

# UVM Project ECHO: Dental Series

## Treatment of Oral Health-Related Pain

### August 27, 2021

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Sue Etminan, DMD, MPH  
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- RECORDING OF SESSION TO BEGIN

# Agenda

- Introductions
- Objectives
- Didactic Presentation (15-20 min)
- Case presentation
  - Clarifying questions
  - Participants – then faculty panel
- Discussion
- Recommendations
- Summary
- Closing Announcements
  - Submission of new cases
  - Completion of evaluations



# CE Disclosures

The Vermont Board of Dental Examiners (BDE) designates this internet live activity for a maximum of 1.0 Continuing Education (CE) Credit. Participants should claim only the credit commensurate with the extent of their participation in the activity.

## Interest Disclosures:

- As an organization accredited by the ACCME to sponsor continuing medical education activities, UVM is required to disclose any real or apparent conflicts of interest (COI) that any speakers may have related to the content of their presentations.



# Series Objectives

At the end of this ECHO series participants will:

- Understand the best practice approach to prescribing opioids for pain
- Be able to implement a workflow for the use of the Vermont Prescription Monitoring System (VPMS), including the use of delegates
- Understand the evaluation and management of patients with substance use disorder
- Identify and understand common causes of chronic orofacial pain and their connection to dentistry
- Understand effective non-opioid options for the management of pain in dental practice

# *Dental Pain Control to Prevent the Need for Opioid Prescriptions*

*Raymond Dionne, DDS, MS, PhD*

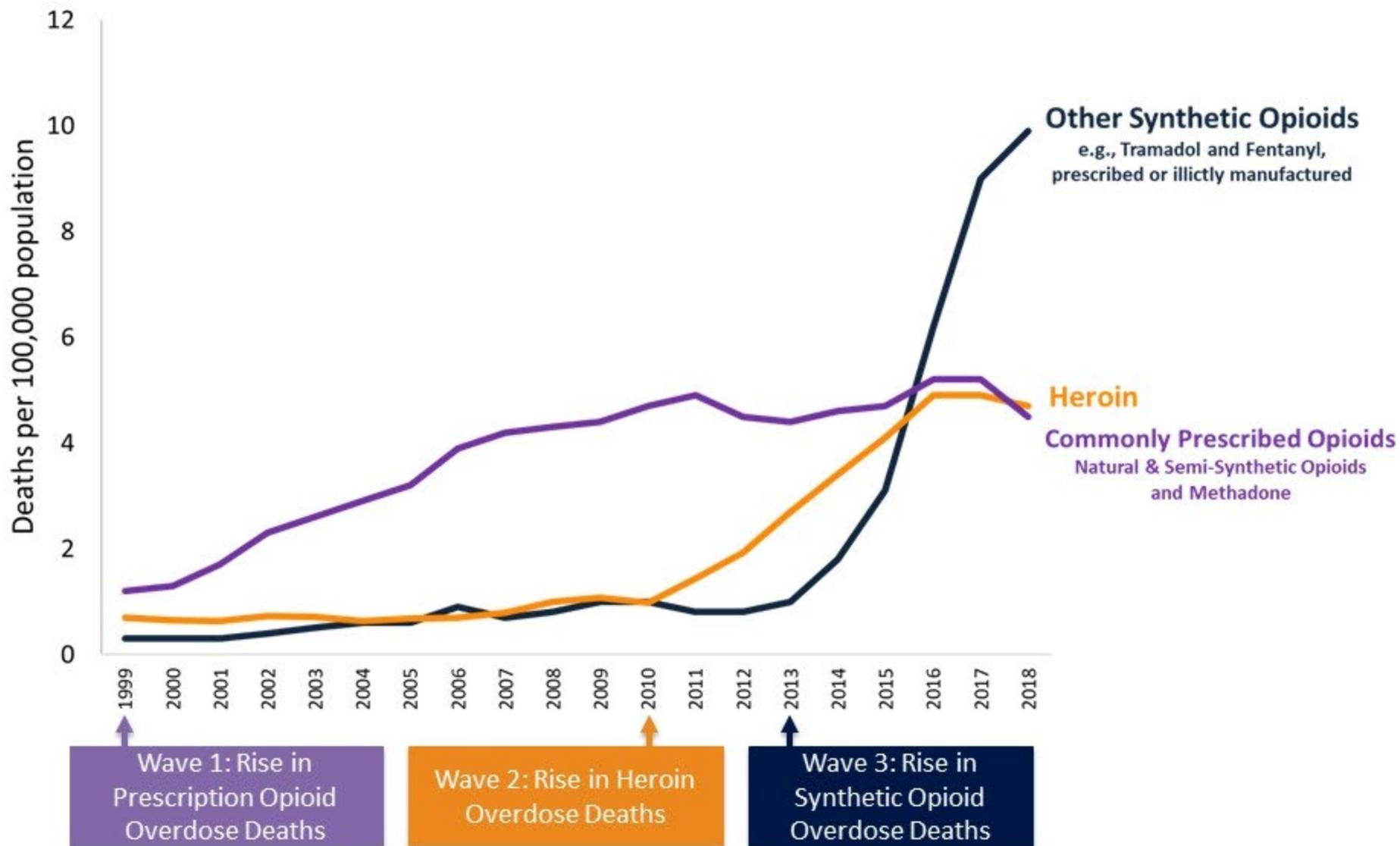
## **Disclosures**

The presenter has consulted for GSK and Rilento Pharma in the past year and serves on the Scientific Advisory Board of Charleston Labs

## **Session Objectives**

- 1. Understand the physiologic process of nerve pain**
- 2. Understand effective non-opioid options for the management of pain in dental practice**
- 3. Understand the use of pre-operative and intra-operative strategies to reduce pain involved with dental procedures**

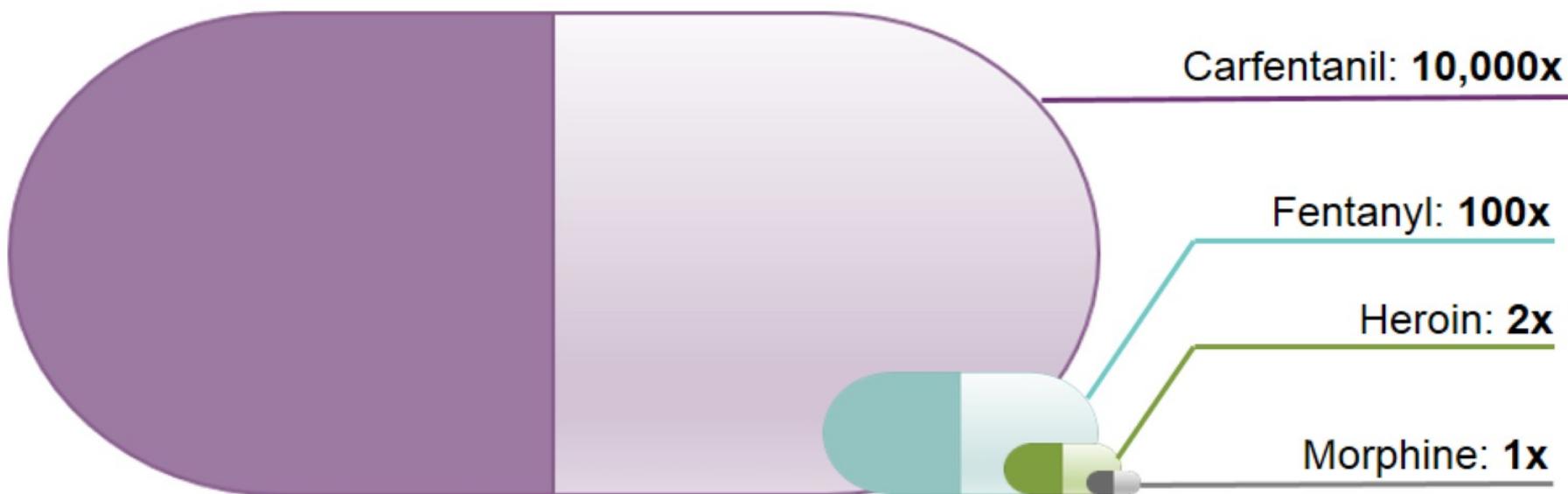
### 3 Waves of the Rise in Opioid Overdose Deaths



SOURCE: National Vital Statistics System Mortality File.

# With unprecedented availability of cheap heroin and fentanyl...

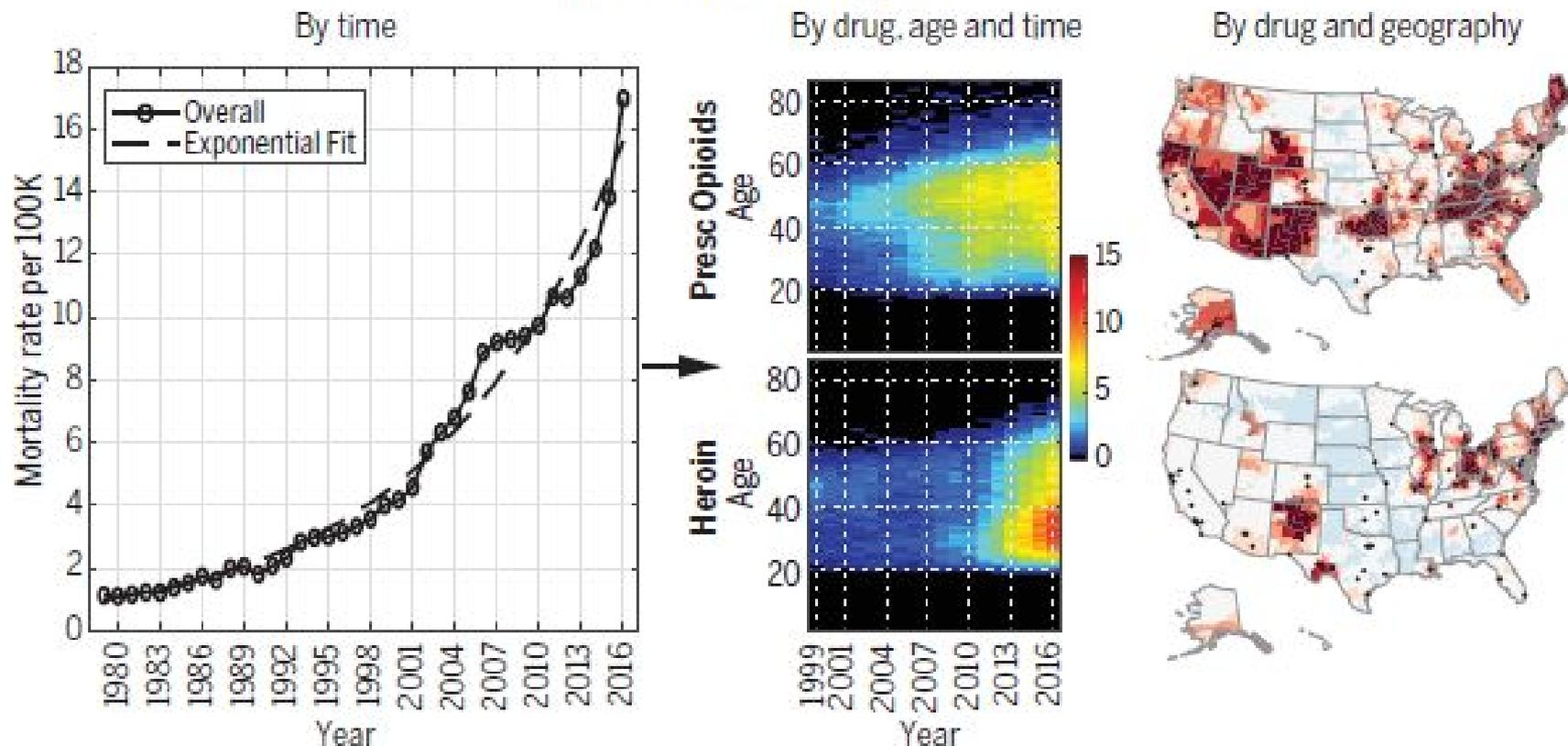
## MORE PEOPLE ARE DYING



### Opioid Potency

# Changing dynamics of the drug overdoses in the US from 1979 to 2016

## Overdose Mortality Rate



**'..the current opioid epidemic may be a more recent manifestation of an ongoing longer-term process'**

**'Understanding the forces that are holding multiple sub-epidemics together...may be important in revealing and effectively dealing with the root causes of the epidemic'**

# Early Exposure to Opioids May Trigger an Opioid Use Disorder

JAMA Internal Medicine | Original Investigation

## Association of Opioid Prescriptions From Dental Clinicians for US Adolescents and Young Adults With Subsequent Opioid Use and Abuse

Alan R. Schroeder, MD; Melody Dehghan, BA; Thomas B. Newman, MD, MPH; Jason P. Bentley, PhD; K. T. Park, MD, MS

**16-fold increase in opioid use/abuse after a single opioid Rx for acute pain following oral surgery**

**‘Use of these prescriptions may be associated with an increased risk of subsequent opioid use and abuse.’**

Table 2. Outcomes in the Opioid-Exposed and Opioid-Nonexposed Cohorts

Outcome (N = 44 664)	Cohort, No. (%)		P Value <sup>a</sup>	Adjusted Absolute Risk Difference, % (95% CI) <sup>b</sup>
	Opioid-Exposed (n = 14 888)	Opioid-Nonexposed (n = 29 776)		
Opioid prescription at 90 to 365 d	1021 (6.9)	30 (0.1)	<.001	6.8 (6.3 to 7.2)
>1 Opioid prescription	387 (2.6)	3 (0.01)	<.001	2.5 (2.2 to 2.7)
At least 1 diagnosis of opioid abuse in subsequent 365 d	866 (5.8)	115 (0.4)	<.001	5.3 (5.0 to 5.7)
Site of encounter <sup>c</sup>				
Office visit	790 (5.3)	97 (0.3)	<.001	4.9 (4.5 to 5.3)
Emergency department visit	25 (0.2)	24 (0.1)	.005	0.1 (0.02 to 0.2)
Hospitalization	74 (0.5)	79 (0.3)	<.001	0.2 (0.1 to 0.4)
Most common diagnoses of opioid abuse <sup>c</sup>				
Opioid type dependence, unspecified	602 (4.0)	66 (0.2)	<.001	3.8 (3.5 to 4.1)
Poisoning by opium (alkaloids), unspecified	82 (0.6)	8 (0.03)	<.001	0.5 (0.4 to 0.6)
Opioid abuse, unspecified	51 (0.3)	25 (0.08)	<.001	0.3 (0.2 to 0.4)
Death	1 (0.007)	1 (0.003)	.62	0.003 (-0.002 to 0.005)

<sup>a</sup> P value obtained from  $\chi^2$  analysis.

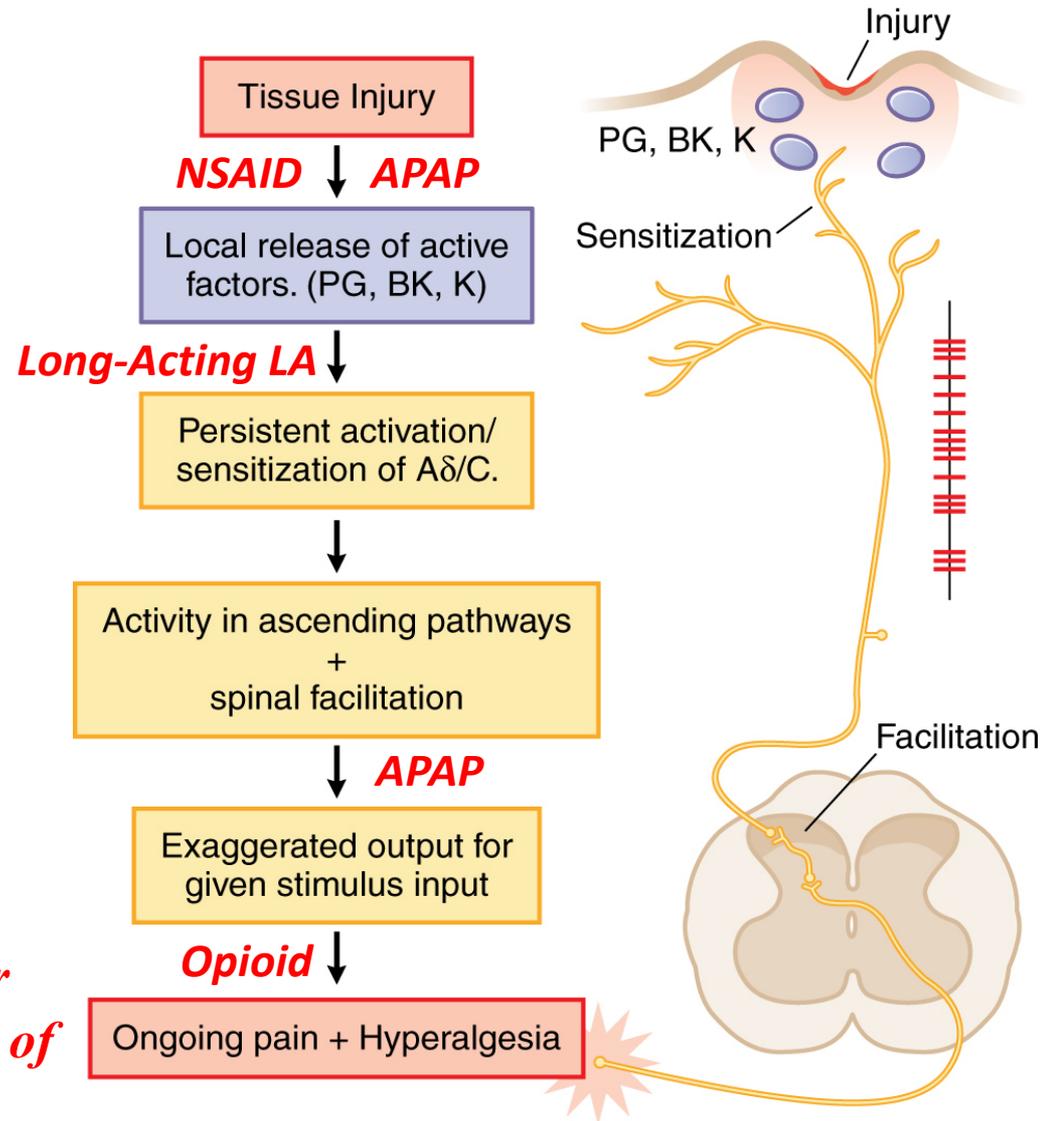
<sup>b</sup> Adjusted for race/ethnicity and previous nonopioid substance abuse.

<sup>c</sup> Some patients had more than 1 site of encounter or diagnosis of opioid abuse.

# **PAIN** Prevention Paradigm to Target Inflammation

- **P** = Prevention
- **A** = Anti-inflammatory  
Acetaminophen  
Anesthetics
- **I** = Individualize
- **N** = Narcotics (opioids)

*'Slight' Pain after  
LA offset, instead of*

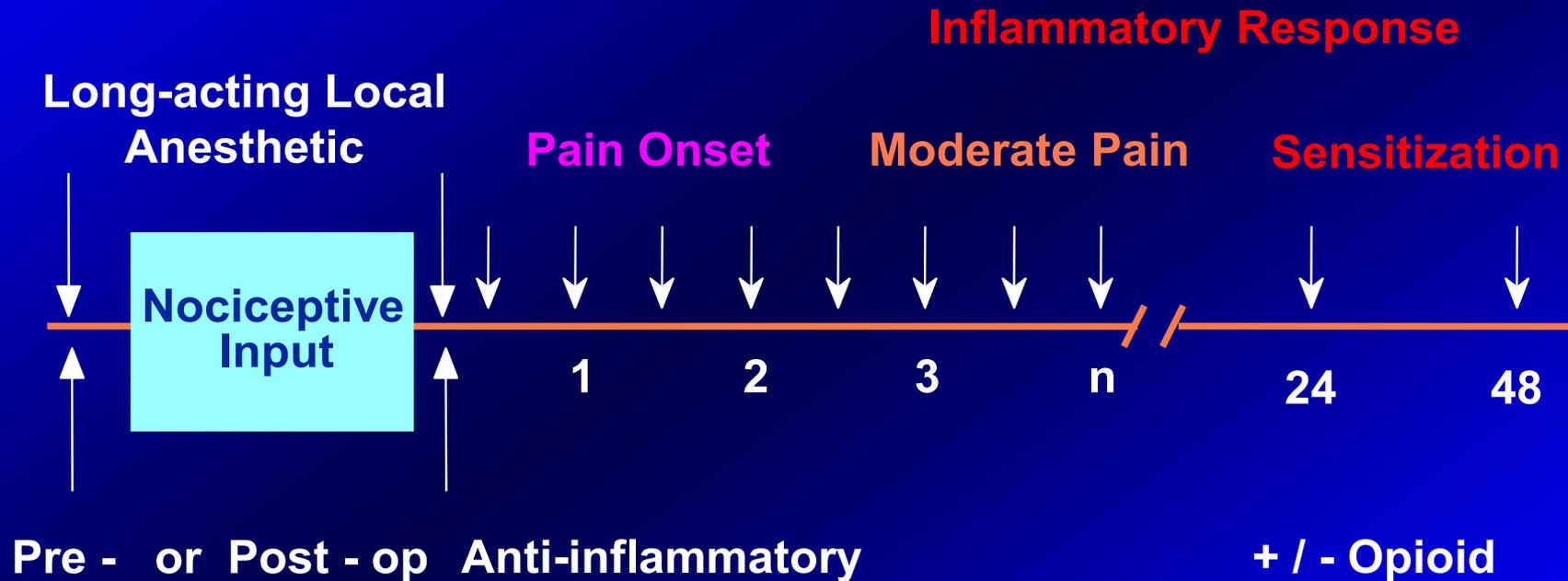


# Steps to Optimize Analgesia, Minimize Side Effects and Lower the Risk of Opioid Abuse

## 1. **Modulate** the Inflammatory Etiology of Acute Pain

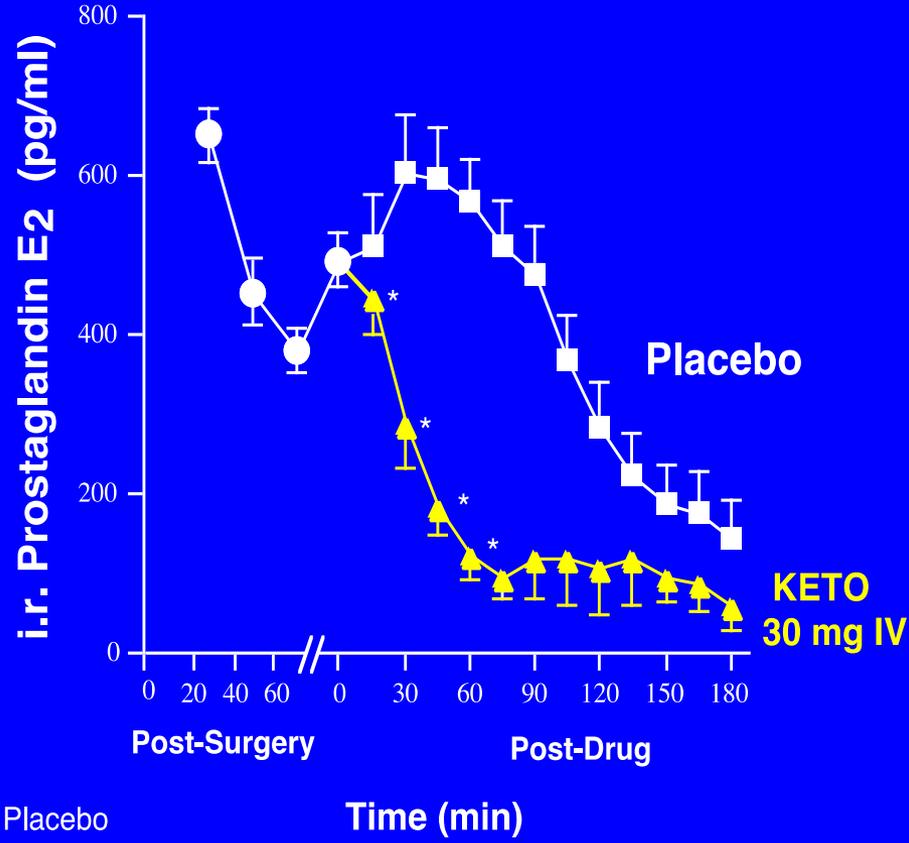
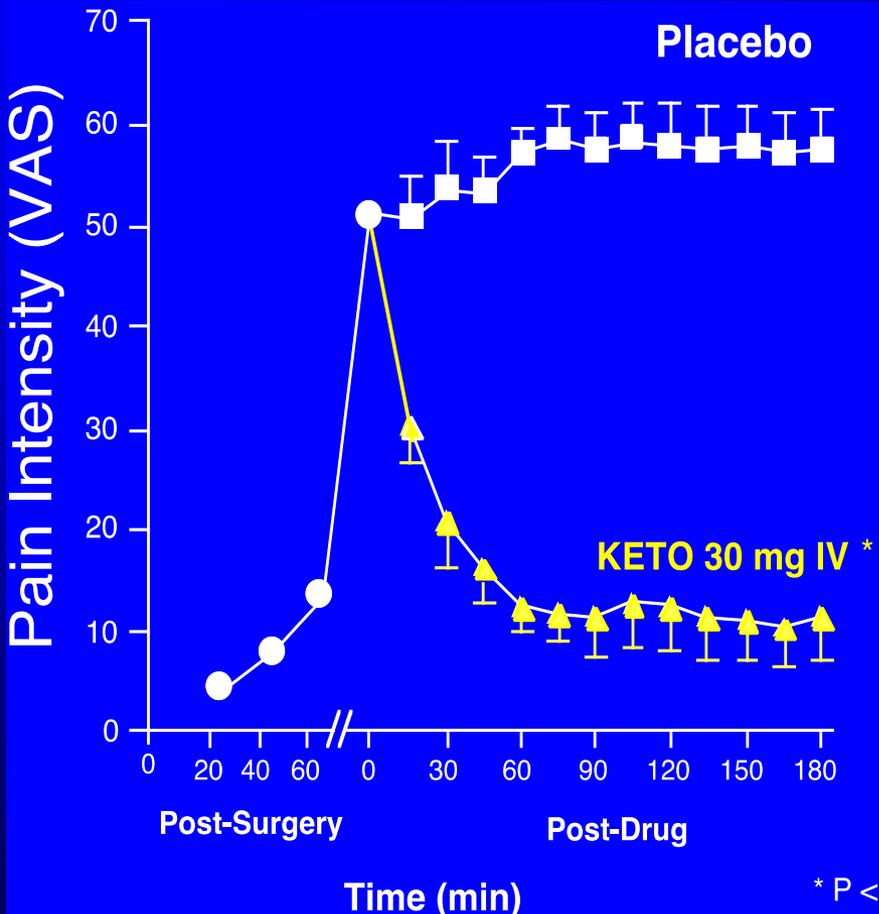
- *Nociceptive - transient, protective/prevent further tissue damage*
- ***Inflammatory – to protect the injured tissue***
- ***Neuropathic – peripheral NS damage***
  - Diabetic neuropathy
  - AIDS
  - Chemotherapy - induced peripheral neuropathy
- ***Functional – abnormal processing or function of CNS***
  - Fibromyalgia

# Rationale for Preventive Strategies



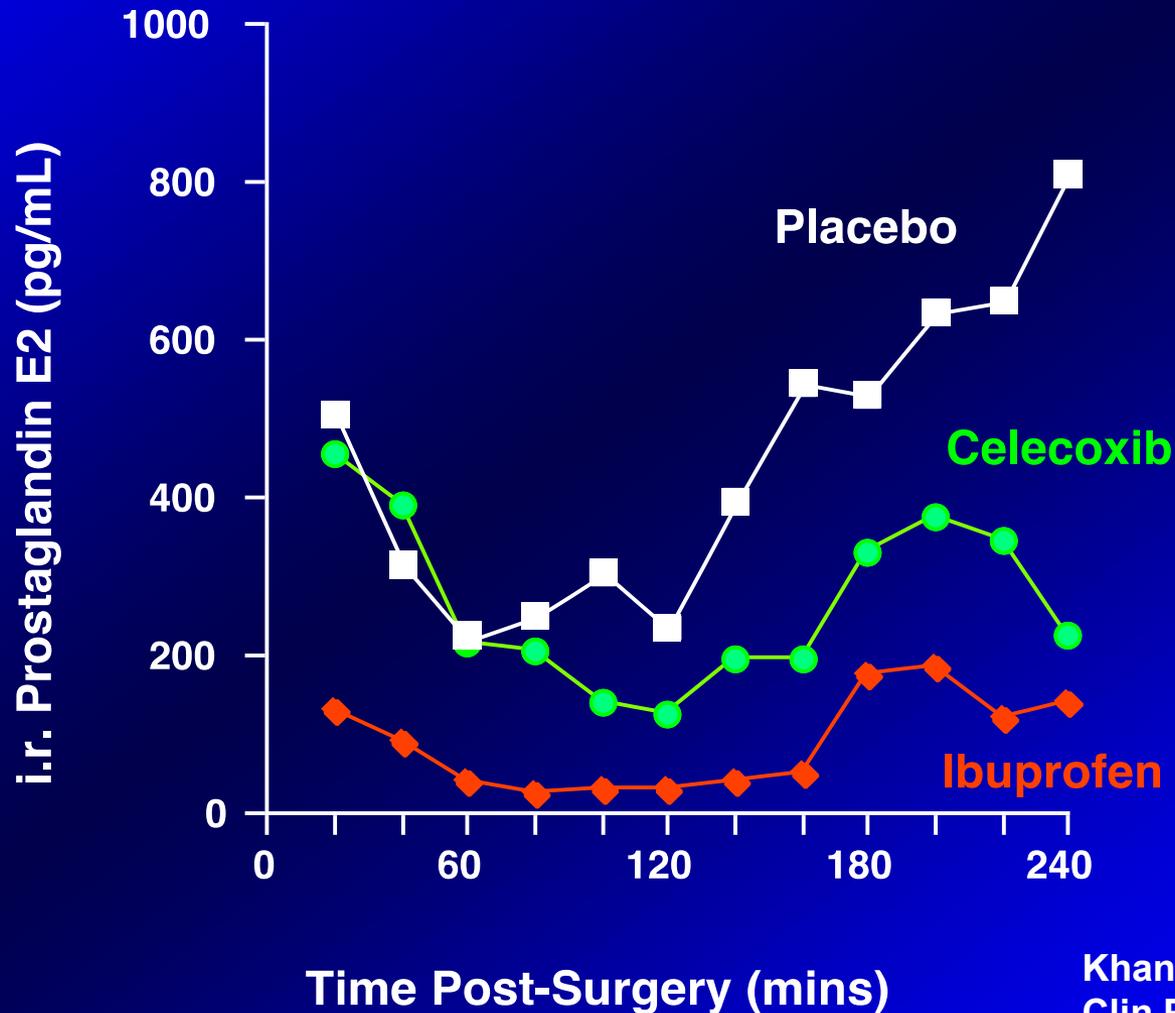
# NSAIDs Produce Analgesia by Lowering PGE<sub>2</sub> Levels at the Site of Injury

NSAID administration after onset of inflammation and pain



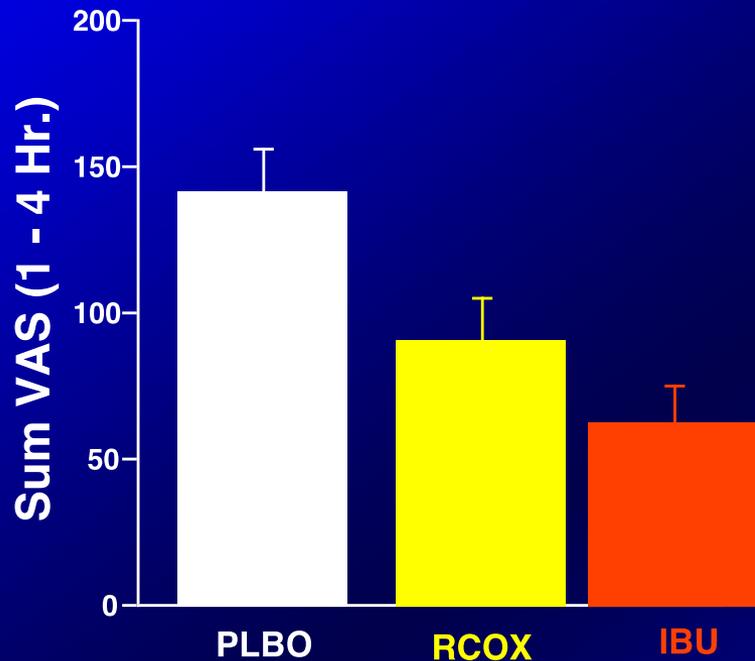
\* P < 0.01 vs. Placebo

# NSAID Prior to Tissue Injury Suppresses COX

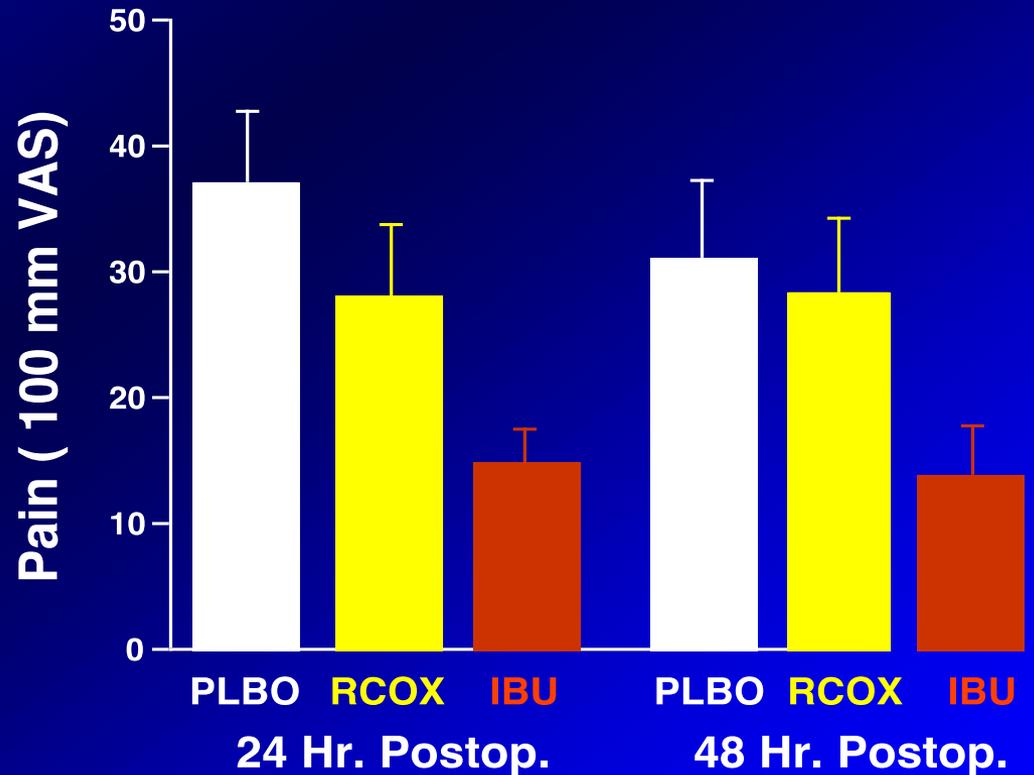


# Dual COX-1/COX-2 Suppression Minimizes Postoperative Hyperalgesia

Pain Postoperatively

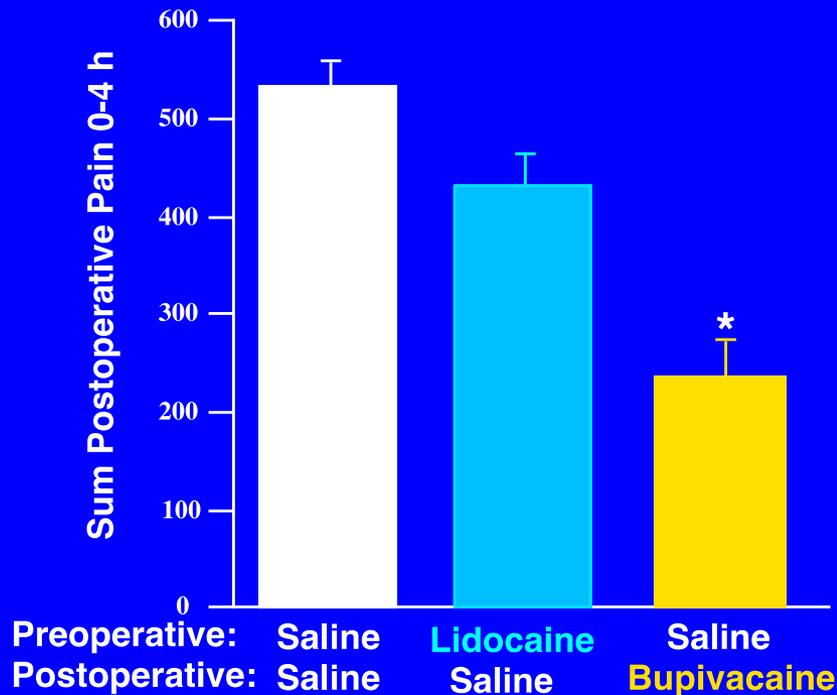


Pain at 24 and 48 hr



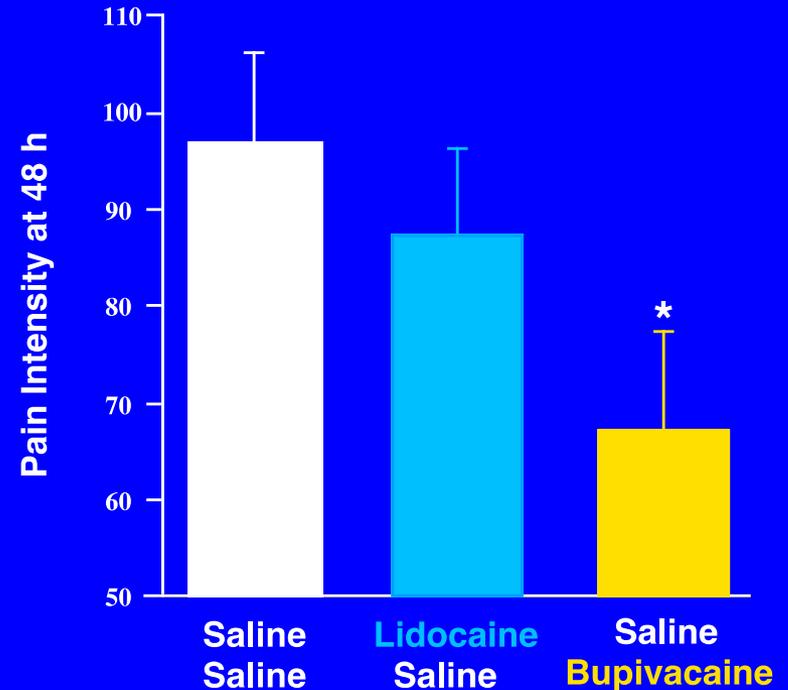
## 2. Use a Long-Acting Local Anesthetic to Block Nociceptive Input into the CNS

### Immediate Postop. Pain



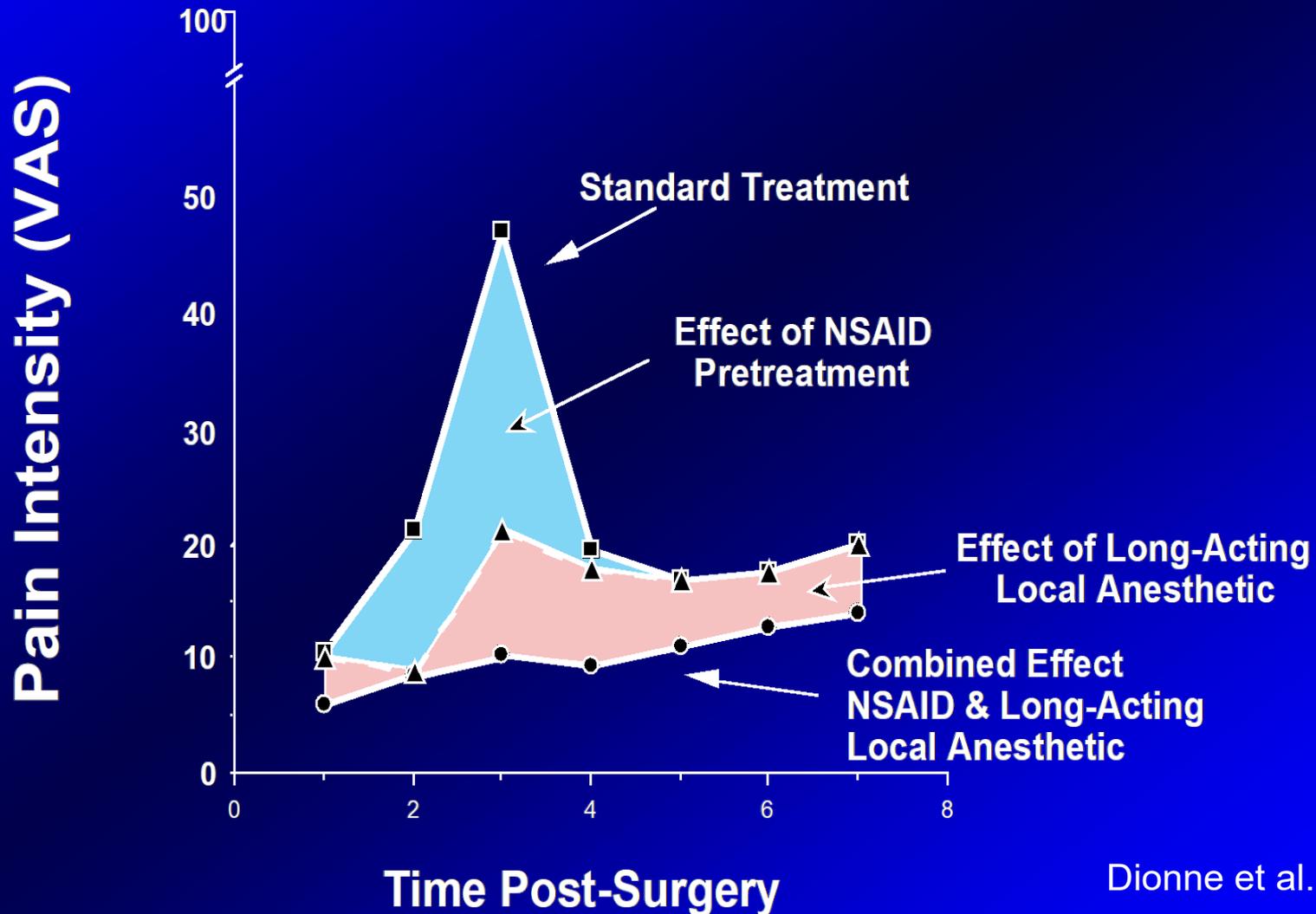
\* P < 0.001 Bupivacaine drug effect, 2-ANOVA

### Pain at 48 Hours



\* P < 0.05 Bupivacaine drug effect, 2-ANOVA

# Additive Preemptive Analgesia for NSAID and Long-Acting Local Anesthetic



### 3. Prescribe Analgesics Based on Scientific Evidence not Tradition

#### Established prescribing behaviors

- Efficacy of APAP-opioids established in 1970's, **before NSAIDs introduced**
- Improved clinical analgesic research (Cooper & Beaver 1976)
- **NSAIDs efficacy and safety >> opioid combinations**

#### Misperception of DEA Scheduling of Opioids

- Schedule 2 drugs have greater *abuse potential*, not efficacy

#### Placebo response contribution to analgesic efficacy

- Placebo response is 30-40% for simple extractions
- **Misperception that Rx analgesics are more potent than OTC analgesics**

#### Prescribing for Most Severe Outcome

- Often prescribe *to manage the worse case scenario*
- May benefit 20% with worse pain, but not needed for the other 80%

#### Unfounded Expectations of APAP Efficacy

- *Maximum dose reduced from 1000 mg to 650 mg*

#### Patient Expectations and Demands

- **Not providing an opioid can be perceived as less than optimal treatment**
- **Need to educate patients that NOT providing an opioid is the best treatment**

## 4. Use Acetaminophen for Additive Analgesia

- **Inhibits Prostaglandin Hydroperoxidase**
- **Metabolites of acetaminophen act on TRPA1-receptors in the spinal cord to suppress the signal transduction** from the superficial layers of the dorsal horn, to alleviate pain.
- **One metabolite (AM-404) inhibits Na channels and the reuptake of endogenous cannabinoids**

### **Acetaminophen 250mg + Ibuprofen 125mg Coated Caplets**

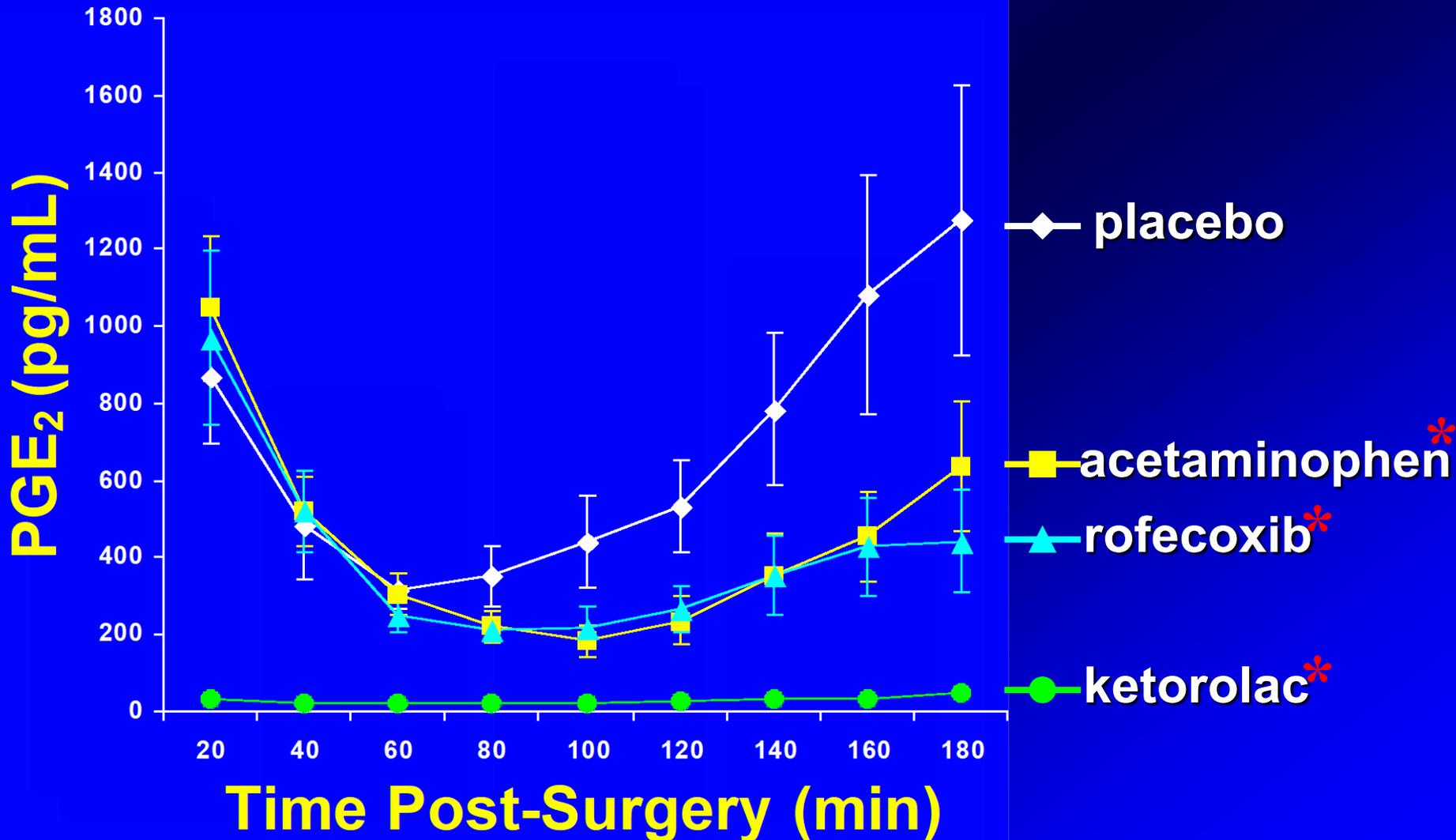
OTC dosing lower than optimal for either ingredient alone

Recommended for every 8 hours

Analgesic efficacy ~ 400 mg ibuprofen

Should have lower adverse events when taken repeatedly

# Acetaminophen COX-2 Inhibition



## 5. Minimize Diversion of Opioids Contributing to Drug Abuse

Most commonly prescribed opioid amount is 20 doses and a 3-day supply.

### What Happens to These Drugs?

- Used in totality as prescribed
- Stored “for a rainy day”
- Sold on the street
- Given to friends/family

**< Half of opioids prescribed for pain after oral surgery were used, only 5 patients used all of the prescribed pills (N=28)**

Maughan BC et al. Drug and Alcohol Dependence 2016

**Extrapolates to millions of pills available for diversion after dental procedures**

# Prescribe Opioids Less Prone to Abuse

## Codeine

- Usually combined with aspirin or acetaminophen due to weak analgesic activity
- Codeine converted to morphine by P450 isozyme CYP2D6
  - About 10% of codeine dose will be converted to morphine

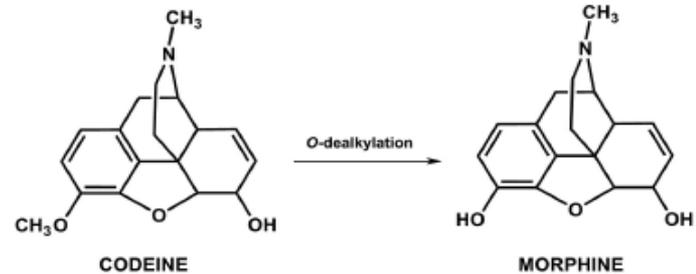


FIGURE 2 - Biotransformation of codeine, with the consequent release of morphine *in vivo*.

## Oxycodone (Oxycontin)

Deaths linked to opioid abusers after pills crushed and dissolved for IV administration

Combined with acetaminophen (Percocet)

## Hydrocodone

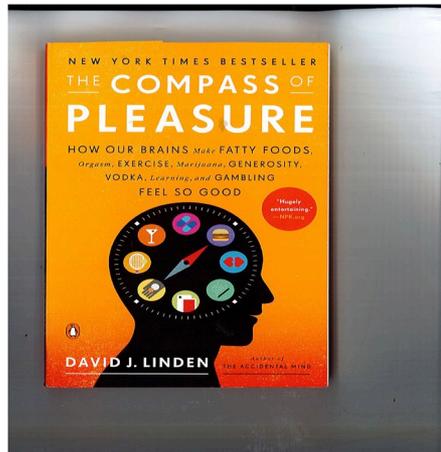
Acetaminophen combination (Vicodin)

Ibuprofen combination (Vicoprofen)

# Individual Variability in Drug Abuse is Heritable

The **addictions are *moderately to highly heritable***, which is paradoxical because **these disorders require use ... the addictions are interrelated and related to other psychiatric diseases by common neurobiological pathways**, including those that modulate reward, behavioral control and the anxiety or stress response.

Goldman D et al. Nature Reviews/Genetics 2005



‘the dark side of pleasure is addiction’

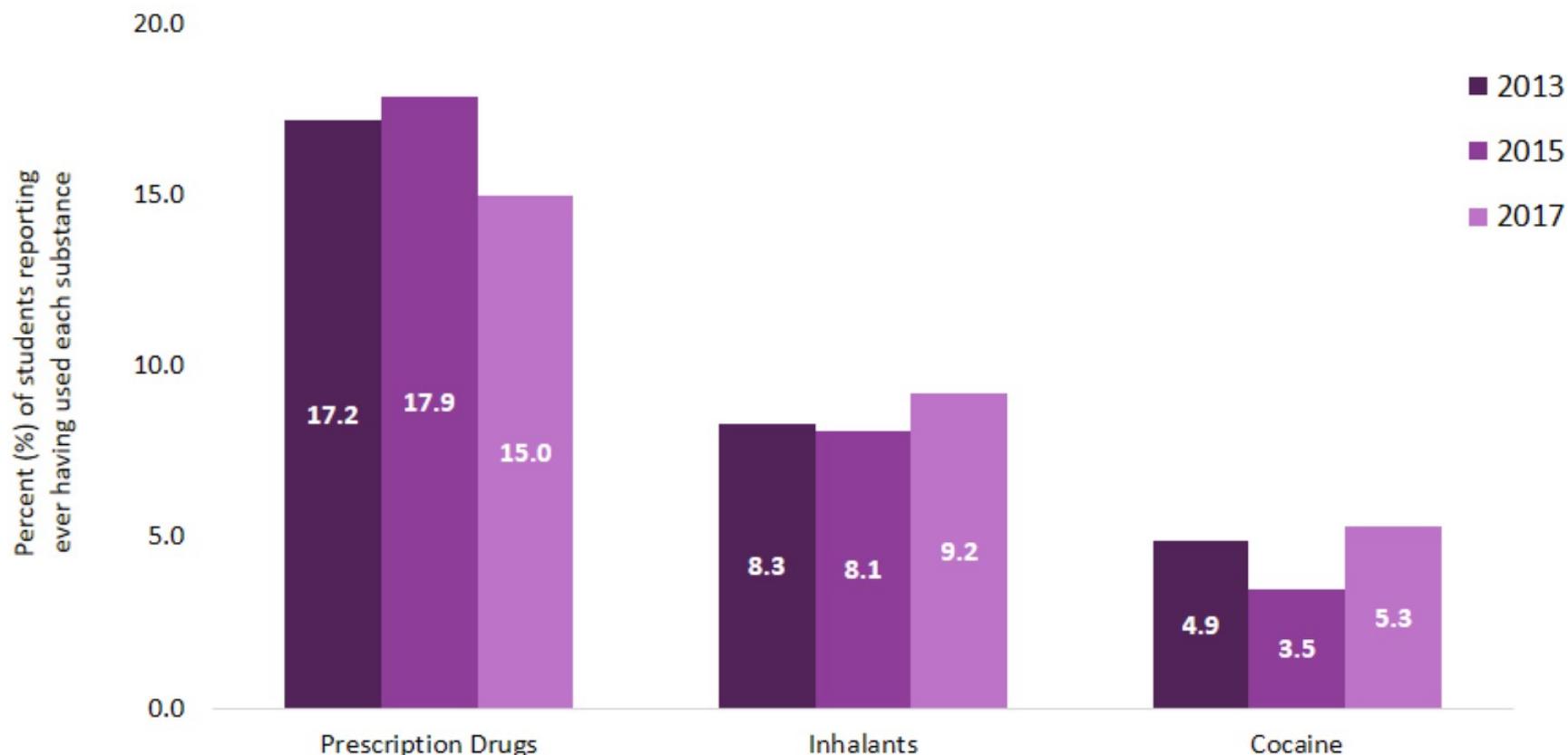
‘brain imaging shows that **heroin**, **orgasm** and **fatty foods** all activate the same pleasure circuits’

Outcome from Short Course of Opioid Abuse Associated with Heritability



## Substance abuse starts in early adolescence

15% of N.C. High School students report using prescription drugs recreationally in 2017



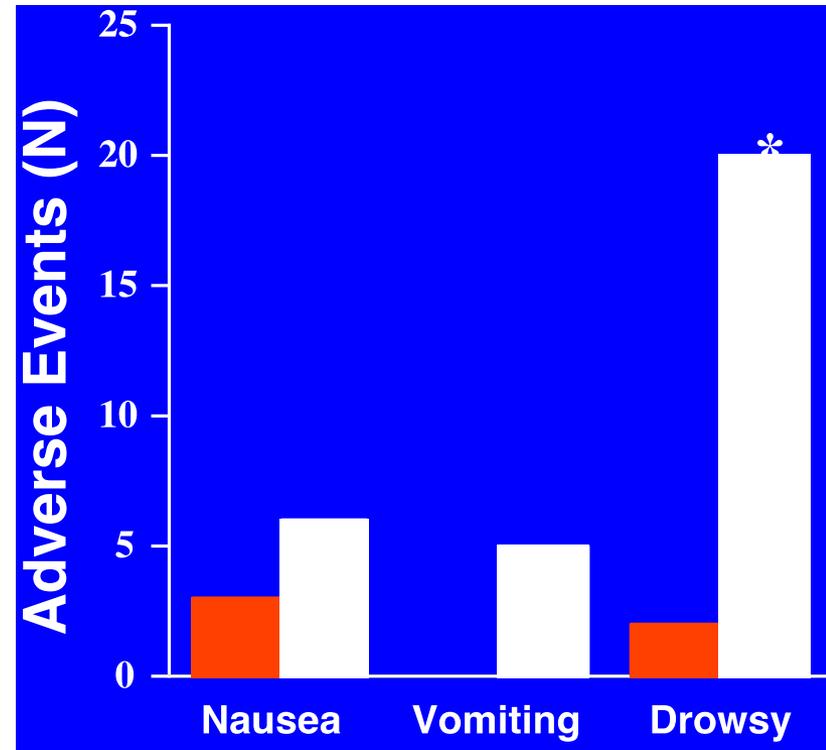
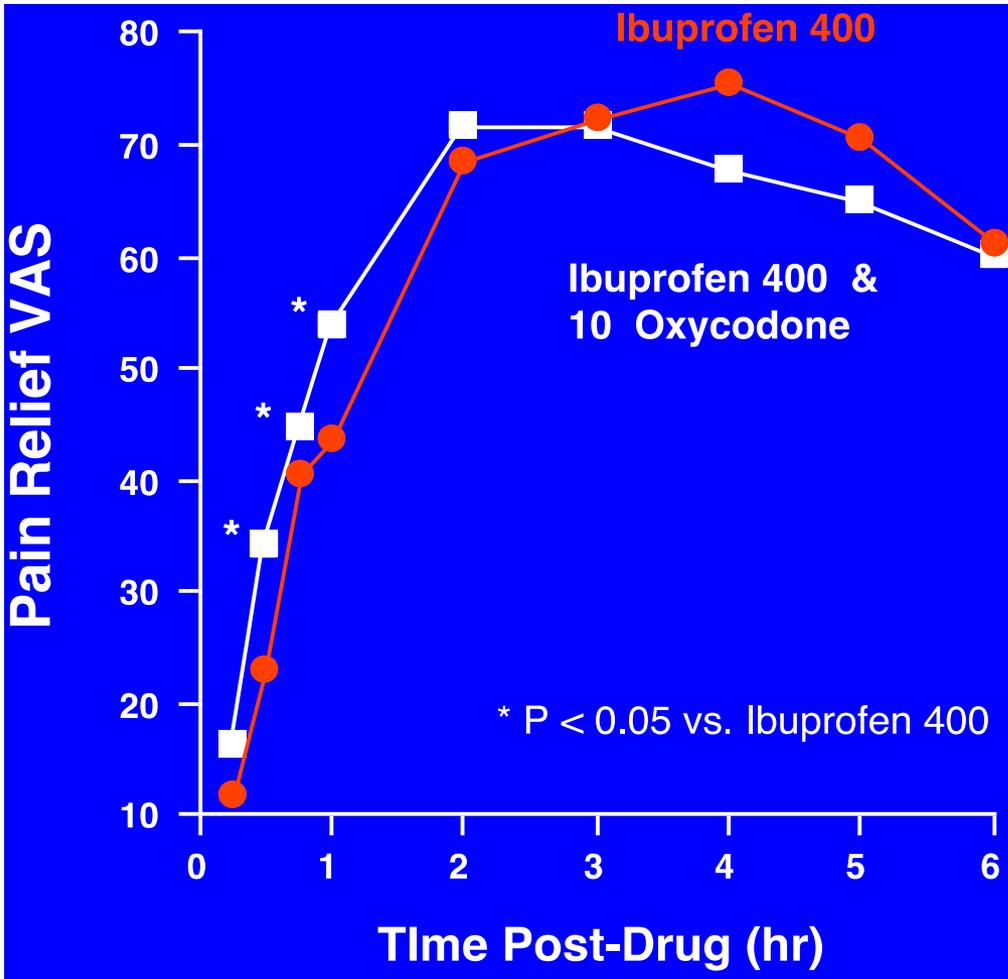
**Technical Notes:** Question based on self-reported lifetime use of substances among High School students

**Source:** N.C. Department of Public Instruction, N.C. Youth Risk Behavioral Survey (YRBS), 2013-2017

**Analysis:** Injury Epidemiology and Surveillance Unit



# Little additive analgesic effect in combination with an NSAID



# Use an Atypical Centrally-Acting Analgesics if an Opioid is Indicated

## Tramadol (Ultram®)

- Moderate-strong analgesic
- Agonist at mu receptors and blocks uptake of NE and 5-HT so spinal pain processing is less efficient
- **Minimal potential for dependence or abuse**
- **Minimal potential for respiratory depression**
- Effects partially blocked by naloxone
- Metabolized by CYPs (CYP2D6 and others) to 5 different metabolites
  - Desmethyltramadol is 200 times more potent
  - Depending on genetics analgesic effects can either increase or decrease

**FDA states that tramadol is contraindicated < 12 years of age for pain**  
**Can be prescribed over the phone or electronically per CVS**  
**Not listed in N.C. STOP Act provisions to limit opioids misuse**

# Opioid Overdose Epidemic 2021

- Leveling off in national death rate but little sign of improvement in some parts of the country: **20% increase in opioid overdose deaths in NC**
- **Decreased life expectancy** in US due to opioid overdoses
- Overall drug overdose mortality has grown **exponentially** over the past 40 years Jalal et al. Science 2018
- Victims not just those who OD
- **'Economic cost of the opioid crisis: \$1 trillion and growing faster'** CNBC.com, 2/13/2018
- Drug rehabilitation **15 - 20% recovery**
- Overdose rescue in ED with naloxone – 6.5% dead < 1 year

**Current Status:** Substance abuse is **endemic** in the US, likely that some of your patients are at risk to develop substance abuse or experience an overdose, **no long-term solution is apparent** as social determinants and genetics drive process

# Interim Guidance for the Management of Acute Dental Pain

- Target the **inflammatory etiology** of acute dental pain
- Minimize nociceptive input contributing to the development of **hyperalgesia** over the first 48-72 hours after tissue injury
- Use acetaminophen for additive analgesia instead of an opioid
- Prescribe an opioid only when indicated for the lowest possible number of pills without refills
- If you must prescribe an opioid, select one with reduced abuse and overdose potential
- Optimize pain prevention with adjunctive regimens supported by scientific evidence

**Clinical application: An ounce of prevention is better than a pound of resuscitation, buprenorphine or rehabilitation treatment**

# Comparison of Conventional Approach to Targeted Strategies

	<u>Opioid Combinations</u>	<u>Preventive/Additive/Adaptive</u>
<b>Analgesia</b>	++	+++
<b>Adverse Effects</b>	+++	+
<b>Abuse Potential</b>	+++	0 (without opioid) + (with tramadol) ++ (with oxycodone or hydrocodone)
<b>Overdose Risk</b>	++	0 (without opioid) + (with tramadol) ++ (with oxycodone or hydrocodone)

**Relative effects based on well-established pharmacology of drug classes and specific agents in Table 1**

# Factor for Individualizing Analgesics to the Patient

## Medical history

- Avoid opioid if any previous drug abuse or alcoholism.
- Avoid opioid if history of nausea or vomiting from previous opioid administration.
- Avoid acetaminophen if current or previous liver disease.
- Avoid NSAID if history of ulcers, irritable bowel disease, renal disease or cardiovascular disease. •Avoid any drug in same class if previous history of allergy.

## Family history

- Avoid opioid exposure if family history of drug abuse.

## Body weight

- Consider greater analgesic dose if BMI > 30.
- Consider lower analgesic dose if BMI < 18.

## Clinical procedure

- Premedication with NSAID and use of long-acting local anesthetic indicated if surgical procedure makes severe postoperative pain likely.
- Pre-existing infection may interfere with local anesthetic efficacy, carefully test for signs of anesthesia before initiating procedure.

## Patient apprehension

- Patient self-report of “somewhat nervous” about the procedure, consider use of nitrous oxide to minimize intraoperative pain perception.
- Patient self-report of “moderately nervous” about the procedure, consider use of enteral sedation with a benzodiazepine to minimize pain perception and recall.
- Patient report of “very nervous” or “terrified” about procedure, consider use of parenteral sedation or general anesthesia.

## Risk factors for drug abuse

- Avoid any opioid if patient identifies necessity or personal perception for oxycodone or hydrocodone containing combinations.
- Avoid opioid if any history of drug rehabilitation or previous arrest related to drug-seeking behavior.
- Avoid opioid if family history of drug abuse due to high heritability of abuse

# Opioids: Bad Medicine for Dental Pain, Patients and Society

- Opioid prescribing contributes to the opioid overdose crisis in the US
- Risk factors for opioid prescribing contributes to substance abuse
- Role of dental profession in fighting substance abuse:
  - Opioid stewardship – avoid use of irrational analgesic combinations
  - Recognizing inherent vulnerability for substance abuse
  - Early prevention through patient education in the dental office
- Beware the potential **consequences of inappropriate opioid prescribing**

# Cases/HIPAA

- Names
- Address
- DOB
- Phone/Fax #
- Email address
- Social Security #
- Medical Record #



The discussion and materials included in this conference are confidential and privileged pursuant to 26VSA Section 1441-1443. This material is intended for use in improving patient care. It is privileged and strictly confidential and is to be used only for the evaluation and improvement of patient care.



- RECORDING TO BE STOPPED FOR CASE PRESENTATION

# Questions and Discussion from the group....



The University of Vermont  
LARNER COLLEGE OF MEDICINE  
OFFICE OF PRIMARY CARE & AHEC PROGRAM



# Prep for Next Session

-Prior to each session, if you have specific questions for our faculty expert(s), please let us know and we will pass along ahead of time.

<b>↔ SESSIONS ARE ON FRIDAYS FROM 12:30PM TO 1:30PM ↔</b>		
<b>DATES</b>	<b>SESSION</b>	<b>DIDACTIC TOPICS (in addition to case review)</b>
<b>July 9</b>	TeleECHO Session 1	<b>Managing Opioids Safely and within Vermont Opioid Prescribing Rules</b> (Charles D. MacLean, MD and Amanda Kennedy, PharmD, BCPS)
<b>July 23</b>	TeleECHO Session 2	<b>Overview of the Vermont Prescription Monitoring System (VPMS) for the Dental Team</b> (Hannah Hauser, MSW)
<b>July 30</b>	TeleECHO Session 3	<b>Treatment Modalities for Patients with Chronic Orofacial Pain</b> (Jeffrey Crandall, DDS)
<b>August 13</b>	TeleECHO Session 4	<b>Fundamentals of FDA Regulations of Oral Health Products and U.S. Trends for Opioid and Antibiotic Prescribing in Dentistry</b> (Natalla Chalmers, DDS, MHSc, PhD)
<b>August 27</b>	TeleECHO Session 5	<b>Pain Control to Prevent the Need for Opioid Prescriptions</b> (Raymond Dionne, DDS, PhD)
<b>September 10</b>	TeleECHO Session 6	<b>Dental Management of Patients with Substance Use Disorder</b> (Sue Etminan, DMD, MPH)



# Conclusion

- Slides are posted at [www.vtahec.org](http://www.vtahec.org)
- Volunteers to present cases (this is key to the Project ECHO model)
  - Please submit cases to [Justin.Hurlburt@uvmhealth.org](mailto:Justin.Hurlburt@uvmhealth.org)
- Please complete evaluation survey after each session
- Once your completed evaluation is submitted, CE information will be emailed to you.
- Please contact us with any questions, concerns, or suggestions
  - [Justin.Hurlburt@uvmhealth.org](mailto:Justin.Hurlburt@uvmhealth.org)
  - [Elizabeth.Cote@uvm.edu](mailto:Elizabeth.Cote@uvm.edu)

