

Pre and Post Operative Pain Management

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Algiatry

The specialty of Pain
Medicine.

Focus: prevention of pain,
evaluation, treatment, and
rehabilitation of persons in
pain while avoiding addiction.

formulate comprehensive
treatment plans, which
consider the patients' cultural
contexts, as well as the
special needs of the pediatric
and geriatric population

Types of pain

Nocioceptive—sensitization to nerves (nocioceptors in periphery) which transduce noxious stimuli into electrical impulses, which are then transmitted to the CNS.

Visceral—nociceptors in CV, respir, GI, and GU=diffuse pain. Maybe constant or intermittent, often “colicky or squeezing”

Somatic—nociceptors in bone, soft tissue, joints, and muscle. Generally well localized and characterized as “aching, gnawing, throbbing or cramping”

Neuropathic Pain

Results from injury to neural structure.

Usually sharp or burning and results in spontaneous firing of damaged nerves.

Peripheral or Central.

Peripheral Neuropathic Pain

Cervical/lumbar nerves or plexus
such as brachial or lumbosacral

Central Neuropathic Pain

Involves CNS at level of SCI, often referred to as sympathetically mediated. Characterized by autonomic dysregulation manifested by vasomotor or pseudomotor phenomena: edema, sweating, and muscle atrophy. Now called complex regional pain syndrome (CRPS)

CRPS/RSD

Type I (was RSD) and occurs
without a definable nerve
lesion.

Type II CRPS, formerly
Causalgia, with a definable
nerve lesion present

Pre-operative pain management

Mary is a 50 year old female administrator for the City of Beautiful People. After a long day of meetings she developed neck and left shoulder pain, while talking and writing. She has no other medical problems but past car accidents with neck pain from a roll over and a \$150,000 settlement, treated conservatively in her 30's. Her exam shows limited ROM for the left shoulder for 90-110 degrees of ABduction, positive Speeds and tenderness over the biceps, with palpable left trapezial muscle spasm. MRI with contrast shows a labral tear and surgery is recomnded.

Somatic and Neuropathic pain

Mary also has insomnia and restlessness and is easily stressed. She denies any problems at work or home, but states she “takes her job very seriously” and used to hike major mountains, cycle and do masters swimming.

Mary is treated with PT 12 sessions and started on Elavil 25mg qhs and told to take her ibuprofen 800mg po tid. Her motion improves but tenderness over biceps continues. A shoulder injection is offered by the surgeon and performed, it provides 1 month of pain relief. She takes Tylenol for break through pain.

Somatic pain treated

Mary has arthroscopic shoulder surgery, and vicodin is used for post operative pain. She begins taking one pill 3 times a day.

Post operative Pain management

After three months, Mary has increased her vicodin to two pills 3-4 times a day and two pills at night to help with sleep. She has anxiety about to return to work and is started on valium 5mg po qhs.

What happened to Vicodin??

It became a schedule II drug effective Oct. 6, 2014. Was a class III for over 40 years

Why!!

Vicodin is the most prescribed narcotic. Centers for Disease Control and Prevention, noted abuse and misuse of opioid painkillers send half a million Americans to the emergency room each year for complications from the drugs and claim the lives of 46 people/ day or nearly 17,000/year.

How to avoid vicodin over dose?

Write clear prescriptions:

Vicodin 1 pill every 4-6 hours for moderate pain 6-7/10.
Do not exceed 8 pills a day. No refills.

Schedule I drugs are mostly illegal substances that are not considered to have a medical use—for example, heroin, marijuana (cannabis) and Ecstasy.

Schedule II drugs have acceptable medical uses, but have a high abuse risk and can lead to physical and psychological dependence. Most narcotic painkillers, including fentanyl (Duragesic, Sublimaze, and generic), hydrocodone alone (Zohydro ER), morphine, oxycodone (OxyContin and generic), oxycodone combined with acetaminophen (Percocet and generic), are already classified as Schedule II. The new rule moves hydrocodone-combination drugs into this category with its chemical cousins.

Schedule III drugs includes drugs such as acetaminophen with codeine (Tylenol with codeine—less than 90 milligrams of codeine per dosage unit) and some stimulants and anabolic steroids, which have a lower abuse risk than Schedule II drugs and are less likely to lead to addiction.

Schedule IV and V drugs, which include sedatives such as alprazolam (Xanax and generic), diazepam (Valium and generic), and lorazepam (Ativan and generic) and some prescription cough drugs, carry the lowest risk of abuse.

Schedule II

refills are not allowed with
Schedule II drugs
can write multiple
prescriptions for a total of up
to 90 days worth—for
example, three 30-day
prescriptions—with
instructions to the pharmacist
to fill them sequentially

In emergency situations you
can phone in a prescription
for a 48 Hours worth of a
Schedule II drug, but must
still follow up in writing within
7 days in California

**How does the switch to
Schedule II for
hydrocodone containing
medications change the
way prescriptions are
handled?**

In the year after the United States Drug Enforcement Administration (DEA) rescheduled hydrocodone combination products from Schedule III to Schedule II, 26.3 million fewer hydrocodone combination product prescriptions were written and 1.1 billion fewer hydrocodone combination product tablets were dispensed.

January 25, 2016 issue of *JAMA Internal Medicine*

Schedule III, IV, and V drugs carry far fewer restrictions. You can write a prescription or phone or fax it into the pharmacy. Allows for refills up to five times in six months without a return visit.

Schedule II prescribing

Come in monthly

Paper or eprescribe ok

Need prescription to pick up
(unless it is for a patient in a
long-term care facility or
hospice program)

Dealing with Pain

- How to identify people who will have chronic pain early and minimize the time they are TTD, especially after surgery.
- Ending cases that have gone on forever.
- Are pain doctors good or bad—and who are they exactly?
- What should be paid for and what is a passive treatment which just feels good?

Key Principles of Chronic Pain Management

1. Promote good communication between yourself and the patient—this is for all parties involved
2. Support the ACTIVE role of the patient
3. Optimize medication use
4. Use a multidisciplinary, multimodal approach

Overall Treatment Goal

- Move from
 - Sensory-physical model
 - Unidimensional (eg: degree of actual or potential tissue damage is equal to reported pain severity)
 - Pain undifferentiated, vague, overwhelming
- Move towards
 - Biopsychosocial model
 - Multidimensional
 - Emphasize interaction of **thoughts, feelings, behaviors and symptoms**



Empathy and Compassion

Acknowledge and validate the human being who is suffering (for whatever reason)

Note if the patient is working modified duty and then suddenly TTD—did something happen and what can be done right then and there to get them back to work ASAP modified or full time.

Ask the patient what is going on, how they are feeling, what they think is wrong.

Immediately set a goal of return to function, then address work.

Pain

“An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage”



The diagram features a large blue 3D arrow pointing downwards, which is split into two sections. The left section is labeled 'Acute' and the right section is labeled 'Chronic'. Below the 'Acute' section, a white arrow points down to a box containing the text '? Adequately Treated'. Below the 'Chronic' section, a white arrow points down to a box containing the text 'Often Under-treated'.

Acute

? Adequately Treated

Chronic

Often Under-treated

Who is going to turn Chronic?

- People with bad work reviews or unhappy work environments or exhaustion. Beware the DOI on or before a holiday/birthday
- Marital discord
- Financial stressors
- Other medical problems (DM, HTN, CA)
- Family issues/problems (Ill parent or child)

Chronic Pain



**100 Million Patients Treated for
Pain Related Indications Worldwide**

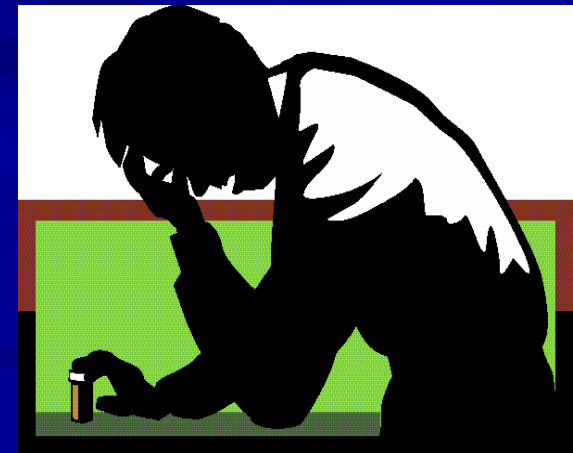
**3 Million Chronic
Pain Sufferers Worldwide**

Definition

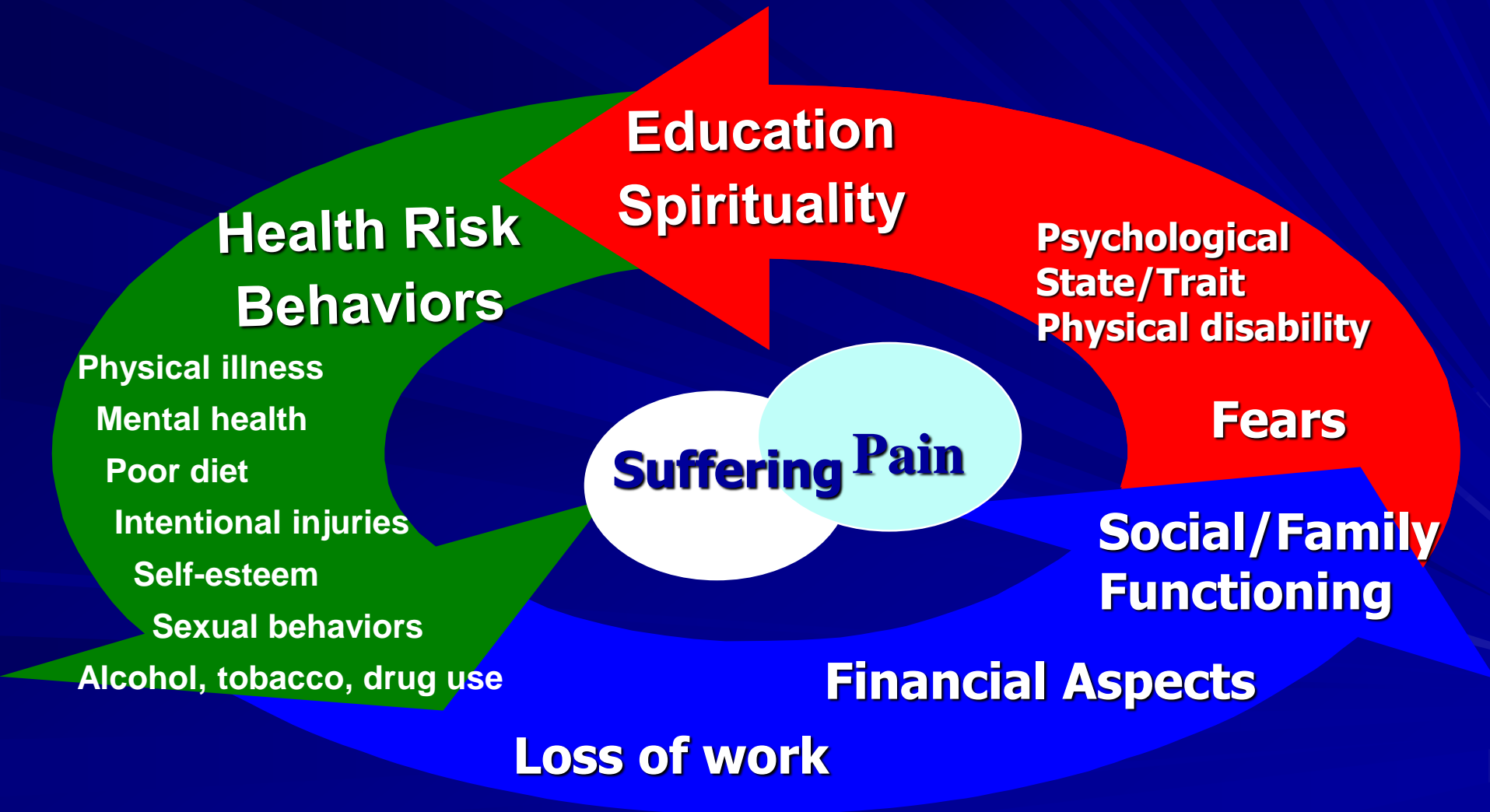
- **Suffering**
 - The reaction of the organism to the experience of pain
 - Pain maybe mandatory but suffering is optional
- **Pain**
 - An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage
- **Pain Behavior**
 - Behavior that leads an observer to conclude that pain is being experienced (validation/guilt)

Pain & Its Comorbidities

- **Comorbidities can substantially increase costs of treatment**
 - Depression
 - Anxiety disorder
 - Substance use-related disorders
 - Somatoform disorders



Multidimensional Nature of Pain



HISTORY

- What meds have been tried and worked and did not work
- Get a clear description of the pain. If burning/tingling most likely neuropathic and antidepressants/neuropathic medications may be more effective
- Aching/sharp pain better response to opioid medications.
- Find how many pills/day the patient is taking.

HISTORY

- Functional history. How is their pain limiting their ADL's. Then set a Functional GOAL.
- Pain score: VAS, numeric scale, etc.
- Is the pain such that they cannot get up in the AM?
- Is the pain preventing them from working?
- **What is the patient seeking?**
 - a) Improvement in function
 - b) Secondary gain, i.e., workman's comp OR disability. Attention? Time off work?

HISTORY

- Sleep History. Important for 3 reasons:
 - 1) Insomnia will lead to further increase in pain
 - 2) Insomnia may also be byproduct of depression for which you may need some additional assistance (Ψ & meds)
 - 3) Insomnia may be result of sleep apnea which needs to be addressed

HISTORY

- SLEEP APNEA
- Chronic pain patients are typically overweight
- Sleep apnea patients increased BP and increased risk of stroke
- Sleep apnea obstacle for exercise prescription for patient because of fatigue

EXAMINATION

- Body Habitus (Overweight/Thin)
- Skin (yellowing, checking nail beds for clubbing. Many chronic pain patients are also chronic smokers.
- Smoking will hinder treatment because of:
 - a) vasoconstriction of vessels to muscles thereby inducing ms. spasm from lactate build up
 - b) smoking also hinders meeting physical therapy goals
 - c) Number one cause of spinal arthritis

EXAMINATION

- Neuro Exam check muscle strength
- MS exam
 - 1) check for trigger points (taut ms. band that radiates pain).
 - 2) check SI joints for joint tenderness, Gillett & Ober test
 - 3) check posture, especially for 'hound-dog' in the shoulders
 - 4) check for pelvic obliquity and for leg-length discrepancy (measure from ASIS to superior portion of the medial malleolus)

TREATMENT

- First establish what the patients' goals are. You will do this in the history, but it needs to be reiterated in the treatment
- Establish the physician is the coach and mentor. NOT the Savior!
- If patient wants cure of chronic pain, unrealistic goals need to be addressed.
- If they want function, and can be specific, there is hope.

TREATMENT

- Establish ground rules for treatment:

- 1) Pain/Opioid contract

- a) One pharmacy/one doc

- b) Opioids are like cash. They lose script or meds, they will not be replaced.

The physician is not an ATM!

- c) Must comply with other forms of treatment: PT, smoking cessation, etc.

- d) No changes mid-stream. Changes are made during office visit. Not over-the-phone or email.

TREATMENT

- Multi-modal. Initially use Machiavelli approach 'by any means necessary.'
- TENS unit
- Physical Therapy. Aquatics very effective
- Compounded medicines
- Scheduled opioids
- Trigger points
- Patient behavior modification:ergo,posture

TREATMENT

Physical Therapy

- ❑ Aquatic Therapy preferred
- ❑ Buoyancy of water unloads joints esp. in those patients who are overweight
- ❑ Water soothing median for pain
- ❑ Helps lower BP via Hydrostatic pressure on soft tissues thus forcing interstitial fluid into vasculature and promoting diuresis
- ❑ Can achieve strengthening in water medium without damage to the joints.

TREATMENT

- **TRIGGER POINT THERAPY**
- Discovered by Janet Travell, MD
- Taut-muscle bands that when compressed triggers sharp pain not only in compressed area but elsewhere along myofascial planes
- Goal to reduce spasm in order to promote proper muscle biomechanics

Principles of adequate pain management

- Person with pain is the expert
- Systematic and ongoing assessment is key
- Combine medications with nondrug interventions in an order that manages pain effectively
- Adjust medications to individual response
- Perform ongoing evaluation of the effect of the plan on pain
- Communicate the plan to others
- Identify and deal with barriers

Purpose of Pain Relief

- Decrease Suffering

- Pain hurts
- Pain causes distress
- Prevents activity
- Prevents enjoyment

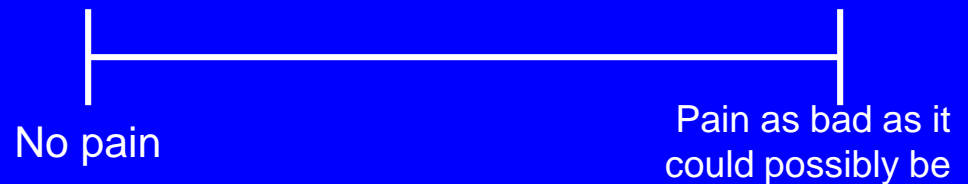
- Decrease Stress

- Hypertension
- Tachycardia
- Tachypnea
- Hormonal changes
- Decreased perfusion
- Ischemia

Pain Assessment

What is the severity of the pain?

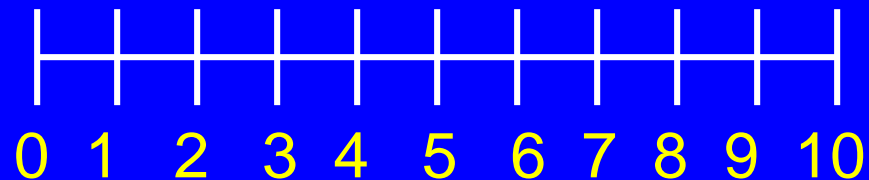
Visual analog scale -

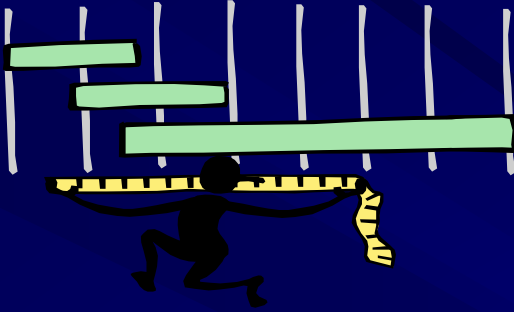


Descriptive intensity scale -



Numerical intensity scale -





Measurement of Pain

- Gives meaning to the VAS
- Prevents “Catastrophizing”
- Helps you speak the same language
- Works for you
 - behavioral modification
 - holds patient accountable
 - aids in treatment planning



Geriatric patients

Assess with MMSE regularly to test for dementia and avoid side effects/risks.

Use a frailty scale: unintentional weight loss, muscle weakness, exhaustion, low physical activity, and slowed walking speed.

people with intermediate frailty scores (2 or 3) are twice as likely to have post-surgical complications, spend 50% more time in the hospital, and are three times as likely to be discharged to a skilled nursing facility instead of to their own homes.

Pediatric patients

Don't under treat pain.

If an adult undergoes a procedure and gets a morphine pump, a 7 year old might need one as well.

The Four “A’s” of Pain Treatment Outcomes

- Analgesia (pain relief)
- Activities of Daily Living (psychosocial functioning)
- Adverse effects (side effects)
- Aberrant drug taking (addiction-related outcomes)

Must be documented on every note

Denials for Medications

Workers comp denials for
medications can cause
withdrawl symptoms

Narcotic withdrawal is
unpleasant, 5-7 days typically

Benzodiazepine withdrawal can
be deadly

Goals of Pharmacotherapy

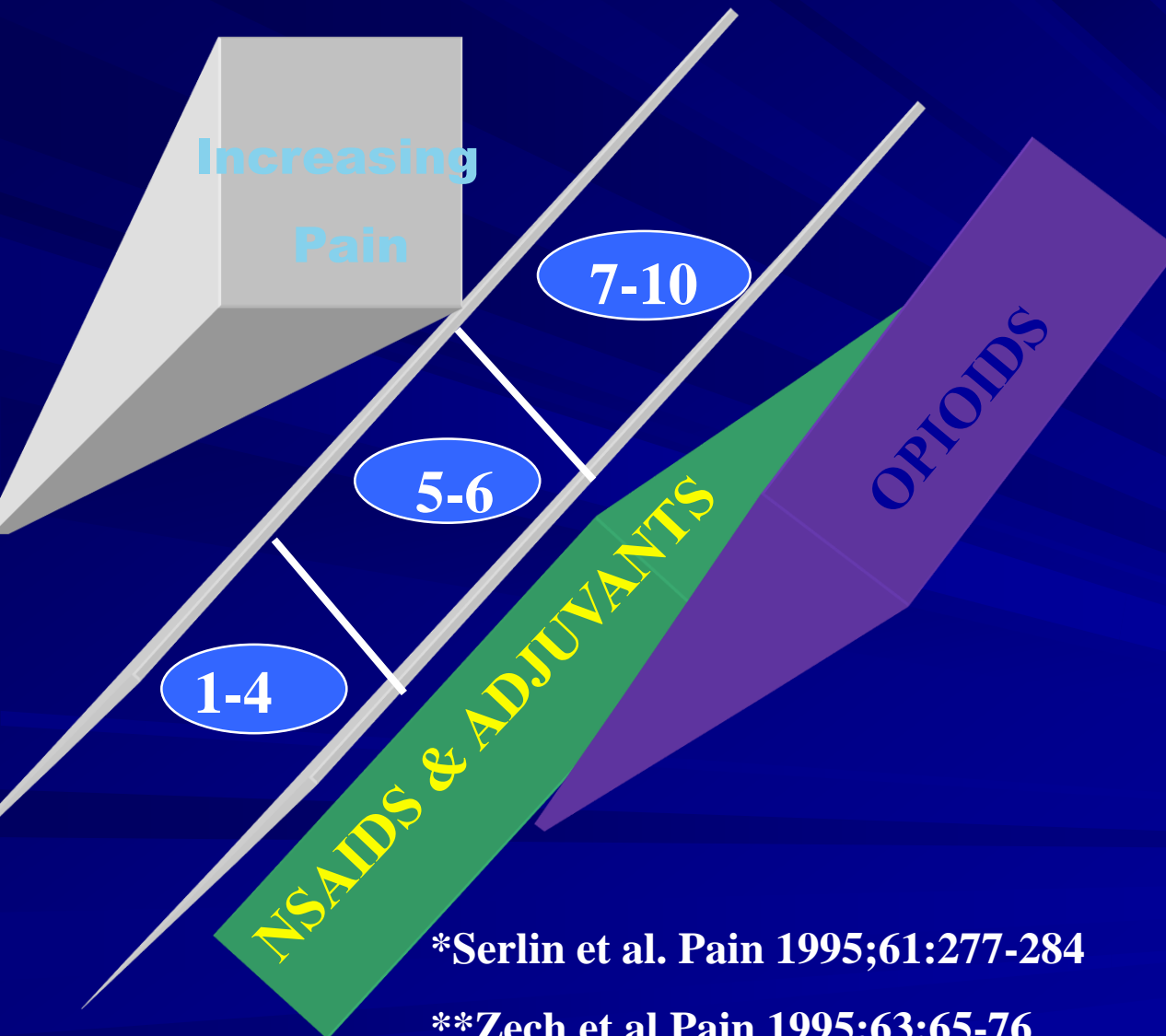
Traditional view:

- Palliate pain
- Use lowest dose of opioid agent
- Administer just a single agent
- Use all agents prn

Modern view:

- Prevent pain
- Dose to individual needs of patient
- Use combination medication therapy
- Use patient-controlled analgesia, scheduled dosing or continuous dosing

Advances in Pain Management & Research



WHO 3 Step Ladder

- Patients assigned to steps of ladder based on self report*
- Individualize dose and add adjuvant/co-analgesic drugs as needed
- Effective in 88-100% of patients**

*Serlin et al. Pain 1995;61:277-284

**Zech et al Pain 1995;63:65-76

Anti-inflammatories

Ibuprofen – Advil, Motrin
Naproxen – Aleve,
Anaprox, Anaprox DS, Naprosyn
Diclofenac –
Voltaren, Voltaren-XR, Arthrotec, Flector,
Pennsaid
Celecoxib – Celebrex
Meloxicam – Mobic
Piroxicam – Feldene
Indomethacin – Indocin,
Indocin
Sulindac – Clinoril
Etodolac –
Lodine
Nabumetone – Relafen
Ketoprofen
Ketorolac
– Toradol
Methylprednisolone – Medrol DosePak
(Dose pack)
Prednisone

Neuropathic Pain Agents:

Gabapentin – Neurontin

Pregabalin – Lyrica

Carbamazepine – Tegretol, Tegretol

XR Lamotrigine – Lamictal,

carbamazepine – Trileptal Topiramate –

Topamax Valproic acid

Alpha Lipoic Acid (ALA)

Antidepressants:

Tricyclic Antidepressants (TCAs) Amitriptyline –
Elavil Nortriptyline – Pamelor

Selective Serotonin and Norepinephrine Reuptake
Inhibitors (SSNRIs) Duloxetine –

Cymbalta Venlafaxine – Effexor, Effexor

XR Milnacipran – Savella Norepinephrine and
Dopamine Reuptake Inhibitors (NDRIs) Bupropion –
Wellbutrin, Wellbutrin SR, Wellbutrin XL

Serotonin Reuptake Inhibitor and 5-HT₂ receptor
antagonist Trazodone – Desyrel

Selective Serotonin Reuptake Inhibitors
(SSRIs) Citalopram – Celexa Escitalopram –
Lexapro Paroxetine – Prozac

Muscle relaxants

Cyclobenzaprine – Flexeril,

Amrix, Tizanidine –

Zanaflex, Baclofen –

Lioresal, Chlorzoxazone –

Parafon ForteMetaxalone –

Skelaxin Methocarbamol –

RobaxinOrphenadrine –

NorflexCarisoprodol –

Soma, Dantrium –

Dantrolene

Sleep Agents

Zolpidem – Ambien, Ambien

CREszopiclone –

LunestaRamelteon –

RozeremTemazepam –

Restoril Trazodone – Desyrel

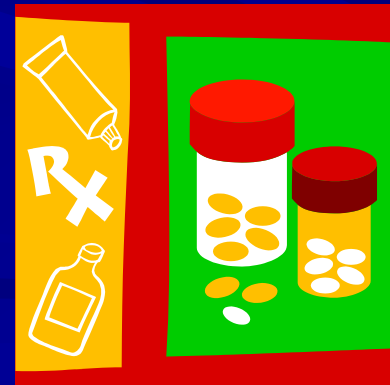
Benadryl

Miscellaneous:

Topical lidocaine –
Lidoderm
Topical low-
concentration capsaicin
High-
concentration capsaicin patch –
Qutenza, EMLA cream
(lidocaine/prilocaine)
Clonidine—alpha 2 agonist
Mexiletine—Ca channel blocker

Overview of Opioids

- **Mu agonists (listed in order of increasing potency)**
 - Codeine
 - Hydrocodone
 - Demerol
 - Morphine
 - Oxycodone
 - Dilaudid
 - Fentanyl
- **Other opioids**
 - Tramadol
 - Propoxyphene
 - Stadol



Opioids

- **Classifications**
 - **Agonists (morphine like drugs)**
 - Codeine, fentanyl, hydromorphone, meperidine, methadone, morphine, oxycodone, propoxyphene
 - **Agonists-antagonists (limited use)**
 - Butorphanol, pentazocine
 - **Antagonists (reverses effects of opioids)**
 - Naloxone



Opioids

- **Mechanisms of action**
 - **Attaches to receptor sites in CNS and blocks release of neurotransmitters (Substance P)**
 - **Most morphine type drugs (pure agonists) attach to mu receptor sites to block pain transmission**
 - **NO ANALGESIC CEILING - increased doses potentially have increased analgesic effect. Dose is limited by side effects**

Opioids

- **Indications for use**
 - All types of pain such as postoperative pain, cancer pain, and also chronic pain
 - More effective with nociceptive than neuropathic pain
- **Routes**
 - PO, SL, PR, IV, SC, IM, Transdermal (TD), Epidural (EA), Intrathecal (IA), oral transmucosal



Addiction, Physical Dependence and Tolerance

- **Addiction**: A primary, chronic, neurobiologic disease, with genetic, psychosocial, & environmental factors influencing its development & 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, & craving
- **Physical dependence**: 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, &/or administration of an antagonist
- **Tolerance**: 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.

Drugs Used to Treat Neuropathic Pain

- Antidepressants
 - Elavil, bupropion, zoloft, wellbutrin, paxil, prozac
- Opioids
 - fentanyl, oxycodone
- Anticonvulsants
 - Gabapentin
- Local Anesthetics
 - lidocaine
- Newer Drugs
 - Cymbalta
 - Lyrica

Opioid Side Effects

- **Common:**

- Constipation
- Nausea
- Somnolence
- Dizziness
- Vomiting
- Pruritus
- Headache
- Dry mouth
- Sweating
- Asthenia



- **Serious:**

- Respiratory depression
- Apnea
- Respiratory arrest
- Circulatory depression
- Hypotension
- Shock

Opioid Side Effects

Constipation

- **Cause**
 - Related to opioid binding to receptors in GI tract and CNS which leads to reduced motility and gastric emptying
 - Tolerance does NOT develop with chronic use
- **Management *MUST BE ON SCHEDULED REGIMEN***
 - Use of stool softener with stimulant on scheduled (Senna-S)
 - Use of laxatives if no BM in 2 days (lactulose, dulcolax)
 - Use of reglan for refractory constipation

Opioid Side Effects

Nausea and Vomiting

- **Causes**
 - Opioid binding to receptors in brain
 - Decreased GI motility
 - Usually develop tolerance to side effect
- **Management**
 - Reduce dose and add or increase nonopioid or adjuvant
 - Anzemet or Compazine
 - Reglan for slowed motility
 - Phenergan (added CNS side effects, caution in elderly)

Opioid Side Effect Pruritis

- Cause

- Thought to be interaction in medulla versus histamine release



- Management

- Lower dose and add or increase nonopioid or adjuvant
- Benadryl, hydroxyzine (however may not work and may only sedate)
- Naloxone IV infusion if above steps fail (very low dose naloxone)

Opioid Side Effects

Confusion

- **Management**
 - Usually resolves over time with use of opioid
 - Look for underlying causes
 - Discontinue CNS acting medications that may be nonessential
 - Consider use of neuroleptic
 - Switch to another opioid
 - Use intraspinal route as much lower doses are necessary by this route

Opioid Side Effects

Sedation

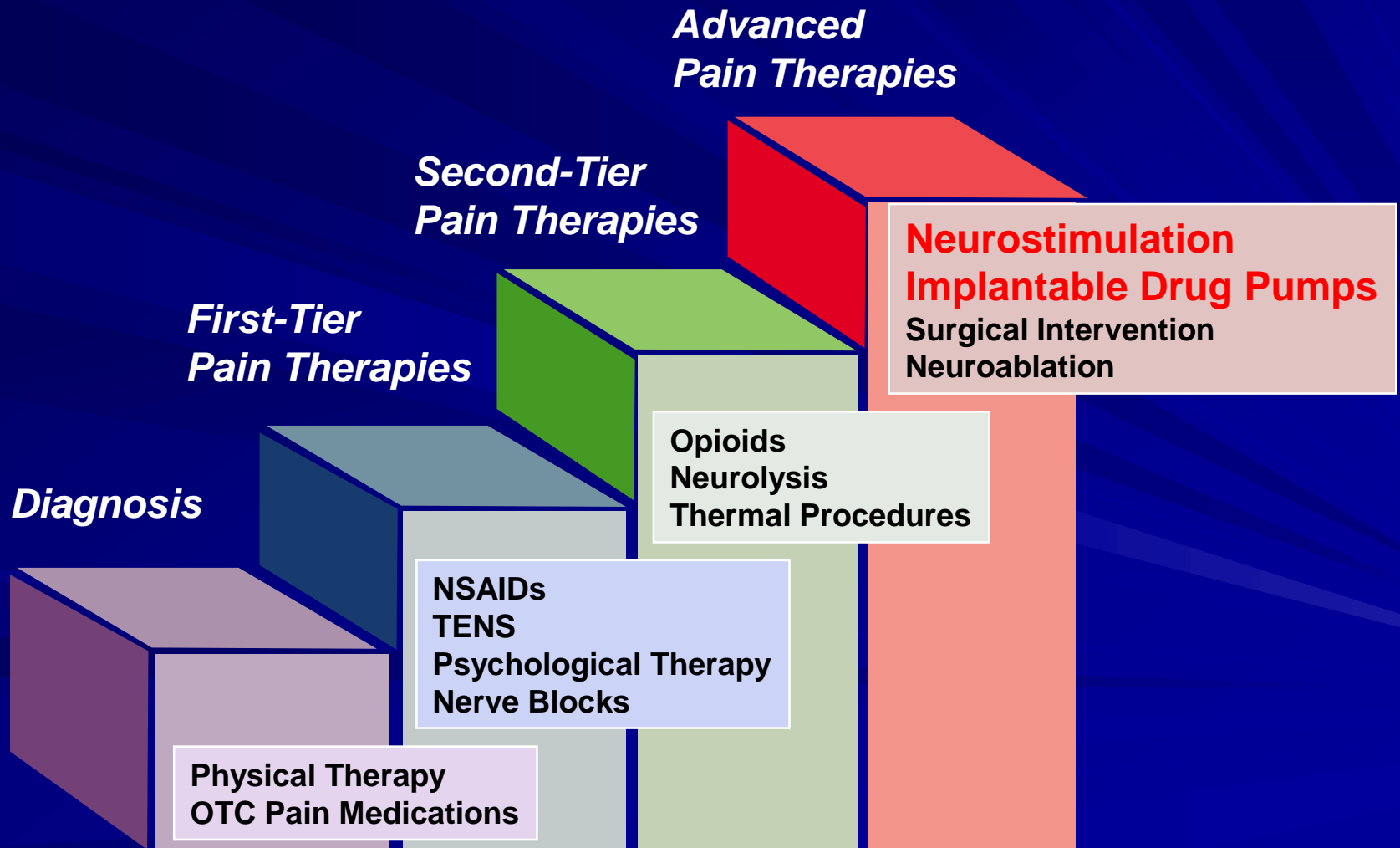
- **Cause**
 - Opioid binding in the brain
 - Improves or resolves with use
- **Management**
 - Reduce dose and add or increase nonopioid or adjuvant
 - Add stimulants (caffeine)
 - Eliminate other CNS depressant medications (ex: phenergan, benadryl, ativan, valium, baclofen)
 - Give a lower dose more frequently

Opioid Side Effects

Respiratory Depression

- **Cause**
 - Opioid binding to receptor sites in medulla
 - Tolerance develops with use
- **Management**
 - Monitor sedation level q1-2 hours during first 24 hours in opioid naïve patients
 - Decrease dose and add or increase use of nonopioid and nonsedating adjuvants
 - Stop opioid and use naloxone for patients that are minimally responsive or unresponsive

Chronic Pain Treatment Continuum



Pain Treatment Continuum

**Least
invasive**

**Most
invasive**

Continuum not related to efficacy

NSAIDs/Psychological/Physical approaches
Spirituality/Mind-Body Medicine/Herbal, ETC

Topical medications/Patches

Injections

Adjuvant therapies

Opioids

Interventional techniques

Pain insists on being attended to.

C.S. Lewis
The Problem of Pain 1940

Although the world is full of
suffering, it is also full of the
overcoming of it.

Helen Keller
Optimism, 1903

Putting the Pieces Together

Cognitive Behavioral Therapy;
pain \neq ongoing damage; chronic illness
like diabetes; realistic goals;
address common errors of thinking;
relaxation/meditation; affirmations;
stress management

Medications, procedures,
surgery, implantation, diet,
flare management

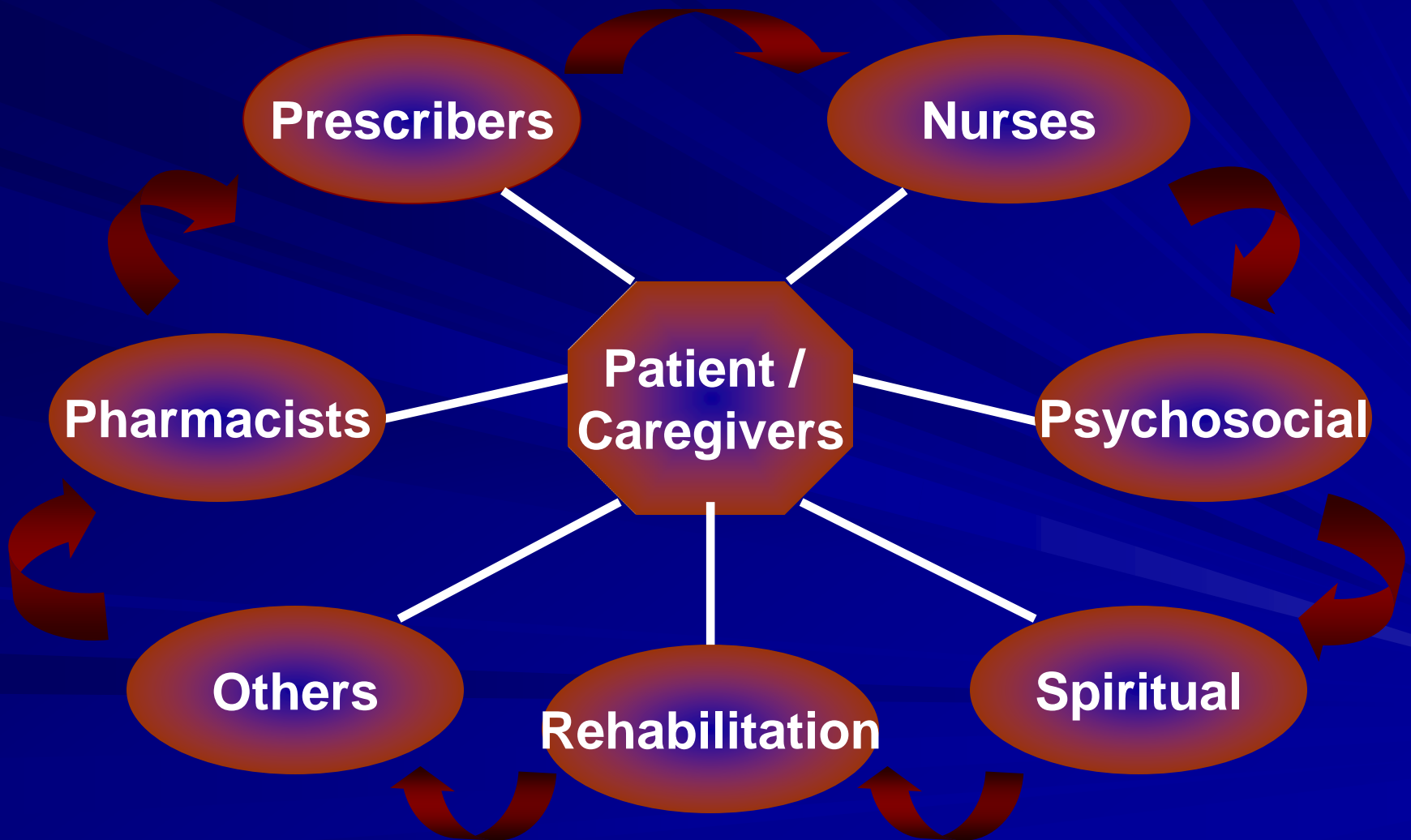
Physical therapies:
exercise/stretch q1h;
start low and go slow; positioning;
aids (walker, splint), TENS;
heat and cold, self massage;
pacing (timer, pedometer),

**Patient
Self
Care**

Co-management of chronic disease

Complementary & Alternative
Medicine: eg, food as medicine,
supplements, herbals, naturopath,
mind-body-spirit, energy medicine,
massage/reiki, acupuncture

Pain Management Requires an Interdisciplinary Pain Management Team



Cardinal Rules of Rehab

- Limit setting
- Consistency
- Repetition
- Emotional Reassurance
- Structure

How to use the Cardinal Rules

- Encourage patients to participate in outside activities such as: art therapy, music therapy, pet therapy. **Find out what they like and help them do it again—this is functional restoration (this gives them structure they are familiar and comfortable with)**
- Make them find a pool or help them get to one (ask them if their apt./condo/neighbor/relative has one). NO excuses (limit setting/consistency)
- Have someone call them everyday to see how they are doing—this can be a simple call from someone to say they are concerned (repetition/emotional reassurance)
- Find out who/what their support system is and ask how they are using it (this is their structure)

"All Aboard!"

one thing

Patients

Physicians

Pharmacists

Psychologists

Mental Therapists

Acupuncturists

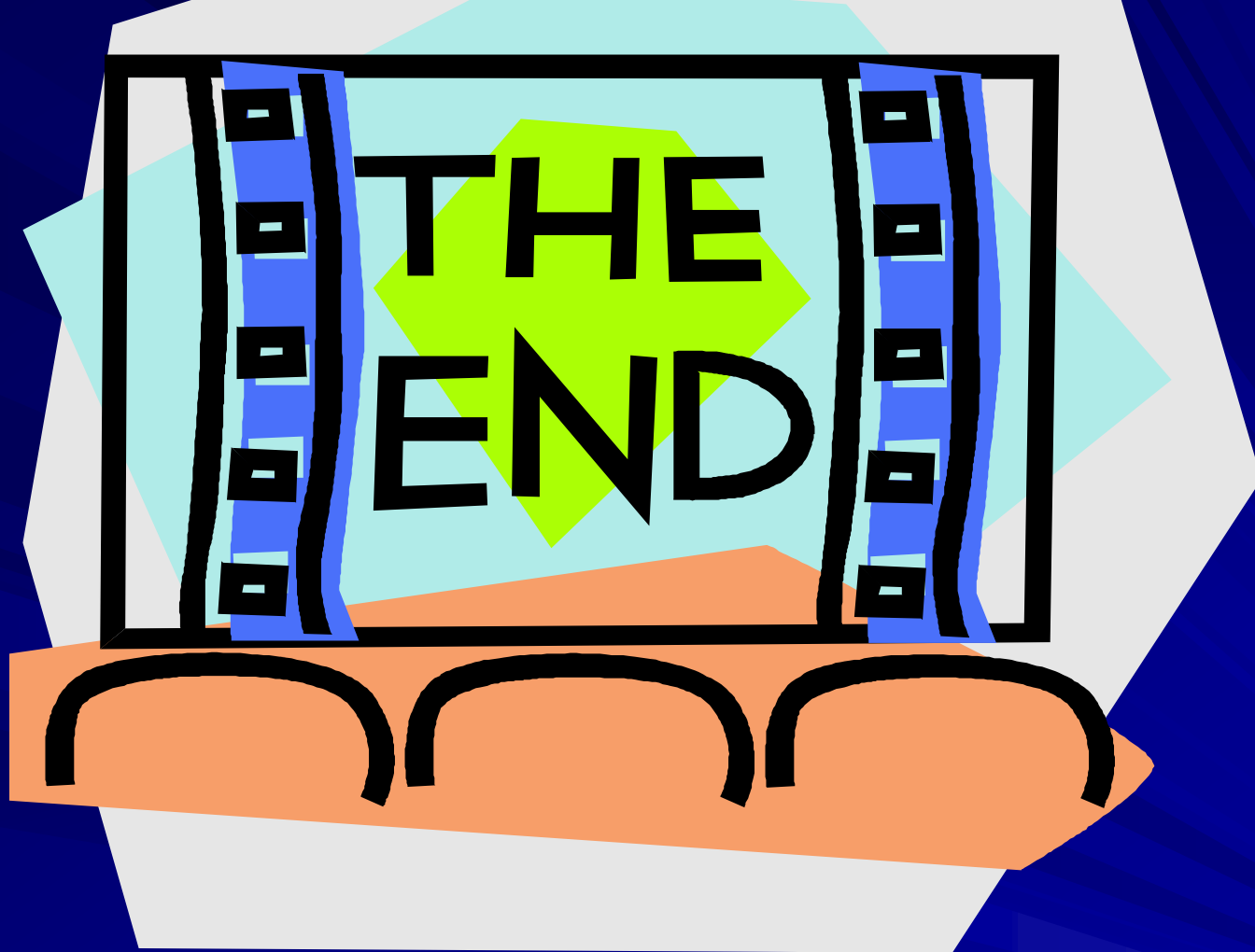
Massage Therapists

Social Workers

Spiritual Advisors

Administrators





FOR YOUR ATTENTION!