

# The role of cognitive biases like pain catastrophizing in chronic pain

**Dr Ashley Craig**  
**Professor of Rehabilitation Studies**  
**John Walsh Centre for Rehabilitation Research**  
**Northern Clinical School, The Faculty of Medicine and Health**  
**The University of Sydney**  
**Kolling Institute of Medical Research, Royal North Shore Hospital**  
**Sydney, NSW, Australia**

---

## Acknowledgement of collaborators

The following have worked with me on this project

Professor James Middleton

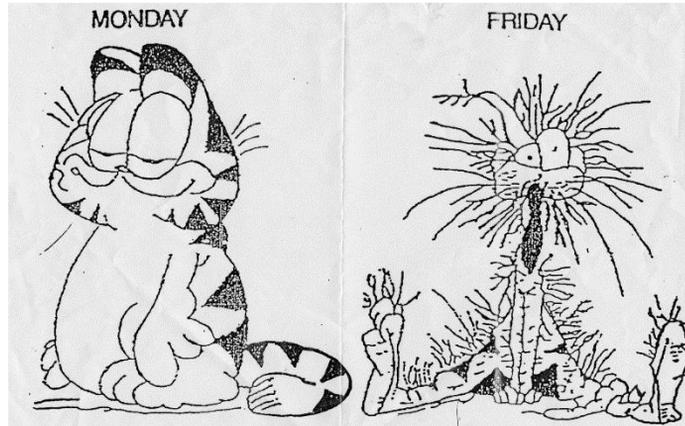
Dr Yvonne Tran

Dr Rebecca Guest

Dr Dianah Rodrigues

Project funded by icare (lifetime care)

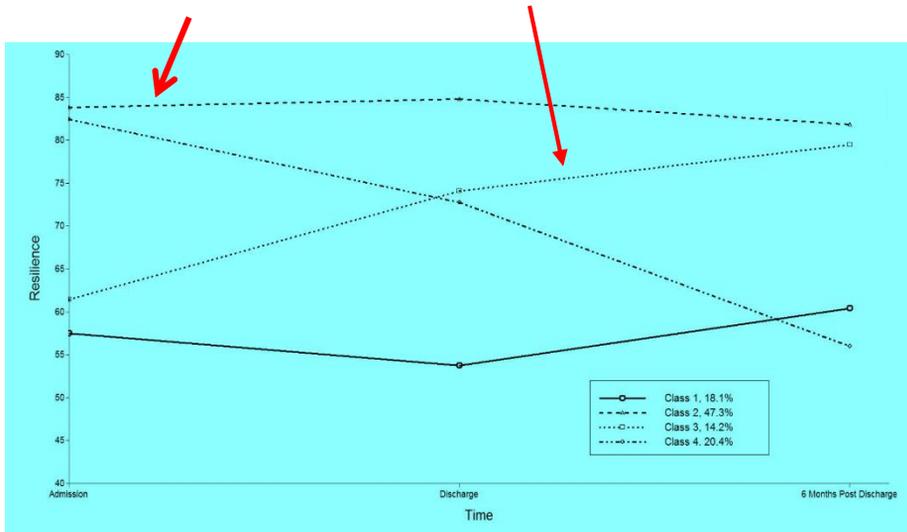
**How resilient do you think you are?**



# How resilient are people with SCI?

We have found most adults with SCI (about 60%) are resilient up to 12 months post-injury.

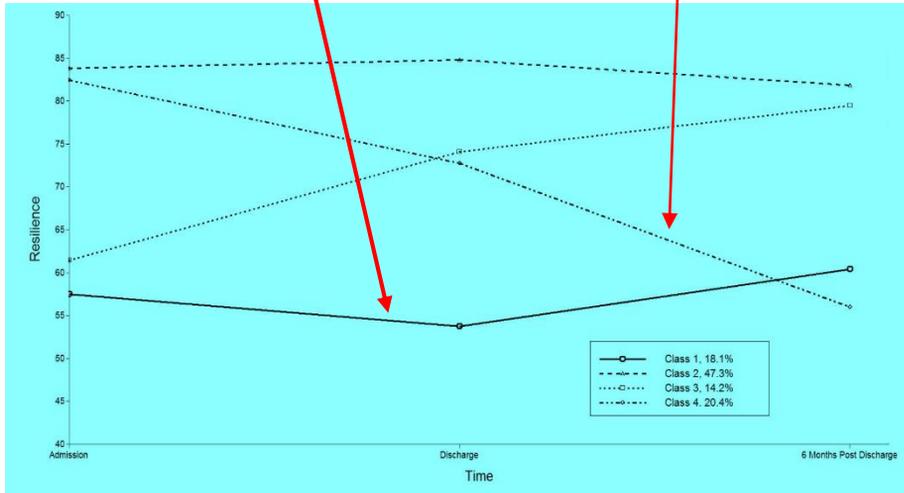
stable resilient (47.3%) and improving resilient (14.2%) trajectories



Shown by this trajectory research on 90 adults consecutively admitted to two SCI Units in Sydney over 2 years. High scores means higher resilience.

Guest, R., Craig, A., Nicholson Perry, K., Tran, Y., Hales, A., Ephraums, C., Dezarnaulds, A., Crino, R., & Middleton, J. (2015). Resilience following spinal cord injury: a prospective controlled study investigating the influence of the provision of group CBT during inpatient rehabilitation. *Rehabilitation Psychology*, 60, 311-321.

## Stable poor resilience (18.1%) and deteriorating resilience (20.4%) over 12-months post injury



The bad news is that around 40% have problems with their resilience

Guest, R., Craig, A., Nicholson Perry, K., Tran, Y., Hales, A., Ephraums, C., Dezarnaulds, A., Crino, R., & Middleton, J. (2015). Resilience following spinal cord injury: a prospective controlled study investigating the influence of the provision of group CBT during inpatient rehabilitation. *Rehabilitation Psychology*, 60, 311-321.

In our research we have focused on what we consider  
major barriers to resilience

Cognitive impairment

Low self-efficacy

Catastrophizing and pain

Fatigue, poor sleep and autonomic problems

Poor mental health

Pain intensity and pain catastrophizing will be barriers  
to resilience

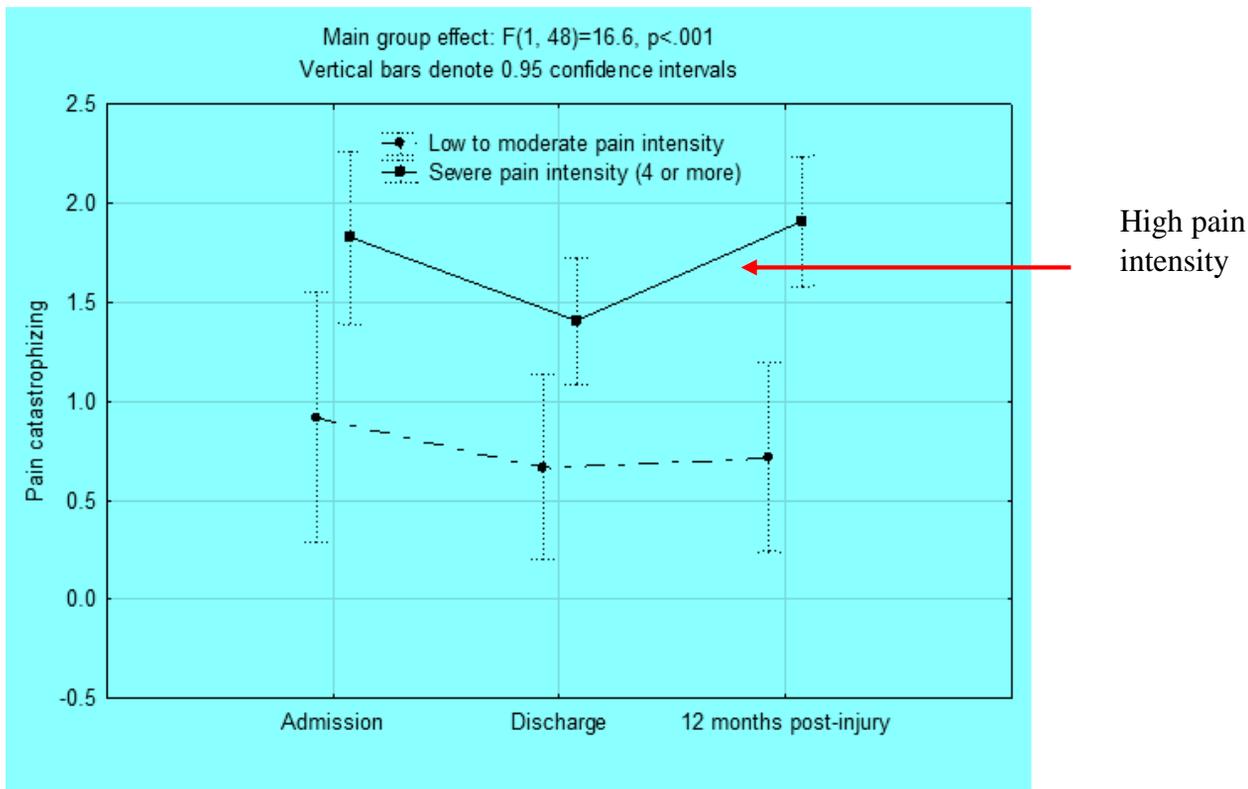
## What is pain catastrophizing?

It is a negative cognitive bias/appraisal involving:

1. Feeling helpless and pessimistic about one's pain.
2. Consistently focusing on the pain and its adverse consequences.
3. Magnifying its effects so that challenges become viewed as disastrous

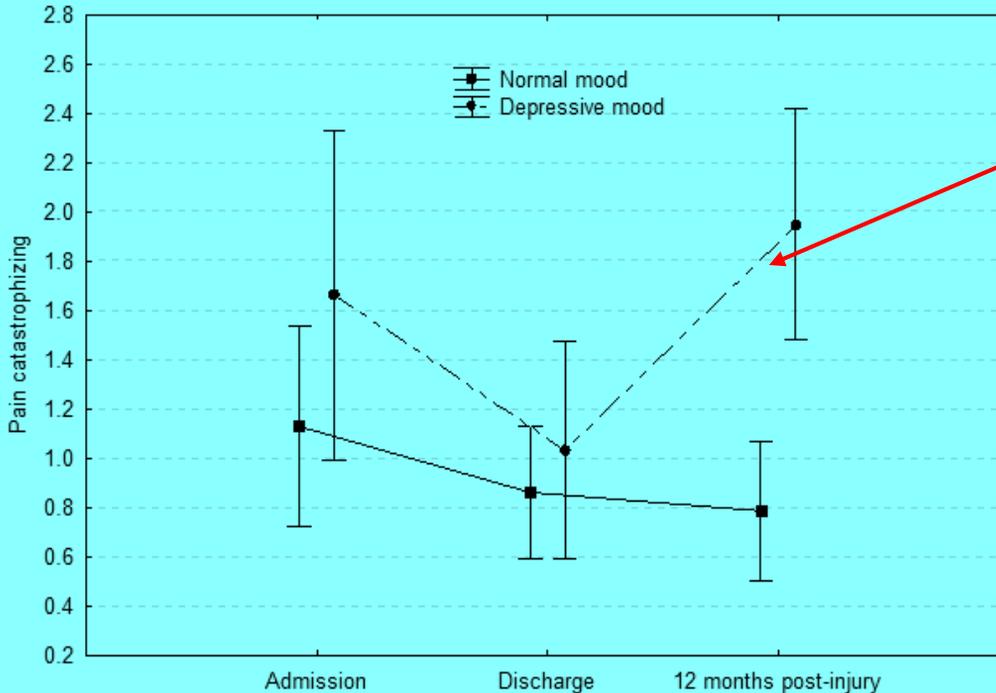


# Higher pain intensity associated with higher pain catastrophizing



# Pain catastrophizing associated with elevated depressive mood

Current effect:  $F(2, 138)=4.27, p=.016$   
Vertical bars denote 95% confidence intervals



Depressive mood

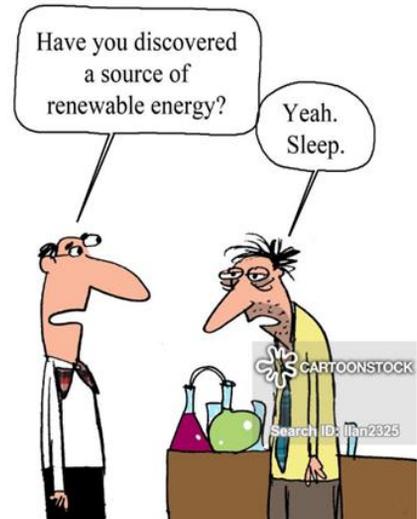
Craig, A., Guest, R., Tran, Y., Nicholson Perry, K., & Middleton, J. (2017). Pain catastrophizing and negative mood states following spinal cord injury: transitioning from inpatient rehabilitation into the community. *The Journal of Pain*, 18, 800-810.

## Pain catastrophizing and poor sleep will be barriers to resilience

Research has revealed reciprocal associations exist between sleep and chronic pain, finding that chronic pain interferes with sleep quality, while poor sleep increases chronic pain.

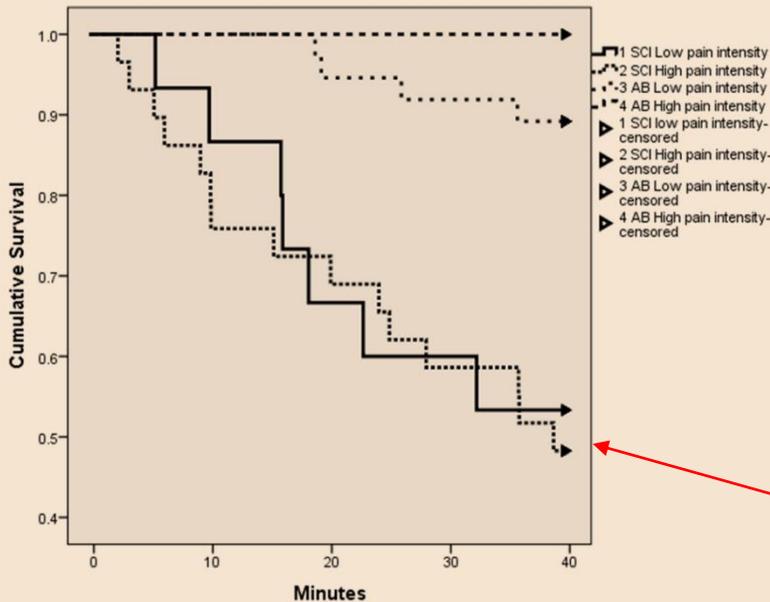
Poor sleep/ sleepiness will reduce top-down cortical resources (e.g. attention), resulting in diminished capacity to detect and modulate pain.

Pain catastrophizing (PC) diminishes top-down resources, resulting in increased pain and risk of psychological disorder



# The influence of bottom-up (pain intensity) versus top-down (pain catastrophizing) factors on sleepiness

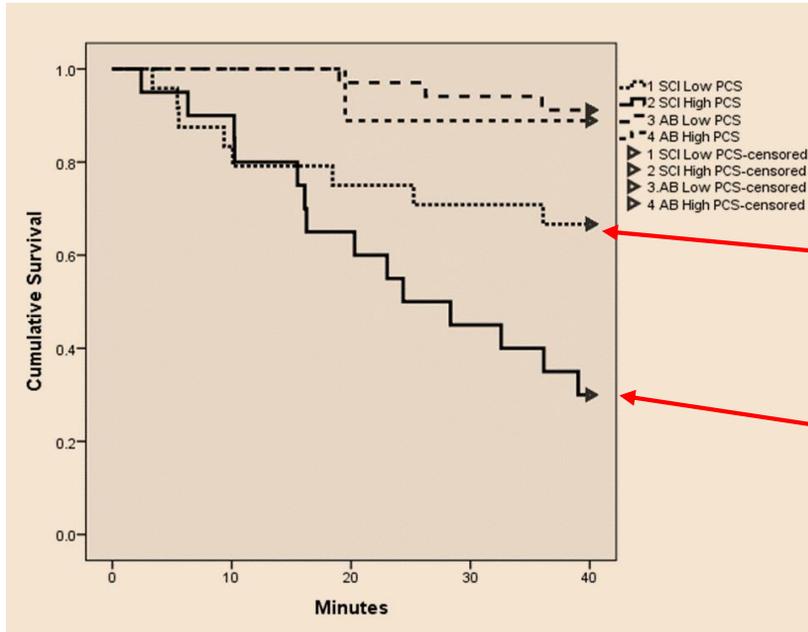
Craig, A., Tran, Y., Guest, R., & Middleton, J. (2020). Excessive daytime sleepiness in adults with spinal cord injury and associations with pain catastrophizing and pain intensity. *Spinal Cord*, [doi.org/10.1038/s41393-020-0425-7](https://doi.org/10.1038/s41393-020-0425-7)



Survival analysis showing those with higher levels of pain intensity have equal risk of excessive daytime sleepiness as those with low pain intensity (bottom-up factor)

Low and high pain intensity SCI groups

Survival analysis showing those with higher levels of pain catastrophizing (top-down factor) have high risk of excessive daytime sleepiness



Low pain catastrophizing around 30% fell asleep

High pain catastrophizing 70% fell asleep

**My thoughts for future interventions that may improve resilience  
when coping with chronic pain**

Anti-catastrophizing cognitive therapy restructuring strategies to improve  
mental health, cortical resources and sleep

Heart rate and respiratory feedback training to improve autonomic balance

Thank you

