Geriatric Refresher Day
Ottawa: March 6th,2013

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March 2, 2011

Healing the Hurt. Finding new ways to treat pain

Pain is not merely a symptom but a disease in itself, one that doctors have only recently come to recognize

LEARNING OBJECTIVES

- What is new in pain management
- Discuss the current state of pain management in older persons
- Address changes in brain morphology with aging and chronic pain
- Describe the consequences of pain in older persons such as depression, loss of independence and reduced quality of life
- Discuss newer drugs in pain management

Case AC

- 98 year old female
- History of osteoarthritis in both knees, hypothyroidism, GERD, Dementia
- levothyroxine sodium, USP 0.025mg, donepezil hydrochloride 10mg, rabeprazole 20mg, VitD 2000 IU VitC 500mg, ferrous fumarate 300mg OD, lorazepam 0.5mg qhs, domperidone 10mg TID acetaminophen 500 TID

Case AC

- Pain scores worst 9/10, least 6/10, average 8/10
- Described as generalized and widespread but worse in knees
- Difficulty sleeping and no interest in social activities.

EPIDEMEOLOGY OF PAIN IN OLDER PERSONS

- Chronic Pain is a complex problem with both clinical and psychological implications
- Chronic pain affects 20% of Canadians and jumps to 60% of those over 65. Chronic Pain in Canada: Prevalence, Treatment. Impact and Role of Opioid Analgesia, Moulin, D et al., Pain Research and Management, 2002. 7:179-84.
- Epidemiologic studies show a very high prevalence of persistence pain, often exceeding 50% of community dwelling older patients and up to 80% of nursing home resident. Gibson, SJ, Expert Review of Neurotherapeutics. 7(6): 627-35, 2007 June.

EPIDEMEOLOGY OF PAIN IN OLDER PERSONS

- Pain management in the older patient requires a comprehensive assessment, adapted to the patients cognitive functioning, using specific tools, and taking into account the activities of daily living and autonomy. Perrot, S. Psychologie et Neuropsychiatrie du Viellissement 4(3): 163-70, 2006 Sep. Cunningham C. Nursing Standard. 20(46):54-8, 2006 Jul-Aug 1.

- The impact of poorly managed chronic pain on the quality of life of elderly patients and the problems related to its management are widely acknowledged. Auret K et al. Drugs and Aging. 22(8): 641-54, 2005.

Kemp C. et al. 2005. A descriptive study of older adults with persistent pain: Use and perceived effectiveness of pain management strategies. BMC Geriatrics. 5(12), 1-12

- Sample of retirement residents :

  -85% of the study participants reported pain in more than one location

  -74% reported pain in the lower extremities, 57% reported pain in the back, and 55% reported pain in the buttocks/hips

- Most popular treatments:

  -acetaminophen (61%)

  -regular exercise (58%)

  -prayer (53%)

  -heat or cold (48%)

- The mean (SD) number of strategies: 5.6

Hollenack K. et al. (2006). The Application of Evidence-Based Principles of Care in Older Persons (Issue 4): Pain Management. JAMDA. 5(7), 514-522

- LTC residents: 45% to 80% live with chronic pain
- Daily pain: 24% to 38% of residents
- 16% received nonopioid medication, 26% received WHO Step-Ladder level 3 opioid medication, 26% received no analgesic medication
- Most commonly prescribed analgesics: Acetaminophen (37.2%), propoxyphene (18.2%), hydrocodone (6.8%), and tramadol (5.4%)
- Acetaminophen was usually prescribed on an as needed basis (65.6%)

- 80% currently used or had used in the past year at least one analgesic or adjuvant medication; 36% used two or more.
- Exercise was rated as quite/extremely helpful/effective by 26–43% of older adults method of management
- The most common and effective strategies: prayer or spiritual practice, opioids, NSAIDs, heat and cold, and physical exercise
- Number of strategies was associated positively with number of body pain locations

Keeney C. et al. (2008). Initiating and sustaining a standardized pain management program in long-term care facilities. JAMDA. 10, 347-353

- As high as 83% of LTC residents struggle with daily pain
- Without standardized pain assessment methods: caregivers are unaware which of their patients experience daily pain
- 44.2% of participants: pain level during vital sign assessment was the same as on admission/completion of initial pain history form

What is new in pain management

- Genetics of pain
- Response of Glia to injury
- Better understanding at the molecular level
- The ability to pre-screen at risk individuals

IASP Meeting Feb 7th-9th 2012 Miami

- "The study of the genetics of pain has become mainstream in neurobiology" Clifford Woolf, Children's Hospital Boston
- If a patient was in a certain cluster they were 2.5 times likely to develop TMD: William Maixner, University Of North Carolina

Genetics of Pain

Recent data from a twin study indicates that pain reporting at different body sites can be explained by a single genetic factor:

Williams et al 2010

Interferon Regulator Factor 8 is a critical factor in transforming microglia: Takakhiro et al Cell Reports Volume 1, Issue 4 334-340 05 April 2012

A Genetic Marker for Risk of Persistent Pain ?

- After nerve injury or inflammation a key enzyme (GCH1) is activated which in turn increases the pain transmitter nitric oxide
- In humans a small set of genes controls how much GCH1 is released
- Some people (15%) release less GCH1 than others and experience less persistent pain

Tegeder et al. Nature Medicine 2006;12:1269-1277

INADEQUATE PAIN TREATMENT IN OLDER PERSONS

- **Consequences of untreated pain**
  - **Depression/social isolation**
  - **Suffering**
  - **Sleep disturbance**
  - **Behavioral problems**
  - **Anorexia, weight loss**
  - **Deconditioning, increased falls**

CHANGES WITH ADVANCING AGE

- Decreased opiate receptors (Hess et al., 1981; Messing et al., 1980).
- Decreased efficacy of opiates mediating antinociception (Crisp et al,. 1994; Jourdan et al., 2002).
- Reduction in myelinated and unmyelinated fibers in peripheral nerves (Ceballos et al, 1999).
- Diminished expression of CGRP, substance P, somatostatin and nitric oxide (Ko et al., 1997).

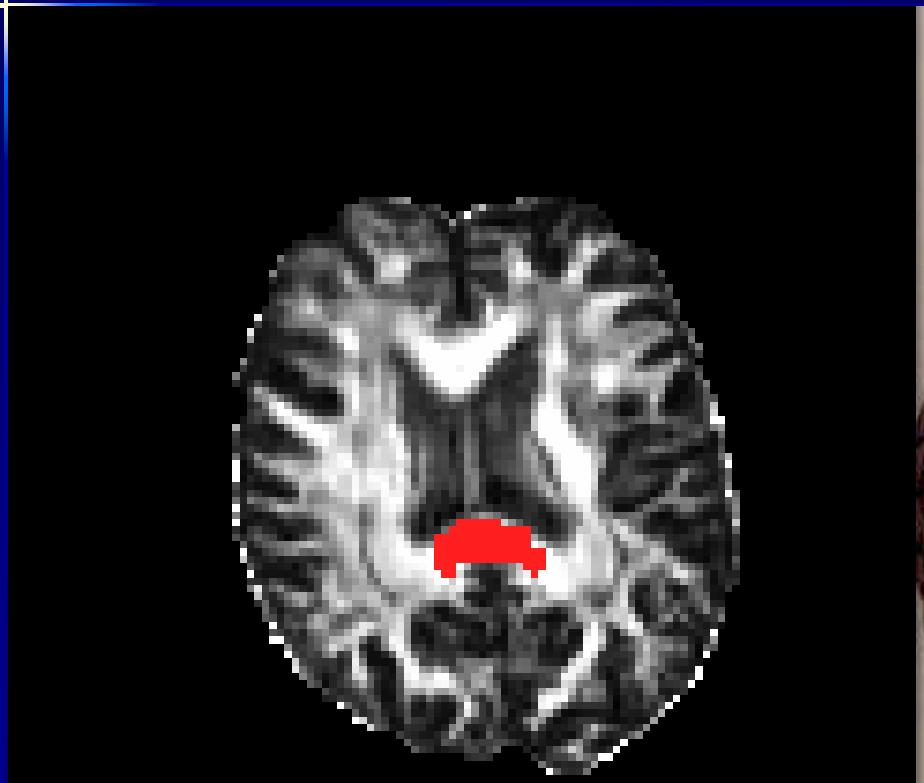
CHANGES WITH ADVANCING AGE

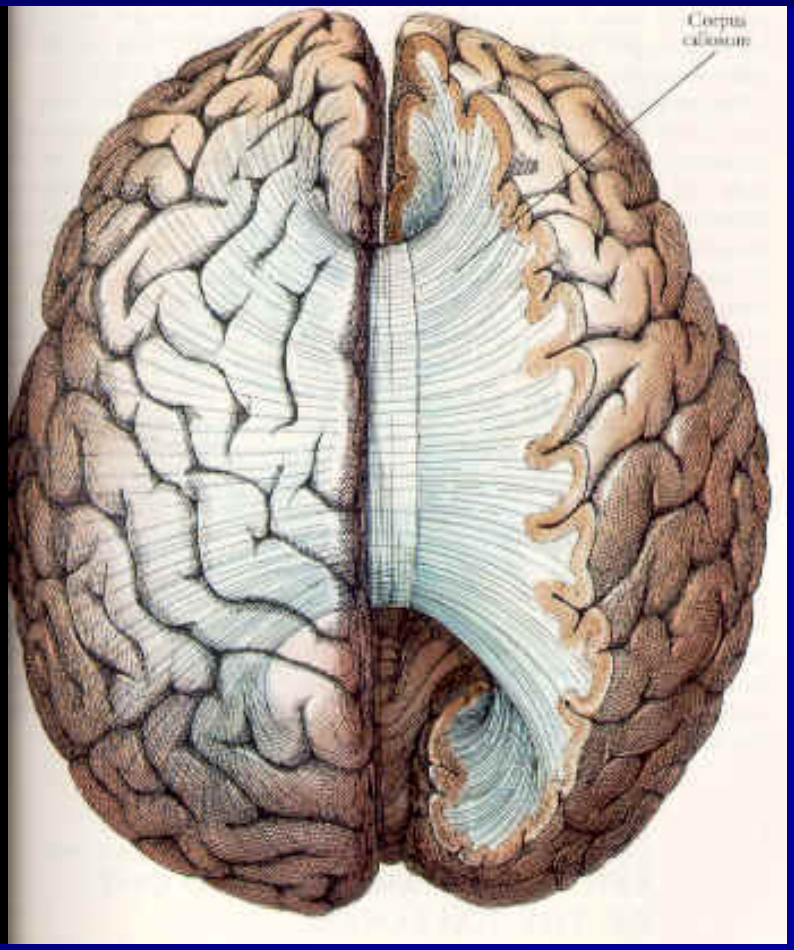
- Decreased levels of 5-HT and NE in dorsal horn and increased c-fos (Iwata et al., 1995; 2002).
- Modifications in the expression and functional state of spinal glial cells (Watkins and Maier, 2003).

“Normal” Aging: Changes in Brain Morphology

- Atrophy of prefrontal gray matter
  - *Raz et al, Cerebral Cortex 1997; 7: 268*
- Atrophy of thalamus
  - *Van Der Werf et al, Cog Brain Res 2001; 11: 377*
- Diminished frontal white matter integrity
  - *Pfefferbaum et al, NeuroImage 2005*

Older Adults with Disabling vs. Non-disabling CLBP





IMPLICATIONS

- Pain is associated with WM damage over and above that associated with aging.
- Chronic non-malignant pain is associated with alterations in brain morphology in older adults, above and beyond those associated with normal aging.
- Understanding what biologically drives subjective pain-associated disability may open the door to newly targeted treatments.

Impact of pain management on brain anatomy

Effective Treatment of Chronic Low Back Pain in Humans Reverses Abnormal Brain Anatomy and Function

David A. Seminowicz et al:

The Journal of Neuroscience, May 18, 2011 • 31(20):7540 –7550

AMDA PAIN MANGEMENT GUIDELINES 2009

- Recognition
- Assessment
- Treatment
- Monitoring

PAIN IN OLDER PERSONS RECOGNITION

Non-specific signs and symptoms suggestive of pain:

- **Frowning, grimacing, fearful facial expressions, grinding of teeth**
- **Bracing, guarding, rubbing**
- **Fidgeting, increasing or recurring restlessness**
- **Striking out, increasing or recurring agitation**
- **Eating or sleeping poorly**

Pain and the cognitively impaired patient: Key points

- Pain is underappreciated and undertreated in the elderly with cognitive impairment
- Consider pain as an independent source of agitation
- Rule out delirium (may overlap dementia)
- Do not assume that the quiet non-communicative patient is not in pain
  - Assessing pain behaviours may be more useful than using self-report scales alone

Hadjistavropoulos T, et al. Physiother Can 2010;62(2):104
Ferrell BA. Consult Pharm. 2010;25 Suppl A:5

Multiple Pathways of Pain Transmission Provide Multiple Targets for Pain Relief

Inhibiting Ascending Pathways[1-4,6]

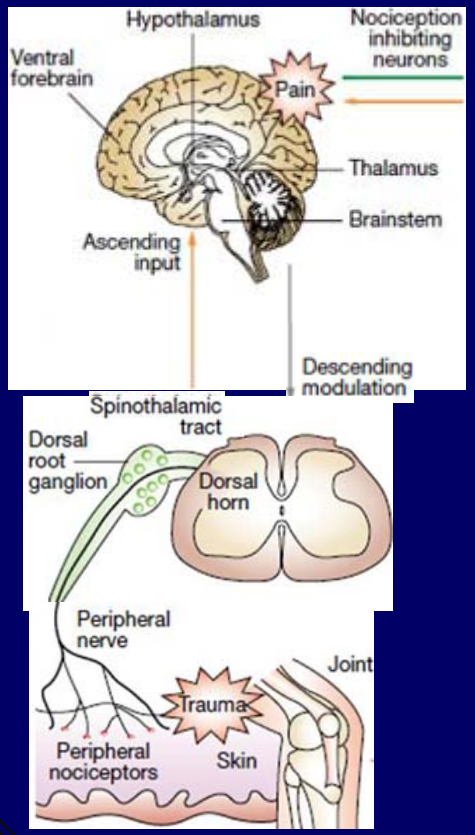
- Opioids[†]
- Local anesthetics
- Antiepileptics[7]
- NSAIDs/acetaminophen

3. Ascending pathways transmit pain signals from the spinal cord to the somatosensory cortex in the brain

2. Synapse: Peripheral nociceptors synapse with CNS within the dorsal horn of the spinal cord

1. Pain stimuli are detected by nociceptors, which transmit pain signals to the CNS

Ascending Pathway



Bingham B, et al. *Nature* 2009;5:28

Descending Pathway

4. Descending pathways originate in the brain and modulate pain at the dorsal horn

5. Descending inhibition dampens pain transmission through the release of norepinephrine (NE) and serotonin

Enhancing Descending Pathways[1,3-5]

- Norepinephrine reuptake inhibitors
- Serotonin reuptake inhibitors
- Tricyclic antidepressants
- Opioids[†]

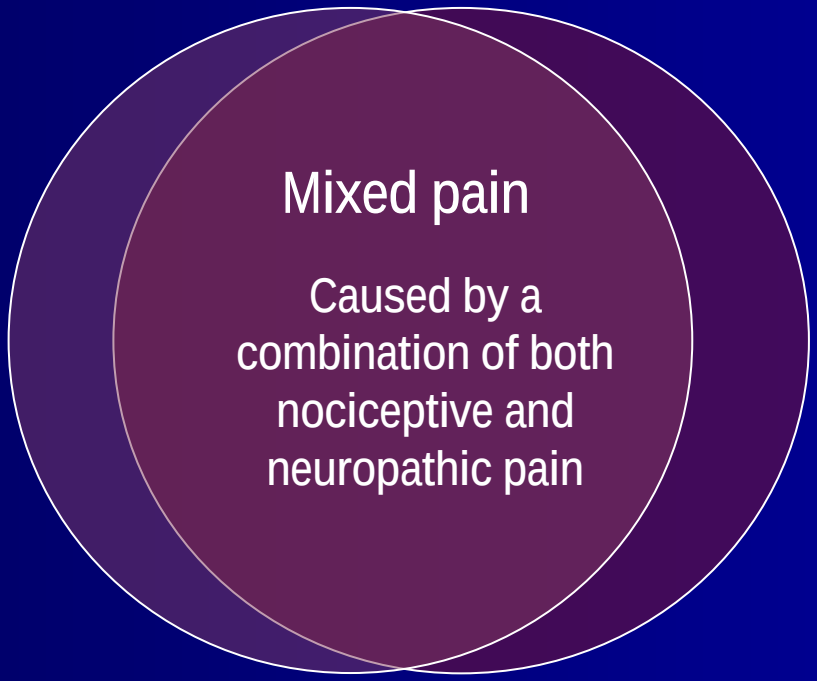
*Theoretical mechanisms of action. [†]It is well established that opioids inhibit the ascending transmission of nociceptive signals. Additional mechanisms have been reported in the literature, including the activation of descending inhibitory pathways and modulation of limbic system activity.[1,3,4,6]

NSAIDs = nonsteroidal anti-inflammatory drugs

1. National Pharmaceutical Council, Joint Commission on Accreditation of Healthcare Organizations. http://www.npcnow.org/resources/PDFs/painmonograph.pdf; 2. Pyati S, Gan TJ. *CNS Drugs* 2007;21:185; 3. Vanderah TW. *Med Clin N Am* 2007;91:1; 4. Woolf CJ. *Ann Intern Med* 2004;140:441; 5. Pertovaara A, Almeida A. In: Cervero F, Jensen TS, eds. *Pain: Handbook of Basis of Therapeutics*. 11th ed. New York, NY: McGraw-Hill; 2006; 6. Knotkova H, Pappagallo M. *Med Clin N Am* 2007;91:113

Mixed Pain Concept

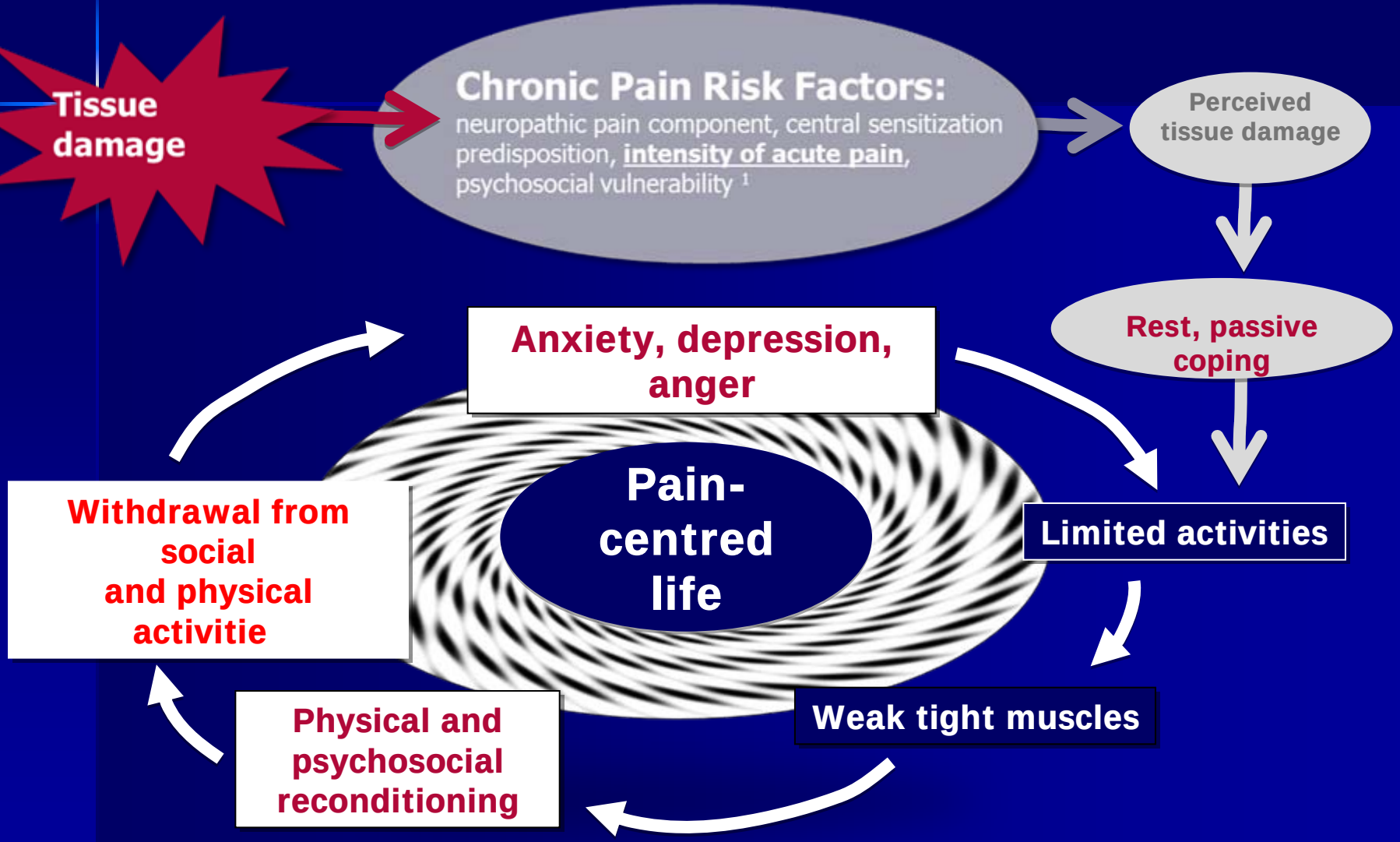
Nociceptive pain:
Caused by activity in neural pathways in response to potentially tissue-damaging stimuli



Neuropathic pain:
Pain arising as a direct consequence of a lesion or disease affecting the somatosensory system

Woolf CJ. *Ann Intern Med* 2004;140:441
Treede RD, Jensen TS, *Neurology* 2008;70:1630
Portenoy R. *Curr Med Res Opin* 2006;22:1555

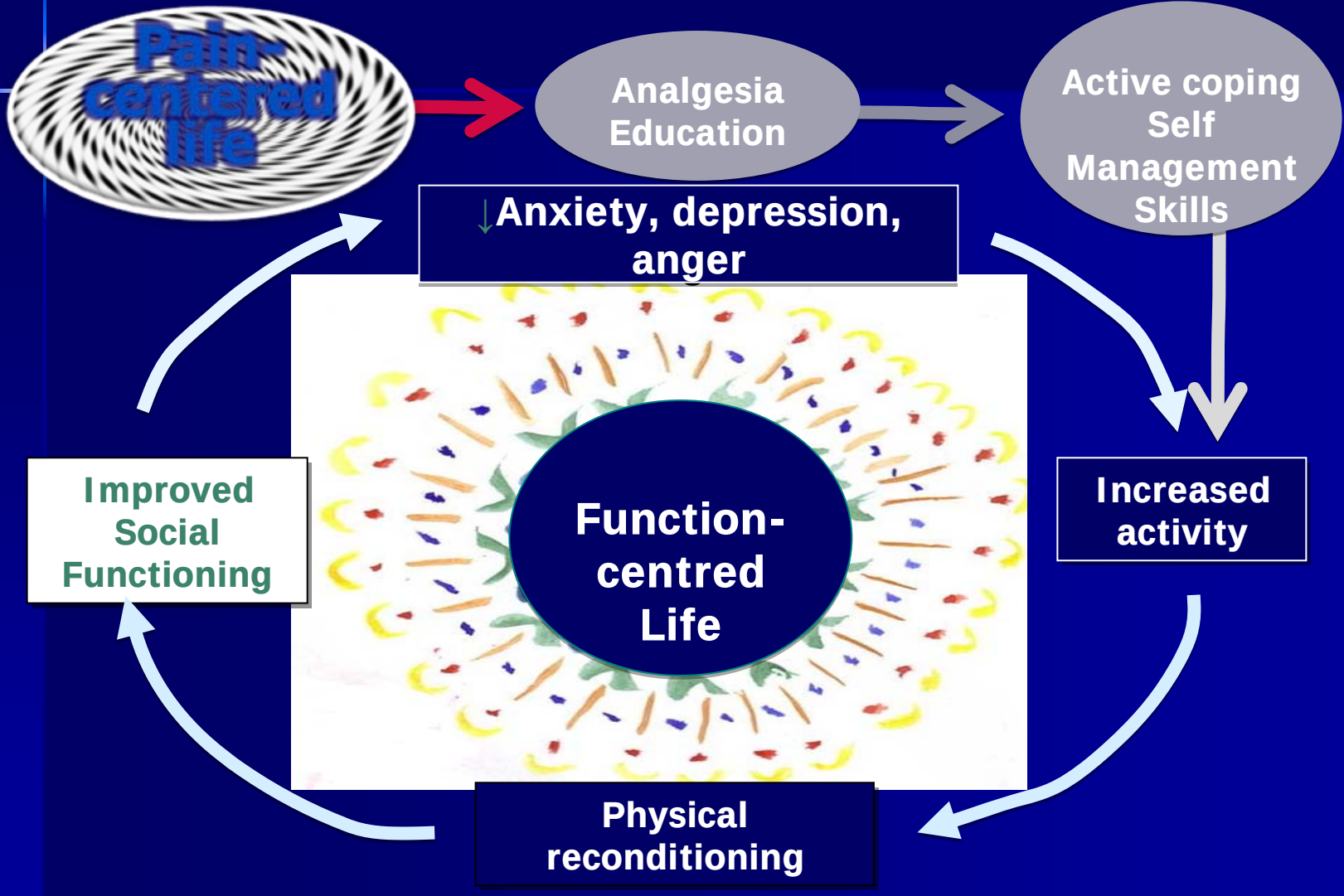
THE CHRONIC PAIN SPIRAL: EVOLUTION FROM ACUTE TO CHRONIC PAIN



ABéland MD 2012 | Abeland@Live.ca

P Lavand'homme. The progression from acute to chronic pain. Current Opinion in Anesthesiology 2011;24:545–550. Adapted from: http://prc.canadianpaincoalition.ca/fr/chronic_pain_and_disability.html

CHANGING THE CHRONIC PAIN SPIRAL: FUNCTION- CENTRED LIFE



ABéland MD 2012 | Abeland@Live.ca
Adapted from: http://prc.canadianpaincoalition.ca/en/self_management.html

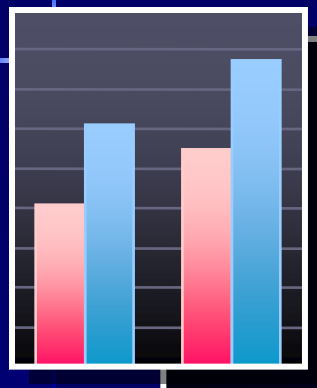
KEY COMPONENTS OF PAIN ASSESSMENT

- Measurement of Pain:
  - Using standardized scales in a format that is accessible to the individual.
- Cause of Pain:
  - Examination and investigation to establish the cause of pain.

Educational needs of health care providers working in LTC facilities with regard to pain management

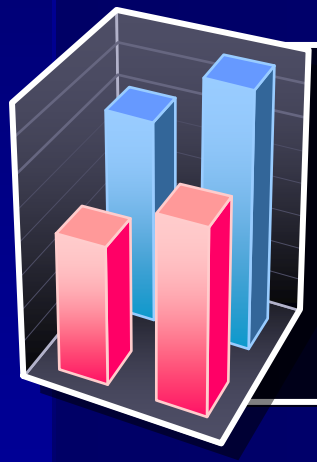
Y Tousignant-Laflamme et al. Pain Research and Management Vol 17 No 5 September/October 2012

Pain Assessment Tools



Unidimensional scales[1]

- Numeric Rating Scale
- Verbal Rating Scale
- Visual Analog Scale
- Faces Pain Rating Scale



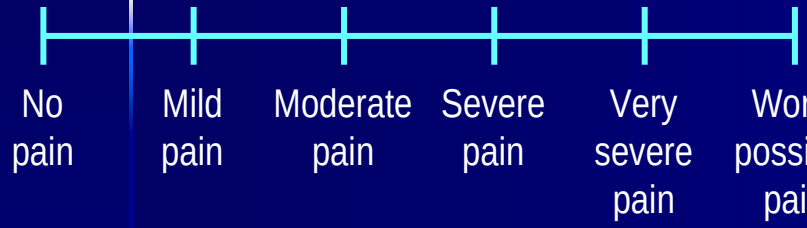
Multidimensional scales

- Brief Pain Inventory[1]
- McGill Pain Questionnaire[1]
- Neuropathic Pain Scale[2]

1. Brunton S. *J Fam Pract.* 2004;53(suppl 10):S3
2. Galer BS et al. *Clin J Pain.* 2002;18:297

Unidimensional Pain Assessment Scales

Verbal Pain Intensity Scale

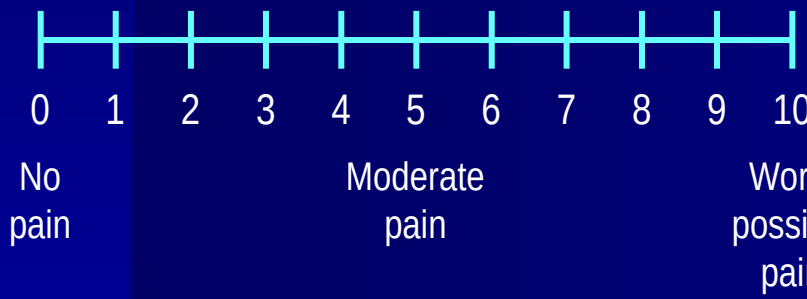


*Incapacitating, God awful, soul stealing

Visual Analog Scale

* Length of line is irrelevant beyond discrimination

0-10 Numerical Rating Scale



*Limits people to 11 “intensities”

Faces Rating Scale

*Intended for children; “used” with nonverbal patients

McLafferty E, Farley A. Nursing Standard 2008;22:42

Type of Pain assessment	Practical Suggestions for Scale Selection	Comments and References
Older people with no significant cognitive/communication impairment and Older people with mild to moderate cognitive/communication impairment	Numeric graphic rating scale. Verbal rating scale. Numerical rating scale (0-10)	High validity and reliability in older people. Can be used in mild/moderate cognitive impairment. Vertical as opposed to horizontal orientation may help to avoid misinterpretation in the presence of visuo-spatical neglect, e.g. in patients with stroke.

Type of Pain assessment	Practical Suggestions for Scale Selection	Comments and References
Older people with moderate to severe cognitive/communication impairment	Pain Thermometer Colored Visual Analogue Scale	Easy to use Validity has not been fully evaluated Well understood in early and mid-stage state of Alzheimer's disease

Type of Pain assessment	Practical Suggestions for Scale Selection	Comments and References
Observational pain assessment Older people with severe cognitive/communication impairment (no single recommendation currently possible)	Abbey pain Scale	Short and easy to apply scale Requires more detailed evaluation.
Multidimensional assessment Older people with minimal cognitive impairment	Brief Pain Inventory	15- item scale assessing: severity, impact on daily living, impact on mood and enjoyment of life.

Observational Changes Associated with Pain

Type	Description
Autonomic Changes	Pallor, sweating, tachypnoea, altered breathing patterns, tachycardia, hypertension.
Facial Expressions	Grimacing, wincing, frowning, rapid blinking, brow raising, brow lowering, cheek raising, eyelid tightening, nose wrinkling, lip corner pulling, chin raising, lip puckering.
Body Movements	Altered gait, pacing, rocking, hand wringing, repetitive movements, increased tone, guarding, *bracing*

Observed Changes Associated with Pain Cont'd:

Type	Description
Verbalisations/vocalisations	Sighing, grunting, groaning, moaning, screaming, calling out, aggressive/offensive speech
Interpersonal interactions	Aggression, withdrawal, resisting
Changes in activity patterns	Wandering, altered sleep, altered rest patterns
Mental status changes	Confusion, crying, distress, irritability.

The Abbey Pain Scale

For measurement of pain in people with dementia who cannot verbalise

How to use scale: While observing the resident, score questions 1 to 6.

Name of resident: .....

Name and designation of person completing the scale: .....

Date: ..... Time: .....

Latest pain relief given was ..... at .....hrs.

Q1. Vocalisation
eg whimpering, groaning, crying
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q1 ☐

Q2. Facial expression
eg looking tense, frowning, grimacing, looking frightened
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q2 ☐

Q3. Change in body language
eg fidgeting, rocking, guarding part of body, withdrawn
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q3 ☐

Q4. Behavioural change
eg increased confusion, refusing to eat, alteration in usual patterns
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q4 ☐

Q5. Physiological change
eg temperature, pulse or blood pressure outside normal limits, perspiring, flushing or pallor
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q5 ☐

Q6. Physical changes
eg skin tears, pressure areas, arthritis, contractures, previous injuries
Absent 0 *Mild 1* *Moderate 2* *Severe 3*
Q6 ☐

Add scores for Q1 to Q6 and record here → Total pain score ☐

Now tick the box that matches the Total pain score →

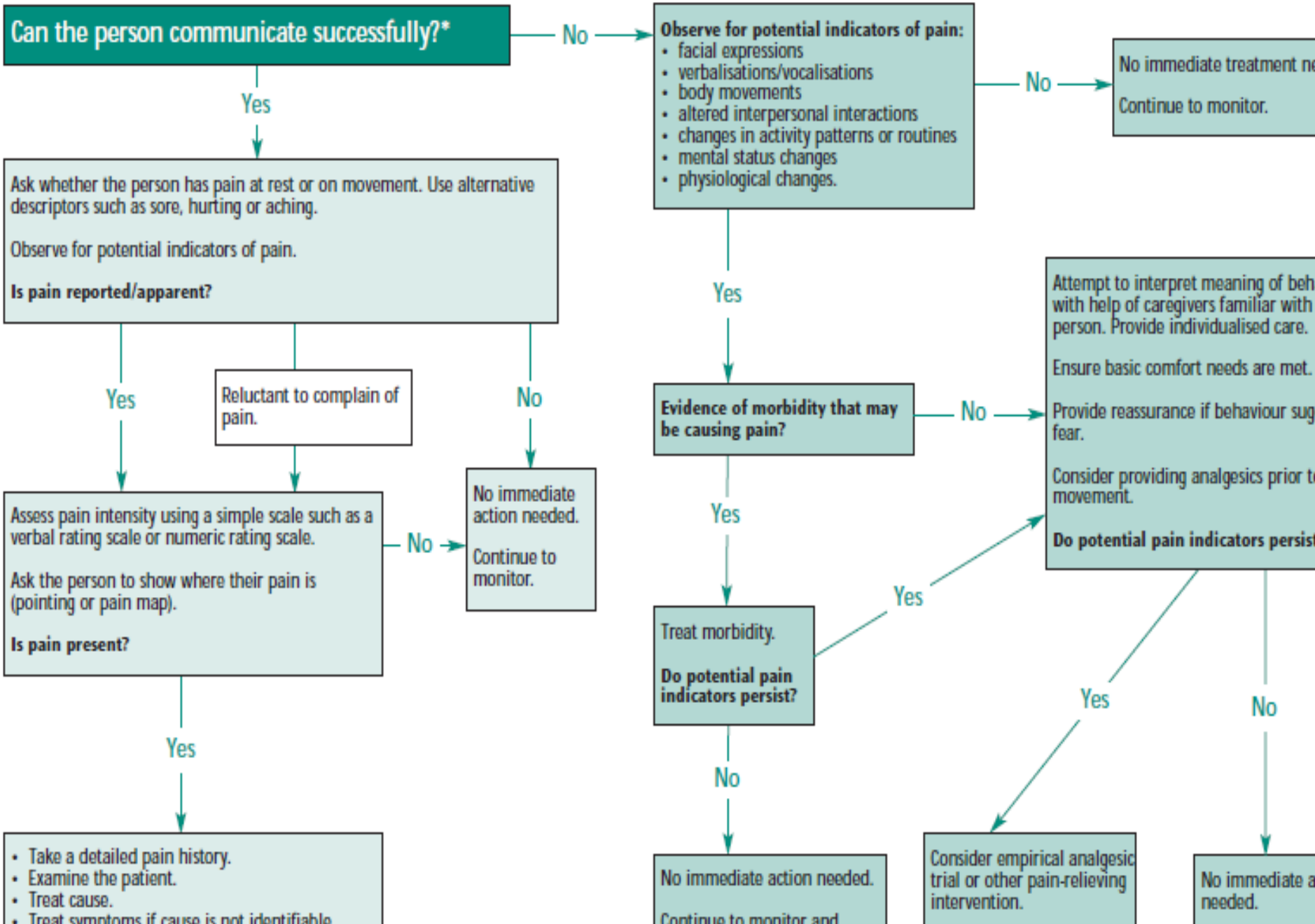
0–2 No pain	3–7 Mild	8–13 Moderate	14+ Severe

Finally, tick the box which matches the type of pain →

Chronic	Acute	Acute on chronic

Abbey J, De Bellis A, Piller N, Esterman A, Giles L, Parker D, Lowcay B. The Abbey Pain Scale. Funded by the JH & JD Gunn Medical Research Foundation 1998–2002.

Appendix 2. Algorithm for the assessment of pain in older people



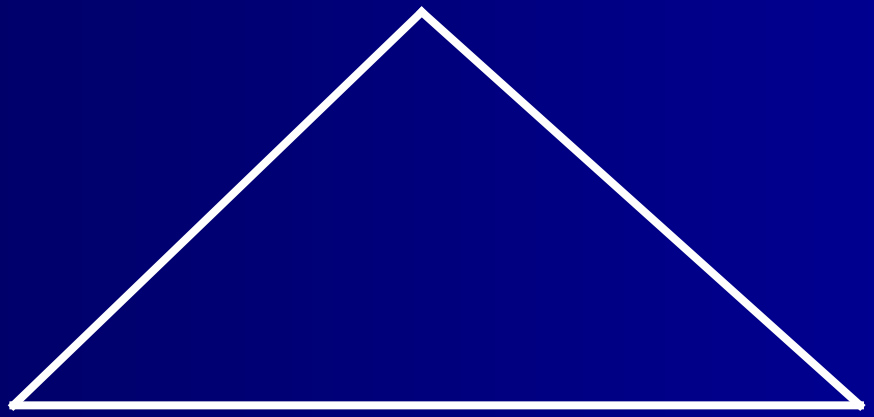
Pain Management Goals

- Decrease pain
- Improve function
  - Physical
  - Psychological
  - Social
- Minimize risk
  - Patient
  - Physician
  - Society

IDEAL TREATMENT OF PERSISTENT PAIN

Physical / Rehabilitative

(CAM)



Psychological

Medical

Pharmacological

Interventional

AGS RECOMMENDATIONS 2009

- Acetaminophen as initial and ongoing pharmacotherapy particularly musculoskeletal pain
- NSAIDS AND Cox-2 selective inhibitors may be considered rarely and with extreme caution
- Opioids for all patients with moderate-to-severe pain

Opioid Guideline 2010

- ***Published by the National Opioid Use Guideline Group (NOUGG) a collaboration of:***

Federation of Medical Regulatory Authorities of Canada
College of Physicians & Surgeons of British Columbia
College of Physicians & Surgeons of Alberta
College of Physicians and Surgeons of Saskatchewan
College of Physicians & Surgeons of Manitoba
College of Physicians and Surgeons of Ontario
Collège des médecins du Québec
College of Physicians and Surgeons of New Brunswick
College of Physicians and Surgeons of Nova Scotia
College of Physicians and Surgeons of Prince Edward Island
College of Physicians and Surgeons of Newfoundland and Labrador
Government of Nunavut
Yukon Medical Council

- April 30 2010 Version 4.5

Opioid Guideline 2010

CTFPHC Evidence Grading System (Woolf 1990)

I – Evidence from RCTs.

II – 1 Evidence from controlled trial(s) without randomization.
II – 2 Evidence from cohort or case-control analytic studies, preferably from more than one centre or research group.
II – 3 Evidence from comparisons between times or places with or without the intervention; dramatic results from uncontrolled studies could be included here.

III – Opinions of respected authorities, based on clinical experience; descriptive studies or reports of expert committees.

Canadian Guideline Recommendation Grading

Grade A: Recommendations are supported by evidence from RCT(s).

Grade B: Recommendations are supported by:
•Evidence from controlled trial(s) without randomization, or,
•Evidence from cohort or case-control analytic studies, preferably from more than one centre or research group, or
•Evidence from comparisons between times or places with or without the intervention; dramatic results in uncontrolled experiments could be included here.

Grade C: Recommendations are supported by consensus opinion of the National Advisory Panel.

Opioid Guideline 2010

- Opioid therapy for elderly patients can be safe and effective (Grade B) with appropriate precautions , including lower starting doses, slower titration, longer dosing interval, more frequent monitoring, and tapering of benzodiazepines (Grade C).

OPIOID TREATMENT IN OLDER PERSONS

- Presence of renal insufficiency also influences choice of opioids
- Oxycodone, morphine, propoxyphene, and meperidine all have active metabolites excreted renally.
- Dose adjustments are necessary for patients with renal insufficiency
- Hydromorphone a possible choice in patients with renal impairment
- M-Eslon can be opened and put in G-Tubes

OPIOID TREATMENT IN OLDER PERSONS

- Transdermal fentanyl patch is another option for patients requiring around-the-clock pain control
- 2005 FDA advisory: “should only be used in patients who are already receiving opioid therapy, who have demonstrated opioid tolerance and require a daily dose of at least 25 mcg/hr”
- Transdermal buprenorphine recently available in Canada —once weekly for moderate pain safe in opioid naïve patients

Chronic Neuropathic Pain Guidelines from CPS

FIRST LINE

- Tricyclic antidepressants (Amitriptyline, nortriptyline)
- Gabapentinoids (gabapentin,pregabalin)
- Carbamazepine and oxycarbazepine in TN

Pain Res Manage 2007; 12(1):13-21;Moulin D, Clark AJ et al

Clin Interv Aging, 2008 March; Clair Haslam and Turo Nurmikko

Neuropathic Pain—Cont'd

SECOND LINE

Serotonin Noradrenaline Reuptake Inhibitors

- Venlafaxine
- Duloxetine
- Topical Lidocaine mixtures

Neuropathic Pain Cont'd

THIRD LINE

- Opioids (Morphine, oxycodone, hydromorphone, methadone)
- Tapentadol CR
- Tramadol
- Citalopram and paroxetine
- Capsaicin

Neuropathic Pain Cont'd

FOURTH LINE

- Cannabinoids
- Methadone

TOPICAL ANALGESIC AGENTS

Lidocaine 5%, Amitriptyline 5%,

Ketoprophen 7.5%, Ketamine 10%

In PLO Gel or Lidoderm TID-QID

NEWER DRUGS

- Transdermal buprenorphine – good for moderate pain in opioid naïve. Patch changed every 7 days
- Oxycodone Hydrochloride /Naloxone Hydrochloride
- Oxycodone hydrochloride controlled release tablets
- Tapentadol – IR/CR
- Fentanyl buccal soluble film - oral patch for breakthrough palliative care

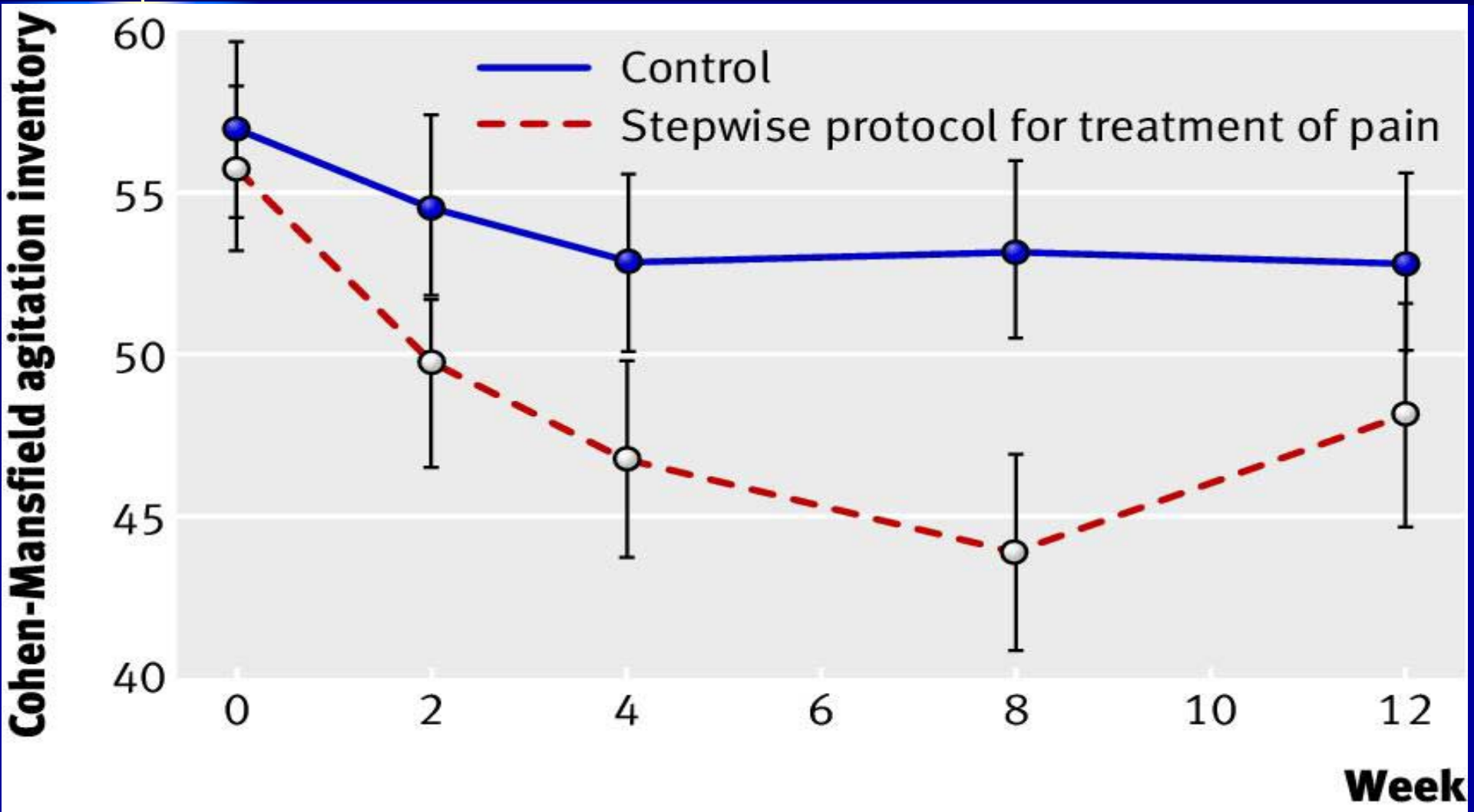
Case AC

- Physical findings of OA in both knees and restricted to wheelchair
- Difficulty sleeping, waking up around 3:00am and mobilizing in morning.
- Stopped lorazepam and started Melatonin 3mg.

Case AC

- Initially oxycodone hydrochloride 2.5mg/acetaminophen 325 mg for 3 weeks then increased to 5.0mg
- Switched to transdermal buprenorphine 5 mcg/hr for 1 month - increased to 10 mcg/hr. Acetaminophen 500 at 6:00 am.

Husebo BS, *et al*. *BMJ* 2011; 343:d4065 **Efficacy of treating pain to reduce behavioural disturbances in nursing home residents with Dementia**



SUMMARY

- Views about management of pain in the elderly have changed in recent years
- It is an expectation that pain be recognized and managed appropriately
- Pain can be effectively treated in the long-term care setting

SUMMARY

- A combination of non-pharmacologic and pharmacologic interventions can effectively reduce pain and its burden
- Consider physiological characteristics in older patients
- Pharmacologic modalities can be used safely and effectively to treat pain in older patients

Pain in Older People: Summary

- Ask about pain regularly
  - Assess pain systematically
- Believe the patient's and family's reports of pain and what relieves it
- Choose appropriate pain control options
- Deliver interventions in a timely, logical and coordinated fashion
- Empower patients and their families

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- Royal College of Physicians, British Geriatrics Society and British Pain Society. The assessment of pain in older people; national guidelines. Concise guidance to good practice series, No 8 RCP, London 2007

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- American Medical Directors Association 2009. Pain Management in the Long Term Care Setting: Clinical Practice Guidelines. Available at www.amda.com/tools/guidelines.cfm
- AGS Panel on Pharmacological Management of Persistent Pain in Older Persons. J Am Geriatr Soc 2009: 57(8): 1331-46

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The Journal of Neuroscience, May 18, 2011 • 31(20):7540 –7550

Zwakhalen, Sandra MG et al:

BMC Geraitrics, 6:3 People with severe dementia: A systematic review of behavioural pain assessment tools

Pain Management in Older Persons

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