The human and economic cost of hard-to-heal wounds

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Smith & Nephew Wound Management Division
Outline

1. The economics of wound care: cost, resources and value as fundamental concepts

2. The impact of wounds on health care resources
   - All wounds
   - Non-healing wounds

3. Non-healing wounds: strategies for reducing resource use
The economics of wound care: cost, resources and value as fundamental concepts
Economic cost

Economic cost is really about the **use of resources**

- HCP time (e.g. nurse and surgeon time)
- Dressings and other materials
- Hospital costs
- Lost productivity

*It’s the opportunity cost*

Economic cost of wounds is **not just about the price** of wound care products

Economic cost can be reduced by **reducing any or all of the resources required to heal a wound**, and not just by releasing cash.
Measuring cost

Perspective
- A given provider
- Healthcare system
- Public sector
- The patient
- Society

Costs which might be included
- Healthcare resources: variable and fixed
- Patient expenses, patient resources
- Resources in other sectors

Measure resources used
Multiply by unit costs

Costs
General shape of cost distribution

Cost per what?
For example…
• Cost per week / month / year
• Cost per episode
Most of the cost of wound care is hidden...

The relatively low proportion of dressing cost does not mean dressings are unimportant. The choice of dressing can have a vital impact on the other resources used.

- **Dressings and materials**: Typically 10% - 15% of total cost
- **Clinician time**: Typically 25% - 30% of total cost
- **Hospitalisation**: Typically 50%+ of total cost
Cost per case vs cost per week

Time
Outcomes

Value

Cost per patient

Worse outcome
Higher cost

Better outcome
Higher cost

Worse outcome
Lower cost

Better outcome
Lower cost

Outcomes
The impact of wounds on health care resources

- All wounds
- Non-healing wounds
The human cost of wounds

Chronic wounds have been shown to have a significant impact on quality of life (QOL).

QOL scores suggest that individuals with chronic wounds have a QOL comparable to those with long-term or progressive diseases, such as heart failure.

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Hopman et al. 2009
Cost impact of wounds

Jorgensen et al

• Evaluation of a community based educational initiative intended to improve wound care across four districts in Denmark (Aabenraa, Aalborg, Frederiksberg, and Ringsted).

• Data available from annual wound care audits, baseline + follow-up audits.
Overview of community based chronic wound care findings (Jorgensen et al)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of wounds identified</td>
<td>1103</td>
</tr>
<tr>
<td>Proportion chronic wounds</td>
<td>64%</td>
</tr>
<tr>
<td>Prevalence of patients with a wound</td>
<td>2.15–2.47/1000 population</td>
</tr>
<tr>
<td>Median wound duration</td>
<td>280 days</td>
</tr>
<tr>
<td>Proportion of wounds &gt; 1 year duration</td>
<td>15% (all), 21% (chronic), 5.6% (acute)</td>
</tr>
<tr>
<td>Wound duration (days)</td>
<td>Mean 280 (all)  353 (chronic)  112 (acute)</td>
</tr>
<tr>
<td></td>
<td>Median 91 (chronic)</td>
</tr>
<tr>
<td>Mean frequency of dressing change</td>
<td>3.53 per week</td>
</tr>
<tr>
<td>Proportion of wounds being dressed on a daily basis</td>
<td>23%</td>
</tr>
<tr>
<td>Nurse time per wound per week</td>
<td>61 minutes</td>
</tr>
<tr>
<td>Nurse time allocated to dressing changes/week (hours)</td>
<td>1122 hours</td>
</tr>
</tbody>
</table>
Cost impact of wounds

Gottrup et al

- Point prevalence study covering two hospitals and two districts (2010)
- Captured data on wounds treated in hospital on a given date.
- Captured data on wounds treated in community over a two week period.
- Focus on resource consumption
- Regional Hospital Viborg with a catchment population of around 250,000
- Hillerød Hospital with a catchment population of approximately 195,000
Overview of community / hospital based chronic wound care findings (Gottrup et al)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of wounds identified</td>
<td>306 (hospital) 324 (municipalities)</td>
</tr>
<tr>
<td>Proportion chronic wounds (hospital)</td>
<td>24%</td>
</tr>
<tr>
<td>Inpatient prevalence</td>
<td>33%</td>
</tr>
<tr>
<td>Prevalence of patients with a wound</td>
<td>2.8/1000 municipalities 0.69/1000 hospitals</td>
</tr>
<tr>
<td>Dressing costs (as a percentage of nurse time + dressings)</td>
<td>23-25% (municipalities) 12-29% (hospitals) 21% (all)</td>
</tr>
<tr>
<td>Mean frequency of dressing change</td>
<td>4.3 (hospital) 2.8 (municipalities)</td>
</tr>
</tbody>
</table>
Aggregated / model data using the Danish surveys
Example: Denmark

- Number of wound patients (caseload): 16,882
- Dressing changes per year: 3,252,921
- Nurse time (hours per year): 987,862
- Bed-days per year: 339,201
- Total cost per year: kr. 1,733,991,766

Pie chart showing:
- Hospitalisation: 64%
- Nurse time: 26%
- Dressings: 10%
### Long-duration wounds

<table>
<thead>
<tr>
<th>Country</th>
<th>Total cost per year (long duration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>kr., 192m</td>
</tr>
<tr>
<td>Sweden</td>
<td>328m kr</td>
</tr>
<tr>
<td>Norway</td>
<td>kr. 174m</td>
</tr>
<tr>
<td>Finland</td>
<td>25m €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Nordics area</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>20.4m</td>
<td></td>
</tr>
<tr>
<td>Patients with a wound</td>
<td>77,500</td>
<td></td>
</tr>
<tr>
<td>Patients with a wound ≥1 year</td>
<td>10,680</td>
<td></td>
</tr>
<tr>
<td>Dressing changes per year (long duration)</td>
<td>2.03m</td>
<td></td>
</tr>
<tr>
<td>Bed-days per year (long-duration)</td>
<td>151,000</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The costs are listed in their respective country's currency.
VLUs

- Highlights the high costs involved in the provision of care for venous leg ulcer patients, particularly for those with hard-to-heal ulcers.

- Hard-to-heal ulcers place a greater demand on resources compared with other ulcer types. This is not only due to the length of treatment required but also to higher weekly treatment costs.

- The weekly cost associated with ulcers of long duration was more than twice that associated with ulcers of short duration, irrespective of ulcer size. This was mainly due to increased staff costs as a direct result of more frequent and lengthier dressing changes and a longer time to healing.
Non-healing wounds: strategies for reducing resource use
Reducing dressing change frequency
Releasing health care professionals’ time

One community health provider in the UK undertook an appraisal of ALLEVYN Life in order to understand its usability, acceptability and clinical performance (Stephen-Haynes et al 2013)

This provider serves a population of over 500,000 people and includes community and practice nurses, community hospitals, long term care facilities and mental health facilities

Nurses compared their visit frequency using ALLEVYN Life with what they had been doing before

On average, using ALLEVYN Life, they were able to release between one and two visits per week per patient, across the range of wounds included

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The clinical performance of a silicone foam in an NHS community trust

Jackie Stephen-Haynes, Alistair Bielby, Richard Searle

The NHS spends the majority of its budget on labour costs and it could be argued that frontline staff such as community nurses are the organisation’s most valuable resource. However, optimal wound care is dependent upon effective patient engagement, the application of clinical expertise and access to wound management products. The tension between increasing demands for services and the number of nurses is already causing problems in care provision as staff cut and excessive workload inevitably endanger patient care. Enhancing efficiency through the use of innovative products will become essential in the future if nurses are to continue to provide expert care against a backdrop of cost-savings. This article details the appraisal process undertaken within Worcestershire Health and Care NHS Trust to investigate the in-practice clinical performance of a silicone foam dressing (ALLEVYN™ Life Smith & Nephew, Hull).

Declaration of interest: Richard Searle and Alistair Bielby are employees of Smith & Nephew. This project was supported by an unrestricted grant from Smith & Nephew.

KEYWORDS: Wound dressings & Foams & Health economics

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<table>
<thead>
<tr>
<th>All dressings</th>
<th>Pre-Life</th>
<th>Post-Life</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (times per week)</td>
<td>4.52</td>
<td>2.88</td>
<td>1.64</td>
</tr>
<tr>
<td>Foams only</td>
<td>4.19</td>
<td>2.66</td>
<td>1.53</td>
</tr>
</tbody>
</table>

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Demand for health care in the UK continues to accelerate although without any additional input resources, imposing further strain on services and putting organisations such as the NHS under increasing pressure. A continuing upward trend in life expectancy, the rising prevalence of chronic disease and higher patient expectations are all factors contributing to this increasing demand for resources.

Simultaneously, as the average age of the population grows, the ability of tax revenues to fund healthcare services decreases. Economic recession further exacerbates this disparity between the differing needs of healthcare and the resources available to meet them.

The NHS spends about 70% of its budget on labour costs (NHS Confederation, 2013). It could be argued that when staffing levels are at their optimum, NHS community nurses are the organisation’s most valuable resource. The role of the nurse is vital in tackling the highly complex challenges posed by wound management. The diverse range of wound aetiologies and associated comorbidities, coupled with the multiplicity of factors that influence the rate of wound healing, presents a unique combination of challenges that the nurse must identify, prioritise and address via an appropriately tailored management strategy.

The implications of increasingly constrained healthcare resources are already apparent in patient-facing areas. Nursing resources are under particular pressure following a reduction in staff numbers over recent years, with a 2013 RCN labour market review stating that the number of district nurses in England fell by 39% between 2002 and 2012 (RCN, 2013a).

In a separate report the RCN suggest that “…there are now red lights flashing across the UK, with more nurses and a nursing shortage that could have serious implications for health and social care” (RCN, 2013b).

These reductions in qualified nurses are mirrored by a decrease in training places for nurses between 2010 and 2012, and compounded by a net flow of nurses out of the UK to other countries (RCN, 2013c).

A scenario analysis modelling the long-term effects of these trends on the future NHS nursing workforce in England predicts that the number of nurses could fall by 28% (100,000) by 2022 (Buchan and Secombe, 2013).

Inevitably these changes have an effect on the staff themselves. Nurses are under increasing pressure (RCN, 2013d) and in a 2012 RCN survey...
A 2013 evaluation (Stephen-Haynes et al) estimated the potential time released if ALLEVYN Life were to be used for those patients with wounds having 3 or more dressing changes per week (estimated at 30% patients or 469 patients).

With a reduction in change frequency of 1.64 changes per week, this would release 769 district nursing visits each week.

This could free up a total of 397 hours of district nursing time per week across the provider.

Over the course of a year, this strategy could release approximately 40,000 visits (20,644 hours or around 2,500 working days).
## Example

<table>
<thead>
<tr>
<th>Parameter</th>
<th>All patients</th>
<th>Patient with wounds ≥ 1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>500,000</td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>1,500</td>
<td>207</td>
</tr>
<tr>
<td>Dressing changes per year</td>
<td>289,000</td>
<td>39,264</td>
</tr>
<tr>
<td>Reduction in changes per week</td>
<td>1 per patient</td>
<td>1 per patient</td>
</tr>
<tr>
<td>Dressing changes saved per year</td>
<td>78,000</td>
<td>10,749</td>
</tr>
<tr>
<td>Nursing hours released</td>
<td>23,525</td>
<td>3,201</td>
</tr>
<tr>
<td>Saving in dressing costs</td>
<td>4,290,000 kr</td>
<td>591,169 kr</td>
</tr>
</tbody>
</table>
Early intervention to heal non-healing wounds
Modelling early intervention for non-healing wounds

Portable, single-use NPWT has the potential to deliver good wound outcomes in community care settings.
VLUs

- Prevalence of non-healing VLU in the UK = 20,000 approx (0.3-0.4 per 1000 population)
- Estimated annual cost to treat = €46m
- Potential cost saving by early intervention and healing of 10% non-healing ulcers = €19,000 over 15 years per 10 ulcers
Modelling early intervention for non-healing wounds

A proportion of wounds could be classified as long-term non-healing wounds (e.g. ≥ 1 year duration)

We assume that these wounds continue to be treated using AWC but remain unhealed

However, if we could heal some of these wounds we could:

- reduce the total wound burden
- release resources
- increase service efficiency
Continuity of care between hospital and community
Continuity of care

Once NPWT is available, continuity of care from acute to community is possible, allowing patients to be discharged on NPWT earlier than would otherwise be the case.

By treating the patient in the community, there is an estimated cost saving to the NHS of £4814 per patient.

Targeted use of NPWT, managed by experienced tissue viability staff, is likely to result in more efficient use of resources.
Organisational change
Niagara Community Care Access Centre

Population = 430,000
Patients with a wound = 1,500
- Surgical/trauma = 61%
- Leg/foot ulcer = 25%
- Pressure ulcer = 14%

Prevalence = 3.5 per 1000

>50% of patients receiving care had a wound
<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average weeks to heal</td>
<td>51.1</td>
<td>20.9</td>
</tr>
<tr>
<td>Frequency of dressing change</td>
<td>5.09</td>
<td>2.18</td>
</tr>
<tr>
<td>Nurse cost per change</td>
<td>$51</td>
<td>$51</td>
</tr>
<tr>
<td>Materials cost per change</td>
<td>$3.75</td>
<td>$28.31</td>
</tr>
<tr>
<td>Cost per patient</td>
<td>$14,350</td>
<td>£3,617</td>
</tr>
<tr>
<td>Materials</td>
<td>$983</td>
<td>$1,291</td>
</tr>
<tr>
<td>Nurse time</td>
<td>$13,362</td>
<td>$2,326</td>
</tr>
</tbody>
</table>
What was driving change?

Healing time: more than 50%
Stage 3+ pressure ulcers: from 39% to 24%
VLU compressed: from 35% to 90%
Daily dressing changes: from 49% to 14%

The saving in the cost of nurse time: $11,000 per patient
Summary

1. Hard to heal wounds require a substantial quantity of resource: mainly hospitalisation and nursing resources

2. Strategies for reducing resource have been proposed:
   - Reducing the frequency of dressing change to release nursing time
   - Reducing the overall number of hard to heal wounds through early intervention
   - Using NPWT to provide continuity of care between hospital and community
   - Using organisational change to increase service efficiency