Evaluation of the feasibility of 3D scanning to provide individualized compression therapies among healthy volunteer subjects.

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Compression hosiery
Healthy volunteer study

25 volunteers
5 male, 20 female
Age 49.2 (12.2), 29 – 71 years.
BMI 27.1 (6.3), 19.8 – 51.1
Ankle circumference 22.3 (2.1), 18.5 – 28.5 cms
Calf circumference 38.0 (24.4), 29.5 – 50.1 cms
Lower leg length 40.6 (3.1), 34.5 – 46.0 cms
Subjects 1-5 had both legs scanned, 6-25 had single leg scanned = 30 legs
Healthy volunteer study

1st visit
Leg scanned from foot to knee (10s)
Scan sent to manufacturer who knitted compression hosiery from scanned data

2nd visit
Wore compression hosiery with pressures measured at B1 and C positions (Kikuhime), three repeat measurements
Compared with Class II Sigvaris stocking selected based on limb measurements (n=23, 2 had made-to-measure stockings)
All pressure measurements within 1 hour.
Approved by School of Medicine Research Ethics Committee, Cardiff University.
## Results

<table>
<thead>
<tr>
<th>Stocking</th>
<th>Sub-stocking pressure</th>
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<tbody>
<tr>
<td></td>
<td>Mean (mmHg)</td>
</tr>
<tr>
<td><strong>3D scanned</strong></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>26.5</td>
</tr>
<tr>
<td>Calf</td>
<td>20.1</td>
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<tr>
<td><strong>Sigvaris or Made to Measure</strong></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>43.2</td>
</tr>
<tr>
<td>Calf</td>
<td>25.6</td>
</tr>
</tbody>
</table>
Results

Higher pressures at ankle and calf where ready to wear or made-to-measure stocking applied. Greater variability of sub-stocking pressures. Class II, 23 to 32mmHg at ankle, Seen 4/30 legs with ready to wear or made to measure stockings
20/30 times 3D scanned stocking
Conclusion

The 3D scanned stockings applied lower pressures than did the ready to wear stockings. The 3D scanned stockings applied more consistent sub stocking pressures as shown by the narrower standard deviations around the mean pressure measurements. The 3D scanned stockings were more likely to apply compression anticipated by a class II stocking.