ASSESSING AND MANAGING PAIN IN OLDER ADULTS WITH COGNITIVE IMPAIRMENT

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FACULTY/PRESENTER DISCLOSURE

- **FACULTY:** ROMAYNE GALLAGHER

- **RELATIONSHIPS WITH FINANCIAL SPONSORS:**
  - **ANY DIRECT FINANCIAL RELATIONSHIPS INCLUDING RECEIPT OF HONORARIA:** NO.
  - **MEMBERSHIPS ON ADVISORY BOARDS OR SPEAKERS' BUREAU:** NO
  - **PATENTS FOR DRUGS OR DEVICES:** NO
  - **OTHER: FINANCIAL RELATIONSHIPS/INVESTMENTS** NO

PAIN AND MORTALITY

- ENGLISH LONGITUDINAL STUDY OF AGING: 6324 ADULTS >50 YEARS FOLLOWED FOR 10 YEARS.
- PAIN, FUNCTION WERE MEASURED AND TRACKED (AMONG OTHER VARIABLES)
- PEOPLE WHO WERE "OFTEN TROUBLED WITH PAIN" OR WHO HAD "QUITE A BIT" OR "EXTREME" PAIN INTERFERENCE WITH DAILY LIFE HAD SIGNIFICANT INCREASE OF ALL CAUSE MORTALITY
- **ONLY PAIN THAT INTERFERES WITH DAILY LIFE AFFECTS MORTALITY**
    - SMITH ET AL. ARTHRITIS CARE RES 2018
- FURTHER ANALYSIS OF DATA: STRONGEST FACTORS MEDIATING PAIN INTERFERENCE AND MORTALITY:
    - FUNCTIONAL LIMITATION (HAZARD RATIO 1.31; 95% CONFIDENCE INTERVAL 1.20-1.39),
    - SYMPTOMS PREVENTING WALKING QUARTER OF A MILE (1.45 [1.35-1.58]),
    - PHYSICAL INACTIVITY (1.14 [1.10-1.20]),
    - POOR SELF-RATED HEALTH (1.32 [1.23-1.41])
        - SMITH ET AL PAIN 2018

PAIN

Declining Function

Inactivity

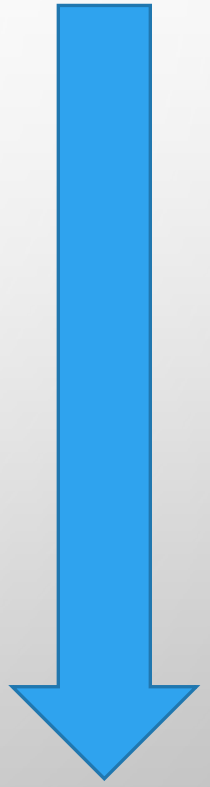
Deconditioning

Decreased function

Social Isolation

Frailty

Declining Health

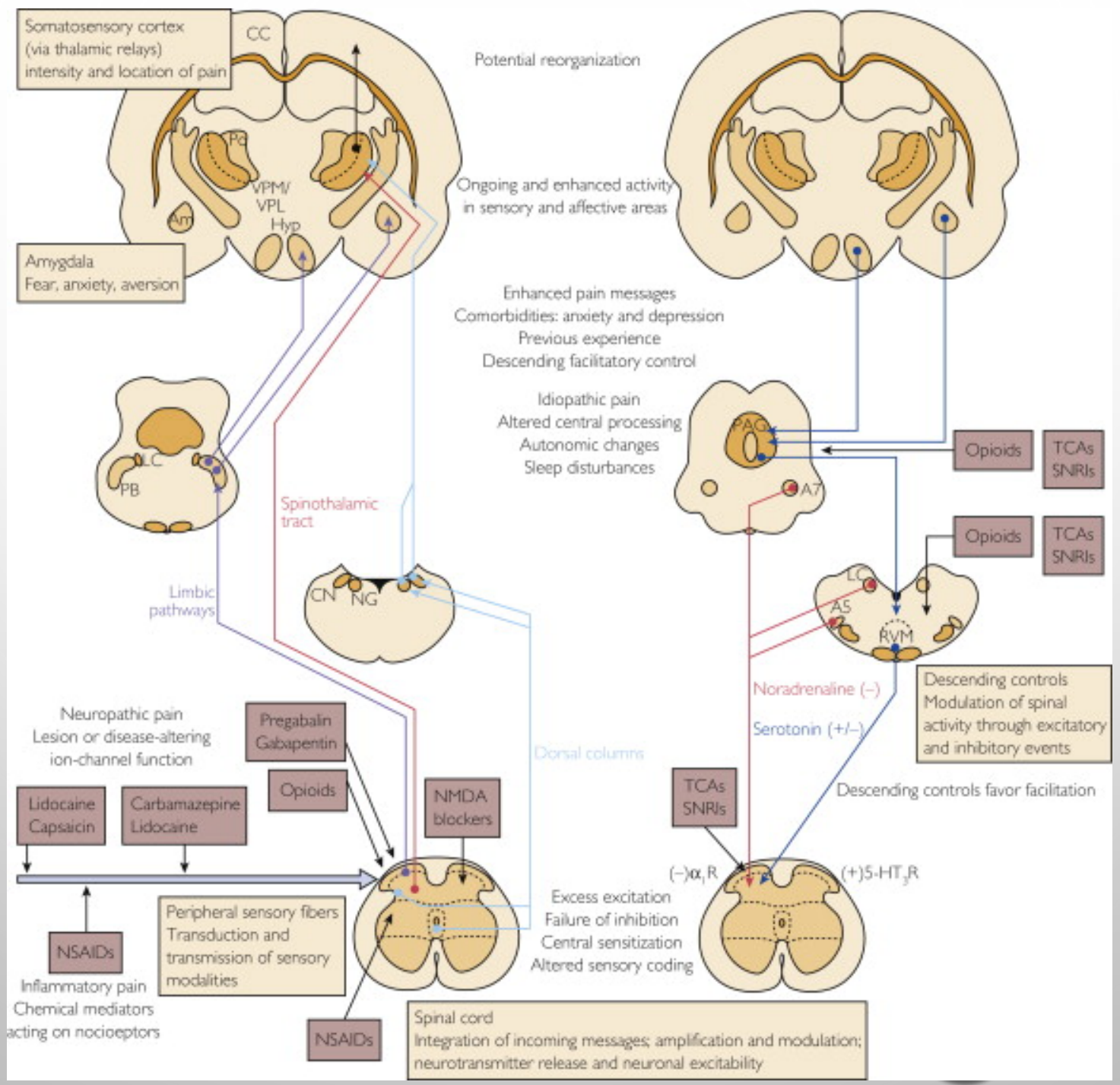


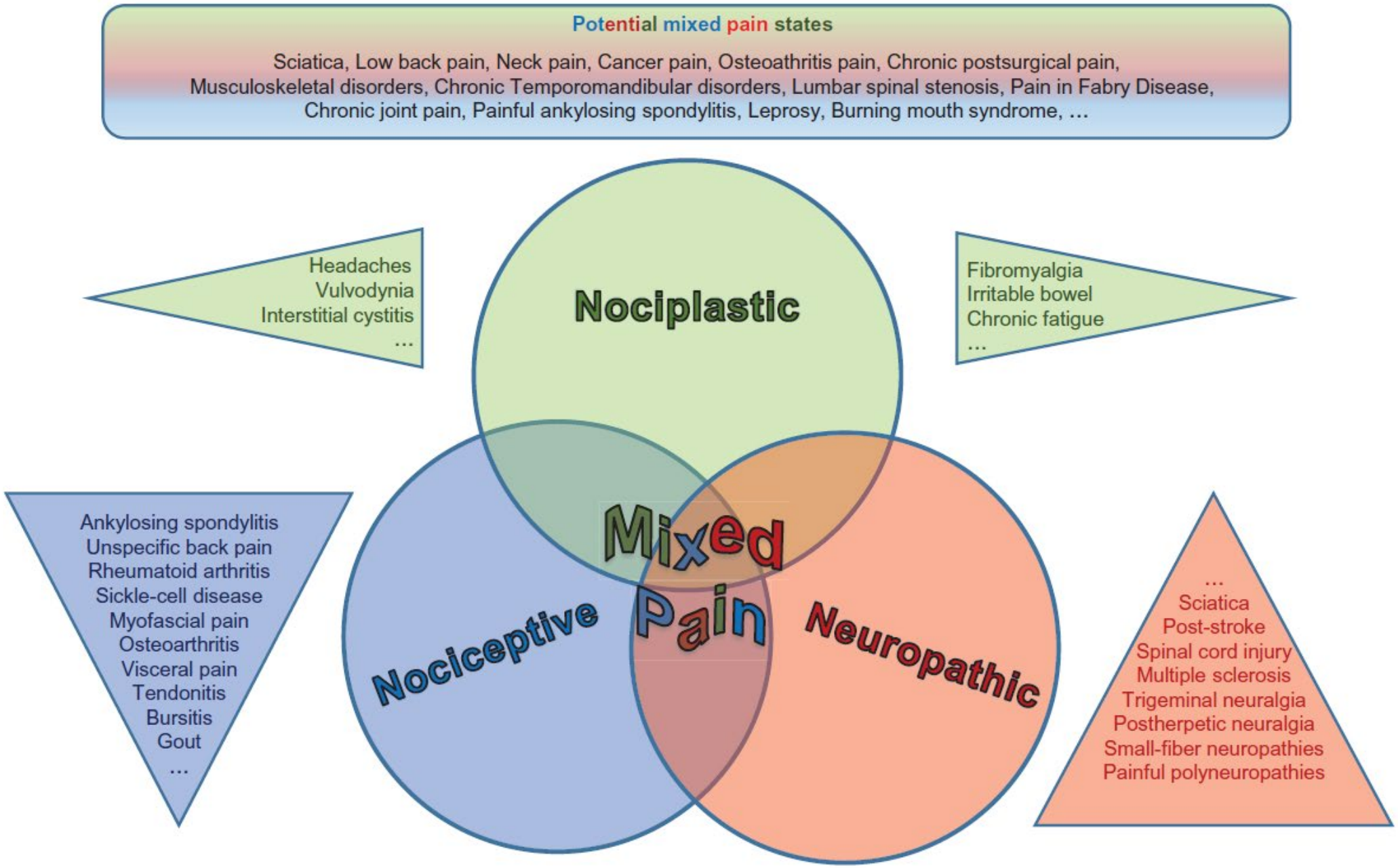
Wade et al. J Gerontol A Biol Sci Med Sci. 2017

Gilron et al.

Mayo Clinic Proceedings

Volume 90, Issue 4, Pages 532-545 (April 2015)
DOI: 10.1016/j.mayocp.2015.01.018





Freynhagen R et al. Current Medical Research and Opinion 2019

NOCIPLASTIC PAIN

- DEFINITION FROM IASP 2017
- PAIN THAT ARISES FROM ALTERED NOCICEPTION, DESPITE NO CLEAR EVIDENCE OF ACTUAL OR THREATENED TISSUE DAMAGE, CAUSING THE ACTIVATION OF PERIPHERAL NOCICEPTORS
- OR EVIDENCE FOR DISEASE OR LESION OF THE SOMATOSENSORY SYSTEM CAUSING THE PAIN

- EXAMPLES: FIBROMYALGIA, COMPLEX REGIONAL PAIN DISORDER (NOT SECONDARY TO TRAUMA), VISCERAL PAIN DISORDERS (IBS, INTERSTITIAL CYSTITIS), HEADACHES (WITHOUT TISSUE DAMAGE)

MIXED PAIN: PRACTICE PEARLS

- DIAGNOSIS OF MIXED PAIN BASED ON CLINICAL JUDGEMENT, FOLLOWING DETAILED HISTORY AND PHYSICAL, NO FORMAL CONFIRMATION FOLLOWING EXPLICIT SCREENING OR DIAGNOSTIC CRITERIA (NOT YET AVAILABLE).
- WHEN ENCOUNTERING A PATIENT WHO PRESENTS WITH AN OVERLAP OF NOCICEPTIVE AND NEUROPATHIC SYMPTOMS, CONSIDER MIXED PAIN AS A WORKING DIAGNOSIS.
- FOR A PATIENT WITH A WORKING DIAGNOSIS OF MIXED PAIN, CONSIDER EARLY TREATMENT WITH A COMBINATION OF AGENTS TARGETING NOCICEPTIVE AND NEUROPATHICMECHANISMS.
- FOR A PATIENT WITH A WORKING DIAGNOSIS OF MIXED PAIN, PERFORM A THOROUGH EVALUATION FOR COMORBIDITIES (E.G. DISTURBED SLEEP, DEPRESSION, ANXIETY) AND MANAGE ACCORDINGLY.

WHAT'S NEW IN OUR UNDERSTANDING OF PAIN IN OLDER ADULTS?

- PAIN AND DEPRESSION OFTEN OCCUR TOGETHER IN OLDER ADULTS
  - DEPRESSION IN CHRONIC PAIN PATIENTS 19-28%
- IS NEUROINFLAMMATION A COMMON PATHWAY FOR BOTH DISORDERS?
- PERIPHERAL NERVE DAMAGE AND PREVIOUS INJURY RESULT IN ACTIVATION OF MICROGLIA
- ACTIVATED MICROGLIA RESPOND VIGOUROUSLY – RELEASE CYTOKINES – INCREASE CENTRAL SENSITIZATION
- **DEPRESSION MAY HEIGHTEN PAIN PERCEPTION AND CENTRAL SENSITIZATION**

Zis et al.
Clinical
Interventions
in Aging
2017

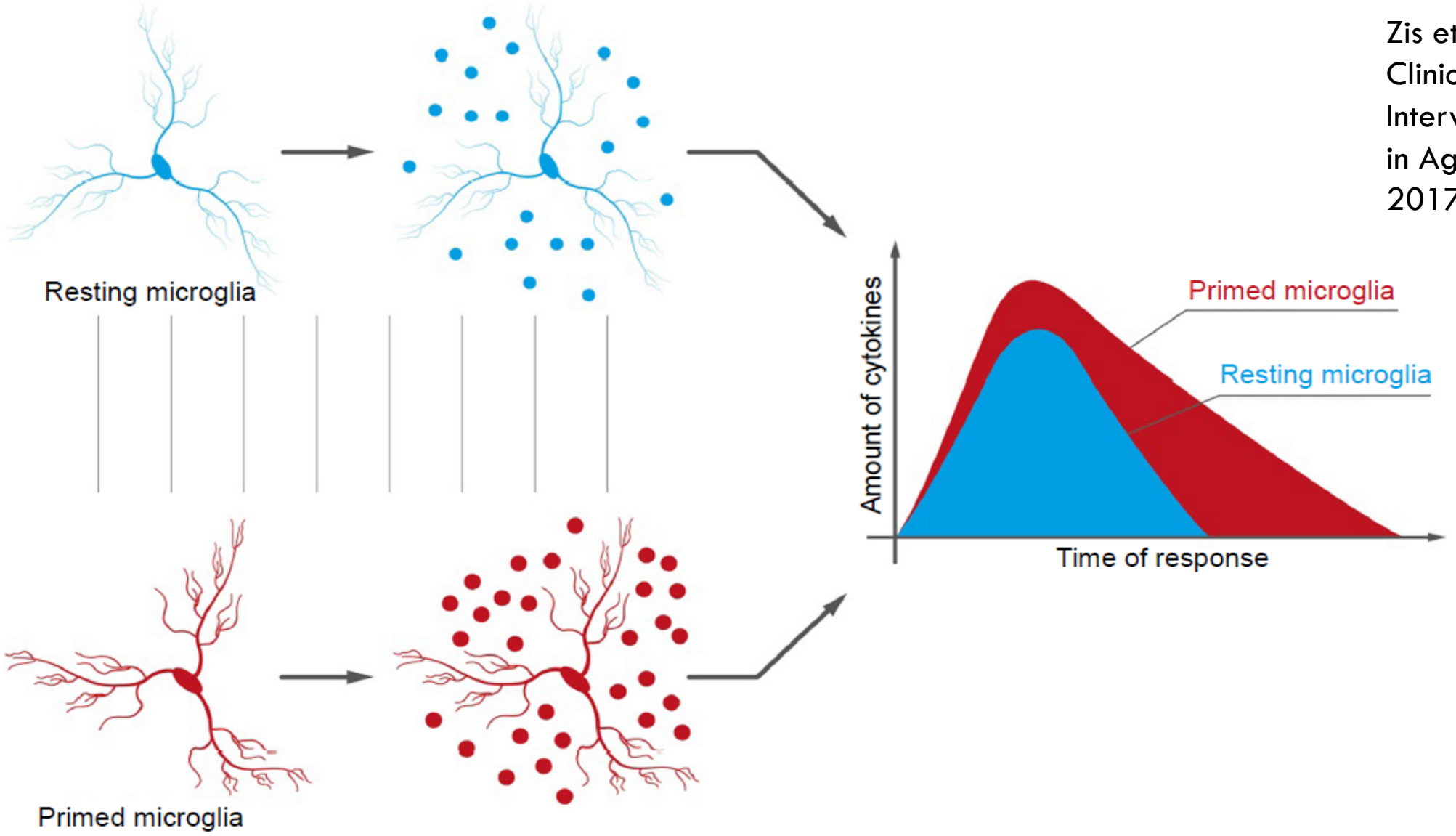
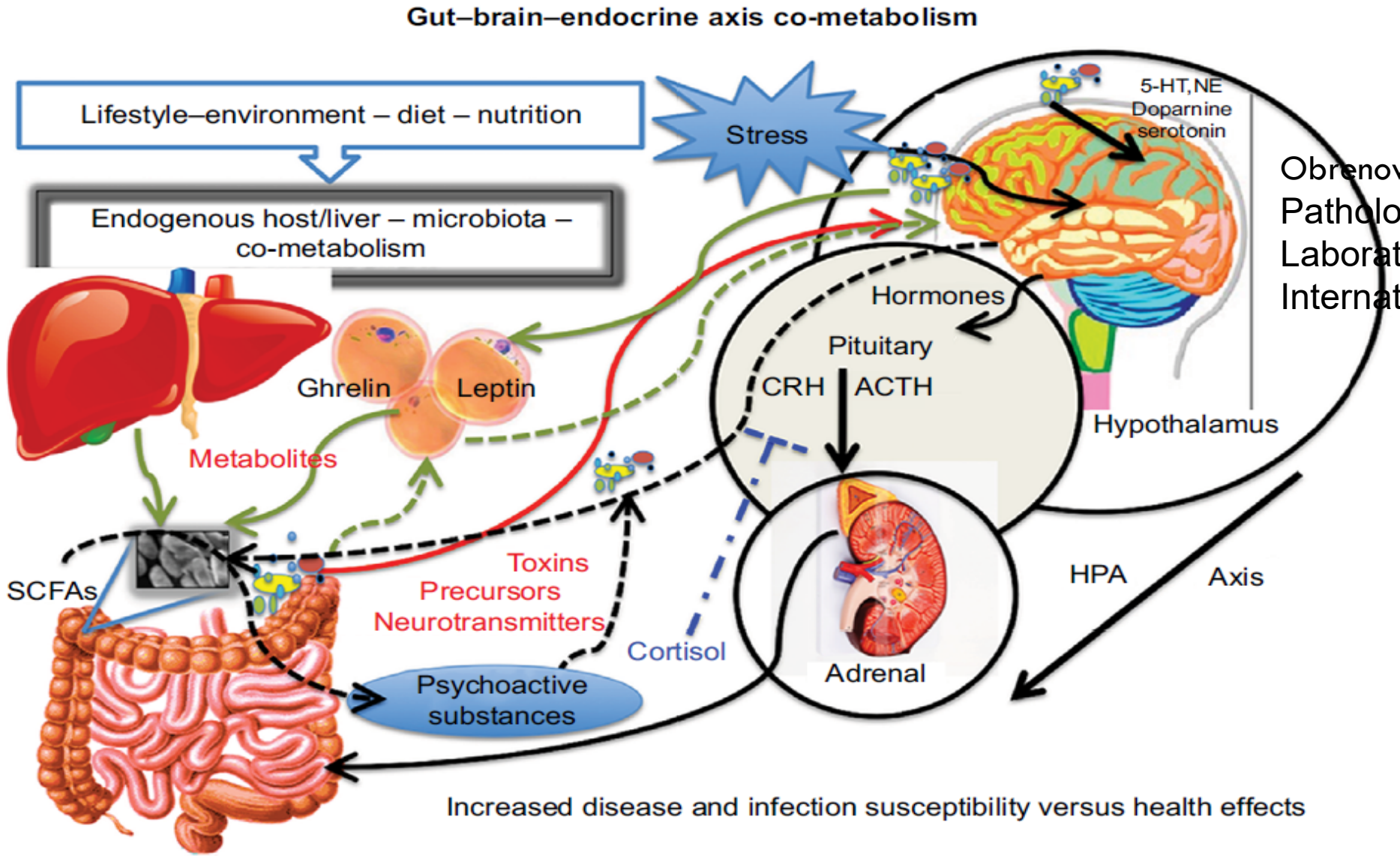


Figure 1 The differences between normal and "primed" microglia consist of an increased sensibility of the latter to any kind of stimulation. The consequence is an increased production of cytokines.

Note: Copyright, with permission from Pain Nursing Magazine, Fusco M, Paladini A, Skaper SD, Varrassi G. Chronic and neuropathic pain syndrome in the elderly: Pathophysiological basis and perspectives for a rational therapy. *Pain Nursing Magazine*. 2014;3:94–104.[156]



Obrenovich et al.
Pathology and Laboratory Medicine International 2017

Figure 1 The HPA microbiota–gut–brain–endocrine pathway and intersecting organs demonstrating a known afferent and efferent cross-talk, which is yet to be well characterized and is very complex.

Note: Movement of metabolites, anterograde, retrograde, or both, from the gut and the brain to distal organs constitutes co-metabolism in a metabolic interactome.

Abbreviations: ACTH, adrenocorticotropic hormone; CRH, corticotropin releasing hormone; HPA hypothalmus pituitary adrenal; SCFA, short chain fatty acid; NE, norepinephrinegiven; HPA, hypothalamic–pituitary–adrenal; 5-HT, 5-hydroxytryptamine.

PAIN ASSESSMENT

CASE

- 88 YEAR OLD WOMAN ADMITTED TO RESIDENTIAL CARE DUE TO DEMENTIA
- PREVIOUSLY LIVED ALONE IN OWN HOME
- WAS ADMITTED TO ACUTE CARE DUE TO RAPIDLY ESCALATING CONFUSION
- HAD COMPLAINED OF BACK PAIN BUT RAPIDLY DEVELOPED MORE CONFUSION AND AGITATION AND REQUIRED ADMISSION

CASE

- PAST MEDICAL HISTORY
  - HYPERTENSION, MILD CHF
  - BREAST CANCER 4 YEARS PREVIOUSLY, TREATED SUCCESSFULLY WITH SURGERY AND HORMONAL AGENTS
  - NIDDM
- LIVED ALONE ALWAYS, NO OTHER FAMILY

CASE

- IN ACUTE CARE:
  - URINARY TRACT INFECTION TREATED
  - CXR AND LUMBAR SPINE FILMS SUGGESTED ABNORMALITIES IN BONE; BONE SCAN SUGGESTED
- AGITATION WAS ONGOING AND OLANZEPINE WAS INCREASED TO 25MG HS
- ACETAMINOPHEN FOR BACK PAIN
- INFECTION RESOLVED BUT UNABLE TO RETURN TO HOME

CASE 1

- ADMITTED TO RESIDENTIAL CARE:
  - STAFF NOTE THAT SHE IS DIFFICULT TO MOBILIZE AND SEEMS IN PAIN
  - VERY DROWSY SO ANTIPSYCHOTICS REDUCED GRADUALLY
  - NSAIDS USED FOR PAIN AS PATIENT WAS THOUGHT TO BE TOO DROWSY TO ADD ON OPIOIDS

CASE 1

- OVER NEXT 6-8 WEEKS:
  - MORE ALERT BUT STILL AGITATED ON MOBILIZING AND WITH CARE
  - TYLENOL #3 GIVEN WHEN SHE SEEMS IN PAIN DOESN'T MAKE ANY DIFFERENCE TO BEHAVIOR
  - DOESN'T EAT WELL AND IS LOOSING WEIGHT
  - WANTS TO BE IN BED AND RESISTS BEING MOBILIZED

WHAT ARE THE POSSIBLE CAUSES OF THIS BEHAVIOR?

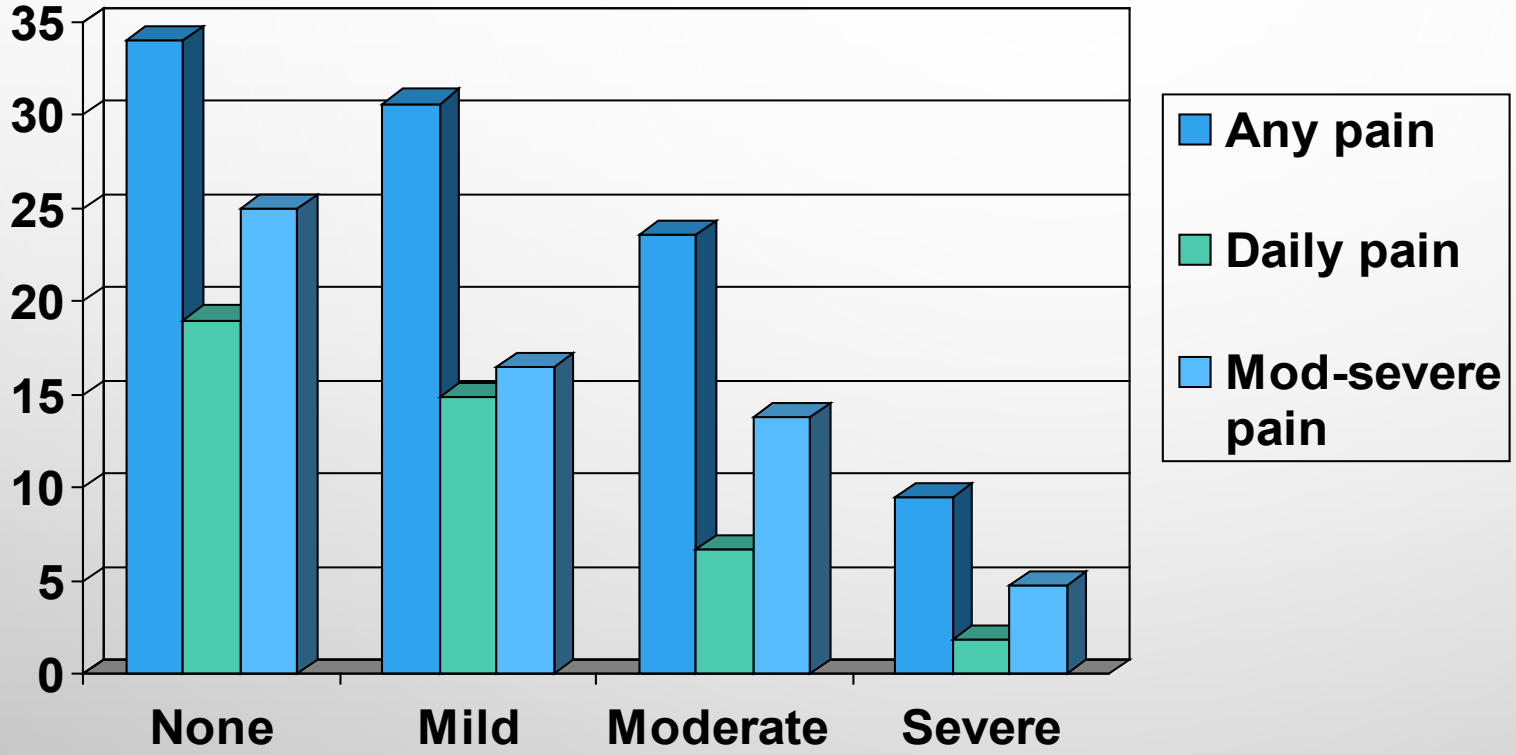
CASE

- LUMBAR SPINE X-RAY: MULTIPLE BONY METASTASES
- LAB WORK" RAISED TUMOR MARKERS FOR BREAST CANCER
- ULTRASOUND: EVIDENCE OF LIVER METASTASES

KEY LEARNING

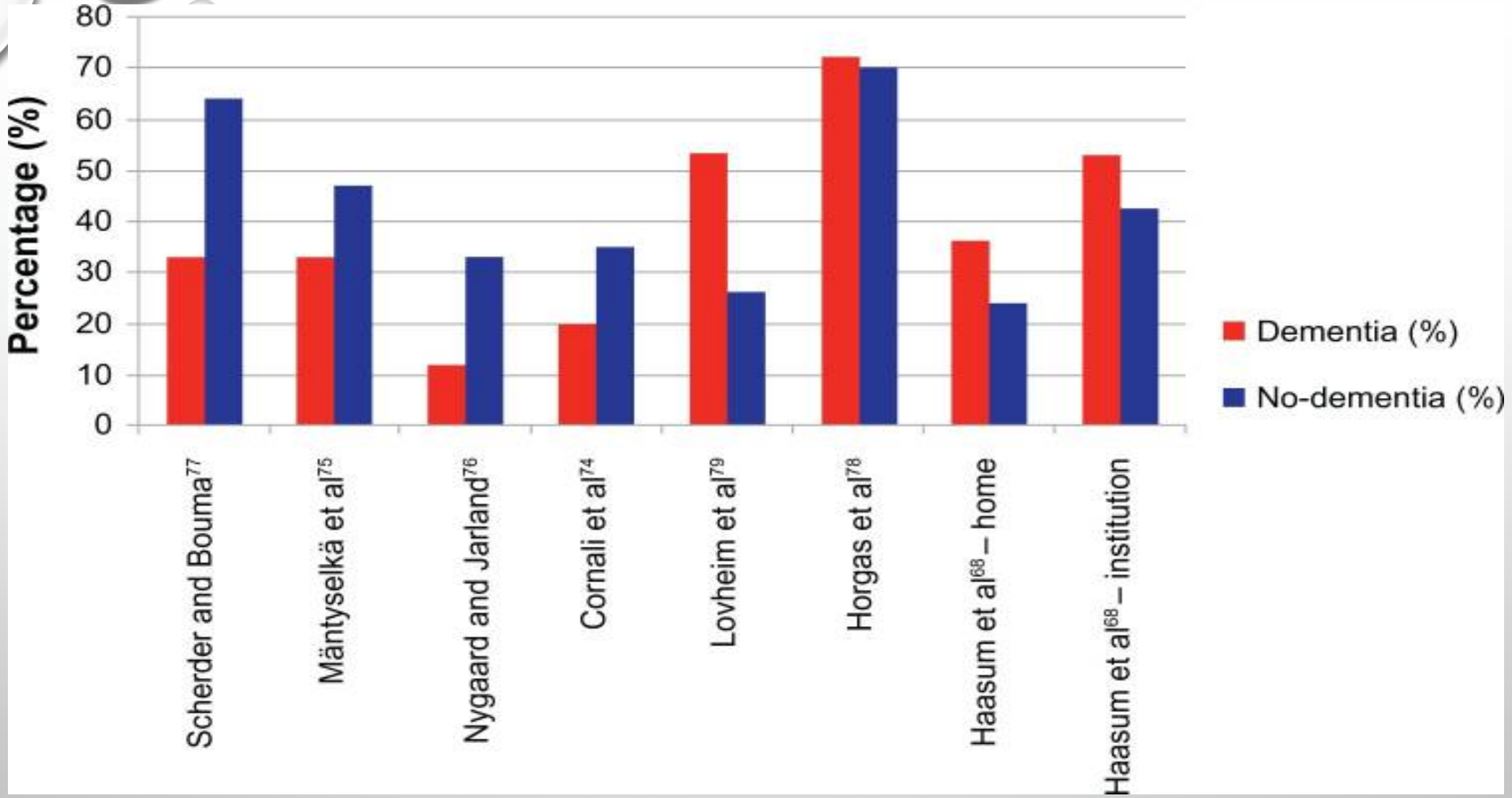
- **PAIN CAUSES DELIRIUM**
  - PATIENT COMPLAINED OF PAIN PRIOR TO BECOMING DELIRIOUS
  - DID NOT CONSIDER PAIN AS UNDERLYING CAUSE OF DELIRIUM
  - GOOGLE: MORRISON, PAIN, DELIRIUM

PAIN REPORTS AND COGNITIVE IMPAIRMENT



Total = 551

Reynolds et al. J Pain & Symptom Management 2008



Studies on the prevalence of analgesic use in patients with dementia vs no dementia. Achterberg et al Clin Intervent Aging 2013

EPAT PAIN ASSESSMENT TOOL

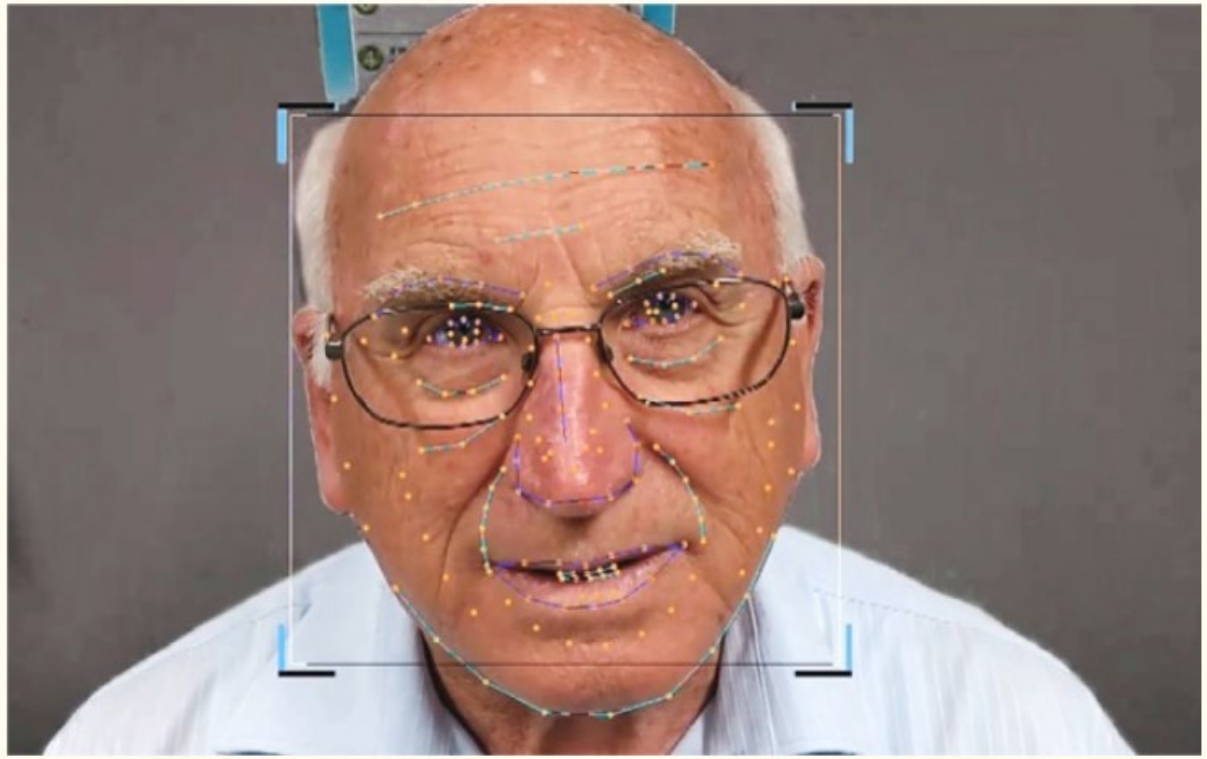


Figure 3

Automated facial recognition and extraction of facial action units (step 2) using active appearance model and facial landmarking.

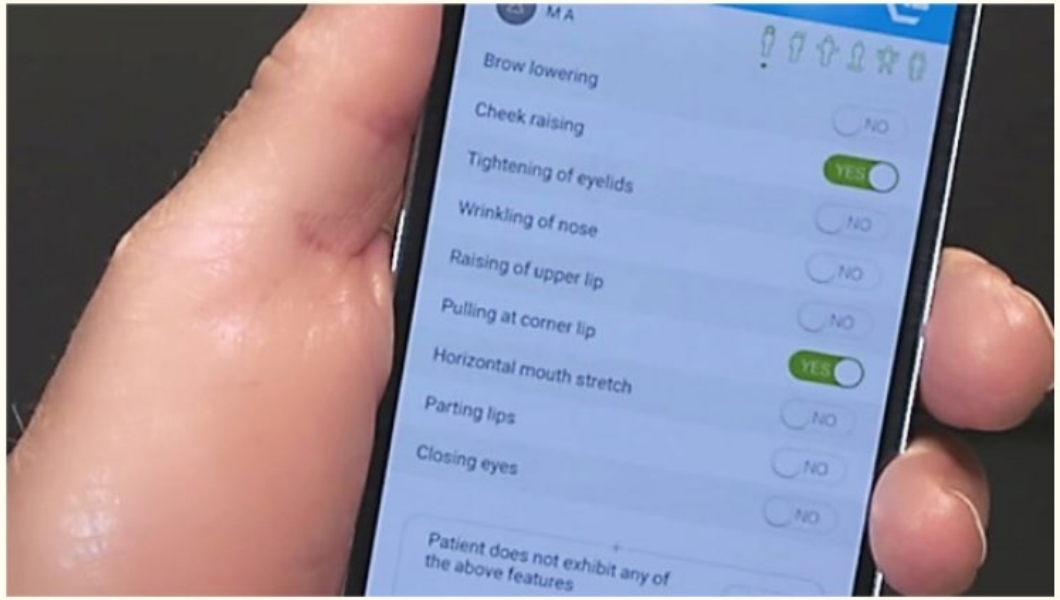


Figure 4

Detection of facial actions using AU descriptors of FACS (step 3).

Abbreviation: AU, action unit; FACS, Facial Action Coding System.

Atee et al Clin Interv Aging 2018

EPAT

- 10 SECOND VIDEO LOOKS AT FACIAL ACTION CODING SYSTEM = FACE DOMAIN
- USER SCORES OTHER DOMAINS:
  - VOICE (MOANING, GROANING, CALLING OUT ETC…)
  - MOVEMENT (GUARDING, FREEZING, PACING ETC…)
  - BEHAVIOUR (AGGRESSIVE, VERBALLY ABUSIVE, EXTREME DISLIKE OF TOUCH…)
  - ACTIVITY (RESISTING CARE, PROLONGED RESTING, ETC…)
  - BODY (SIGNS OF ACUTE PAIN, KNOWN PAINFUL CONDITIONS…)
- 353 PAIRED ASSESSMENTS OF PEOPLE WITH DEMENTIA +/- PAIN THE TOOL SCORED WELL.
  - ATLEE ET AL J ALZHEIMER'S DISEASE 2017

Forms from VCH

Vancouver Coastal Health

RESIDENTIAL CARE

PAIN MONITORING RECORD

Site:_____

PCIS LABEL

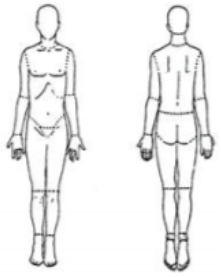
LOCATION
(List most severe first)

0 1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5
No pain Moderate Extreme

1. _____
2. _____
3. _____
4. _____
5. _____

NONVERBAL INDICATORS INCLUDE:

Verbally Excessive	V	Rubs or protects part	P
Moans/sighs	M	Restless/rocks	R
Weeps/cries	W	Holds body part	H
Cries when moved	C	Fidgets	F
Grimaces/grunts	G	Resistive to touch	T



PAIN INTERVENTIONS & EVALUATION

Date:														
Time:														
Location:														
Pain Intensity (0-10/0-5):														
Observed indicator of Pain (pain behaviors):														
Intervention e.g. heat, reposition, distraction, medication														
EVALUATION ONE HOUR LATER														
Pain Intensity (0-10/0-5):														
Observed Indicator of Pain (pain behaviors 1hr later):														
Initials:														

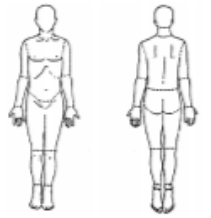
VCH.0118 | FEB.2011

Vancouver Coastal Health

Residential Care
PAIN ASSESSMENT TOOL FOR THE VERBALLY RESPONSIVE

Site:_____

1. Where is your worst pain? (point to the spot) _____
2. Where else do you have pain or discomfort? _____



3. ***Onset*** - When did the pain start? _____
4. ***Pattern*** - What makes the pain(s) better? _____ worse? _____
5. ***Quality*** - How would you describe your pain(s)? – Throbbing ☐, shooting ☐, numbness ☐, stabbing ☐, sharp ☐, dull ☐, aching ☐, burning ☐, pins and needles ☐, grinding ☐.
6. ***Radiating*** - Does the pain(s) spread to other areas? _____
7. ***Severity*** - How would you rate your pain(s), 0-10, 0-5 scale ☐ Descriptions ☐ Faces ☐

_____

8. ***Timing*** - Is the pain(s): Constant? ☐ Come and go? ☐ Only with movement? ☐
9. ***Understanding*** - What do you think causes the pain(s)? _____
10. ***Value*** - What is your acceptable comfort level? _____
11. What medications do you use? _____

    Do they help? _____
12. What have you used in the past? _____
14. Does your pain(s) affect your: Sleep ☐ Appetite ☐ Activity ☐ Mood ☐ Other ☐
15. Do you have any concerns about taking pain medications? Yes ☐ No ☐

    If yes, describe: _____

Nurse:_____ Signature:_____ Assessment Date:_____

VCH.0159 | DEC.2011

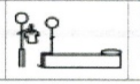
NOPPAIN
(Non-communicative Patient's Pain Assessment Instrument)
Activity Chart Check List

Date: _____ Time: _____

Name of Evaluator: _____

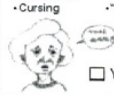
Signature: _____

DIRECTIONS: Nursing assistant should complete at least 5 minutes of daily care activities for the resident while observing for pain behaviors. This form should be completed immediately following care activities

		Did you do this? Check Yes or No	Did you see pain when you did this? Check Yes or No
(a) Put resident in bed OR saw resident lying down		☐ YES ☐ NO	☐ YES ☐ NO
(b) Turned resident in bed		☐ YES ☐ NO	☐ YES ☐ NO
(c) Transferred resident (bed to chair, chair to bed, standing or wheelchair to toilet		☐ YES ☐ NO	☐ YES ☐ NO
(d) Sat resident up (bed or chair) OR saw resident sitting		☐ YES ☐ NO	☐ YES ☐ NO
(e) Dressed resident		☐ YES ☐ NO	☐ YES ☐ NO
(f) Fed resident		☐ YES ☐ NO	☐ YES ☐ NO
(g) Helped resident stand OR saw resident stand		☐ YES ☐ NO	☐ YES ☐ NO
(h) Helped resident walk OR saw resident walk		☐ YES ☐ NO	☐ YES ☐ NO
(i) Bathed resident OR gave resident sponge bath		☐ YES ☐ NO	☐ YES ☐ NO

REMEMBER: Make sure to **ASK THE PATIENT** if he/she is in pain!

Pain Response/Responsibility (What did you see and hear?)

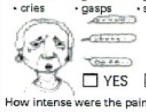
Pain Words?
• "That hurts!" • "Ouch!" • Cursing • "Stop that!"

☐ YES ☐ NO
How intense were the pain words?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Pain Faces?
• grimaces • winces • furrowed brow

☐ YES ☐ NO
How intense were the pain faces?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Bracing?
• rigidity • holding • guarding (especially during movement)

☐ YES ☐ NO
How intense was the bracing?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Pain Noises?
• moans • groans • grunts • cries • gasps • sighs

☐ YES ☐ NO
How intense were the pain noises?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Rubbing?
• massaging affected area

☐ YES ☐ NO
How intense was the rubbing?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Restlessness?
• frequent shifting • rocking • inability to stay still

☐ YES ☐ NO
How intense was the restlessness?
0 1 2 3 4 5
Lowest Possible Intensity — Highest Possible Intensity

Locate Problem Areas

Please "X" the site of any pain
Please "O" the site of any skin problems

FRONT BACK

Snow AL, O'Malley K, Kunik M, Cody M, Bruera E, Beck C, Ashton C. Developed with support from the U.S. Veterans Affairs Health Services Research & Development Service and the National Institute of Mental Health. For more information, contact Dr. Snow at asnow@bcm.tmc.edu. *(This document may be reproduced*

NOPPAIN
(Non-communicative Patient's Pain Assessment Instrument)
Activity Chart Check List

Date: _____ Time: _____

Name of Evaluator: _____

Signature: _____

Rate the resident's pain at the highest level you saw it at during care. **(circle your answer)**

Pain is almost unbearable
Very bad pain
Quite bad pain
Moderate pain
Little pain
No pain

Snow et al. Dement Geriatr Cogn Disord. 2004

PAIN ASSESSMENT IN VERBALLY RESPONSIVE DEMENTIA PATIENTS

- FOCUS ON PRESENT PAIN "DO YOU HURT RIGHT NOW?"
- USE VERBAL REPORTS BY STAFF AND FAMILY
  - WHAT WAS THEIR PRE-DEMENTIA BEHAVIOR WHEN IN PAIN?
- WHAT BEHAVIOR DO STAFF AND FAMILY IDENTIFY AS DISTRESS?
- OBSERVATIONS DURING CARE, MOBILIZING OR OTHER PAIN-INDUCING ACTIVITIES

MEDICAL PROBLEMS - PREVIOUS AND CURRENT

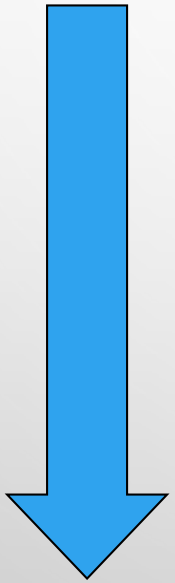
- OTHER CURRENT MORBIDITIES: CHF, COPD, CRF, CVA, CANCER
- PAST PAINFUL CONDITIONS
  - PREVIOUS TRAUMATIC INJURIES
  - PAST MEDICATION HISTORY SUGGESTS PREVIOUS PAINFUL CONDITION
- PAST MEDICAL HISTORY
    - 20-24% OF DIABETICS EXPERIENCE PAINFUL DPN
    - 25-50% OF PATIENTS >50 YEARS WITH HERPES ZOSTER DEVELOP PHN

CENTRAL PAIN

- PAIN SECONDARY TO DAMAGE OF SPINOTHALAMOCORTICAL (PAIN SYSTEM) TRACTS
- CVA, VASCULAR DEMENTIA, MULTIPLE SCLEROSIS, TRAUMATIC BRAIN INJURY (TBI), SPINAL CORD INJURY (SCI),
- PREVALENCE – 10-55% OF PATIENTS, LESS IN MS, GREATER IN SCI
- FACTORS THAT INCREASE RISK OF CENTRAL PAIN: OLDER AGE, FEMALE, COMORBID DEPRESSION, ALCOHOL USE, DM, PERIPHERAL ARTERY DISEASE
- ISCHEMIC>HEMORRHAGIC PATHOLOGY IN CAUSING CENTRAL PAIN
- DIAGNOSIS: ALLODYNIA, HYPERPATHIA – HOW DO THESE PRESENT IN PATIENTS WITH DEMENTIA?
    - HASSABALLA ET AL 2018

HIERARCHY OF DATA SOURCES

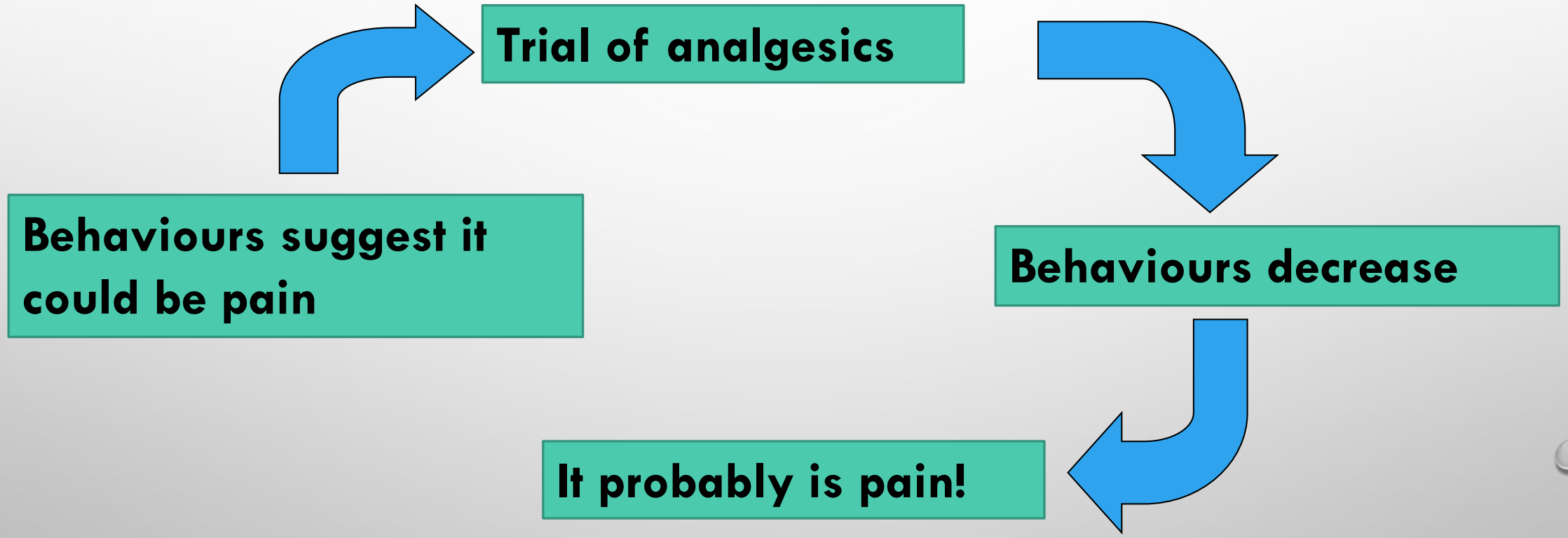
"Most reliable"



"Least reliable"

- RESIDENT REPORT *(IF POSSIBLE)*
- FAMILY/CAREGIVER REPORT
- PRIOR PAIN HISTORY
- PAINFUL COMORBIDITIES
- BEHAVIORAL INDICATORS
- OBSERVER ASSESSMENT

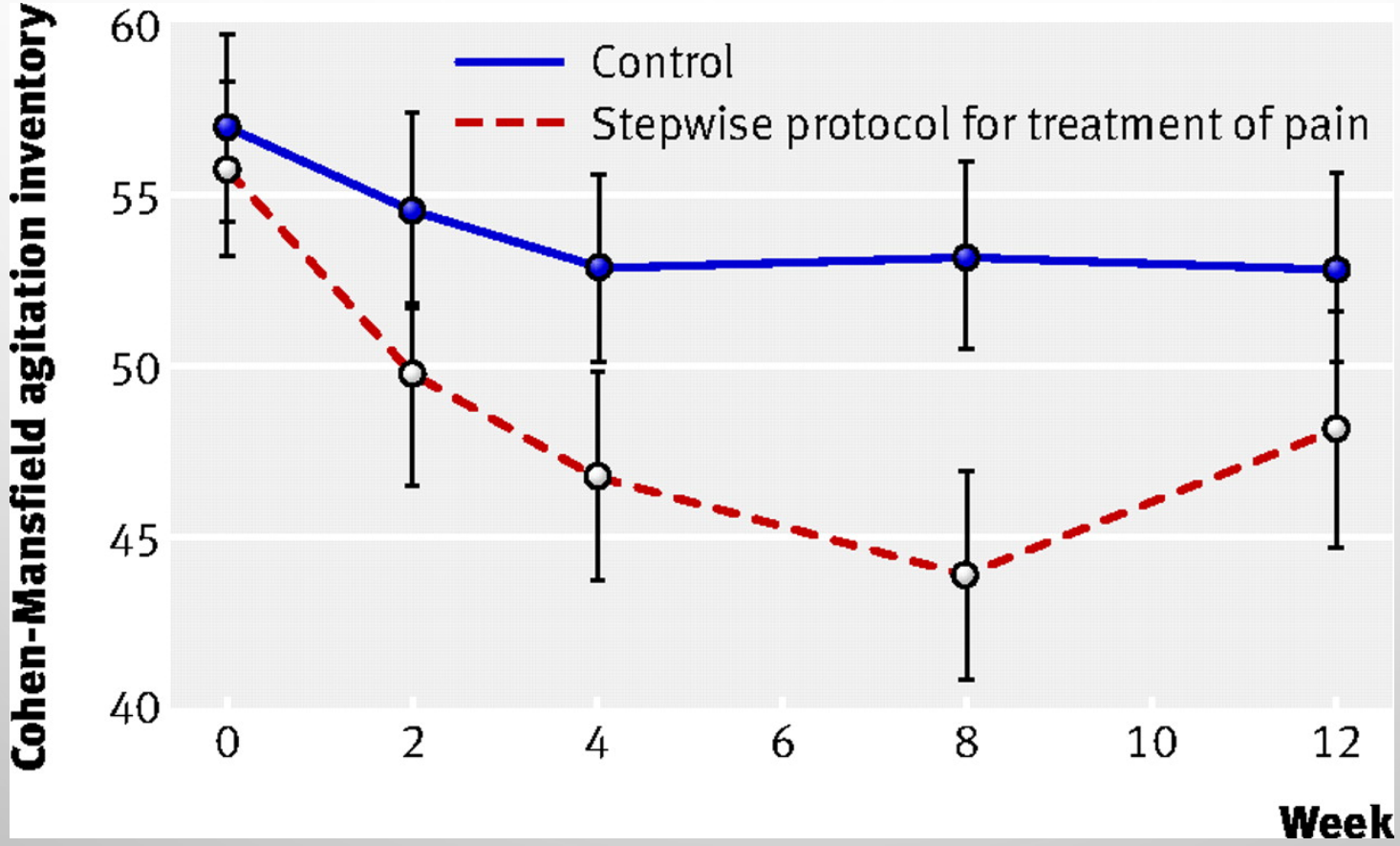
EMPIRICAL TRIALS OF ANALGESICS



EVIDENCE FOR EMPIRICAL TRIALS OF ANALGESICS

- 352 RESIDENTS IN FACILITY CARE
- MODERATE TO SEVERE DEMENTIA - WITH AGITATION
- RANDOMIZED: STEP WISE PROTOCOL VS REGULAR CARE
- INTERVENTION: DAILY PAIN CARE USING STEP-WISE PROTOCOL
- PROTOCOL: ACETAMINOPHEN, MORPHINE OR BUPRENORPHINE PATCH + PREGABALIN
    - HUSEBO ET AL BMJ 2011

Using step-wise pain management in agitated residents

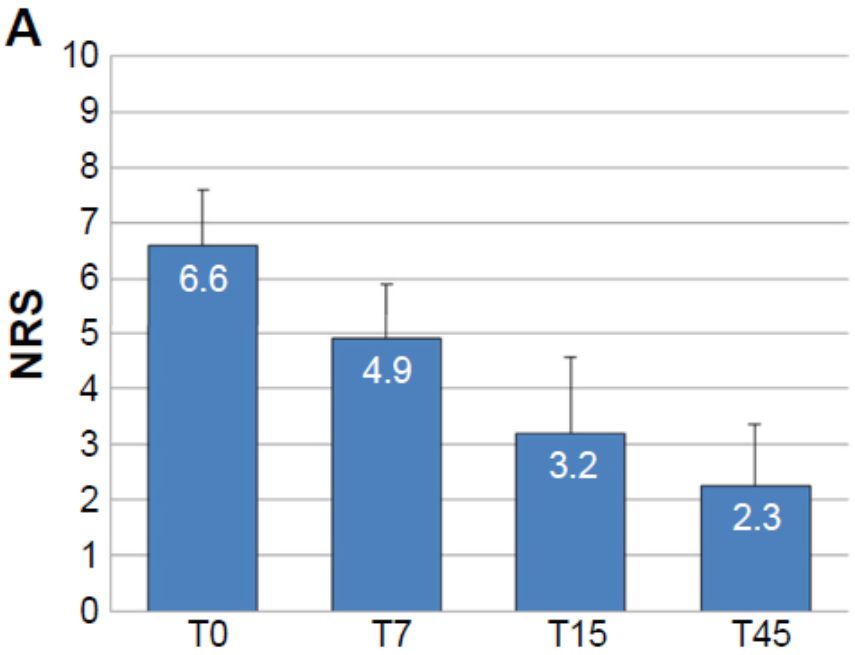


ADLs and cognition unchanged

Husebo et al BMJ 2011

PROSPECTIVE TRIAL OF OXYCODONE/NALOXONE IN MILD TO MODERATE DEMENTIA

- 53 PATIENTS WITH MILD (MMSE <18-24) AND MODERATE (MMSE <15-18) KNOWN TO HAVE MODERATE TO SEVERE PAIN NOT RESPONDING TO ACETAMINOPHEN/NSAIDS AND NOT ON OPIOIDS
- ASSESSED EFFECT ON ANALGESIC EFFICACY, ADL, BEHAVIORAL DISTURBANCES, BOWEL FUNCTION
- OXYCODONE/NALOXONE 5MG/2.5MG TO MAXIMAL DOSE 20MG/10MG
- OBSERVED OVER 45 DAYS
  - PETRO ET AL. NEUROPSYCHIATRIC DISEASE AND TREATMENT 2016


A
NRS
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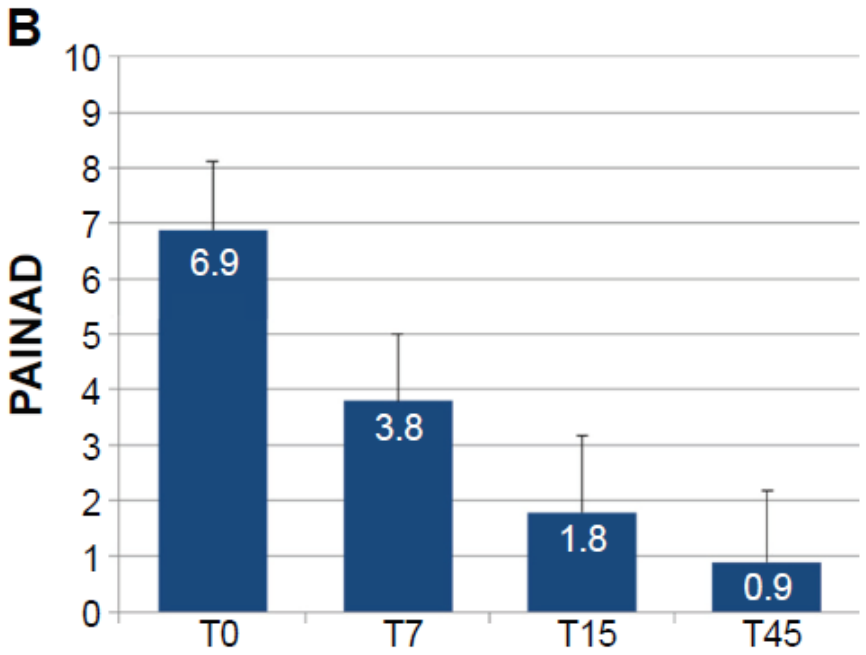
9
8
7
6
5
4
3
2
1
0
6.6
4.9
3.2
2.3
T0
T7
T15
T45


B
PAINAD
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T7
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T45

Table 2 Changes in secondary efficacy variables during treatment with prolonged-release oxycodone/naloxone (OXN-PR)

Variable	Baseline	T7	T15	T45	*P*-value
Rescue analgesics	17 (32.1)	16 (30.2)	14 (26.4)	12 (22.6)	0.24[a]
Adjuvants	18 (34.0)	14 (26.4)	15 (28.3)	13 (24.5)	0.34[a]
NPI	25.5±27.3	20.6±23.0	11.6±11.3[c]	8.8±9.0	<0.0001[b]
BFI	25.6±19.7	24.5±17.9	19.7±16.2[c]	18.1±16.9	<0.0001[b]
Laxatives	21 (39.6)	30 (56.6)[c]	32 (60.4)	31 (58.5)	0.047[a]

Notes: All values are expressed as mean ± standard deviation or n (%). T45 versus baseline. [a]Chi-square for trend; [b]analysis of variance; [c]$P<0.05$ versus previous observation.
Abbreviations: BFI, Bowel Function Index; NPI, Neuropsychiatric Inventory; T7, T15, and T45, respectively, 7-, 15-, and 45-day treatment with OXN-PR.

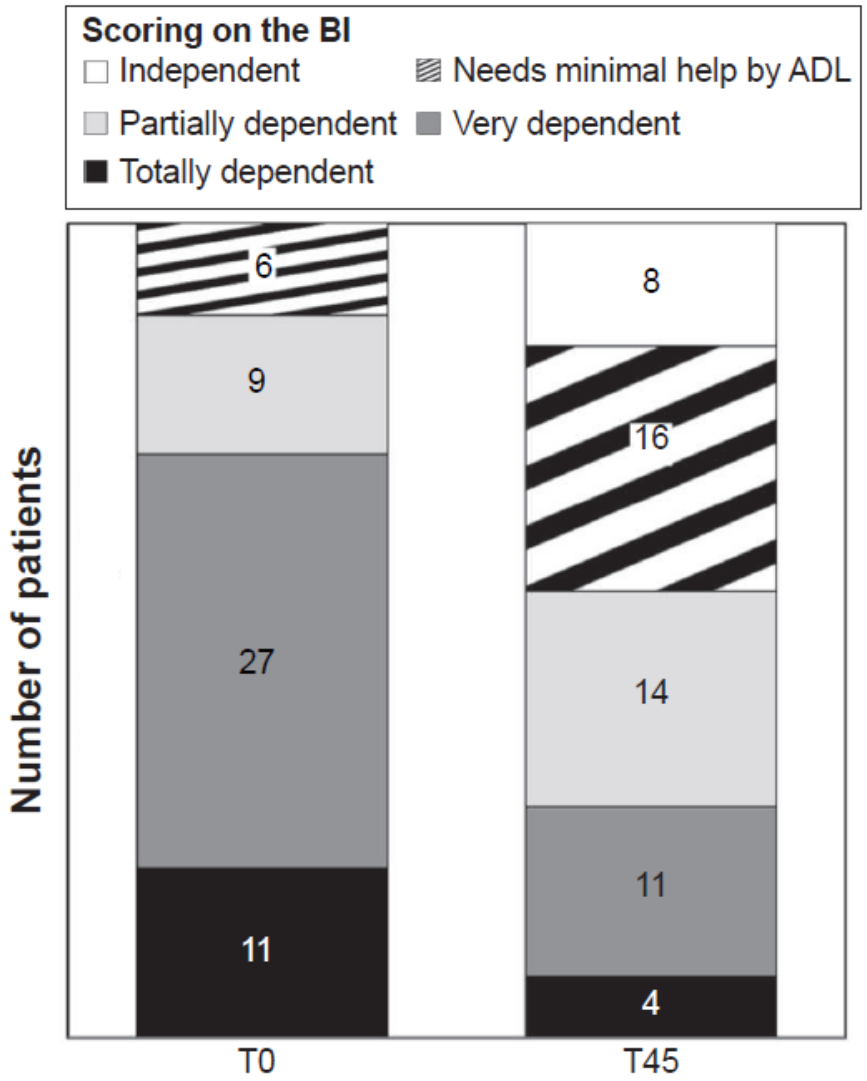


Figure 4 Pattern of physical disabilities at baseline (T0) and after the 45-day treatment with prolonged-release oxycodone/naloxone (T45), as measured by the Barthel activities of daily living (ADL) index.

Note: Differences between T0 and T45 were statistically significant ($P<0.001$ for all comparisons).

Abbreviation: BI, Barthel activities of daily living index.

CASE

- 81 YR-OLD CHINESE WOMAN, SPEAKS LITTLE ENGLISH
- RIGHT-SIDED CVA CAUSING HEMIPARESIS 7 YEARS AGO
- FACILITY CARE NOW FOR 5 YEARS
- ON ADMISSION TO FACILITY NOTED TO RESIST CARE, BE AGITATED
- TREATED WITH OLANZEPINE, NORTRIPTYLINE, PAROXETINE, TYLENOL #3 PRN
- BEHAVIOUR SETTLED

CASE

- VASCULAR DEMENTIA PROGRESSES: BECOMES LESS MOBILE AND LESS COMMUNICATIVE
- ANNUAL CARE CONFERENCE NOTES DROWSINESS
- OLANZEPINE STOPPED, PAROXETINE SWITCHED TO CITALOPRAM, NORTRIPTYLINE STOPPED
- 6 WEEKS LATER: AGITATED, EATS ALMOST NOTHING, ANXIOUS, OFTEN TAKING OFF CLOTHES
- SON WANTS FULL INVESTIGATIONS AND TRANSFER TO ACUTE CARE

CASE

- RESTARTED OLANZEPINE TO REDUCE AGITATION AND INCREASE APPETITE
- SWITCH CITALOPRAM TO MIRTAZEPINE
- LONG INSIGHTFUL DISCUSSION WITH SON ABOUT PREFERENCES FOR CARE

DOES TAKING OFF CLOTHES SUGGEST ANYTHING IN THIS WOMAN'S SITUATION?

CASE

- ALLODYNIA: A NON-PAINFUL SENSATION IS PAINFUL
- SIGN OF CENTRAL NEUROPATHIC PAIN
- TYLENOL #3 DISCONTINUED
- METHADONE 1MG Q12 HR TITRATED UP TO 2MG IN AM AND 1MG IN PM
- RESIDENT EATING ALL MEALS, KEEPING HER CLOTHES ON, NOT ANXIOUS

KEY LEARNINGS

- MEDICATIONS CONTROLLING SYMPTOMS WE ARE NOT AWARE OF
- PAST MEDICATION HISTORY IS IMPORTANT
- WHEN DEMENTIA REDUCES COMMUNICATION LOOK FOR SIGNS OF DISCOMFORT

HYPERALGESIA AND ANALGESIC TOLERANCE

- HYPERALGESIA: INCREASED SENSITIZATION AND PERCEPTION OF PAIN
- ANALGESIC TOLERANCE: MORE OPIOID NEEDED TO CONTROL THE SAME INTENSITY OF PAIN

- OIH SEEN IN ANIMAL MODELS, EXPERIMENTAL PAIN (USUALLY NORMAL SUBJECTS), SEEN IN PATIENTS ON OPIOIDS WITH SUBSTANCE USE DISORDER, REPORTED IN PATIENTS ON OPIOID TAPERS

SYSTEMATIC REVIEW OF OPIOID-INDUCED HYPERALGESIA IN CLINICAL POPULATIONS

- TOTAL OF 2706 SUBJECTS IN 26 STUDYS
- POOLED ANALYSIS SHOWED:
  - OIH WAS SEEN ONLY IN THERMALLY INDUCED PAIN AND NOT WITH ELECTRICALLY INDUCED PAIN
- OIH WAS SIGNIFICANTLY MORE COMMON IN PATIENTS WITH OPIOID USE DISORDER

PAIN MANAGEMENT

- Non-pharmacologic
- Pharmacologic
- Interventional

NON-INVASIVE NON-PHARMACOLOGICAL THERAPIES IN CHRONIC PAIN – AGENCY HEALTH RESEARCH & QUALITY 2018

- INTERVENTIONS THAT IMPROVED FUNCTION AND/OR PAIN FOR AT LEAST 1 MONTH WHEN USED FOR—
  - CHRONIC LOW BACK PAIN: EXERCISE, PSYCHOLOGICAL THERAPIES (PRIMARILY COGNITIVE BEHAVIORAL THERAPY [CBT]), SPINAL MANIPULATION, LOW-LEVEL LASER THERAPY, MASSAGE, MINDFULNESS-BASED STRESS REDUCTION, YOGA, ACUPUNCTURE, MULTIDISCIPLINARY REHABILITATION (MDR).
  - CHRONIC NECK PAIN: EXERCISE, LOW-LEVEL LASER, ALEXANDER TECHNIQUE, ACUPUNCTURE.
  - KNEE OSTEOARTHRITIS: EXERCISE, ULTRASOUND.
  - HIP OSTEOARTHRITIS: EXERCISE, MANUAL THERAPIES.
  - FIBROMYALGIA: EXERCISE, CBT, MYOFASCIAL RELEASE MASSAGE, TAI CHI, QIGONG, ACUPUNCTURE, MDR.
  - CHRONIC TENSION HEADACHE: SPINAL MANIPULATION.
  - MOST EFFECTS WERE SMALL. LONG-TERM EVIDENCE WAS SPARSE.
- THERE WAS NO EVIDENCE SUGGESTING SERIOUS HARMS FROM ANY OF THE INTERVENTIONS STUDIED; DATA ON HARMS WERE LIMITED.

EVIDENCE FOR ANALGESICS IN OLDER ADULTS

- EFFICACY STUDIES FOR OPIOIDS HAVE **NO PATIENTS OVER 73 YEARS** OF AGE
    - PAPALEONTIOU A ET AL JAGS 2010

- GUIDELINES FOR MANAGEMENT OF PAIN IN OLDER ADULTS FOCUS PRIMARILY ON ANALGESIC EFFICACY
- THE EFFICACY OF ANALGESICS MUST BE BALANCED WITH ADVERSE DRUG EVENTS (ADE) SINCE THE RISK OF ADE ARE MUCH HIGHER IN OLDER ADULTS
    - O'NEIL C ET AL AM J GERIATR PHARMACOTHER. 2012

ACETAMINOPHEN
SYSTEMATIC REVIEW/META ANALYSIS OF RCT

- 10 TRIALS OF 3521 PATIENTS FOR OA HIP AND KNEE
- 3 TRIALS OF 1825 PATIENTS FOR LOW BACK PAIN
- ACETAMINOPHEN IS INEFFECTIVE:
  - FOR REDUCING PAIN, DISABILITY OR IMPROVING QUALITY OF LIFE IN LOW BACK PAIN
- ACETAMINOPHEN DETECTABLE BUT NOT CLINICALLY IMPORTANT:
  - FOR REDUCING PAIN AND DISABILITY IN KNEE AND HIP OSTEOARTHRITIS
- ACETAMINOPHEN USERS HAVE ALMOST 4 TIMES LIKELIHOOD OF ABNORMAL LIVER FUNCTION TESTS – EFFECT UNCERTAIN
  - MACHADO ET AL. BMJ 2015;350:H1225 | DOI: 10.1136/BMJ.H1225

NSAIDS IN OLDER ADULTS

- NSAIDS USE VS NO USE: SIGNIFICANTLY HIGHER ALL CAUSE MORTALITY (OR 1.76)
    - KERR ET AL. CLIN PHARMACOL 2011
- RISK OF ACUTE RENAL FAILURE SIGNIFICANTLY HIGHER IN ALL NSAIDS AND SIGNIFICANT PROGRESSION OF CKD
    - SCHNEIDER V ET AL. AM J EPID. 2006
- COMPOSITE CARDIOVASCULAR OUTCOME (MI, STROKE, CHF, CARDIAC DEATH) HIGHER IN ALL NSAIDS
    - SOLOMON ET AL ARCH INT MED 2010

EFFICACY OF OPIOIDS IN OLDER ADULTS

- SYSTEMATIC REVIEW AND META-ANALYSIS
- 43 STUDIES, 8690 PATIENTS, AGE 60-73, MEAN AGE 64 YEARS
- MEAN DURATION OF TREATMENT: 4 WEEKS (12% OF STUDIES > 12 WEEKS)
- OSTEOARTHRITIS (70%), NEUROPATHIC PAIN(13%) AND OTHER CONDITIONS(17%)
- **SIGNIFICANT PAIN REDUCTION (P<0.001), PHYSICAL DISABILITY REDUCTION (P<0.001)**
- **SLEEP IMPROVEMENT (P=0.31)**
- ADVERSE EVENTS: CONSTIPATION (30%), NAUSEA (28%), DIZZINESS (22%)
- **ADVERSE EVENTS CAUSED 25% TO STOP OPIOID**
    - PAPALEONTIOU ET AL J AM GERIATR SOC 2010

EFFECTIVENESS OF OPIOIDS – LONG TERM STUDIES

- SELECTION CRITERIA: ADULTS, ≥10 SUBJECTS PER ARM, ANY CHRONIC PAIN CONDITION, DOUBLE-BLIND TREATMENT PERIOD LASTING ≥12 WEEKS, AND ALL M-AGONIST OPIOIDS APPROVED IN THE USA
- ENROLLED ENRICHMENT DESIGN TRIALS ONLY – INDIVIDUAL TITRATION TO OPTIMUM DOSING BEFORE START OF ANALYSIS.
- 15 STUDIES MET CRITERIA
- OPIOID EFFICACY WAS STATISTICALLY SIGNIFICANT ($P<0.001$) VERSUS PLACEBO: FOR PAIN INTENSITY, ≥30% AND ≥50% IMPROVEMENT IN PAIN, PATIENT GLOBAL IMPRESSION OF CHANGE, AND PATIENT GLOBAL ASSESSMENT OF STUDY MEDICATION.
- THERE WERE MINOR BENEFITS ON PHYSICAL FUNCTION AND NO EFFECT ON MENTAL FUNCTION.
  - MESKE ET AL. J PAIN RESEARCH 2018

EFFECTIVENESS OF OPIOIDS

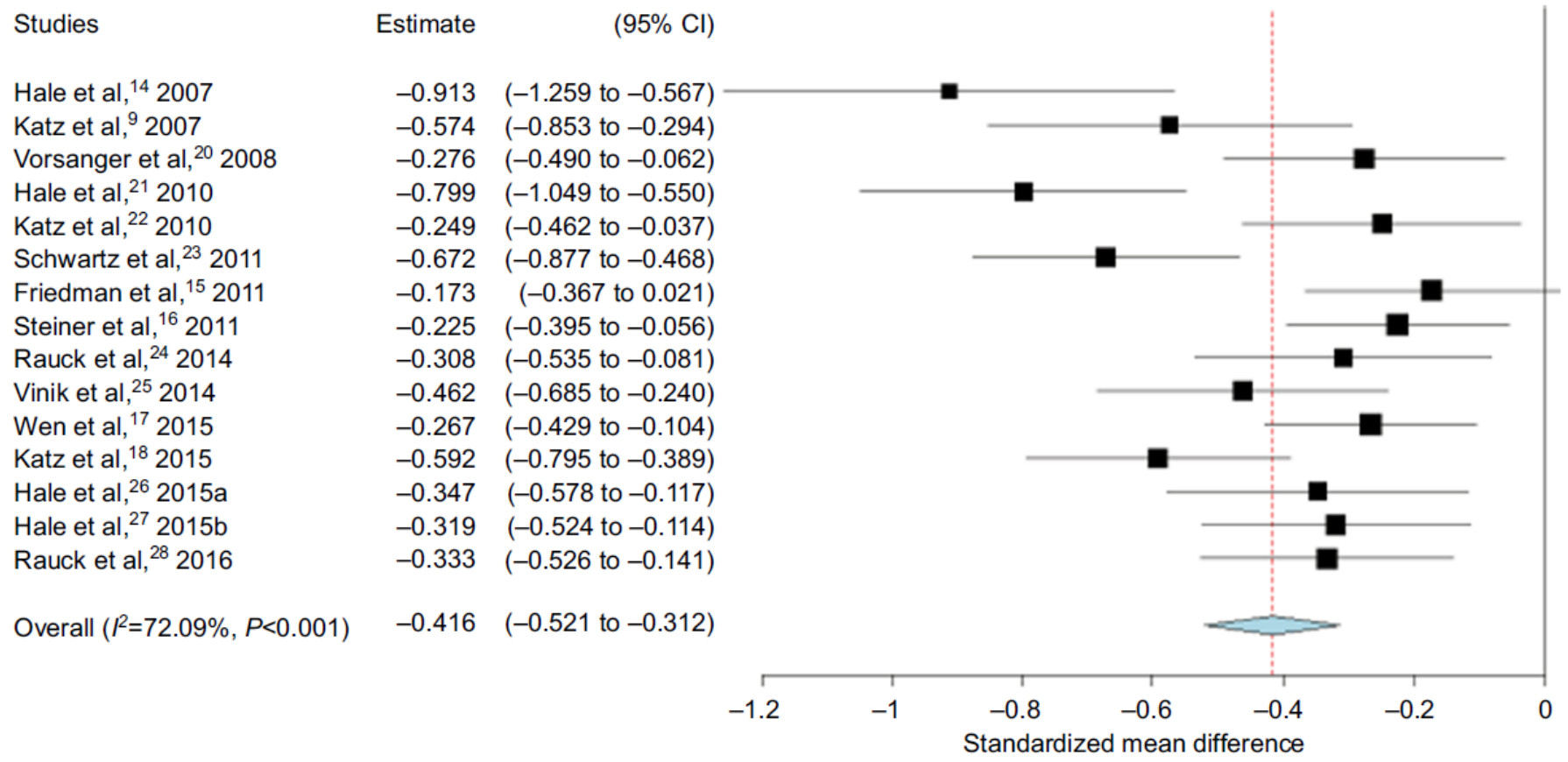
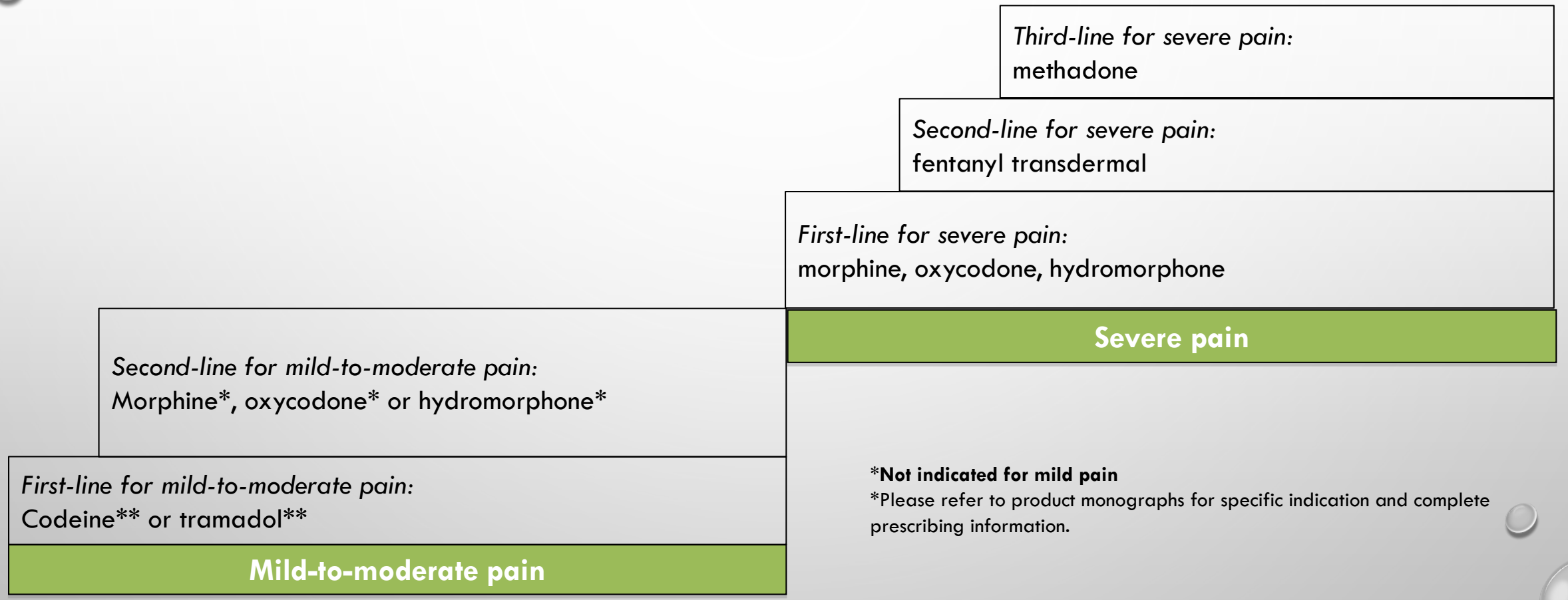


Figure 2 Change in PI from randomization baseline to week 12 with active study opioid drug versus placebo.
Notes: The standardized mean difference effect size was –0.416 and p<0.001, with a lower bound estimate of –0.521 and an upper bound –0.312.
Abbreviation: PI, pain intensity.

Meske et al J Pain Research 2018

PHARMACOLOGIC TREATMENT OPTIONS: STEPPED APPROACH TO OPIOID SELECTION



***Not indicated for mild pain**
*Please refer to product monographs for specific indication and complete prescribing information.

**±acetaminophen
NRS, numerical rating scale. NSAID, non-steroidal anti-inflammatory drug.

National Opioid Use Guideline Group (NOUGG), 2010.

OPIOID CLASSES

- ARE ALL OPIOIDS THE SAME?
  - OPIOIDS BIND TO THREE OPIOID RECEPTORS WITH DIFFERING EFFECTS
  - THERE ARE AT LEAST TWO DISTINCT CLASSES OF OPIOIDS BASED ON STRUCTURE
  - METHADONE ALSO TARGETS NMDA RECEPTORS
  - THERE ARE TWO PATHWAYS OF METABOLISM FOR OPIOIDS
  - SOME OPIOIDS ARE LIPOPHILIC AND THE REST ARE MORE HYDROPHILIC

  - **THEY ARE NOT THE SAME, BEWARE OF STUDIES THAT COMPARE ALL OPIOIDS**

VARIABILITY OF RESPONSE TO STRONG OPIOIDS

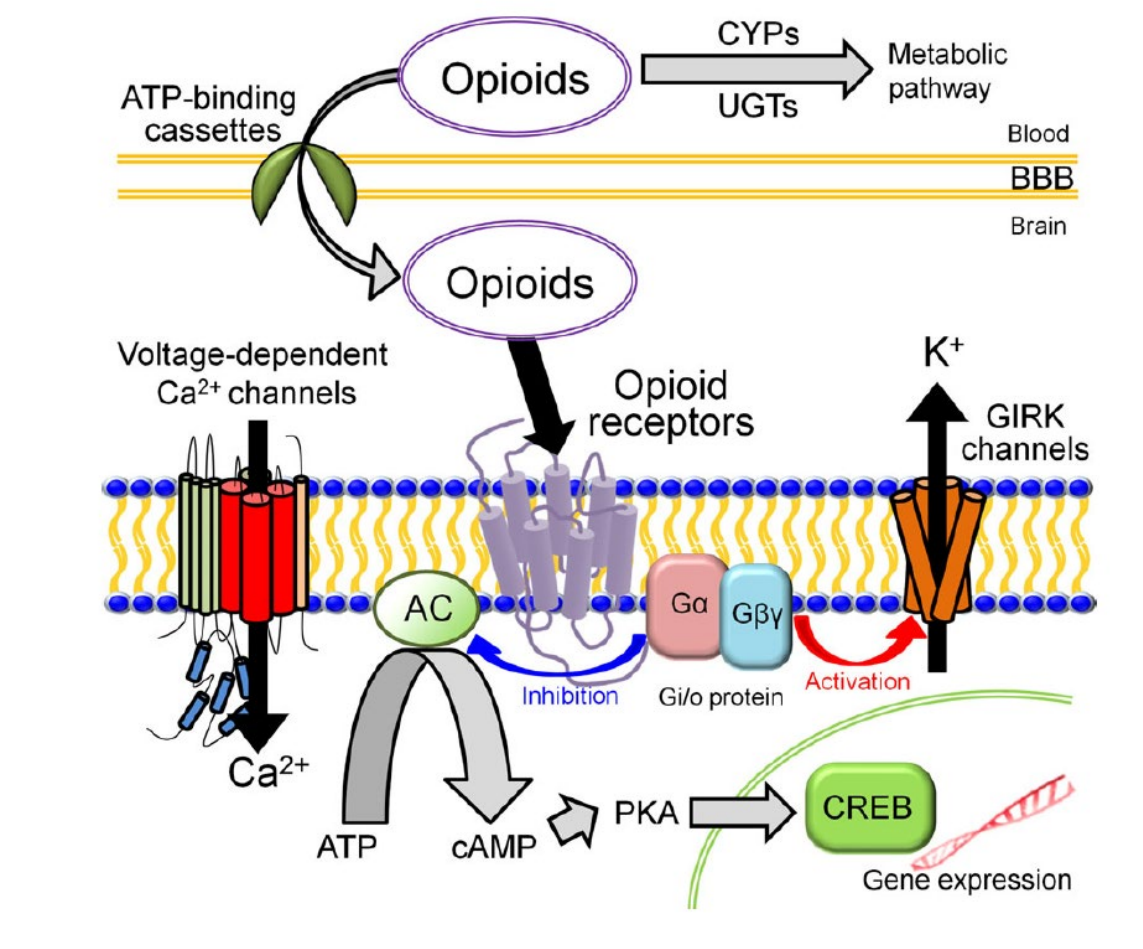
- FOUR-ARM MULTICENTER, RANDOMIZED, COMPARATIVE, TRIAL
- 520 PATIENTS RANDOMIZED TO RECEIVE MORPHINE, OXYCODONE, BUPRENORPHINE OR FENTANYL FOR 1 MONTH TO MANAGE CANCER PAIN
- MEAN AGE = 67 (12 SD)
- STARTED ON MORPHINE 30MG/DAY (OPIOID NAÏVE) OR 60MG/DAY (ALREADY ON OPIOID) OR MORPHINE EQUIVALENTS
- ASSESSED NON-RESPONDER OR POOR RESPONDER, PREVALENCE OF ADVERSE EFFECTS, CHANGES TO THERAPY TO MAINTAIN PAIN CONTROL
- **APROX. 25% WERE POOR TO NON-RESPONDERS**

VARIABILITY OF RESPONSE TO STRONG OPIOIDS

	Morphine	Oxycodone	Buprenorphine	Fentanyl	
% Increase in daily dose	32.7	70.9	56.4	121.2	Significant
% requiring increase dose	29.5	26.4	37.8	37.1	Not sig.
Rotation	22.1	12	16.5	12.9	Significant
Stopped due to toxicity/pain	27	15.2	20.5	14.5	Significant
Severe confusion	15.5	9.3	9.2	6.3	Significant

Corli et al. Annals of Oncology 2016

OPIOID GENOMICS



- GENETIC FACTORS ASSOCIATED WITH THE ACTION OF OPIOIDS:
- METABOLISM
- TRANSPORTATION
- OPIOID RECEPTORS
- CA & K CHANNELS
- GENE EXPRESSION - CREB

CASE

- 79 YEAR OLD WOMAN
- RIGHT CVA WITH LEFT HEMIPLEGIA
- RECURRENT TIAS, HT, AF, BLINDNESS L EYE
- OSTEOPOROSIS, RECURRENT FALLS
- DISTANT BREAST CANCER
- DEMENTIA – MODERATE
- ENGLISH WAS SECOND LANGUAGE

CASE

- NOISY AND AGITATED WITH CARE
- SUN DOWNING: LOXAPINE 2.5MG AT HS NOT EFFECTIVE
- SEEN BY PSYCHIATRIST, SCREENING TESTS FOR DELIRIUM
- INCREASE DOSE OF ANTIPSYCHOTIC IN LATE AFTERNOON AND PM

CASE

- ANOTHER FALL RESULTING IN UNSTABLE INTERTROCHANTERIC HIP#
- ADMITTED TO ACUTE CARE AND HAD HIP SCREW
- ADMITTED TO REHAB WARD
- SEEMED TO BE UNABLE TO FOLLOW DIRECTIONS AND WAS RESISTING CARE AND PINCHING STAFF.
- DIAGNOSIS: ADVANCED DEMENTIA, RETURN TO RESIDENTIAL CARE

CASE

- ACUTE CARE PAIN MEDICATION ORDERS:
  - HYDROMORPHONE 1-2MG Q4HR WHILE AWAKE
  - TYLENOL 650MG QID WHILE AWAKE

- WHAT IS WRONG WITH THESE ORDERS?

CASE

- RETURNED TO RESIDENTIAL CARE
- STARTED ON OXYCODONE SR 15MG Q12HR
- TITRATED UP TO 50MG IN AM, 40MG IN PM
- COMFORTABLE: SMILING, NO RESISTANCE TO CARE, ABLE TO CONVERSE WITH INTERPRETER

CASE 4

- EQUIVALENT DOSE FOR ACUTE CARE ORDERS:
  - 2MG X 4 DOSES = 8MG = **40MG MORPHINE/DAY**
- EQUIVALENT DOSE FOR RESIDENTIAL CARE ORDERS:
  - 50MG + 40MG = 90MG/DAY = **135MG MORPHINE** /DAY

KEY LEARNING

- WHILE AWAKE AND PRN ORDERS NOT ACCEPTABLE IN DEMENTIA PATIENTS WITH KNOWN PAIN
- OLDER PEOPLE GENERALLY REQUIRE LOWER OPIOID DOSES THAN YOUNGER PEOPLE BUT…
- **THE DOSE THAT GIVES PAIN RELIEF VARIES FROM PERSON TO PERSON**

OPIOIDS OF CHOICE IN FRAIL ELDERLY AND RENAL FAILURE

- HYDROMORPHONE IS BETTER THAN MORPHINE AND CODEINE
- OXYCODONE
- FENTANYL
- METHADONE
- BUPRENORPHINE

TRAMADOL

- DUAL ACTION
  - OPIOID AGONIST
  - INHIBITS REUPTAKE OF SEROTONIN AND NOREPINEPHRINE
- METABOLISM: LIKE CODEINE REQUIRES METABOLISM TO BECOME ACTIVE
- VIEW AS A **WEAK OPIOID** – I.E. FOR MODERATE PAIN
- AVAILABLE DOSAGE STRENGTHS (CR TRAMADOL, Q24H)
  - 150MG Q24H IS THE USUAL ADULT STARTING DOSE FOR OPIOID NAÏVE PATIENTS
  - NOT TO EXCEED 400 MG TOTAL DAILY DOSE
- RECENT REPORT OF INCREASED RISK OF HYPOGLYCEMIA AND HYPONATREMIA
  - FOURNIER ET AL. JAMA INTERNAL MEDICINE 2015; FOURNIER ET AL AM J MED 2015
- RECENT REPORT OF 29% NAUSEA AND VOMITING IN PALLIATIVE PATIENTS
  - HUSIC ET AL. MATER SOCIOMED 2015

FENTANYL PATCH

- FENTANYL IS HIGHLY LIPOPHILIC AND POORLY ABSORBED ORALLY
- A 25MCG FENTANYL PATCH = 100MG MORPHINE/DAY = 20 TYLENOL #3 PER DAY
- TAKES 12 HOURS FOR ONSET OF ANALGESIA
- NEED ADEQUATE SUBCUTANEOUS TISSUE FOR ABSORPTION
- TAKES 24 HOURS TO REACH MAXIMUM EFFECT
- CHANGE PATCH EVERY 72 HOURS
- DOSAGE CHANGE AFTER SIX DAYS ON PATCH

SUFENTANIL FOR INCIDENT PAIN

- WELL ABSORBED THROUGH BUCCAL, SUBLINGUAL AND NASAL MUCOSA
  - ONSET IS 5-10 MINUTES
  - CLEARED IN 30 MINUTES
  - 12.5MCG- 25MCG STARTING DOSE
  - UP TO 100MCG PER DOSE
  - FOR SUBLINGUAL USE MUST BE ABLE TO FOLLOW DIRECTIONS
- IF UNABLE TO FOLLOW DIRECTIONS MAY USE INTRANASAL

OXYCODONE/NALOXONE CR TABLETS

- OXYCODONE WITH CORE OF NALOXONE
- LOWER INCIDENCE OF CONSTIPATION
- NALOXONE NOT ABSORBED FROM THE GUT – NO EFFECT ON ANALGESIA
- COMES IN 5,10, 20, 40MG OXYCODONE SIZE
- NOT COVERED BY PHARMACARE BUT MAY HAVE OTHER COVERAGE

BUPRENORPHINE

- PARTIAL AGONIST OF MU RECEPTOR
- PHARMACOKINETICS ARE COMPLEX AND STILL NOT COMPLETELY UNDERSTOOD
- SLOW ONSET, HIGHLY BOUND TO RECEPTOR
- CAN BE STARTED IN OPIOID NAÏVE PATIENTS
- CEILING EFFECT – **CONSIDER AS A WEAK OPIOID**
- COMES IN PATCH THAT LASTS 7 DAYS
- USEFUL FOR MODERATE PAIN
- BUPRENORPHINE PATCH CURRENTLY NOT REIMBURSED BY PHARMACARE – MAY HAVE OTHER COVERAGE

METHADONE

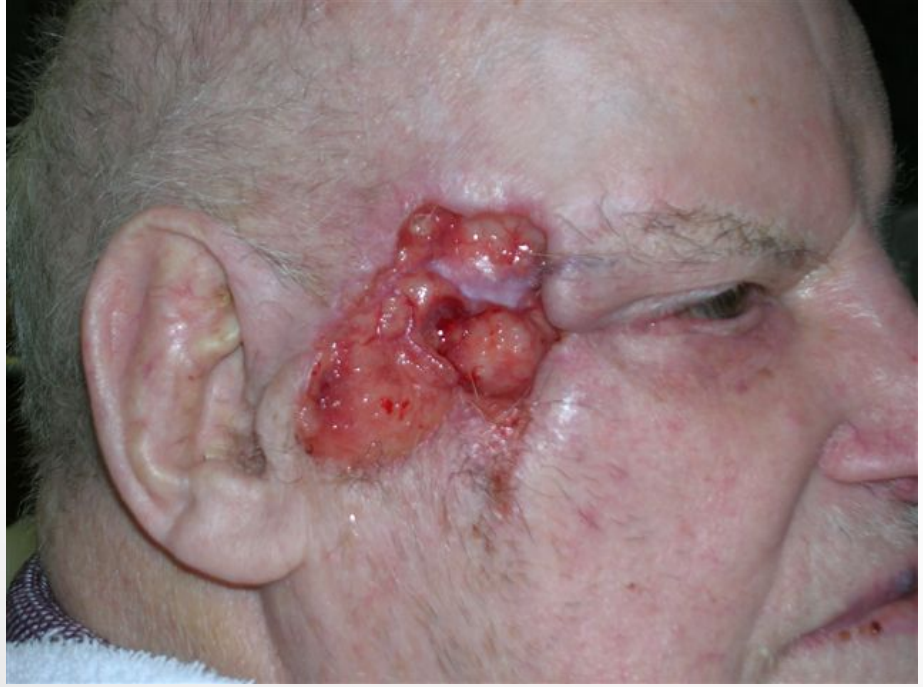
- WELL TOLERATED AND EFFECTIVE
- STARTING DOSE 1MG Q12HR
- WELL ABSORBED ORALLY AND BUCALLY
- TITRATE ONCE WEEKLY ONLY
- USE OTHER SHORT ACTING OPIOID FOR BREAKTHROUGH PAIN WHILE TITRATING METHADONE
- USE METHADONE FOR BREAKTHROUGH DOSE BID-TID ONCE ON STABLE DOSE
    - GALLAGHER PAIN MED. 2009

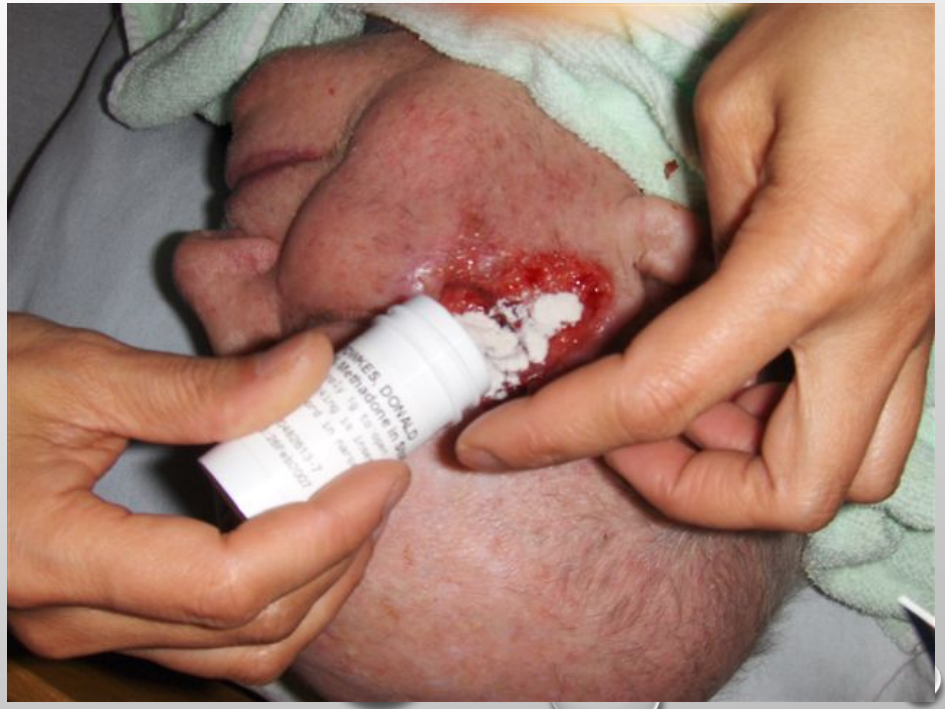
LONG-ACTING OPIOIDS

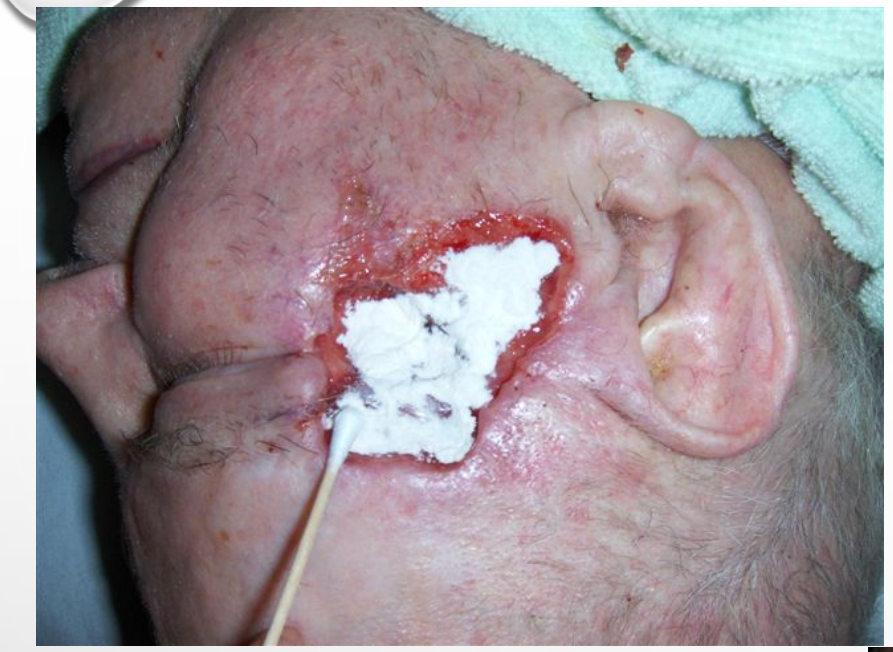
- INCREASE DOSE BY 15-20% EACH TIME IF SYMPTOM NOT CONTROLLED
- STARTING WITH LONG-ACTING OPIOIDS?
  - OFFICIALLY NO, BUT IN REALITY…..
  - INADEQUATE STAFF TO DO Q4HR OPIOIDS IN LONG TERM CARE
  - OXYCODONE SR 5MG = 1.5 TYLENOL #3 Q12
  - METHADONE 1MG Q12 HRS = 2 TYLENOL #3 Q12
  - ½ 12MCG PATCH = 5 TYLENOL #3 Q24
- BUPRENORPHINE PATCH IS SAFE IN OPIOID NAIVE

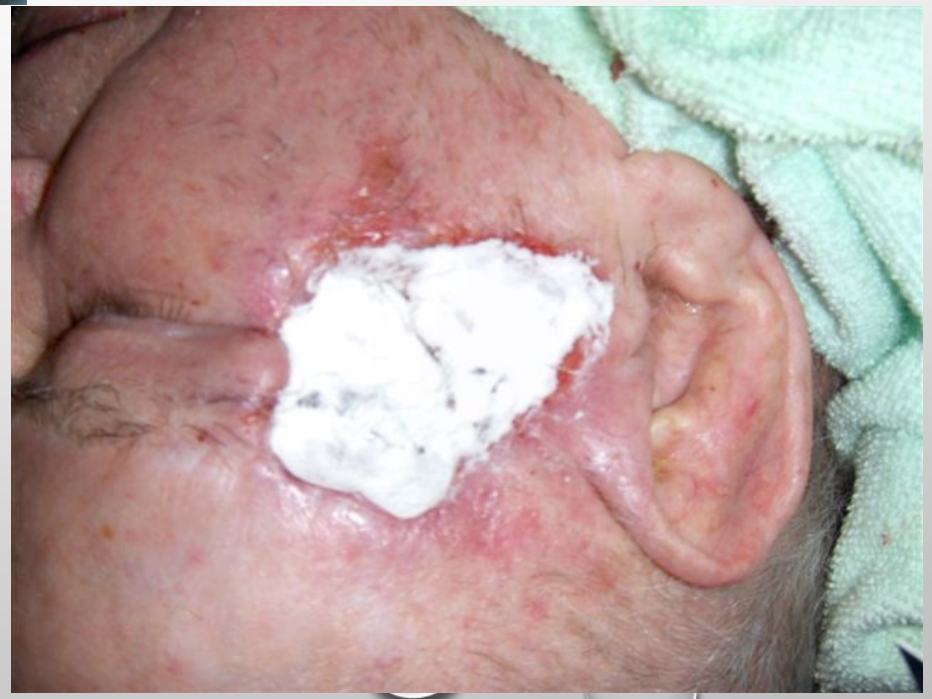
TOPICAL OPIOIDS

- ISCHEMIC ULCERS, PRESSURE ULCERS
- TUMORS
- EXPOSED TISSUE HAS OPIOID RECEPTORS
- MORPHINE 1% CONCENTRATION IN INTRA-SITE GEL
- METHADONE 1% CONCENTRATION IN INERT WOUND POWDER









CANNABIS FOR NEUROPATHIC PAIN

- VERY LOW TO MODERATE QUALITY OF EVIDENCE
  - SMALL STUDY NUMBERS
  - HIGH RATE OF PATIENTS DROP OUT OR LOST TO FOLLOW UP
  - MULTIPLE PRODUCTS USED (INCLUDING NABILONE)
- MANY ADVERSE EVENTS
- CONCLUSION: RISK OF ADVERSE EVENTS MAY OUTWEIGH SMALL BENEFITS THAT WERE SEEN
  - MUCKE ET AL COCHRANE DATABASE SYST REV 2018
- IF YOU ARE GOING TO TRY IT: USE CBD ONLY

NEUROPATHIC PAIN ADJUVANTS

- NNT GABAPENTIN 7.7, NNT PREGABALIN 7.2
- NNT FOR STRONG OPIOIDS 4.3
  - FINNERUP ET AL. LANCET NEUROLOGY 2015
- SYSTEMATIC REVIEW OF GABAPENTINOIDS
  - NON-SPECIFIC BACK PAIN AND LUMBAR RADICULAR PAIN
  - 9 TRIALS, 859 PATIENTS
  - GABAPENTINOIDS: HIGH-QUALITY EVIDENCE THAT GABAPENTINOIDS **DID NOT** REDUCE PAIN OR DISABILITY COMPARED TO PLACEBO
  - ADVERSE EVENTS WERE COMMON: DROWSINESS, DIZZINESS, NAUSEA
    - ENKE ET AL CMAJ 2018

NEUROPATHIC PAIN ADJUVANTS

- NNT TCA = 3.6 NNT SNRI = 6.4
  - FINNERUP ET AL. LANCET NEUROLOGY 2015
- TCAS HAVE INTOLERABLE SIDE EFFECTS
  - IN A TRIAL OF TCA VS OPIOIDS FOR NEUROPATHIC PAIN, BOTH WERE EFFECTIVE, BUT PATIENTS PREFERRED OPIOIDS (54%) TO TCAS(30%) TO PLACEBO(10%) P=0.02
    - RAJA ET AL NEUROLOGY 2003
- **SNRIS ARE LIKELY THE BEST OPTION FOR OLDER ADULTS WITH NEUROPATHIC PAIN**
  - STUDY OF >80 YEARS OLD FOUND IT SAFE AND EFFICACIOUS FOR DEPRESSION
    - BACA ET AL INT J GERIATR PSYCHIATRY 2006

STRATEGY FOR MANAGING PAIN IN RESIDENTIAL CARE

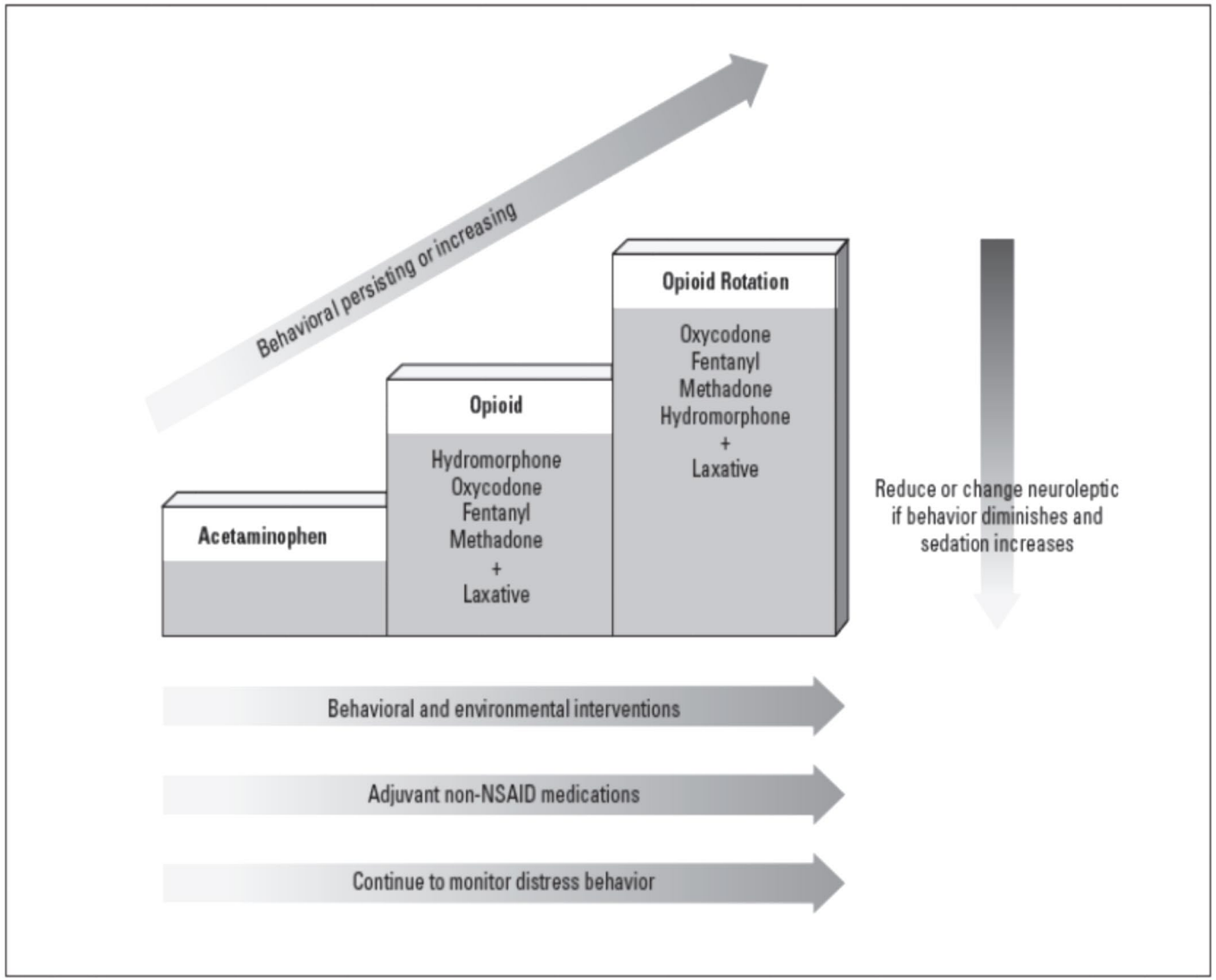


Figure. Trial of analgesics for older adults with advanced dementia exhibiting distress behavior.

Adapted from the World Health Organization's "Three-step analgesic ladder" for cancer pain relief[17]

PAIN AND DEPRESSION

- IF PAIN AND DEPRESSION COEXIST – TREAT BOTH AT THE SAME TIME
- USE NON-PHARMACOLOGICAL THERAPIES THAT TARGET BOTH PAIN AND DEPRESSION
  - CBT, HYPNOTHERAPY, ACCEPTANCE THERAPY
- USE ANTIDEPRESSANTS THAT WORK FOR PAIN AND DEPRESSION
  - SNRI, MIRTAZAPINE
  - MAY NEED HIGHER DOSES THAN TYPICAL FOR DEPRESSION ALONE

CASE

- 84 YEAR OLD WOMAN
- ADMITTED TO ACUTE CARE FROM FACILITY FOR ONGOING ABDOMINAL PAIN AND DECLINING FUNCTION.
- PAST MEDICAL HISTORY OF CORONARY ARTERY DISEASE, TIA
- PAIN DIFFUSE, WORSE WITH EATING SO EATING LITTLE. SIGNIFICANT WEIGHT LOSS OVER LAST 6 MONTHS
- DENIES ANXIETY OR DEPRESSION. NO PREVIOUS HISTORY OF MENTAL ILLNESS.
- LOOSING FUNCTION AND MAY NOT BE SUPPORTABLE IN ASSISTED LIVING
- NO ABNORMALITIES ON PHYSICAL EXAM.
- ALL INVESTIGATIONS NORMAL FOR AGE – CT, ENDOSCOPY, COLONOSCOPY, ULTRASOUND
- ON MULTIPLE MEDICATIONS TO DEAL WITH HER PAIN: OXYCODONE 20MG SR Q12HR, OXYCODONE 5MG Q4HR PRN, PEG 17G DAILY, LACTULOSE PRN, ENEMA PRN, HYOSCINE BUTYLBROMIDE TID FOR SPASM,

CASE

ADMITTED TO ACUTE CARE WITH PRESUMED DIAGNOSIS OF PRIMARY UNKNOWN OR ISCHEMIC BOWEL. PALLIATIVE CARE ASKED TO SEE TO MANAGE PAIN SO SHE IS COMFORTABLE.

INTERPRETER CALLED TO VISIT WITH PALLIATIVE TEAM. SHE IS A WIDOW WHO CAME TO CANADA TO LIVE WITH DAUGHTER 20 YRS AGO. TEARFUL AND VERY EMOTIONAL AS DAUGHTER HAS DIED AND SHE IS LONELY AND MISSES HER

HOW LONG AGO DID DAUGHTER DIE?

16 YEARS AGO

CASE

- MIRTAZEPINE STARTED AND TITRATED UP IN HOSPITAL.
- STOPPED HYOSCINE BUTYLBROMIDE
- REDUCED OPIOID AS SHE BEGAN TO IMPROVE AND REPORT LESS PAIN

KEY LEARNING

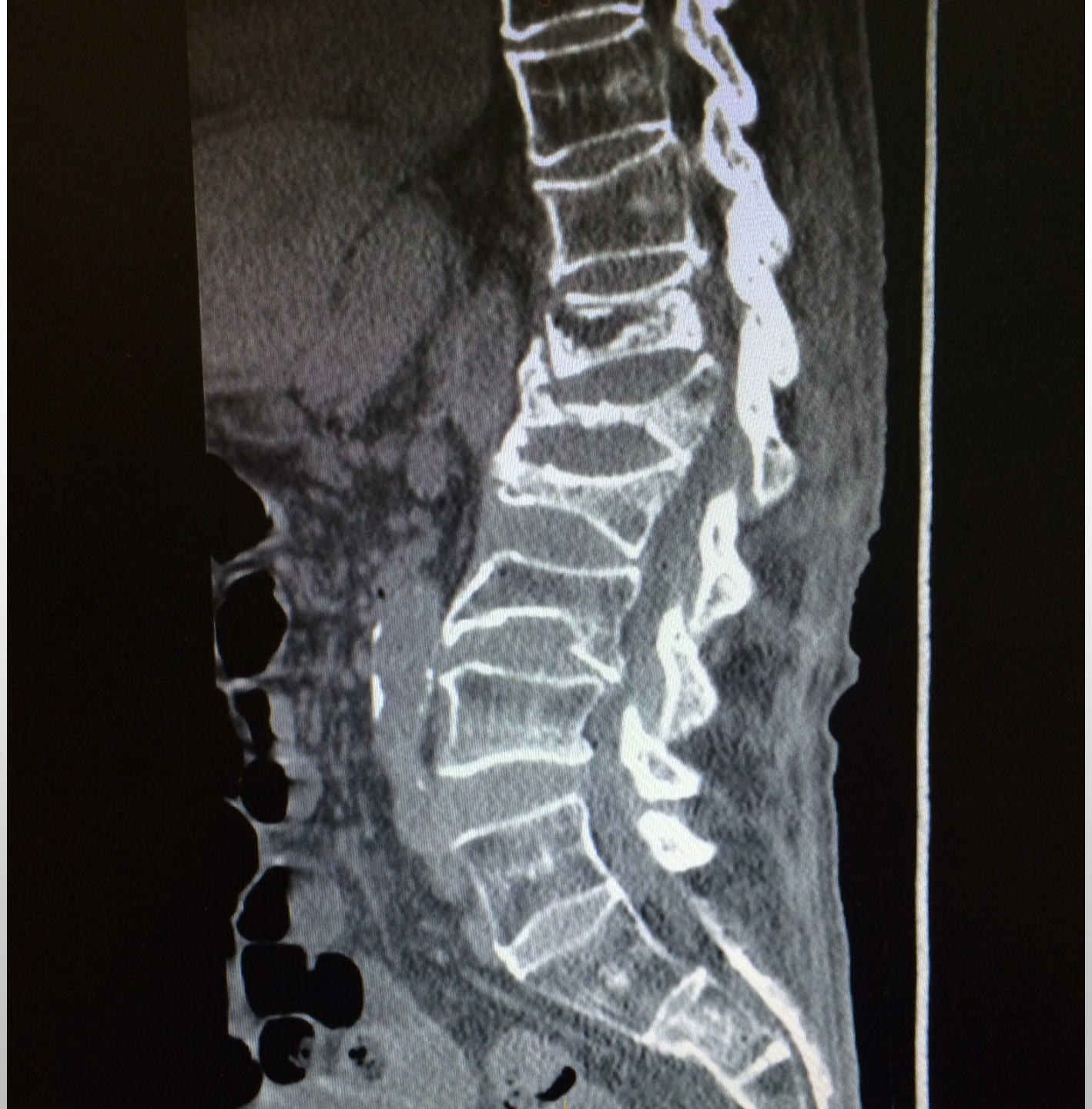
- PAIN AS A SOMATIC MANIFESTATION OF DEPRESSION
- CAN SEE IN ALL CULTURES BUT MORE COMMON IN TRADITIONAL SOCIETIES WHERE MENTAL ILLNESS STILL HAS ENORMOUS STIGMA.
- RESPONDS TO ANTIDEPRESSANTS

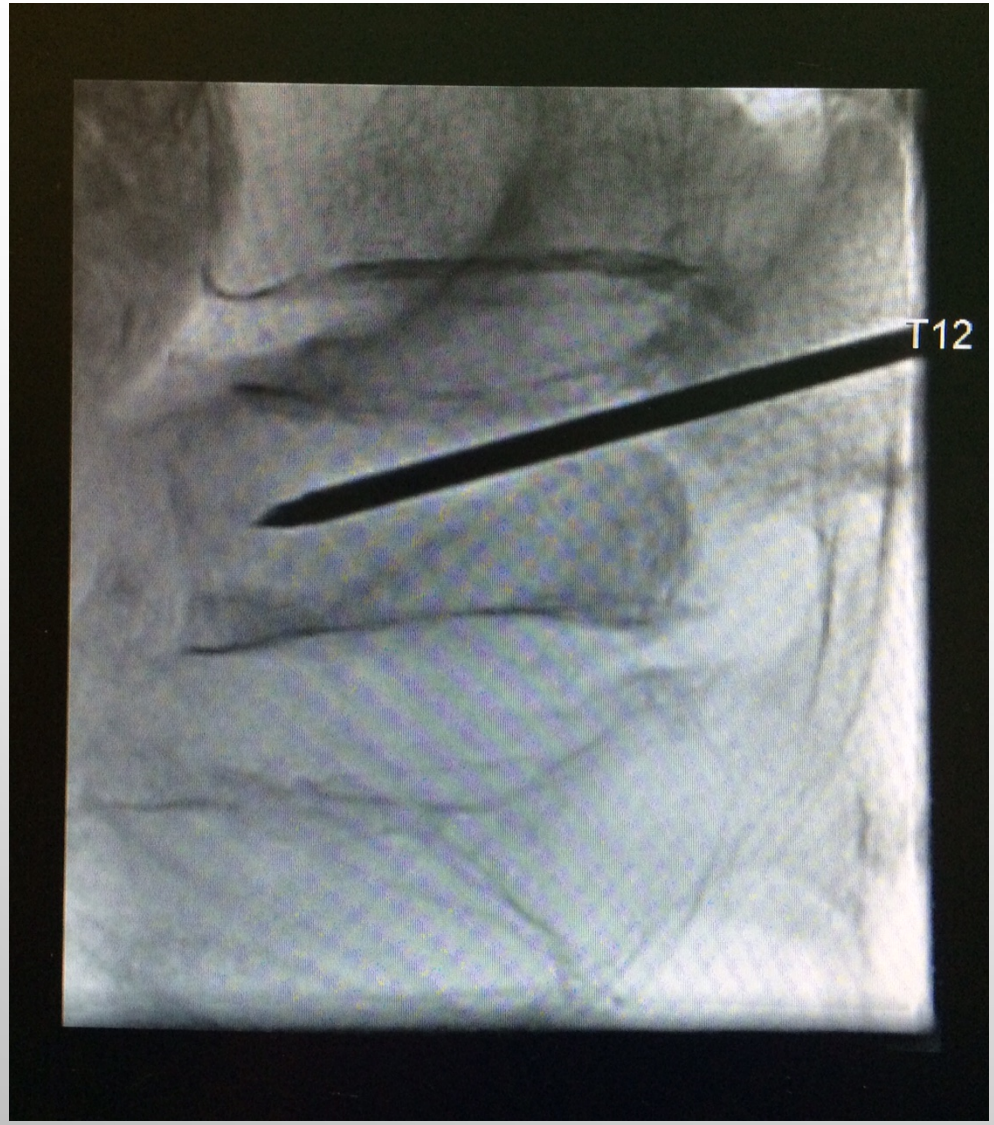
PAIN AND SLEEP

- PAIN IS AN INDEPENDENT FACTOR CAUSING POOR SLEEP
- >50% OF CHRONIC PAIN PATIENTS HAVE POOR SLEEP
- POOR SLEEP IS AN INDEPENDENT FACTOR CAUSING INCREASED PAIN SENSITIVITY
- ENSURE THAT MEDICATIONS DO NOT EXACERBATE SLEEP
- IF PAIN MEDICATIONS NOT EFFECTIVE, IMPROVING SLEEP MAY IMPROVE QUALITY OF LIFE SOMEWHAT
    - FERINI-STRAMBI 2017, HASSABALA ET AL 2018

PAIN INTERVENTIONS

- VERTEBROPLASTY
  - CT SCAN MORE ACCURATE THAN X-RAY
  - MAY IMPROVE PAIN EVEN PAST ACUTE FRACTURE PERIOD
  - DONE AS OUTPATIENT
- EPIDURAL STEROID INJECTION
  - SPINAL STENOSIS, NERVE ROOT ENTRAPMENT: MULTIPLE SITES
- NERVE ROOT INJECTION
  - SINGLE SITE

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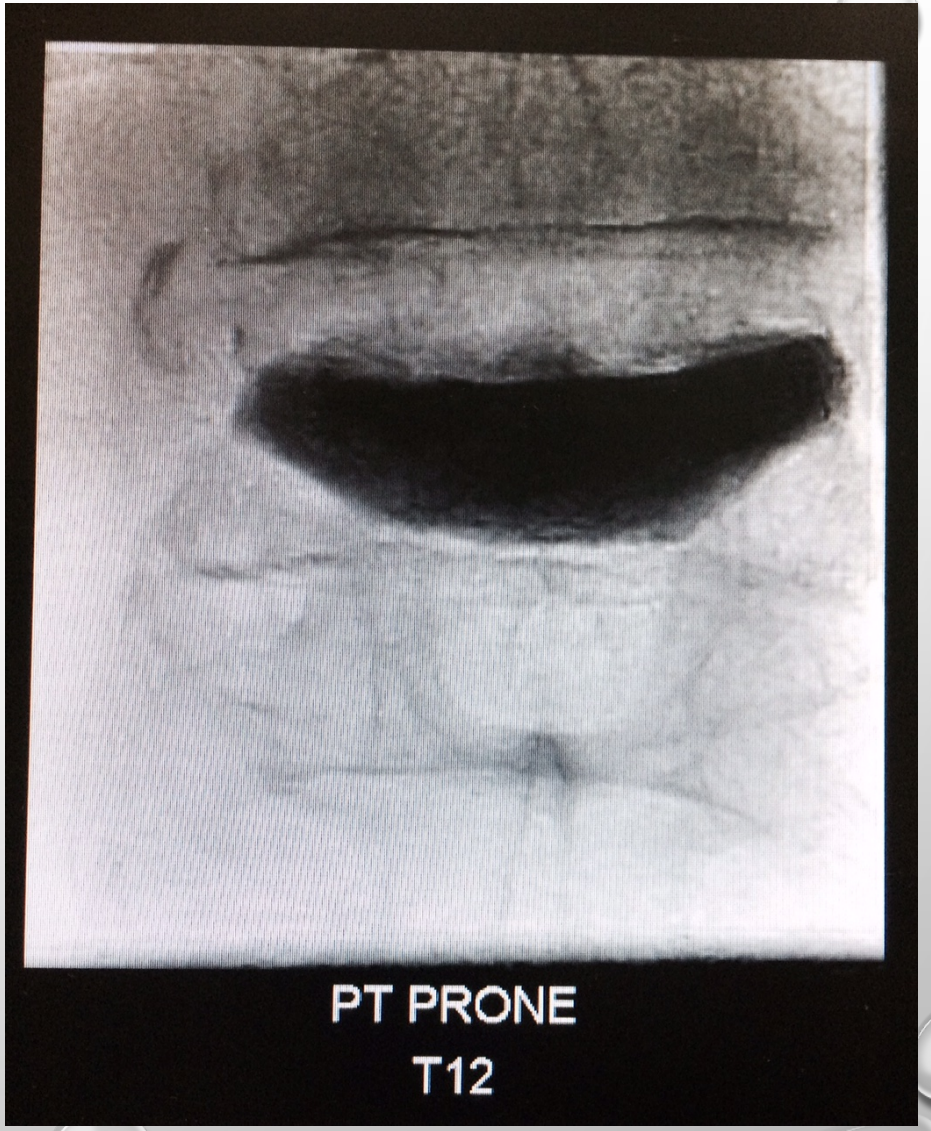
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IPAL

- ESSENTIAL INFORMATION FOR PALLIATIVE CARE/SYMPTOM MANAGEMENT
- WEB-BASED APP WORKS ON ANY SMART PHONE

- HTTP://IPALAPP.COM

- DEVELOPED BY PROVIDENCE HEALTH CARE PALLIATIVE CARE PROGRAM

PLEASE FILL OUT THE ASSESSMENT

- HTTPS://WWW.SURVEYMONKEY.COM/R/ASSESS_TREAT