Pain Pathophysiology Part II
Bridging the Mechanism of Action of Opioid Medications
9:45am – 11:15am

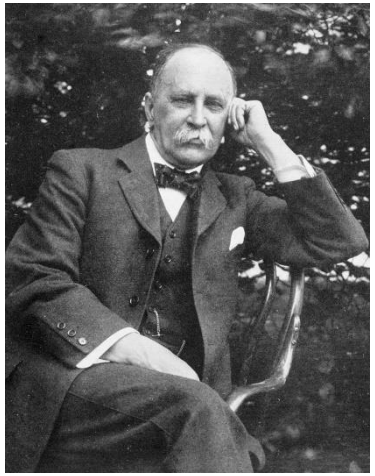
Jeremy A. Adler, DMSc, PA-C

Pacific Pain Medicine Consultants

Encinitas, CA

“If it were not for the great variability among individuals, medicine might as well be a science and not an art.”

-William Osler (1892)



Brief History of Opioids

- 3400 B.C. Opium poppy cultivated in Mesopotamia (*Papaver somniferum*)
- 1300 B.C. Opium trade in reign of King Tutankhamen
- 1680 Thomas Sydenham – Laudanum (opium, sherry wine and herbs)– remedy for numerous ailments
- 1729 China prohibits smoking opium, unless use as medicine
- 1803 Morphine identified
- 1827 Merck & Co. commercially manufacture Morphine
- 1874 Ddiacetylmorphine first synthesized
- 1898 Bayer registers “Heroin” in Germany as children’s cough suppressant
- 1890 US Congress imposes tax on opium and morphine
- 1905 Congress bans opium
- 1914 Harrison Narcotics Act
- 1923 US Treasury Dept Narcotic Division bans all legal narcotic sales
- 1964 Methadone Maintenance Developed
- 1970 Controlled Substance Act
- 1972 Opiate receptor discovered
- 1973 DEA Created

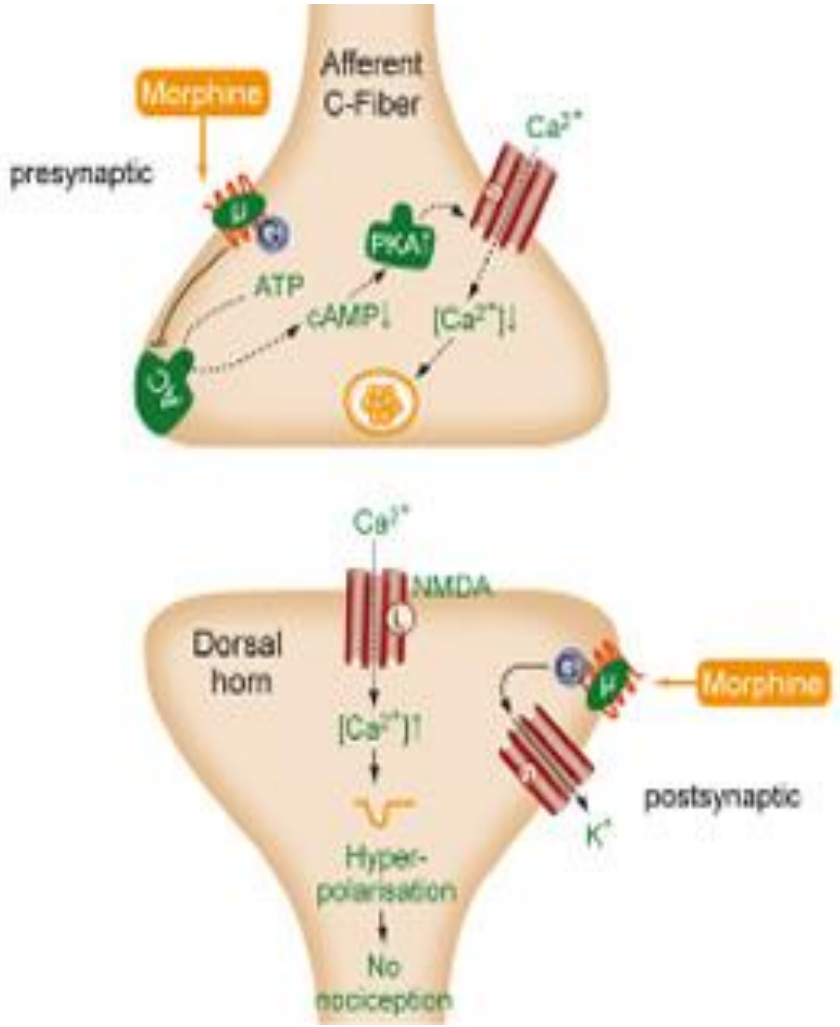
Poppy Plants

Opioids

- Pharmacologic effects result from opioid receptor binding
- Opioid receptors widely distributed
    - Supraspinal
    - Spinal
    - Peripheral

Opioid pharmacology

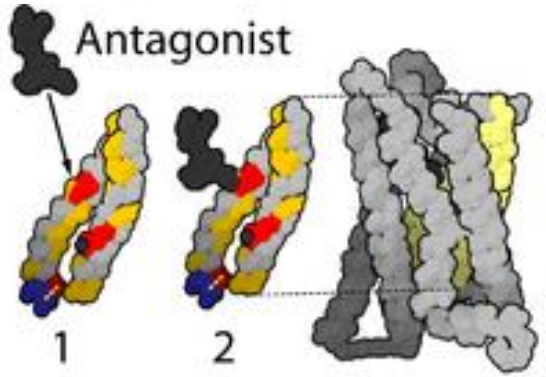
- Presynaptic Binding ⇨
  - Ca^{2+} channel inhibition
  - G-protein linked
- Postsynaptic Binding ⇨
  - Membrane Hyper-polarization by opening K^{+} channels
- Suppress Peripheral Inflammatory Cells
- Central Actions

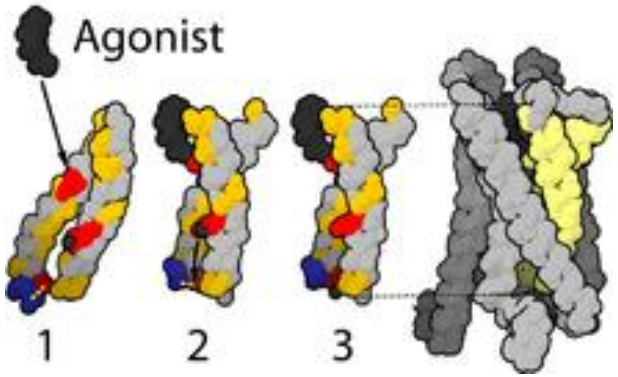


Opioid Receptors

Receptor Types

- Mu (μ)
  - mu1/mu2
- Kappa (κ)
  - Up to 5 receptor subclasses
- Delta (δ)
  - Delta1/delta2
- Nociceptin Receptor (NOP)





Mu (μ) Receptor

- μ_1
  - Analgesia
  - Physical Dependence
- μ_2
  - Respiratory Depression
  - Miosis
  - Euphoria
  - Physical Dependence
  - Decreased GI function

Kappa (κ)

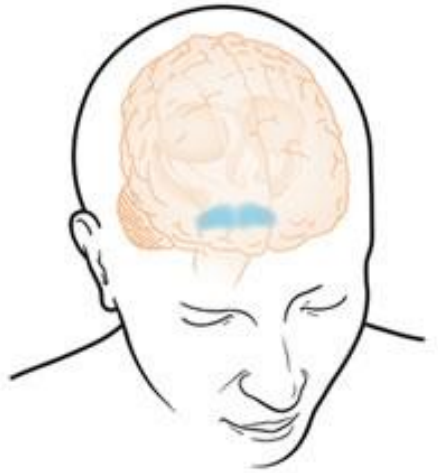
- Analgesia
- Sedation
- Miosis
- Inhibit ADH release
- Dysphoria

Delta (δ)

- Analgesia
- Antidepressant effects
- Physical Dependence
- Not in spinal cord

Supraspinal

- Modulate Pain Behavior
- Best characterized
    - Mesencephalic Periaqueductal Gray (PAG)
- Can modulate excitability of dorsal raphe and locus coerulus ⇨ affective effects of opioids
- Medial thalamus
- Amygdala



Spinal

- Binding μ in dorsal horn ⇨ Substantia Gelatinosa
- Inhibits presynaptic Ca^{2+} channels and postsynaptic K^{+} channels
- κ receptors in post-ganglionic sympathetic fibers

Peripheral

- Appear to have effect only in inflammation and hyperalgesia
- Not naloxone reversible
- Intra-articular knee injection reduces firing of spontaneous afferents when inflamed
- Target may be inflammatory cells

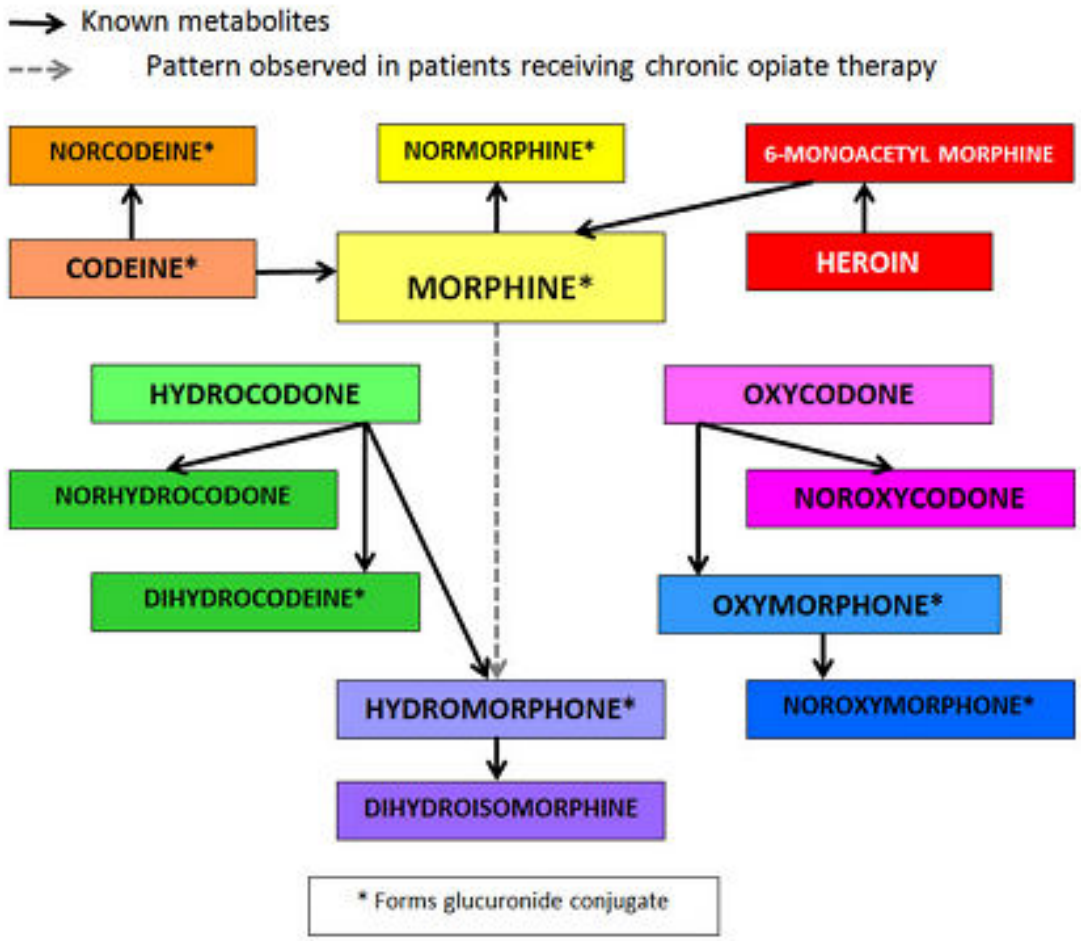
Mixed Agonist/Antagonist

- Buprenorphine
  - Partial μ & δ agonist, κ antagonist
- Pentazocin
  - κ receptor agonist
- Nalbuphin
  - μ agonist/antagonist
- Butorphanol
  - Partial agonist and antagonist at μ receptor and agonist at κ receptor

	Receptor type			
Opioid	**MOP**	**KOP**	**DOP**	**NOP**
β-endorphin	+++	+++	+++	−
Morphine	+++	+	+	−
Oxycodone	+++	+	+	−
Hydromorphone	+++	+	+	−
Butorphanol	−	++	+	−
Methadone	+	+++	+++−	−
Fentanyl	+++	−	−	−
Codeine	++	+	−	−
Buprenorphine	++	−		

MOP = μ opioid receptor; KOP = κ opioid receptor; DOP = δ opioid receptor; NOP = nociceptin opioid peptide receptor. − = No affinity; + = low affinity; ++ = moderate affinity; +++ = high affinity.

Opioid Metabolism



Opioid Pharmacogenetics

"Your weight problem is partly genetic and partly Boston Cream pie."

Genetics in Pain

Twin Studies

- Migraine Headaches
  - 39-58% Genetic Contribution
- Low Back Pain
  - 21-67% Genetic Contribution
- Menstrual Pain
  - 55% Genetic Contribution

Considerations

- Why do some patients with DPN have numbness and others pain?
- Why do some patients develop PHN following HZ?
- Genetic Variation in collagen has been associated with 4X risk in annular tears in 30-39 y.o. and 2.4X risk for DDD and HNP in 40-49 y.o.

- What does this mean for pharmacotherapeutics?

Pain Management

- Goals:
  - Analgesia without Adverse Effects
  - Improved Quality of Life
- Complications of Pharmacotherapy
  - Lack of adherence
  - Drug Abuse / Dependence
  - Adverse Effects
  - Drug Interactions
  - Absorption, Distribution, Elimination

Optimizing Treatment - Personalized Medicine

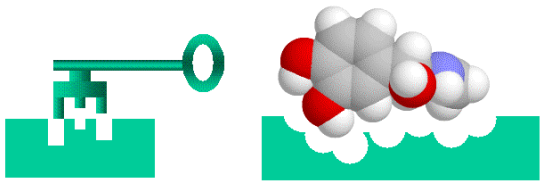
- Patient Specific Treatment
- Improve Outcome
  - Maximize Benefit
  - Minimize Harm
- Cost effective
  - Rapid resolution of dysfunction
  - Reduced Cost of Treatment Failures
- Understand prior responses

Basic Drug Outcomes

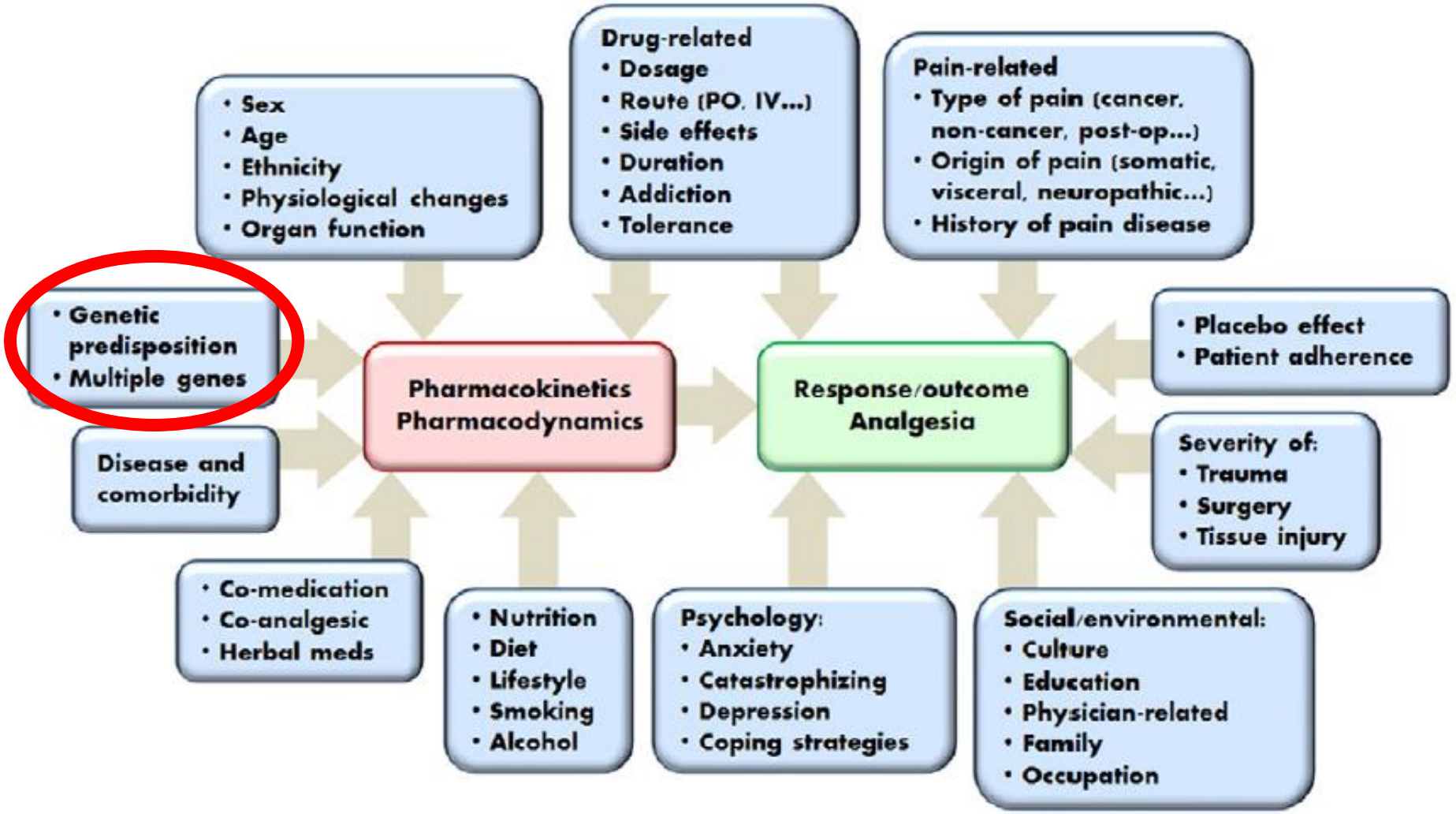
- Efficacy
  - No or minimal Adverse Effects
  - Intolerable Adverse Effects
- No Efficacy
  - No or minimal Adverse Effects
  - Intolerable Adverse Effects

How and Why Drugs Work

- Physiology is changed when a drug reaches a target
- Pharmacokinetics
  - What the body does to the drug
- Pharmacodynamics
  - What the drug does to the body
- Tolerance
  - Both kinetic and dynamic mechanisms



Influencing Factors on Pain Relief Outcomes



Pharmacokinetics

- Absorption
- Metabolism
- Distribution
- Elimination

- Effects on drug dose versus steady state serum concentrations

Pharmacodynamics

- Ligands and Receptors
- Transporter Proteins

- Effects on drug response to a particular drug exposure

Pharmacogenetics

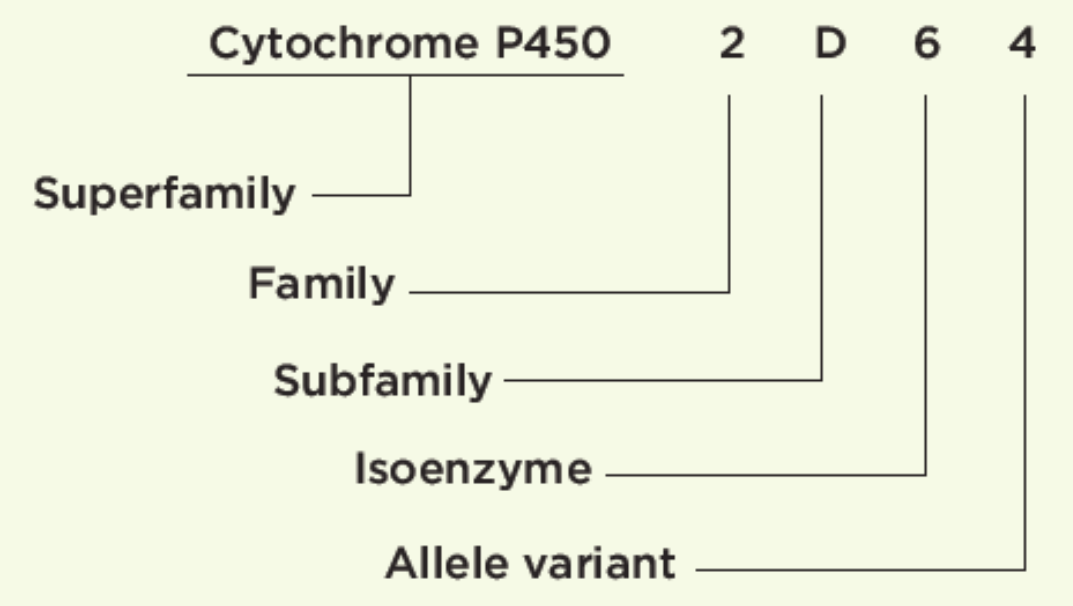
- The genetic influence on both pharmacokinetics and pharmacodynamics
  - Drug metabolizing enzymes
  - Drug transporters
  - Drug receptors
  - Other proteins

Drug Metabolism

- Biochemical Modification
  - Diminish Toxicity
  - Ease Elimination
- Phase I
  - Cytochrome P450 Enzymes (80%)
- Phase II
  - Glucuronidation (conjugation)
- Phase III
  - Further processing for elimination

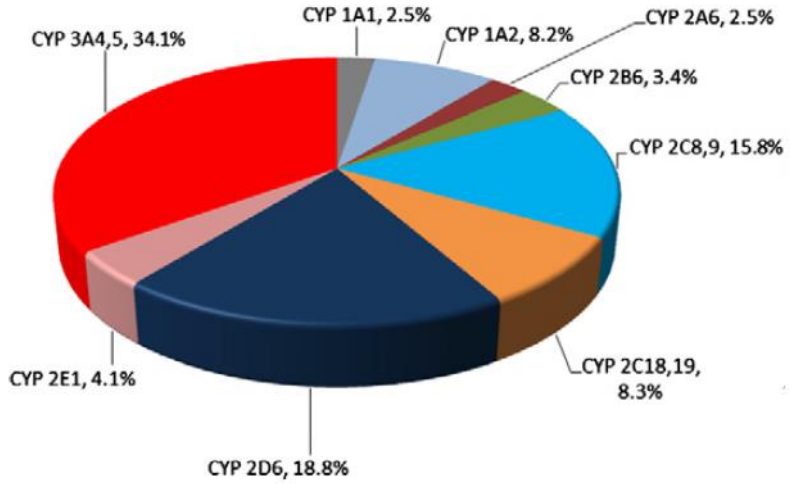
Cytochrome P450 Enzymes

- 57 Enzymes in humans
- Divided into Family, Subfamily and isoenzymes
  - Clinically Relevant
    - CYP1A2 / CYP2C8
    - CYP2C9 / CYP2C19
    - CYP2D6 / CYP2E1
    - CYP3A4/5

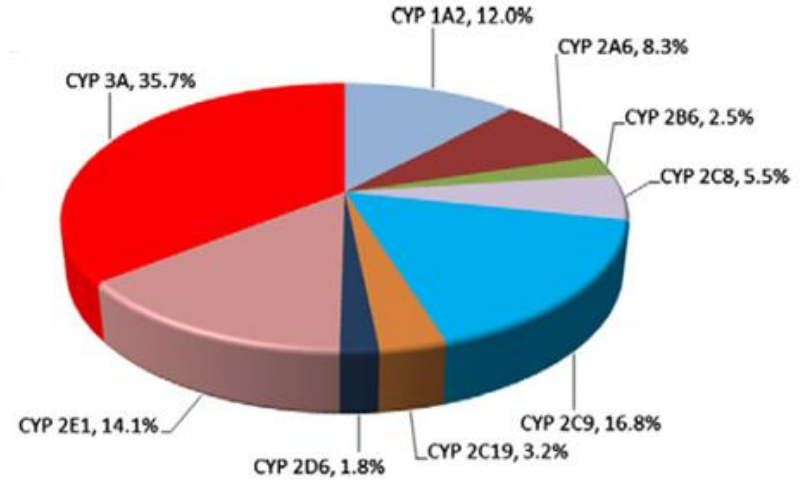


Cytochrome P450 Enzymes

Percent of Drugs Metabolized through CYP Enzymes



Liver Distribution of CYP Enzymes

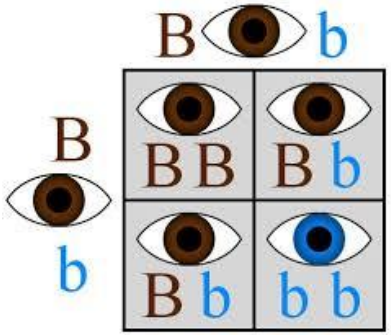


Genotype

	B	b
B	BB	Bb
b	Bb	bb

- Genetic Makeup
- Allele
  - Sequence of gene / DNA
- Wild-type
  - Gene that prevails in natural conditions
- Polymorphism
  - Change or variation in forms / sequence
- SNP
  - Single Nucleotide Polymorphism

Phenotype



- Characteristics of a Genotype
- Drug Metabolism:
  - Poor Metabolizer (PM)
    - 2 Mutant Alleles with very limited or loss of activity
  - Intermediate Metabolizer (IM)
    - 1 wild-type and 1 reduced allele or 2 reduced alleles
  - Extensive Metabolizer (EM)
    - 2 wild-type or functional alleles
  - Ultra-rapid Metabolizer (UM)
    - Multiple copies of functional alleles

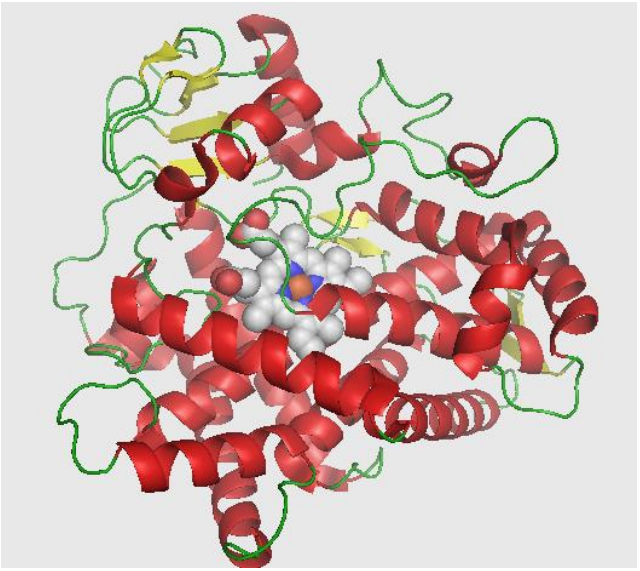
Drug Interactions

- Inducers
  - Enhance the metabolism
- Inhibitors
  - Reduce the metabolism
- Active Drug
- Prodrug

Interaction

- Tobacco & Caffeine
- Caffeine is Active Drug metabolized by CYP1A2
- Tobacco is Inducer of CYP1A2 which decreases caffeine level
- Increased agitation in smoking cessation may from higher caffeine levels

CYP 2D6



- Metabolizes 20% of all drugs
- <2% of CYP enzymes
- Pain
  - Most Common Opioids
- Psychiatry
  - 52% of all psychiatric drugs
  - 62% of antidepressants/antipsychotics

CYP 2D6

- Breast CA relevance:
  - Tamoxifen MUST by metabolized to endoxifen by CYP2D6 to be effective
- Many illicit drugs:
  - Methamphetamine / MDMA
    - Substrate and Inhibitor
    - Functional PM CYP2D6

Pain Management & CYP2D6

- Codeine (Prodrug)
  - Morphine (Active)
- Tramadol (Prodrug)
  - M1 (Active)
- Hydrocodone (Weak)
  - Hydromorphone (Active)
- Oxycodone
  - Oxymorphone (2X potency)

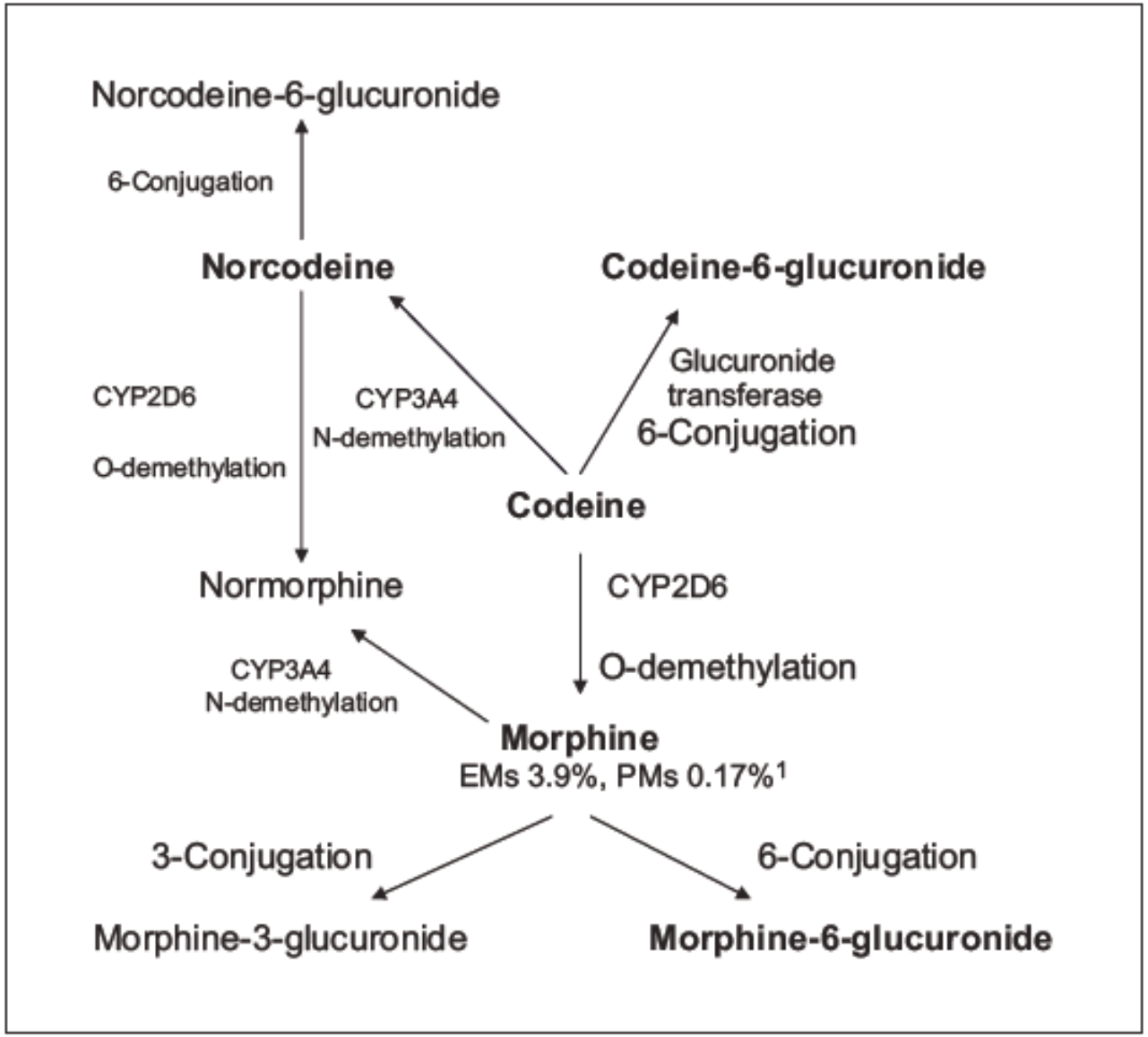
CYP 2D6

- 80 Variants with Polymorphisms
- Functional: *1 & *2
- Many SNPs
  - Most Common *3, *4, *5, & *6
- Ethnic Distribution:
  - White – 7-10% PM
  - Asian – 1-2% PM / 30% IM
  - Black – 2-4% PM / 30% IM
  - UM – 29% Ethiopian / 10% Southern European / 1-2% Northern European

Case Study #1 (*Lancet*)

- 13 day old breast fed infant died from opioid toxicity
- Mother prescribed Codeine post-episiotomy pain
- Stored breast milk
  - Expected morphine (1.9-20.5 ng/ml)
  - Measured morphine (87 ng/ml)
- Mother CYP2D6 : Ultra-rapid (UM)

Codeine Metabolism



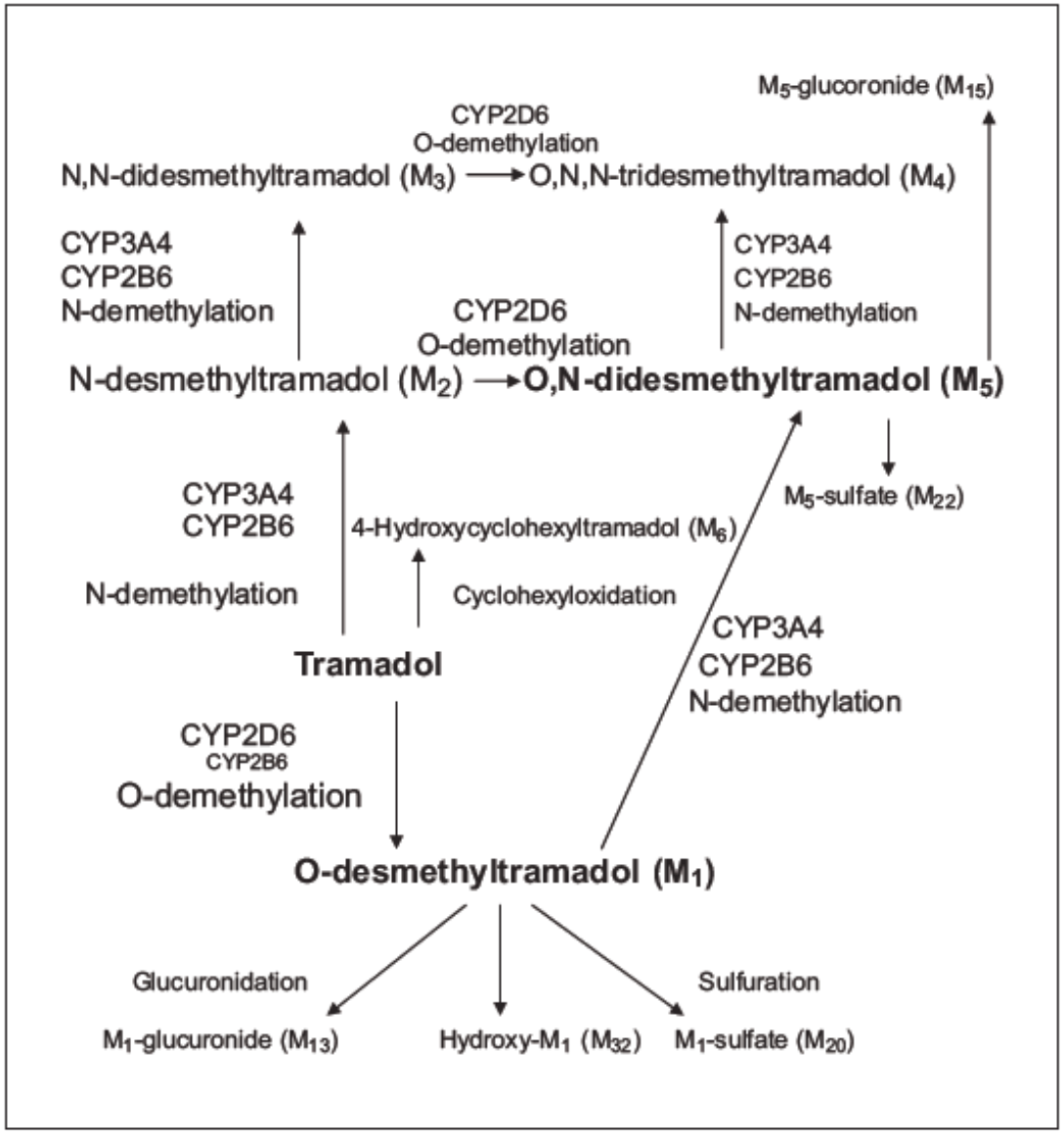
Case Study #2 (*N Eng J Med)*

- 62 y.o. male with CLL
- Fatigue, Dyspnea, Fever, Cough and bronchoalveolar lavage +yeast
- Codeine Cough Suppressant
- Day 4 Unresponsive – + Naloxone
- CYP2D6 UM
- Co-prescribed clarithromycin & voriconazole (CYP3A4 inhibitors)
- Also acute renal failure (↑ M6G)

Case Study #3 (*Pediatrics*)

- 5 y.o. male – outpatient adenotonsillectomy
- 6 hour uncomplicated recovery
- At home – tramadol 20mg
- Next day
  - lethargic – ER – comatose/pinpoint
  - SaO2 48% / Minimal respiratory effort
  - Frequent apneas
  - Fully reversed with naloxone

Tramadol Metabolism



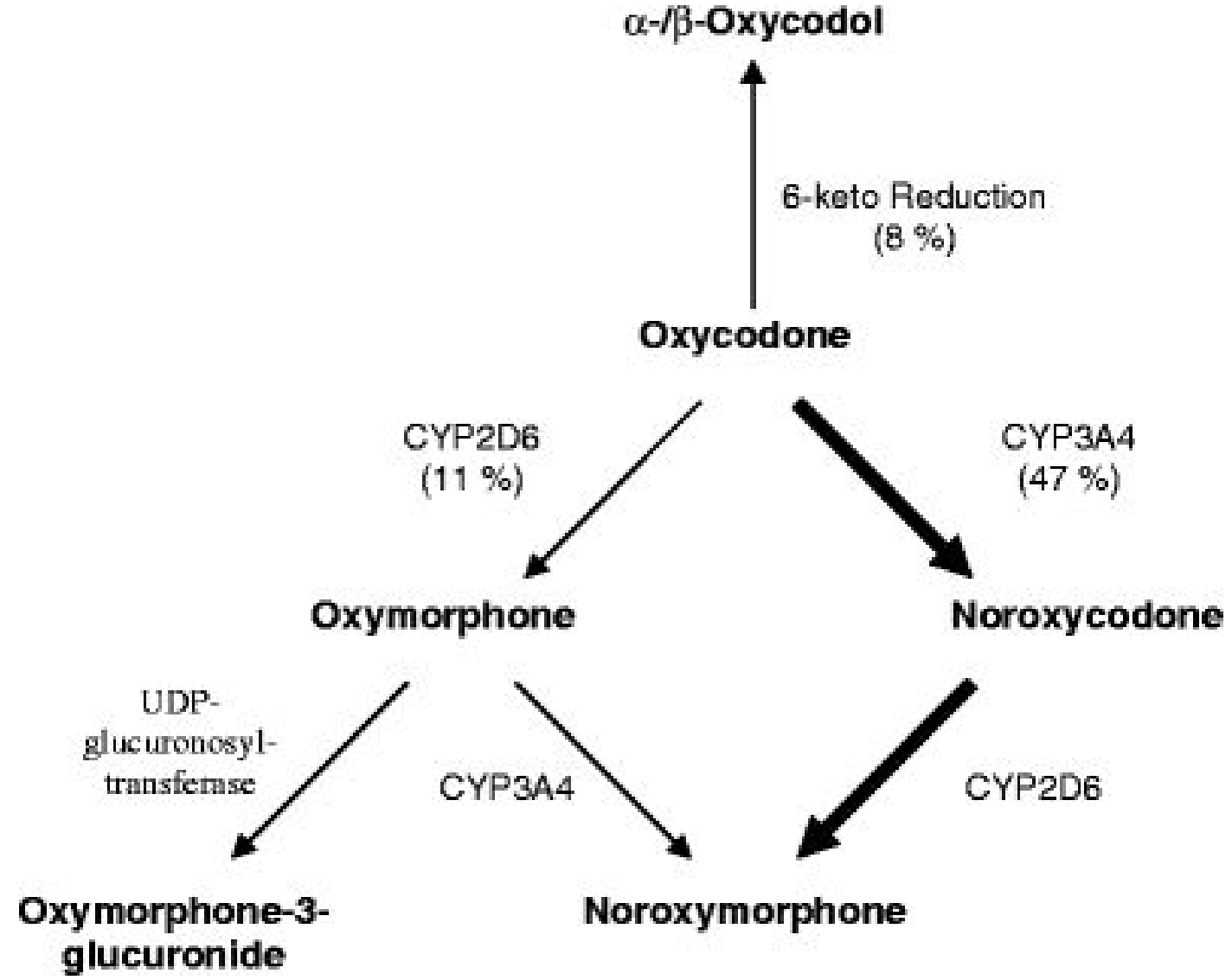
Tramadol

- 3 functional alleles CYP2D6*2 X 2 / CYP2D6*2 genotype
- UM Phenotype

Case Study #4

- 62 y.o. female chronic pain with DPN on dialysis TIW
- Successful Pain Control
  - Oxycodone CR 15mg Q12h
  - Oxycodone IR 5mg ~2/d
  - Pregabalin 50mg QD and post dialysis
- Urine Drug Testing
  - Positive Oxycodone and Noroxycodone
  - Negative Oxymorphone

Oxycodone Metabolism



Case Study #4

- Patient Admitted with Cough
- Provided Clarithromycin
- Opioid Dose Unchanged
- Respiratory Arrest
- Naloxone Reversed
- Discharged on oxycodone 5mg max 4/d – pain not managed

Case Study #4

- What happened???

- CYP2D6: PM
- Clarithromycin
  - Potent CYP3A4 Inhibitor

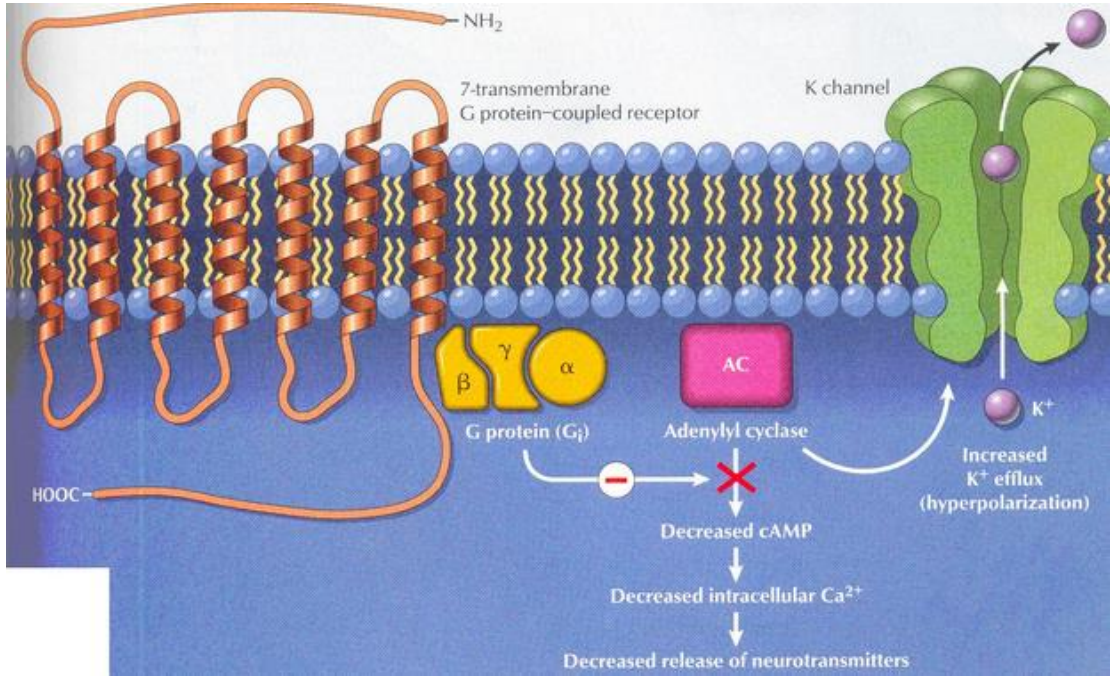
- Oxycodone metabolized by
  - CYP2D6 / CYP3A4 $\rightarrow$ Oxycodone OD

So the drug made it through the hurdles of pharmacokinetics

Now what?

Pharmacodyamics

- Opioid Receptors
  - Gene is OPRM1
    - 13,486 SNPs identified in humans 2015
    - 1,800 SNPs identified in humans in 2010

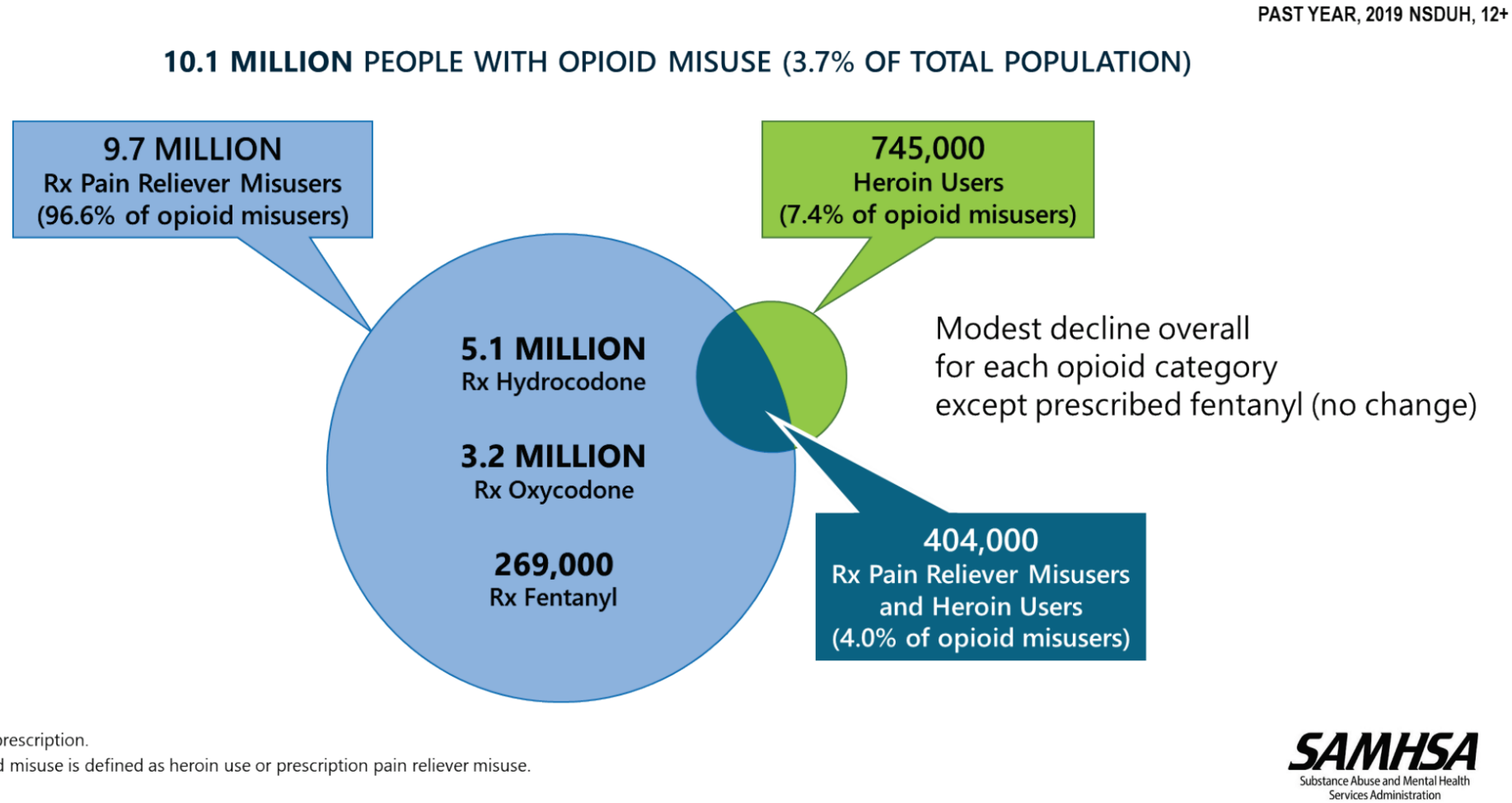


Mutations in OPRM1

- Decreased G-protein coupling
  - 779 G>A, 794 G>A, 802 T>C
  - Rare (<0.1%), but opioids expected to be ineffective
- More common 118 A>G
  - 8-17% in White
  - 47% in Japanese
  - Decrease in opioid potency for pupillary constriction
  - Decrease opioid potency
  - Greater post-op opioid requirements
  - Greater chronic pain opioid dose

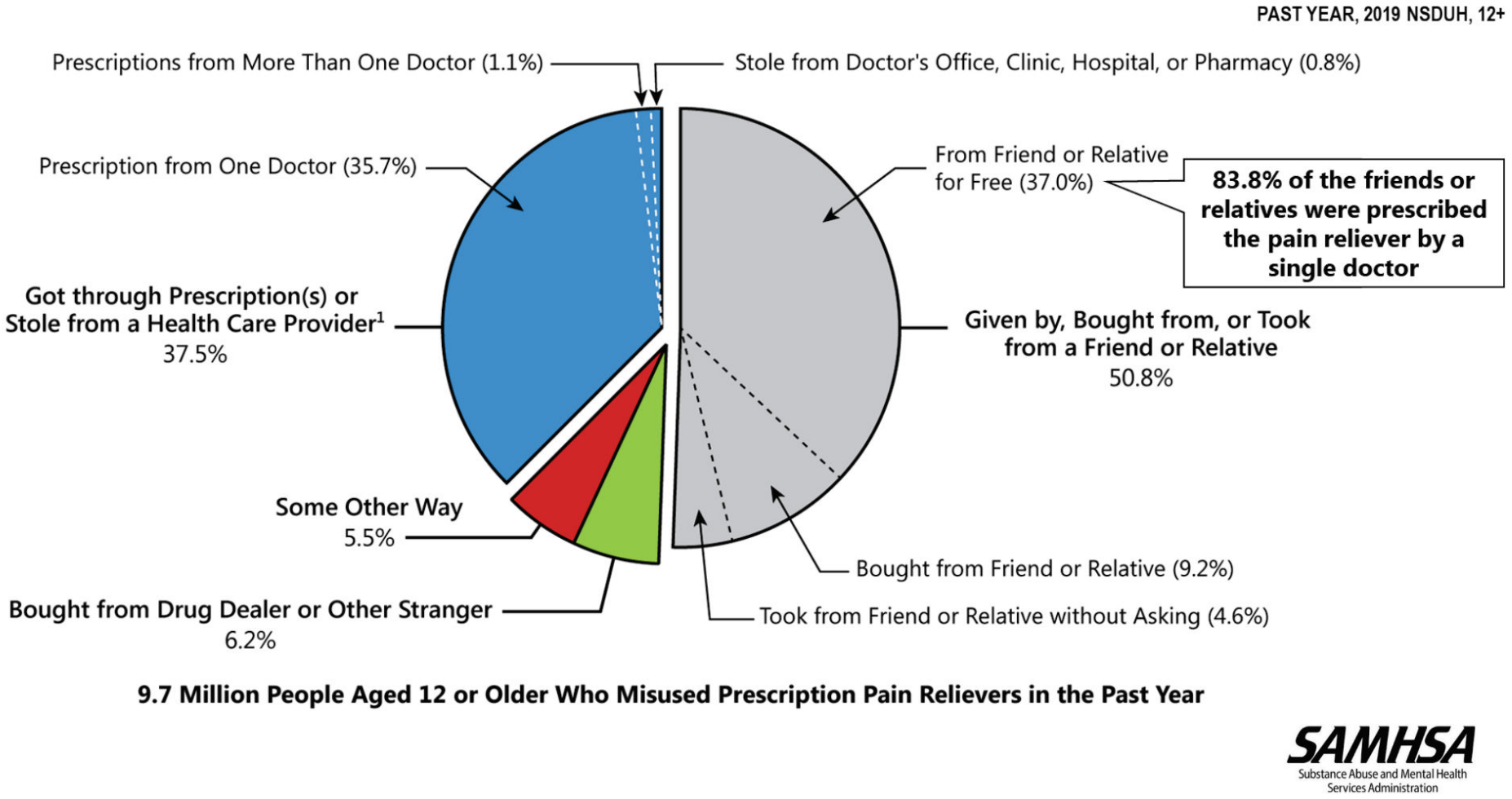
Urine Drug Monitoring

Opioid Misuse Age 12+
National Survey of Drug Use and Health - 2019



https://www.samhsa.gov/data/sites/default/files/reports/rpt29392/Assistant-Secretary-nsduh2019_presentation/Assistant-Secretary-nsduh2019_presentation.pdf

Opioid Source for Most Recent Misuse National Survey of Drug Use and Health - 2019



SAMHSA
Substance Abuse and Mental Health Services Administration

https://www.samhsa.gov/data/sites/default/files/reports/rpt29392/Assistant-Secretary-nsduh2019_presentation/Assistant-Secretary-nsduh2019_presentation.pdf

Iatrogenic Addiction

- Not well defined
- Multiple Risk Factors (known and unknown)
- May occur even with proper prescribing
- May represent small percent, but absolute numbers are high
- Patient harm may be significant

Beauchamp, Gillian A., Erin L. Winstanley, Shawn A. Ryan, and Michael S. Lyons (2014)

Urine Drug Monitoring Goals

- Can aid in identifying misuse and diversion
  - Prescribed medication
  - Other non-disclosed prescription medication
  - Illicit substances

- May be the only tool to identify diversion

Quick Case

- 40 y.o. female patient prescribed Hydrocodone 10/325 at 2 tablets every 4 hours (10 total per day)
- Urine Drug Test Results:

Cannabinoids	NEGATIVE
Cocaine	NEGATIVE
Amphetamines	NEGATIVE
Opiates	NEGATIVE
Phencyclidine	NEGATIVE

- Consistent?
- Inconsistent?
- Don’t know?

The Federal Five – Employee Drug Testing

- Cannabinoids (marijuana, hashish - tests for metabolite THCC00H)
- Cocaine (cocaine, benzoylecognine, cocaethylene) - tests for cocaine metabolite)
- Amphetamines (amphetamine, methamphetamine)
- Opiates (heroin, opium, codeine, morphine, 6-MAM)
- Phencyclidine (PCP)

- Immunoassay Test (Qualitative) – Presumptive

- Thoughts on case?

Why Urine?

- Other Specimen Types
  - Urine, Blood, Hair, Saliva
- Urine preferred for most practice locations:
  - Non-invasive collection
  - Provides a snapshot from days to weeks
- Testing Methods
  - Immunoassay – Presumptive (Qualitative)
  - LC/MS - GC/MS – Definitive Testing (Quantitative)

What do the results mean?

- POSITIVE: Substance detectable above a specified threshold
- NEGATIVE: Substance non-detectable above a specific threshold
- CONSISTENT: Results have been compared to a medication list
- NOT-CONSISTENT: No matching substance was provided to lab
- XXXX ng/ml – Concentration of detected substance

Urine Testing

- Understand the limits of the actual test
  - Many Urine Drug Screens test only morphine and codeine (this test would be negative in someone taking hydrocodone)

Urine Detection Times

Substance	Length of Detection
Amphetamines	3 days
Barbiturates	
Short/Intermediate acting (butalbital)	24–72 hours
Long acting (phenobarbital)	2–3 weeks
Benzodiazepines	
Short acting	3 days
Long acting	3 weeks
Cannabinoids	
Single use	3 days
Heavy user	4–6 weeks
Cocaine	3–5 days
Opioids	3–5 days
Phencyclidine	8 days

False Positive / False Negatives

	False Positive	False Negative
Amphetamines	Amantadine Buproprion Ephedrine Labetolol Methylphenidate Phentermine Pseudoephedrine Ranitidine Seligiline Trazadone	MDMA (ecstasy) Synthetic amphetamines (cathinones, bath salts, etc)
Benzodiazepines	Oxaprozin Sertraline Efavirenz	Alprazolam Clonazepam Lorazepam
Cannabinoids	Ibuprofen Naproxen Efavirenz Baby washes	Synthetic cannabinoids

	False Positive	False Negative
Opioids	Poppy seeds Quinolones Verapamil	Fentanyl Hydrocodone Hydromorphone Meperidine Methadone Oxycodone
Phencyclidine	Dextromethorphan Diphenhydramine Ketamine Tramadol Venlafaxine	
Tricyclic Antidepressants	Carbamazepine Cyclobenzaprine Diphenhydramine Phenothiazines	

False positive methadone screens have been reported to be caused by quetiapine, doxylamine, olanzapine, diphenhydramine, and verapamil

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6170116/

Predictive Value

- Specificity – positive when substance present
- Sensitivity – negative when substance absent
- Urine Drug Testing:
  - Immunoassay:
    - Poor specificity and sensitivity
    - Inexpensive
  - Definitive:
    - Higher specificity and sensitivity
    - Expensive
- Adulterants

Urine Drug Testing Summary

- Collection can be problematic
- Interpretation can be challenging
  - Many metabolic pathways
    - Codeine ⇨ morphine (as soon as 1 hour post dose)
    - Hydrocodone ⇨ hydromorphone
    - Oxycodone ⇨ oxymorphone
    - Heroin ⇨ morphine (10) > codeine (1), morphine >10,000
    - Tramadol (prodrug) ⇨ M1 (o-desmethyltramadol) – CYP2D6
  - Impurities in drug manufacturing
    - Oxymorphone may have 0.3% oxycodone contamination in manufacturing
  - Genetic Polymorphisms (CYP2D6)
  - Limits in laboratory testing methods (cut offs)

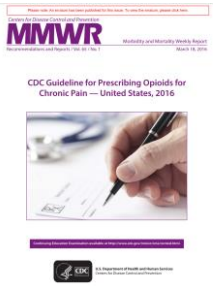
Prescription Drug Monitoring Programs

Prescription Drug Monitoring Programs

- State managed databases of dispensed controlled substances
- Generally schedule II-IV controlled substances
- Data obtained primarily from community-based pharmacies
- Generally accessible by:
  - Prescribers
  - Pharmacist
  - Possibly law enforcement, insurers, researchers, and medical licensing boards
- Make obtaining prescriptions inappropriately from multiple providers "doctor shopping" harder
- Identify "pill mills"
- Identify potential drug interactions – safety enhancement

https://www.hhs.gov/sites/default/files/pmtf-final-report-2019-05-23.pdf

Clinical Practice Guidelines
Centers for Disease Control (2016) Guideline for Prescribing Opioids for Chronic Pain — United States



Recommendation 9:

Clinicians should review the patient's history of controlled substance prescriptions using state prescription drug monitoring program (PDMP) data to determine whether the patient is receiving opioid dosages or dangerous combinations that put him or her at high risk for overdose. Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every 3 months.

https://www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm

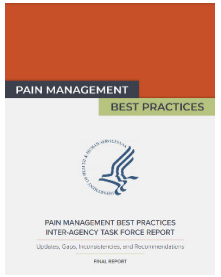
Clinical Practice Guidelines
Pain Management Best Practices Inter-Agency Task Force Report (2019)

GAP:

PDMP use varies greatly across the United States, with variability in PDMP design; the state's health information technology infrastructure; and current regulations on prescriber registration, access, and use.

https://www.hhs.gov/sites/default/files/pmtf-final-report-2019-05-23.pdf

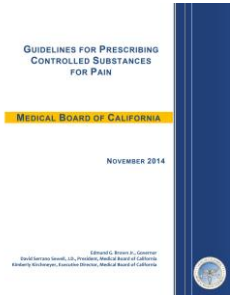
Clinical Practice Guidelines



- HHS Interagency Task Force
  - Recommendations:
    - 1A: Consider checking PDMPs, in conjunction with other risk stratification tools, upon initiation of opioid therapy, with periodic reevaluation.
    - 1B: Provide clinician training on accessing and interpreting PDMP data.
    - 1C: Clinicians should engage patients to discuss their PDMP data rather than making a judgment that may result in the patient not receiving appropriate care. PDMP data alone are not error proof and should not be used to dismiss patients from clinical practices.
    - 1D: If already performed upon admission in the inpatient hospital setting, the health care team should not be mandated to repeatedly check the PDMP if already performed upon admission and pending discharge.
    - 1E: Conduct studies to better identify where PDMP data are best used (e.g., inpatient versus outpatient settings). Adjust PDMP data use based on the findings of the recommended studies to minimize undue burdens and overuse of resources (i.e., streamline PDMP data use).
    - 1F: States are encouraged to have interoperability between PDMP and EHR platforms (Code of Federal Regulations 170.315). EHR vendors should work to integrate PDMPs into their system design at minimal to no additional cost or burden to providers (to eliminate barriers to accessing PDMP data), especially when these data points are mandated.
    - 1G: Enhance the interoperability of PDMPs across state lines to allow for more effective use, along with consistent reporting to PDMP by the VA and military health system.
    - 1H: Clinicians within and outside federal health care entities should have access to each other's data to ensure safe continuity of care.
    - 1I: Allow access to PDMPs by all opioid prescribers.
    - 1J: Encourage funding programs to link interstate PDMP programs to each other.

https://www.hhs.gov/sites/default/files/pmtf-final-report-2019-05-23.pdf

Clinical Practice Guidelines (State Example) Medical Board of California (2014)



- Clinicians should use the Prescription Drug Monitoring Program (PDMP) to identify patients who obtain drugs from multiple sources.

- In patients with above-average risk of substance use: Regularly check with a PDMP for compliance with prescribed amounts of opioids (using cross-state PDMP systems whenever they are available)

- Medical Records: An “adequate medical record” includes results of PDMP data searches

https://www.mbc.ca.gov/Download/Publications/pain-guidelines.pdf

California Law (State Example)
Health and Safety Code §11165.4(a)(1)(B)

- Mandatory PDMP/CURES use:
  - The first time a patient is prescribed, ordered, administered, or furnished a controlled substance, unless one of the exemptions apply.
  - Within the twenty-four hour period, or the previous business day, before prescribing, ordering, administering, or furnishing a controlled substance, unless one of the exemptions apply.
  - Before subsequently prescribing a controlled substance, if previously exempt.
  - At least once every six months if the controlled substance remains a part of the patient's treatment plan.

- Who: Physician and Surgeon, Certified Nurse Midwife (Furnishing), Dentist, Naturopathic Doctor, Nurse Practitioner (Furnishing), Optometrist, Physician Assistant, Podiatrist

- Action for Failing: A health care practitioner who fails to consult the CURES database must be referred to their state professional licensing board for administrative sanctions, as deemed appropriate by that board.

https://www.mbc.ca.gov/Licensees/Prescribing/CURES/Mandatory_Use.aspx

California Law
Health and Safety Code §11165.4(a)(1)(B)

- Exemptions:
  - While the patient is admitted to, or during an emergency transfer between a
    - Licensed Clinic, or
    - Outpatient Setting, or
    - Health Facility, or
    - County Medical Facility
  - In the emergency department of a general acute care hospital, and the controlled substance does not exceed a non-refillable seven-day supply.
  - As part of a patient's treatment for a surgical procedure, and the controlled substance does not exceed a non-refillable five-day supply when a surgical procedure is performed at a
    - Licensed Clinic, or
    - Outpatient Setting, or
    - Health Facility, or
    - County Medical Facility, or
    - Place of Practice
  - The patient is receiving hospice care.

https://www.mbc.ca.gov/Licensees/Prescribing/CURES/Mandatory_Use.aspx

California Statute
Health and Safety Code §11165.4(a)(1)(B)

Additional Exemptions

- What if it is not reasonably possible for a prescriber to access the information in CURES in a timely manner?
    - If another individual with access to CURES is not reasonably available, a five-day supply of the controlled substance can be prescribed, ordered, administered, or furnished as long as there is no refill allowed. In addition, the prescriber must document in the patient's medical records the reason for not consulting CURES.
- What if I determine that consulting CURES would result in a patient's inability to obtain a prescription in a timely manner and thereby adversely impact the patient's medical condition?
    - A prescriber may provide a non-refillable five-day supply if they make this determination. The prescriber must document in the patient's medical records the reason for not consulting CURES.
- What if I experience technical difficulties with CURES?
    - There are exemptions to consulting CURES if there are technical difficulties accessing CURES, such as CURES is temporarily unavailable for system maintenance, or you experience temporary technological or electrical failure and CURES cannot be accessed (e.g., power outage due to inclement weather).

NOTE: A prescriber must, without undue delay, seek to correct any cause of the temporary technological or electrical failure that is reasonably within their control.

There is no private cause of action for a prescriber's failure to consult CURES.

https://www.mbc.ca.gov/Licensees/Prescribing/CURES/Mandatory_Use.aspx

Roots of Opioid Regulation

1914 Harrison Narcotic Tax Act

- “an act to provide for the registration of, with collectors of internal revenue, and to impose a special tax upon all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away any opium or coca leaves, their salts, derivatives, or preparations, and for other purposes”
- "Nothing contained in this section shall apply . . . to the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this Act in the course of his professional practice only.“
- Addiction not a disease, an addict not a patient, therefore not “in the course of his professional practice”

https://www.druglibrary.org/schaffer/history/e1910/harrisonact.htm

History of PDMPs

- 1914-1917 – New York State required physicians to submit duplicate prescription forms to centralized state database
  - State issued, numbered and required verification prior to dispensing
- 1939 – California Triplicate Prescription Program (Model Program)
  - Bureau of Narcotics Enforcement (Department of Justice)
  - State-issued prescription forms
  - One copy sent to state, one copy maintained by both prescriber and pharmacist
- 1943 – Hawaii
- 1961 – Illinois
- 1967 – Idaho
- 1973 – New York
- 1978 – Rhode Island
- 1981 – Texas
- 1988 – Michigan

Holmgren, A. J., Botelho, A., & Brandt, A. M. (2020)

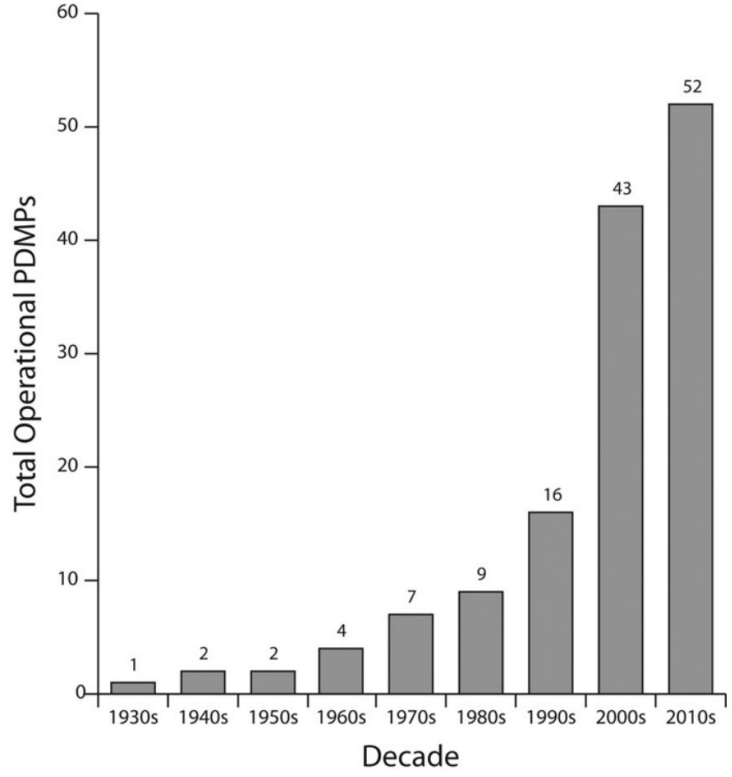
History of PDMPs (Continued)

- Supreme Court: *Whalen v. Roe* (1977)
  - New York PDMP required names and address listed in a centralized database of those prescribed CII drugs
  - Challenge: “Violated the patient’s right to privacy [protected by 14th Amendment] and interfered with the doctor’s right to prescribe treatment for his patient solely on the basis of medical considerations
  - SCOTUS determined there was no violation of the 14th Amendment
    - PDMP data was a state administrative reporting requirement, not determining medical care
    - PDMP was a “state law enforcement tool for preventing unlawful diversion of controlled substances, not an instrument of medicine and public health”

Holmgren, A. J., Botelho, A., & Brandt, A. M. (2020)

History of PDMPs (Continued)

- 1990's – Oklahoma, Nevada, Massachusetts, Utah, Indiana, Kentucky, Guam
  - Oklahoma 1st in completely electronic PDMP
- 2000-2009 – 27 PDMPs added
- 2010-2019 – 8 PDMPs added
- District of Columbia, Puerto Rico
- Missouri – Last State - 2021



Holmgren, A. J., Botelho, A., & Brandt, A. M. (2020)

Federal Health

- Veteran's Affairs and Indian Health Service
  - VA physicians support PDMPs
  - 2016 HHS requires prescribers to use PDMP before prescribing opioids and pharmacists must report dispensing
  - IHS established a memorandum of understanding the states

https://www.hhs.gov/sites/default/files/pmtf-final-report-2019-05-23.pdf

Transition of PDMP

- Foundation
  - Generally developed primarily for law enforcement
  - Generally managed by Bureau of Narcotics Enforcement or Attorney General
- Modern
  - Some transition in management to Medical or Public Health Departments
    - Pennsylvania – Established in AG's office in 1972 moved to state health department in 2016
- Policy efforts to transition the utility of the PDMP from being punitive to enhancement of public health, though their law enforcement role remains in tact

Holmgren, A. J., Botelho, A., & Brandt, A. M. (2020)

Evidence-Based Practice

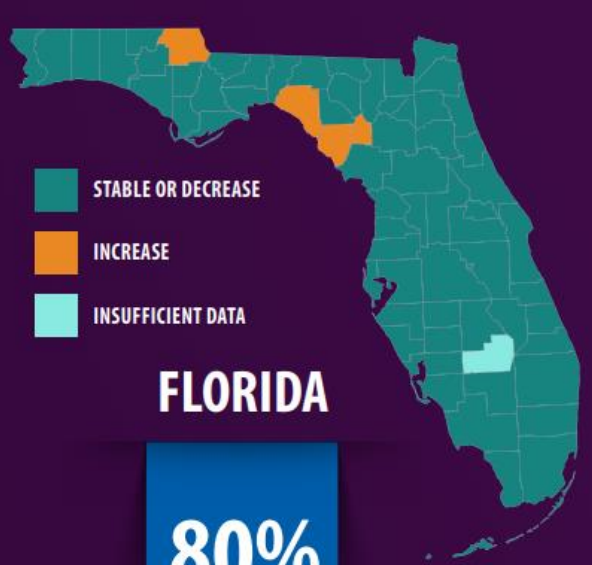
- ED Prescribing
  - FL prescribers reported PDMP data altered their prescribing and improved comfort in prescribing, though no change in the number of controlled substances prescribed (McAllister, M et al. 2015)
  - OH prescribers seeing patients with painful conditions (dental, neck, back, head, joint, or abdominal pain), excluding acute injuries, changed clinical management in 41%, 61% fewer or no opioid, and 39% more opioid (Baehren et al. 2010)
- PDMP on Opioid Utilization in Medicare (Buchmueller & Carey 2018)
  - Only if PDMP use mandated did measures drop in Medicare Part D beneficiaries
- KY, NM, TN, NY – Insurance claims data between 2010-14 with states implementing PDMP mandates between 2012-13. Results were a 6-77 MED per person reduction per quarter and in KY the percent of people filling opioids declined 1.6% (Haffajee 2018)

STATE SUCCESSES: Decreases in Opioid Prescribing

Average Morphine Milligram Equivalants (MME)* per person decreased in most counties in Florida, Ohio, and Kentucky from 2010 to 2015.

These states have regulated pain clinics and set requirements for their state's PDMP.

PDMP, Prescription Drug Monitoring Program, is a state-run electronic database used to track the prescribing and dispensing of controlled prescription drugs to patients.



FLORIDA

80% of counties DECREASED

OHIO

85% of counties DECREASED

KENTUCKY

62% of counties DECREASED

* MME is a way to calculate the amount of opioids, accounting for differences in opioid drug type and strength.

www.cdc.gov/vitalsigns/opioids

https://www.cdc.gov/drugoverdose/policy/successes.html

PDMP and Opioid Related Overdose Death

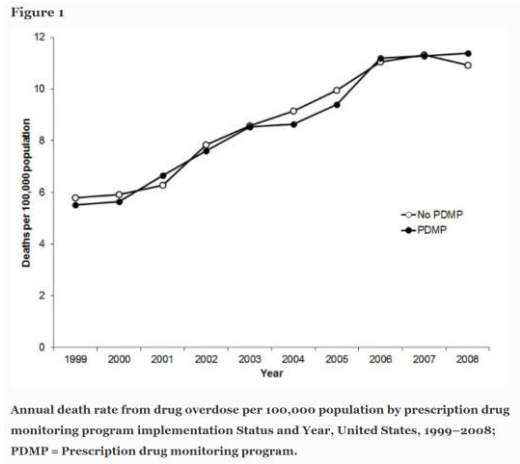
- Between 1999-2005 “PDMPs not significantly associated with lower rates of drug overdose or opioid overdose mortality or lower rate of consumption of opioid drugs” (Paulozzi et al. 2011)
- Between 1999-2008 drug Overdose Deaths increase 96%. PDMP did not reduce drug overdose mortality in most states (Li et al. 2014)
- FL 2012 – Oxycodone-caused deaths declined 25%

the month after implementation of FL’s PDMP (Delcher 2015)

- Systematic Review – Evidence that PDMP implementation

either increases or decreases nonfatal or fatal overdose is

largely insufficient (Fink et al 2018)



Annual death rate from drug overdose per 100,000 population by prescription drug monitoring program implementation Status and Year, United States, 1999–2008; PDMP = Prescription drug monitoring program.

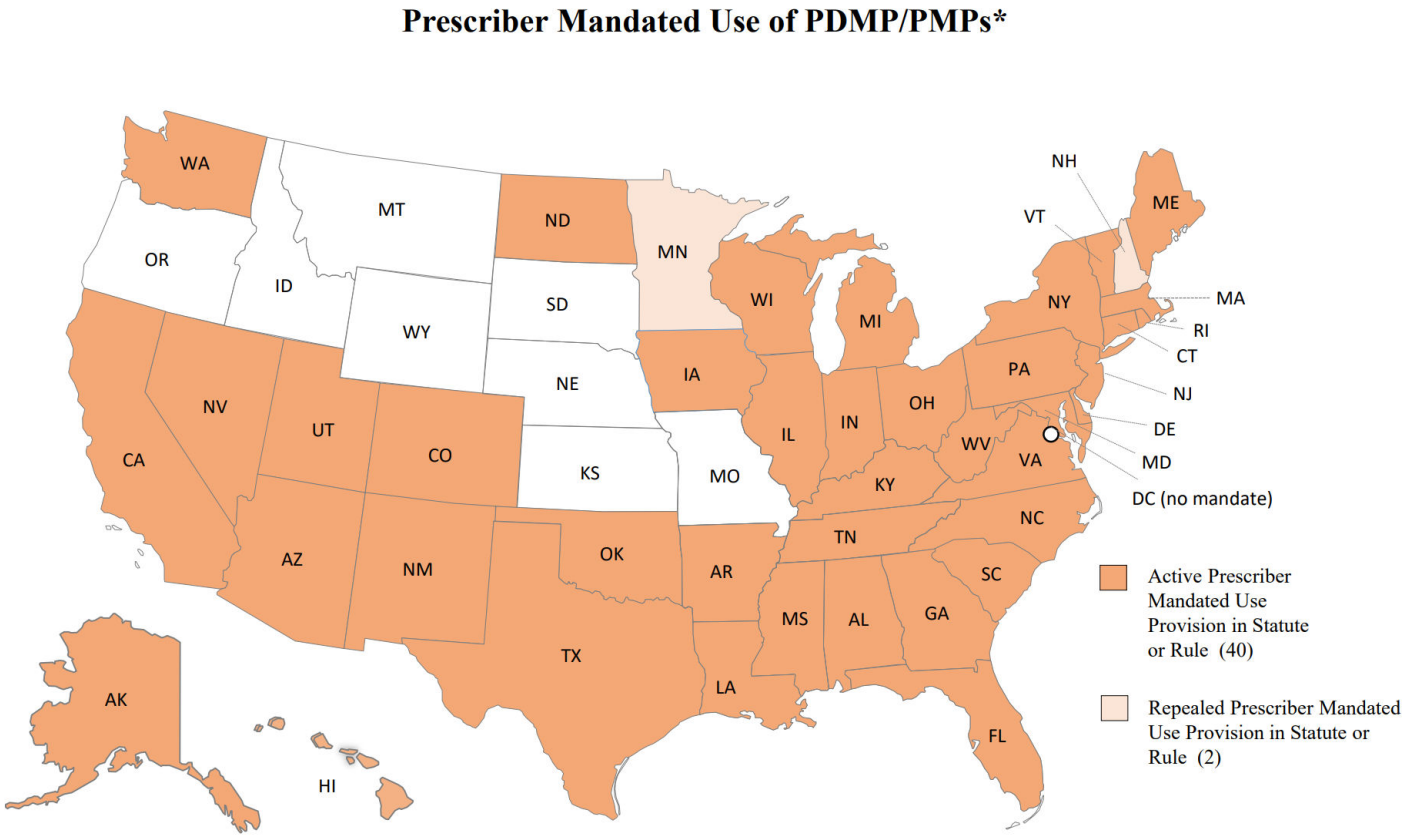
PDMP and Opioid Related Overdose Death

- All 50 states and DC between 1999-2014 opioid overdoses. PDMP strength was determined and for every 1 point increase in strength there was a 1% reduction in overdose deaths (Pardo 2017)

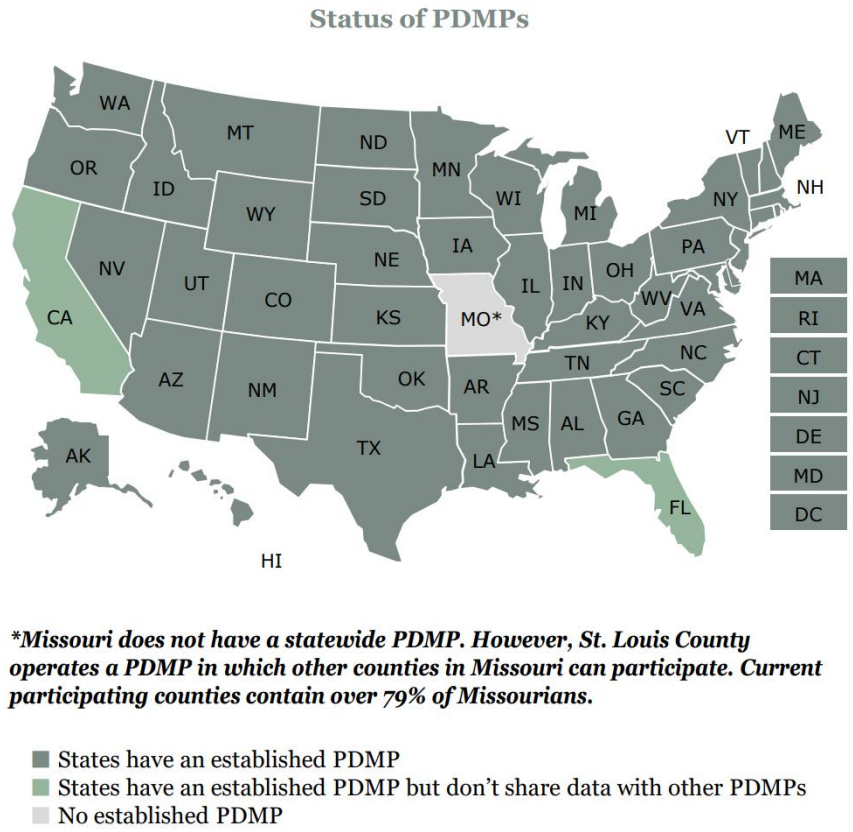
Table 1 Point allocation to rules to create score variable; number of states with operational Prescription Drug Monitoring Programs (PMPs) denoted by *n*.

	Statutory regulation or best practice	*Outcomes listed from literature*	*Type (number of studies)*	*Weight*
1	Monitor more than Schedule II drugs (Schedules III, IV or V)	Reduced doctor-shopping, decreased inappropriate opioid pain relievers (OPR) use	Time series and descriptive/before–after [13]	3
2	PMP permitted or required (i.e. proactive) to identify suspicious prescribing, dispensing or purchasing activity	Decreased prescription sales	Observational with controls [4]	4
3	Access for law enforcement and prosecutors	None	None	1
4	Access for physicians, pharmacists, nurse practitioners/physicians; assistants, dentists, chiropractors	None	None	1
5	Reporting frequency	Decreased doctor-shopping, increase use of program by prescribers	Observational with controls [2]	Baseline < month, > week−2 if not required −1 for monthly 0 for less than a month, greater than a week 1 for weekly 2 for daily 3 for live system
6	Prescribers required to check PMP before prescribing to a patient	None	None, but Haegerich *et al.* [14] and Davis *et al.* [23] mention it	4
7	PMP permitted to share data with other states	None	None, but Brandeis best practices report mentions	1
8	Law requires program evaluation	None	None	1
9	PMP has oversight board	None	None	1
10	Data retention	None	None	1
11	Funding mechanism	None	None, but Brandeis best practices report mentions	0 no funding, 1 grants or gifts, 2 charging fees, 3 appropriated

National Alliance for Model State Drug Laws (NAMSDL)



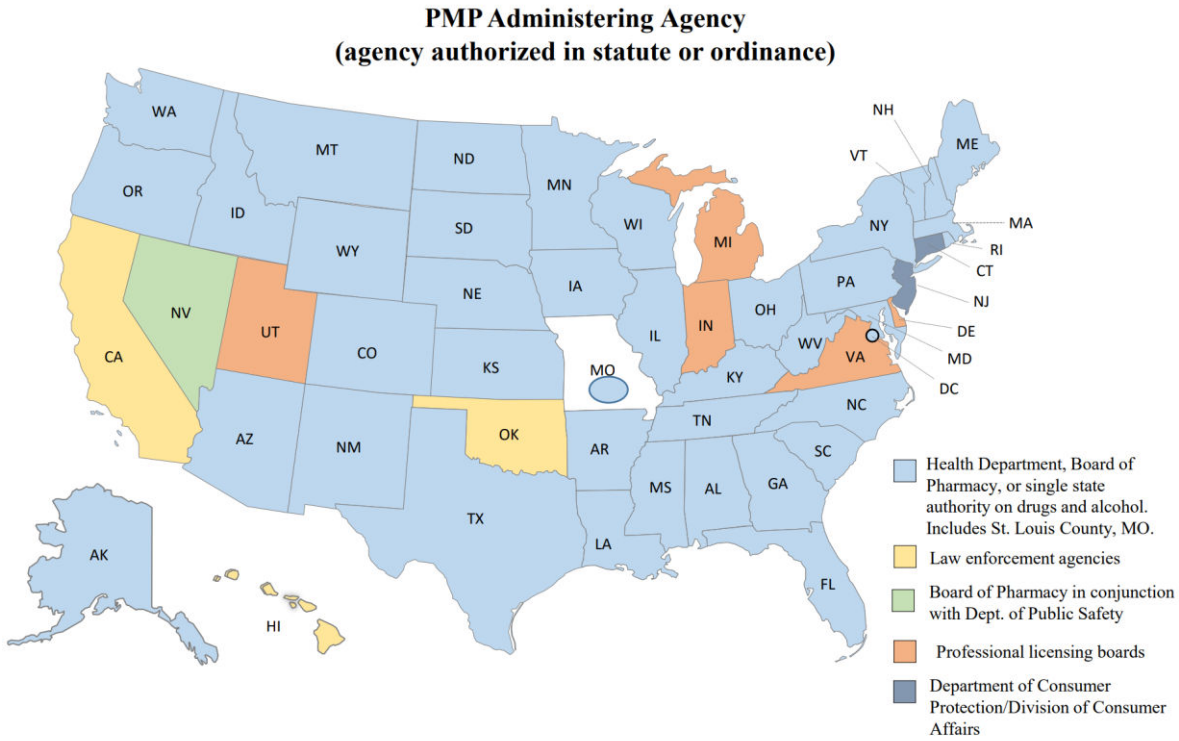
2019

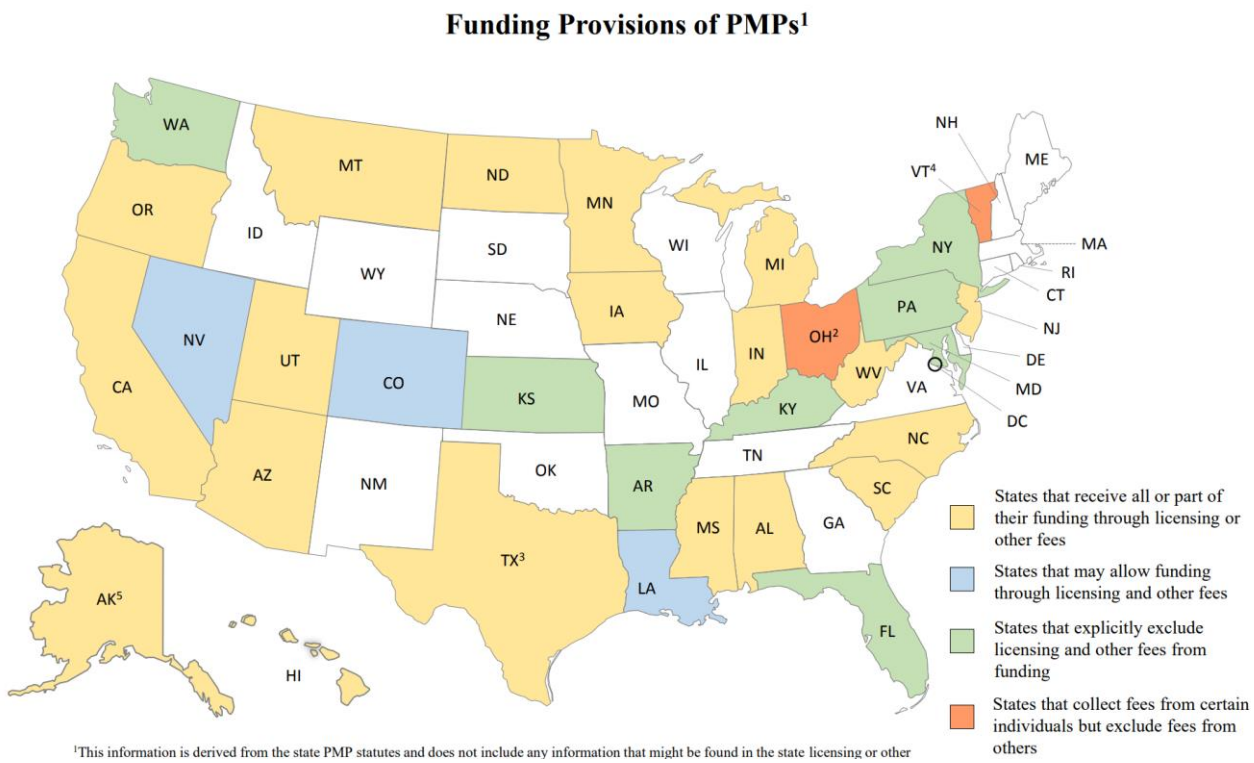


2016

https://namsdl.org/topics/pdmp/

National Alliance for Model State Drug Laws (NAMSDL)





https://namsdl.org/topics/pdmp/

Limitations & Concerns

- Team Practice
- Administrative Burden (Enrollment, Access, ability to Delegate)
- Concern of Loss of License
- Fear of imprisonment
- Inappropriate modification of treatment for patients
- Less appropriate medical access may lead to greater misuse
- Provider burnout
- Lack of real-time access
- Lack of interstate data
- Lack of Full Integration into workflow (EHR)

Federal Policy

- SUPPORT (Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment 2018) (https://www.congress.gov/bill/115th-congress/house-bill/6)
  - Requires providers to check PDMP for a Medicaid enrollee's prescription history before prescribing a controlled substance
  - Bill authorizes improvements for PDMPs regarding use, data reporting, and intrastate and interstate interoperability
- National Drug Control Strategy (January 2019) (https://namsdl.org/wp-content/uploads/NDCS.pdf)
  - Improve interoperability and address legal challenges
  - Improve PDMP integration and data sharing
  - Incentivize states to make PDMP checking mandatory for all providers

Clinical Actions

- Per CDC:
  - Do not dismiss patients from care
  - Calculate the total daily dose of opioids for safer dosages
  - If patients are receiving high total opioid dosages
    - Consider collaborating with the patient to taper opioids for chronic pain to a safer dosage
    - Consider offering naloxone
  - If patients are taking benzodiazepines with opioids
    - Communicate with others managing the patient
    - Weigh patient goals, needs, and risks
  - If considering opioid use disorder, discuss safety concerns and treatment options

https://www.cdc.gov/opioids/providers/pdmps.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fdrugoverdose%2Fpdmp%2Fproviders.html

[redacted]

Department of Justice - Bureau of Narcotic Enforcement
Controlled Substance Utilization Review & Evaluation System

CONFIDENTIAL DOCUMENT

PATIENT/CLIENT ACTIVITY : CONSOLIDATED REPORT

Prescription Drug Transaction Details :

Number of Hits: 116 **Start Date: 07/09[redacted]** **End Date: 07/09/2[redacted]**

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
07/10/2[redacted]	[redacted]				APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	30	[redacted]			[redacted]		1
07/12/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60						0
07/15/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	50						0
07/18/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	25						0
07/19/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	25						0
07/19/2					OXYCODONE AND ACETAMINOPHEN	TAB	325 MG-2.5 MG	20						0
07/20/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	25						0
07/25/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	50						0
07/27/2					ALPRAZOLAM	TAB	1 MG	60						0
08/07/2					CHLORDIAZEPOXIDE HYDROCHLORIDE	CAP	25 MG	10						0
08/10/2					CLONAZEPAM	TAB	0.5 MG	60						0
08/12/2					ROXICET	TAB	325 MG-5 MG	15						0
08/13/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	40						0
08/15/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30						0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	
08/16/	[redacted]				APAP/OXYCODONE	TAB	325 MG-10 MG	30	CVS #91	[redacted]	[redacted]	SCH LEO	[redacted]	0
08/17/					ALPRAZOLAM	TAB	1 MG	48	RIT			MOR RAP		1
08/22/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	30	VO 232			MYE SEY		0
08/29/					ALPRAZOLAM	TAB	1 MG	60	VO 232			MOR RAP		0
08/29/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	16	VO 232			HAR THO		1
08/29/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	34	VO 232			HAR THO		0
08/31/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	30	CV #91			MYE SEY		0
09/09/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	50	VO 232			HAR THO		0
09/23/					ALPRAZOLAM	TAB	1 MG	60	VO 232			MOR RAP		1
09/29/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	50	VO 232			HAR THO		0
10/06/					ALPRAZOLAM	TAB	1 MG	12	RIT			MOR RAP		2
10/14/					ALPRAZOLAM	TAB	1 MG	60	RIT			MOR RAP		0
10/17/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	50	VO 232			HAR THO		0
10/17/					ALPRAZOLAM	TAB	1 MG	60	VO 232			MOR RAP		2
10/24/					LUNESTA	TAB	3 MG	30	RIT			MOR RAP		0
10/24/					ALPRAZOLAM	TAB	2 MG	60	RIT			MOR RAP		0
11/03/					ALPRAZOLAM	TAB	1 MG	180	MB PH			MOR RAP		0
11/04/					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	20	WA #1			SOC		0
11/07/					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	20	MB PH			SOC		0
11/09/					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	50	VO 232			HAR THO		0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
01/09/20	[redacted]				APAP/OXYCODONE	TAB	325 MG-5 MG	20	SA	[redacted]				0
01/10/20					APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	30	CV #9					0
01/11/2					APAP/OXYCODONE	TAB	325 MG-5 MG	10	WA #1					0
01/17/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	20	RI					0
01/19/2					APAP/OXYCODONE	TAB	325 MG-5 MG	30	RA NC					0
01/21/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	20	RI					0
01/23/2					ROXICET	TAB	325 MG-5 MG	30	CV #9					0
01/24/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	NC MB PH					0
01/26/2					APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	20	CV #3					0
01/26/2					APAP/OXYCODONE	TAB	325 MG-5 MG	60	CV #9					0
01/27/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	RI					0
01/29/2					APAP/OXYCODONE	TAB	325 MG-5 MG	35	WA 06					0
01/30/2					APAP/OXYCODONE	TAB	325 MG-5 MG	20	MB PH					0
01/31/2					APAP/OXYCODONE	TAB	325 MG-5 MG	12	SH ST PH					0
02/01/2					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	24	RI					0
02/02/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	MB PH					0
02/05/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	15	SA					0
02/06/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	CV #9					0
02/10/2					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	MB PH					0
					HYDROCODONE		325		VI					

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
02/10/20	[redacted]				APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	RITE	[redacted]				0
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02/14/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	WAL #116					0
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02/16/20					LUNESTA	TAB	3 MG	30	RITE					1
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02/21/20					HYDROCODONE BITARTRATE AND ACETAMIN	TAB	750 MG-7.5 MG	20	RITE					0
02/23/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	SUP PHA					1
02/23/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	RITE					0
02/25/20					APAP/OXYCODONE	TAB	325 MG-5 MG	40	WA 060					0
02/26/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	RITE					0
02/27/20					APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	12	WA #11					0
02/27/20					APAP/OXYCODONE	TAB	325 MG-5 MG	5	RITE					0
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02/28/20					HYDROCODONE BITARTRATE AND	TAB	325 MG-5	30	TA NO					0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
03/02/20	[redacted]				APAP/OXYCODONE	TAB	325 MG-7.5 MG	35	WA 060					0
03/05/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	10	RAI NO					0
03/12/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	20	SAV					0
03/12/20					LUNESTA	TAB	3 MG	30	RIT					2
03/12/20					ALPRAZOLAM	TAB	2 MG	60	RIT					1
03/14/20					APAP/OXYCODONE	TAB	325 MG-5 MG	50	SU PH					0
03/19/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	CV #91					0
03/20/20					ALPRAZOLAM	TAB	2 MG	60	RIT					0
03/21/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	10						0
03/21/20					ALPRAZOLAM	TAB	2 MG	90	CV #39					0
03/22/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	CV #39					0
03/23/20					CHLORDIAZEPOXIDE HYDROCHLORIDE	CAP	25 MG	8	CV #91					0
03/23/20					SUBOXONE	FIL	2 MG-0.5 MG	60	RIT					0
03/24/20					SUBOXONE	FIL	8 MG-2 MG	60	RIT					0
04/04/20					ALPRAZOLAM	TAB	2 MG	60	RIT					1
04/16/20					SUBOXONE	FIL	8 MG-2 MG	60	RIT					1
04/30/20					ALPRAZOLAM	TAB	2 MG	90	CV #3					1
05/01/20					ALPRAZOLAM	TAB	2 MG	60	RIT					0
05/05/20					ROXICET	TAB	325 MG-5 MG	20	CV #3					0
05/07/20					APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10	30	VC 23					0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
05/09/20	[redacted]				APAP/OXYCODONE	TAB	325 MG-5 MG	30	SA	[redacted]				0
05/10/20					APAP/OXYCODONE	TAB	325 MG-5 MG	40	RI					0

Disclaimer: The Patient Activity Report (PAR) is compiled from information maintained in the Department of Justice's Controlled Substance Utilization Review and Evaluation System (CURES). The CURES maintains Schedule II, Schedule III and Schedule IV prescription information that is received from California Pharmacies and is therefore only as accurate as the information provided by the Pharmacies. If data was submitted with errors or have unknowns within a field, it will not be displayed within this report.

3- Suboxone #180
26- Oxycodone/APAP #721
60- Hydrocodone/APAP #1782
21- Alprazolam #1388
3- Lunesta #90
1- Clonazepam #60

Prescribers #46
Pharmacies #28
Profiles #34

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
11/27/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	SEA PHA	[redacted]	[redacted]	LAUREN MD	[redacted]	[redacted]
11/27/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	CVS #947	[redacted]	[redacted]	SEAN, J	[redacted]	[redacted]
11/30/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-10 MG	20	THE WIL PER CAR	[redacted]	[redacted]	JAMILA	[redacted]	[redacted]
12/01/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	20	MIS MED PHA	[redacted]	[redacted]	THOMAS R MD	[redacted]	[redacted]
12/01/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	CVS #09	[redacted]	[redacted]	BRIAN R PA	[redacted]	[redacted]
12/07/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	30	RITE	[redacted]	[redacted]	DALE MD	[redacted]	[redacted]
12/07/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	50	WAL 061	[redacted]	[redacted]	STEPHEN J MD	[redacted]	[redacted]
12/09/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	240	SAV PHA	[redacted]	[redacted]	MD	[redacted]	[redacted]
12/18/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	30	RITE	[redacted]	[redacted]	HARRIS MD	[redacted]	[redacted]
12/18/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	30	SEA PHA	[redacted]	[redacted]	DANIEL MD	[redacted]	[redacted]
12/19/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	30	SAV	[redacted]	[redacted]	JOSE A	[redacted]	[redacted]
12/20/2	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-10 MG	20	RITE	[redacted]	[redacted]	KEVIN C MD	[redacted]	[redacted]
12/20/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	20	THE WIL PER CAR	[redacted]	[redacted]	PETER J MD	[redacted]	[redacted]
12/21/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-5 MG	8	WAL 019	[redacted]	[redacted]	GORDON S MD	[redacted]	[redacted]
12/21/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-7.5 MG	12	PRO PHA	[redacted]	[redacted]	KEVIN G MD	[redacted]	[redacted]
12/21/2	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-10 MG	15	RITE	[redacted]	[redacted]	TODD, C, M.D.	[redacted]	[redacted]
12/22/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	15	RITE	[redacted]	[redacted]	, SAUL D. (MD)	[redacted]	[redacted]
12/22/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	SEA PHA	[redacted]	[redacted]	CAROL A MD	[redacted]	[redacted]
12/23/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	PRO PHA	[redacted]	[redacted]	STEVEN J PA	[redacted]	[redacted]

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
12/24/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	120	SAV	[redacted]	[redacted]	GARY L MD	[redacted]	[redacted]
12/26/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	40	SAV	[redacted]	[redacted]	DAVID MD	[redacted]	[redacted]
12/26/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	40	WA PHA 507	[redacted]	[redacted]	DAVID MD	[redacted]	[redacted]
12/27/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	VO 234	[redacted]	[redacted]	[redacted] ALISON (D.O.)	[redacted]	[redacted]
12/28/2	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-10 MG	120	RIT	[redacted]	[redacted]	RICHARD A MD	[redacted]	[redacted]
12/28/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	25	PR PHA	[redacted]	[redacted]	STEVEN J PA	[redacted]	[redacted]
12/29/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	WA #11	[redacted]	[redacted]	TIMOTHY J MD	[redacted]	[redacted]
12/30/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	40	SAV	[redacted]	[redacted]	DAVID MD	[redacted]	[redacted]
01/01/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	CVS #91	[redacted]	[redacted]	JOHN MD	[redacted]	[redacted]
01/01/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	10	CVS #88	[redacted]	[redacted]	[redacted] KEVIN DO	[redacted]	[redacted]
01/02/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	90	WA PHA 507	[redacted]	[redacted]	NONA LYN MD	[redacted]	[redacted]
01/04/2	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	15	PR PHA	[redacted]	[redacted]	SOHEIL	[redacted]	[redacted]
01/04/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	20	PR PHA	[redacted]	[redacted]	RICKY A PA	[redacted]	[redacted]
01/04/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	120	VO 236	[redacted]	[redacted]	TIMOTHY J MD	[redacted]	[redacted]
01/06/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	30	RIT	[redacted]	[redacted]	HARRIS MD	[redacted]	[redacted]
01/07/2	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	120	SAV	[redacted]	[redacted]	NORMAN MD	[redacted]	[redacted]
01/07/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	SEA PHA	[redacted]	[redacted]	VANAJA PAC	[redacted]	[redacted]
01/10/2	[redacted]	[redacted]	[redacted]	[redacted]	LORAZEPAM	TAB	1 MG	15	VO 236	[redacted]	[redacted]	CHAD M (MD)	[redacted]	[redacted]
01/11/2	[redacted]	[redacted]	[redacted]	[redacted]	CHLORDIAZEPOXIDE HCL	CAP	25 MG	20	CVS #91	[redacted]	[redacted]	TIMOTHY J MD	[redacted]	[redacted]
01/12/2	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	30	VO 236	[redacted]	[redacted]	[redacted] KELLY T. (PA-C)	[redacted]	[redacted]

PDMP Results

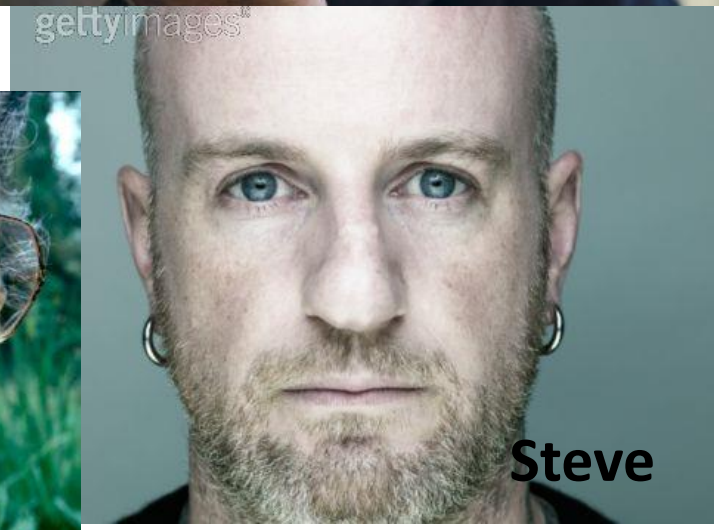
- 30 Days
- Total Prescriptions: 29
- Total Providers: 25
- Total Pharmacies: 18
- Vicodin 5/500: 148
- Vicodin ES: 12
- Norco 10/325: 1315

PDMP Summary

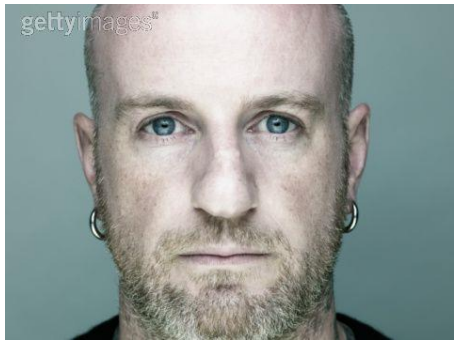
- PDMP use is widely supported by legislators, regulators, policymakers, medical societies and clinical practice guidelines
- Funding is complicated
- Evidence-based research is necessary to determine optimal utilization of data to improve patient outcomes
- No specific guidance exists on interpretation and standard of care actions when reviewing the results
- Requirements to utilize PDMPs is moving from professional standards to legal mandates
- PDMPs have a benefit and harm like any intervention

Case Studies

In Pain? Abuser? Diverter? All?



Meet Steve



- 37 y.o. male
- Owns a successful tattoo parlor
- Sole earner for wife and 3 kids
- Spinal fracture and disc herniation after crashing while mountain biking
- 6 months later pain remains severe and only able to work few hours per week
- Business risks bankruptcy

Patient Selection

- History and physical
- Moderate to severe pain
- Consider the diagnosis and more appropriate therapies

  (pregabalin or duloxetine for painful diabetic neuropathy)
- Consider the benefits and harms ratio
- Risk assessment for misuse/adverse effects
- Stratify into low and high risk

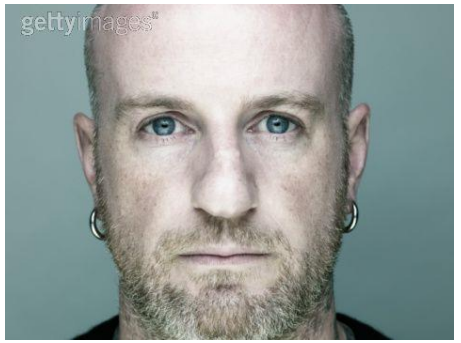
Risk Assessment Tools

- Opioid Risk Tool (ORT)
- Screener and Opioid Assessment for Patients with Pain (SOAPP)
- Others such the DIRE, COMM
- No perfect instrument exists

Opioid Risk Tool

		Male	Female
Family History of Substance Abuse	Alcohol	3	1
	Illegal Drugs	3	2
	Prescription Drugs	4	4
Personal History of Substance Abuse	Alcohol	3	3
	Illegal Drugs	4	4
	Prescription Drugs	5	5
Age (if between 16-45)		1	1
History of Preadolescent Sexual Abuse		0	3
Psychological Disease	ADD, OCD, Bipolar, Schizophrenia	2	2
	Depression	1	1
Low (0-3), Moderate (4-7), High (8+)	Total	(26)	(26)

Steve (cont.)

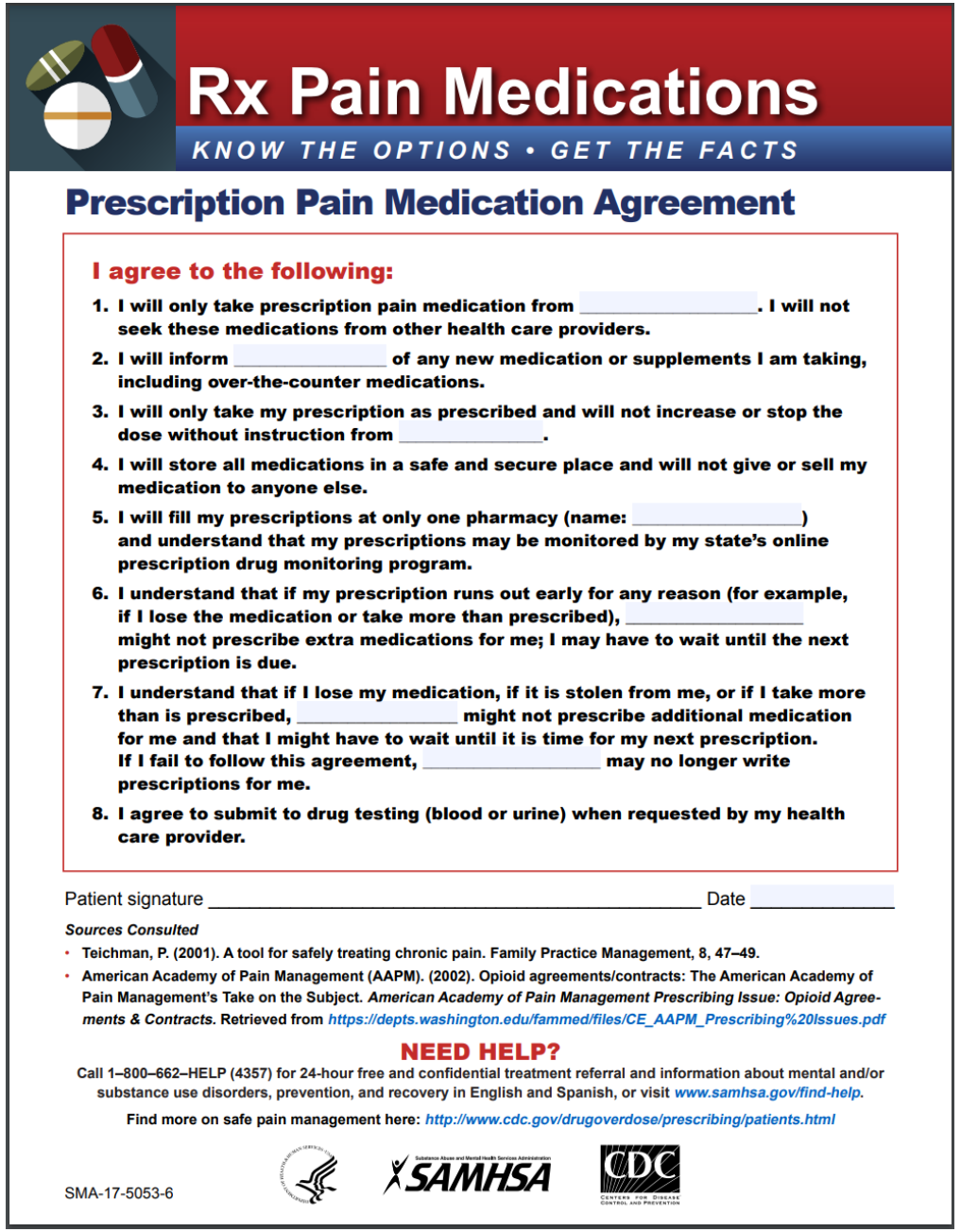


- No satisfactory relief with non-opioid or adjuvant analgesics
- Denies substance or alcohol abuse
- Opioid Risk Tool Score: 1 (low risk)
- Established Goals:
  - Decrease pain by 50%
  - Improve functioning, return to full time work
  - No intolerable adverse effects
  - No aberrant behaviors

Opioid Agreement

Sample from
HHS/SAHMSA/
CDC

https://store.samhsa.gov/sites/default/files/d7/priv/sma17-5053-6.pdf



Rx Pain Medications

KNOW THE OPTIONS • GET THE FACTS

Prescription Pain Medication Agreement

I agree to the following:

1. **I will only take prescription pain medication from _____. I will not seek these medications from other health care providers.**
2. **I will inform _____ of any new medication or supplements I am taking, including over-the-counter medications.**
3. **I will only take my prescription as prescribed and will not increase or stop the dose without instruction from _____.**
4. **I will store all medications in a safe and secure place and will not give or sell my medication to anyone else.**
5. **I will fill my prescriptions at only one pharmacy (name: _____) and understand that my prescriptions may be monitored by my state's online prescription drug monitoring program.**
6. **I understand that if my prescription runs out early for any reason (for example, if I lose the medication or take more than prescribed), _____ might not prescribe extra medications for me; I may have to wait until the next prescription is due.**
7. **I understand that if I lose my medication, if it is stolen from me, or if I take more than is prescribed, _____ might not prescribe additional medication for me and that I might have to wait until it is time for my next prescription. If I fail to follow this agreement, _____ may no longer write prescriptions for me.**
8. **I agree to submit to drug testing (blood or urine) when requested by my health care provider.**

Patient signature _____ Date _____

Sources Consulted

- **Teichman, P. (2001). A tool for safely treating chronic pain. Family Practice Management, 8, 47–49.**
- **American Academy of Pain Management (AAPM). (2002). Opioid agreements/contracts: The American Academy of Pain Management's Take on the Subject. *American Academy of Pain Management Prescribing Issue: Opioid Agreements & Contracts.* Retrieved from *https://depts.washington.edu/fammed/files/CE_AAPM_Prescribing%20Issues.pdf***

NEED HELP?

Call 1–800–662–HELP (4357) for 24-hour free and confidential treatment referral and information about mental and/or substance use disorders, prevention, and recovery in English and Spanish, or visit *www.samhsa.gov/find-help*.

Find more on safe pain management here: *http://www.cdc.gov/drugoverdose/prescribing/patients.html*

SMA-17-5053-6

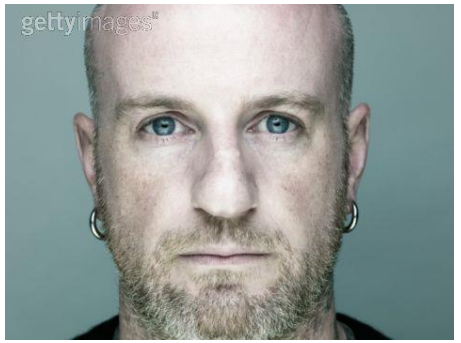
SAMHSA

CDC

Initiation of Opioids

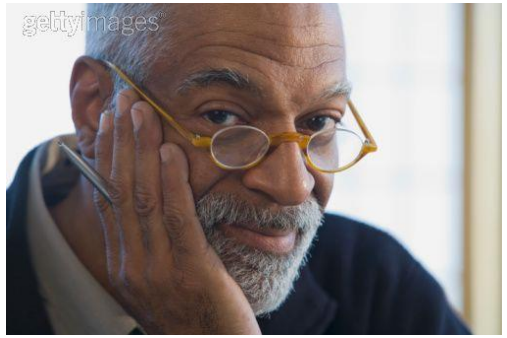
- Opioids should be started as a *trial*
- Duration of trial will vary
- “Start low, go slow”
- Generally opioids are started with short-acting opioids on an as needed basis
  - Hydrocone/APAP (Norco)
  - Oxycodone/APAP(Percocet)
  - Tylenol with Codeine
  - Others

Steve (cont.)



- Started on Hydrocodone/APAP 5/325
- By taking 3/d, he is meeting goals:
  - Pain relief is at least 50%
  - Able to return to full time work
  - Able to perform physical rehabilitative program
  - No intolerable side effects
- Compliant with treatment
- Able to taper off after 6 months with exercise program

Meet James



- 65 y.o. retired male diabetic
- Gradually develops severe burning in his feet
- Unable to sleep or exercise because of pain
- Alcohol and marijuana use in 20s, no current alcohol or illicit drug use
- No relief with pregabalin or duloxetine
- Provided Hydrocodone/APAP #30
- Out after 5 days, refill given for #60, out after 7 days, no refill provide, obtains Percocet from Urgent Care, etc.

Aberrant Drug-taking Behaviors Predictive of Misuse, Abuse, and Diversion

- Probably more predictive
  - Selling prescription drugs
  - Prescription forgery
  - Stealing or borrowing another patient's drugs
  - Injecting oral formulation
  - Obtaining prescription drugs from non-medical sources
  - Concurrent abuse of related illicit drugs
  - Multiple unsanctioned dose escalations
  - Recurrent prescription losses
- Probably less predictive
  - Aggressive complaining about need for higher doses
  - Drug hoarding during periods of reduced symptoms
  - Requesting specific drugs
  - Acquisition of similar drugs from other medical sources
  - Unsanctioned dose escalation 1 – 2 times
  - Unapproved use of the drug to treat another symptom
  - Reporting psychological effects not intended by the clinician

What is happening?

- Consider Possibilities
  - Substance Use Disorder (Addiction)
  - Abuse
  - Diversion
  - Pseudoaddiction
- Key elements for consideration
  - Compliance across treatment
    - PT, Referrals, Diagnostic Testing
  - Functional outcomes
  - Social outcomes

Addiction

Addiction is a primary, chronic, neurobiologic disease, with genetic, psychosocial, and environmental factors influencing its development and manifestations. It is characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

Physical Dependence

Physical dependence is a state of adaptation that is manifested by a drug class specific withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, and/or administration of an antagonist.

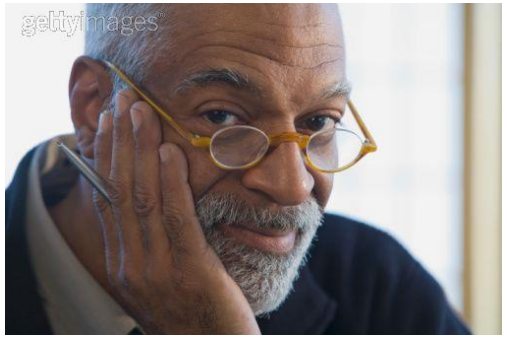
Tolerance

Tolerance is a state of adaptation in which exposure to a drug induces changes that result in a diminution of one or more of the drug's effects over time.

Pseudoaddiction

- Not officially defined and controversial if it exists
- Generally regarded as the development of abuse-like behaviors due to unrelieved pain. When the pain is relieved, the behaviors resolve
- May result from inadequate treatment

James (cont.)



- After multiple providers, sees a Pain Management specialist
- Started on long acting opioid in structured setting
- Titrated up on sustained release morphine
- Goals achieved – Able to golf
- Sleep restored
- Aberrant behaviors end

Meet Irene

- 76 y.o. widowed female with

  Rheumatoid Arthritis
- Chronic pain in joints over last 15 years
- Prescribed oxycodone sustained release for pain
- Has a Primary Care Provider, Rheumatologist and Pain Specialist
- Has requested “early refills” 4 times in the last year and is currently requesting one
- Urine Drug Test is ordered

Irene's Urine Drug Tests Results:

- Oxycodone: POSITIVE
- Oxymorphone: POSITIVE

- Fentanyl: POSITIVE

- Opioids Discontinued and Addiction Medicine Referral:
  - When out early on prescription, obtains oxycodone from a non-medical source

One Pill Can Kill

DEA Laboratory Testing Reveals that 6 out of 10 Fentanyl-Laced Fake Prescription Pills Now Contain a Potentially Lethal Dose of Fentanyl

What are fake pills?

- The Sinaloa Cartel and Cartel de Jalisco Nueva Generacion are making fentanyl and pressing it into fake pills. Fake pills are made to look like OxyContin®, Xanax®, Adderall®, and other pharmaceuticals. These fake pills contain no legitimate medicine.
- Fentanyl is also made in a rainbow of colors so it looks like candy.

***FAKE**
rainbow oxycodone M30 tablets containing fentanyl

https://www.dea.gov/sites/default/files/2022-11/DEA-OPCK_Parent%20flyer_V2.pdf

Meet Brenda

- 36 y.o. female nurse
- Chronic neck pain
- Managed well with Norco 10/325 at 4/day
- States able to work, raise 4 kids and has no side effects
- Claims reason for visit was because insurance changed
- Requests a 3 month quantity for “mail-order” pharmacy

Department of Justice - Bureau of Narcotic Enforcement
Controlled Substance Utilization Review & Evaluation System

01/26/2010 9:00

CONFIDENTIAL DOCUMENT

PATIENT/CLIENT ACTIVITY : CONSOLIDATED REPORT

Prescription Drug Transaction Details :

Number of Hits: 50 **Start Date: 01/26/2(** **End Date: 01/26/2(**

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
01/30	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	120	SA PH	[redacted]	[redacted]	[redacted]	[redacted]	3
02/12	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	300	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
02/12	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
02/18	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	120	RIT	[redacted]	[redacted]	[redacted]	[redacted]	3
03/09	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE	TAB	325 MG-10	60	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
03/12/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	300	C &					
03/13/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	180	SA PH					
03/17	[redacted]	[redacted]	[redacted]	[redacted]	BITARTRATE	TAB	MG-10 MG	60	RIT	[redacted]	[redacted]	[redacted]	[redacted]	1
03/28	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	60	RIT	[redacted]	[redacted]	[redacted]	[redacted]	2
04/03	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	180	SA PH	[redacted]	[redacted]	[redacted]	[redacted]	2
04/07	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	300	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
04/27	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	500 MG-5 MG	24	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
05/05	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	300	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
05/07	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	180	C &	[redacted]	[redacted]	[redacted]	[redacted]	0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
06/02/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	180	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
06/04/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	360	COS PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
06/30/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	180	COS PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
06/30/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	120	C &	[redacted]	[redacted]	[redacted]	[redacted]	0
07/28/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	60	C &					
07/28/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	240	SAV PHA					
08/01/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	180	COS PHA					
08/01/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	MG-10 MG	180	COS PHA	[redacted]	[redacted]	[redacted]	[redacted]	3
08/06/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	240	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	2
08/25/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	720	COS PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
08/28/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10	240	SAV	[redacted]	[redacted]	[redacted]	[redacted]	3
08/25/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	720	COS PHA					
08/28/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	240	SAV PHA					
09/28/20	[redacted]	[redacted]	[redacted]	[redacted]	NUVIGIL	TAB	MG	30	PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
10/02/20	[redacted]	[redacted]	[redacted]	[redacted]	KLONOPIN	TAB	0.5 MG	50	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
10/06/20	[redacted]	[redacted]	[redacted]	[redacted]	PERCOCET	TAB	325 MG-5 MG	60	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
10/12/20	[redacted]	[redacted]	[redacted]	[redacted]	XANAX	TAB	1 MG	20	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
10/13/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	100	WAL PHA 170	[redacted]	[redacted]	[redacted]	[redacted]	0
10/16/20	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10 MG	200	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	0
10/19/20	[redacted]	[redacted]	[redacted]	[redacted]	XANAX	TAB	1 MG	20	SAV PHA	[redacted]	[redacted]	[redacted]	[redacted]	0

Date Filled	First Name	Last Name	DOB	Address	Drug Name	Form	Str	Qty	PHY Name	PHY#	Dr.'s DEA #	Dr.'s Name	RX#	Refill#
10/20/2(	[redacted]	[redacted]	[redacted]	[redacted]	NORCO	TAB	325 MG-10	200	SA PH	[redacted]	[redacted]	[redacted]	[redacted]	1
11/06/20	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	600	WAL PHA 170	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11/17/20	[redacted]	[redacted]	[redacted]	[redacted]	SUBOXONE	TAB	2 MG-0.5 MG	60	CVS #91	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11/17/2(	[redacted]	[redacted]	[redacted]	[redacted]	ALPRAZOLAM	TAB	1 MG	60	#91	[redacted]	[redacted]	[redacted]	[redacted]	0
11/19/2(	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	100	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
11/19/2(	[redacted]	[redacted]	[redacted]	[redacted]	OPANA ER	TER	20 MG	30	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
11/24/2(	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-5 MG	90	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
12/03/2(	[redacted]	[redacted]	[redacted]	[redacted]	SUBOXONE	TAB	2 MG-0.5 MG	30	RIT	[redacted]	[redacted]	[redacted]	[redacted]	0
12/18/2(	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	240	WA PH 170	[redacted]	[redacted]	[redacted]	[redacted]	0
12/29/2(	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	30	CV #91	[redacted]	[redacted]	[redacted]	[redacted]	0
12/30/2(	[redacted]	[redacted]	[redacted]	[redacted]	APAP/HYDROCODONE BITARTRATE	TAB	325 MG-10 MG	600	WA PH 170	[redacted]	[redacted]	[redacted]	[redacted]	1
01/06/2(	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	30	CV #91	[redacted]	[redacted]	[redacted]	[redacted]	1
01/09/2(	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	30	CV #91	[redacted]	[redacted]	[redacted]	[redacted]	0
01/11/2(	[redacted]	[redacted]	[redacted]	[redacted]	APAP/OXYCODONE	TAB	325 MG-10 MG	100	CV #91	[redacted]	[redacted]	[redacted]	[redacted]	0
01/12/2(	[redacted]	[redacted]	[redacted]	[redacted]	HYDROCODONE BITARTRATE AND ACETAMIN	TAB	325 MG-5 MG	30	CV #91	[redacted]	[redacted]	[redacted]	[redacted]	1

Disclaimer: The Patient Activity Report (PAR) is compiled from information maintained in the Department of Justice's Controlled Substance Utilization Review and Evaluation System (CURES). The CURES maintains Schedule II, Schedule III and Schedule IV prescription information that is received from California Pharmacies and is therefore only as accurate as the information provided by the Pharmacies. If data was submitted with errors or have unknowns within a field, it will not be displayed within this report.

CURES Results

- 7 Prescribers for Controlled Substances
- 7 Pharmacies
- Between 7/1/09 – 12/31/09
  - 5220 doses of analgesics
  - Equals 28.4 doses/day
- “This is a waste of my time”

Monitoring High Risk Patients

- Structured treatment plan
  - More frequent visits
  - Smaller pill quantities
  - Compliance monitoring
- Coordinate care with mental health / addiction medicine
- Use the PDMP report
- Consider using non-opioid therapies and discontinuing controlled substances

Security and Storage

- Majority of non-medical use is through diversion
- Store controlled substances in similar fashion to a loaded weapon
- Medication Safes
- Dispose of all unused or expired pain medication
- Mix with undesirable material such as cat litter or coffee grounds and place in nondescript container

www.whitehousedrugpolicy.gov/drugfact/factsht/proper_disposal.html.

Future Directions

Abuse-Deterrent Technology

- New Drug Formulation
- Sophisticated Packaging
  - Blister packs and Dial packs with pill counters
  - Institution
    - Lockable pill dispensers
    - Bar-coded tablets
  - Supply chain Radiofrequency Identification
- Addition of Aversive Components or Antagonists
  - Naltrexone, Capsaicin, Niacin

Conclusions

- Legitimate need for opioids remains
- Prescribing must be balanced
- Although imperfect, risk assessment and compliance monitoring should be done
- Securing and storing opioids critical
- Future technologies are emerging
- Collaboration between the medical community and law enforcement will yield the best outcome