

## Treatment of Pain: Including Best Practices in Prescribing Opioids and Controlled Substances

Leonid Skorin, Jr., OD, DO, MS, FAAO, FAOCO

Leonid Skorin, Jr., OD, DO, MS, FAAO, FAOCO

Consultant, Department of Surgery

Consultant, Department of Surgery  
Community Division of Ophthalmology  
Community Division of Ophthalmology  
Mayo Clinic Health System in Albert Lea

Mayo Clinic Health System in Albert Lea

Assistant Professor of Ophthalmology

Assistant Professor of Ophthalmology  
Mayo Clinic College of Medicine  
Mayo Clinic College of Medicine

### Course Objectives

1. Best practices in prescribing opioids and controlled substances.
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2. Non-pharmacological and implantable device alternatives for treatment of pain and ongoing pain.
2. Non-pharmacological and implantable device alternatives for treatment of pain and ongoing pain.

## Pain

- Is not a disease

## Pain Classification

- Is not a disease
- Natures earliest symptom of morbidity
- Natures earliest symptom of morbidity • Any unpleasant sensory and emotional experience
  - Any unpleasant sensory and emotional experience associated with actual or potential tissue damage
  - 100 million suffer from chronic pain
- 100 million suffer from chronic pain

Duration

Duration

- Acute – lasts for only a matter days or at most, a few weeks
- Acute – lasts for only a matter days or at most, a few weeks
  - arises from obvious tissue injury – arises from obvious tissue injury



– usually fades with healing

- 1/3 – 1/2 require daily pain management
- 1/3 – 1/2 require daily pain management • Found in 25% - 50% of all older adults,
- Found in 25% - 50% of all older adults, higher if in nursing home higher if in nursing home

months or longer

## Pain Classification

### 1. Nociceptive

#### 1. Nociceptive

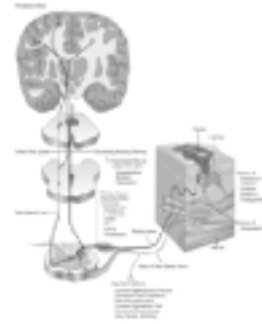
- Results from actual damage or potentially tissue-damaging stimuli
- Results from actual damage or potentially tissue-damaging stimuli
- Specialized nerve endings in peripheral tissues (nociceptors) are stimulated
- Specialized nerve endings in peripheral tissues (nociceptors) are stimulated
- Nociceptors exist in high levels in the eye and orbit (especially central cornea) – usually fades with healing
- Chronic – lasts 3 months or longer • Chronic – lasts 3

## Pain Classification

### 1. Nociceptive (cont.)

#### 1. Nociceptive (cont.)

- Pain signal is sent from the eye through the trigeminal nerve to the brainstem-nucleus and travels to the somatosensory areas of the brain
- Pain signal is sent from the eye through the trigeminal nerve to the brainstem-nucleus and travels to the somatosensory areas of the brain



## Pain Mediators

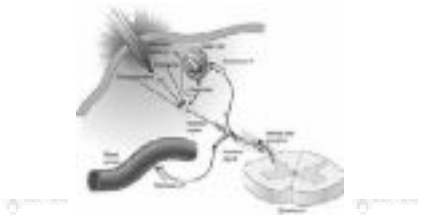
- Tissue injury causes release of chemicals
- Tissue injury causes release of chemicals • They sensitize or activate receptors
- They sensitize or activate receptors • Neurons release *substance P*, which stimulates
- Neurons release *substance P*, which stimulates mast cells and blood vessels
- Histamine released from mast cells and
- Histamine released from mast cells and bradykinin released from blood vessels add to pain stimulus

NonTraumatic, NonInfectious  
NonTraumatic, NonInfectious  
Primary Anterior Segment Eye Pain

## Primary Anterior Segment Eye Pain •

### Dry eye syndrome

- Dry eye syndrome
- Anterior uveitis
- Anterior uveitis
  - Epithelial basement membrane dystrophy
- Epithelial basement membrane dystrophy • Recurrent corneal erosion
- Recurrent corneal erosion
  - Significant hypoxia/CL-associated red eye
- Significant hypoxia/CL-associated red eye • Corneal hydrops – keratoconus
- Corneal hydrops – keratoconus
- Iatrogenic/medicamentous
- Iatrogenic/medicamentous



NonTraumatic, NonInfectious

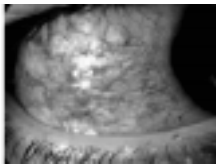
NonTraumatic, NonInfectious  
Primary Anterior Segment Eye Pain (cont.)

Primary Anterior Segment Eye Pain (cont.)

- Post-surgical irregularities
- Post-surgical irregularities
- Shield ulcer – vernal/atopic
- Shield ulcer – vernal/atopic



NonTraumatic, NonInfectious  
NonTraumatic, NonInfectious



• Episcleritis/scleritis

- Episcleritis/scleritis
- Bullous keratopathy
- Bullous keratopathy
- Acute angle closure
- Acute angle closure

- Abnormal response to a stimulus caused by maladaptive neuronal signals by maladaptive neuronal signals
- Can be continuous or episodic
- Can be continuous or episodic
- Complex – difficult to diagnose and manage
- Complex – difficult to diagnose and manage • Responds poorly to opioids and NSAID's
- Responds poorly to opioids and NSAID's • Responds better to anti-epileptics,
- Responds better to anti-epileptics, antidepressants or local anesthetics

- Posterior scleritis
- Posterior scleritis

- Panuveitis
- Panuveitis

- HZO prodrome phase
- HZO prodrome phase

- Ocular ischemic syndrome
- Ocular ischemic syndrome

## Pain Classification

2. Neuropathic  
2. Neuropathic

- Results either from actual nerve damage or
  - Results either from actual nerve damage or inadequately treated nociceptive pain
- Abnormal response to a stimulus caused

## Sensitization

- State of hyperexcitability in either peripheral nociceptors or CNS neurons
- State of hyperexcitability in either peripheral nociceptors or CNS neurons
- Can occur in BOTH nociceptive and neuropathic pain •

Can occur in BOTH nociceptive and neuropathic pain •

Hyperalgesia – heightened pain from a stimulus that

- Hyperalgesia – heightened pain from a stimulus that normally provokes pain normally provokes pain

- Allodynia – pain from a stimulus that is not normally painful
- Allodynia – pain from a stimulus that is not normally painful

- Often seen in patients with chronic pain
- Often seen in patients with chronic pain

## Pain Classification

3. Psychogenic
3. Psychogenic

- Physical pain that is caused, increased or prolonged by mental, emotional or behavioral factors
- Physical pain that is caused, increased or prolonged by mental, emotional or behavioral factors

- Seen in combination of
- Seen in combination of
- Anxiety
- Anxiety
- Poor sleep patterns
- Poor sleep patterns
- Uncooperativeness

## Physiologic Effects of Pain

- Tachycardia

- Tachycardia
- Systemic hypertension
- Systemic hypertension
- Tachypnea
- Tachypnea

- Can exacerbate pre-existing cardiovascular disease •

Can exacerbate pre-existing cardiovascular disease

- Uncooperativeness

## Pain Assessment Tools

1. Unidimensional pain scales
1. Unidimensional pain scales

- Numeric or “faces”
- Numeric or “faces”
- Best for acute pain
- Best for acute pain

## Pain Assessment Tools (cont.)



2. Multidimensional

tools

2. Multidimensional tools

- Best for chronic pain
- Best for chronic pain
- McGill Pain Questionnaire
- McGill Pain Questionnaire

3. Communication – best “tool” of all 3. Communication – best “tool” of all

### Pain Management Strategies

- Identify and treat source of pain
- Identify and treat source of pain
  - In chronic pain – source may not be found  In chronic pain – source may not be found •

### Non-pharmacologic approaches to eye pain

- Non-pharmacologic approaches to eye pain 
  - Hot-cold compresses
    - Hot-cold compresses
    - Bandage contact lens
    - Bandage contact lens
    - Artificial tears/ointment
    - Artificial tears/ointment
    - Hypertonic saline drops/ointment
    - Hypertonic saline drops/ointment

### Pain Management Strategies (cont.)

- Interventional and implantable devices •
  - Interventional and implantable devices 
    - Trigger point injections
      - Trigger point injections
      - Sympathetic nerve block
      - Sympathetic nerve block
      - Spinal cord stimulation
      - Spinal cord stimulation
        - Peripheral nerve stimulators
        - Peripheral nerve stimulators
        - Dorsal root ganglion stimulation
        - Dorsal root ganglion stimulation
      - Pain pumps
      - Pain pumps

### Implantable Devices

1. Spinal cord stimulation
  - “Pacemaker” for chronic pain
  - “Pacemaker” for chronic pain
  - FDA-approved for intractable neuropathic pain
  - FDA-approved for intractable neuropathic pain of trunk and both upper and lower extremities

of trunk and both upper and lower extremities

### Implantable Devices (cont.)

2. Dorsal root ganglion stimulation
  - FDA-approved only for lower extremity complex regional pain syndrome
2. Dorsal root ganglion stimulation
  - FDA-approved only for lower extremity complex regional pain syndrome





### Implantable Devices (cont.)

3. Peripheral nerve stimulation

3. Peripheral nerve stimulation

- Targets specific peripheral nerve for isolated neuralgia •

Targets specific peripheral nerve for isolated neuralgia



stimulate the supraorbital nerve  
stimulate the supraorbital nerve

- 20 minutes a day, 18 years or older
- 20 minutes a day, 18 years or older

• Three programs:

• Three programs:

- Treatment – blocks flow of pain
- Treatment – blocks flow of pain
- Prevention – increases endorphins in CNS
- Prevention – increases endorphins in CNS
- Anti-stress – general relaxation
- Anti-stress – general relaxation

Preventive treatment of cluster headache

- Preventive treatment of cluster headache •

Hand-held device applied to the neck

- Hand-held device applied to the neck

### Transcutaneous Magnetic Stimulation •

sTMS mini

- sTMS mini

- Abortive & preventive treatment of migraine

- Abortive & preventive treatment of migraine •

Applies magnetic impulse to cerebral cortex

- Applies magnetic impulse to cerebral cortex •

Central neuromodulation

- Central neuromodulation

### Vagus Nerve Stimulation

- gammaCore

- gammaCore

- Acute treatment for episodic & chronic migraines

- Acute treatment for episodic & chronic migraines •



### Quiz Question 1

A patient with bilateral neuropathic pain has tried different oral pain medications including opioids. Even though her diabetes is well-controlled, her pain continues to be severe. You decide to refer the patient for an implantable device.

Which of the following implantable pain control technologies is MOST appropriate for this patient who has neuropathic pain in both arms?

- A. Spinal cord stimulation
- B. Pain pump
- C. Peripheral nerve stimulation
- D. Dorsal root ganglion stimulation



### Definitions

Abuse:

### Acetaminophen

Abuse:

- Any drug use intentionally self-administered
- Any drug use intentionally self-administered for a nonmedical purpose

### DEA Drug Schedules

1. High potential for abuse/addiction with no medical use (heroin, LSD, methamphetamine)
2. High potential for abuse/addiction (opioids, stimulants)
3. Less potential for abuse/addiction (Tylenol #3, Tylenol #4, ketamine)
4. Low potential for abuse/addiction (tramadol, diazepam, alprazolam, lorazepam, phenobarbital)
5. Even lower potential for abuse/addiction (antitussive, anti-diarrheals, analgesics such as acetaminophen)

- for a nonmedical purpose
- Pleasure-seeking, consciousness-altering
- Pleasure-seeking, consciousness-altering

Addiction:

Addiction:

- Substance use disorder
- Chronic, neurobiological disease with genetic, psychosocial and environmental factors
- Characterized by behaviors that include
  - APAP – N-acetyl-para-aminophenol
  - Best known by patients as Tylenol
  - Analgesic and antipyretic

- Analgesic and antipyretic
- Poor anti-inflammatory effect
- Poor anti-inflammatory effect
- Hepatotoxicity – leading cause of drug-induced



- Craving
- Craving
- Compulsive use
- Compulsive use
- Impaired control over drug use
- Impaired control over drug use
- Continual use despite harm
- Continual use despite harm

- Hepatotoxicity – leading cause of drug-induced acute liver failure in U.S.

### Acetaminophen (cont.)

- Total adult dose should not exceed 4g/day •
- Total adult dose should not exceed 4g/day •
- Older adults 3g/day
- Older adults 3g/day
- Commonly paired with opioids
- Commonly paired with opioids
  - Potentiates opioid effect
  - Potentiates opioid effect
  - Improves efficacy of opioid
  - Improves efficacy of opioid
  - Allows less opioid to be prescribed
- Allows less opioid to be prescribed

### Non-Steroidal Anti Steroidal Anti-Inflammatory Drugs Inflammatory Drugs

- Analgesic, antipyretic and anti-inflammatory
- Analgesic, antipyretic and anti-inflammatory •
- Inhibit enzyme cyclooxygenase which produces
- Inhibit enzyme cyclooxygenase which produces prostaglandins, arachidonic acid, etc.
  - Good for ocular surface injuries, moderate to severe episcleritis, mild scleritis and uveitis
- Good for ocular surface injuries, moderate to severe episcleritis, mild scleritis and uveitis •
- Black box warnings:
- Black box warnings:
  - Risk of myocardial infarction and stroke
  - Risk of myocardial infarction and stroke  Risk of fatal GI bleeding, ulcer and stomach or
  - Risk of fatal GI bleeding, ulcer and stomach or intestinal perforation
  - Risk of fatal GI bleeding, ulcer and stomach or intestinal perforation
- Allergic to one, allergic to all
- Allergic to one, allergic to all
  - Avoid in asthmatics, renal insufficiency, CHF,
- Avoid in asthmatics, renal insufficiency, CHF, pregnancy and kids with fever - Reye's Syndrome
- pregnancy and kids with fever - Reye's Syndrome

### Benzodiazepines

- CNS depressants – sedate, induce sleep,
- CNS depressants – sedate, induce sleep, prevent seizures, relieve anxiety
- prevent seizures, relieve anxiety
- Avoid taking benzodiazepines and other

- Avoid taking benzodiazepines and other respiratory depressants such as barbituates
- respiratory depressants such as barbituates and alcohol with opioids
- and alcohol with opioids
- Share with barbituates and opioids same
- Share with barbituates and opioids same potential for abuse and addiction



potential for abuse and addiction

### Benzodiazepines (cont.)

- Intoxication – large pupils and disinhibited judgment •

Intoxication – large pupils and disinhibited judgment •

Commonly prescribed benzodiazepines

- Commonly prescribed benzodiazepines □

- alprazolam – Xanax
- alprazolam – Xanax
- diazepam – Valium
- diazepam – Valium
- lorazepam - Ativan
- lorazepam - Ativan



□ □ Opioid Receptor Types

- Located in brain and spinal cord

- Stimulated by endogenous endorphins
- Stimulated by endogenous endorphins

- Binding of drug to these receptors produces analgesia,
- Binding of drug to these receptors produces analgesia, sedation, decreased BP, itching, nausea, euphoria, decreased respiration, constipation

- Effects decline as drug tolerance develops • Effects decline as drug

tolerance develops • Narcotic antagonists such as naloxone block these

- Narcotic antagonists such as naloxone block these receptors

- Effect begins within 2 – 5 minutes after administration □ Effect begins

within 2 – 5 minutes after administration



### Opioids

- Indication: moderate to severe acute ocular pain

### Opioid Systemic Side Effects

- Indication: moderate to severe acute ocular pain • Opioids

prescribed for acute ocular pain should be

- Opioids prescribed for acute ocular pain should be limited to a 3-day supply
- limited to a 3-day supply

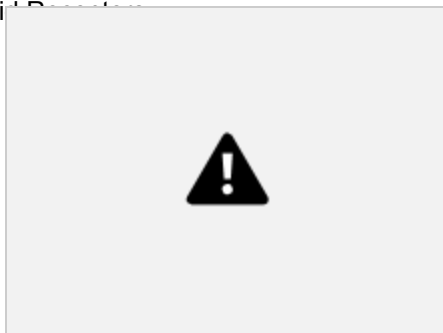
- Not as effective for neuropathic pain
- Not as effective for neuropathic pain

- When opioid treatment is initiated, both the patient • When opioid
- treatment is initiated, both the patient

- Abuse
- Abuse
- Addiction – euphoria
- Addiction – euphoria
- Death
- Death

### MU Opioid Receptors

- MU
- MU
- Kappa •
- Kappa •
- Delta •
- Delta



- Classic morphine receptor
- Classic morphine receptor
- Located in brain and spinal cord

- Nausea, vomiting
- Nausea, vomiting

- Fainting/weakness/low energy • Fainting/weakness/low energy



- Rash/itching

and clinician should view the commitment as a short-term trial of therapy.

opioid formulations to treat acute ocular pain.

- Do not use extended-release or long-acting opioid

- Rash/itching • Nervousness
- Nervousness • Head pain
- Head pain • Liver damage
- Liver damage

- Do not use extended-release or long-acting

### Opioid Systemic Side Effects (cont.) •

### Opioid Ocular Side Effects

Constipation – inhibits intestinal tract motility

- Constipation – inhibits intestinal tract motility •

Low blood pressure, decreased pulse rate

- Low blood pressure, decreased pulse rate •

Dizzy/lightheaded

- Dizzy/lightheaded

Drowsiness/sedation

- Drowsiness/sedation

Adrenal hormone insufficiency – Addison's •

Adrenal hormone insufficiency – Addison's

- Diplopia

- Diplopia



- Acute onset esotropia

- Acute onset esotropia • Miosis

– pinpoint pupils

- Miosis – pinpoint pupils •

Nystagmus

- Nystagmus

- Conjunctival injection • Conjunctival injection



- Urinary retention

- Urinary retention

- Low platelet count

- Low platelet count

- Low white blood cell count

- Low white blood cell count

Visual distortion

- Visual distortion

- Visual hallucinations

- Visual hallucinations

- Altered visuo-motor coordination

- Altered visuo-motor coordination

- Icterus –hepatocellular jaundice

- Icterus –hepatocellular jaundice

(especially in combination with acetaminophen)

### Opioid Ocular Side Effects (cont.) •

(especially in combination with acetaminophen)

### Combination Opiate + Analgesic

- Codeine + APAP = Tylenol #3, #4 • Codeine + APAP = Tylenol #3, #4 • Hydrocodone + APAP = Vicodin, Lortab • Hydrocodone + APAP = Vicodin,



Lortab • Hydrocodone + Ibuprofen = Vicoprofen •

Hydrocodone + Ibuprofen = Vicoprofen •

Oxycodone + ASA = Percodan • Oxycodone + ASA = Percodan

- Oxycodone + APAP = Percocet, Tylox
- Oxycodone + APAP = Percocet, Tylox

- Oxycodone + Ibuprofen = Combunox
- Oxycodone + Ibuprofen = Combunox

- Tramadol + APAP = Ultracet
- Tramadol + APAP = Ultracet

- A. Sleep disorder clinic
- B. Physical therapy
- B. Physical therapy
- C. Pain psychologist
- C. Pain psychologist
- D. Registered dietician
- D. Registered dietician

### Quiz Question 3

You want to start a patient on an opioid for their severe trauma-induced ocular pain. Which one of the following items in their medical/social history places this patient at the GREATEST risk for developing an addiction to the opioid?

Several years of depression

- A. Several years of depression
- B. History of another substance use disorder
- B. History of another substance use disorder
- C. Anxiety
- C. Anxiety
- D. Suicide attempt(s)
- D. Suicide attempt(s)

### Quiz Question 2

A 48-year-old with chronic pain comes to your office for a routine eye exam. The patient has difficulty doing the eye testing. You can see that the patient exhibits anxiety. They tell you that they are concerned about their current state of pain and cannot concentrate. They also have insomnia, loss of appetite and little desire to interact with family or friends.

Which of the following is the MOST appropriate referral?

Which of the following is the MOST appropriate referral? A.

Sleep disorder clinic

Best Practices in Prescribing Opioids •

Always try to identify patients who are "at risk" for

- Always try to identify patients who are “at risk” for developing substance use disorder or opioid use disorder
- Greatest risk is history of another substance use disorder
- Greatest risk is history of another substance use disorder
- Other risk factors
- Other risk factors
  - Sociodemographic factors
  - Sociodemographic factors
  - Genetics
  - Genetics
  - Environment
  - Environment
  - Psychosocial
  - Psychosocial
  - Psychopathology such as anxiety, depression or suicide attempt(s)
  - Psychopathology such as anxiety, depression or suicide attempt(s)
  - Family history
  - Family history

#### Quiz Question 4

Which of the following statements is correct? Which of the following statements is correct? A. Regarding eye pain, opioids are indicated if

- A. Regarding eye pain, opioids are indicated if the patient can see an ophthalmologist within 72 hours.
- B. In patients receiving long-term opioid treatment, overdose risk decreases with increasing prescribed dose.
- C. Opioid withdrawal typical starts within one day of cessation of short-acting opioids.
- D. Long-acting or extended-release opioids are the treatment of choice for acute pain.

#### Opioid Withdrawal

#### Quiz Question 5

- Psychological opioid withdrawal typically starts within 12 hours
- Psychological opioid withdrawal typically starts within 12 hours
- Physical opioid withdrawal starts within 24 hours
- Physical opioid withdrawal starts within 24 hours

Opioid rotation – switching from one opioid to

- Opioid rotation – switching from one opioid to another may be needed to reduce side effects, improve efficacy, avoid dose limitations of compounded acetaminophen or because of a patient's inability to absorb the medication in its present form.

Usually in the treatment of acute ocular pain in an opioid naïve patient, opioids are rarely indicated, but if opioids are used, they should be limited to: A.

No limitation is necessary since the opioid

- A. No limitation is necessary since the opioid problem is not due to acute pain conditions
- B. Maximum 3 days or 20 short-acting low-dose

Maximum 3 days or 20 short-acting low-dose

- B. Maximum 3 days or 20 short-acting low-dose opioid pills, whichever is less
- C. Maximum 3 days or 20 short-acting low-dose opioid pills, whichever is less

C. Maximum 7 days or 60 short-acting low-dose opioid pills, whichever is less  
C. Maximum 7 days or 60 short-acting low-dose opioid pills, whichever is less  
opioid pills, whichever is less

D. Maximum 10 days or 90 short-acting low-dose opioid pills, whichever is less  
D. Maximum 10 days or 90 short-acting low-dose opioid pills, whichever is less  
opioid pills, whichever is less



still having pain to return to their eye doctor sooner

### Specific Opioids For Acute Ocular Pain

### Opioid Treatment of Acute Pain

- Recommended maximum of 3 days or 20 short-acting low-dose opioid pills
- Recommended maximum of 3 days or 20 short-acting low-dose opioid pills
- Reduces any surplus of opioid prescriptions left in medicine cabinets and thus diversion and exposure to others
- Reduces any surplus of opioid prescriptions left in medicine cabinets and thus diversion and exposure to others
- Limiting amount dispensed requires patients who are still having pain to return to their eye doctor sooner

Ultram (tramadol)  
Ultram (tramadol)

- Weak opioid agonist and inhibits reuptake of norepinephrine/serotonin
- Schedule 4 narcotic
- Schedule 4 narcotic
- Adult dose 50mg – 100mg q 4-6 hours not to exceed 400mg per day
- Adult dose 50mg – 100mg q 4-6 hours not to exceed 400mg per day
- Available as Ultracet (APAP 325mg with tramadol 37.5mg). Take 2 tablets q 4-6 hours with a maximum of 8 tablets per day for up to 5 days
- Available as Ultracet (APAP 325mg with tramadol 37.5mg). Take 2 tablets q 4-6 hours with a maximum of 8 tablets per day for up to 5 days



### Specific Opioids For Acute Ocular Pain (cont.)

Tylenol #3 / Tylenol #4

Tylenol #3 / Tylenol #4

- Both are Schedule 3 drugs
- Both are Schedule 3 drugs
- #3: 30mg codeine with 300mg APAP
- #3: 30mg codeine with 300mg APAP
- #4: 60mg codeine with 300mg APAP
- #4: 60mg codeine with 300mg APAP
- Both: one to two tablets q 4-6 hours
- Both: one to two tablets q 4-6 hours

### Specific Opioids For Acute Ocular Pain (cont.)



Oxycontin (oxycodone)  
Oxycontin (oxycodone)

- Schedule 2 narcotic – higher risk of abuse
- Schedule 2 narcotic – higher risk of abuse • Available in 5mg, 10mg, 15mg, 20mg, 30mg tablets
- Available in 5mg, 10mg, 15mg, 20mg, 30mg tablets • Available as extended-release to decrease risk of abuse
- Available as extended-release to decrease risk of abuse • Adult dose 5mg to 30mg q 4-6 hours for significant/severe pain
- Adult dose 5mg to 30mg q 4-6 hours for significant/severe pain

Hydrocodone  
Hydrocodone

- Schedule 2 narcotic – higher risk of abuse
- Schedule 2 narcotic – higher risk of abuse
- Vicodin – combined with 300mg APAP
- Vicodin – combined with 300mg APAP

- Lortab – combined with 325mg APAP
- Lortab – combined with 325mg APAP
- Vicoprofen – combined with 200mg ibuprofen
- Vicoprofen – combined with 200mg ibuprofen
- Flowtuss – combined with 400mg quaifenesin
- Flowtuss – combined with 400mg quaifenesin
