

Pain Management in Primary Care

Part One

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Objectives

- Background and Significance of Chronic Pain
- Interventional treatment options for pain conditions
- Pharmacology for Pain Management.
- Proper Patient Selection, Compliance Monitoring, and Treatment Agreements
- Case Studies.

Disclosures

- No Disclosures

What is Pain?

- International Association for the Study of Pain Definition: An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage
- Margo McCaffery's Definition: "Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does".

TYPES OF PAIN

Duration	Cause	Location
Acute	Nociceptive	Somatic
Chronic	Neuropathic	Visceral

Duration

Acute pain

Chronic pain

- | | |
|--------------------------------|---------------------------|
| - Relatively brief duration | - Longer duration |
| - Etiology known | - Etiology ~ unknown |
| - Pain proportionate to damage | - Pain ~disproportionate |
| - ~ Transient objective signs | - Often no objective sign |
| - Anxiety, anger, fear common | - Depression is common |

Background & Significance

- According to the Institute of Medicine Report on Relieving Pain in America 2011:
- Chronic pain affects > 100 million Americans
 - 35% to 50% of adults
 - \$560 to 635 billion per year in healthcare costs and lost productivity.
 - Chronic pain will continue to rise as a result of: age, obesity, advances in medicine, poor management of surgical pain, recognition of the disease.

Lower Back Pain

- The financial burdens to the patient, the healthcare system, and society are immense.
- Low back pain is the leading cause of disability for Americans under 45 years of age.
- Lower back pain is one of the primary reasons for patients to seek healthcare.

Consequences of Unrelieved Pain

- Physical stress, emotional distress, & suffering
- Insomnia
- Immobility & de-conditioning
- Impaired hormonal & immune function
- Atelectasis, hypoxia, & increase cardiac workload
- Increases morbidity and mortality
- Sensitization & neuroplasticity

Assessing the Body

- Comprehensive pain assessment
- Examination of affected body part(s)
- Symmetry
- Effect of medications (desired / undesired)
- ROM, Strength, Functioning
- General health
- Review of Systems

Assessing the Mind

- Emotional state (sad, mad, scared, frustrated)
 - Stress / distress level
- Memory, concentration (MMSE)
- Cognitions
 - Self doubts, learned helplessness
 - Rumination, self-pity
 - Distortions, catastrophizing
 - Acceptance

Assessing Social Interactions

- Impact of pain on activities (meaningful, pleasurable)
- Relationships with family members / friends
- Abusive relationships?
- Assistance given / received from others
- Use of alcohol, drugs, tobacco
- Talk with patient and S.O.'s
- Self awareness re: therapeutic relationship

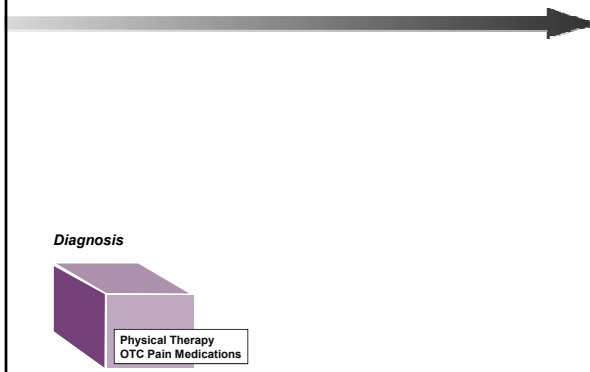
Targeting the Body: Selected techniques

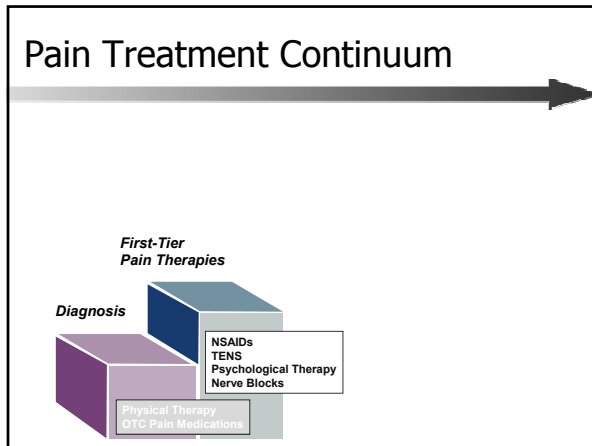
- Medications
- Invasive procedures
 - Nerve blocks / neuroablation
 - Implanted devices
- Acupuncture
- Massage / manipulation
- Apply heat / ice
- Avoid pain triggers
 - environmental,
 - dietary,
 - overexertion
- Exercise
- Positioning
- Sleep Hygeine

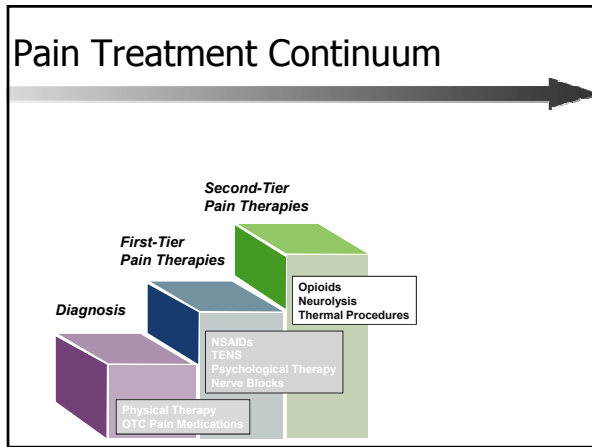
Targeting the Body

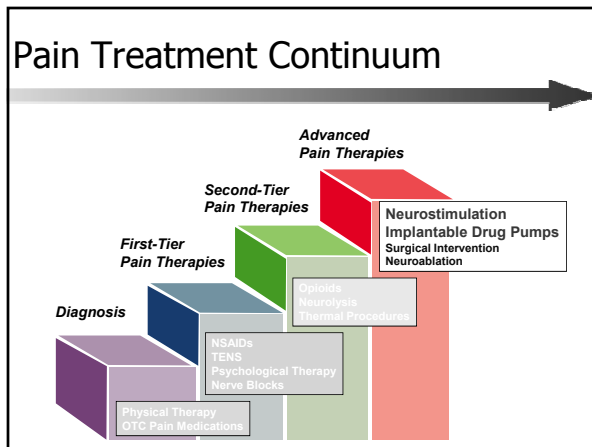
- Fix treatable causes of the pain
 - Cure-directed
 - Block or damage malfunctioning nerves
- Strengthen defenses to dampen pain
 - Increase endorphin production / release
- Prevent Pain Flares
 - Avoid factors that exacerbate pain
 - Promote wellness and develop strength

Pain Treatment Continuum







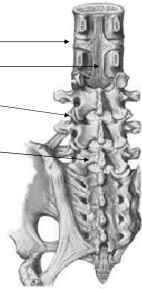


Chronic Pain

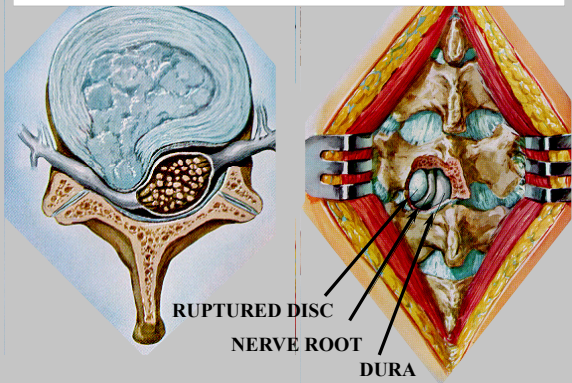
- Sources of Pain
- Diagnostics
- Treatment
 - interventional spine procedures (epidural steroid injections, facet joint injections, spinal cord stimulator, Intrathecal pump)

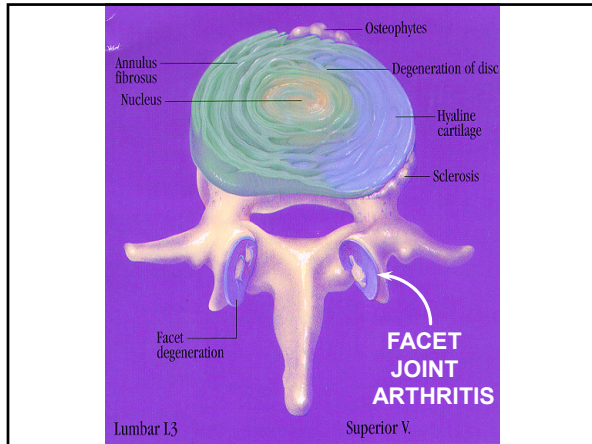
SOURCES OF SPINAL PAIN

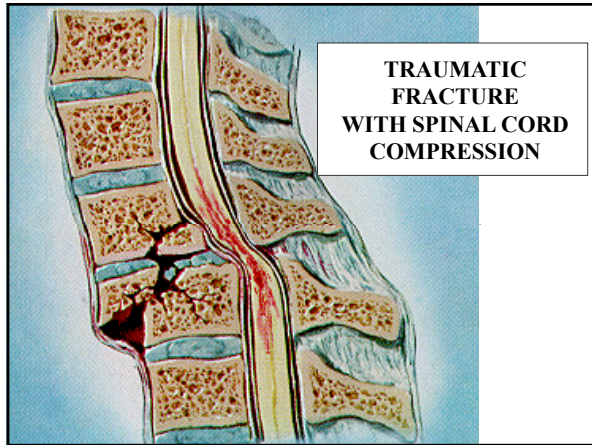
- Discs
- Ligaments
- Facet (zygapophyseal) joints
- Vertebrae
- Muscles
- Nerve roots
- Spinal cord and dura

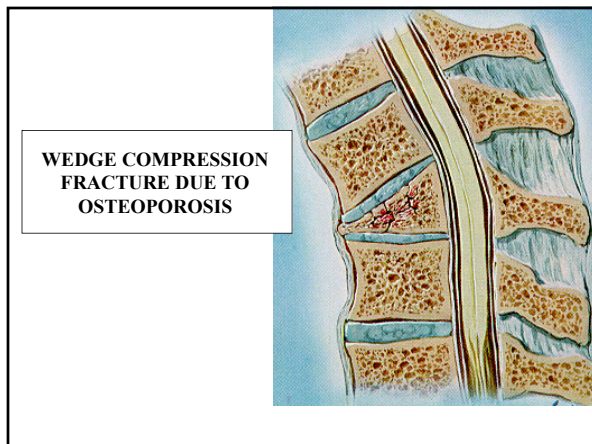


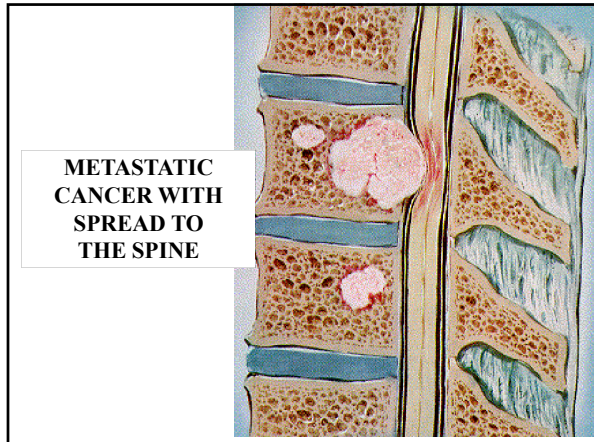
RUPTURED DISC-SURGICAL TREATMENT











**Back Pain and Sciatica:
Imaging Evaluation**

- Lumbosacral x-ray studies with flexion/extension/oblique views
- MRI of the spine
- CT with 3-D reconstruction
- CT plus myelography

***Basic Interventional
Techniques***

- **Nerve Blocks**
 - Epidural steroid injection
 - Z-joint (facet joint) injection
 - Sacroiliac joint injection

Advanced Techniques

New advanced techniques for treatment of back and neck pain

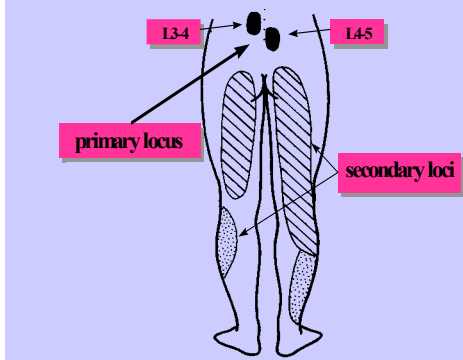
- Radiofrequency
- IDET (Intradiscal Electrothermal Therapy)
- Nucleoplasty
- Implants
 - Spinal cord stimulation
 - Infusion pumps

ZYGAPOPHYSEAL JOINT INTERVENTIONS

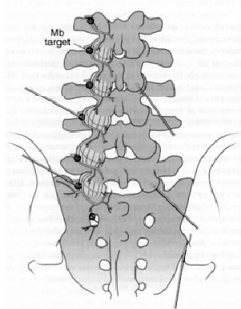
- Diagnostic intraarticular injection
- Diagnostic medial branch block
- Therapeutic intraarticular injection
- Radiofrequency treatment of medial branch
- Z joints = Most common cause of spinal pain (40-60%)

Bogduk N et al., Clin J Pain, 1997
Schwarzer AC et al., Clin J Pain, 1994
Barnsley L et al., Spine, 1995

lumbar facet referral pattern



Z-Joint treatment



Manning et al. 1998

DDD of lumbar spine



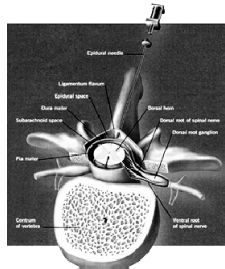


TREATMENT Options for DISCOGENIC LOW BACK PAIN

- Lifestyle modification
- Exercise/Physical therapy
- Medication therapy
- Epidural steroid injections
- Discography
- IDET
- Fusion surgery
- Disc Replacement Surgery

EPIDURAL STEROID INJECTIONS

- Interlaminar
 - Cervical
 - Thoracic
 - Lumbar
- Transforaminal
 - Cervical
 - Thoracic
 - Lumbar
- Caudal



Discography and Percutaneous Annuloplasty

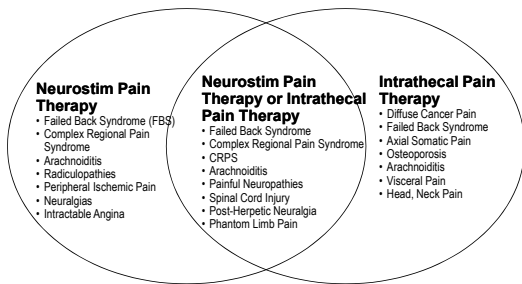
- Pressure-controlled discography
 - Provocation of familiar pain
 - Enables grading disc sensitivity (chemical, mechanical, indeterminate, normal)
 - May predict surgical outcome (Derby et al, 1999)
 - "positive" result (pain intensity, concordance, pain behavior, psychological factors, WC, etc.)

Patient Selection Criteria for Spinal Cord Stimulation and Intrathecal Pumps.

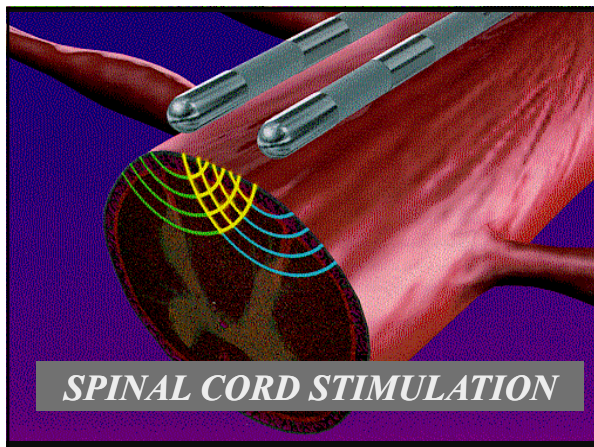
- More conservative therapies have failed
- An observable pathology exists that is concordant with the pain complaint
- Further surgical intervention is not indicated
- No serious untreated drug habituation exists
- Psychological evaluation and clearance for implantation has been obtained
- No contraindications to implantation exist. These include sepsis, coagulopathy, etc.
- Trial screening has been successful

E. Krames, J Pain & Symptom Mgt, 1996

Indications for Advanced Pain Therapies



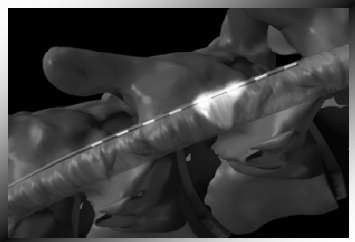
Courtesy E. Krames, M.D.



Neuromodulation Devices

Electrical Stimulators and Drug Pumps

Precise delivery of small doses of electricity or drugs directly to targeted nerve sites.



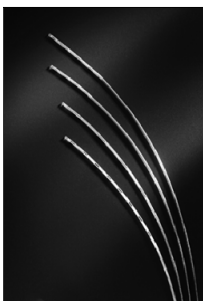
Spinal Cord Stimulation (SCS)



Implanted medical device that delivers electrical pulses to nerves in the dorsal aspect of the spinal cord that can interfere with the transmission of pain signals to the brain and replace them with a more pleasant sensation called paresthesia.

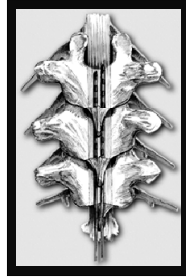


Percutaneous Leads

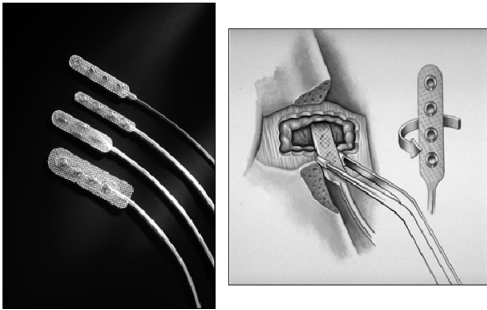


Percutaneous Leads

- Catheter style
- Placed via special needle
- Less invasive
- More prone to migration
- Cylindrical electrodes

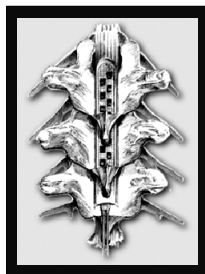


Surgical Leads



Surgical Leads

- Paddle style
- Placed via incision (laminectomy)
- More invasive
- Very stable
- Plate electrodes



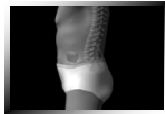
Internal Pulse Generator



SCS Systems

Two Types of Systems

1. Implanted Pulse Generator (IPG)
 - Pulse generator and battery inside
 - Power controls outside
2. Radio Frequency (RF)
 - Pulse generator inside
 - Battery and power controls outside



The Renew® RF System

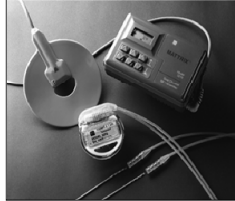


When a Single Lead Trial is Unsatisfactory

Dual Leads Improve Likelihood of Success

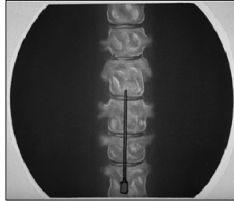


- C**
- Totally Implantable Dual Lead Therapy
 - Single Stim™ Only



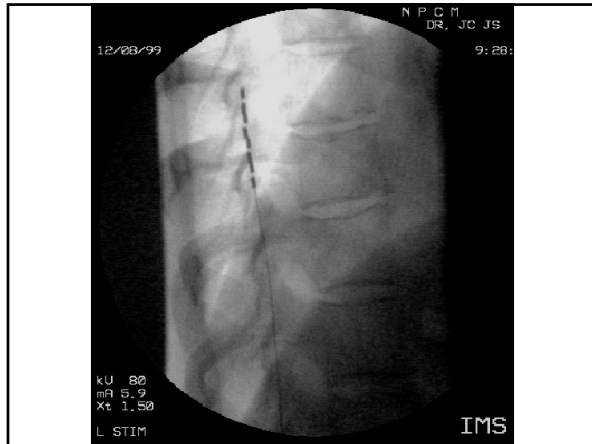
- M**
- Steerable Dual Lead Therapy
 - Single Stim™ or Dual Stim™

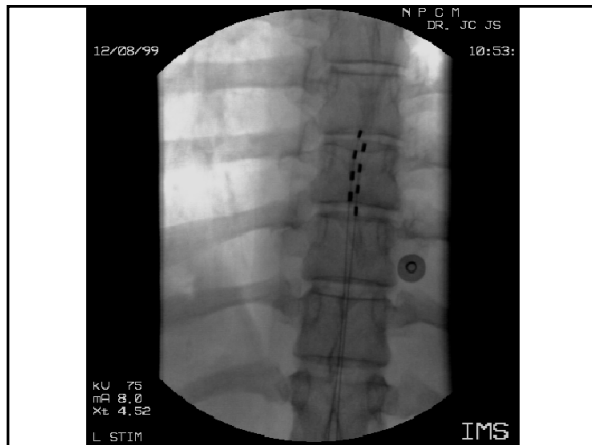
Percutaneous Lead Placement: Insert Touhy Needle



Percutaneous Lead Placement: Confirm Lead Position



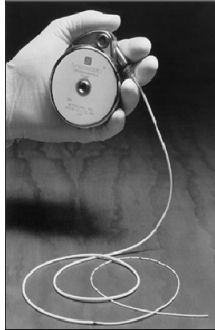




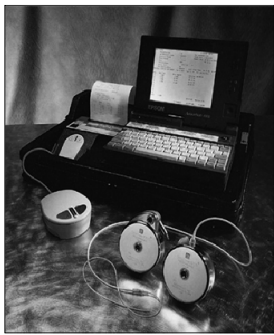
**Screening Techniques
Intrathecal Pain Therapy**

- The purpose of the trial is to assess the efficacy and side effects of intrathecal morphine
- Trialing methods include:
 - Continuous epidural
 - Continuous intrathecal
 - Bolus intrathecal
 - Bolus epidural
- At least 50% reduction in pain may indicate a successful trial

Infusion System



PC-based Programmer

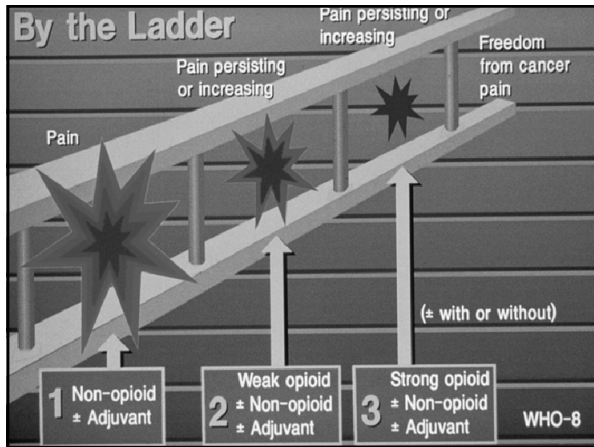


Options



Principles for Using Analgesics

- By the Step (WHO ladder)
- By the Clock
- Adequately trial each drug
- Stay low and go slow



Non-Opioids / NSAIDs

- | | |
|---|--|
| <ul style="list-style-type: none"> • Benefits – Good for mild pain – Helps sore, aching pain – Treats inflammation – Treats fever – Many products – Available in many routes – Not habit forming | <ul style="list-style-type: none"> • Risks / problems – Ceiling effect – May delay healing – GI toxicity – Renal toxicity – Hepatic toxicity – Asthma, HTN warning |
|---|--|

Commonly Used NSAIDs

Drug	Dosing Strengths mg	Dosing Frequency	Maximum Daily Dose
Ibuprofen	100,200,400,600,800	300 to 800 mg tid to qid prn	3200 mg
Naprosyn	250, 375,500	250 to 500 mg bid to tid	1500 mg
Relafen	500, 750	1000 mg qd to bid	2000 mg
Diclofenac	25,50,75 DR 100 ER	50 mg bid to tid 100 mg qd to bid	200 mg
Mobic	7.5, 15	7.5 mg bid 15 mg qd	15 mg
Celebrex	100,200	100 to 200 mg qd to bid	400 mg

Non-Opioids/ Skeletal Muscle Relaxants

- Benefits
- Helps muscle spasm/tension.
- Helps pain.
- Many Products available.
- Not habit forming.
- Risks
- Hepatic toxicity
- Sedation
- Syncope
- Hypotension
- Anticholinergic effects

Commonly USED SMRs

Drug	Dosing Strengths mg	Dosing Frequency	Maximum Daily Dose.
Robaxin	500,750	1000 mg qid	8000 mg qd
Baclofen	10,20	20 to 80 mg qd in divided doses.	80 mg qd
Zanaflex	2,4 tablet 2,4,6 capsule	8 mg q6 to q8 prn	Max 3 doses in 24h
Skelaxin	800	Tid to qid prn	Not defined
Flexeril	5,10	5 to 10 mg tid	30 mg qd

Other Medications for Pain

Drug	Class	Indication	Dosing Frequency	Maximum Recommend Dose
Gabapentin	Seizure Disorder, Other Neurologics	Neuropathic Pain	300 to 1200 mg tid	3600 mg qd
Lyrica®	Seizure Disorder, Other Neurologics, Fibromyalgia	Fibromyalgia, Neuropathic Pain	100 to 300 mg bid to tid	450 mg qd-FMS 600 mg qd Neuropathic Pain
Amitriptyline	TCA	Pain, chronic	0.1 mg/kg qhs	150 mg qd
Cymbalta®		Fibromyalgia, Neuropathic Pain, diabetic Musculoskeletal Pain, Chronic	60 to 120 mg qd	60 mg qd for FMS and Musculoskeletal. 120 mg qd for Neuropathic
Tramadol	Opioids, other analgesics	Acute/chronic moderate to severe pain	50 to 100 mg q4 to 6 pm	400 mg qd

Opioid Benefits:

- Highly effective, sometime the only effective Rx
- Promotes healing
- Improves mood
- Products with low or "no" ceiling
- Accumulation ~ occur
- Pure agonists have no known end-organ damage

Opioids: Potential Problems

- | | |
|---|---|
| <ul style="list-style-type: none"> • Side effects – Respiratory depression – Sedation – Nausea / vomiting – Urinary retention – Hormonal changes – Sexual dysfunction – Constipation | <ul style="list-style-type: none"> • Risks – Addiction – Physical dependence – Tolerance – Safety concerns (driving) – Drug interactions |
|---|---|

A Range of Products

- Weak or Mixed Opioids
 - Codeine
 - Propoxyphene
 - Tramadol
 - Pentazocine
 - Nalbuphine
- Strong Opioids
 - Hydrocodone
 - Oxycodone
 - Morphine
 - Levorphanol
 - Hydromorphone
 - Fentanyl
 - Oxymorphone
 - Tapentadol

End of Part One
Please proceed to Part Two
