

TITLE: Hip Protectors: A Review of the Comparative Clinical and Cost-Effectiveness

DATE: 11 February 2015

CONTEXT AND POLICY ISSUES

Hip fractures, usually resulting from a fall, affect the proximal femur and were predicted to reach a global number of 6.26 million per year by the year 2050 with clinical and economic consequences.¹⁻³ In 2008, over 300,000 Canadians were residing in long-term care facilities, a population prone to falling leading to hip fractures, with a societal cost in the first year following a hip fracture of about Can\$ 34,000 per resident.⁴ Hip protectors, by protecting the hip with a firm shell (hard protectors), or a compressible pad (soft protectors), are designed to reduce the forces impacting the hip in a sideways fall, and may lessen the chance for a femoral neck fracture.^{5,6}

A Cochrane review published in 2014⁷ included 19 randomised or quasi-randomised controlled trials comparing the intervention group (with hip protectors) and the comparator group (without hip protectors) found a small reduction in hip fracture risk for people in nursing or residential care settings (risk ratio 0.82; confidence interval 0.67 to 1.00), and no effect in a community-dwelling setting. There were no subgroup analyses based on brands of hip protectors.

There are several different commercially available hip protectors the comparative effectiveness of each type is unclear. This Rapid Response report aims to review the comparative clinical and cost-effectiveness of HipSaver, Safe Hip, and Secure brands of hip protectors.

RESEARCH QUESTIONS

1. What is the comparative clinical effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors?
2. What is the comparative cost-effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors?

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KEY FINDINGS

The literature search did not find any evidence comparing the clinical or cost-effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors.

METHODS

Literature Search Strategy

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 1), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No methodological filters were applied to limit retrieval to study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2005 and December 31, 2015.

Selection Criteria and Methods

One reviewer screened citations and selected studies. In the first level of screening, titles and abstracts were reviewed for relevance. Full texts of any relevant titles or abstracts were retrieved, and assessed for inclusion. The final article selection was based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria	
Population	Patients at risk for falls and potential hip fracture; primarily older adults (over 65 years), adults under 65 years with osteoporosis; in any setting
Intervention	HipSaver, Safe Hip, and Secure brands of hip protectors
Comparator	Brands compared to each other
Outcomes	Effectiveness in preventing hip fractures Patient compliance Harms such as skin breakdown, pressure ulcers, etc. A reference list of biomechanical studies is provided as an appendix.
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials (RCTs), non-RCTs, and economic evaluations.

Exclusion Criteria

Articles were excluded if they did not meet the selection criteria in Table 1, if they were published prior to January 2009, if they were duplicate publications of the same study, or if they were referenced in a selected systematic review.

SUMMARY OF EVIDENCE

Quantity of Research Available

The literature search yielded 125 citations. After screening of abstracts from the literature search and from other sources, 10 potentially relevant studies were selected for full-text review.

No studies met the inclusion criteria and were included in the review. The PRISMA flowchart in Appendix 1 details the process of the study selection. Appendix 2 provides a list of biomechanical hip protector studies.

Summary of Findings

1. What is the comparative clinical effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors?

There was no evidence found on the comparative clinical effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors.

2. What is the comparative cost-effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors?

There was no evidence found on the comparative cost-effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors.

Limitations

Evidence comparing clinical and cost-effectiveness between different hip protector products such as HipSaver, Safe Hip, and Secure is lacking. Such evidence would help decision makers to advise patients or hospitals on the type of product to purchase.

CONCLUSIONS AND IMPLICATIONS FOR DECISION OR POLICY MAKING

There was no evidence found on the comparative clinical and cost-effectiveness of the HipSaver, Safe Hip, and Secure brands of hip protectors. One study examined the issues that influence hip protector use among community-dwelling older adults and found that beliefs concerning the amount of protection that a hip protector provided was positively associated with the length of time the hip protector was worn.⁸ A randomized controlled trial showed that the uptake of hip protectors in nursing homes did not depend on whether the protectors are hard or soft; however there were significantly more 24-hour users among people using soft protectors, which may indicate that design may affect hip protector adherence.⁹ In agreement with some cost-effectiveness studies that showed hip protector use in elderly people is cost-effective,^{2,3} a cost analysis by the Ministry of Health in 2007 showed that the strategy of provision of hip protectors to all elderly Ontario nursing home residents could result in an overall cost savings of Can\$6.00 million in one year, with a cost saving probability of 63%.¹⁰ Evidence that directly compared the clinical and cost-effectiveness of different products would be useful for patients and clinical care facilities on the decision to purchase hip protectors.

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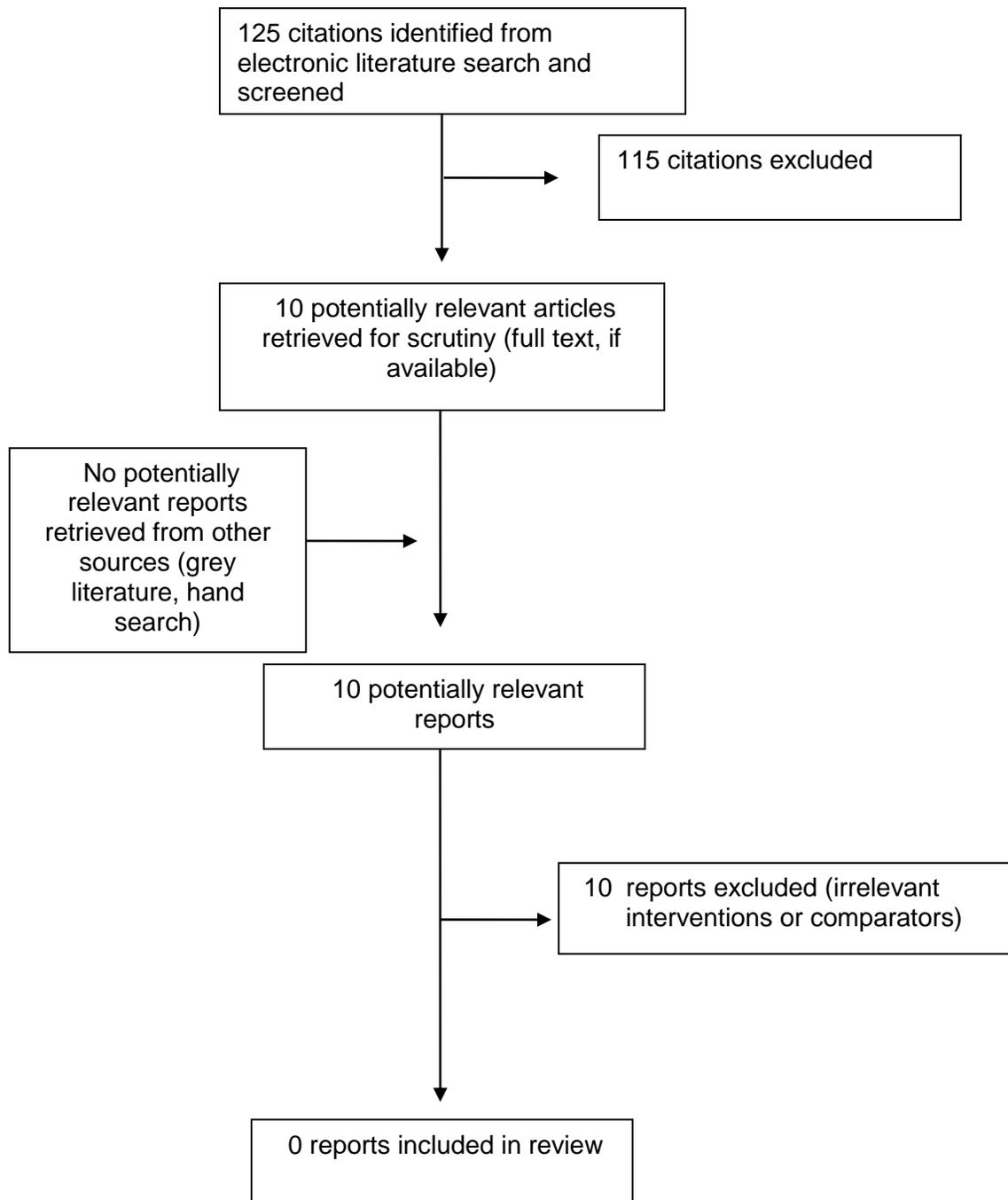
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Appendix 1: Selection of Included Studies



Appendix 2: List of Potentially Relevant Biomechanical Studies

Laing AC, Feldman F, Jalili M, Tsai CM, Robinovitch SN. The effects of pad geometry and material properties on the biomechanical effectiveness of 26 commercially available hip protectors. *J Biomech.* 2011 Oct 13;44(15):2627-35

Choi WJ, Hoffer JA, Robinovitch SN. Effect of hip protectors, falling angle and body mass index on pressure distribution over the hip during simulated falls. *Clin Biomech.* 2010 Jan;25(1):63-9.

Choi WJ, Hoffer JA, Robinovitch SN. The effect of positioning on the biomechanical performance of soft shell hip protectors. *J Biomech.* 2010 Mar 22;43(5):818-25.

Laing AC, Robinovitch SN. Characterizing the effective stiffness of the pelvis during sideways falls on the hip. *J Biomech.* 2010 Jul 20;43(10):1898-904.

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