Complex Regional Pain Syndrome: The Clinical Playbook

An evidence-based diagnostic and multidisciplinary treatment algorithm for Australian healthcare professionals.

The Executive Summary

CRPS Definition

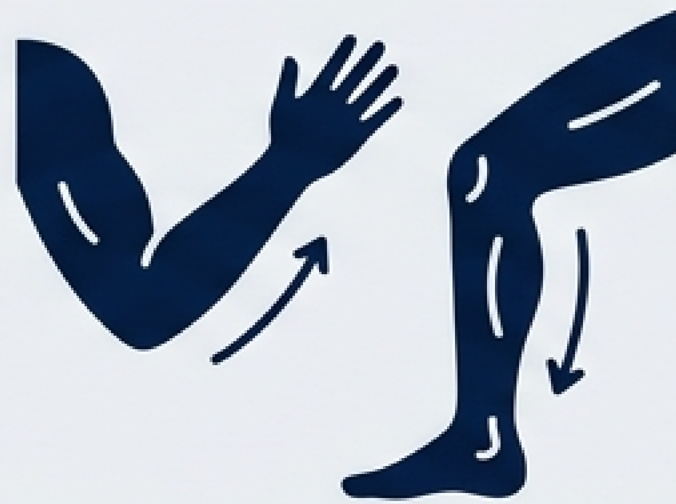
A chronic neuropathic pain condition characterised by pain, sensory, autonomic, motor, and trophic changes entirely disproportionate to the inciting event.

5.46 – 26.2 per 100k

Australian incidence per person-years. Peaks in 5th–7th decades. 3–4x more common in females.

60:40

Ratio of Upper Limb to Lower Limb involvement.



40 – 46%

Triggered by fractures, making it the most common inciting event over surgery surgery or sprains.

The Golden Window: Time is Tissue

Delays **beyond 6 months** drastically alter the disease trajectory from functional recovery to permanent limb dysfunction.

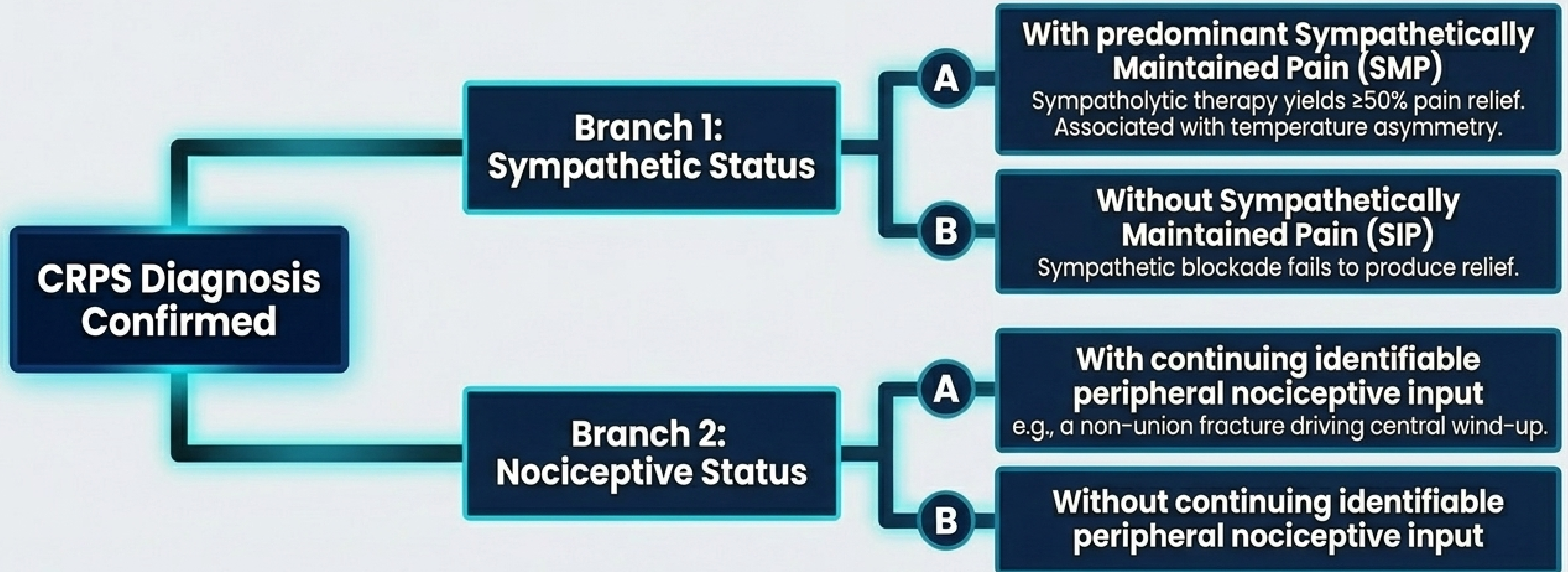
CRPS is frequently misdiagnosed or diagnosed late. Any disproportionate pain, swelling, colour change, or functional impairment following an injury—especially a fracture—demands immediate assessment.

The Budapest Diagnostic Criteria

Category	Symptoms (Patient Report)	Signs (Clinical Exam)
Sensory	Hyperaesthesia and/or allodynia	Hyperaesthesia and/or allodynia
Vasomotor	Temperature asymmetry and/or skin colour changes	Temperature asymmetry and/or skin colour changes
Sudomotor / Oedema	Oedema and/or sweating changes	Oedema and/or sweating changes
Motor / Trophic	Decreased range of motion and/or motor dysfunction and/or trophic changes	Decreased range of motion and/or motor dysfunction and/or trophic changes

[≥1 Symptom in 3 of 4 Categories] + [≥1 Sign in 2 of 4 Categories] + [No better alternative diagnosis] = CRPS

Diagnostic Specifiers & Classification



Clinical Note: A single negative sympathetic block (MBS item 18260) does not definitively exclude SMP. Serial blocks may be required.

Type I vs. Type II CRPS

CRPS Type I

Historical Name: Reflex Sympathetic Dystrophy (RSD)

Incidence: 85–90% of cases

Precipitant: No identifiable major nerve lesion. Follows fracture, minor trauma, sprain.

Investigations: NCS/EMG usually **normal.**

Pattern: Diffuse, **does not respect a single nerve territory.** Favourable prognosis with early treatment.

CRPS Type II

Historical Name: Causalgia

Incidence: 10–15% of cases

Precipitant: Identifiable major nerve injury (crush, transection, gunshot).

Investigations: NCS/EMG **abnormal** (axonal loss/demyelination).

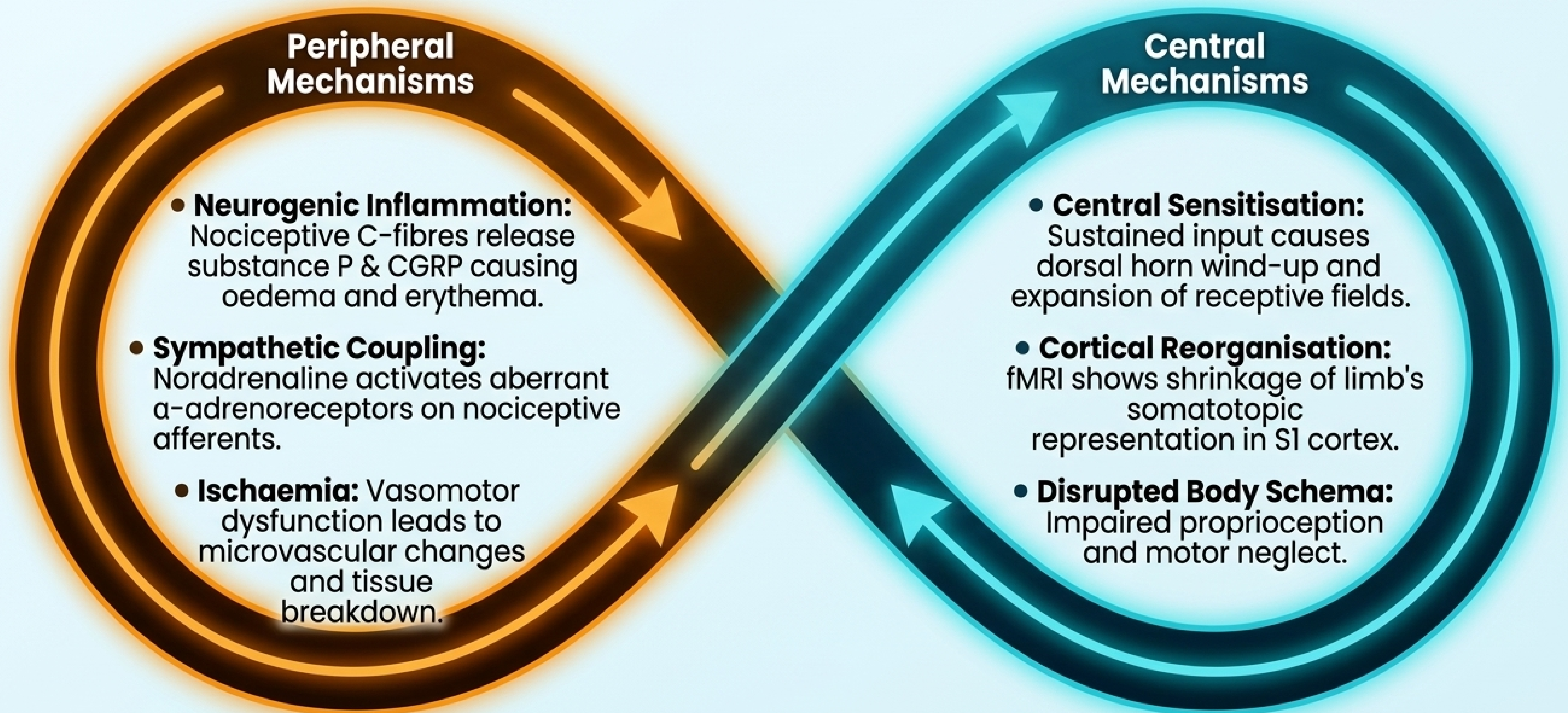
Pattern: Initially **follows injured nerve distribution.** Protracted course.

Red Flags & Differential Diagnosis

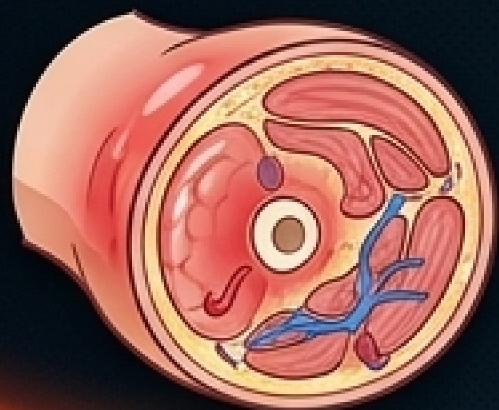
If you observe...	Consider...
Absence of an inciting event	Diagnose CRPS only with extreme caution
Symptoms confined strictly to a single dermatome without spread	Consider nerve entrapment or radiculopathy
Systemic inflammatory features (fever, weight loss, polyarthralgia)	Consider vasculitis, rheumatoid arthritis, or malignancy
Bilateral symmetrical limb involvement	Consider peripheral neuropathy or fibromyalgia

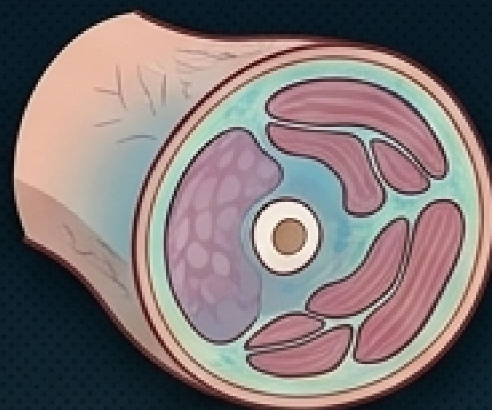
WARNING: CRPS is NOT a psychiatric diagnosis, though comorbid anxiety and depression are common and require management.

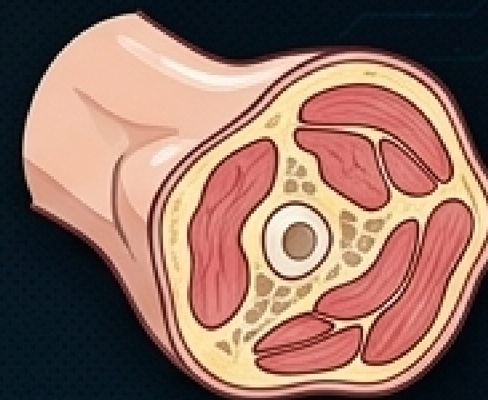
The Sensitization Loop: Pathophysiology



The Clinical Trajectory







Phase I: Acute (0–3 months)

- Burning pain disproportionate to injury.
- Oedema, warmth, erythema, hyperhidrosis.
- Radiographs normal.

Setting: GP / ED

Phase II: Dystrophic (3–12 months)

- Skin becomes cool, cyanosed, dry.
- Brawny oedema.
- Muscle atrophy begins.
- Periarticular osteopaenia appears on X-ray.

Setting: Pain Specialist

Phase III: Atrophic (>12 months)

- Irreversible trophic changes: shiny atrophic skin, fixed contractures.
- Severe wasting and irreversible osteoporosis.

Setting: Tertiary Rehab

The Role of Investigations

Specialist

- **Sympathetic Ganglion Block**: Diagnostic for SMP.
- **DEXA**: Quantifies regional osteoporosis in chronic phases.

Available

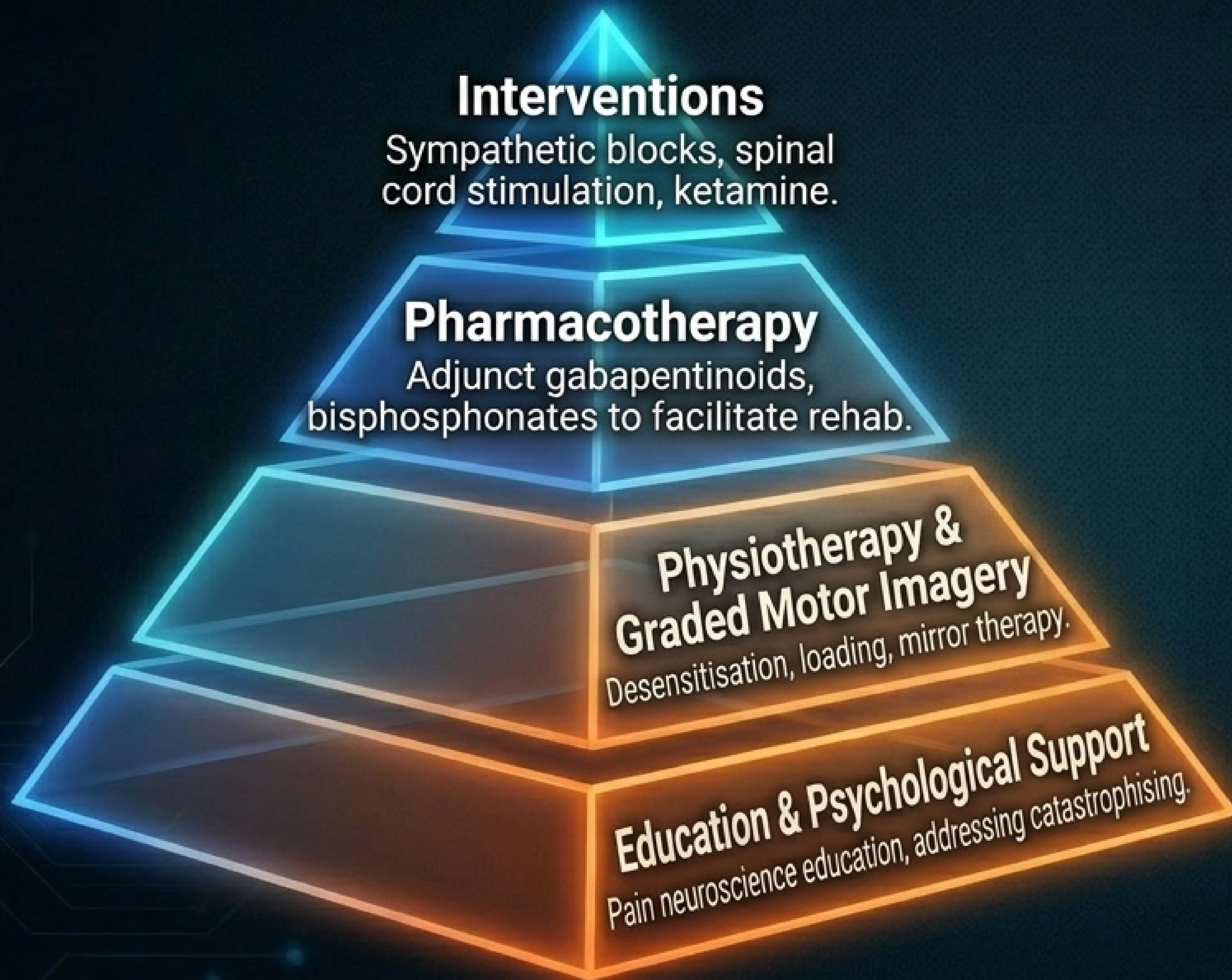
- **MRI**: Shows bone marrow/subcutaneous oedema; excludes alternative pathology.
- **Bone Scintigraphy**: Diffuse periarticular uptake in delayed phase supports diagnosis.
- **NCS/EMG**: Indicated only to confirm Type II (nerve injury).

Essential

- **Plain Radiograph:** Often normal <3 months. May show periarticular osteopaenia in Phases II-III.

CRPS is a clinical diagnosis. Investigations are used to exclude alternative diagnoses, not to screen for CRPS.

The Multidisciplinary Treatment Algorithm



MBS Care Coordination

- Item 110: GP Management Plan
- Item 723: Team Care Arrangement
- Items 10950–10970: Allied Health
- Item 81300: Pain Medicine Physician

Brain Training: Graded Motor Imagery (GMI)

Mirror Therapy

- **Protocol:** Patient performs movements with unaffected limb while viewing its mirror image superimposed over the hidden affected limb.
- **Goal:** Activates mirror neuron system, reversing cortical reorganisation.

Explicit Motor Imagery

- **Protocol:** Mentally visualising the affected limb performing movements without physical movement.
- **Goal:** Progress from simple to complex imagined tasks.

Left-Right Discrimination

- **Protocol:** Recognise app or flashcards. 2 weeks, twice daily.
- **Goal:** Rebuild laterality recognition and restore S1 cortical representation without moving the limb.

Physical & Psychological Therapies

Functional Restoration

- **Desensitisation**: Graded exposure to textures (silk -> cotton -> wool -> denim).
- **Stress Loading**: TENS combined with scrunch tasks.
- **Graded Exercise**: Aerobic and aquatic therapy. Avoid aggressive ROM in acute phase.
- **Oedema Management**: Elevation, manual lymphatic drainage.

Psychological Interventions

- **Rationale**: Pain catastrophising and kinesiophobia heavily predict poor outcomes.
- **CBT**: Level I evidence for fear-avoidance.
- **ACT**: Acceptance and Commitment Therapy highly utilized in chronic pain programs.
- **EMDR**: Emerging evidence for trauma-associated onset.

First-Line Pharmacotherapy

Gabapentin

- **Class:** α2δ calcium channel ligand.
- **Adult Titration:** 300mg Day 1 -> 300mg BD Day 2 -> 300mg TDS Day 3. Titrate over 2-4 weeks.
- **Target Max:** 1800–3600 mg/day (3 divided doses).
- **Renal Check:** Reduce max to 1400mg (eGFR 30-59), 700mg (15-29), 300mg (<15).
- **Status:** PBS General Benefit

Pregabalin

- **Class:** α2δ calcium channel ligand.
- **Adult Titration:** Start 75mg BD.
- **Target Max:** 150–600 mg/day (2 divided doses).
- **Renal Check:** Reduce max to 300mg (eGFR 30-59), 150mg (15-29), 75mg (<15).
- **Status:** PBS General Benefit

Clinical Rule: Pharmacotherapy is an adjunct to facilitate rehabilitation, not a monotherapy.

Second-Line & Specialist Agents

Amitriptyline

- **Dose:** 10–25 mg nocte; titrate to max 75–150 mg.
- **Use Case:** Comorbid insomnia or depression. Caution in elderly.
- **Status:** PBS General Benefit

Bisphosphonates (Alendronate / Neridronate)

- **Mechanism:** Inhibits osteoclast resorption, reduces bone marrow oedema.
- **Alendronate:** 70 mg PO weekly (8-week course). PBS General Benefit.
- **Neridronate:** 100 mg IV infusion x4 over 10 days. Requires TGA Special Access Scheme (SAS).

Low-Dose IV Ketamine

- **Regimen:** 0.1–0.5 mg/kg/hour over 4–10 days (inpatient).
- **Setting:** Pain specialist inpatient only. Requires continuous cardiorespiratory monitoring.

The Opioid Warning

1. Strictly Not Recommended

Long-term opioids are strictly NOT recommended as a primary treatment for CRPS.

2. Supporting Evidence

Zero RCT evidence supporting chronic opioid use in CRPS. Endorsed by RACGP, ANZCA, and TGA.

3. Clinical Risks

Drives opioid-induced hyperalgesia, physical dependence, and drastically reduces active engagement with physical rehabilitation.

4. Exception

Short-course (≤2 weeks) may be used for acute flare management under specialist guidance only.

Structured Clinical Monitoring

Clinical Domain	Validated Tool	Frequency
Pain	Visual Analogue Scale (VAS) or NRS	Every visit
Function	CRPS Severity Score (CSS) / Patient-Specific Functional Scale	Monthly initially, then 3-monthly
Quality of Life	EQ-5D-5L / SF-36	3–6 monthly
Psychological	PHQ-9 (Depression), GAD-7 (Anxiety), PCS (Catastrophising)	Baseline and 3-monthly
Physical	Limb volume (circumference/water displacement), ROM goniometry	Monthly initially
Bone Density	DEXA (MBS 12306)	12-monthly if on bisphosphonate therapy

Check FBC, LFTs, UECs baseline and 3-monthly for Gabapentinoids.

Special Populations: Pregnancy & Paediatrics

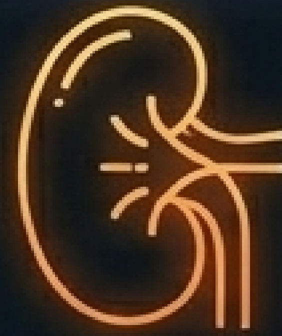
Pregnancy

- **Gabapentin:** Category B2 (lowest effective dose, paracetamol preferred).
- **Pregabalin:** Category B3 (Avoid in 1st trimester).
- **Alendronate:** Category D (CONTRAINDICATED. Requires 6-month washout pre-conception).
- **Strategy:** Prioritize physiotherapy and mirror therapy. Avoid sustained supine after 20 weeks.

Paediatrics

- **Presentation:** Differs from adults with lower limb predominance (≈70%) and higher remission rates.
- **Strategy:** Intensive physiotherapy (2-3 weeks daily) is first-line and often successful as monotherapy.
- **Pharma:** Gabapentin (10-15 mg/kg/day) is PBS-listed for paediatrics. Avoid bisphosphonates/ketamine.

Special Populations: Elderly & Organ Impairment

The Elderly	 Renal Impairment	Hepatic Impairment
• Start low, go slow. High risk of sedation and falls. • **Gabapentin** preferred over pregabalin due to lower fall risk. • **Avoid Amitriptyline** due to anticholinergic burden and QTc prolongation; use nortriptyline.	• **Gabapentin:** Mandatory dose reduction at eGFR <60. Supplement post-dialysis. • **Alendronate:** Contraindicated if eGFR <30 mL/min.	• **Gabapentinoids:** Minimal hepatic metabolism, generally safe. • **Amitriptyline and Ketamine:** Hepatically metabolised. Reduce dose, monitor LFTs, avoid in severe impairment.

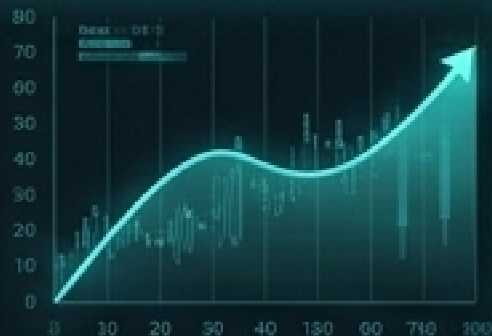
Aboriginal & Torres Strait Islander Health

Barriers	Solutions
Barrier: Diagnostic Confusion	**Solution:** Proactive Budapest Criteria screening. Do not automatically misattribute distal limb pain to diabetic neuropathy without assessing for CRPS.
Barrier: Geographic Isolation	**Solution:** Telehealth pain consultations (MBS 91822) to bypass regional waitlists. App-based GMI (Recognise app) for home use.
Barrier: Medication Cost	**Solution:** Utilize Closing the Gap (CTG) PBS co-payment provisions for gabapentin, pregabalin, and amitriptyline.
Barrier: Cultural Safety	**Solution:** Co-design pain management plans with Aboriginaal Health Workers (AHWs), Aboriginal Liaison Officers (ALOs), and local ACCHs.

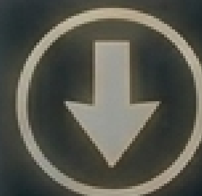
The Prognostic Matrix & Clinical Checklist

The Prognostic Matrix

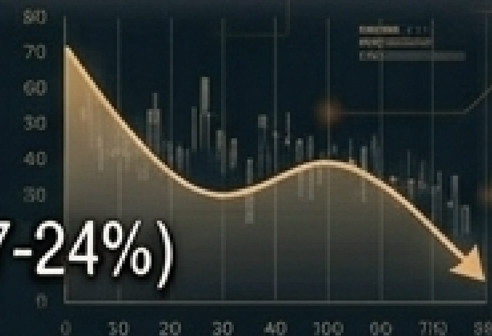
Favorable Factors:
- <3 months duration
- Type I
- fracture precipitant
- low catastrophising
- early multidisciplinary rehab.



Outcome: ~70% achieve significant improvement/remission within 12-18 months.



Guarded Factors:
- >12 months duration
- Type II
- spreading to other limbs (7-24%)
- litigation
- isolated pharmacotherapy.



Outcome: 30-40% chronic disability at 5 years.

The Golden Rules Checklist

Suspect CRPS early following any disproportionate post-injury pain.

Diagnose strictly using the Budapest Criteria.

Initiate Graded Motor Imagery immediately.

Prescribe Gabapentinoids as an adjunct to facilitate rehab, not as a cure.

Strictly avoid long-term opioid prescribing.

Coordinate complex care using MBS chronic disease items.