



**Australian Government**  
**Department of Health and Ageing**



# Horizon Scanning Technology Prioritising Summary

## Skip laminectomy for spinal disorders

June 2004



**Australian  
Safety  
and Efficacy  
Register  
of New  
Interventional  
Procedures -  
Surgical**



**Royal Australasian  
College of Surgeons**



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The production of this Horizon scanning prioritising summary was overseen by the Health Policy Advisory Committee on Technology (HealthPACT), a sub-committee of the Medical Services Advisory Committee (MSAC). HealthPACT comprises representatives from health departments in all states and territories, the Australia and New Zealand governments; MSAC and ASERNIP-S. The Australian Health Ministers' Advisory Council (AHMAC) supports HealthPACT through funding.

This Horizon scanning prioritising summary was prepared by staff from the Australian safety and Efficacy Register of New Interventional Procedures – Surgical (ASERNIP-S).

**NAME OF TECHNOLOGY:**

Skip Laminectomy

**PURPOSE & TARGET GROUP:**

This technique results in the decompression of the cervical spinal canal with minimal invasion of the posterior extensor mechanisms. It may therefore be applicable for treatment of spinal disorders resulting from spinal canal compression such as cervical spondylotic myelopathy, spinal canal stenosis and calcification of ligamentum flavum.

**STAGE OF DEVELOPMENT (IN AUSTRALIA):** Yet to emerge in Australia

- Experimental
- Investigational
- Nearly Established
- Established
- Established but changed indication or modification of technique
- Should be taken out of use

**INTERNATIONAL UTILISATION:**

COUNTRY	LEVEL OF USE		
	Trials underway	Limited use	Widely Diffused
Japan	✓		

**IMPACT SUMMARY****Background:**

Traditionally the treatment of spinal compression disorders such as cervical spondylotic myelopathy, spinal canal stenosis and calcification of ligamentum flavum has involved undertaking a standard laminectomy or laminoplasty.<sup>1</sup> These procedures, whilst accomplishing decompression of the spinal canal, can result in extensive intraoperative damage to the deep extensor muscles resulting in axial symptoms such as nuchal and shoulder pain, neck movement restriction and the reduction of cervical lordosis.<sup>2</sup>

Skip laminectomy effectively decompresses the spinal canal with minimal damage to the deep extensor mechanism by reducing the number of vertebrae subjected to full laminectomy.<sup>1</sup> The procedure involves undertaking standard laminectomy of alternate vertebrae and a partial laminectomy of the lower adjacent vertebra. Interluminal decompression is accomplished by removing the cephalad half of the inferior lamina and ligamentum flavum without detaching the semispinalis cervicis and multifidus muscles (extensor muscles).<sup>2</sup>



**Clinical need and burden of disease:**

The epidemiological impact of disorders that result from compression of the spinal canal in Australia is currently unknown. However, it is known that back and disc problems are a significant cause of ill health within the community, with increased prevalence in the older adult. Figures gathered by the Australian Bureau of Statistics show the 16% of 16-24 year olds and 32% of 55-64 year olds have required medical attention for back and disc problems.<sup>3</sup> However, this statistic should be regarded as the ‘upper limit’ for spinal disorders that could be treated by skip laminectomy due to the fact that this technique is only used for the cervical spine.

Back and disc problems including spinal canal stenosis cause patients substantial discomfort and subsequently impact heavily on employment and social abilities.<sup>4</sup>

**Estimated speed, geographic and practitioner use patterns of diffusion in the health system:**

Shiraishi and colleagues have performed in excess of 100 skip laminectomy procedures since December 1998, and have since published two papers in 2002 with an update in 2003 of their comparative study.

**Existing comparators:**

- Laminectomy
- Laminoplasty

**Estimated cost impact:**

The costs associated with this new procedure are not available. The cost of surgery involving laminectomy or laminoplasty in Australia is also not available. However, reimbursement fees of traditional spinal canal decompression by laminectomy as stated in the Medicare Benefits Schedule is estimated to be approximately \$1190.<sup>6</sup>

**Efficacy and safety issues:**

Short and long-term safety and efficacy data exist from one comparative study (evidence level III-3)<sup>7</sup> with historical control (published in 2002<sup>1,8</sup>, updated 2003).<sup>2</sup>

Study details	Key efficacy findings	Key safety findings
<i>Comparative study</i>		
<b>Shiraishi et al. (2003)<sup>2</sup></b> 94 Patients Group 1: Skip laminectomy (n=43) Group 2: Open-door laminectomy (n=51)  Mean follow-up: Group 1: 30 months Group 2: 43 months  <i>Selection Criteria</i> Patients with cervical spondylotic	No significant differences in recovery rates between group 1 (mean 59.2%) and group 2 (mean 60.1%).  Average blood loss was decreased in group 1 (mean 18 mL) compared to group 2 (mean 249 mL).  Axial symptoms were decreased in group 1 ( 1/43 : 2%) compared to group 2 (34/51 : 76%). There was a significant difference in	No patients in group 1 had neurological complications. These complications occurred in 3/51 (5.7%) group 2 patients.



<p>myelopathy</p> <p>Patients also reported in Shiraishi 2002a<sup>1</sup> and some patients in Shiraishi 2002b<sup>8</sup>.</p>	<p>incidence of axial symptoms between the two groups (P&lt;0.05).</p> <p>The mean range of flexion and extension between preoperative and postoperative measurements in group 1 was 98% compared to 44% in group 2. There was a significant difference in range of motion (%) between the two groups (P&lt;0.05).</p> <p>The mean cervical curvature index in group 1 increased from 11.4 preoperatively to 13.1 postoperatively. Group 2 decreased from 16.0 preoperatively to 11.8 postoperatively. The mean postoperative cervical curvature was significantly smaller than the preoperative in group 2 (P&lt;0.05).</p> <p>The mean atrophy rate of extensor muscles was lower in group 1 (13.6%) compared to group 2 (59.7%). There was a significant difference in the atrophy rates between the two groups (P&lt;0.05).</p>	
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Only three studies, with patient overlap, have reported on the safety and efficacy of skip laminectomy as an alternative to standard laminectomy. However, they indicate that skip laminectomy may enable effective decompression of the spinal canal whilst resulting in less axial symptoms, increased range of motion, increased cervical curvature which identified reduction of cervical lordosis and less atrophy of extensor muscles.

**Ethical issues:** Not applicable

**Cultural or religious considerations:** Not applicable

**Other issues:** The same research group conducted both studies on which the safety and efficacy of skip laminectomy are based.

**Conclusion:**

Limited evidence exists on the safety and efficacy of skip laminectomy. Long-term safety and efficacy data from randomised controlled trials may be required before this procedure can be widely accepted.

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## REFERENCES:

1. Shiraishi T. Skip Laminectomy - a new treatment for cervical spondylotic myelopathy, preserving bilateral muscular attachments to the spinous processes: a preliminary report. *The Spine Journal* 2002a;**2**:108-15.
2. Shiraishi T, Fukuda K, Yato Y, Nakamura M, Ikegami T. Results of skip laminectomy – a minimum 2-year follow-up study compared with open-door laminoplasty. *Spine* 2003;**28**(24):2667-2672.
3. Australian Bureau of Statistics: National health survey - summary of results, Australia <http://www.abs.gov.au> Accessed January 2004
4. The epidemiology of neck pain <http://www.digital-doc.com/neckpain.htm> Accessed January 2004
5. Skip laminectomy may be better than conventional laminoplasty 2004 <http://www.medscape.com/viewarticle/466151?mpid=22651> Accessed January 2004
6. Medicare Benefits Schedule – item 40306. <http://www.health.gov.au/pubs/mbs/mbs6/cat3gro6.htm#Items-40306> Accessed January 2004.
7. Designation of level of evidence. How to use the evidence: assessment and application of scientific evidence, pp8. Canberra: NHMRC,2000.
8. Shiraishi T. A new technique for exposure of the cervical spine laminae: Technical note. *Journal of Neurosurgery (Spine 1)* 2002b;**96**:122-126.

## SEARCH CRITERIA:

A search of MEDLINE, PubMed and Cochrane Library, Current Controlled Trials metaRegister, UK National Research Register International, Network for Agencies for Health Technology Assessments, relevant online journals and the Internet was conducted in January 2004.

Search terms used were: ‘skip laminectomy’, ‘partial laminectomy’, ‘Shiraishi T’ and ‘spinal canal decompression’