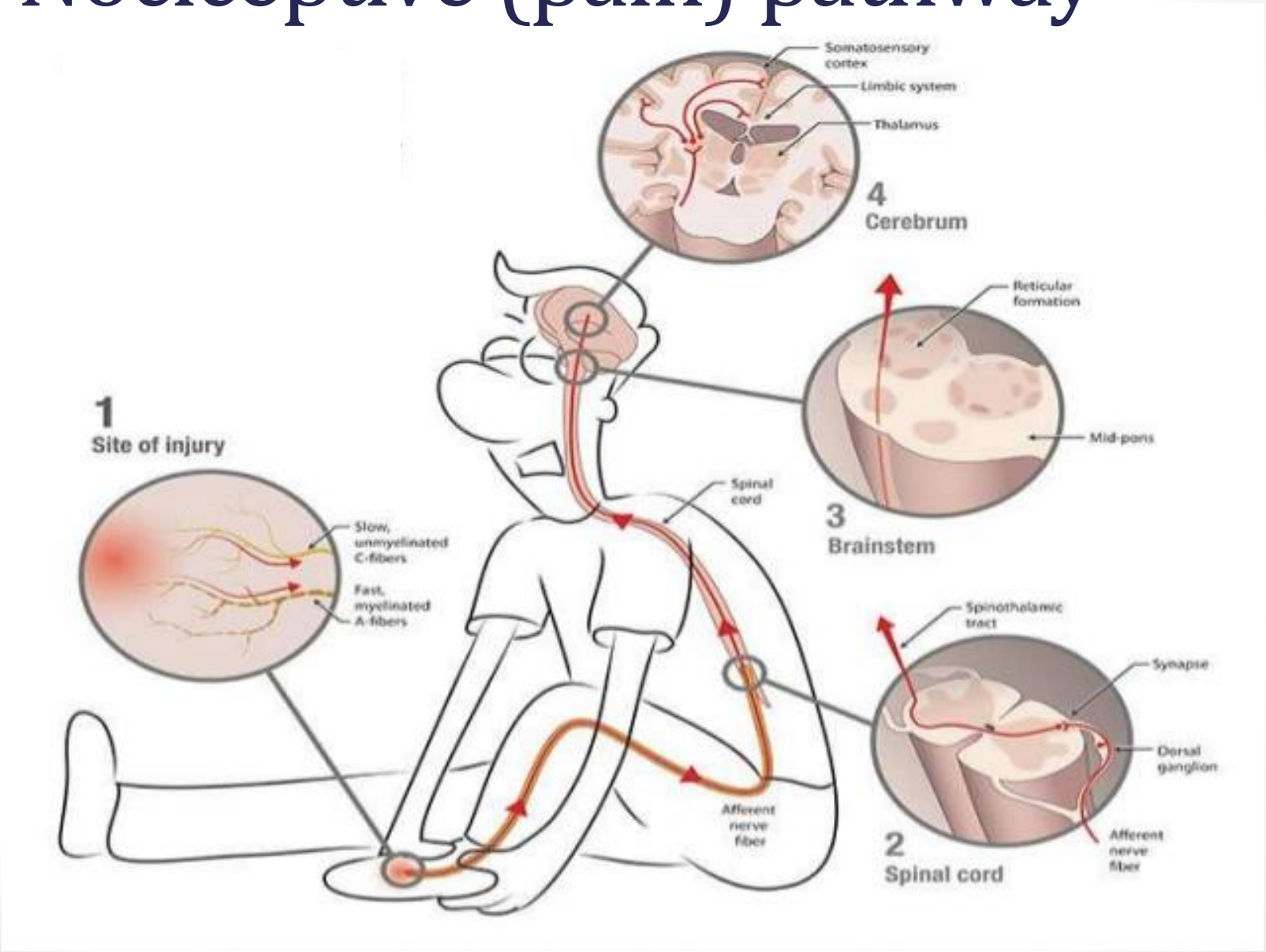
(International Association for the Study of Pain)

"An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"

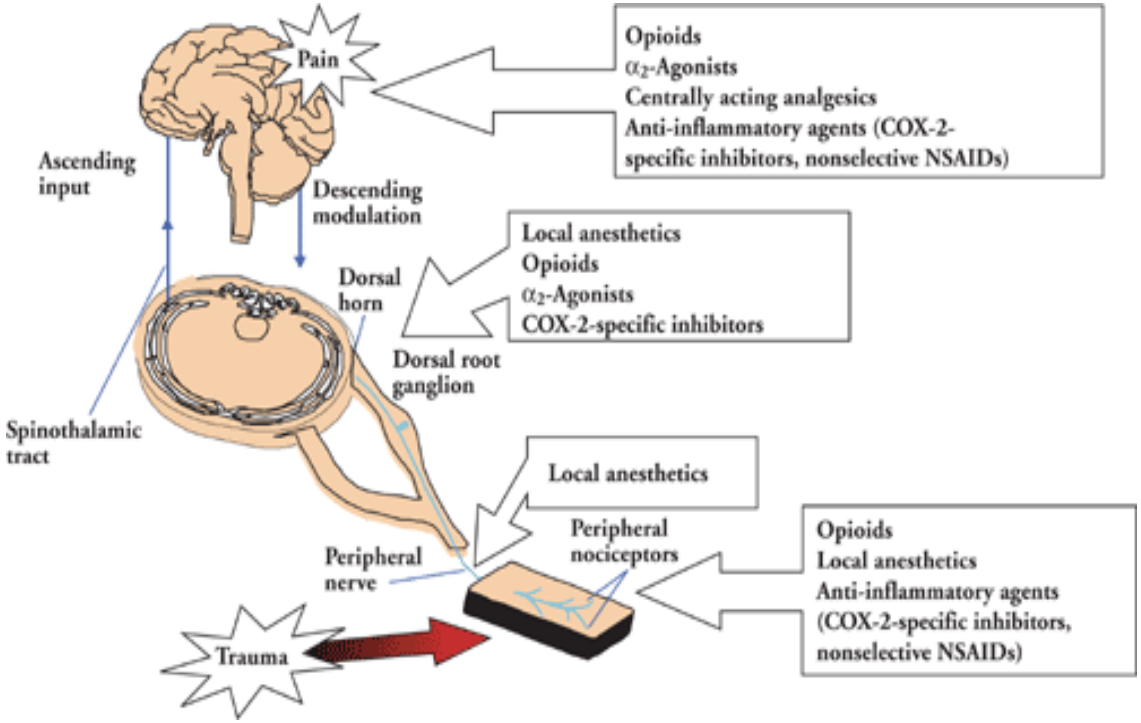
Key points in definition

- Pain is always subjective.
- Every individual learns the application of the word pain through experience early in life.
- It is a sensation that is always unpleasant, and therefore an emotional experience.
- Many people report pain in the absence of tissue damage, or any likely pathophysiologic cause, and there is no way to distinguish their experience from one caused by tissue damage - *but it is still pain.*

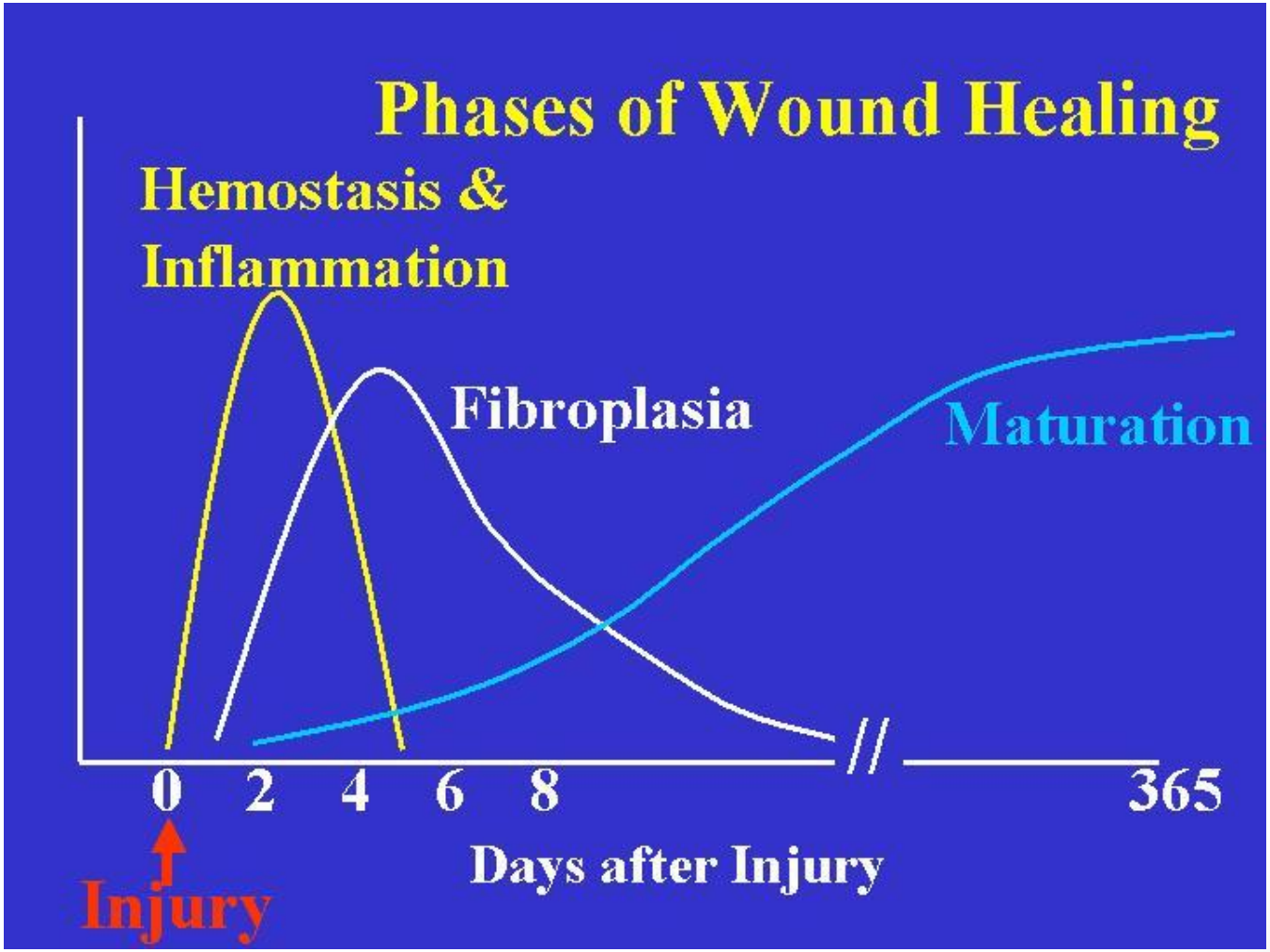
Nociceptive (pain) pathway

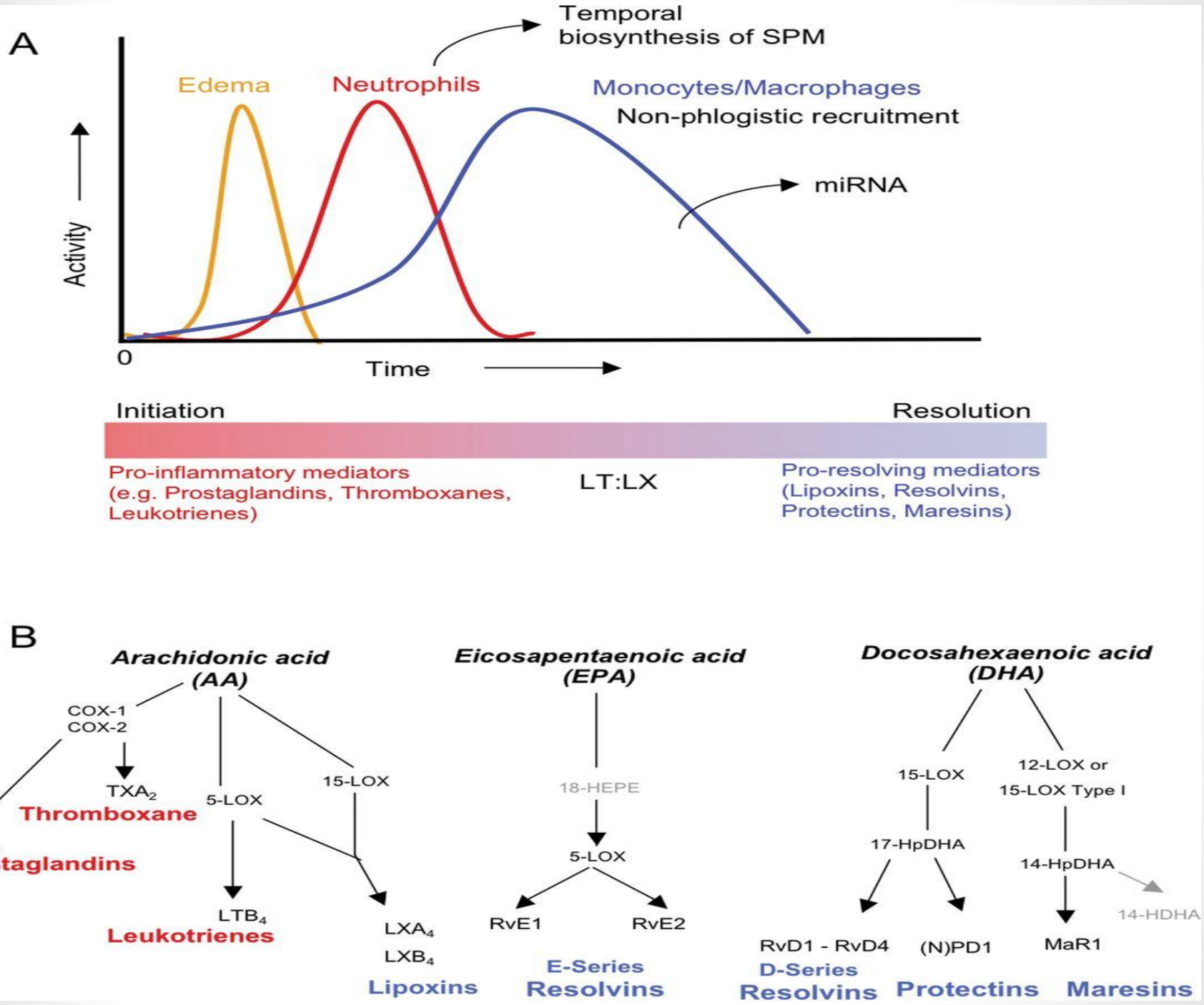


Modifying signal transmission



Acute injury, inflammation, healing curves

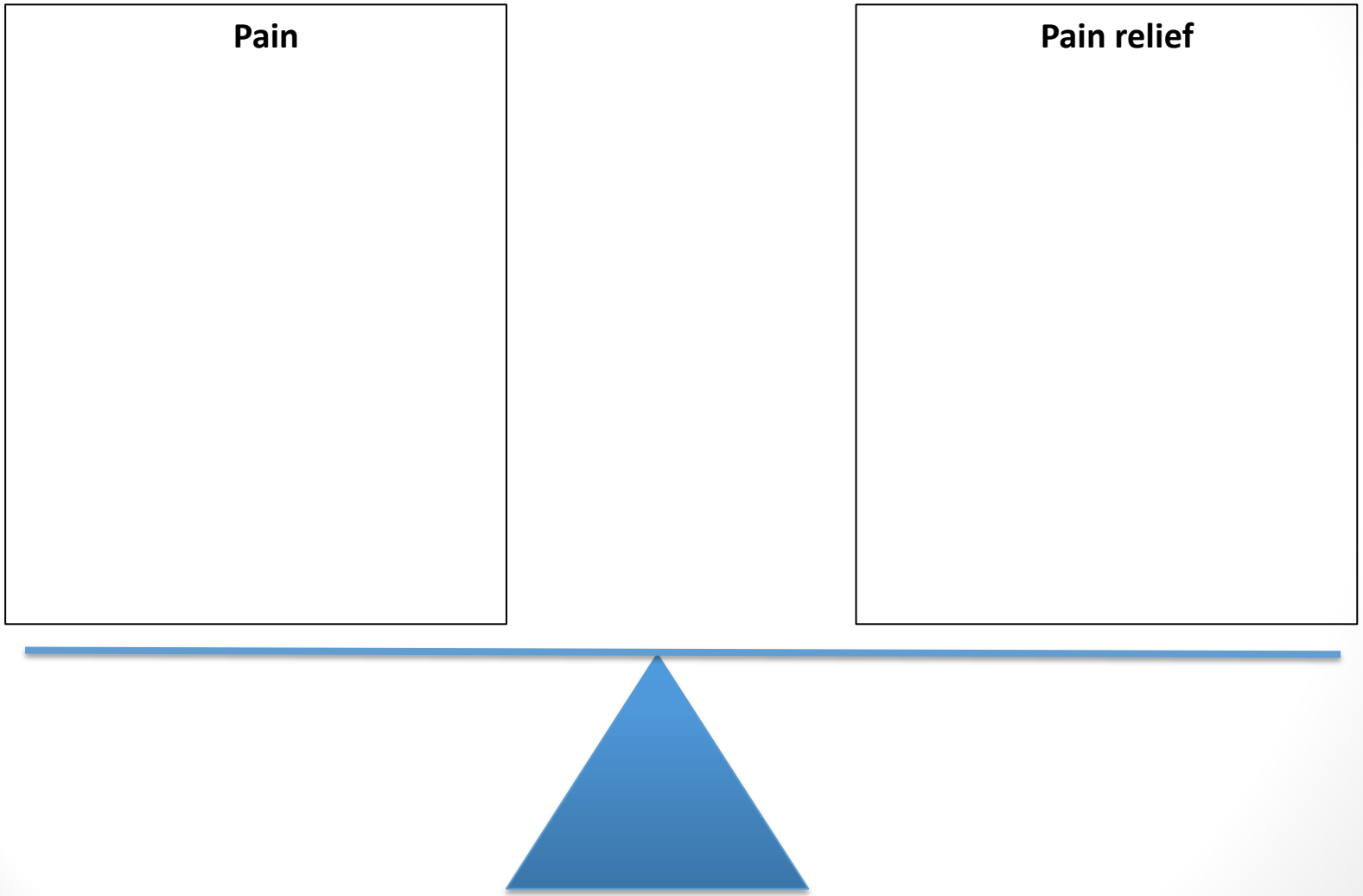



A
Temporal
biosynthesis of SPM
Edema
Neutrophils
Monocytes/Macrophages
Non-phlogistic recruitment
miRNA
Activity
0
Time
Initiation
Resolution
Pro-inflammatory mediators
(e.g. Prostaglandins, Thromboxanes,
Leukotrienes)
LT:LX
Pro-resolving mediators
(Lipoxins, Resolvins,
Protectins, Maresins)
B
Arachidonic acid
(AA)
COX-1
COX-2
TXA2
Thromboxane
PGE2
Prostaglandins
5-LOX
15-LOX
LTB4
Leukotrienes
LXA4
LXB4
Lipoxins
Eicosapentaenoic acid
(EPA)
18-HEPE
5-LOX
RvE1
RvE2
E-Series
Resolvins
Docosahexaenoic acid
(DHA)
15-LOX
12-LOX or
15-LOX Type I
17-HpDHA
14-HpDHA
14-HDHA
RvD1 - RvD4
D-Series
Resolvins
(N)PD1
Protectins
MaR1
Maresins

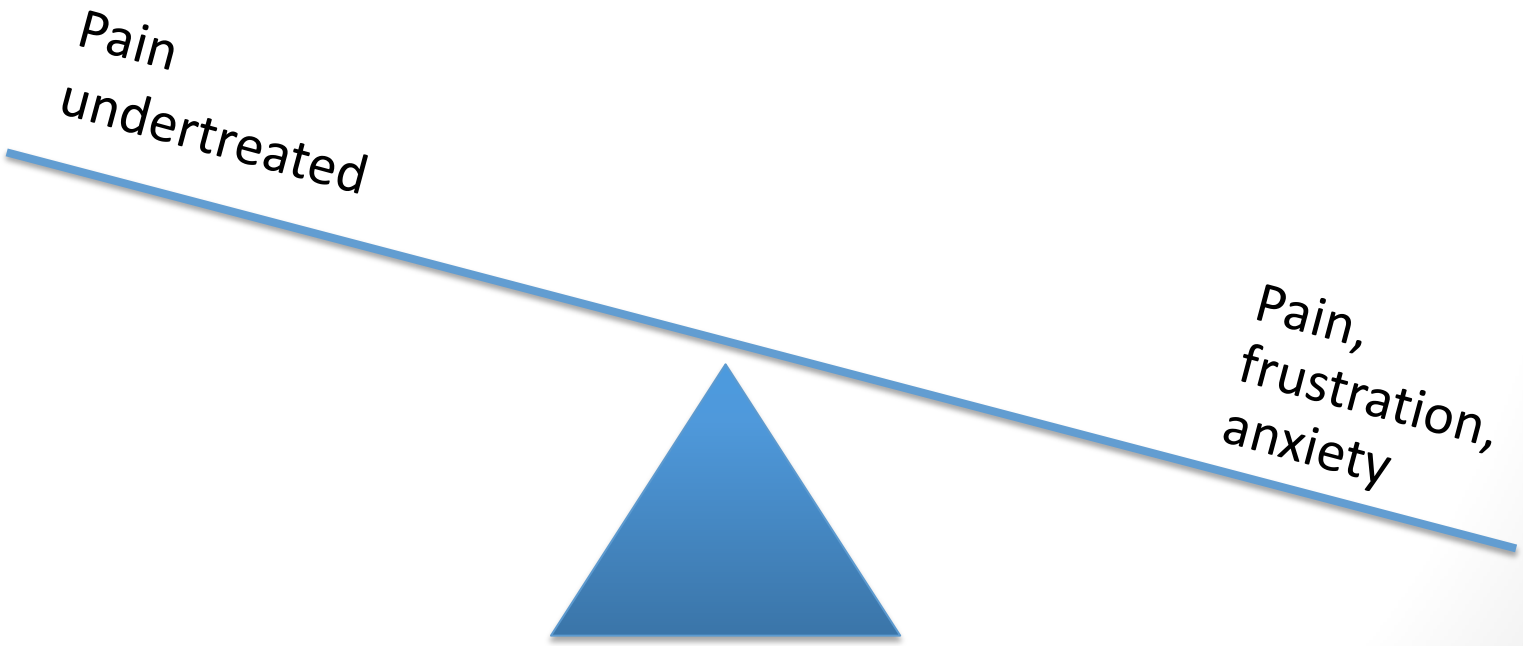
2001 JCAHO statement of pain management standard

- "Pain as the 5th vital sign"
- This required every patient to have their pain level queried, as the perception was that pain was being undertreated
- There are many factors to the opiate crisis but the culture of trying to eliminate all pain has changed the mindset of providers, patients and parents over the past decade.

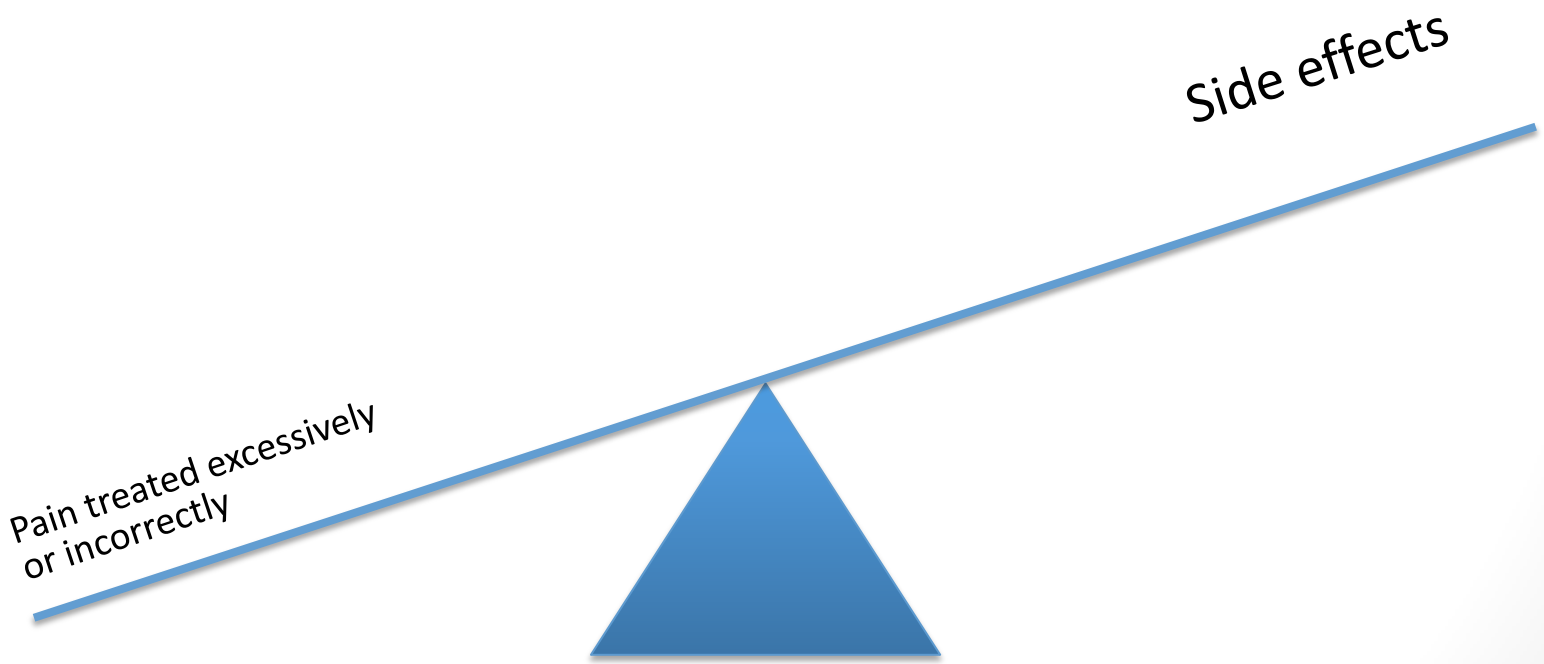
A perfect balance



Unbalanced: under treated



Unbalanced: over treated



A perfect balance

Pain

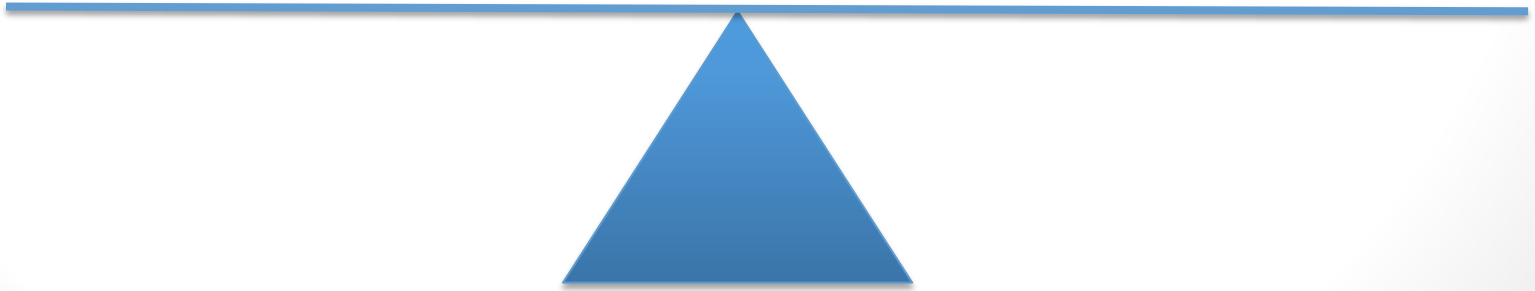
Pain fibers = nociceptors

- Fast (A-delta, “coated”)
- Slow (C, “uncoated”)
- Inflammation and its contribution to ongoing pain
- Muscle spasm
- Anxiety

Caregivers/Family

Previous experience

School/Social



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Pain relief

Setting realistic expectations that not all pain will be eliminated

Acetaminophen/NSAIDs

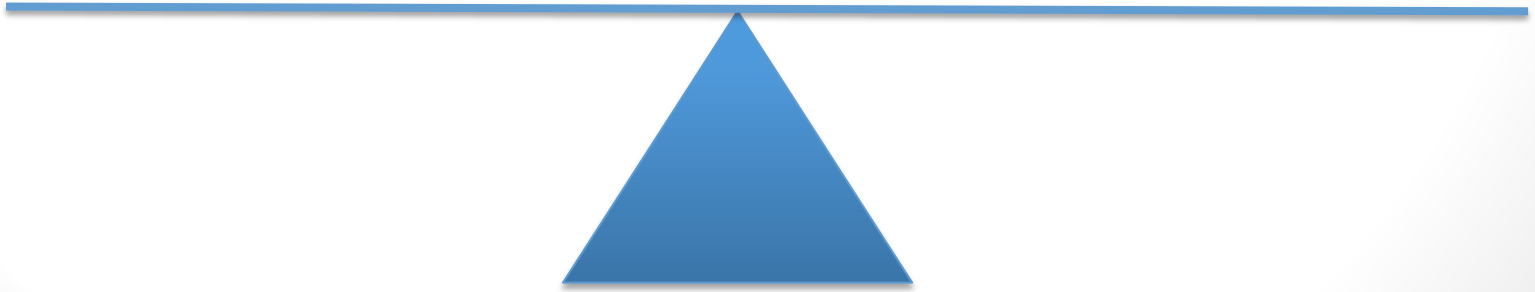
Opiates (mu receptor)

Benzodiazepines

Regional (eg, epidural, long acting regional)

Non pharmacologic:

- Psychological support
- Complimentary (eg, acupuncture)



Old and new drugs

- Tylenol – enteric (multiple formats), IV Tylenol (Ofirmev)
- NSAIDS - ketorolac/celecoxib/naprosyn/ibuprofen
- Benzodiazepines - lorazepam/diazepam
- Membrane stabilizer - gabapentin/pregabalin
- Local anesthetics/nerve blocks - Exparel
- NMDA antagonist – ketamine, bolus or infusion
- α-2 agonist - clonidine/dexmedetomidine
- Opiates - many formulations and deliver modalities

Quality Improvement Timeline for PSF Patients

2/1/17 — 9/1/17

Initiation — Intervention

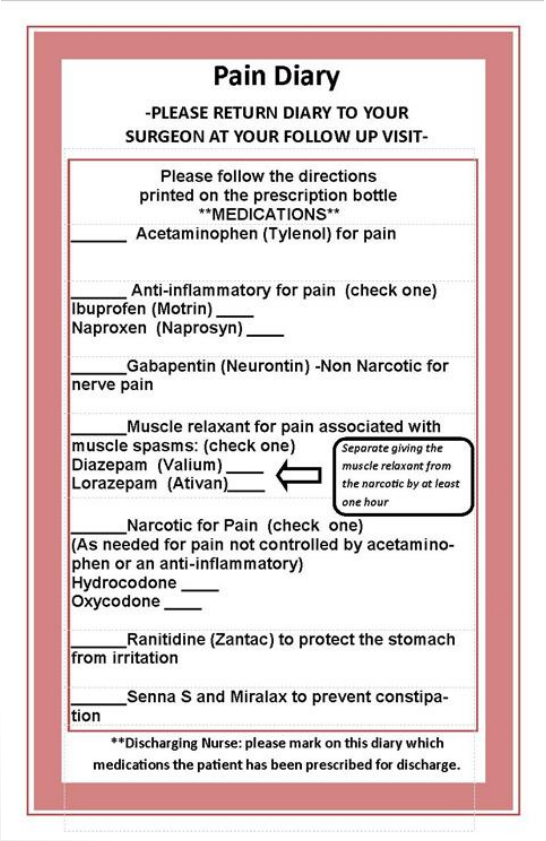
- **Change in regimen:**
  - naprosyn/acetaminophen for primary pain control
  - gabapentin (Neurontin)
  - oxycodone/diazepam only for break through pain
  - Multimodal analgesia
- **Decrease in Prescribed Amount:**
  - oxycodone
  - diazepam
- **Use of Exparel intraoperatively on some patients (about 50% at onset of data collection period)**

Quality Improvement Timeline

Initiation

2/1/17

9/1/17



Pain Diary

-PLEASE RETURN DIARY TO YOUR SURGEON AT YOUR FOLLOW UP VISIT-

Please follow the directions printed on the prescription bottle **MEDICATIONS**

_____ Acetaminophen (Tylenol) for pain

_____ Anti-inflammatory for pain (check one)
Ibuprofen (Motrin) ____
Naproxen (Naprosyn) ____

_____Gabapentin (Neurontin) -Non Narcotic for nerve pain

_____Muscle relaxant for pain associated with muscle spasms: (check one)
Diazepam (Valium) ____
Lorazepam (Ativan)____

Separate giving the muscle relaxant from the narcotic by at least one hour

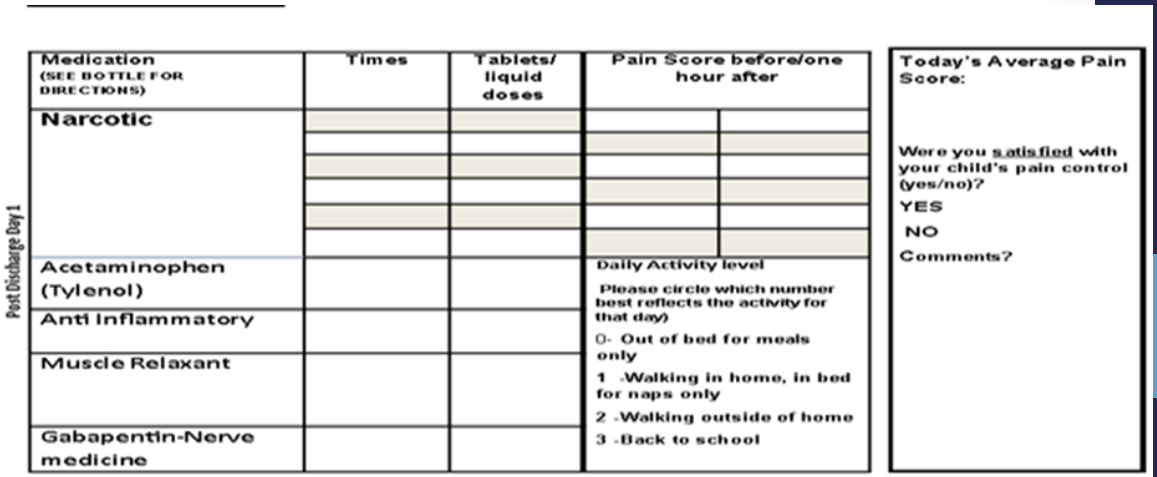
_____Narcotic for Pain (check one)
(As needed for pain not controlled by acetaminophen or an anti-inflammatory)
Hydrocodone ____
Oxycodone ____

_____Ranitidine (Zantac) to protect the stomach from irritation

_____Senna S and Miralax to prevent constipation

**Discharging Nurse: please mark on this diary which medications the patient has been prescribed for discharge.

- Medication Dose
- Pain level
- Activity Level
- Pain control satisfaction



Post Discharge Day 1

Medication (SEE BOTTLE FOR DIRECTIONS)	Times	Tablets/ liquid doses	Pain Score before/one hour after	
Narcotic				
Acetaminophen (Tylenol)			Daily Activity level	
Anti Inflammatory			Please circle which number best reflects the activity for that day)	
Muscle Relaxant			0- Out of bed for meals only	
			1 -Walking in home, in bed for naps only	
			2 -Walking outside of home	
Gabapentin-Nerve medicine			3 -Back to school	

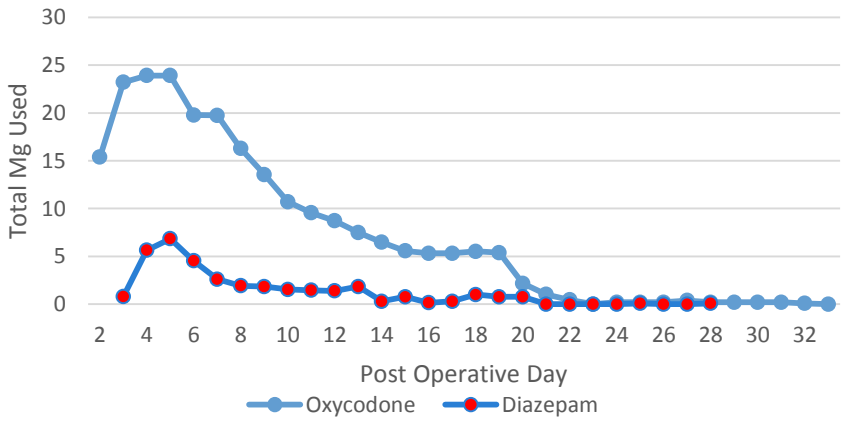
Today's Average Pain Score:

Were you satisfied with your child's pain control (yes/no)?
YES
NO
Comments?

Pre-Intervention Opiate and Benzodiazepine Use

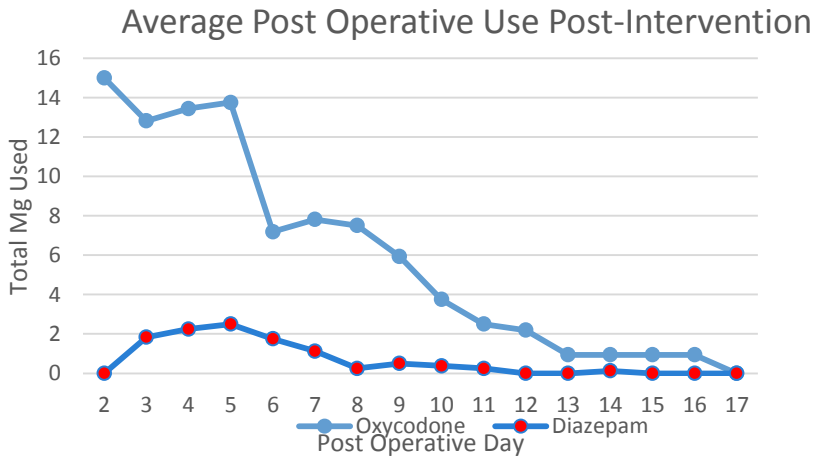
PSF Patients

	Oxycodone		Diazepam	
	Central Tendency	***Range***	**Central Tendency**	***Range***
Amount Used	200mg (40 tabs)	*6 – 129 tabs*	7mg (3.5 tabs)	*0-105 tabs*
Prescribed	400mg (80 tabs)	*27-140 tabs*	60mg (30 tabs)	*0-150 tabs*
Percentage Rx Used	50%	*11-97%*	20%	*0-100%*
Days Used	16.5	*7-33*	6	*0-25*



Post-Intervention Opiate and Benzodiazepine Use

	Oxycodone		Diazepam	
	Central Tendency	***Range***	**Central Tendency**	***Range***
Amount Used	105mg (21 tabs)	*0-27 tabs*	8mg (6 tabs)	*0-13 tabs*
Prescribed	250 mg (50 tabs)	*35-80 tabs*	36mg (18 tabs)	*10-25 tabs*
Percentage Rx Used	37%	*0-48%*	23%	*0-85%*
Days Used	9	*3-16*	7	*1-14*



ENT management of T&A

New strategy

- Oral ibuprofen, 1st dose before leaving hospital
- Sent home with ibuprofen and Tylenol with a dosing schedule outlined in discharge instructions for regular administration
- 3 day supply of hycet or lortab as prn (instead of 7 day supply)
- Pain control the same (no change in frequency of calls back to the office for pain control needs)
- No change in post op bleeding incidence

ENT management of T&A

Future strategy

- IV Tylenol to anesthetic in order to see if that decreases amount of pain and subsequent post op opiate need.
- Dexmedetomedine (α agent)
- Ketamine (NMDA)
- Working with ENT to change practice of prescribing combination drugs (Vicodin/Lortab) to single agent - oxycodone

Take aways

- Change in practice
- Change in culture
- Education
- Tylenol/NSAID as “base” of pain control, opiates as prn only
- Remember GI prophylaxis if anticipate prolonged NSAID
- Multimodal analgesia
- No longer using combination opiate/tylenol (Vicodin/Lortab/Hycet)
- Pain still has to be treated - untreated pain can lead to further morbidity (infection, chronic pain, non-healing etc)