

EXERCISE FOR CHRONIC LOW BACK PAIN

CASE STUDY



Accredited Exercise Physiologists:

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Client Names: Sam*

Ages: 43



OVERVIEW OF CHRONIC LOW BACK PAIN

Low back pain (LBP) is the leading cause of disability worldwide¹. The majority of LBP (90-95%) is considered “non-specific”², due to the inability to reliably identify a specific cause³. For 40% of individuals with LBP, pain and disability persists beyond 3 months⁴, which is referred to as chronic low back pain (CLBP). Contemporary pain treatment recommends exercise for individuals with CLBP. Although no one type is endorsed over another, it is suggested that exercise is most effective when it is individualised, contains an adequate level of supervision, and is delivered within a biopsychosocial (BPS) framework⁵.

This case study explores the application of a biopsychosocial treatment approach to elicit meaningful rehabilitation and return-to-work outcomes for an individual with CLBP.



REFERRAL AND PATIENT HISTORY

Sam* is a 43-year-old male with non-specific CLBP who developed pain at work 5 months ago. Following injury, Sam has not returned to work as a greenkeeper and has significantly decreased his daily physical activity levels. Sam lives at home with his wife and two children who provide assistance with his household chores. Sam reported no previous history of back pain. He is overweight and takes medication for his high blood pressure. Previous treatments include 12 physiotherapy sessions and 4 massage therapy sessions. Sam was referred for exercise physiology sessions by his GP to improve his physical activity and functional tolerances, and to assist with pain reduction.

INVESTIGATIONS:

Lumbar spine imaging revealed mild disc degeneration at L1-L3 and moderate degeneration at L4-L5. Disc protrusion was noted at L4-L5 with grade 1 spondylolisthesis.

MEDICATION:

Meloxicam (anti-inflammatory) and Tramadol (weak opioid analgesic), as required.





ASSESSMENT FINDINGS

Sam perceives significant functional limitations due to back pain. He has markedly restricted trunk movements and avoids activities requiring trunk bending or lifting. Sam has a fear of symptom provocation and further injury, and experiences heightened anxiety related to his ongoing difficulties. He has ceased all recreational pursuits and decreased his daily activity levels. Sam exhibits unhelpful beliefs about physical activity, pain and injury, and a sense of hopelessness about his recovery and the possibility of long term disability.

PRIMARY LIMITING FACTORS:

- Poor physical conditioning and physical activity tolerances
 - Reduced physical activity levels
 - Has not resumed work
 - Unhelpful beliefs about pain, injury and recovery
 - Maladaptive coping strategies (fear-avoidance, reliance on passive treatments)
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GOALS – SHORT TERM

- 1) Lift and carry 10kg (complete grocery shopping)
 - 2) Resume lawn mowing; front one day, back the second
 - 3) Resume role as assistant coach for son's soccer team; capable with basic ball skills and activity requiring trunk bending
 - 4) Return to pre-injury work hours (35h/week) on suitable duties (lifting to 10kg)
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CORE PILLARS OF INTERVENTION

PAIN NEUROSCIENCE EDUCATION

- Through harnessing Sam's lived experiences, targeted education helped to break down Sam's current unhelpful beliefs about pain, injury and movement, and assisted Sam to make sense of his pain. For Sam, it was important to normalise and de-threaten the investigative imaging results and his concerns of structural damage.

GOAL SETTING

- In collaboration with Sam, meaningful, value-based treatment goals were identified to help direct treatment and support Sam's sense of autonomy.

GRADED EXPOSURE TO PHYSICAL ACTIVITIES AND MOVEMENTS

- In a graduated manner, Sam engaged with previously avoided physical activities and movements (i.e., trunk flexion) that were identified as both meaningful and congruent with his goals.

TARGETED, GOAL SPECIFIC EXERCISE THAT MAKES SENSE TO THE PATIENT

- Sam's exercises utilised a combination of aerobic and resistance exercise grading from moderate to hard intensity during treatment. There was a strong emphasis on developing Sam's confidence with movement.

SELF-MANAGEMENT

- Sam's treatment ensured he developed adaptive self-management strategies to cope with his persisting symptoms and any potential flare-ups. It was important that Sam developed the confidence and knowledge of how and when to use each strategy.





EXERCISE INTERVENTION

Following the initial assessment, Sam engaged in a combination of supervised and self-managed exercise twice a week for 12 weeks in a private exercise physiology clinic. Sam also completed an adjunct home exercise program and directed learning activities (pain neuroscience education reading/videos and breathing relaxation exercises). Supervised exercise sessions were staggered throughout treatment, with higher levels of supervision at the start of treatment, transitioning to self-management as Sam's pain self-efficacy and coping improved.

Treatment was a collaborative process between clinician and patient focusing on supporting autonomy in decision making and empowering self-management skills. There was a strong emphasis on developing a positive therapeutic alliance and fostering a supportive and non-threatening clinical setting.

In the first phase of treatment, Sam established meaningful treatment goals and unhelpful beliefs about pain and injury were addressed through pain neuroscience education. Key messages⁶ relevant to Sam involved:

- backs are strong and robust
- investigative scans are generally unnecessary and tell us more about aging than pain
- movement is medicine
- pain doesn't reflect tissue damage
- the nervous system and brain are bioplastic and can change
- an early return to work has been linked to improved return-to-work outcomes and recovery

The second phase of treatment involved gradually resuming meaningful but feared activities and movements through graded exposure. This incorporated progressively overloaded aerobic and resistance exercise that Sam could link to his treatment goals.

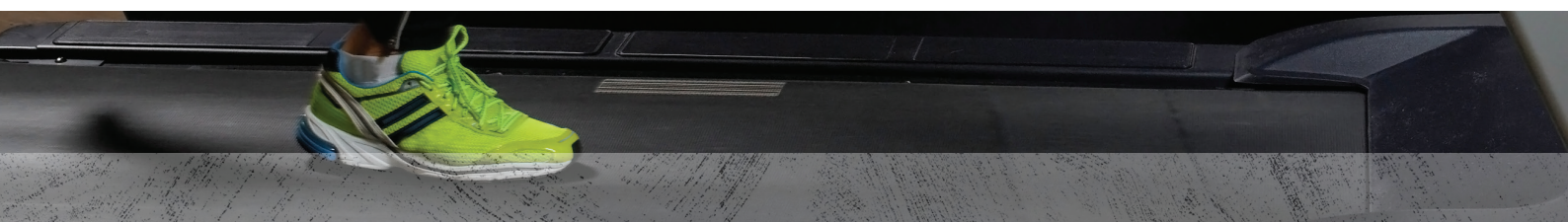
The third phase of treatment involved more intensive aerobic exercise and work related and functional exercise to improve Sam's capacity to resume his pre-injury work and daily activities. During this phase, Sam's exercise program transitioned towards a greater component of self-managed activities and emphasised more on home exercise.



OBJECTIVE MEASURES / RESULTS

OUTCOME	BASELINE	12 WEEKS	INTERPRETATION
Pain intensity "average last week" (0-10 NRS)	6	2	Reduced pain intensity
Perceived disability "today" (RMDQ 0-24)	18	5	Reduced perceived disability
Pain self-efficacy (PSEQ 0-60)	21	47	Improved pain self-efficacy
Anxiety (DASS-21)	14	4	Reduced anxiety
Work Capacity Certificate	Unfit for work	Suitable duties (lifting to 8kg), pre-injury hours	Increased work capacity
10RM floor to waist lift	0kg	8kg	Improved lifting ability
6-minute walk test	200m	660m	Improved aerobic capacity

NRS, Numerical Rating Scale; RMDQ, Roland-Morris Disability Questionnaire; PSEQ, Pain Self-Efficacy Questionnaire; DASS-21, The short-form Depression Anxiety Stress Scales; 10RM, 10-repetition maximum





CONSIDERATIONS

- Although the presence of serious spinal pathology in individuals with LBP is rare⁷, screening for a range of clinical features or red flags is important in the initial assessment. Recently, the diagnostic accuracy of some red flags has been questioned⁸. Contemporary approaches rely on distinctive clusters of characteristic history cues and positive clinical examination signs⁹.
- It is imperative that clinicians understand contemporary pain neuroscience concepts to facilitate meaningful pain dialogue with patients, enabling the patients to make sense of their pain and adapt pain education concepts into their daily life. It is important that patients understand and believe that it is safe to move with discomfort which can be monitored by the clinician through a tolerable/non-tolerable dichotomy.
- Exercise intensity can be monitored using a Borg 6–20 scale rating of perceived exertion (RPE) or combined RPE and heart rate.



STATEMENTS TO SUPPORT AEP INTERVENTIONS

Accredited Exercise Physiologists (AEP) play an important role in the management of individuals with CLBP. This case study demonstrates that a patient-centred contemporary pain treatment, delivered according to a biopsychosocial treatment approach, can reduce pain and perceived disability in individuals with CLBP. As clinicians' understanding of contemporary pain neuroscience increases, their ability to implement effective exercise interventions for CLBP improves. There are many available resources to assist clinicians with this.



RESOURCES

Helpful resources include *Explain Pain Supercharged*⁶ (for an understanding of contemporary pain science), *Non-specific Low Back Pain*² (overview of the LBP problem), and *Exercise for chronic musculoskeletal pain: A biopsychosocial approach*⁵ (a clinical overview of exercise interventions for pain).

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*Patient name has been changed

