Educational Objectives

- Apply understanding of neurotransmission of pain to identify therapeutic interventions
- Increase identification of addictive behavior in patients on chronic pain medications
- Develop clinical strategies to minimize risk of addiction when prescribing opioids
- Improve understanding of set points of self administration to monitor for the development of tolerance and physical dependence
- Review pharmacology of opioid medications with emphasis on use of buprenorphine for management of concurrent pain and addiction
Epidemiology of Pain

- Pain > 4 billion work days lost per year.
- Causes more disability than cancer and heart disease combined.
- Up to 34 million Americans suffer from pain.
- Aging population will make the problem worse.

- Pain is the most common complaint for which individuals seek medical attention

♫ Brian Goldman, M.D., FACEP
ASAM Pain and Addiction, Common Threads II
Physician, 1894

“We have an army of women in America dying from the opiate habit - larger than our standing army. The profession (medicine) is wholly responsible for the loose and indiscriminate use of the drug.”

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Rates of Misuse / Abuse

Prescription Drug Misuse/Abuse is a Major Problem in the US
Current Drug Use Rates in Persons Ages 12+

- Illicit Drugs: 22.5 (8.7%)
- Marijuana: 18.1 (7.0%)
- Psychotherapeutics: 6.1 (2.4%)
- Cocaine: 1.4 (0.5%)
- Hallucinogens: 1.0 (0.4%)
- Inhalants: 0.6 (0.2%)
- Heroin: 0.3 (0.1%)

OD and Scripts by Age

Opioid Prescriptions by Age

- No. of Prescriptions (millions)
- 0 to 9
- 10 to 19
- 20 to 29
- 30 to 39
- 40+

- 2002: 2
- 2006: 6
- 2009: 19
- 2012: 30

Opioids Overdose Death by Age Group, US, 2008

- Rate per 100,000
- Age Group
- 45-54: 159
- 55-64: 180

IMS Health, Vector One® National

Admissions & OD by Year

More Than 5-Fold Increase in Treatment Admissions For Prescription Painkillers In the Past Decade

Drug OD in the US Have More Than Tripled since 1990 and INCREASES Greater for Women (Five-FOLD)

100 people die from drug overdoses every day in the US

Source: SAMHSA Treatment Episode Data Set (TEDS), 2000-2010

National Vital Statistics System.
CDC Vital Signs, July 2013.
Source of Non-Medical Opioid Misuse

Where are the prescription opioids obtained?
Source of Prescription Opioids for Most Recent Nonmedical Use: Ages 12+

Source Where Respondent Obtained

- More than One Doctor: 1.6%
- One Doctor: 19.1%
- Bought/Took from Friend/Relative: 14.8%
- Drug Dealer/Stranger: 3.9%
- Bought on Internet: 0.1%
- Other: 4.9%

Source Where Friend/Relative Obtained

- More than One Doctor: 3.3%
- Free from Friend/Relative: 7.3%
- Bought/Took from Friend/Relative: 4.9%
- Drug Dealer/Stranger: 1.6%
- Other: 2.2%

Note: Totals may not sum to 100% because of rounding or because suppressed estimates.

1 The Other category includes the sources: “Wrote Fake Prescription,” “Stole from Doctor’s Office/Clinic/Hospital/Pharmacy,” and “Some Other Way.”

Source: SAMHSA, 2006 National Survey on Drug Use and Health
Pain Relief & Recovery: Balancing Act

Medical
- Pain Relief
- Improvement in Functioning
- Monitor adherence + diversion
- Tolerance + physical dependence
- Breakthrough pain
- Drug seeking behavior

Addiction
- Withdrawal severity
- Substance use history
- Believe pain complaints
- Preoccupation with supply
- Detoxification
- Relapse prevention
Distinguish between an addict and a patient with pain?

- Patients with active addictions with painful conditions
- Recovering patients with painful conditions
- Patients who misuse
- Patients who abuse to get high
- Patients who abuse to self-medicate

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Tolerance

- The need for an increased dosage of a drug to produce the same level of analgesia that previously existed. Tolerance also occurs when a reduced effect is observed with constant dose. Analgesic tolerance is not always evident during opioid treatment and is not addiction.

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Pseudotolerance

- The need to increase dosage due to other factors such as:
- Disease progression, new disease, increased physical activity, lack of compliance, change in medication, drug interaction, addiction, and deviant behavior.

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Hyperalgesia and Rebound

- Common and under recognized in high dose opioid analgesic treatment as well as in opioid maintenance therapy
- Pain-opioid spiral
- Rebound headaches: transformed migraines
- Role of medication withdrawal

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Physical dependence

- Indicated by the occurrence of withdrawal symptoms after opioid use is stopped or quickly decreased without titration, or if an antagonist is administered.
- Can be avoided by warning patients not to abruptly stop the medication and by using a tapering regimen.
- Physical dependence is not addiction.

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Drug misuse

- Unintentional consumption of a drug in other than the commonly accepted manner.
  - Physician mis-prescription
  - Patient misunderstanding

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Drug abuse

- Deliberate misuse of a drug.
- Self-medication of painful feelings and/or reality
- To get high

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Patient Interviews : CNS Productions

Dr. Darryl Inaba  Co-founder of Haight Ashberry Clinic
Research Director, CNS Productions

Excerpts – part one – Beyond Pain
Risk of Addiction

- Lifetime prevalence of addiction in general population is 3%-16%.

- Regier, Meyers, & Kramer, 1984

Adapted from Don Kurth, MD-Non Narcotic Pain Management-Common Threads Conference 2002
Risk to becoming addicted to therapeutic opioids depends upon interaction between personal and family history and environmental stressors.

High Risk:
- Personal history of opioid addiction
- Person history of non-opioid addiction
- Family history of addiction

Low Risk:
- No personal or family history of addiction + stressors
- No personal or family history of addiction, no stressors
Risk of Addiction When Treating Pain

- Acute Pain  Low Risk of Addiction
- Chronic Pain  Up to 50-70%

- Living with Pain
  Richard L. Reilly, D.O.

Adapted from Don Kurth, MD-Non Narcotic Pain Management-Common Threads Conference 2002
Intoxication & Withdrawal

Opioid See-Saw Effect

Intoxication

- OD
- Nodding
- High
- Pain relief
- Relaxation
- Pinned pupils
- Comfortable
- Drug desire

Withdrawal

- Vomiting
- Diarrhea
- Cramps
- Sweats
- Nausea
- Chills
- Bone Aches
- Restlessness
- Craving

Same order of appearance & disappearance

As dose increases, withdrawal severity lessens
As dose decreases, withdrawal severity worsens
# Signs & Symptoms of Opioid Withdrawal

<table>
<thead>
<tr>
<th>Mild - subjective</th>
<th>Severe - objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of withdrawal</td>
<td>Dilated pupils</td>
</tr>
<tr>
<td>Craving</td>
<td>Runny nose</td>
</tr>
<tr>
<td>Anxiety &amp; irritability</td>
<td>Teary eyes</td>
</tr>
<tr>
<td>Restlessness</td>
<td>Sweating</td>
</tr>
<tr>
<td>Bone aches</td>
<td>Diarrhea</td>
</tr>
<tr>
<td>Yawning</td>
<td>Gooseflesh</td>
</tr>
<tr>
<td>Hot and cold sensations</td>
<td>Vomiting</td>
</tr>
<tr>
<td>Sneezing</td>
<td>Increased blood pressure</td>
</tr>
<tr>
<td>Nausea &amp; cramps</td>
<td>Increased pulse</td>
</tr>
</tbody>
</table>
Self administration and medication compliance require:

- Understanding of dosing instruction
- Awareness of dose response
- Timing of appearance and disappearance of pain-relief symptoms
- Availability of drug
- Experience with drug
- Changes over time in dose response
Self Administration Signals

- **Set points for self administration**
  - thoughts, feelings and behaviors that occur when:

- **“On” signal**
  - Pre next dose signal that results in decision to take next dose

- **“Off” Signal**
  - Dose that results in undesirable side effects of excessive sedation, mental clouding, nausea, dizziness, etc that result in decision to not take as much next time

- **“Ah” Signal**
  - Dose that results in the desirable effect – pain relief, anxiety reduction, sleep, energy, etc
Set Points of Drug Self Administration

Drug Effect

OD
Nodding
High
Pain relief
Relaxation
Pinned pupils
Comfortable
Drug desire
Craving
Restlessness
Bone Aches
Chills
Nausea
Sweats
Cramps
Diarrhea
Vomiting

Withdrawal
Self Administration Signals

- Set points for self administration
  - Use COWS withdrawal assessment scales (may require modification for improved sensitivity) to identify pre-dose signal
  - Compare onset of pain to any withdrawal associated symptoms
  - If on signal = withdrawal symptoms and expectation of worsening with delay of dosing AND pain severity is mild, then pain generator is really withdrawal mediated and not underlying condition = good candidate for buprenorphine or increasing dosage of medication
  - If the on signal is associated with high dose effects (closer to the ah and off signal), then the desired effect is more likely to be addiction related
## Changes in Set Points in Addiction

<table>
<thead>
<tr>
<th></th>
<th>Non Addict in Pain</th>
<th>Addict in Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On</strong></td>
<td>Moderate Pain severity</td>
<td>Mild Withdrawal Symptoms</td>
</tr>
<tr>
<td><strong>Ah</strong></td>
<td>Functional Pain Relief</td>
<td>Desired Side Effect</td>
</tr>
<tr>
<td><strong>Off</strong></td>
<td>Negative Side Effects</td>
<td>Coma - Death</td>
</tr>
</tbody>
</table>

**Dominion Diagnostics**
Addictive behavior vs Medical dependence

- Primary purpose: euphoria
- Rapid dose escalation as tolerance develops
- Abstinence unlikely to be maintained despite frequent attempts
- Relief of pain
- Constant dose and frequency with slow increases for tolerance
- Usually able to abruptly stop or if wd develops can be successfully managed

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Addictive behavior vs Medical dependence

- Function: frequent intoxication
- Behavior: focus on drug-seeking to exclusion of socially productive activities
- Able to function productively; in acute pain states slight sedation may occur
- Able to engage in productive activity due to relief of pain

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Addictive behavior vs Medical dependence

- Side effects common due to dose and routes of administration; continued use despite complications
- Polydrug use frequent

- Mild, manageable side effects
- Polydrug use rare unless prescribed by physician

From Caring for People With Chronic Pain and Addiction Issues: Mark Publicker, MD, FASAM
Suspect Addiction Associated with Chronic Opioid Therapy

- Adverse consequences of opioid use.
- Loss of control over medication use.
- Preoccupation with opioids.
- Does not actively participate in an addiction treatment program.

Is Patient Using Drugs Addictively?

What is the nature of the relationship between patient and drug?

- Did they want to take more?
  - ❌ If one is good, two is better

- Did the thought of stopping increase desire for the drug?
  - ❌ Loss of supply requires awareness of “special relationship”

- Is there awareness of the need to cut down or control use?
  - ❌ Awareness of cutting down or controlling use = problem

- Is the use resulting in negative feelings toward use
  - ❌ Feeling guilty about using and continuing to use = use despite consequences
  - ❌ Social users and adequately dosed pain patients aren’t guilty about use

- Are any family members or friends giving feedback to them about their use?
  - ❌ Usually adequate treatment does not result in others worrying about use
  - ❌ When someone is annoyed at feedback, then they have a problem
5 Questions: Risk Assessment

- Atypical Response
  - “Perc Up” + Motivation - opioids
  - Slow down + focus - stimulants
- Hollow Leg – inherited tolerance
- Minimal severity of hangovers
- Co-occurring ADD, PTSD, Mood, etc
- Family history of alcohol & drugs
Factors Contributing to Vulnerability to Develop a Specific Addiction

Genetic (25-50%)
- DNA
- SNPs
- other polymorphisms

Environmental (very high)
- prenatal
- postnatal
- contemporary
- cues
- comorbidity

Drug-Induced Effects (very high)
- mRNA levels
- peptides
- proteomics
- neurochemistry
- behaviors

Kreek et al., 2000
The Human Genome

- In the human genome, there are ~3 billion bases (nucleotides)
- In humans, there are estimated to be ~30,000 genes (many but not all identified and annotated)
- Each gene is a sequence of bases or nucleotides

Kreek (Rockefeller University) & Hassin (Columbia P&S), 2004
Single Nucleotide Polymorphisms (SNPs) in Genes: Definitions

- **SNP** — a single nucleotide polymorphism, that is, one nucleotide or base of any base pair

- **Allelic Frequency:**
  - <1% low or rare
  - 1–5% intermediate
  - >5% high, frequent

*Kreek (Rockefeller University) & Hassin (Columbia P&S), 2004*
The Brain Reward Cascade

Gene Targets in the Brain Reward Cascade

- SEROTONIN
  - SERT, 5HT2a
  - ENKEPHALIN
  - PENK
  - OPIATE RECEPTOR
    - Mu
    - GABAA
    - D1, D2, D3, D4, D5
  - GABA
    - GABA

- DOPAMINE
  - MAO-A
  - COMT, DAT

- REWARD
The Dopamine D<sub>2</sub> Receptor Gene
The Reward Gene
A\textsubscript{2} Gene = Normal D\textsubscript{2} Receptors
$A_1$ Gene = $\frac{1}{3}$ Lower $D_2$ Receptors
Equates to 100,000,000 people living in the USA
1/3 of the total US population carries the DRD2 A1 gene.

(Over 100,000,000 people)

- 50% of African Americans carry the DRD2 A1 gene
- 58% of Hispanics carry the DRD2 A1 gene
- 72% of Asians carry the DRD2 A1 gene
- 85% of Native Americans carry the DRD2 A1 gene
# Reward Deficiency Syndrome

<table>
<thead>
<tr>
<th>addictive behavior</th>
<th>impulsive behavior</th>
<th>compulsive behavior</th>
<th>personality disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>severe alcoholism</td>
<td>attention-deficit disorder, hyperactivity</td>
<td>aberrant sexual behavior</td>
<td>conduct disorder</td>
</tr>
<tr>
<td>polysubstance abuse</td>
<td>Tourette syndrome</td>
<td>pathological gambling</td>
<td>antisocial personality</td>
</tr>
<tr>
<td>smoking</td>
<td></td>
<td></td>
<td>aggressive behavior</td>
</tr>
<tr>
<td>obesity</td>
<td>autism</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Recreated from the original By:
Prof. Bowirrat A. 2009.

[Diagram of genetic family tree with notes on genetic markers and disorders]

Legend:
A- Alcohol
B- COCAINE
C- CARBO
D- SMOKING
E- HYPERACTIVITY
F- SEX ADDICTION
G- PATHOL. VIOLENCE
H- TOURETTE SYM.
I- AUTISM
J- PERSONALITY DISORDER

Intensity of syndrome 1 Throughs

A1/A2 - A2/A2 Not found
D/D - NOT GENOTYPE
Comorbid Reward Genes in Psychiatry

Schizophrenia

Personality Disorders

Anxiety Disorders

Bipolar Depression

Major Depression

Reward Deficiency Syndrome

Spectrum Disorders
  ADHD
  Tourette
  Autism

DRD1
DRD2
DRD3
DRD4
DAT1
5HT2A
5HTTLPR
MOR1
GABA-B3
PENK
MAO-A
COMT
DRD2 and Defense Style

Defense Style Questionnaire given to 3 populations:
- 123 Addiction treatment unit
- 42 Tourette syndrome
- 49 controls

Addiction and Tourettes
- Decrease in mature defense
- Increase in immature defenses compared to

### Genetics, P300 & Personality

<table>
<thead>
<tr>
<th>100 Adolescent COA – 39 A1 + 62 A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 had higher IQ and Self directedness</td>
</tr>
<tr>
<td>A1 had lower harm avoidance and novelty seeking – Tridimensional Personality Questionaire (TPQ)</td>
</tr>
<tr>
<td>Worry, pessimism, shyness, alienation</td>
</tr>
<tr>
<td>A2 had P300 peak and Cooperativeness</td>
</tr>
</tbody>
</table>

At risk adolescents had lower % P300 and higher % A1 – low dopamergic

## Genetic Addiction Risk Score (GARS)

<table>
<thead>
<tr>
<th>GENE/ALLELE</th>
<th>Function and Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caspi MAOA uVNTR</td>
<td>Increased mitochondrial metabolism of dopamine</td>
</tr>
<tr>
<td>DRD4</td>
<td>High risk for novelty seeking</td>
</tr>
<tr>
<td>DAT</td>
<td>Increased reuptake of dopamine – increased ADD risk</td>
</tr>
<tr>
<td>5HTTLLR dialletic</td>
<td>5HTTLLR dialletic</td>
</tr>
<tr>
<td>COMT</td>
<td>Enhanced synaptic catabolism of dopamine</td>
</tr>
<tr>
<td>DRD2</td>
<td>Reduced number of dopamine receptors</td>
</tr>
<tr>
<td>DRD3</td>
<td>Increased risk for cocaine addiction</td>
</tr>
<tr>
<td>OPRM1</td>
<td>Carriers of G Allele hypofunction opioids+dopamine</td>
</tr>
<tr>
<td>GABRA3</td>
<td>Defective hypofunctioning GABA: Increased anxiety</td>
</tr>
</tbody>
</table>
Addiction is a primary, chronic disease of brain reward, motivation, memory, and related circuitry. Dysfunction in these circuits leads to characteristic biological psychological social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.

August 15, 2011
Essential components of pain

- Pain experience
  - Nociceptive - physical pathways of pain
- Subjective nature
  - No pain meter - patient is own control
- Emotional component
  - Other emotional problems color pain experience severity and interpretation
- Occurs with and without injurious stimuli
- Functional limitations most important in development of coping patterns
Components of Pain

- Pain – Nociceptor pain generator – treat the cause to produce the effect

- Suffering – Modulation within emotional and expectation circuits with addictive disease are at special risk for suffering due to inadequate management of their pain. (Savage, 1998)
Cortical pain processing

- Sensory aspects of pain seem to be processed in the Somatosensory cortex.
- Emotional distress associated with pain seems to be processed in the Anterior Cingulate Cortex (ACC).
- Subjects with lesions in ACC could still accurately judge the intensity of pain. But they were not in the least bothered by it.

- On the other hand, subjects empathy for the pain of others only elicits activity in ACC, not Somatosensory cortex.
Concurrent Emotional States

- Depression and anxiety augment pain
  - Opioids allow for emotional escape and distancing

- Hyperventilation and panic

- Continued use of substances masking pain

- Functional limitations secondary to chronic pain overlap with dysfunctional addictive behaviors augmenting pain and disability
Chronic Pain Causes Secondary Problems

- **Bodily functional impairments**
  - Sleep disturbance
  - Physical deconditioning
  - Sex dysfunction
  - Affective disturbances - depression, anxiety

- **Behavioral functional impairments**
  - Interference of work
    - Financial problems, free time, lack of distraction
    - Disability payments tied to inability to work
  - Interference with home and family roles
    - Acute illness sick role creates stress on others over time
      - Excuses from daily roles burdensome to others
      - Interference of family rituals
    - Family dysfunction may continue pain syndrome
      - Communication occurs through language of pain
      - Anger from family members unexpressed
      - Enabling behaviors
Clinical Management to Minimize Risk of Addiction

- Encourage integrated pain management
  - Active patient role
  - Physical conditioning
  - Self awareness
  - Non-medication therapies
  - Functional rehabilitation
  - Family involvement
  - Therapeutic drug monitoring
  - Withdrawal severity and pain scales
Pain Management: Treatment Approach

- What type of pain problem?
- What was the drug of choice?
- Is the patient stable?
- What agonist is involved?
  - Special concerns regarding dose, agent or other medications
  - Can the maintenance drug be used for pain?
- Is the addictive disorder dominant?
  - Never dismiss or minimize the pain component
- Is the pain opioid responsive?
  - Mechanical and structural, neuritic and intermittent
- Do you have the resources to manage the patient?
  - Methadone program but no pain specialist and no on-site evaluation
  - Detox program with return of pain as dose is dropped?
    - Withdrawal based changes in pain sensitivity
    - Masking on underlying condition and need for re-evaluation for acute pain
  - Use of withdrawal assessment scales and pain scales
Pain Management: Clinical Concerns

- **Altered pain threshold and sensitivity**
  - Addicts may need higher dosages of medication to control pain
  - Addicts may interpret withdrawal symptoms as need for medication

- **Surgical procedures**
  - Speak with surgeon prior to surgery to discuss pain management
    - Ask what usual dosage and duration of opioid requirements for usual patient
    - Explain that you will help them with pain management or arrange for pain consultation rather than “dumping” problem patient upon surgical staff
    - Demand adequate dosage to achieve pain relief to estimate size of tolerance “filling the tank”
  - Inadequate pain control is more risk to relapse than drugs prescribed
    - If you do not prescribe enough pain medication or don’t know what you are doing, then patient will take over control since they know how to do it well
Avoid PRN

- For an opioid addict, PRN = per request of narcotic addict
- Indication for next dose in addict will most likely be subjective

Use time contingent rather than symptom contingent dosing

- Avoids reinforcement of pain-relief cycle
  - Addict not longer has to prove need for drug based upon severity of complaints
  - Patient does not have to ask for meds
  - Patient requests are less likely to be interpreted as drug-seeking behavior

Scheduled dosing

- Indication for next dose = time not symptoms
  - Careful attention to induction of tolerance and fast metabolizers

- Consider “reverse PRN”
  - RN asks patient if need drug based upon time schedule and patient can refuse if not needed
Meet baseline opioid requirements for prevention of withdrawal + add dose to cover pain requirements

- Determine average daily dose of opioids
- Calculate equianalgesic dose (see dosing table)
- Decide whether to maintain patient on methadone or switch to equianalgesic dose

- **“Methadone on methadone”**
  - Take one per day dosing and split into three/four
    - Use low dose (5-10 mg) methadone for breakthrough
    - **Advantages**
      - Urine drug screens remain interpretable
      - Cost effective, well tolerated and familiar, easy to return to QD dosing

- **“Methadone plus mu agonist”**
  - Maintain daily dose of methadone for withdrawal prevention and add short acting mu opioid agonist for pain control
    - Use immediate release opioid (orally or parenterally) for pain relief
    - Do **NOT** use partial mu agonist or antagonist (may precipitate withdrawal)
Pain Management: Suboxone

- **Dose of Suboxone will determine extent of opioid blockade**
  - > 16 mg / day of buprenorphine – majority of opioid receptors blocked
  - Low dose buprenorphine < 4 mg/day may allow for reversal of blockade

- **Stickiness to opioid receptor prevents binding of opioid antagonist**
  - May need 8-10 amps of Narcan to overpower affinity for receptor
  - Pain control requires high dose of high affinity opioid
    - X Fentanyl or Dilaudid IV is usually needed to overpower opioid blockade
    - X Short duration of action of opioid antagonist may result in return of opioid blockade

- **Slow dissociation from receptor = long duration of blockade**
  - Duration of blockade may continue 2-3 days after stopping buprenorphine
  - Rapidly changing rate of reversal of opioid tolerance may result in oversedation
  - Resetting of opioid receptor tolerance may allow for reversal of tolerance and lower than expected opioid dosage
Pain Management : Suboxone

- **Overpower buprenorphine blockade**
  - Use of high affinity pure mu agonist
    - Dilaudid and Fentanyl IV
      - May require much higher doses than usual
      - Needs careful monitoring for oversedation and respiratory depression
      - Short duration of action of agonist may cause wearing off of effectiveness

- **Bypass opioid system for pain relief**
  - General anesthesia with non-opioid agents
    - Propofol, Benzodiazepines, paralytics, inhalable anesthetics
  - Regional anesthesia – locally acting nerve blockade

- **Discontinue buprenorphine and restart pure mu agonist**
  - Pay attention to duration of action of buprenorphine – slow dissociation
    - Blunted analgesic effect secondary to continued blockade

- **Continue Buprenorphine with regional anesthesia or non opioid treatments**
  - Increase dose of buprenorphine for pain on top of maintenance dose
  - 1 mg sublingual buprenorphine = 5-10 mg of hydrocodone, oxycodone, morphine
  - Split dosing of buprenorphine to TID to QID dose schedule
  - Add non steroidal antiinflammatories, Ice, TENS, PT
Pain Management: Dosing of Non Drug Therapies

Increase “dose of recovery” and relapse prevention activities during increased pain

Increase frequency of addiction treatment
  Increase AA/NA meetings and one to one support from sponsor
  Increase frequency of counseling appointments or higher level of care
  Increase frequency of urine toxicology testing
    Therapeutic drug monitoring
    Decrease temptation to abuse if know levels are monitoring
    Know if patient relapses to other non-prescribed drugs

Increase frequency of non-drug therapeutic activities
  Increase PT appointments, office visits or other follow up treatment activities

Measure “dose equivalency” of recovery activity by objective pain scale
  How much pain relief is obtained by “talking and doing therapy”

Monitor recovery attitude and recovery behavior
  “What’s below the surface of the iceberg is what sinks ships”
  what’s not said is sometimes more important and predictive of relapse
  Monitor frequency of utilization of recovery skills - “the 500 pound phone”
Recovery Skill Development

Concept of “dose equivalent” = reduction of withdrawal symptoms by non-drug techniques = social setting detoxification, supportive care

- Need to try non-pharmacological approaches
  - Change setting – go for a walk, exit strategies, re-arrange living environment
  - Asking for help
    - Calling sponsor
    - Speaking about feelings
  - Exercise
  - Attending meetings
  - HALT techniques
  - Hot baths / showers
  - Massage
  - Meditation, visualization

- Other pharmacotherapies
  - NSAID
  - Mood stabilizers
  - Antidepressants
  - Sleeping aids (often unnecessary when buprenorphine dose is adequate)
Detox Schedule
Rate Dosage Adjustment + Recovery Skill Acquisition

Week 1
Week 2
Week 3
Week 4
Week 5
Week 6

Dose Drug
Dose Recovery
Chronic Pain & Addiction Program

- Comprehensive Pain Evaluation
- Physical and Mental Status Exam
- Opioid Withdrawal Severity Assessment
- Buprenorphine Pain Management
- Medication Monitoring & Adherence Program

Chronic Pain Coping Evaluation
Osteopathic Manipulation
Neuropsychological Evaluation
Medication Assisted Therapy
Pain Support and Skills Group Therapy
Cognitive Behavioral and Mindfulness Groups