Activity modification advice: Part 1–The hip hinge

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Abstract This paper discusses the role of activity modification advice for low back patients. Reactivation advice as opposed to prolonged bed rest is shown to enhance recovery. One specific form of advice is called the hip hinge which teaches the patient how to stabilize the back during high-risk activities.

Key words: Spinal injury; Spinal rehabilitation; End range flexion; Repetitive strain

Introduction

Acute back pain patients require reassuring reactivation advice in order to hasten their recovery. Rest, one of the more popular treatments for acute pain can actually slow down the healing process. While resumption of near-normal activities is generally recommended, activity modification advice is also important since certain movements such as repetitive end-range flexion have been shown to be harmful to the spine and to delay recovery (Snook et al. 1998, 2002). This article will discuss a simple activity modification advice – the hip hinge – which helps to protect the spine during common activities such as bending.

Reactivation advice

Information and advice emphasizing the value of fitness and the safety of resuming activities achieved superior outcomes to advice which reinforced rest, activity restrictions and the notion that the spine was injured or damaged (arthritis, herniated disc) (Burton & Waddell 1999). Reassuring workers and encouraging resumption of ordinary activities was superior to medication, bed rest or mobilization exercises (Malmivaara et al. 1995).

Iatrogenic effect of prolonged bed rest

Deyo performed a controlled clinical trial which compared 2 days of bed rest against 2 weeks. Two days of bed rest was found to be as effective as 2 weeks, while limiting the negative effects of prolonged immobilization (Deyo et al. 1986). A Cochrane Collaboration review concluded that bed rest (Hagen et al. 2000):

- has no positive effect for low back pain (LBP)
- may have slightly harmful effects

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Journal of Bodywork and Movement Therapies (2003)
7(3), 148–150

doi:10.1016/S1360-8592(03)00039-1
S1360-8592/03/$ - see front matter

- yields no improvement with 7 days compared with 2–3 days in LBP or sciatica

Is the spine vulnerable to repetitive end-range flexion load?

The lumbar spine has been shown to be particularly vulnerable to repetitive motion at end range. Disc herniation is related to repeated flexion motion (Callaghan & McGill 2001), especially if coupled with lateral bending and twisting (Adams & Hutton 1985, Gordon et al. 1991). Injuries to the posterior elements including the facet joints have been shown to be related to cyclic full flexion and extension (Hardcastle et al. 1992, Burnett et al. 1996), as well as to excessive shear forces (Cripton et al. 1995, Yingling & McGill 1999).

Increased end-range flexion loading of the spine has been shown to occur as a result of a fatiguing repetitive task such as lifting (Sparto et al. 1997). Increases in spinal flexion and decreases in knee and hip motion were shown to occur as a stoop lifting strategy replaced squat lifting. Sixteen subjects performed with a submaximal load at maximum lifting rate to study the effects of fatigue. Fatigue was associated with a decrease in knee and hip motion and an increase in peak lumbar flexion, indicating a change from a squat lift to a stoop lift strategy. Decreased postural stability documented by a greater anterior to posterior excursion of the trunk center of mass was also noted.

Etnyre et al. (1999) showed that LBP patients alter their sit-to-stand motions by reducing their hip motion and increasing their spine flexion motion during this movement stereotype.

It has been shown that after just 20 minutes of full flexion of the spine (e.g. couch sitting or stooping over) ligamentous creep or laxity occurs which persists even after 30 minutes of rest! (McGill 1992). Therefore, avoidance of high-risk activities early in the morning or after sitting or stooping in full flexion is crucial to injury or re-injury prevention. Not surprisingly, Snook demonstrated that avoidance of early morning flexion facilitated recovery from acute LBP (Snook et al. 1998, 2002).

Hip-hinge activity modification advice

Most acute low back problems are worsened by inappropriate end-range loading. For instance, discs are sensitive to repetitive end-range flexion. According to McGill (1998), 'Evidence from tissue-specific injury generally supports the notion of a neutral spine (neutral lordosis) when performing loading tasks to minimize the risk of low back injury.'

Spare the spine by hinging with the hips instead of the spine. This entails maintaining mild lordosis – the position of 'static elastic equilibrium' – when getting in/out of chairs; lifting and bending; squatting, stooping, or kneeling; and stretches (e.g. hamstring) (see Figs 1–3).

To perform the hip hinge while rising up from a chair or sitting back down (see Fig. 1B):

- start by perching at edge of a chair
- maintain lordosis
- stand up and then return to perch position
- this can be progressed by using the seat of a lower height chair (see Fig. 1B)

Key errors to watch for are:

- flexion of the lumbo-pelvic spine (bending forward from waist instead of hips) (see Fig. 1A)
- thoraco-lumbar hyperextension

Troubleshooting:

- use a high bench, bar stool, arm rest of a chair or couch, or top of the backrest on a chair turned backwards (see Fig. 4)

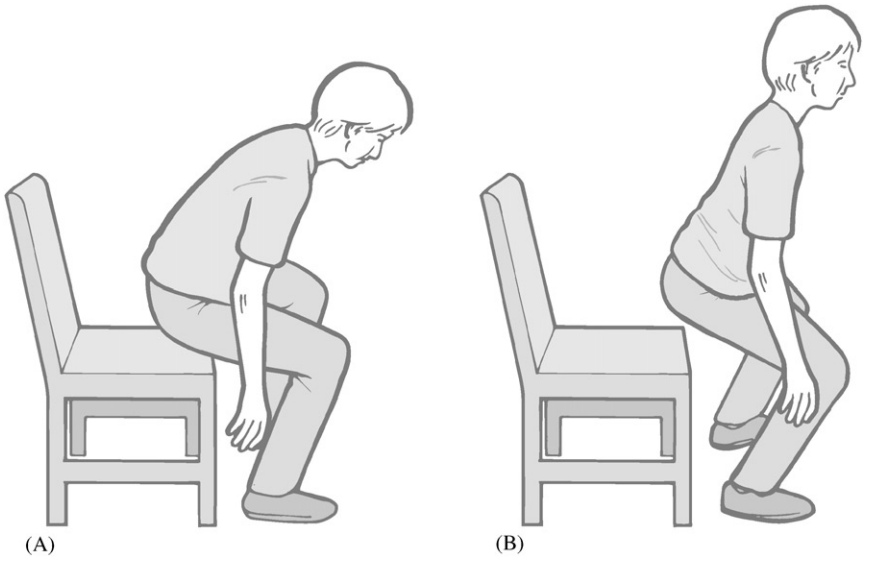

Fig. 1 (A) Incorrect – rising from a chair with lumbo-pelvic flexion. (B) Correct – rising from a chair with hip hinge to protect the lumbar spine.

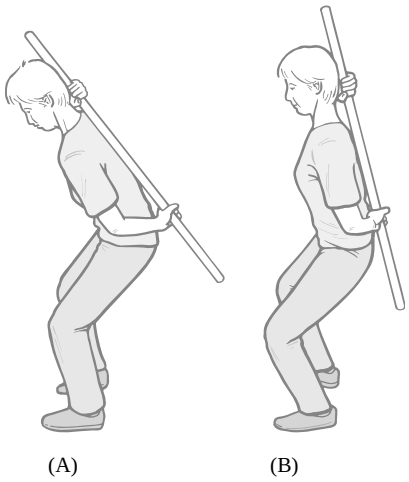

Fig. 2 (A) Incorrect – squat with lumbo-pelvic flexion. (B) Correct – squat with hip hinge.

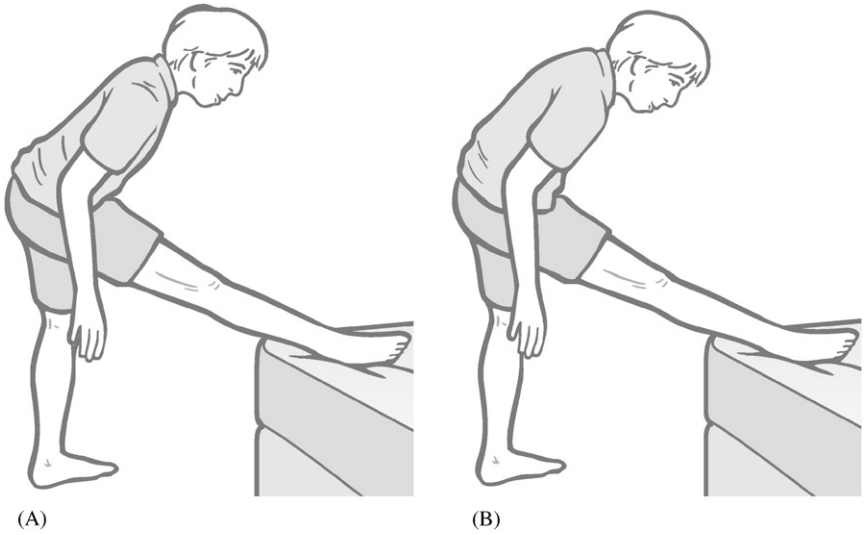

Fig. 3 Hamstring stretch with (A) hip hinge; (B) lumbo-pelvic flexion.

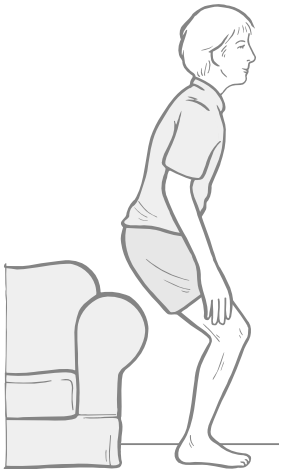

Fig. 4 Rising from a higher surface to initiate training of the hip hinge.

- use a dowel to demonstrate to the patient the difference between squatting with a hip hinge vs. squatting with a stooped posture (see Fig. 2)

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