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# A meta-review of the impact of compression therapy on venous leg ulcer healing

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#### 1. Introduction

- Compression therapy (CT) represents the standard of care for conservative treatment of venous leg ulcers (VLU).
- Published healing rates of VLU managed with CT vary widely from 40% to 95%.
- This meta-review of existing systematic reviews considers the impact of CT on VLU healing.

#### 2. Review Questions

- 1. What is the effect of compression therapy on venous leg ulcer healing?
- 2. What is the effect of venous leg ulcer compression therapy on adverse events?

#### 3. Methods

- We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to guide the conduct and reporting of the meta-review.
- Five databases were searched.
- The AMSTAR-2 tool was used to quality appraise the selected articles.
- The certainty of the evidence was appraised using GRADEpro.

#### 4. Results

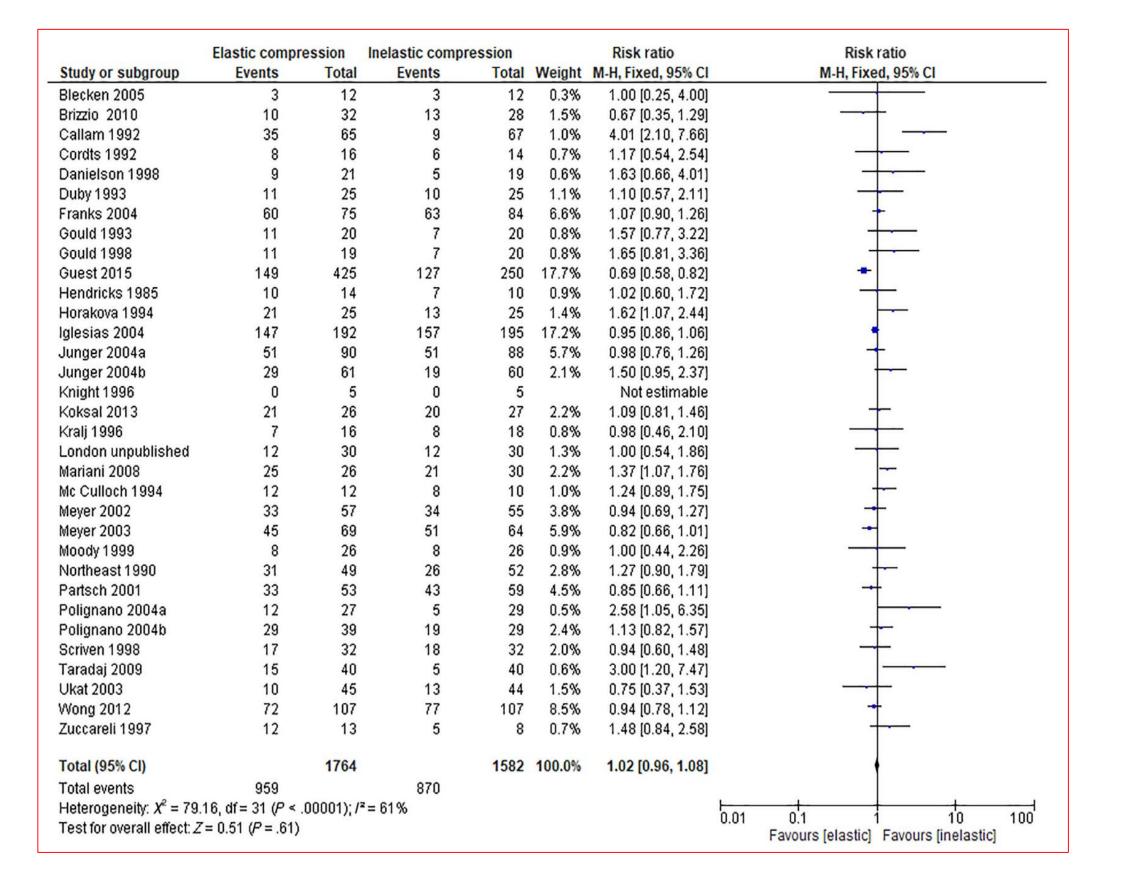
- We identified 12 systematic reviews published between 1997 and 2021.
- Three reviews were assessed as high quality, five as moderate quality, and four as low quality.
- Seven comparisons were reported, with a meta-analysis undertaken for five of these comparisons.

# Key Messages

There is a statistically significant difference in venous leg ulcer healing rates when compression is utilised compared with no compression, with moderate certainty evidence.

There is no statistically significant difference in venous leg ulcer healing rates between different types of compression systems.

# Elastic vs Inelastic compression



### Bandage vs Stocking

| Ashby 2013<br>Brizzio 2006<br>Brizzio 2010<br>Dolibog 2013<br>Finlayson 2012<br>Hendricks 1985 | 157<br>8<br>13<br>2<br>41 | 223<br>14<br>28<br>25 | 163<br>19<br>10 | 230<br>21          | Weight<br>34.4%<br>3.3% | M-H, Fixed, 95% CI<br>0.99 [0.88, 1.12] | M-H, Fixed, 95% CI                                       |
|--|---------------------------|-----------------------|-----------------|--------------------|-------------------------|---|--|
| Brizzio 2006<br>Brizzio 2010<br>Dolibog 2013<br>Finlayson 2012<br>Hendricks 1985               | 8<br>13<br>2              | 14<br>28              | 19              | 21                 |                         |   | •  |
| Brizzio 2010<br>Dolibog 2013<br>Finlayson 2012<br>Hendricks 1985                               | 13<br>2                   | 28                    |                 |                    | 3 30%                   |   |  |
| Dolibog 2013<br>Finlayson 2012<br>Hendricks 1985   | 2                         |                       | 10              |                    | 3.3 /0                  | 0.63 [0.39, 1.01]                       |  |
| Finlayson 2012<br>Hendricks 1985   | 2000                      | 25                    |                 | 32                 | 2.0%                    | 1.49 [0.78, 2.85]                       |  |
| Hendricks 1985   | 41                        |                       | 5               | 23                 | 1.1%                    | 0.37 [0.08, 1.71]                       |  |
|  |                           | 53                    | 33              | 50                 | 7.3%                    | 1.17 [0.92, 1.50]                       | <del>-</del>   |
|  | 7                         | 10                    | 10              | 14                 | 1.8%                    | 0.98 [0.58, 1.65]                       | +  |
| Horakova 1994  | 13                        | 25                    | 21              | 25                 | 4.5%                    | 0.62 [0.41, 0.94]                       |  |
| Junger 2004a   | 51                        | 88                    | 51              | 90                 | 10.8%                   | 1.02 [0.79, 1.32]                       | +  |
| Junger 2004c   | 19                        | 60                    | 29              | 61                 | 6.2%                    | 0.67 [0.42, 1.05]                       |  |
| Koksal 2013  | 20                        | 27                    | 21              | 26                 | 4.6%                    | 0.92 [0.69, 1.23]                       | -  |
| Mariani 2008   | 21                        | 30                    | 25              | 26                 | 5.7%                    | 0.73 [0.57, 0.93]                       | -  |
| Milic 2010   | 63                        | 89                    | 13              | 42                 | 3.8%                    | 2.29 [1.43, 3.66]                       |  |
| Partsch 1994   | 13                        | 25                    | 21              | 25                 | 4.5%                    | 0.62 [0.41, 0.94]                       |  |
| Polignano 2004a  | 5                         | 29                    | 12              | 27                 | 2.7%                    | 0.39 [0.16, 0.96]                       |  |
| Szewczyk 2010a   | 10                        | 16                    | 8               | 15                 | 1.8%                    | 1.17 [0.64, 2.15]                       | <del></del>  |
| Szewczyk 2010b   | 19                        | 31                    | 8               | 15                 | 2.3%                    | 1.15 [0.66, 1.99]                       |  |
| Taradaj 2009   | 5                         | 40                    | 15              | 40                 | 3.2%                    | 0.33 [0.13, 0.83]                       |  |
| Total (95% CI)   |                           | 813                   |                 | 762                | 100.0%                  | 0.95 [0.87, 1.03]                       |  |
| Total events   | 467                       |                       | 464             |                    |                         |   |  |
| Heterogeneity: $\chi^2 = 47.98$ ,  | , df = 1                  | 6 (P <                | .0001);/        | <sup>2</sup> = 679 | 6                       |   | 1 1 10 10  |
| Test for overall effect: $Z = 1$   | 1.34 (F                   | 2=.18                 | )               |                    |                         |   | 0.01 0.1 1 10 10<br>Favours [stocking] Favours [bandage] |

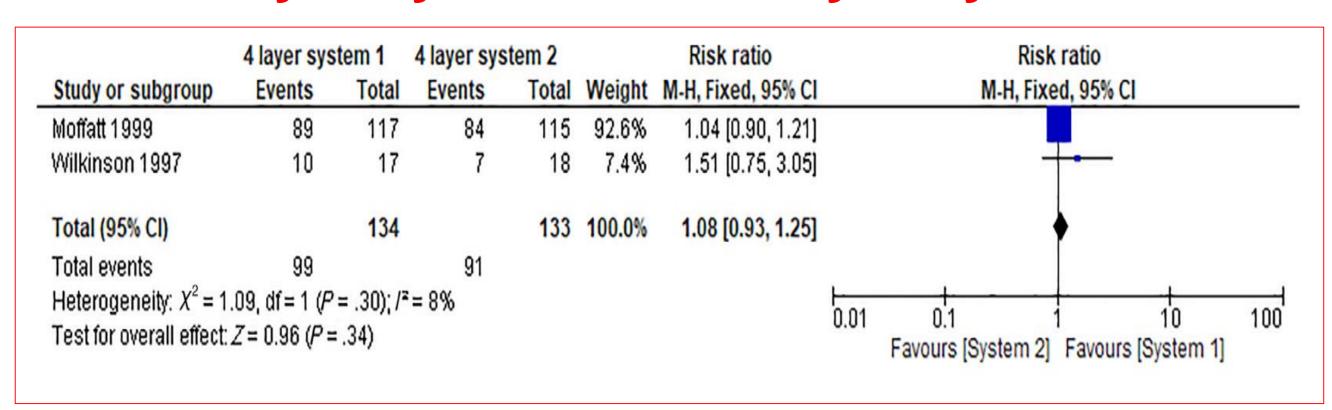
### Compression vs no Compression

|                             | Compres       | ssion              | No compre        | ssion |        | Risk ratio         | Risk ratio   |
|-----------------------------|---------------|--------------------|------------------|-------|--------|--------------------|--|
| Study or subgroup           | <b>Events</b> | Total              | Events           | Total | Weight | M-H, Fixed, 95% CI | M-H, Fixed, 95% CI   |
| Charles 1991                | 15            | 22                 | 5                | 22    | 3.3%   | 3.00 [1.32, 6.82]  |  |
| Eriksson 1984               | 0             | 22                 | 0                | 22    |        | Not estimable      |  |
| Eriksson 1986               | 9             | 17                 | 7                | 17    | 4.6%   | 1.29 [0.62, 2.65]  | <del></del>  |
| Kikta 1988                  | 21            | 30                 | 15               | 39    | 8.6%   | 1.82 [1.15, 2.89]  | <del></del>  |
| Morrell 1998                | 78            | 120                | 62               | 113   | 42.2%  | 1.18 [0.96, 1.47]  | <del>-</del>   |
| O'Brien 2003                | 54            | 100                | 34               | 100   | 22.4%  | 1.59 [1.14, 2.20]  |  |
| Rubin 1990                  | 18            | 19                 | 7                | 17    | 4.9%   | 2.30 [1.29, 4.10]  |  |
| Sikes 1985                  | 17            | 21                 | 15               | 21    | 9.9%   | 1.13 [0.81, 1.59]  | <del>-</del>   |
| Taylor 1985                 | 12            | 16                 | 3                | 14    | 2.1%   | 3.50 [1.23, 9.92]  |  |
| Taylor 1998                 | 12            | 18                 | 3                | 18    | 2.0%   | 4.00 [1.35, 11.82] |  |
| Total (95% CI)              |               | 385                |                  | 383   | 100.0% | 1.55 [1.34, 1.78]  | •  |
| Total events                | 236           |                    | 151              |       |        |                    |  |
| Heterogeneity: $\chi^2 = 1$ | 9.66, df = 8  | $(P = .0)^{\circ}$ | 1); $/^2 = 59\%$ |       |        |                    | 100  |
| Test for overall effect:    | Z = 6.03 (F   | 2 < .000           | 01)              |       |        |                    | 0.01 0.1 1 10 100 Favours [no compression] Favours [compression] |

# 4 layer vs < 4 layer

|                             | 4 Lay         | er           | <4 lay        | er    |        | Risk ratio         | Risk ratio         |
|-----------------------------|---------------|--------------|---------------|-------|--------|--------------------|--------------------|
| Study or subgroup           | <b>Events</b> | <b>Total</b> | <b>Events</b> | Total | Weight | M-H, Fixed, 95% CI | M-H, Fixed, 95% CI |
| Colgan 1996                 | 6             | 10           | 2             | 10    | 0.8%   | 3.00 [0.79, 11.44] | +                  |
| Harley 2004                 | 8             | 14           | 13            | 16    | 5.1%   | 0.70 [0.42, 1.17]  | <del> </del>       |
| Lazareth 2012               | 41            | 93           | 36            | 93    | 15.2%  | 1.14 [0.81, 1.61]  | +                  |
| Moffatt 2003                | 40            | 52           | 50            | 57    | 20.2%  | 0.88 [0.73, 1.05]  | <del></del>        |
| Moffatt 2008                | 6             | 39           | 3             | 42    | 1.2%   | 2.15 [0.58, 8.03]  |                    |
| Mosti 2011                  | 11            | 50           | 5             | 50    | 2.1%   | 2.20 [0.82, 5.87]  | <del></del>        |
| Nelson 1995                 | 69            | 100          | 49            | 100   | 20.7%  | 1.41 [1.11, 1.79]  | <del></del>        |
| Nelson 2007                 | 63            | 128          | 78            | 117   | 34.5%  | 0.74 [0.59, 0.92]  | -                  |
| Total (95% CI)              |               | 486          |               | 485   | 100.0% | 1.03 [0.92, 1.16]  | <b>→</b>           |
| Total events                | 244           |              | 236           |       |        |                    |                    |
| Heterogeneity: $\chi^2 = 2$ | 7.20, df=     | 7(P =)       | 0003); /2     | = 74% |        |                    | 0.01 0.1 1 10 100  |

# 4 layer system 1 vs 4 layer system 2



#### Reference

Patton D, Avsar P, Sayeh A, Budri A, O'Connor T, Walsh S, Nugent L, Harkin D, O'Brien N, Cayce J, Corcoran M, Gaztambide M, Moore Z. A meta-review of the impact of compression therapy on venous leg ulcer healing. Int Wound J. 2022 Jul 18. doi: 10.1111/iwj.13891. Epub ahead of print. PMID: 35855678.