A budget impact analysis comparing a Hydrofiber® dressing to an alginate dressing in managing exuding venous leg ulcers in France

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Key words
Budget impact; Chronic wound care; Cost; Venous leg ulcers

Abstract
An Excel model was developed to compare total costs (including primary and secondary dressings only) of Hydrofiber® dressing (2010 branded price) versus an alginate dressing (generic or branded price) in managing exuding venous leg ulcers considering mean wear time and mean duration of exudate management phase, from the French Social Security perspective over 5 years (2011–2015). Budget impact (based on prevalence of venous leg ulcers in France) was estimated as the difference between scenario 1 (Hydrofiber® versus alginate dressing usage proportion increasing slightly per year) and Scenario2 (proportion remaining at 2010 levels). Annual costs and net savings per patient for the dressings were calculated in analyses 1 and 2. Analysis 1 (28-day mean exudate management phase for both Hydrofiber® and alginate dressing groups): total costs 66·82 € Hydrofiber®, 70·08 € generic alginate, 77·0 € branded alginate; net savings 3·26 € and 10·18 € for Hydrofiber® versus generic and branded alginate. Analysis 2 (mean exudate management phase of 22·2 versus 28 days for Hydrofiber® versus alginate): total costs 52·92 €, 70·08 € and 77·0 €, and net savings 17·10 € and 24·02 €, accordingly. Total cost savings (budget impact scenario 1 minus scenario 2): Analysis 1 – 223 107 € and 696 304 € for Hydrofiber® versus generic and branded alginate dressings, respectively; Analysis 2 – 1 169 845 € and 1 643 042 € accordingly. Sensitivity analyses indicated that results are reliable. This conservative analysis shows that effective exudate management using Hydrofiber® dressing can produce sizeable cost savings.

Introduction
Venous leg ulcers (VLUs) are chronic subcutaneous ulcerations of the skin that occur on the lower leg; they account for between 70% and 80% of leg ulcers overall (1). Resulting from chronic venous disease such as sustained venous hypertension (2), they may take years to heal and often recur (3). VLUs are burdensome to the affected individuals; they are often malodorous, weep and reduce mobility, which may cause incapacitation and social isolation (3).

Key Messages
• venous leg ulcers (VLUs) are physically and economically burdensome; prevalence increases with age, reaching more than 2% of those aged 80 or older.
• In France, venous leg diseases account for 1.5–2% of the total national health budgets.
• management of VLUs involves compression using bandages with dressings beneath to manage exudates.
• Choice of dressing is based on clinical experience and product characteristics such as absorbing capacity, hydrating ability and adhesive components.
• previous studies showed Hydrofiber® dressing to be superior to alginate dressings in VLU management when considering healing rates and wear time.
• the cost to health care budgets is dependent on more than the price of dressings alone.
• We constructed an economic model in Excel to examine the budget impact of using Hydrofiber® dressing compared with alginate dressings, at brand and generic prices, using a holistic but conservative approach that considered factors influencing overall effectiveness and resource utilisation, such as wear time and exudate handling.
• the budget impact analysis, modelled on the French Social Security perspective over 5 years (2011–2015), showed that Hydrofiber® dressing was cost saving versus an alginate dressing at either generic or branded price in managing exuding VLUs.

Although VLUs have been reported to affect 0·045–0·63% of the population in general, prevalence increases with age, reaching more than 2% of those aged 80 or older (4). Further, management and treatment of VLUs can be quite costly, leading to a large economic burden on health care systems. For example, in France, venous leg diseases account for 1·5–2% of the total national health budgets (3). VLU treatment cost per patient in France was estimated in 2001 at 888€ (5827 FF), broken down into 48% for care, 33% for drugs, 16% for hospitalisations and 3% for unemployment (5). As dressing products accounted for 48% of the total cost of all drugs and products used during the treatment period (5), reducing the cost of dressings will lead to tangible overall cost savings.

Management of VLUs varies depending on the severity of each case, with the current standard of care being compression of venous hypertension (6). Compression bandages are used to reduce ambulatory venous pressure, control oedema and improve venous return. Dressings are applied beneath compression bandages to optimise healing and control exudates (6). The types of dressings currently available include hydrocolloids, hydrogels, alginates, Hydrofiber® and silver-containing dressings, among others. The choice of dressing is based on clinical experience and product characteristics such as absorption capacity, hydrating ability and adhesive components (6).

In France, Social Security reimburses alginate dressings if used during the debridement of chronic wounds and heavily exudative phases of wound healing (7). Alginate dressings are composed of fibres of calcium alginate derived from seaweed. Alginate dressings, as defined in the reimbursement nomenclature by the French Social Security, are composed of more than 50% alginate, may contain carboxymethylcellulose (CMC) and are available in the form of compresses or ribbons (7). These dressings are indicated for heavily exuding wounds and haemorrhagic wounds mainly because of their absorption capacity and haemostatic effects (6). For VLU exudate management in France, Hydrofiber® and alginate dressings play a key role and, in addition to effectiveness, the total cost associated with their use is an important topic of interest.

CMC fibre (Hydrofiber®) dressings, as defined in the reimbursement nomenclature by the French Social Security, are composed of more than 50% non-woven fibres of pure CMC and are available in the form of compresses or ribbons (7). These fibres are transformed into a cohesive gel in contact with the exudates (7). Their absorption capacity is 2–3 times that of alginates and are commonly used for heavily exuding ulcers at all phases of wound healing (6). Because of their high absorption capacity, Hydrofiber® dressings are reimbursed for the management of heavily exuding chronic and acute wounds and, until July 2011, a Hydrofiber® dressing (AQUACEL®) was reimbursed in the branded category in France for the management of exuding and/or deep non-haemorrhagic wounds (6). In clinical trials, a Hydrofiber® dressing has shown superiority over two alginate dressings (Sorbsan® and Kaltostat®) in VLU management when considering healing rates and mean wear time (8–10).

When considering health care expenditure for VLU management, a higher priced dressing associated with faster healing rates and longer wear time may be more cost saving or cost effective than a cheaper product when its overall effectiveness and advantages are taken into consideration. The aim of this study was to investigate the budget impact of using a Hydrofiber® dressing at its original brand price in 2010, compared to alginate dressing, at both generic and brand prices in France. The focus was the management of exuding VLUs (not bleeding wounds), which is a common indication for Hydrofiber® and alginate dressings as defined in the reimbursement nomenclature by the French Social Security (as described earlier); therefore, the comparison is on the same basis. VLUs in France are mostly managed in the community and incur high expenses for the community-based social security budget, in both direct and indirect costs; this budget impact analysis may help gain further understanding from this perspective.

Methods

Budget impact model overview

A budget impact model (BIM) was developed using Excel 2003® and Visual Basic for Applications. The basic structure of the model is shown in Figure 1. This population-based model considers two scenarios. Scenario 1 used forecasted annual market shares for alginate, generic or brand (Algostéril®, Brothier) and Hydrofiber® (AQUACEL®) dressing to simulate a situation where the Hydrofiber® dressing would continue to gain a slight market share over time; scenario 2 used fixed market shares to simulate a situation where Hydrofiber® and alginate market shares remain constant at 2010 levels. Resources used were considered when the absorptive dressings, that is Hydrofiber® or alginate, were used to manage exudates, and associated unit costs were applied to obtain the total cost for managing VLU in France. The budget impact was calculated as the difference between scenario 1 and scenario 2 for a given year from the French Social
Security perspective over a 5-year time horizon, beginning in 2011 (year 1). The BIM was built to be able to include resource data such as primary and secondary dressings, compression bandages, and nurse and physician visits. However, to be conservative, only primary and secondary dressings were included in the analyses presented in this report.

**Target population**

The number of patients with VLU in France was estimated from the published literature. Although literature on epidemiology of leg ulcers in France is sparse, a study specific to France investigated chronic wounds among patients hospitalised in 14 geriatric hospitals in the Haut-Rhin region and reported a prevalence rate of 1.6% for all types of leg ulcers in their population (11). As VLUs account for 70–80% of total leg ulcers (1), the prevalence rate of VLUs could be estimated between 1.12% and 1.28%. However, as reported by Senet for a European population, VLUs affect the elderly to a greater degree than the population in general (12). Therefore, an overall prevalence rate of approximately 1% was used. When applied to the population of France using the last data available (64.3 million inhabitants in year 2009) (13), it is estimated that the population in France affected by VLUs...
would be approximately 600,000 patients in the year 2010, which aligns with other estimates (14). As no incidence data were available for VLUs in France, the number of patients was fixed over the 5 years.

The respective market shares for Hydrofiber® versus alginate dressing, shown in Table 1 (%), were estimated from GERS databases (15). Applying these market share percentages to the 600,000 VLU population size, Table 1 shows the number of patients (n) that are estimated to be managed for VLUs with an alginate dressing or Hydrofiber® dressing in years 1–5. In scenario 1, the number of patients managed with a primary absorptive dressing during the exudate management phase varied according to the forecasted market shares, while in scenario 2, the number of patients managed with each dressing was fixed at market shares observed in 2010 for each product.

Input data and analysis specifications

In this model, data which realistically reflected the clinical practice (i.e. mean wear time of dressings, mean duration of the exudate management phase, number of primary and secondary dressings and compression bandages) in the management of VLUs in France were explored via literature review and expert interviews. The objective of the expert interviews was to substantiate the use of Hydrofiber® and alginate dressings in chronic wound management in general, as well as specifically in exuding VLUs, and to obtain data to be used in the model to supplement data from the literature. The experts were five physicians and three nurses specialising in wound care. A questionnaire structured around the management of chronic wounds and exuding VLUs was developed beforehand and each expert was individually interviewed over the phone by a professional interviewer. Responses from the eight experts were analysed as averages or percentages, where applicable. Table 2 summarises the data inputs to the model, with specifications of four analyses using two different data options for mean duration of exudate management phase in combination with two pricing options for alginate dressing (generic or branded). Again, to be conservative, these analyses only included primary and secondary dressings, but not compression bandages and nurse and physician visits.

As shown in Table 2, analyses 1a and 1b were based on a 28-day exudate management phase for both Hydrofiber® and alginate dressings (conservative assumption applying the result for alginate from the expert interviews to both groups), whereas analyses 2a and 2b considered a shorter exudate management phase for Hydrofiber® of 22.2 days compared to 28 days for alginate, based on the corresponding results from the expert interviews (Convatec Inc. Summary report of experts’ interviews on management of exuding wounds including venous leg ulcers in France. March 2011).

A conservative approach was considered regarding mean wear time because it can directly affect the frequency of dressing changes and, consequently, the level of resource consumption. The mean wear time used was the same for all four analyses [3–6 days for alginate versus 3–6 days for Hydrofiber® (AQUACEL® dressing) as reported by Harding et al.] (10). Data for mean wear time from the study by Harding et al. with Sorbsan® dressing (9) as comparator and the study by Armstrong et al. with Kaltostat® dressing (9) as comparator showed statistically significant differences in favour of the Hydrofiber® dressing. For this report, Harding et al. was chosen as the only source of input data for wear time because its results were most conservative. Assuming one dressing used per application, the number of primary

Table 1 Estimated market share and number of VLU patients in France managed over 5 years

<table>
<thead>
<tr>
<th>Scenario 1 (forecasted market shares used):</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed with alginate dressing (%) n (x 1000)</td>
<td>(59-5) 357</td>
<td>(58-6) 351-6</td>
<td>(58-1) 348-6</td>
<td>(57-6) 345-6</td>
<td>(57-3) 343-8</td>
</tr>
<tr>
<td>Managed with Hydrofiber® dressing (%) n (x 1000)</td>
<td>(40-5) 243</td>
<td>(41-4) 248-4</td>
<td>(41-9) 251-4</td>
<td>(42-4) 254-4</td>
<td>(42-7) 256-2</td>
</tr>
<tr>
<td>Scenario 2 (2010 market shares used):</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Managed with alginate dressing (%) n (x 1000)</td>
<td>(60-5) 363</td>
<td>(60-5) 363</td>
<td>(60-5) 363</td>
<td>(60-5) 363</td>
<td>(60-5) 363</td>
</tr>
<tr>
<td>Managed with Hydrofiber® dressing (%) n (x 1000)</td>
<td>(39-5) 237</td>
<td>(39-5) 237</td>
<td>(39-5) 237</td>
<td>(39-5) 237</td>
<td>(39-5) 237</td>
</tr>
</tbody>
</table>

n, number of patients; VLU venous leg ulcer.

Table 2 Parameter inputs and specifications of analysis settings

<table>
<thead>
<tr>
<th>Analysis 1</th>
<th>Analysis 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean duration of exudate management phase (Hydrofiber® versus alginate)</td>
<td>28 versus 28 days*</td>
</tr>
<tr>
<td>Number of dressings (primary or secondary) calculated per patient (Hydrofiber® versus alginate) (10)</td>
<td>7.7 versus 8.6</td>
</tr>
<tr>
<td>Mean wear time for Hydrofiber® versus Alginat (10)</td>
<td>3.6 versus 3.3 days</td>
</tr>
<tr>
<td>Weighted unit price of Hydrofiber® (7)</td>
<td>5.04 €</td>
</tr>
<tr>
<td>Weighted unit price of modern secondary dressings (7) (a) Using weighted unit price of generic alginate at 4.56 € (7)</td>
<td>3.62 €</td>
</tr>
<tr>
<td>(b) Using weighted unit price of the branded alginate at 5.37 € (7)</td>
<td></td>
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</tbody>
</table>

*Conservative assumption: using the result for alginate from expert interviews for both Hydrofiber® and alginate groups.
†Using corresponding results for Hydrofiber® and alginate from expert interviews.
analyses), generic alginate dressing, and the branded alginate, and for secondary dressings as well. Advanced secondary dressings as defined in the French reimbursement nomenclature, such as foams, were considered because expert interviews deemed them to be used more frequently than traditional secondary dressings. In calculating the weighted unit price for generic alginate dressing, because no sales volume data were available, the same distribution of sales volume per size for Hydrofiber® dressing was used. As a result of these calculations, the weighted unit prices for the primary dressings were Hydrofiber® 5.04€ (used in all four analyses), generic alginate 4.56€ (used in analyses 1a and 2a) and branded alginate 5.37€ (used in analyses 1b and 2b). The weighted unit price for modern secondary dressings was 3.62€.

Sensitivity analysis

One-way sensitivity analysis was performed for each of the four specified analyses using a 25% variation range for each of the input parameters used in the model (mean duration of exudate management phase, mean wear time, number of primary and secondary dressings, and unit prices of primary and secondary dressings). Results are presented as ‘Tornado’ diagrams, where the midline represents the point estimates of each analysis, and the ranges of parameter values varied are represented by the horizontal bars. Parameters that were more impactful to the difference in total cost per patient between Hydrofiber® and alginate dressing are placed towards the top of the diagram. Probabilistic sensitivity analyses (PSA), which simultaneously vary all input parameters as full probability distributions rather than varying each of them separately – as is the case with the above mentioned one-way sensitivity analyses (16) – were also performed, using 2000 iterations; a variation range of 25% was used. Values of the net cost difference per patient obtained from the 2000 iterations were obtained as a scatter plot. A probability of cost saving in favour of Hydrofiber® dressing was calculated as the number of iterations that gave a cost-saving result (negative number for the difference of total cost per patient between Hydrofiber® dressing and alginate) divided by the total number of iterations (2000 in this case).

Results

Analysis 1

Costs and budget impact

Using the parameters for analysis 1 of mean duration of the exudate management phase of 28 days, with weighted generic alginate price (analysis 1a) or the weighted branded alginate price (analysis 1b), Table 3 shows that the total costs per patient were 70.08€, 77.00€ and 66.82€ for generic alginate dressing, the branded alginate and Hydrofiber®, respectively. The difference in total cost per patient between Hydrofiber® and alginate dressing leads to a net cost saving of 3.26€ per patient in favour of Hydrofiber® when considering generic alginate dressing (analysis 1a) and 10.18€ per patient when using branded alginate dressing (analysis 1b).

The per-patient cost results from Table 3 were combined with the estimated number of VLU patients in France managed over 5 years to calculate the budgets for the two scenarios described in Table 1. In scenario 1 where Hydrofiber® market share increases slightly each year relative to alginate, the total cost to the French health care system, shown in Table 4a, is projected to be 206.16 million (€) over 5 years. In scenario 2, which simulates the situation where Hydrofiber® market shares are fixed throughout the 5 years at the 2010 level, a total cost of 206.38 million (€) over 5 years was projected. The difference between the two scenarios shows a cost saving of 223.107€ in favour of scenario 1. Net savings tripled over the 5 years, increasing from 19.571€ in year 1 to 62.627€ in year 5. When comparing branded alginate to Hydrofiber® (Table 4b), total cost of management over 5 years was higher at approximately 218.24 million (€) for scenario 1 and of 218.94 million (€) for scenario 2. Savings in favour of scenario 1 were 61.079€ for year 1 up to 195.454€ for year 5, for a total net cost savings over 5 years estimated at 696.304€.

Sensitivity analysis

One-way sensitivity analysis showed that the mean wear time and the mean duration of the exudate management phase were the most influential parameters (Figures 2 and 3). For example, a 25% variation in the mean wear time of branded

| Table 3 Costs per patient (in €) for analyses 1a and 1b |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cost of primary dressings        | 39.07€           | 45.99€           | 38.88€          | −0.19€           | −7.10€          |
| Cost of secondary dressings      | 31.01€           | 31.01€           | 27.94€          | −3.08€           | −3.08€          |
| Total cost                       | 70.08€           | 77.00€           | 66.82€          | −3.26€           | −10.18€         |

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Table 4  Budget impact results for the management of VLU in France (analysis 1)

<table>
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<tr>
<th></th>
<th>Year 1</th>
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<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
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<tbody>
<tr>
<td><strong>(a) Analysis 1a: Budget impact using weighted unit price of generic alginate</strong></td>
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<tr>
<td><strong>Scenario 1:</strong></td>
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<tr>
<td>Cost of patients (€)</td>
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<tr>
<td>Generic alginate group</td>
<td>25 019 045</td>
<td>24 640 606</td>
<td>24 430 362</td>
<td>24 220 117</td>
<td>24 093 971</td>
<td>122 404 101</td>
</tr>
<tr>
<td>Hydrofiber&lt;sup&gt;®&lt;/sup&gt; group</td>
<td>16 237 152</td>
<td>16 597 978</td>
<td>16 798 437</td>
<td>16 998 895</td>
<td>17 119 171</td>
<td>83 751 633</td>
</tr>
<tr>
<td>Total cost scenario 1 (C1) (€)</td>
<td>41 256 197</td>
<td>41 238 584</td>
<td>41 228 798</td>
<td>41 219 013</td>
<td>41 213 142</td>
<td>206 155 734</td>
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<td><strong>Scenario 2:</strong></td>
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<tr>
<td>Cost of patients (€)</td>
<td></td>
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<tr>
<td>Hydrofiber&lt;sup&gt;®&lt;/sup&gt; group</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>79 181 175</td>
</tr>
<tr>
<td>Total cost scenario 2 (C2) (€)</td>
<td>41 275 768</td>
<td>41 275 768</td>
<td>41 275 768</td>
<td>41 275 768</td>
<td>41 275 768</td>
<td>206 378 841</td>
</tr>
<tr>
<td>Budget impact (C1) − (C2) (€)*</td>
<td>−19 571</td>
<td>−37 185</td>
<td>−46 970</td>
<td>−56 755</td>
<td>−62 627</td>
<td>−223 107</td>
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<tr>
<td><strong>(b) Analysis 1b: Budget impact using the weighted unit price of the branded alginate</strong></td>
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<tr>
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<tr>
<td>Cost of patients (€)</td>
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<tr>
<td>Branded alginate group</td>
<td>27 488 802</td>
<td>27 073 005</td>
<td>26 842 006</td>
<td>26 611 008</td>
<td>26 472 409</td>
<td>134 487 230</td>
</tr>
<tr>
<td>Hydrofiber&lt;sup&gt;®&lt;/sup&gt; group</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>79 181 175</td>
</tr>
<tr>
<td>Total cost scenario 1 (C1) (€)</td>
<td>43 725 954</td>
<td>43 670 983</td>
<td>43 640 443</td>
<td>43 609 904</td>
<td>43 591 580</td>
<td>218 238 863</td>
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<tr>
<td><strong>Scenario 2:</strong></td>
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<tr>
<td>Cost of patients (€)</td>
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<tr>
<td>Branded alginate group</td>
<td>27 950 798</td>
<td>27 950 798</td>
<td>27 950 798</td>
<td>27 950 798</td>
<td>27 950 798</td>
<td>139 753 992</td>
</tr>
<tr>
<td>Hydrofiber&lt;sup&gt;®&lt;/sup&gt; group</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>15 836 235</td>
<td>79 181 175</td>
</tr>
<tr>
<td>Total cost scenario 2 (C2) (€)</td>
<td>43 787 034</td>
<td>43 787 034</td>
<td>43 787 034</td>
<td>43 787 034</td>
<td>43 787 034</td>
<td>218 935 168</td>
</tr>
<tr>
<td>Budget impact (C1) − (C2) (€)*</td>
<td>−61 079</td>
<td>−116 051</td>
<td>−146 590</td>
<td>−177 130</td>
<td>−195 454</td>
<td>−696 304</td>
</tr>
</tbody>
</table>

VLU, venous leg ulcer.

*Negative values indicate cost savings with scenario 1 versus scenario 2.

Figure 2  Sensitivity analysis (Tornado diagram: analysis 1a). Cost difference per patient (Hydrofiber<sup>®</sup> vs generic alginate).
alginate made the total cost difference over 5 years shift from a 5.2€ loss to a 35.8€ savings for Hydrofiber® versus the branded alginate (Figure 3). The non-symmetry around the midline of the wear time variable was because of the non-linear relationship between the total number of dressings used (hence the total cost per patient) and the wear time, that is the total number of dressings used is obtained by dividing the duration of the exudate management phase by wear time. The PSA showed Hydrofiber® to be cost saving 57% and 70% of the time when considering the generic (analysis 1a) and branded alginate (analysis 1b) dressings, respectively.

**Analysis 2**

**Costs and budget impact**

Analysis 2, using an exudate management phase of 28 days for alginate dressing and 22.2 days for Hydrofiber®, led to a 17.10€ and 24.02€ (versus generic and branded alginate, respectively) net cost savings per patient in favour of Hydrofiber®, where the total costs per patient were 70.08€, 77.0€ and 52.98€, for generic alginate dressing, the branded alginate and Hydrofiber® (Table 5).

The budget impact for analysis 2, when Hydrofiber® was compared with generic alginate (Table 6a), showed a total cost of management over 5 years of approximately 188.81 million (€) for scenario 1 and 189.98 million (€) for scenario 2. The cost savings in favour of scenario 1 more than tripled over 5 years, growing from 102.618€ in year 1 to 328.378€ in year 5 for a predicted total cost savings of 1.169.845€ over 5 years. When the branded alginate was used as the comparator (Table 6b), total cost of management over 5 years was higher at approximately 200.89 million (€) for scenario 1 and 202.53 million (€) for scenario 2. Total cost savings in favour of scenario 1 increased to 1.643.042€ over 5 years.

**Sensitivity analysis**

Mean wear time and mean duration of the exudate management phase remained the most influential parameters in one-way analysis, as with analysis 1 (Figures 4 and 5). Using PSA, the cost-saving probability of Hydrofiber® was 85% when compared to generic alginate dressing, and reached a high of 92% when the price of the branded alginate was used.

**Discussion**

VLU is a burdensome condition and careful management is required to heal ulcers and prevent the incapacitation and social isolation which may ensue (3). Management, however, can be costly. For example, in the USA, it has been reported that treatment costs for individual venous ulcerations...
Table 6  Budget impact results for the management of VLU (analysis 2)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
</tr>
</thead>
</table>
| (a) Analysis 2a: Budget impact results using the weighted unit price of generic alginate

**Scenario 1:**
Costs of patients (€)
- Generic alginate group: 25 019 045
- Hydrofiber® group: 12 873 742
- Total cost scenario 1 (C1) (€): 37 892 787

**Scenario 2:**
Costs of patients (€)
- Generic alginate group: 25 439 533
- Hydrofiber® group: 12 555 872
- Total cost scenario 2 (C2) (€): 37 995 405

Budget impact (C1) - (C2) (€)*
- Year 1: -102 618
- Year 2: -194 974
- Year 3: -246 283
- Year 4: -297 592
- Year 5: -328 378
- Total: -1 169 845

(b) Analysis 2b: Budget impact results using the weighted unit price of the branded alginate

**Scenario 1:**
Costs of patients (€)
- Branded alginate group: 27 488 802
- Hydrofiber® group: 12 873 742
- Total cost scenario 1 (C1) (€): 40 362 544

**Scenario 2:**
Costs of patients (€)
- Branded alginate group: 27 950 798
- Hydrofiber® group: 12 555 872
- Total cost scenario 2 (C2) (€): 40 506 671

Budget impact (C1) - (C2) (€)*
- Year 1: -144 126
- Year 2: -273 840
- Year 3: -345 904
- Year 4: -417 967
- Year 5: -461 205
- Total: -1 643 042

VLU, venous leg ulcer.
*Negative values indicate cost savings with scenario 1 versus scenario 2.

Figure 4  Sensitivity analysis (Tornado diagram: analysis 2a). Cost difference per patient (Hydrofiber® vs generic alginate).

ranged between $959 and $1352 per ulcer (17). With an estimated 2.5 million people suffering from VLUs in the USA, VLU management costs were reported in 2003 to be approximately $2.5–$3.5 billion (3). A study from Sweden has also estimated annual costs for all venous ulcers at 73 million € for the year 2002 (18). In France, it has been reported that venous leg diseases account for 1.5–2% of the total French national health budgets (3). Furthermore, data
from France showed that dressings accounted for 48% of the total cost of all drugs and products used during the treatment period for VLU (5); therefore, it is reasonable that cost-saving measures around dressings reimbursed for use in managing VLUs would be deemed important.

As dressings associated with faster healing rates and longer wear time may lower the amount of dressings needed and/or extend the dressing wear time and potentially reduce other resource utilisation as well, considering the prices of the primary dressings alone does not provide a complete assessment. The present study modelled the total impact to the French health care budget of using Hydrofiber® at its original brand price, compared to alginate dressing, at both generic and brand prices, in managing exuding VLUs in France. Results showed that the Hydrofiber® dressing, although priced higher than a generic alginate dressing, yielded cost savings of 3.26€ per patient compared to generic alginate, with even higher savings of 10.18€ per patient when compared with the branded alginate.

This per-patient saving was projected to the population of VLU patients in France to estimate the budget impact to the French health care system for a projected scenario where Hydrofiber® gained a small percentage of increase in the market share each year over 5 years, compared with a scenario where the market shares of Hydrofiber® and alginate dressings remained constant at the 2010 levels over the 5 years. Even with the highly conservative approach and parameter setting adopted in the base case analysis, Hydrofiber® at its original branded price, in comparison with lower priced generic alginate dressing, was estimated to save 223,107€ over 5 years. The 57% probability of cost saving for Hydrofiber® dressing, generated from the PSA, was consistent with the point estimates of the costs. This result means that, with the very stringent and conservative parameter inputs used in the base case analysis, Hydrofiber® dressing at its original brand (weighted) price of 5.04€ was still cost saving compared to generic alginate at a weighted price of 4.56€. Three other alternative analyses using survey results on duration of VLU exudate management phase from wound experts and/or weighted price of the branded alginate instead of generic alginate price showed greater cost savings (nearly 700,000€ to over 1.6 million€ over the 5 years) with scenario 1. The probability of cost saving for Hydrofiber® dressing in these alternative analyses was at least 70% and reached as high as 92%, indicating a high likelihood that Hydrofiber® dressing is cost saving.

Potential limitations exist in this study. As with any other modelling analysis, only a limited number of variables can be included, while in the real world there may be more factors that can influence the management of wounds and their costs. For example, long-standing or non-healing VLUs may have a prolonged phase of exudate management; also, VLUs are known to have a fairly significant recurrence rate. These were not accounted for in this model; hence, the total cost may be higher than what this analysis has shown. In addition, it is often the case that ‘outliers’ drive the cost of health care and this model focussed on a population with similar and average wound progression. However, these factors can be expected to increase the cost difference between the two dressing groups evaluated. The perspective of this analysis is that of the community setting as defined by the French Social Security; so, although specific results for a different
setting would differ, a consistent trend of cost saving in favour of Hydrofiber® should be seen. Although generalisation to other countries or jurisdictions cannot be concluded with total certainty because specific analysis needs to be performed to examine each case, similar results can be expected unless the unit price of Hydrofiber® is extremely high compared to a comparable size of alginate dressing.

In conclusion, a dressing associated with a faster healing rate and a longer wear time can reduce total resource utilisation and cost of wound management and hence benefit health care budgets for VLU management, when overall benefits are taken into consideration. In this report, it has been shown that Hydrofiber® dressing is cost saving to the French health care system in managing exuding VLU, compared with alginate dressing at both generic and branded prices.

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