

SURGERY & PERSISTENT PAIN



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STUDY OF PAIN

OUTLINE

1. Evolution of Surgical Pain Relief to 2008
2. Cardiac Model of Unrelieved Postoperative Pain
3. Strategies for Change



Surgery & Pain Treatments through the Ages



Fanny Burney undergoes a mastectomy, 30 September 1811

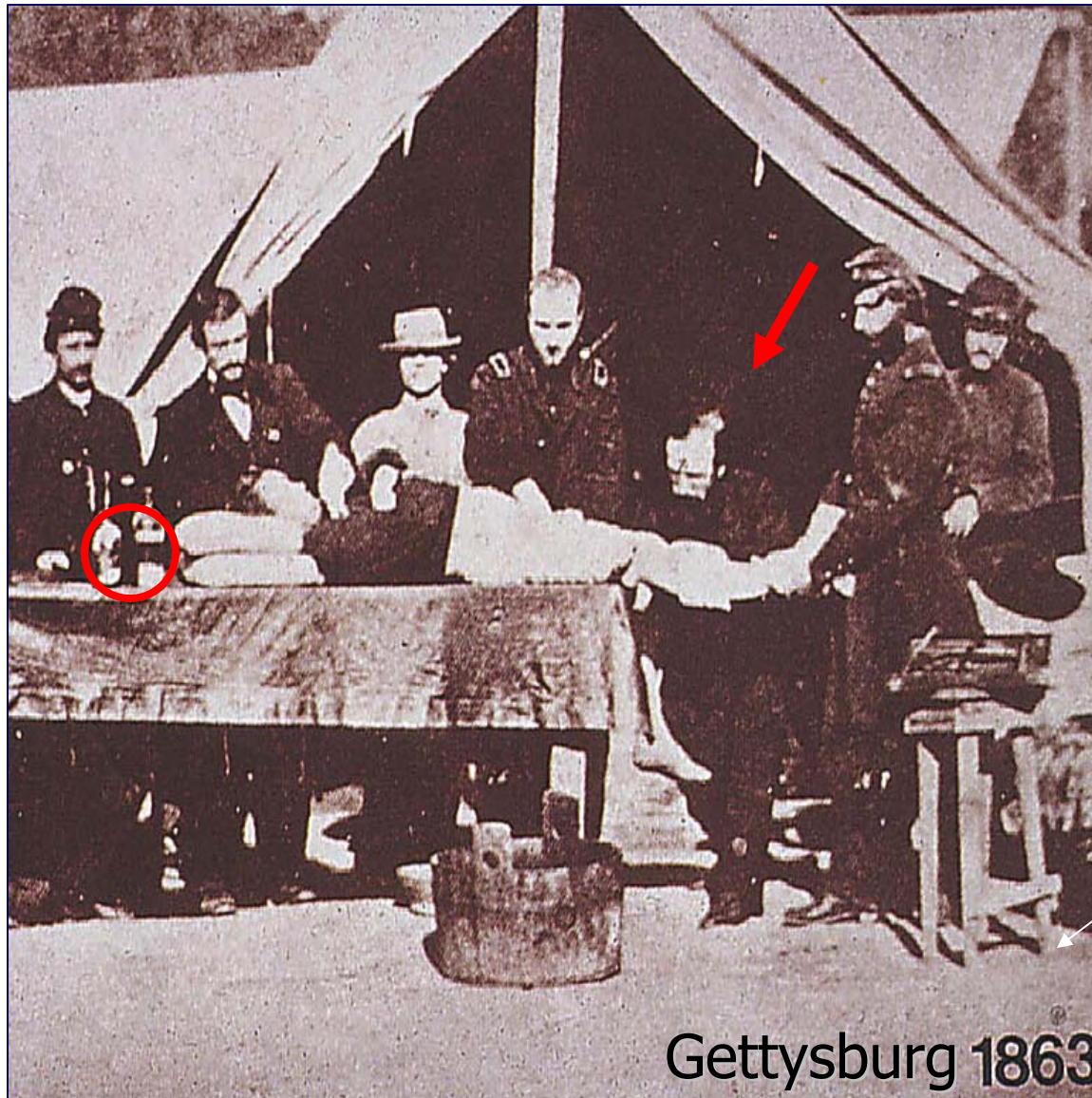
"the dreadful steel was plunged into the breast - cutting through veins - arteries - flesh - nerves - I needed no injunctions not to restrain my cries... I began a scream that lasted unintermittingly during the whole time of the incision... I felt the Knife tackling against the breast bone - scraping it!"

Source:
Selected letters and Journals, edited by Joyce Hemlow, (Oxford University Press, 1986)



Fanny Burney
Author

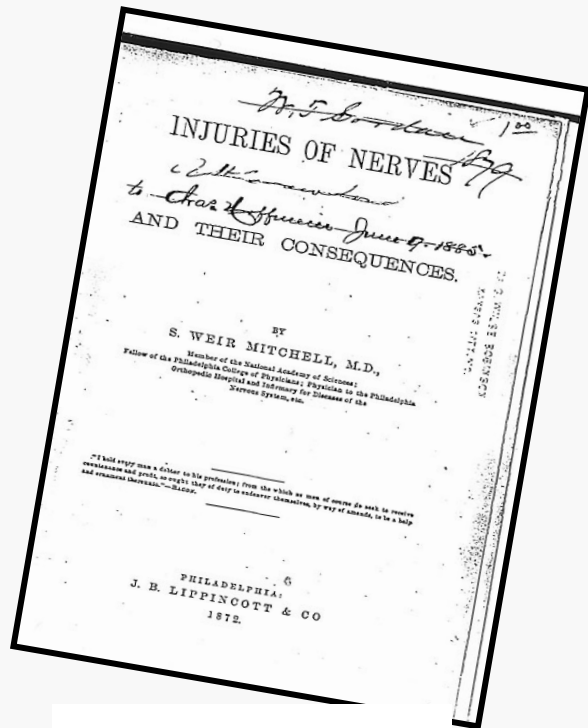
(1752-1840)



Amputations became so fast that a "great surgeon once amputated a leg & accidentally also 2 fingers of an assistant in 30 seconds"

Lawrence, *Lancet* 371 2008

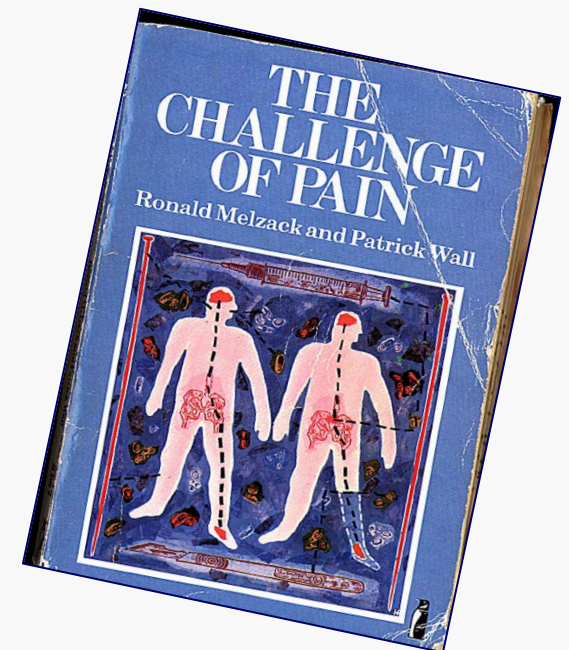
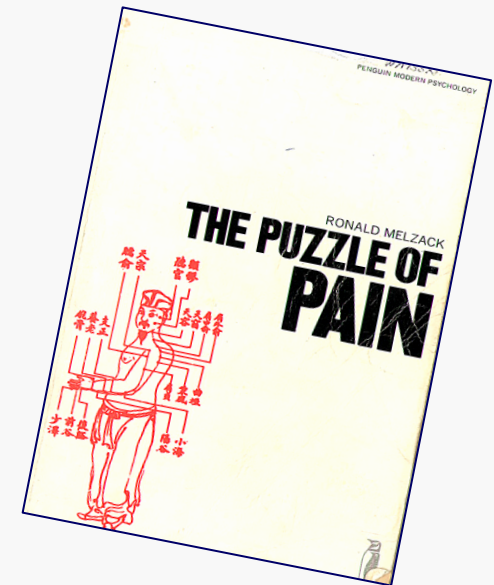
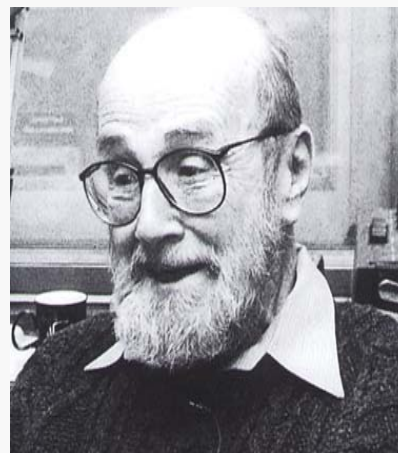
What is known....



**Weir Mitchell
1872**



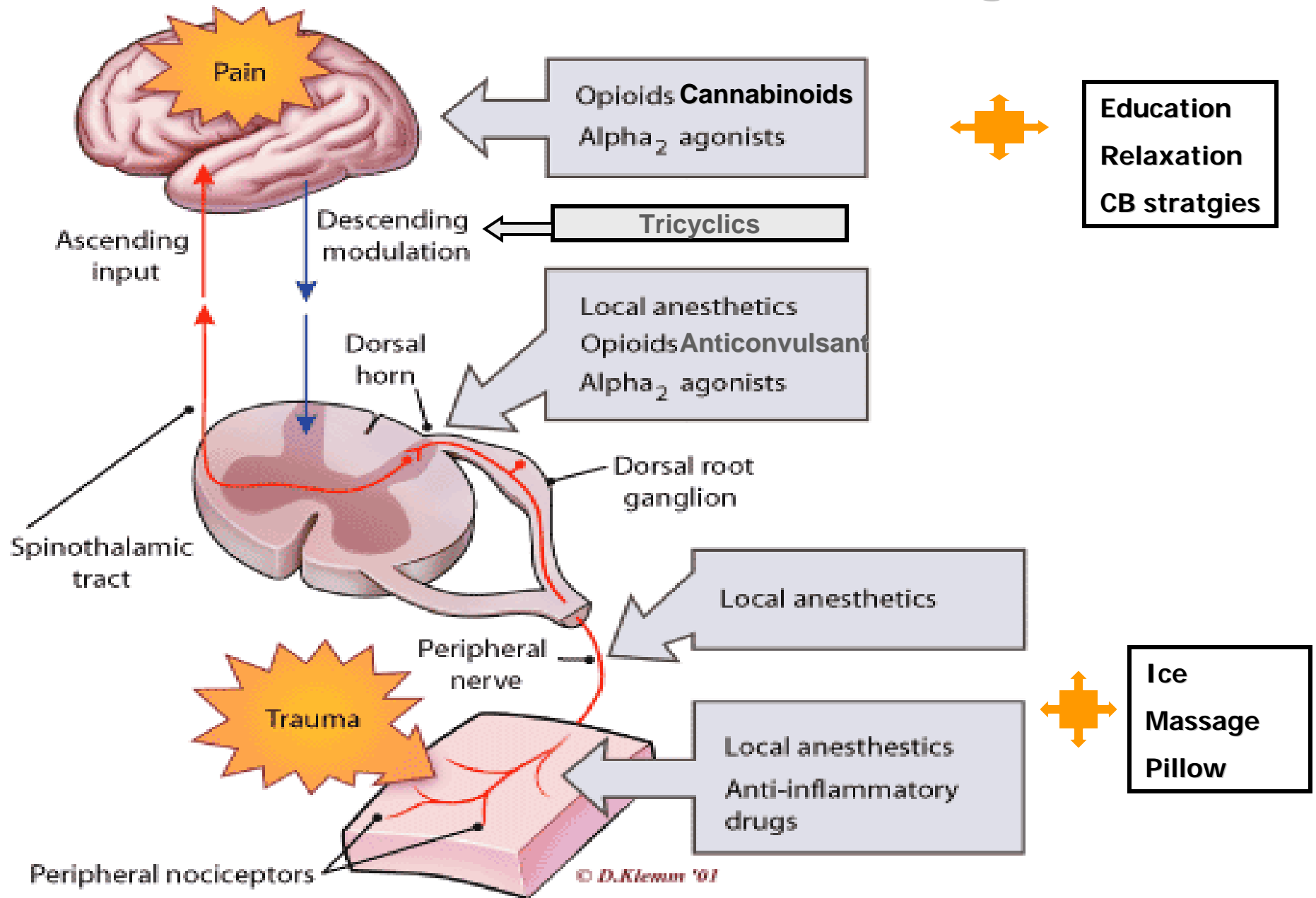
**Melzack & Wall
1965**



Woolf 1991

Given the advances in understanding of the pathogenesis of pain and the amount of discomfort and distress involved, no patient should be expected to experience ... moderate or severe pain postoperatively.

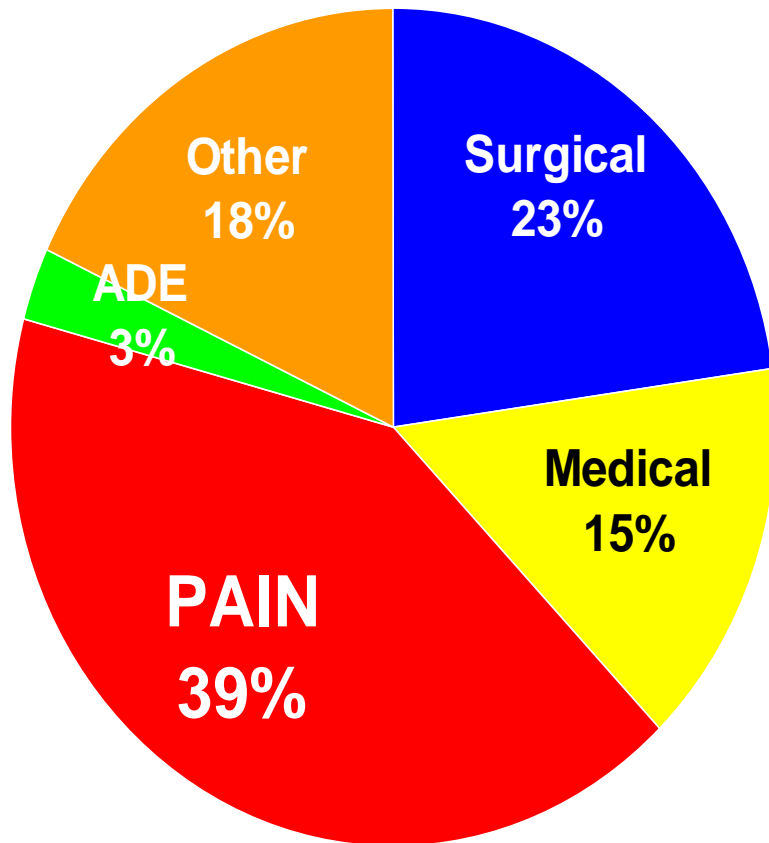
Pain Relief Strategies



Evidence : acute pain relief problematic

- 50-80% surgical patients have inadequate pain relief (Apfelbaum et al., 2003; Dolin et al., 2002; Rawal & Langford, 2007; Watt-Watson et al., 2001, 2004)
- 69% post-CABG patients at discharge rated pain as moderate-severe (Watt-Watson et al., Pain 2004)

Same Day Surgeries Readmission Categories



■ 6% of patients returned/admitted to hospital within 30 days

■ Pain most common reason (Coley et al., 2002)

Unrelieved Acute Pain: **Consequences**

Physiological & psychological :

Respiratory and cardiac complications

Decreased gastric and bowel motility

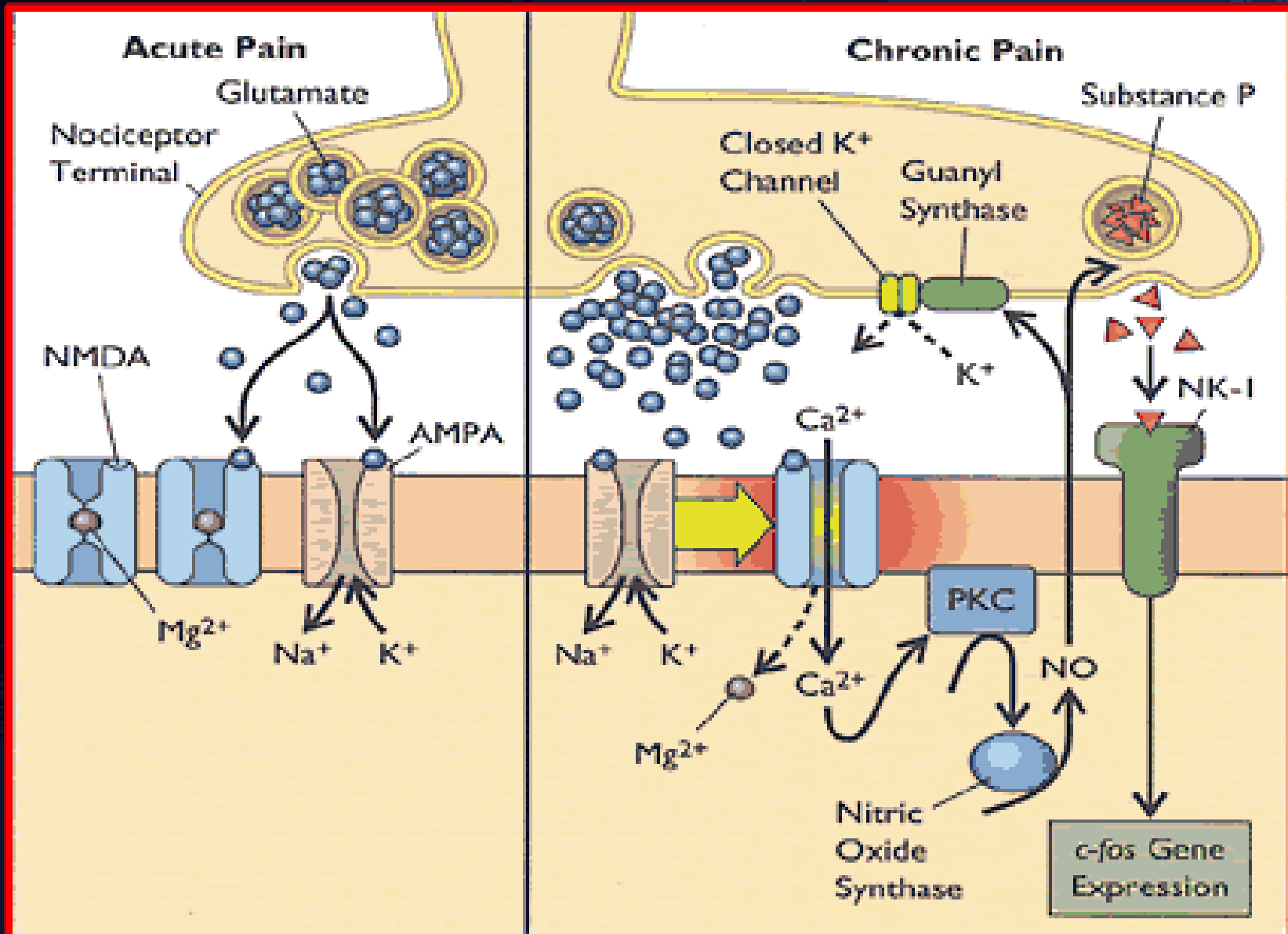
Depressed immune response

Hyperglycemia & insulin resistance

Decreased cognitive function

Mood, activities and QOL

(Moline, 2001)



Persistent Pain after Surgery

Intensity of acute post-surgical pain correlates with persistent pain risk

(Katz et al., 1996; Kehlet et al., 2006 Lahtinen et al, 2006; Steegers et al, 2007)

Under-treatment may predispose patients to persistent pain due to neuronal plasticity and CNS changes

(ANZCA, 2005; American Pain Society, 2003; Breivik, 2002; Coderre et al. 1993; Goldman 2002; Kalso 1997; Katz 1996)

Persistent pain after cardiac surgery first described in 1989 (Mailis et al; Defalque & Bromley)

Estimated incidence of persistent post-surgical pain

Amputation	30-50%
Breast (lumpectomy/mastectomy)	20-30%
Thoracotomy	30-40%
Inguinal hernia repair	10%
Coronary artery bypass	30-50%

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BACKGROUND:

Cardiovascular Diseases

Remain a leading cause of death for both men and women in many countries, including Canada (Norekval et al., 2005)

Cardiac surgeries including coronary artery bypass grafting (CABG) are frequently performed procedures worldwide

(AHA 2003; Society of Thoracic Surgeons, 2004; Graham et al., 2006; Sullivan, 2001)

Cardiovascular Surgery

Major increase in surgical treatment for CV disease (Cardiac Care Network, 2006)

- 70% CABG + 11% CABG/valve
- >20% hospital stays & >\$22,000/patient

Treatment costs are over \$20 billion in Canada and \$56 billion in US per year

LITERATURE REVIEW

Question:

How well is pain managed after CABG surgery?



Unrelieved Pain in CV Settings

Puntillo & Weiss 1994 (N=60)

First 3 days received inadequate analgesia ($\bar{X} = 11 \text{ mg} / \text{day}$)

~75% received no analgesia for moderate-severe procedural pain

Patients with greater pain had higher incidence of respiratory complications

Inadequate Analgesia after CV surgery

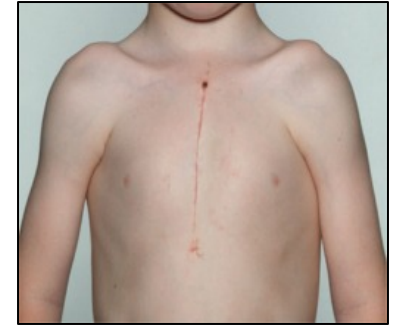
Day 1-3: 25% received NO prescribed
morphine; *total dose/72h = 14 ± 13.5 mg*

Maxam-Moore et al. 1994 (N=66 chart audits)

Day 1-2: worst pain ratings ↑ but dose
opioids given ↓

Ferguson et al. 1997 (N=43 ICU patients)

Research Focus: ACUTE CARDIAC PAIN



- 1. Prevalence of acute pain in hospital and post-discharge after CABG surgery**
- 2. RCT of an education intervention**
- 3. Risk factors in transition of acute to persistent pain after cardiac surgery**

Nurses' Empathy & Knowledge and Pain Management in Acute Care

**J Watt-Watson, P Garfinkel,
B Stevens, R Gallop, D Streiner**

Funded by Health Canada

**Nursing Research 49, 1-10 2000
J. Advanced Nursing 36, 535-545 2001**

METHOD

Sample & Setting

94 nurses from 4 cardiovascular units in
3 university-affiliated hospitals

225 patients on 3rd day following their
initial, uncomplicated coronary artery
bypass graft (CABG) surgery

Unrelieved pain & inadequate analgesia on day 3 (N=225)

- 86% had moderate-severe pain ($\geq 4/10$) & most undermedicated

ave. orders = 33 mg/24h 80% < 50mg morphine equivalents
ave. given = 14 mg/24h 80% < 16mg morphine equivalents

- 66% patients “not asked about pain”
- 83% “would not ask for medication”

Knowledge, Beliefs and Actions

40% RNs said patients overstate pain >25%

30% disagreed with patient's self-report >25%

most expected patients to say when in pain

Nurses gave 47% of prescribed analgesia although
86% patients had moderate-severe pain.

*Major problems in pain knowledge-beliefs for all
nurses, regardless of empathy level.*

Impact of Preoperative Education on Pain Outcomes after CABG Surgery: An RCT

**J. Watt-Watson, B. Stevens, J. Katz,
J. Costello, G. Reid, T. David**



Pain 2004: 109, 73-85

CJNR 2002: 31, 41-56

Method

RCT with repeated measures

To examine the impact of **pre-operative pain education** vs usual care on outcomes after surgery:

pain & related interference with activities (MPQ-SF, BPI-I)

analgesic intake

concerns about seeking help (BQ)

length of stay

Design

In a preadmission session 406 patients randomly assigned to either:

1. **CONTROL** (n=202): standard hospital booklet + video
2. **INTERVENTION** (n=204): control + pain booklet

PAIN *relief*



After Your Surgery

Important to your recovery

This booklet discusses why pain relief is important, how and when to ask for help with pain, concerns patients have about seeking help with pain, and examples of pain relief methods.

If you have questions please contact
Judy Watt-Watson RN, PhD at 416-978-2850.

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CONTENT (8 pages):

- why pain relief is important
- how and when to ask for help with pain
- patient concerns about seeking help
- pain relief methods

RESULTS

WORST 24-hour Pain Intensity

Moderate–severe pain ($\geq 4/10$)

➤ **80% 2nd day** ($\bar{X} = 6.23 \pm 2.74$, *50% severe*)

➤ **69% 5th day** ($\bar{X} = 5.06 \pm 2.5$, *30% severe*)

Pain-related Interference (BPI-I)

Intervention group

- 5th day: less interference, especially in general activities & deep breathing- coughing

Women's scores

- significantly higher than men
- increased or did not change across 3rd–5th days

Analgesia Administered per 24h

No study group effect across all 5 days.

Total group: **33% prescribed dose given.**

1st Day: $\bar{X} = 21 \pm 12$ mg to 5th Day: $\bar{X} = 20 \pm 16$ mg/24h

Booklet group had fewer **concerns** about taking analgesics by 5th day including addiction.

Comments about pain....

"Feels like a truck going over me"

"Would be punishing or cruel if it was being done deliberately"

"They explained to me which pain was OK...if pain is to be 'expected' then I know my healing is OK"

Adverse Effects Day 4

Constipation identified by 78% of both groups

Nausea more in control group

(34% v 24%, $p < 0.00$)

CONCLUSIONS

Analgesia, pain & related interference
scores still problematic but improved from
previous study

68% rated booklet as very or extremely valuable

Sex differences need examination with a
larger sample.

RECOMMENDATIONS

Inclusion of reinforcement telephone call before admission to discuss questions & reiterate booklet and followup call

Staff education as a component of the intervention

Patients' pain management at home after CABG surgery

**J. Watt-Watson, B. Stevens,
J. Costello, M. McGillion**



Weeks 1, 2, 3 post-discharge

312 patients (42 women) from in-hospital trial received follow-up phone calls weekly in 1st 3 weeks

Moderate-severe pain ($\geq 4/10$):

- 37% (48%) 1st week
- 30% (35%) 2nd week
- 17% (20%) 3rd week

Pain-related interference

(BPI-I, $\geq 4/10$)

	WK 1	WK 2	WK 3
general activity*	26 %	23 %	22 %
mood*	19 %	18%	15%
sleep	30 %	28 %	19%
coughing /deep breathing	26 %	21 %	17%

What helps with pain....

"attempt to hide the burning/stabbing pain in my ankle [*from wife*]...try to focus on other things".

"I hope it ends soon ...I wouldn't want it to go on much longer". I take sleeping pills at night and they knock me out".

"Not moving".

Is this pain neuropathic?

~ 10% rated descriptors of **shooting, stabbing, sharp, hot/burning, tender** as moderate-severe (McGill-SF)

e.g. *"avoid having shirt touch the incision"*
"chest burns if clothes rub my skin"

Risk Factors Contributing to Persistent Pain After Cardiac Surgery

M Choiniere (PI), J Watt-Watson (Co-PI),
J Cogan, JP Collet, J Costello, C Feindel,
D Guerriere, M Carrier, F Lesperance, MC
Guertain, J Sullivan, J McFetridge-Durdle



Method

Design: prospective longitudinal followup for 2 years in 4 centres Toronto, Montreal, Halifax, Quebec City

Sample: 1400 people with 1st elective CABG surgery \pm /or valve replacement

Study phases:

pre-hospital;

hospital- 24h, 48h, 72h, 7days;

post-hospital- 3 mo, 6mo, 12 mo, 24 mo

SUMMARY

Pain Management after CABG

Unrelieved post-surgical cardiac pain a consistent finding

Analgesia inadequate: "Tylenol® #3" problematic

Assessment issues including patient expectations

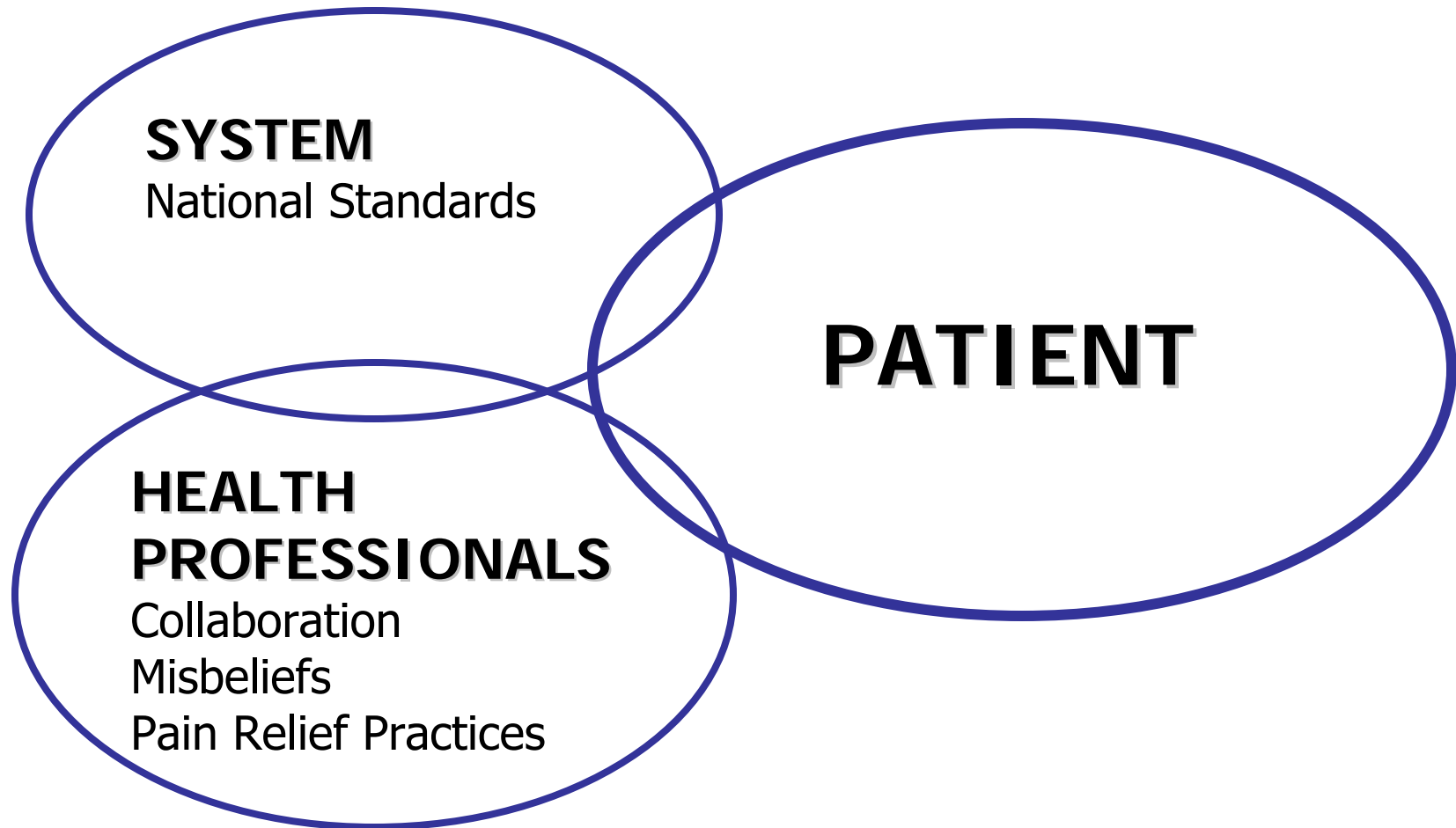
Discharged home with unresolved pain

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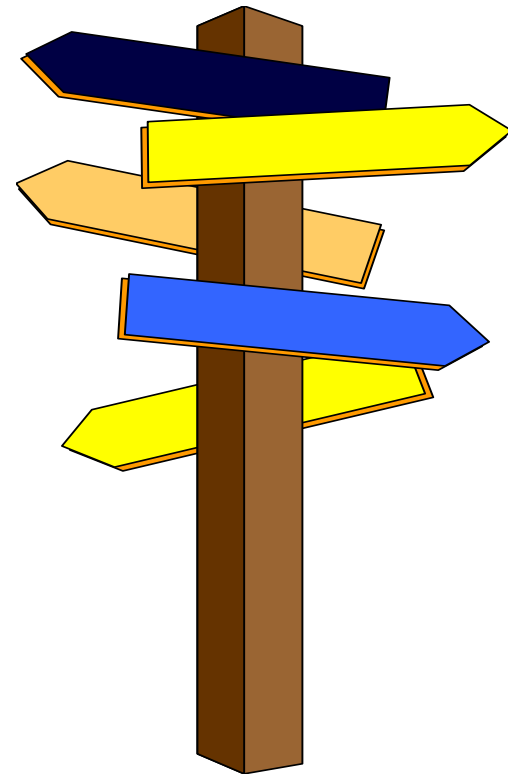


Strategies for Change



SYSTEM:

Can accountability for pain management be mandated nationally





Standard Components

**Assessment using standardized pain measures,
from admission**

**Appropriate management strategies &
monitoring, documentation**

Team effort: interprofessional collaboration

Organization responsibilities

ACCREDITATION PAIN STANDARD: Making It Happen!



Manual is available at
www.canadianpainsociety.ca

Health Professional Education

Entry-to-practice Pain Competency Requirements

Clearly identified statements minimal (1-4) or none in the **Health Science** documents.

National requirements for **Veterinary
Medicine:**

- 9 competencies related to analgesic and anesthetic management
- 1 competency to alleviate suffering.

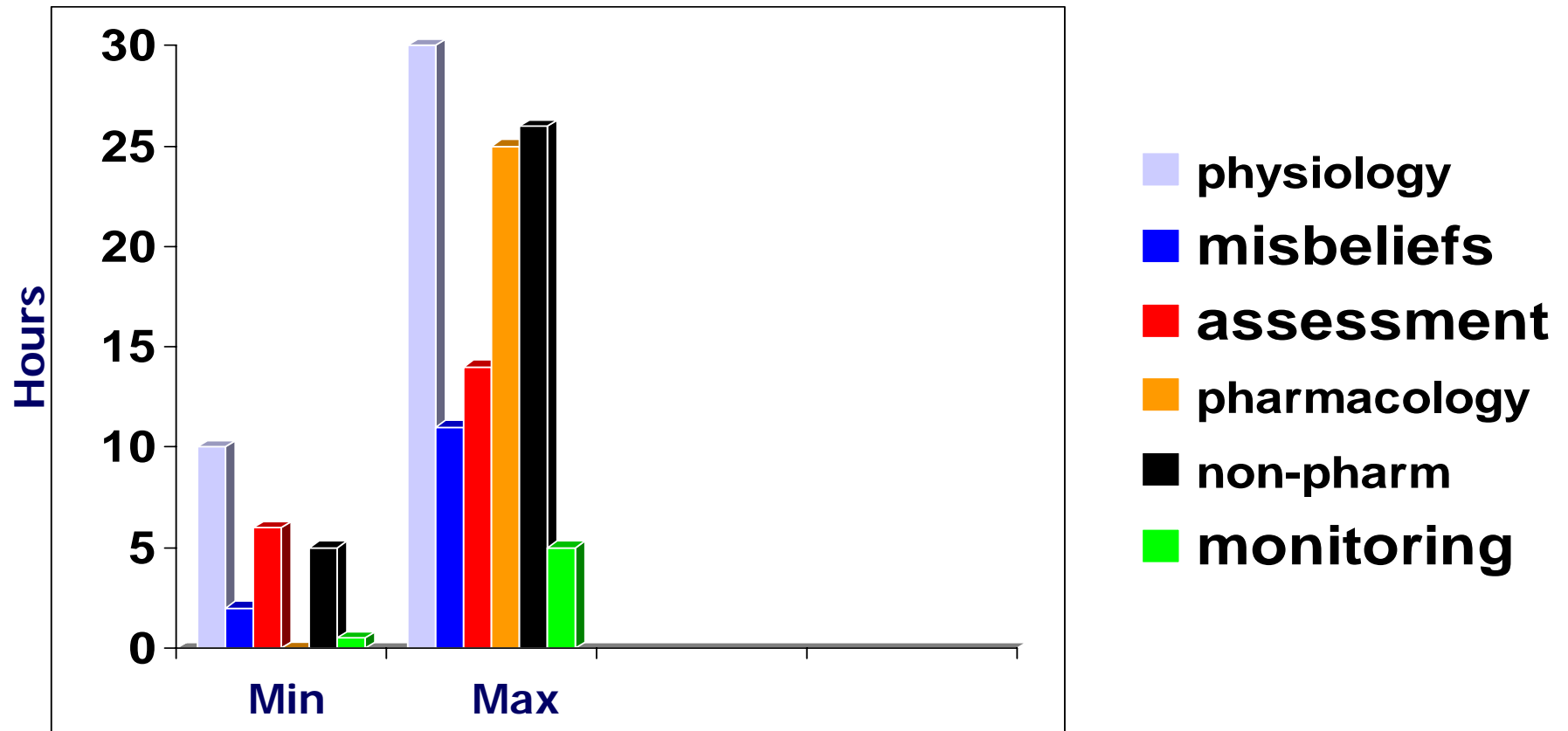


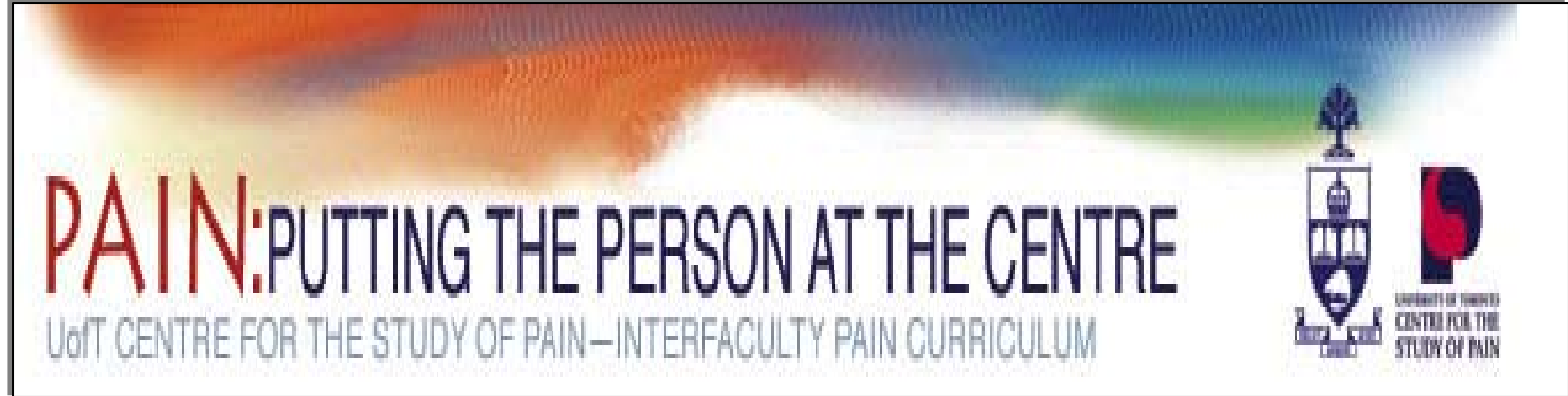
Pain education in Canada:

Veterinary medicine grads get on average 3 times more specific pain education than other health science students.

NEWS RELEASE Toronto November 7, 2007

Focus of Designated Hours





Integrated Pre-licensure Pain Curriculum

Dentistry, Medicine, Nursing, Occupational Therapy,
Pharmacy, Physical Therapy

N=540 – 860 students

March 2002 - 2008

COLLABORATIVE PRACTICE

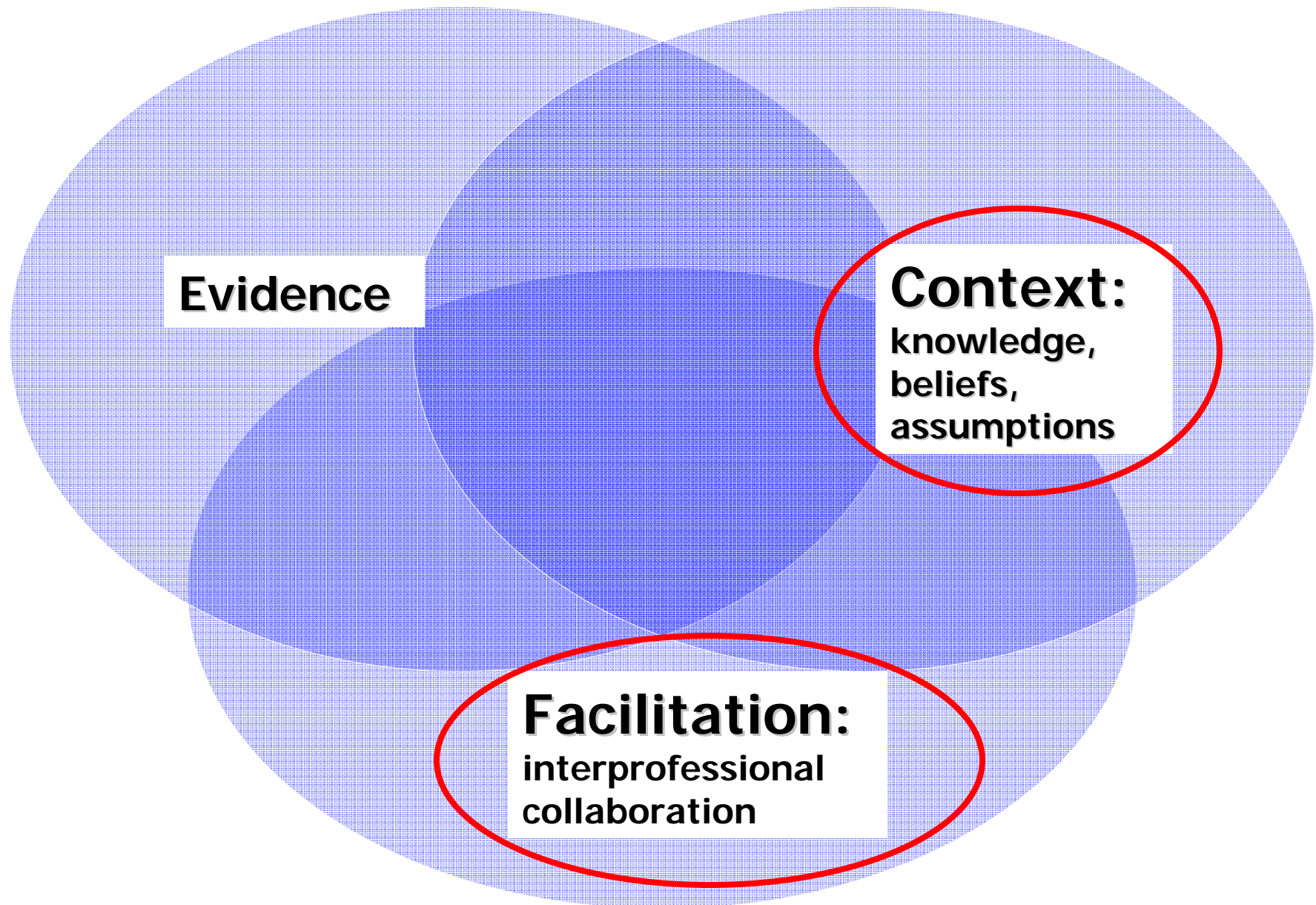


Figure 1. Research utilization model adapted from Kitson et al, 2002

MISBELIEFS

1. Acute pain has **no consequences**
2. **Fears of addiction** with opioids for acute pain
3. **Expect patient to ask for help**; pain ratings not valid
4. Use **one treatment at a time**

CODEINE

Note: WEAK OPIOID

- 200 mg po q3-4h = 10 morphine IV/SC
- nausea problematic
- often given with Tylenol®

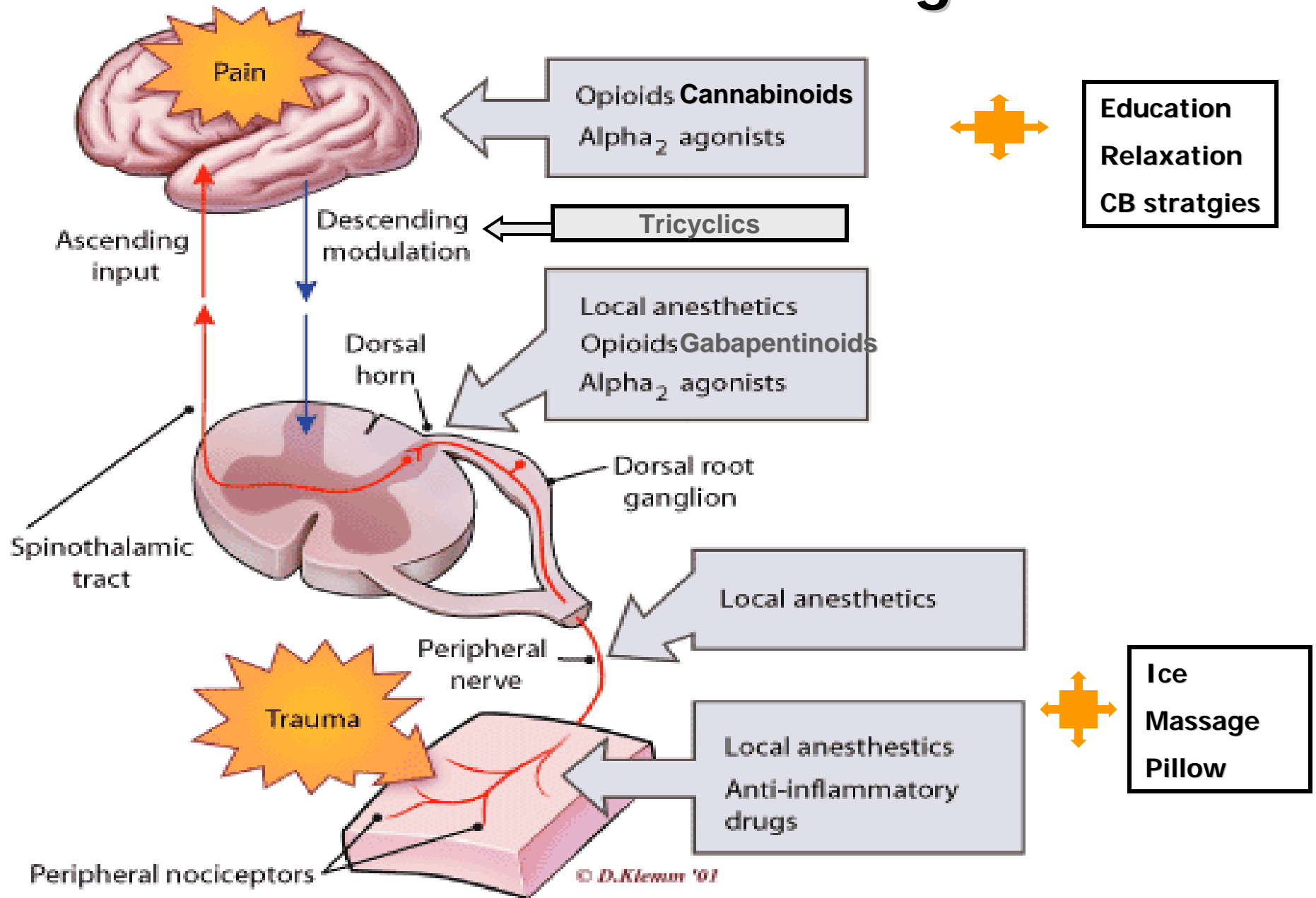
- bioavailability problematic
 - pro-drug for morphine
 - ultra metabolizers up to 30%
 - non-metabolizers 10-20%

Pain Relief Strategies

"The bad news is that using highly targeted drugs ... may not be enough to reduce nociceptive input to the spinal cord... the long sought magic bullet may not be found"

Alan Basbaum 2004

Pain Relief Strategies



Acute Pain Guidelines & Standards



PATIENT ORGANIZATIONS



Canadian Pain Coalition

Management Issue

The problem of under-treatment is NOT due to a lack of effective analgesics and other therapies; *the problem is that they are not being used appropriately.*

(Dahl et al., 2002)

CONCLUSION

**Unrelieved ACUTE pain
has consequences**

Education:

- pain in competencies & curricula

Management:

- moderate-severe postoperative pain is unacceptable

Resources: multiple options,
guidelines, accreditation
standard