



TITLE: Compression Garments for the Treatment of Primary and Secondary Lymphedema: Clinical Effectiveness and Guidelines

DATE: 10 November 2011

RESEARCH QUESTIONS

1. What is the clinical effectiveness of compression garments for the treatment of primary lymphedema?
2. What is the clinical effectiveness of compression garments for the treatment of secondary lymphedema?
3. What are the evidence-based guidelines regarding the use of compression garments for the treatment of primary and secondary lymphedema?

KEY MESSAGE

There is evidence to support the usage of compression garments in both primary and secondary lymphedema; however, the evidence also suggests that further studies are warranted.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2010, Issue 10), 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 by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2006 and October 27, 2011. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One health technology assessment, five systematic reviews, five randomized controlled trials, five non-randomized studies and two guidelines regarding the use of compression garments in the treatment of lymphedema were identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One health technology assessment¹ examined the usage of compression garments in lymphedema and found there was no clear evidence that these garments were effective in the treatment of secondary lymphedema.

Three systematic reviews²⁻⁴ found compression garments to be useful in the treatment of secondary lymphedema related to breast cancer treatment. One systematic review⁶ discussed the implication of self-application and adherence which can negatively affect reduction of upper and lower limb lymphedema. A review² by INESSS reported that patients should wear compression garments regularly after developing lymphedema. One review⁵ described a lack of evidence to support the use of compression garments in treating lymphedema (primary and secondary), and concluded that further studies are needed.

Five randomized controlled trials⁷⁻¹¹ and six non-randomized studies¹²⁻¹⁶ were identified. The characteristics and findings of these studies are outlined in Table 1.

Table 1: Characteristics and Findings of Randomized Controlled Trials		
Study	Objective	Results and Conclusions
King et al. 2011 ⁷	To determine the effectiveness of using compression garments to treat breast cancer related lymphedema.	Compression bandaging helped to reduce lymphedema volume in lower extremities, but worsened lymphedema in upper extremities.
Lamprou et al. 2011 ⁸	Compared short-stretch bandages and a 2CC system to traditional multilayer bandaging in the treatment of lymphedema.	The new 2CC system was a good alternative to traditional bandaging for treating lymphedema.
Kasseroller and Brenner 2010 ⁹	Tested the effectiveness of new, alginate drenched compression bandages in the treatment of breast cancer related lymphedema.	Alginate bandages were a useful alternative to conventional bandages in treating secondary lymphedema. Proper administration of alginate bandages provided

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Study	Objective	Results and Conclusions
		greater reduction in leg lymphedema than traditional bandages.
Damstra and Partsch 2009 ¹⁰	Tested the pressure used when applying SSBs to treat lymphedema.	Compression bandages, such as SSBs with lower pressure, provided more reduction in lymphedema than higher pressure applications.
Sawan et al. 2009 ¹¹	Discussed the effectiveness of using prophylactic compression stockings to prevent leg lymphedema following vulval cancer.	Prophylactic use of compression stockings was an option for preventing leg lymphedema, but the authors suggested more studies be conducted.
Characteristics and Findings of Non-Randomized Studies		
Study	Objective	Results and Conclusions
Vignes et al. 2011 ¹²	Examining effective treatments during the maintenance phase of lymphedema; these methods include using compression bandages.	The use of compression bandages and elastic sleeves was effective in the treatment phase. Non-compliance was a prevalent issue which was factored by patient age, higher weight, etc.
Damstra, Brewer and Partsch 2008 ¹³	SSBs were applied on leg to measure pressure volume and lymphedema reduction.	SSBs for inelastic, multicomponent bandages showed an immediate reduction in leg volume in both lymphedema-affected and healthy patients.
Stout Gergich et al. 2008 ¹⁴	Studied the effectiveness of early diagnosis of lymphedema in breast cancer patients (post-operatively) and applying compression bandages to reduce limb volume.	Using compression garments for the first 4 weeks post-operatively was effective for the treatment of secondary lymphedema. Continued usage was recommended only when there was visible swelling or other symptoms.
Vignes et al. 2007 ¹⁵	Discussed the causes of lymphedema volume during treatment and studied the best options to reduce volume, including compression bandages.	Non-compliance was a factor in lymphedema volume during the treatment phase. The authors state that compression garments were a

Table 1: Characteristics and Findings of Randomized Controlled Trials		
Study	Objective	Results and Conclusions
		useful treatment when used continuously and properly.
Brambilla et al. 2006 ¹⁶	Studied the effectiveness of using below-knee elastic stockings versus no compression in secondary lymphedema.	Compressive therapy was a useful treatment for the management of secondary lymphedema. Both limb volume increase and decrease was reported.

2CC=Two Component Compression; SSBs=Short-Stretch Bandages

Two guidelines¹⁷⁻¹⁸ provide evidence regarding recommended practices for the use of compression garments in the treatment of lymphedema. One of these guidelines, available through the National Guideline Clearinghouse,¹⁶ recommends the use of compression garments but finds their usage a contraindication in treating lymphedema. The second guideline developed by CREST¹⁷ supports the use of compression garments or multilayer bandaging. The authors suggest that each patient is prescribed specialized bandaging over a lifetime. In combination with other modalities, compression garments provide effective treatment for lymphedema.

REFERENCES SUMMARIZED

Health Technology Assessments

1. Oremus M, Walker K, Dayes I, Raina P. Diagnosis and treatment of secondary lymphedema: technology assessment report [Internet]. Baltimore (MD): AHRQ (for INNESS) Technology Program; 2010 [cited 2011 Nov 03]. Available from: <http://www.cms.gov/determinationprocess/downloads/id66aTA.pdf>

Systematic Reviews and Meta-analyses

2. Larouche K, Witty, MF. Treatment of cancer-related secondary lymphedema [Internet]. Quebec: INESSS; 2011 [cited 2011 Nov 03]. Available from: http://www.inesss.qc.ca/fileadmin/doc/aetmis/Rapports/Cancer/INESSS_Summary_lymphoedeme_EN.pdf
3. McNeely ML, Peddle CJ, Yurick JL, Dayes IS, Mackey JR. Conservative and dietary interventions for cancer-related lymphedema: a systematic review and meta-analysis. *Cancer*. 2011 Mar 15;117(6):1136-48. [PubMed: PM21381006](#)
4. Karki A, Anttila H, Tasmuth T, Rautakorpi UM. Lymphoedema therapy in breast cancer patients: a systematic review on effectiveness and a survey of current practices and costs in Finland. *Acta Oncol*. 2009;48(6):850-9. [PubMed: PM19235573](#)
5. Preston NJ, Seers K, Mortimer PS. Physical therapies for reducing and controlling lymphoedema of the limbs. *Cochrane Database Syst Rev*; 2008;(3):CD003141. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003141.pub2/pdf>
6. Moseley AL, Carati CJ, Piller NB. A systematic review of common conservative therapies for arm lymphoedema secondary to breast cancer treatment. *Ann Oncol*. 2007 Apr;18(4):639-46. [PubMed: PM17018707](#)

Randomized Controlled Trials

7. King M, Deveaux A, White H, Rayson D. Compression garments versus compression bandaging in decongestive lymphatic therapy for breast cancer-related lymphedema: a randomized controlled trial. *Support Care Cancer*. 2011 May 8. [PubMed: PM21553314](#)
8. Lamprou DA, Damstra RJ, Partsch H. Prospective, randomized, controlled trial comparing a new two-component compression system with inelastic multicomponent compression bandages in the treatment of leg lymphedema. *Dermatol Surg*. 2011 Jul;37(7):985-91. [PubMed: PM21575097](#)

9. Kasseroller RG, Brenner E. A prospective randomised study of alginate-drenched low stretch bandages as an alternative to conventional lymphologic compression bandaging. *Support Care Cancer*. 2010 Mar;18(3):343-50.
[PubMed: PM19484485](#)
10. Damstra RJ, Partsch H. Compression therapy in breast cancer-related lymphedema: A randomized, controlled comparative study of relation between volume and interface pressure changes. *J Vasc Surg*. 2009 May;49(5):1256-63.
[PubMed: PM19394553](#)
11. Sawan S, Mugnai R, Lopes AB, Hughes A, Edmondson RJ. Lower-limb lymphedema and vulval cancer: feasibility of prophylactic compression garments and validation of leg volume measurement. *Int J Gynecol Cancer*. 2009 Dec;19(9):1649-54.
[PubMed: PM19955953](#)

Non-Randomized Studies

12. Vignes S, Porcher R, Arrault M, Dupuy A. Factors influencing breast cancer-related lymphedema volume after intensive decongestive physiotherapy. *Support Care Cancer*. 2011 Jul;19(7):935-40.
[PubMed: PM20495983](#)
13. Damstra RJ, Brouwer ER, Partsch H. Controlled, comparative study of relation between volume changes and interface pressure under short-stretch bandages in leg lymphedema patients. *Dermatol Surg*. 2008 Jun;34(6):773-8.
[PubMed: PM18336577](#)
14. Stout Gergich NL, Pfalzer LA, McGarvey C, Springer B, Gerber LH, Soballe P. Preoperative assessment enables the early diagnosis and successful treatment of lymphedema. *Cancer*. 2008 Jun 15;112(12):2809-19.
[PubMed: PM18428212](#)
15. Vignes S, Porcher R, Arrault M, Dupuy A. Long-term management of breast cancer-related lymphedema after intensive decongestive physiotherapy. *Breast Cancer Res Treat*. 2007 Mar;101(3):285-90.
[PubMed: PM16826318](#)
16. Brambilla L, Tournalaki A, Ferrucci S, Brambati M, Boneschi V. Treatment of classic Kaposi's sarcoma-associated lymphedema with elastic stockings. *J Dermatol*. 2006 Jul;33(7):451-6.
[PubMed: PM16848816](#)

Guidelines and Recommendations

17. Poage E, Singer M, Armer J, Poundall M, Shellabarger MJ. Demystifying lymphedema: development of the lymphedema putting evidence into practice card. *Clin J Oncol Nurs* 2008 Dec;12(6):951-64. NCG summary available:
<http://www.guideline.gov/content.aspx?id=15699&search=lymphedema+and+compression>

18. CREST. Guidelines for the diagnosis, assessment, and management lymphoedema [Internet]. Belfast: Clinical Resource Efficiency Support Team (CREST); 2008 [cited 2011 Nov 03]. Available from: <http://www.gain-ni.org/Library/Guidelines/CrestGuidelines.pdf>

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APPENDIX – FURTHER INFORMATION:

Review Articles

19. Korpan MI, Crevenna R, Fialka-Moser V. Lymphedema: a therapeutic approach in the treatment and rehabilitation of cancer patients. *Am J Phys Med Rehabil.* 2011 May;90(5 Suppl 1):S69-S75.
[PubMed: PM21765266](#)
20. Lawenda BD, Mondry TE, Johnstone PAS. Lymphedema: a primer on the identification and management of a chronic condition in oncologic treatment [Internet]. *CA Cancer J Clin* 2009;59:8-24 [cited 2011 Nov 07]. Available from:
<http://onlinelibrary.wiley.com/doi/10.3322/caac.20001/pdf>
21. Mayrovitz HN. The standard of care for lymphedema: current concepts and physiological considerations. *Lymphat Res Biol.* 2009;7(2):101-8.
[PubMed: PM19522678](#)
22. Partsch H, Mosti G. Thigh compression. *Phlebology.* 2008;23(6):252-8.
[PubMed: PM19029006](#)
23. Flour M. Creative compression treatment in challenging situations. *Int J Low Extrem Wounds.* 2008 Jun;7(2):68-74.
[PubMed: PM18492674](#)
24. Hopkins A. A community nursing guide: multilayer lymphoedema bandaging. *Br J Community Nurs.* 2008 Apr;13(4):S18, S20-S18, S24.
[PubMed: PM18595308](#)
25. Warren AG, Brorson H, Borud LJ, Slavin SA. Lymphedema: a comprehensive review. *Ann Plast Surg.* 2007 Oct;59(4):464-72.
[PubMed: PM17901744](#)
26. Linnitt N, Davies R. Fundamentals of compression in the management of lymphoedema. *Br J Nurs.* 2007 May 24;16(10):588, 590, 592.
[PubMed: PM17577161](#)
27. Compression hosiery in lymphoedema [Internet]. London: Medical Education Partnership, Lymphoedema Framework; 2006 [cited 2011 Nov 07]. Available from:
http://www.lympho.org/mod_turbolead/upload/file/Lympho/Template_for_Practice_-_Compression_hosiery.pdf

Additional References

28. Morgan PA, Murray S, Moffatt CJ, Young H. The experience of patients with lymphoedema undergoing a period of compression bandaging in the UK and Canada using the 3M Coban 2 compression system. *Int Wound J.* 2011 Aug 17.
[PubMed: PM21848728](#)

29. Alberta Aids to Daily Living. Compression stockings and lymphedema sleeves: ready made [Internet]. Edmonton (AB): Government of Alberta; 2011 [cited 2011 Nov 07]. Available from:
http://www.seniors.alberta.ca/aadl/av/manual/PDF/41_manual_n_p_and_p.pdf
30. 3M™ Coban™ 2 layer compression therapy [Internet]. London (ON): 3M; 2010 [cited 2011 Nov 03]. Available from:
<http://multimedia.3m.com/mws/mediawebserver?mwsId=66666UuZjcFSLXTtnXT2OXfaEVuQEcuZgVs6EVs6E666666--&fn=70-2009-7363-7.pdf>
31. Brorson H, Ohlin K, Olsson G, Svensson B, Svensson H. Controlled compression and liposuction treatment for lower extremity lymphedema. *Lymphology*. 2008 Jun;41(2):52-63.
[PubMed: PM18720912](#)