A severity score comprising patient age, ulcer chronicity, and venous refill time predicted venous leg ulcer healing at 24 weeks

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Can a simple scoring system predict wound healing in patients with chronic venous ulceration?

### METHODS

**Design:** separate cohorts were used to develop and validate the scoring system.

**Setting:** an open access, nurse-led leg ulcer service in Gloucestershire, UK.

**Patients:** patients with open leg ulceration lasting ≥4 weeks, an ankle-brachial pressure index >0.85, and superficial venous reflux alone or mixed superficial and deep venous reflux on duplex imaging. Exclusion criteria were deep reflux only or occluded deep veins and inability to conduct plethysmography. The derivation cohort included 229 patients (median age 73 y, 58% women) who participated in the Effect of Surgery and Compression on Healing and Recurrence (ESCHAR) study, and the validation cohort included 86 patients (median age 72 y, 57% women) who were selected prospectively from the leg ulcer service over a 13-month period.

**Description of prediction guide:** of 12 risk factors assessed, age (hazard ratio [HR] 0.990, 95% CI 0.982 to 0.999) and venous refill time <20 seconds (HR 0.656, CI 0.517 to 0.833) were found to be independent risk factors for ulcer healing (ie, increasing age was associated with delayed healing and venous refill time >20 seconds with improved healing). Although the analysis did not identify ulcer chronicity as an independent risk factor (HR 0.995, CI 0.989 to 1.001), the authors included it in the score because previous studies had shown a statistically significant relation. The Ulcerated Leg Severity Assessment (ULSA) score = age (y) + ulcer chronicity (mo) + venous refill time (20 sec); when venous refill time <20 sec, when venous refill time >20 sec, ULSA = age (y) + ulcer chronicity (mo).

**Outcomes:** ulcer healing (complete re-epithelialisation of the wound).

### MAIN RESULTS

In the derivation study, the overall healing rate was 76% at 24 weeks. Patients with ULSA scores ≤50 had better wound healing at 24 weeks (table); the log rank test for trend indicated that for scores >50, the higher the score, the lower the healing rate (p<0.001). In the validation cohort, the overall healing rate was 62% at 24 weeks. Results were similar to, albeit lower than, those found in the derivation cohort (table).

### CONCLUSION

The Ulcerated Leg Severity Assessment score, comprising 3 risk factors (age, ulcer chronicity, and venous refill time), predicted venous leg ulcer healing at 24 weeks.

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### Venous leg ulcer healing rates by Ulcerated Leg Severity Assessment (ULSA) score

<table>
<thead>
<tr>
<th>ULSA score</th>
<th>Derivation cohort</th>
<th>Validation cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤50</td>
<td>91%</td>
<td>77%</td>
</tr>
<tr>
<td>51–90</td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td>≥91</td>
<td>45%</td>
<td>33%</td>
</tr>
</tbody>
</table>

### Commentary

Venous leg ulcers are a chronic condition with variable rates of healing. Several prognostic indicators have been suggested to identify ulcers that may be particularly difficult to heal.1 2 The study by Kulkarni et al aimed to develop and validate a prognostic score, the ULSA score. The data were derived and validated in patients treated by a specialised leg ulcer service in the UK, and so the findings may not be valid for patients receiving standard community-based care. In addition, the study did not assess ulcer size as a risk factor when developing the tool, although some authors3 4 have found this to be an important variable. Another limitation is that venous refill time could not be measured in 24% of potential participants. This suggests that the ULSA score cannot be applied in a significant number of patients, particularly those with deep, rather than superficial, venous disease.

The findings are relevant to nurses working in specialist leg ulcer services and in wound care research. However, the authors caution that one element of the ULSA score—venous refill time—is not commonly available in most settings. This limits the applicability of the tool in routine clinical practice. A tool based on more readily available measurements, such as ulcer area and duration, may have greater practical application in community practice.

The ability to predict the likely healing time of venous ulcers can help in planning adjuvant treatment (eg, superficial venous surgery, skin grafting, or pentoxifylline) for hard-to-heal ulcers. Prediction of fast healing is also useful to promote concordance with treatment. In the study by Kulkarni et al, patients with ULSA scores ≤50 could be advised that the ulcer has a 70% chance of healing within 12 weeks, and this information itself may motivate patients to adhere to treatment advice.1

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