Safe and Effective Alleviation of Pain

David Ring MD PhD
Disease vs. Illness
Nociception vs. Pain

Perception of Pain

To the Limbic System

Descending Inhibitory Pathway

Neurotransmitters at Dorsal Horn Level:
- Norepinephrine
- Serotonin
- Enkephalins

Primary Afferent Neurotransmitter Candidates
- Substance P
- L-Glutamate
- GABA
- VIP
- CCK-B
- Somatostatin

Sensory Nerve

Motor of Other Efferent Nerve

Segmental Reflexes:
- Increased Skeletal Muscle Tension
- Decreased Chest Compliance
- More Nociceptive Input
- Increased Sympathetic Tone
- Decreased Gastric Mobility
- Ileus, Nausea, Vomiting

Release of:
- Substance P
- Histamine
- Serotonin
- Bradykinin
- Prostaglandins

Release of: Norepinephrine
The US medical sector ranks second in the world for opioid use

Opioid consumption in the medical retail sector per year and per capita, in morphine equivalents

1980s
1990s
2000s
2010s

As a result, medical opioid consumption more than tripled, soaring far beyond levels seen in other countries. Today, the US medical sector ranks second in the world for opioid use behind only Canada, which is struggling with its own overdose crisis.
Prevalence of opioid use at least once during past year

Per 1,000 adults

- 0-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-61
- no data

Top 5 countries

- United States: 61.0
- Czech Republic: 27.0
- Estonia: 15.3
- Ukraine: 9.1
- Ireland: 7.2

Sociology: Netherlands vs. USA

Prospective cohort study

• ORIF ankle fracture
• NL: acetaminophen or tramadol
• USA: oxycodone
• Equal pain intensity
• Equal satisfaction with pain relief
Sources of Prescription Painkillers Among Past-Year Non-Medical Users

- Given by a friend or relative for free
- Prescribed by ≥1 physicians
- Stolen from a friend or relative
- Bought from a friend or relative
- Bought from a drug dealer or other stranger
- Other

Percent of Users

Number of Days of Past-Year Non-Medical Use

Any | 1-29 | 30-99 | 100-199 | 200-365
---|---|---|---|---
Psychology: Inpatients after Orthopedic Surgery

Greater pain intensity / lower satisfaction:
• More opioids (oral morphine equivalents)

Lower pain intensity / higher satisfaction:
• Fewer symptoms of depression
• Greater self-efficacy
Pain Relief After Fracture Surgery

• More opioids = more pain
• Not related to nociception
• Comfort associated with self-efficacy
Opioid Intake 1-2 Months After Surgery

- PTSD
- Symptoms of anxiety
- Symptoms of depression
- Catastrophic thinking
After Fracture

• Depression
  – 1-2 months: 26%
  – 6-8 months: 21%

• PTSD
  – 1-2 months: 32%
  – 6-8 months: 18%
Opioid

A molecule that binds to and activates opioid receptors
(a) Structures of endorphin and morphine

(b) Binding to endorphin receptors
OPIUM TINCTURE USP
(DEODORIZED)

10 mg/mL
of anhydrous morphine

Rx only

118 mL (4 fl oz)
LYDIA E. PINKHAM'S
VEGETABLE COMPOUND

Has
Cured More
Women Than
Any Other
Medicine in the
World.

Its annual sales are greater than
those of any other medicine exclu-
sively for women. It holds the record
for the greatest number of actual cures of woman's
ills. This fact is attested by hundreds of thou-
sands of letters from grateful women which are
on file in the Pinkham laboratory, and which are
distributed to hospitals.
Legislation

- Opium Exclusion Act 1909
- Harrison Narcotics Tax Act 1914
- Heroin Act 1924
- Food, Drug, and Cosmetic Act 1938
- Controlled Substances Act 1970
- DEA formed 1973
ADDITION RARE IN PATIENTS TREATED WITH NARCOTICS

To the Editor: Recently, we examined our current files to determine the incidence of narcotic addiction in 39,946 hospitalized medical patients who were monitored consecutively. Although there were 11,882 patients who received at least one narcotic preparation, there were only four cases of reasonably well documented addiction in patients who had no history of addiction. The addiction was considered major in only one instance. The drugs implicated were meperidine in two patients, Percodan in one, and hydromorphone in one. We conclude that despite widespread use of narcotic drugs in hospitals, the development of addiction is rare in medical patients with no history of addiction.

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Figure 1. Number and Type of Citations of the 1980 Letter, According to Year.

Shown are number of citations of a 1980 letter to the *Journal* in which the correspondents claimed that opioid therapy rarely resulted in addiction. The citations are categorized according to whether the authors of the articles affirmed or negated the correspondents’ conclusion about opioids. Details about “other” citation categories are provided in Section 2 in the Supplementary Appendix.
Chronic Use of Opioid Analgesics in Non-Malignant Pain: Report of 38 Cases

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**Summary**

Thirty-eight patients maintained on opioid analgesics for non-malignant pain were retrospectively evaluated to determine the indications, course, safety and efficacy of this therapy. Oxycodone was used by 12 patients, methadone by 7, and levorphanol by 5; others were treated with propoxyphene, meperidine, codeine, pentazocine, or some combination of these drugs. Nineteen patients were treated for...
“Pain is the 5th Vital Sign”

• International Association for the study of pain (IASP)
• Initial wide adoption in VA hospitals
JACHO (now the Joint Commission)

- 2000 release standards on pain management
  - Do not mention opioids
- Released pain CME booklet sponsored by Purdue that said:

  “Some clinicians have inaccurate and exaggerated concerns” about addiction, tolerance and risk of death, the guide said. “This attitude prevails despite the fact there is no evidence that addiction is a significant issue when persons are given opioids for pain control.”
Iatrogenic & Advocatogenic

• You undertreat pain
• You over-worry addiction
(a) Structures of endorphin and morphine

(b) Binding to endorphin receptors
Pain Relief Toolkit

Preoperative Pain Relief Discussion
Help prepare patients for what to expect and make a plan for pain relief.

Postoperative Pain Relief
Pain is part of the healing process and knowing what to expect will help patients achieve peace of mind.

Preoperative Screening Questionnaires
Determine your patients' risk for opioid dependence.

Emergency Dept. Opioid Strategy
Strategies for relief of musculoskeletal pain in the Emergency Department.

Orthopaedic Dept./Service Strategies
Having a prescribing policy in place, such as receiving prescriptions from one provider or limiting the number of pills prescribed, will reduce the number of pills that can be abused.

Safe Use, Storage, and Disposal
Strategies for safely using, storing and disposing of opioids.
Pain Relief Toolkit

Preoperative Pain Relief Discuss Help prepare patients for what to ex...

Postoperative Pain Relief Pain is part of the healing process a...

Preoperative Screening Question Determine your patients’ risk for opi...

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Safe Use, Storage, and Disposal Strategies for safely using, storing a...

Doctor-Patient Scripts Scripts for dealing with common pai...
Alleviation of Pain

• Effective communication strategies
• Effective planning and preparation
• Screening
• Depersonalize it: stick to the strategy
  – Reasonable maximum amount of opioids
• Mindset:
  – Compassion, trust
  – Stress, distress, effective coping strategies