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ACUTE PERI-OPERATIVE PAIN MANAGING PLANNING: SPINAL SURGERY

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Responsible Director:	Medical Director	
Approved by and date:	**Drugs & Therapeutics Committee**	**November 2018**
Document Type:	**CLINICAL GUIDELINE**	**Version 1.0**
Scope:	All trust employees.	
Document Approval, History/Changes	[redacted]	

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1. Purpose

To assist in providing guidance to inform safe and effective administration of acute peri-operative analgesic plan for surgical patients by clinical staff.

2. Definition

Information to provide an introduction to acute pain management & guidance for acute peri-operative pain (APOP) management strategies.

3. Overall aim

To assist clinical staff in providing safe and effective APOP management strategies.

4. Background

Effective management of postsurgical pain in adults contributes to faster and better recovery and is important for the well-being and comfort of the patient.

Acute pain management following spinal surgery is often complicated by preoperative chronic pain and long-term medication use. In this complex and challenging group of patients a further challenge is faced with advancing burden of age, co-morbidity and frailty. Therefore, managing acute postoperative pain, in spinal surgery patients particularly, can be more difficult, with an increased risk of persistent postoperative pain.

Those who care for such patients should perform a thorough history and examination to develop an individually tailored pain management plan through a shared decision-making approach.

The following patient factors should be taken into account when considering pain management for their elective surgery:-

- Allergies/sensitivities
- Weight/BMI
- APFEL score (nausea and vomiting prediction score) - *see Appendix 1*
- Pain rating score at rest and movement pre-surgery
- Regular analgesia regime prior to admission (with specific attention to Chronic opioids)
- Previous pain management history, including long term pain conditions and analgesic history
- Clinical function and co-morbidities
- Establish NSAID risk – *see Appendix 2*
- Any beliefs, concerns anxieties relating to pain management
- Their response to prescribed analgesics and compliance
- Use of non-prescribed drugs (e.g. cannabinoids, cocaine)
- Potential for interactions of analgesics with regular medication

5. Patient Groups with Additional Considerations

Specific consideration for opiate choice, oxycodone, dose, route of administration and observations should be made in some groups of patients such as:

5.1. Renal Dysfunction

Those considered to have renal dysfunction are those patients are who:

- Have CKD history
- Have a eGFR<60ml/min

5.2. Elderly patients (over 65 years of age)

The physiological, psychological and cultural changes associated with ageing affect the perception and reporting of pain by elderly patients. Older people are at particular risk of under or over treatment, increased sensitivity to the analgesic and side-effects of opioids and gastric and renal toxicity from Non-steroidal Anti-Inflammatory Drugs (NSAIDs) because of reduction in renal clearance and other pharmacokinetic changes associated with getting older.

Because elderly patients often receive multiple drugs for their multiple diseases this greatly increases the risk of drug interactions as well as adverse reactions and may affect compliance. If the patient has dementia the use of The Abbey Pain Scale may be more appropriate *(see Appendix 3).*

5.3. Underweight BMI <20 or <55kg

5.4. Risk of Obstructive Sleep Apnoea

Patients who score 3 or more of the following criteria:

- Neck circumference >40cm
- Male
- Age >50
- Hypertension
- Snorer
- Daytime somnolence
- BMI >40
- Told they stop breathing at night

5.5. Frail patients:

Those with coexisting significant risk factors for opioid toxicity and local anaesthetic toxicity e.g. low body weight (<55kg), liver impairment.

Frailty can be defined as a clinical syndrome in which three or more of the following criteria are present:

- Unintentional weight loss
- Self-reported exhaustion
- Weakness (based upon objective measure of grip strength) not otherwise explained by unilateral specific myopathic symptoms
- Slow walking speed
- Low levels of physical activity

6. Strategies for Acute Peri-operative Pain Management

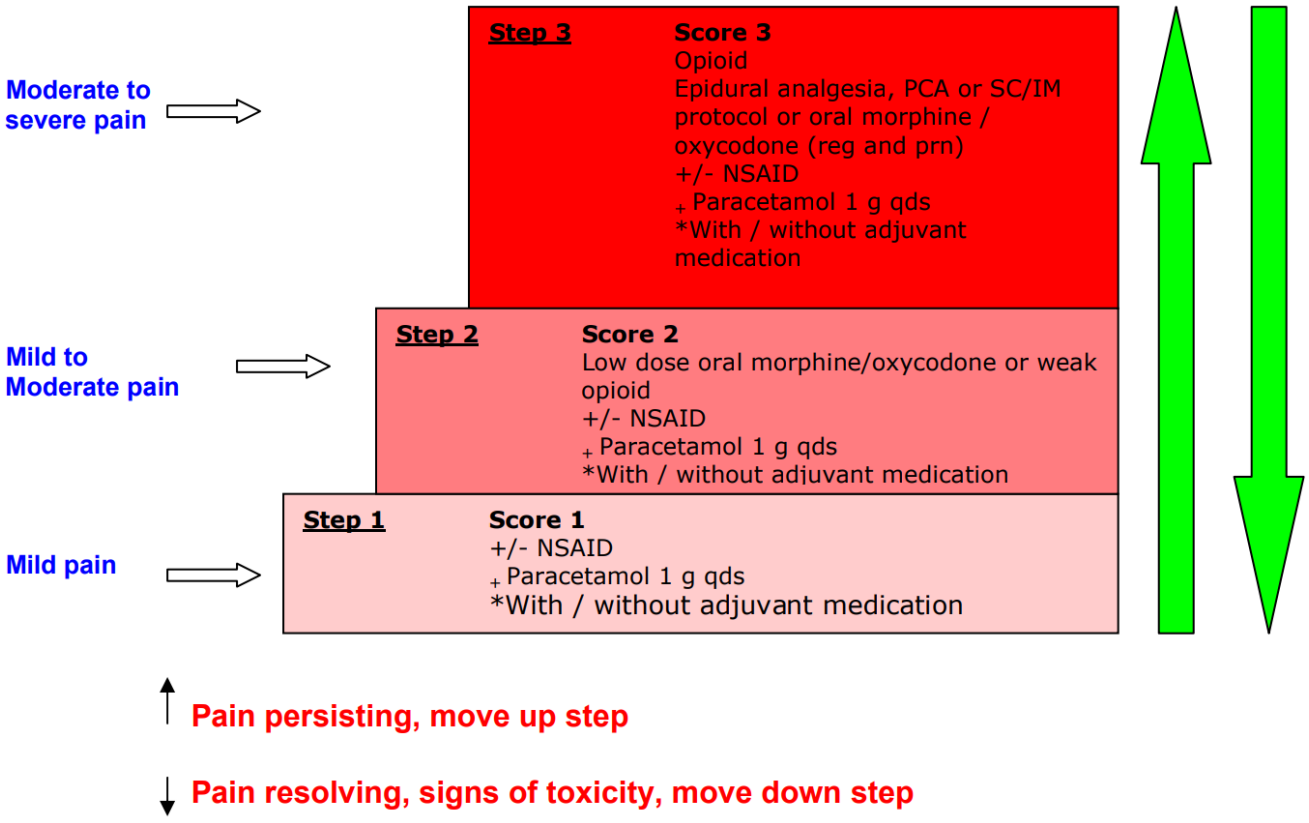
Evidence supports three essential strategic components:

- Multimodal analgesia
- Procedure-specific analgesia
- Acute rehabilitation after surgery

A recent review suggests improvement in the provision of analgesic care can be achieved using a practical three-step approach. The suggested steps are:

1) identification of high-risk patients,
2) implementation of multimodal analgesic strategies, and
3) ready availability of rescue analgesic regimens

6.1. The WHO Analgesic Ladder Example



7. Example Peri-operative Analgesia Regimes

7.1. OPIATE NAÏVE PATIENT – low expected analgesic requirement post-surgery e.g. simple lumbar microdiscectomy

STAGE :	CONSIDER:
PRE-INCISIONAL/ PRE-EMPTIVE	Dexamethasone
	LA infiltration
INTRA-OP	NSAID if no contraindictions
	Second antiemetic if APFEL >3
	IV Paracetamol
	?small dose opioid (aim NRS<4 on waking) Morphine standard/Oxycodone if variation
POST OP	REGULAR IV/PO paracetamol
	?NSAID if no contraindications
	PONV protocol
	Morphine/Oxycodone recovery protocol
	Codeine 30-60mg PO/IM QDS if not chronic medication already
	or
	Morphine oral solution 10-15 mg QDS
	with rescue prn doses 5-15 mg PRN

7.2. OPIATE NAÏVE PATIENT – moderate expected analgesic requirement post-surgery e.g. single lumbar decompression/fixation

STAGE :	CONSIDER:
PRE-INCISIONAL/ PRE-EMPTIVE	Dexamethasone
	LA infiltration
+/-	Ketamine
INTRA-OP	NSAID if no contraindictions
	Second antiemetic
	IV Paracetamol
	Magnesium/Clonidine
	Morphine standard/Oxycodone if special consideration
	(aim NRS<4 on waking)
POST OP	REGULAR IV/PO paracetamol
	?NSAID if no contraindications
	PONV protocol
	Morphine/Oxycodone recovery protocol
	Morphine MR 10-20mg BD
	with rescue oral morphine solution doses 10 -15 mg PRN
	OR
	Oxycodone MR 5-10 mg BD
	with rescue Oxynorm prn doses 2.5-5mg3 HRLY PRN

7.3. OPIATE NAÏVE PATIENT – moderate to high expected analgesic requirement post-surgery e.g. complex/re-do fusion/TLIF

STAGE :	CONSIDER:
PRE-INCISIONAL/ PRE-EMPTIVE	Dexamethasone
	LA infiltration
+/-	Ketamine
INTRA-OP	NSAID if no contraindictions
	Second antiemetic
	IV Paracetamol
	Magnesium/Clonidine/Lidocaine
	Morphine standard/Oxycodone if special consideration patient
	(aim NRS<4 on waking)
POST OP	REGULAR IV/PO paracetamol
	?NSAID if no contraindications
	PONV protocol
	Morphine/Oxycodone recovery protocol
	Morphine MR 20mg BD
	WITH rescue Oral Morphine solution doses 10-20mg PRN
	OR
	Oxycodone MR 10 mg BD
	(Regular reassessment req'd - establish if long acting doses are adequate)
	with rescue Oxynorm prn doses 2.5-5mg3 HRLY PRN
	OR
	PCA Morphine standard/Oxycodone if special consideration patient

7.4. OPIATE NAÏVE PATIENT – severe expected analgesic requirement post-surgery e.g. complex multi-level TLIF

STAGE :	CONSIDER:
PRE-INCISIONAL/ PRE-EMPTIVE	Dexamethasone
	LA infiltration
+/-	Ketamine
	Discuss with HDU and or ? SUITABLE FOR spinal diamorphine?
INTRA-OP	NSAID if no contraindictions
	Second antiemetic
	IV Paracetamol
	Magnesium/Clonidine/Lidocaine
	Dose opioid Morphine standard/Oxycodone if special consideration patient
	(aim NRS<4 on waking)
POST OP	REGULAR IV/PO paracetamol
	?NSAID if no contraindications
	PONV protocol
	Morphine/Oxycodone recovery protocol
	Morphine MR 20+mg BD
	With rescue Oral morphine solution 10-20mg PRN
	OR
	Oxycodone MR 10+ mg BD
	(Regular reassessment to establish if long acting doses are adequate is requi
	with rescue Oxynorm prn doses 2.5-5mg 3 HRLY PRN
	OR
	PCA Morphine standard/Oxycodone if special consideration patient
	+/-Ketamine oral 10-20mg TDS - observations will need to ensure no excess sedation
	OR HDU Ketamine/morphine infusion

If the patient's pain is consistently assessed as uncontrolled with pain scoring method and continues to be unacceptable the analgesia should be titrated within the experience and prescribing capability of the clinician or non-medical prescriber responsible. Advice and support should be sought as appropriate from senior members of the team, pharmacist, nurse specialist and, when necessary, anaesthetic team via bleep 2019. See algorithm for ward assessment of pain and escalation.

8. Principles for the Management of Chronic/Opioid Tolerant Pain Patients

(more detailed information can be found in the document 'INTRODUCTION TO ACUTE PAIN MANAGEMENT & SUMMARY OF AVAILBLE SCIENTIFIC EVIDENCE', found on the Anaesthesia pages of the intranet)

These patients should be identified pre-operatively and a coordinated multi-disciplinary plan made after detailed assessment made by the anaesthetic and surgical teams for safe and effective management of their peri-operative analgesia and monitoring. It can be helpful to discuss these patients with their chronic pain consultant in pre-op clinic to get advice. They are at higher risk of inadequate analgesia and (counterintuitively) remain at risk of respiratory depression and other complications of high dose opioids.

Patients who have complex pain management issues (especially those under chronic pain teams), or those taking long term opioids at doses over morphine 40mg day or equivalent (including topical preparations), must be brought to the attention of the team caring for the patient and the anaesthetist. This is so that a multidisciplinary approach can be taken to formulate a suitable, individualised POP management plan, which should be handed over to recovery staff. The individual anaesthetist is responsible for prescribing this regime. The acute post-operative pain ward round review should be made aware of these patients via recovery.

Generally these patients should continue their usual pain medication and additional analgesia should be prescribed in line with the principles outlined within this guideline. Additionally consideration of whether the operation will negate the continuation of their chronic opioid therapy postoperatively should also occur.

Consider increased dosing of opioids/opioid switching.

Opioid tolerant patients express higher rest and dynamic pain scores, and two to three times greater opioid use via patient-controlled analgesia (PCA). They require more frequent consultations and prescription alterations. *(Perioperative management of opioid-tolerant patients. Simpson et al. BJA Education, 17 (4): 124–128 (2017))*

8.1. Opioid-Sparing Techniques

- Regularly prescribed paracetamol, non-steroidal anti-inflammatory drugs, or COX-2s should be used unless contraindicated.
- The use of local anaesthetic techniques including wound infiltration, regional, or neuroaxial block should be used where possible to improve postoperative analgesia and decrease immediate-release (IR) opioid requirement.
- Ketamine (10-20mg TDS PO) is recommended in the acute pain management of opioid-tolerant patients as it has been shown to reduce postoperative opioid use and pain scores. Activation of the N-methyl-aspartate (NMDA) receptor is believed to be one of the mechanisms for the development of opioid tolerance and opioid-induced hyperalgesia (OIH). Ketamine is a non-competitive antagonist of the NMDA receptor and can attenuate both of these phenomena. Ketamine administered in a low dose as a continuous IV. or subcutaneous infusion for 1–3 days can be a useful adjunct for opioid-tolerant patients. There is a specific Ketamine protocol for suitable patients available on the Critical Care unit.
- The use of gabapentinoids (e.g. gabapentin/pregabalin) in acute pain has become more prevalent, particularly in enhanced recovery protocols. Initial studies indicated improved postoperative pain relief and reduced opioid use,

but this was traded against an increased risk of sedation. There is little clinical evidence to support their use in this group of patients or to guide their dosing regimen. The authors use postoperative doses similar to that for the initial management of neuropathic pain such as pregabalin 50–75 mg BD, titrated according to efficacy (for neuropathic elements of pain and opioid sparing effect) and side-effects.

- The use of IV lidocaine infusions can be useful in some situations and is the subject of a review there is a specific Lidocaine protocol for suitable patients available on the Critical Care Unit

8.2. Prevention of withdrawal

Withdrawal symptoms occur if a drug is suddenly stopped, reversed, reduced too quickly, or fails to reach its intended site of action. It is generally recommended that the patient's baseline opioid (usually a sustained-release form) is continued in the postoperative period and that acute post-surgical pain is managed with the addition of appropriate doses of immediate release opioids.

Recommend continuing transdermal opioids at their baseline dose, although caution must be taken with the positioning of the patch. Direct heat applied to the patch, for example, via perioperative warming devices may enhance drug administration, whereas the use of a patch over an area of poor-perfusion or reduced temperature can reduce drug delivery.

It is important to remember that parenteral replacement may be needed if a patient taking oral opioids is unable to take medication orally or is not absorbing from the gut.

8.3. Additional Opioids

In the postoperative period, opioid-tolerant patients may require a greater amount of immediate release (IR) oral opioids than is usually expected.

Traditionally, the 'as required' (PRN) dose is calculated based on the cumulative oral opioid dose given in the preceding 24 hours, with one-sixth of the total dose prescribed 4 hourly.

Nevertheless, the dose of IR opioid required for analgesia may not correlate so easily, and starting with standard doses may be appropriate with regular assessment and titration depending on patient response.

IV PCA is in widespread use for the management of acute pain. It allows individual dose titration and reduces workload for staff. It can be difficult to identify the optimal starting regime in opioid-tolerant patients, but one method is to base the size of the bolus dose on the patient's usual 24 hour opioid requirement. There is a separate policy and guideline for the use and management of PCAs.

Analgesic requirements should be reviewed in follow up clinic and assessed to be appropriately titrated down.

When performing an opioid rotation, it is recommended to reduce the calculated equianalgesic dose by 30–50% because of the possibility of incomplete cross-tolerance. Patients can use additional IR opioids if necessary.

8.4. Patients on Buprenorphine/Naltrexone/Subutex

The use of a buprenorphine patch (up to 70 microgram/hour) is unlikely to interfere with the use of full opioid agonists for acute pain management and these should also be continued in the perioperative period, will need high dose full agonists to achieve pain relief.

However, the management of patients taking high-dose sublingual (SL) buprenorphine as a substitution therapy for drug addiction can be problematic, therefore attempts should be made to identify these patients pre-operatively and coordinate with their substance team to organise opioid rotation to methadone prior to admission to allow for receptor sensitivity and prevent withdrawal.

Analgesic requirements should be reviewed in follow up clinic and assessed to be appropriately titrated down.

APPENDICES

Appendix 1: APFEL Post-operative Nausea and Vomiting Prediction Scoring

CHARACTERISTICS	*POINTS*
Female sex	1
History of motion sickness or postoperative nausea and vomiting	1
Non-smoker	1
Postoperative opioid treatment is planned	1

Total: ____

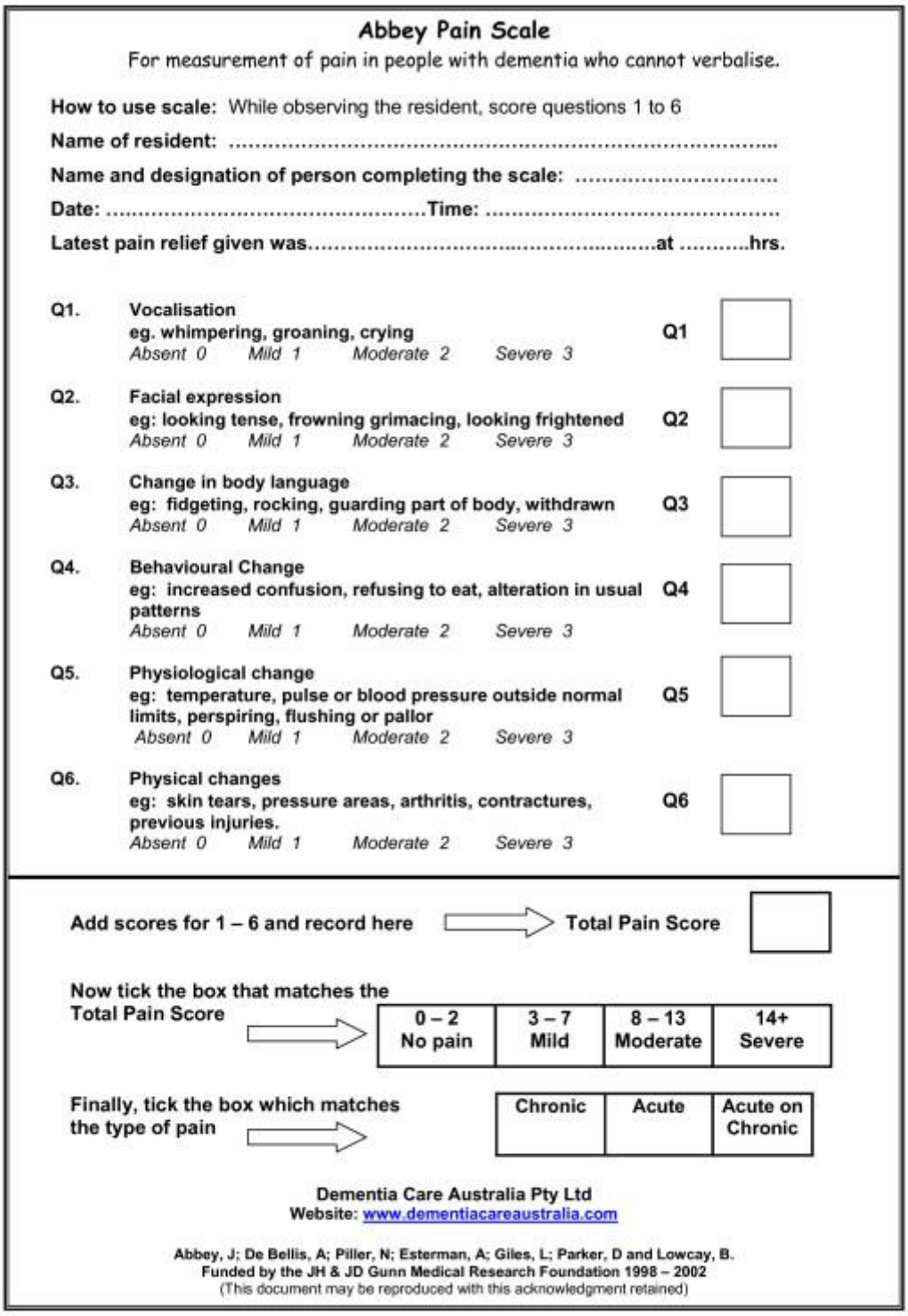
SCORE PROBABILITY OF POSTOPERATIVE NAUSEA AND VOMITING (%)	
0	10
1	21
2	39
3	61
4	78

Appendix 2: NSAID Risk Assessment

NSAID RISK ASSESSMENT

CAUTION	**CONTRAINDICATIONS**
Elderly	Severe heart failure
Allergic disorders	Severe renal failure
NSAID sensitive asthma	Severe liver failure
Renal impairment	Gastrointestinal Ulceration
Liver impairment	GI bleeding history
Coagulation defects	Brittle Asthma
Connective tissue disorders/cardiac impairment	Pregnancy
GI disorders or inflammatory intestinal disease eg Crohn's or Ulverative Colitis	Hypersensitivity
Heart Failure	
Poorly controlled Hypertension	
Ischaemic Heart Disease	
Cerebrovascular disease	
Dehydration	

Appendix 3: Abbey Pain Scale



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 **Q1**
Absent 0 Mild 1 Moderate 2 Severe 3

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

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

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

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

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

Add scores for 1 – 6 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

Dementia Care Australia Pty Ltd
Website: www.dementiacareaustralia.com

Abbey, J; De Bellis, A; Piller, N; Esterman, A; Giles, L; Parker, D and Lowcay, B.
Funded by the JH & JD Gunn Medical Research Foundation 1998 – 2002
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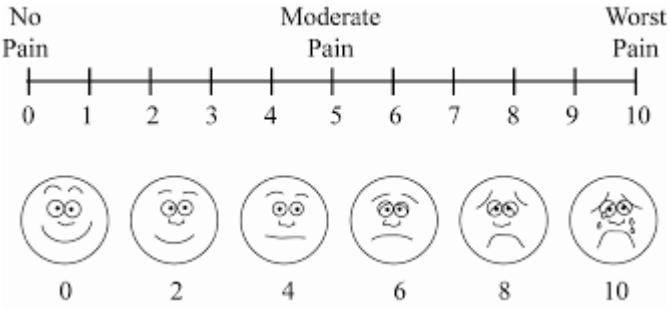
Appendix 4: NRS Pain Scoring for pain

Purpose:
The NRS for pain is a unidimensional measure of pain intensity in adults. Although various iterations exist, the most commonly used is the 11-item NRS, which is described here.

Content:
The NRS is a segmented numeric version of the visual analog scale (VAS) in which a respondent selects a whole number (0–10 integers) that best reflects the intensity of their pain. The common format is a horizontal bar or line. Similar to the pain VAS, the NRS is anchored by terms describing pain severity extremes.

Number of items:
The pain NRS is a single 11-point numeric scale.

Response options/scale:
An 11-point numeric scale (NRS 11) with 0 representing one pain extreme (e.g., “no pain”) and 10 representing the other pain extreme (e.g., “pain as bad as you can imagine” and “worst pain imaginable”).



Appendix 5: OPIOID CONVERSION TABLE

s/c Diamorphine in 24 hrs	SR oral morphine (12 hour release)	SR oral oxycodone	Fentanyl patch	Methadone OD	Tramadol oral	Codeine/ Dihydrocodeine	Buprenorphine patch (Butrans or transtec)	Tapentadol SR 12HR
						30-60 mg/day	5mcg/hr	
	5mg BD					120-180 mg/day	10mcg/hr	
	10mg BD	5mg BD		2mg OD		240mg/day	20mcg/hr	
10mg	15mg BD			3mg OD	50mg TDS/QDS		30mcg/hr	
	20mg BD	10mg BD	12mcg/hr	4mg OD	100mg TDS/QDS		35mcg/hr	50mg BD
20mg	30mg BD	15mg BD	12/25mcg/hr	6mg OD			35-40mcg/hr	
30mg	40-45mg BD	20mg BD	25mcg/hr	9mg OD			52.5mcg/hr	100mg BD
40mg	60mg BD	30mg BD	37mcg/hr	12mg OD			52.5-70mcg/hr	150mg BD
60mg	90mg BD	45mg BD	50mcg/hr	18mg OD			70mcg/hr	200mg BD
80mg	120mg BD	60mg BD	62mcg/hr	24mg OD				250mg BD
	135mg BD	70mg BD	75mcg/hr	27mg OD				
	150mg BD	75mg BD	87mcg/hr	30mg BD			105mcg/hr	
	180mg BD	90mg BD	100mcg/hr	36mg OD				