PAIN
rethinking our approach to pain and the role of opioid therapy

Malcolm Hogg
Royal Melbourne Hospital
Australian Pain Society
Declaration

- Pharma research
  - Mundipharma

- Education/Advisory
  - Mundipharma
  - Sequiris
  - NPS
  - University of Melbourne
  - move (Arthritis OP Victoria)

- Boards
  - Australian Pain Society
  - painaustralia
Current thinking: take home messages

• Pain is a multidimensional personal experience
  – psychosocial aspects relevant pre and post pain onset
  – neurological basis, with genetic and developmental influences
  – socio-psycho-neurological management required

• Opioids are anti-nociceptive
  – essential to (severe) acute pain management
  – role in chronic pain as part of a multidisciplinary, multimodal approach
    • function rather than pain reduction the focus

• Optimal use of opioids requires effort
  – limit opioid failure, adverse effects
    • combine with anti-hyperalgesic
  – educate, review, titrate/taper
    • boundaries
An approach to pain assessment: initial

• **Who is the person?**
  – family history, development, adversities
  – past pain experience and response
  – psychological and physical fitness: depression, anxiety, appraisals

  *yellow flags: psycho-social factors associated with increased risk of disability, distress*

• **What are the potential mechanisms?**
  – nociceptive, neuropathic, “sensitisation”

  *red flags: clinical indicators of possible serious medical conditions*

• **What is the impact?**
  – biological, psychological, social
  – bi-directional interactions/cycle development: disability
An approach to pain assessment: review

• **What is the expected/actual journey?**
  – trajectory predicts recovery, although consider neuropathy
    • tissue recovery/injury
    • social response/interactions

  *Response:* _how is the person and their environment responding?_

• **Flag system**
  – Based on RTW analysis/data, although applicable to other pain experiences
    • a flag suggesting increased risk of failed RTW

  – **Orange**: mental health disorders
  – **Blue**: workplace or social related factors/perceptions
  – **Black**: compensation system/legal factors
An approach to pain management

- **Manage from a socio-psycho-biological perspective**
  - Patient education essential
    - team liaison, including family, medical
  - Pharmacological
    - opioids for nociceptive pain, with anti-HA'ics
    - NSAIDS, biologicals, anti-oxidants for inflammation
    - regionals, ketamine, clonidine, TCAD/SNRI, GBP for sensitisation
  - Non-pharmacological
    - physical rehabilitation, re-exposure
    - psychology assessment/management
      - education, cognitive re-appraisals, acceptance, mindfullness
    - social
      - judicious support, lessen solicitation, legal (?early apology)
Pain pathways

- Nociception
  - respond to thermal, chemical and mechanical
  - somatic
    - deep, superficial
  - visceral
    - include vagal afferents

- Multiple brain centres activated
  - sensory-discriminative: SS1, SS2,
  - affective-motivational: ACC, Insular
  - cognitive-evaluative: PFC

- Pain is a multidimensional experience

Do we need a third mechanistic descriptor for chronic pain states?

Eva Kosek\textsuperscript{a,*}, Milton Cohen\textsuperscript{b}, Ralf Baron\textsuperscript{c}, Gerald F. Gebhart\textsuperscript{d}, Juan-Antonio Mico\textsuperscript{e}, Andrew S.C. Rice\textsuperscript{f}, Winfried Rief\textsuperscript{g}, A. Kathleen Sluka\textsuperscript{h}

Kosek E. Pain 2016; 157: 1382

- Nociceptive
  - Damage or threat to non-neural tissue, normal system
- Neuropathic
  - Clinical description, with defined pathology of somatosensory system
- Other term required for clinical description
  - Clinical and psychophysical evidence of altered nociception
    - \textit{Nociplastic}: change in function
    - \textit{Algopathic}: pathologic perception of pain
    - \textit{Nocipathic}: pathological nociception

In reality: complex, combination, inferred but often unknown mechanisms
Clinical pain

- Sensitisation
  - peripheral: inflammatory mediators, nerve changes
  - spinal cord sensitisation: up-regulation (NMDA, NOS, PG’s)
    - Including glial cell activation
  - brain changes: cortical re-organisation

- Behavioural change
  - sleep, mood, fear-avoidance, hyper-vigilance

- Descending modulation
  - inhibition
  - facilitation

- Catastrophising associated with É TS, Í DINC

  » Yarnitsky D. Pain 2012; 153: 1193

Consider a person's nociceptive spectrum in assessing current pain.
Factors associated with pain severity and persistence

- Acute pain severity biggest predictor of chronic pain
  - surgical factors, post-operative care, rehabilitation
  - ? neurogenic inflammation

- Psycho-social aspects important, including the trajectory
  - genetic
    - including anxiety, catastrophising
  - adverse childhood experiences
    » Scott K. Arch Gen Psych 2011; 68: 838
  - plus parental style
  - past pain and pain cognitions
  - compensation/solicitous systems
  - perceived injustice
    » Martel M. Clin J Pain 2016; aug12
Influence of opioids

- OIHA: ñ nociceptive threshold
- OT: ñ anti-nociceptive processes

- Opioid exposure at moderate dose
  - pain sensitivity, including ñ pressure, thermal pain threshold
  - ñ DINC
  - ñ temporal summation
    » Mao J. Reg Anesth Pain Med 2015; 40: 663

- Dose response relationship
  - >100 oral Meq associated with pressure pain sensitivity
  - hyperalgesia with fentanyl (males)
Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain

• “non-elaborative, non-judgmental awareness” of present moment experience
  – regulated, sustained attention to sensory, emotional, cognitive events
  – recognition as momentary, fleeting and changeable
  – lack of cognitive and emotional appraisal

• EEG and fMRI suggest long term meditators change brain response to noxious stimuli (in non-meditative state)
  – less unpleasantness, greater sensory activation (insula, cingulate, OFC)
  – less med-PFC, amygdala, less connectivity between PFC-cingulate

• Increased sensory processing whilst meditating
  » Zeidan F. Neurosci Lett 2012; 520: 165

• Different fMRI activation to placebo in experimental pain
  – greater effect
  » Zeidan F. J Neuroscience 2015; 35: 15307
Breast Surgery

- PVB
- SNRI x10/7
- iv LA
- top LA + GBP

- Schreiber K. Pain Manag 2014; 4: 445
Fear-Avoidance Model and beyond

- Formulation of cumulative risk and protection to identify risk of prolonged pain and disability
  - FAM + avoidance endurance model: causality tbc
    » Edwards R. J Pain 2016; 17: S2, T70
Care with investigations

• Indicated when “red flags” identified
  – potential to increase somatic focus
  – early MRI detrimental, costly
    » Webster B. Spine 2013; 38; 1939
  – changes common in asymptomatic

• Structure vs function
  – pain is dynamic CNS evaluation
Bone Scan with SPECT

- New technology low dose CT
  - up to 6 mSv
- Limited prospective support in diagnostic approach
  - identifies alternative diagnosis, role in athletes
  - may improve outcome of interventional approaches

  » Carstensen M. Chiro Man Therap 2011; 19: 2
  » Jain A. Clin J Pain 2015; 31: 1054
Interventional pain management

- Influence nociceptive/pain physiology
  - steroid injections
    - role for PRP
  - LA/radiofrequency ablation
    - spinal facet joints
    - knee, hip
  - neuromodulation
    - peripheral, spinal cord, brain stimulation
    - TMS
  - vertebroplasty
    » Bird P. MJA 2017; 207: 279
Fifteen Years of Explaining Pain: The Past, Present, and Future

G. Lorimer Moseley* † and David S. Butler* †

*Sansom Institute for Health Research, University of South Australia, Adelaide, Australia.
†Neuroscience Research Australia, Sydney, Australia.
‡Neuro-Orthopaedic Institute, Adelaide, Australia.

• Education psychology
  – conceptual change: pain is dynamic
  – pain as a perceived need to protect rather than as a marker of damage
  – doesn’t deny peripheral nociceptor activity
  – not behavioural or educational therapy per se, rather cognitive modulation

• Effective
  – improves knowledge
  – decreases catastrophising
  – short term reduction in pain, disability
  – assists (should integrate) with MDT rehab

» Journal of Pain 2015; 16(9): 807-13
Back pain - Disc's
- Nerve
- Joint

Leg pain
(Sciatica)

Psychology
Relaxation

Medicines
Injection

Structural

Electric

Sensation

Psychology
Impact

Influenced by
- Genetics
- Past pain
- Meaning
- Hormones
- Sleep
- Weather
- Stress
- Optional use

Response

Blood flow, muscle

Posturology
Postural bone health
Opioids

- Effective in acute (nociceptive) pain
  - up to 70% pain severity reduction
  - dose response relationship
    - potential toxicity

- Less effective in chronic pain
  - 30% pain reduction (nociceptive)
    - varied tolerance to side effects
      » CMAJ 2006; 174: 1189
  - ? role in neuropathic pain

- Higher doses associated with
  - anxiety/psychological distress
  - substance use disorder
    » Clinical J Pain 2010; 26: 1
  - cancer/palliative treatment

“You should just feel a tiny prick, and then a lifetime of morphine addiction.”
Issues re RCT’s opioids for non-cancer pain

- No RCTs >300 mg morphine (equivalent) per day for more than 16 weeks
  - 15-30% for placebo
- Mean decrease in pain intensity was 30%
  - 15-30% for placebo
- Withdrawal significant
  - no benefit 10-20%
  - adverse effects 20-30%
  - 30% remain on long term opioids
- Cochrane review > 6 mths
  - one RCT, quality of published literature an issue
  - weak evidence of efficacy in those tolerating
    - functional impact unclear
    » Noble M. Cochrane Database Reviews 2010
- No difference with ADF
  » Mincha E. Pain Med 2014; 15: 79
240 patients with moderate-severe chronic pain

- back, hip or knee
- mean pain BPI-severity 5.4 in both arms

- At 12 months, opioid arm (4.0) > non-opioid arm (3.5) (P=0.034)
- similar between groups re BPI-interference

» Krebs et al. Pre-publication. Society for general internal medicine 2017
### Opioids

- Large range strong opioids, patient variability
  - morphine
    - longer $t^{1/2}$ in older, accumulation risk
    - more potent, equal efficacy via PCA in aged
  - fentanyl
    - potent, no metabolites, patch
  - oxycodone
    - abuse deterrent formulations
    - low dose naloxone may reduce tolerance
  - hydromorphone
  - methadone
    - long $t^{1/2}$, potent, cardiac concerns

- Tapentadol
  - nor-adrenaline re-uptake inhibition, SR only
  - ? role in neuropathic pain, ? less constipation
    - 50 mg equivalent to 10 mg oxycodone
    - Vadivelu N. *J Pain Research* 2011; 4: 211
**Buprenorphine**

- Effective in cancer and neuropathic pain
  - broader pain phenotypes
- Less tolerance and dependence
  - can be combined other opioids; anti-hyperalgesic
- Less adverse effects
  - cognitive, constipation, respiratory depression no immuno-suppression, hormonal
- Safe in aged, renal disease
  - Davis M. *J Support Oncol* 2012; 10: 209

- Low intrinsic efficacy means higher receptor occupancy required
  - no apparent ceiling for analgesia, but limited respiratory depression
    - 0.3 mg comparable to 10 mg morphine in acute studies
      » Raffa RB. *J Clin Pharm Therapeutics* 2014; 39: 577
  - use in acute pain: 30 mcgm pca bolus, 0.2 mg S/L (*Temgesic*)
**Codeine**

- Metabolised to morphine
  - CPD2D6 variation
    - genetics
    - drug interactions
- Low analgesic potency
  - constipation
  - neuro-inflammation/hyperalgesia
- Easy access
  - Schedule 3: 8-16 mg
  - Schedule 4: 30 mg, with paracetamol
  - Schedule 8: 30 mg single agent
- Co-agent toxicity risk
  - NSAID enteropathy

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**NNT (acute pain)**

<table>
<thead>
<tr>
<th>Drug Combination</th>
<th>NNT</th>
</tr>
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<tbody>
<tr>
<td>codeine 60mg</td>
<td>7</td>
</tr>
<tr>
<td>para. 1gm /ibup. 400mg</td>
<td>1.5</td>
</tr>
<tr>
<td>para. 1gm/codeine 60</td>
<td>2.2</td>
</tr>
<tr>
<td>para. 1gm/cod. 60mg vs. para.</td>
<td>6.1</td>
</tr>
</tbody>
</table>
Other issues with opioids: persistent pain

• Improved understanding/experience of long term use
  – hormonal, immune dysfunction (T-k inhibition, glial cell activation)
    • ?? increased cancer recurrence
      » Lennon FE Anesthesiology 2012; 116: 940
  – sleep disordered breathing, dental, cardiovascular risks
    • sudden/overdose deaths: increase >100 mg oral morphine equivalents/day

• Addiction: low rates if risk stratified in chronic non malignant pain
  – no history of abuse: estimated 0.19% addiction, 0.59% aberrant use
  – increases to 3.3 and 11% if risk factors
    • past addiction, genetics, alcohol, psychiatry, abuse history
      » Fishbain D. Pain Medicine 2008; 9: 444
  – long term use oxycodone
    • majority dose stable after 3 months, side effects less
      – 2.6% misuse rate
    • ? higher addiction risk
Reviewing and maintaining opioid therapy

• Regular review initially (6 A’s)
  – define nociception
  – reassess/reaffirm messages, education, dose limitation
  – engage non-pharmacological management
    • Mx/care with psychological aspects

• Adjuvant medications
  – regular paracetamol +/- NSAIDs
  – anti-hyperalgesic medication
    • Gabapentin/Pregabalin
      – 100-300 mg tds GBP
    • TCAD/SNRI
      – Nortriptyline 10-25 mg nocte
      – Duloxetine 30-60 mg daily
    » Myers J. BMC Musculoskeletal Disorders 2014; 15: 76
  • Clonidine 50-100 mcgm tds
Opioid Calculator App

- Linked to PM 01 2015

- Opioid dose calculator
  - Converts to OMED
    - Green
    - Amber > 40 mg
    - Red > 100mg

Anti-neuropathics

• Gabapentin/Pregabalin
  – evidence in neuropathic pain
  – anti-hyperalgesia
  – sedative, easy dose titration

• Valproate, Carbamazepine

• TCAD/SNRI
  – anticholinergic effects
  – effective in PHN, including preventative
  – NNT 2.2-2.6

• Clonidine/dexmedetomidine
  – anti-nociceptive, anti-hyperalgesia
  – e.g. dex 0.5-1 mcgm/kg/hr intraop in opioid tolerant

• topical therapies
  – lignocaine: 2-5%
  – amitriptyline/clonidine
Allied Health

• Principles
  – assess and engage client in self-management approach
    • stages of change, locus of control
      – role for motivational interviewing
    • aim for functional gains rather than pain reduction per se
  – target unhelpful cognitions and behaviours
    • catastrophising, low self-efficacy
    • fear-avoidance behaviour
    • mood disorder
  – optimise physical-psycho-social function
    • muscle tone, posture
    • boom-bust vs pacing
    • solicitous systems

• Evidence of benefit, maintained at 12 mths
  – potential to benefit from group dynamic

  » Kamper SJ. Cochrane Database Syst Rev 2014; 9: CD000963
Pain Management Programs

- Co-ordinated, multi/interdisciplinary, groups
  - selected based on prognostic indicators: ePPOC measures

- Range of processes and program structures described
  - education: 2-8 hrs, eg STEPS program
    - neurophysiology, self-management principles
    - options: directs ongoing care, shortens wait time
      » Davies S. Pain Medicine 2011; 12: 59
  - PMP
    - Individual: targeted/focused program
    - Low: 6-24 hrs, low depression, disability
    - Medium: 25-50 hrs, over 4-8 weeks
    - High intensity: >100 hrs, intensive
  - specific approaches: yoga (mindfullness), Thai Chi, pilates
    » ACI; PMP: which program for which patient? 2013
Pain and pain management

Living with persistent pain

Pain is our built-in alarm system. It makes us aware that something might be going wrong in our body. However, there are many things you can do to deal effectively with persistent pain...

When do I need to see my doctor about persistent pain?

Treating persistent pain

Back pain

Understanding pain

Learn more about pain from these videos, developed by Hunter Integrated Pain Service (HIPS). Hunter New England Local Health District, New South Wales, Australia.

Guide to pain

About pain

Living with persistent pain

Managing pain

Who to see about your pain

Multilingual resources on pain

اء العربية

Chinese

简体字

Chinese (simplified)

繁體中文

Chinese (traditional)

Hrvatski

See more translations for Pain on Health Translations
Welcome to the ACI Pain Management Network

This website is designed to help you gain a better understanding of your pain. The site contains information to enable you to develop skills and knowledge in the self-management of your pain in partnership with your healthcare providers.

You will hear from other people, just like you and learn how they too have lived with chronic pain. The website has a number of episodes which should be viewed over several days to weeks. If anyone has concerns viewing or reading the material, they should consult their doctor or health professional.

If you are a young person with chronic pain, there's a youth channel with episodes for you to work through with a range of exercises and useful tips throughout.

Successful management of chronic pain can be facilitated via a range of active strategies - sleep and mood management, as well as via the...
Internet based pain management programs

St V’s (NSW): CBT + PT, 8 modules

McQuarie Uni (NSW): CBT, interactive
Consumer groups

- **CPA**
  - National Pain week
  - Patient stories/forum
  - Advocacy, support

- **APMA**
  - Helpline
  - Local support groups

- **Consumers Health Forum**
  - National collaborative organisation
Module 9: Post-discharge acute pain management
Professor Pamela Macintyre, Dr Myles Conroy, Associate Professor Andrew Zacest, Trudy Maunsell

Module 10: Understanding pain-related procedures
Dr Marc Russo, Dr Diarmuid McCoy, Dr Geoff Speldewinde, Associate Professor Andrew Zacest, Ms Jacqueline Hunt

Module 11: High-dose problematic opioid use
Dr Matthew Frei, Jacqueline Hunt, Dr Diarmuid McCoy, Dr Bridin Murnion

Module 12: Pain in children
Dr Susan M Lord, Ms Joy Burdack, Dr Meredith Craigie, Dr Ross Drake
Painaustralia

- NFP advocacy body
  - Clinician groups
    - APS, FPM/ANZCA
  - Consumers
    - CPA, APMRA, Arthritis groups
  - Research/clinical groups
  - Industry
    - Health insurance, pharma
  - Advocates
    - philanthropy
Painaustralia

- Prosecutes case for NPS
  - Document developed 2010
  - Government submissions
    - Education grant basis for BPM program
    - Funding for prevention program, NSW
    - MBS review submissions
    - Codeine program
- Resources
- Links
  - Collaborative approach
    - consumers, clinicians, researchers

The key goals of the National Pain Strategy are:
- People in pain as a national health priority
- Knowledgeable, empowered and supported consumers
- Skills professionals and best-practice evidence-based care
- Access to interdisciplinary care at all levels
- Quality improvement and evaluation
- Research
For your patients

The following fact sheets are available for you to download and print for your patients.

- The Nature and Science of Pain (Painaustralia)
- Prevalence and the Human and Social Cost of Pain (Painaustralia)
- Clinical Assessment of Pain (Painaustralia)
- Multidisciplinary Pain Management (Painaustralia)
- Spinal Cord Stimulation (Painaustralia)
- Targeted Drug Delivery (Painaustralia)
- Chronic Pain – A Major Issue in Rural Australia (National Rural Health Alliance)
- Chronic Physical Illness, Anxiety and Depression (Beyond Blue)
- TENS; Transcutaneous Electrical Nerve Stimulation (Painaustralia)
- Neuropathic (Nerve) Pain (Painaustralia)
- Self-Managing Chronic Pain
- Shingles – Busting the myths (Seqirus)
- The Pain Toolkit Australia (www.paintoolkit.org)
- Chronic Pain Management Strategies (NSW ACI)
- Communicating and building your healthcare team (NSW ACI)
For you

- The Nature and Science of Pain (Painaustralia)
- Prevalence and the Human and Social Cost of Pain (Painaustralia)
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- Spinal Cord Stimulation (Painaustralia)
- Targeted Drug Delivery (Painaustralia)
- Chronic Pain – A Major Issue in Rural Australia (National Rural Health Alliance)
- Chronic Pain Management Strategies (NSW ACI)
- Communicating and building your healthcare team (NSW ACI)
- 8 Aboriginal Ways of Learning
- ‘Yarn with me’: applying clinical yarning to improve clinician–patient communication in Aboriginal health care (Australian Journal of Primary Health 2016)
State Health websites/resources

• Better Health Channel
  – updated information (2016), limited re specialist services
• Pain Health (WA)
  – http://painhealth.csse.uwa.edu.au
• NSW Network Pain (ACI)
• HNE health (HIPS)
  – Patient and clinician resources
  – Referral processes, home of “brainman”
  – https://www.youtube.com/watch?v=5KrUL8tOaQs
Follow-up

- **Pain Clinics**
  - prolonged wait times: median 150 d
    » Hogg M MJA 2012; 196:386
  - role for transitional pain service
    • opioid dose reduction
      » Huang A. Pain Management 2016 (july)
  - early psychology access
    » Nicholas M. WISE study, APS 2016
    » Vranceanu A. Injury 2015; 46: 552

- **LMO, surgical and patient education**
  - improved health literacy reduces HCU
  - community based allied health programs reduce wait times
    » Davies S. Pain Med 2011; 12: 59

**Recent reviews**
- Reddi D. Preventing chronic postoperative pain. *Anaesthesia* 2016; 71 (S1): 64-71
- Edwards RR. The role of psychosocial processes in the development and maintenance of chronic pain. *J Pain* 2016; 17: S2 T70
RTPM – Business context

Doctor accesses the real-time prescription monitoring database to check medication history.

If prescribed, patient presents prescription at a pharmacy.

Pharmacist accesses the real-time prescription monitoring database to check medication history.

Pharmacist decides whether or not to dispense.

If dispensed, record captured in the real-time prescription monitoring database.

DHHS has access to the real-time prescription monitoring database to oversee the appropriate supply of medicines by doctors and pharmacists.

Patient visits doctor.

Doctor decides whether or not to prescribe.

Real-time prescription monitoring data security

Only users issued with the right security credentials in GP clinics or pharmacies can access the real-time prescription monitoring database. Patient searches by GPs and pharmacists are logged and can be audited to monitor phishing or inappropriate use.
## RTPM Project for Victoria

<table>
<thead>
<tr>
<th>Victoria:</th>
<th>$29.5 million investment over 4 years</th>
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</table>

### Phased implementation from 2018

### Comprehensive approach:
- Medicines to be monitored: all Schedule 8 medicines, all benzodiazepines (including diazepam), zolpidem, zopiclone and quetiapine
- PBS and non-PBS prescriptions for monitored medicines
- Workforce development
- Modest enhancement of AOD referral pathways
- Analysis of RTPM data to tailor response
What are we trying to achieve?

• RTPM: “decision support tool” - more informed, safer supply of high risk medicines
• Essential, but not sufficient on its own
• Will identify:
  • existing problems and risks
  • new problems - early intervention
• Problematic prescribing - tailored individual, strategic response
• More rational supply - attitudes
RMH-Pain Management Services

- Clinics
  - Rehabilitation, Aged Care, Telehealth
  - Subacute, Interventional, Neurosurgical
- Allied Health Pain Management Programs
- Clinical Education and Research
- Acute and Interventional Services
  - City Campus

The Royal Melbourne Hospital

Royal Park Campus
34-54 Poplar Road
Parkville Vic 3052