



NON-SURGICAL MANAGEMENT OF KNEE PAIN

Cameron Little outlines the case of a patient presenting with a 10-year history of insidious, worsening bilateral knee pain, discussing the psychosocial factors that impacted on the patient's pain and the treatment plan to help him recover.

BL, a 44-year-old male, reported morning pain on the Visual Analogue Scale (VAS) of 5/10 on right, 3/10 on left aggravated by any squatting or ambulation over five minutes and stairs (Figure 1). Pain was eased by medication (Panadol Osteo daily 3 x 665mg). He had an X-ray taken 13 months ago. Anteroposterior scans met the Grade 2 criteria (ranked 0–4) on the Kellgren-Lawrence scale for assessment of knee osteoarthritis (OA), showing tibio-femoral narrowing of the joint space and mild tibial osteophyte formation (Kohn et al 2016).

The patient has a largely external locus of control, relying on his GP's plan of medication and referral to a surgeon. BL was seen by a surgeon 13 months ago and was told he would need bilateral

knee replacements in the future. However, due to his young age, he was told he should wait. Previously, BL received treatment from two physiotherapists with little positive effect. He 'went a few times' and they 'gave me a rub and a machine, which helped a bit'. BL ambulates with a walking stick indoors and with bilateral elbow crutches outdoors.

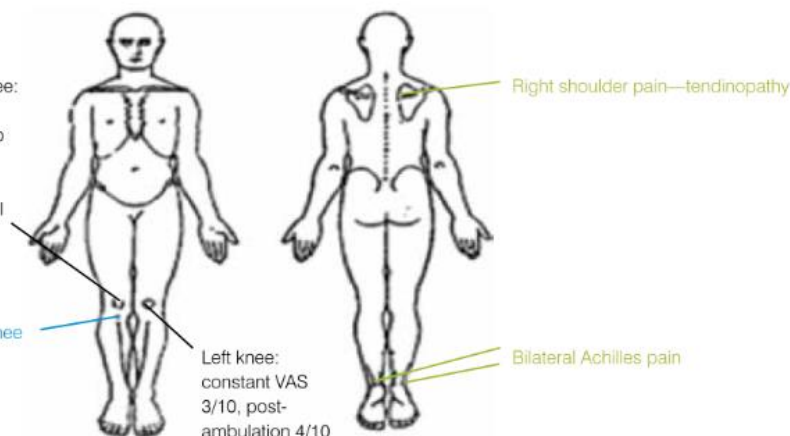
BL had a right ACL reconstruction 20 years ago. He suffers some unmanaged right shoulder pain, diagnosed as tendinopathy and bilateral Achilles tendon pain, worse in the morning. His general health is okay and he has a BMI of 27.8: overweight but not obese. He sleeps a maximum of six hours per night, waking typically 2–3 times each night, which he attributes to mild knee pain but more

Figure 1. Body chart.

Visual Analogue Scale (VAS) right knee: constant pain VAS 3/10 (dull aching); with ambulation: initially 5/10, rising to 7/10 (sharp, throbbing) after 5 mins

Painful to touch VAS 6/10. Occasional flare-ups to VAS 10/10, last being two months ago

Slight numbness, inferior to medial knee joint line 2cm below, 50 cent area



so a feeling of being unsettled. BL doesn't drink or smoke, he is unemployed and is receiving the disability support pension. He last worked as a cleaner; however, this ceased two years ago due to an increase in his knee pain. He lives alone in government housing and has an estranged spouse and child aged nine. He blames the knee pain and poor sleep for the marriage break-up. He thinks his life is 'a bit pathetic' and believes his knees are 'no good' and 'need surgery'.

Screening tools used included the Modified Tampa Scale Kinesophobia 17 point scale (max score 68) looking at fear of movement. A study of 200 OA participants using this tool had a mean score of 31.8, SD 10.4 (Kilinc et al 2019). BL scored highly at 48. This tool has useful prognostic value with strong correlations to fear of movement, anxiety, disability and depression (Filardo et al 2017, Axford et al 2010).

Pain detect: identification of neuropathic pain is an indicator of reduced function and outcomes (Moss et al 2018). BL scored 17/35 on Pain Detect test, grading him as unclear neuropathic. On the Oxford Knee Score (OKS), a useful screening tool for conservative knee OA management, BL scored 29/48, which indicates a moderate physical burden of disease (lower scores indicate greater burden) (Harris et al 2013).

Physical examination: BL had knee active range of motion (ROM) (measured supine) of 13–90 degrees right, 3–105 degrees on left. Passive ROM equalled active ROM—limited by pain and stiffness (mild joint line crepitus). On palpation, joint line pain was 5/10 on right, 3/10 on left.

Neurological test with light touch: mild differences right to left were observed over medial inferior knee 2cm below joint line, otherwise unremarkable although there is possible superficial saphenous nerve affect from previous ACL reconstruction. There is no indication of allodynia. Pinprick hyperalgesia 4/10 on right and 0/10 on left. Repetitive pinpricks increased pain on right to 6/10, indicative of a central sensitisation (mild wind up) (Rolke et al 2006). No warmth, swelling or effusion. Functionally, BL can sit-to-stand three times with two elbow crutches limited by pain.

Mobility: on the 6-minute walk test (6MWT) with single point stick (SPS), covering 260m, BL demonstrated an antalgic gait pattern with reduced weight-bearing on the right and bilateral circumduction of hip at toe-off stage of gait, with minimal knee bend (VAS 6/10). 6MWT results for an OA population of 200 showed nine had a mean of 327m +/-SD of 67m. This test has been shown to correlate strongly with a variety of primary knee OA indicators (Ateef et al 2016).

Current management regime: program has been three weeks to date, using Arthritis Australia handouts focused on education around movement (Arthritis Australia 2018), Lorimer Moseley's *Explain Pain* handouts (Butler & Moseley 2013) and the painHealth website (WA Dept of Health 2018). A walking program has been implemented (RACGP 2018) on SPS: three days on, one day off, with no aggravation of pain at increased distance of 10 per cent, currently 14 minutes daily with SPS (2 x blocks). An antalgic pattern is discouraged. BL has not trialled hydrotherapy or strength training. AROM=PROM left (0–110), right (8–100) normalised within functional ranges.

Evidence-based recommendations

Kittelson et al (2014) provides a template for individualising OA management that can be applied to BL's history and screening tools to prioritise his management. This is inclusive of structure (moderate priority), neurophysiological (moderate) and psychological (high priority).

Osteoarthritis Research Society International (OARSI) provides current (2019) evidence-based guidelines for the non-surgical management of knee, hip and polyarticular osteoarthritis (Bannuru et al 2019). Core values including education and medication advice, specifically the use of topical non-steroidal anti-inflammatories and Cox 2's (Bannuru et al 2019), which can be

Table 1. Management program.

Goals	Management	Comments/basis of recommendation and why important	Outcome measure/ screening tool
Short term (2–4 weeks)			
<p>Week 3: sleep for six hours, waking less than twice during the night, in three weeks. Minimum for three days in the week.</p> <p>Week 4: walk for 24 minutes per day 4x6 min small block, 4x around block (300m) with SPS, no aggravation of pain past resting.</p>	<ul style="list-style-type: none"> Sleep hygiene pamphlet WA Dept of Health (tinyurl.com/v2mb6fv) given and educated on Gentle use of static foot pedals 2–5mins before bed for pain-free ROM (Bannuru et al 2019) Pain-coping strategies to challenge negative beliefs around movement and pain (Bennell et al 2016). Education on pacing (Kittelson et al 2014) Mindfulness for anxiety and fear (Shapiro et al 2006). Headspace app 10 minutes, use daily Education: painHealth website (tinyurl.com/y5kgpsas), especially Rose and Jamie patient stories. Read Arthritis Australia and Explain Pain handouts Advice on topical NSAIDs, Cox 2 inhibitors and paracetamol (Bannuru et al 2019) Walking program, rule of 3's increasing length by 10% per three days. At week 3 (300m) increase frequency to 3x day 	<p>Sleep is a priority for BL: for general health, energy and maintaining homeostasis and because his poor sleep contributed to his relationship issues.</p> <p>Self-controlling and managing his pain through mindfulness, pacing and education is important for empowering BL. Mindfulness may also help manage any neuropathic pain (Grossman et al 2004).</p>	<ul style="list-style-type: none"> Sleep diary: total sleep time, times woken up OKS improvement on sleep question (25%) Self-reported pain VAS nil aggravation TAMPA scale 10% reduction (43) OKS 10% (25) Pain detect <15 6MWT improve 10% (>290m)
Medium term (4–8 weeks)			
<p>Week 7: mobilise 1x big block (800m) x2 daily with SPS (total 30–40 mins) without flare-up.</p> <p>Week 8: complete 5x sit to stand and 4x stairs. Nil aggravation at time or after.</p>	<ul style="list-style-type: none"> Gait retraining, normalising knee bend Ongoing walking program: focusing increasing time not frequency of walks (in line with rule of 3's) Ween off systemic NSAIDs Sit to stand practice with ¼ squats x6 (x4) daily, strength dosage. Up/down 1 x step (x4) daily. Can do step same time as walk 	<p>To return to work at RSL, BL needs to increase ambulation and load tolerance. Also wants to complete the big block (800m) as it takes him out of the housing estate.</p> <p>He wants to increase his independence in the community by completing stairs.</p>	<ul style="list-style-type: none"> VAS reported pain (<4) Exercise diary indicating success 6MWT (>320m) TAMPA scale improve 10-plus % (below 39) OKS 10% improve (21)
Long term (8–12 weeks)			
<p>Week 10: Dinner with wife. Goal for restaurant trip: six stairs, walk with SPS 10 minutes and 6 x sit to stands. Nil aggravation of pain</p> <p>Week 12: Return to work at RSL one day a week for one hour, light duties.</p>	<ul style="list-style-type: none"> Begin tai chi and body–mind exercise (Bannuru et al 2019) ½ squats 6 (x4) daily Review pain-coping and education Broad-based strength program with balance, lower limb strength and general conditioning 3x weekly 30 minutes 30 minutes physical activity per day Collaborative meeting RSL, re job 	<p>Beginning to repair relationship with wife, important self-identified step to go to favourite restaurant.</p> <p>Regaining occupation and sense of purpose, going back to work was where he felt included and was happier. Beginning to improve whole body and QOL.</p>	<ul style="list-style-type: none"> VAS reported pain (<4) throughout TAMPA scale (35) OKS (18) Pain detect (<12), for negative neuropathic 6MWT (>360m)

combined with paracetamol as a low-risk adjunct (RACGP 2018). Mind-body exercises such as tai chi or yoga are effective (Bannuru et al 2019), as are non-weight-bearing aquatic exercises (Bannuru et al 2019) (BL does not want to participate in hydrotherapy). For BL, self-management strategies and cognitive based therapy (CBT) combined with walking exercise are effective (Bannuru et al 2019). CBT, mindfulness and mental imagery are all techniques that are effective in changing sensorimotor function and reduce fear of movement (Grossman et al 2004, Shapner et al 2014). Combining his exercises with pain-coping strategies will have a modest effect on pain (Bennell et al 2016).

Focusing on his function rather than pain will be best practice (Bannuru et al 2019). Looking forward as function improves, whole-body considerations, general health and positive lifestyle behaviours will also be a focus. A land-based exercise program,

including strength, cardio, balance training and neuromuscular exercise, are core OARSI values (Bannuru et al 2019).

To improve quality of life, 30 minutes of physical activity a day is required (RACGP 2018), especially when combined with sleep hygiene work to maintain homeostasis and reduce chronicity of pain (Finan et al 2013). BL's neuropathic pain component does not currently justify medication management.

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