

# Clinical care delivery implications of the ‘Burden of Wounds’ study

## KEY WORDS

- ▶ Health Improvement Network
- ▶ Surgical wounds
- ▶ Wound prevention

The recently published ‘Burden of Wounds’ study (Guest et al, 2015a) not only highlighted the cost of delivering wound care in the UK but also revealed a number of shortcomings in the method of care delivery, many of which could potentially have adversely affected patient outcome. This paper looks more closely at some of the clinical and service issues raised by the published data from the study and combines this with observations made by the research team when reviewing the patient records to generate a number of recommendations for improvements in staff engagement, documentation, clinical management and service delivery. By implementing these recommendations variations in care standards should be reduced, delayed and non-healing be recognised earlier and as a result cost savings generated.

There is general agreement that best practice in management of a patient with a wound is driven by an accurate holistic and specific assessment process which identifies wound causality and associated comorbidities likely to adversely affect healing (Benbow, 2016). Using this information, and with the patient’s input, a comprehensive individualised treatment plan should be agreed which all members of the multidisciplinary care team implement (Bumpus and Maier, 2013). The plan should be updated according to treatment response and an ongoing assessment process which reflects changes in patient condition and the state of the wound.

The wound assessment is underpinned by accurate recording of wound characteristics including wound dimensions, wound bed status, exudate levels, periwound skin and patient reported symptoms such as pain and odour and previous dressing performance. According to Vowden and Vowden (2015) this forms the basic requirements for documentation and allows the development of an effective wound management plan that responds to wound needs during healing and recognises non-healing. Failure to adhere to an agreed treatment plan has been identified as a factor associated with delayed wound healing (Khalil et al, 2015).

The ‘Burden of Wounds’ (BofW) study (Guest, et al, 2016; Guest et al, 2015a) was based on information that has been systematically extracted from the anonymised electronic patient records of patients in The Health Improvement Network (THIN) database. This included manual searches of all scanned communications to ensure as complete a capture as possible was made of the available data. The most clinically relevant findings of the study are summarised in *Box 1*.

## **What are the nursing implications of the findings of this study and how may these deficiencies in care be addressed?**

The study highlighted many deficiencies in care delivery. The following key issues raised the most concerns.

### **DOCUMENTATION**

Although the assessment process and the underpinning basic wound documentation should be standardised and provide equivalent data across all care settings this proved not to be the case when wound related data was extracted from the records of patients in the THIN database. Consistency in documentation would undoubtedly have improved care delivery and assisted in data analysis.

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### Box 1. Background, outline and key findings of the 'Burden of Wounds' study

The NIHR Wound Prevention and Treatment Healthcare Technology Cooperative (NIHR WoundTec HTC) commissioned a study on 'real world' wound care provision in the UK. The ethically approved study analysed data from the full medical records of 1000 patients with wounds and 1,000 age- and sex-matched control subjects obtained from The Health Improvement Network (THIN) database, which currently contains the fully anonymized and validated electronic medical records of 11.1 million patients (3.7 million active patients) equivalent to 75.6 million patient years of data collected from 562 general practices in the UK, covering 6.2% of the UK population.

The study provides a comprehensive analysis of current wound care practice and includes a randomly selected cohort of patients 18 years or older with a Read code for a wound in their medical records and available continuous medical record for a year after the first mention of their wound. Only patients with a dermatological tumour or a surgical wound which healed within 4 weeks of the surgical procedure were excluded. The output from this study has already provided a unique insight into wound prevalence, care costs and current wound care practice within the UK and the key findings from the study have now been published (Guest, et al, 2015b; Guest et al, 2016). These can be summarized as:

- ▶ The NHS treats in excess of 2.2 million wounds annually. *Figure 1* outlines the proportion of wounds in each wound category
  - Worryingly over 30% of wounds lacked a diagnosis (unspecified wound type)
- ▶ The total cost of managing these wounds and their associated comorbidities was calculated to be £5.3 billion annually. After adjusting for comorbidities, this was reduced to between £5.1 and £4.5 billion
  - This is well above previous estimates, and comparable to the cost associated with managing the consequences of obesity, an NHS priority area for care
  - Wound care products accounted for only 14% of the costs of managing wounds and the associated comorbidities, staff and hospital costs accounting for the bulk of the costs incurred
  - Non-healing or delayed healing was a major factor in driving up care costs (*Table 1*), costs per patient for venous leg ulcer (VLU) management increasing from £788 (healed) to £4,472 (unhealed). Only 47% of VLUs healed during the study period (1 year)
  - Cost related to surgical wounds (i.e. surgical wounds taking more than 4 weeks to heal) was almost £1 billion. Most acute wounds heal in a predictable and timely fashion and require little specialist intervention. When acute wound healing is delayed costs are high
- ▶ There was a lack of evidence-based care with treatment at times deviating from approved guidelines
  - For example, in the management of lower limb ulceration and diabetic foot wounds basic data such as the ankle brachial pressure index (ABPI) necessary for management was lacking in >80% of cases
  - There was inconsistency in management with often unexplained treatment changes. Other wound care studies undertaken using THIN derived data have demonstrated similar findings (Guest et al, 2012; Panca et al, 2013; Guest et al, 2015b)
- ▶ There has been a shift in health care professional involvement in care delivery, with an increasing number of patients being managed by practice nurses as opposed to community nurses
- ▶ Senior engagement, particularly the involvement of tissue viability nurses or other specialist health care professionals in direct patient care was uncommon
- ▶ A number of factors associated with wound onset and non-healing were identified including patient nutritional status.

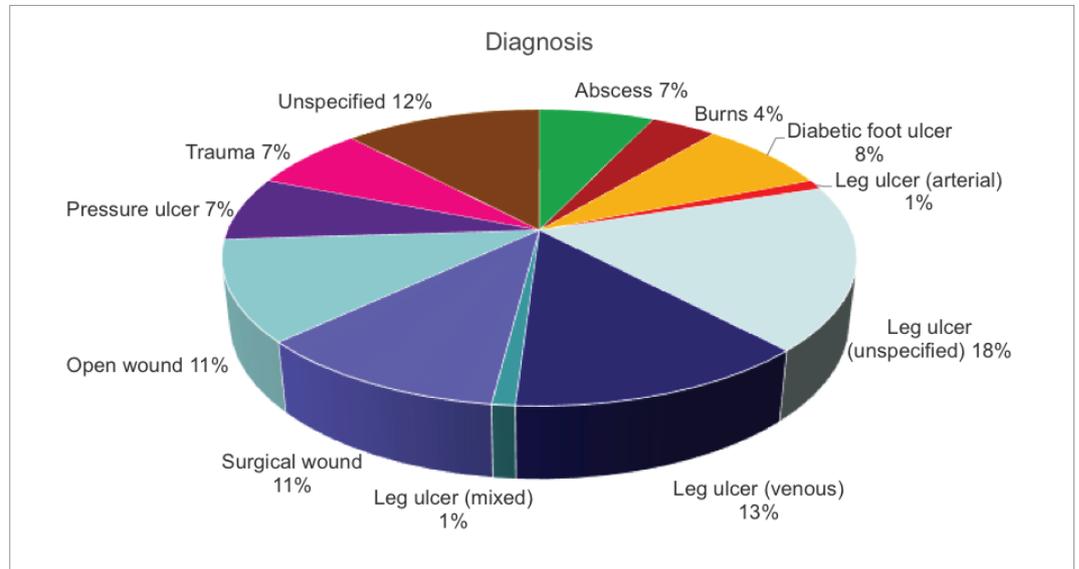
#### Recommendation

- ▶ A consistent method of documentation based around a minimum data set is needed to improve communication and to assist in data retrieval.

#### ESTABLISHING A WOUND DIAGNOSIS

Effective treatment protocols can only be implemented once a wound diagnosis is established

and relevant comorbidities addressed. This is particularly important when patients have a chronic wound (such as a pressure ulcer, leg ulcer or diabetic foot ulcer) or patients have a non-healing 'acute wound' due to underlying comorbidities affecting healing. In the BofW study by (Guest et al, 2015b; Guest et al, 2016) there were a large proportion of wounds (*Figure 1*) that were classified as



**Figure 1. Distribution of wounds by type**

‘unspecified’ (12% of wounds had neither a location or diagnosis and 18% were identified as wounds on the lower limb but no further information on the nature of the wound was available). In addition, there was little or no review of the diagnosis or treatment plan over time. The BofW studies emphasised the high incidence of comorbidities in the population of patients with a wound and in particular the role of dermatological conditions, nutritional deficiency and diabetes in both wound development and delayed wound healing.

**Recommendation**

- ▶▶ Failure to reach a working diagnosis at initial assessment should trigger early senior involvement or onward referral for specialist opinion to ensure correct diagnosis and appropriate pathway of care
- ▶▶ The wound diagnosis should be reviewed as part of the recurring re-assessment process to ensure ongoing appropriate treatment
- ▶▶ An integrated ‘holistic’ approach to care is needed which addresses comorbidities and risk factors for non-healing. This will entail a multidisciplinary multi-professional approach to care for some patients.

**LOWER LIMB ASSESSMENT**

The ‘Burden of Wounds’ study, like earlier studies (Srinivasaiah, et al, 2007; Vowden and

Vowden, 2009a; Vowden and Vowden, 2009b) confirm that the lower limb or foot is a common anatomical region for wounds. Guidance (Scottish Intercollegiate Guidelines Network [SIGN], 2010; National Institute for Health and Care Excellence [NICE], 2015) indicates that lower limb and foot wounds require a vascular assessment to assist in the wound diagnosis and to define, where appropriate, the level of compression that can safely be applied to patients with a venous leg ulcer or if referral to specialist teams is required. The BofW study confirms the concerns raised in earlier work by Srinivasaiah et al (2007) who identified a lack of ankle brachial pressure index (ABPI) calculation in the management of these patients. The lack of basic assessment of the lower limb vasculature would indicate that the correct treatment pathway could not be initiated and that sub-optimal treatment may be used.

**Recommendation**

- ▶▶ To improve diagnosis and therapy all staff managing patients with lower limb wounds should have access to, or training in, the necessary skills and equipment to perform a lower limb vascular assessment or be able to obtain an ABPI
- ▶▶ Patients with a lower limb or foot wound and a low ABPI should be offered senior review and onward referral in line with current guidelines

▶ Time delays for ABPI calculation should be minimal as the ABPI is currently the cornerstone of both the diagnosis and treatment of lower limb ulceration.

### WOUND ASSESSMENT

Accurate documentation of wound size and wound bed status is vital to monitoring of the healing process and key to the early recognition of delayed healing (Margolis et al, 2003; Margolis, et al., 2004). This key element of wound assessment was not readily available and not recorded in patient records. In an earlier study (Guest, et al, 2015a) working with data from the THIN database it was necessary to use the size of the dressing prescribed as a surrogate marker for wound dimensions.

#### Recommendation

- ▶ All healthcare professionals managing wounds should record, as part of the ongoing assessment process, the wound dimensions and use them to monitor progress towards healing
- ▶ Lack of progress should trigger senior review or onward referral
- ▶ Data should allow both patient healing and overall system performance to be routinely audited.

### HEALING OF WOUNDS

Delayed wound healing is recognised as a major cost driver in wound care and is associated with increased rates of wound complications including infection which can result in hospitalisation (Dowsett, 2015; Vowden and Vowden, 2016). The BofW study confirmed this, highlighting the major additional financial costs associated with non or delayed wound healing. Although not achievable in all wounds, healing is the primary desirable outcome for all wound types. This study highlighted a significant deviation from the published healing rates, for example the healing rates for venous leg ulcers reported in previous research studies was 70% or above at 24 weeks (Vowden et al, 2000; Moffatt et al, 2003; Franks et al, 2004). In the BofW study less than half of venous leg ulcers healed (47%) within the study year.

Surgical wounds failing to heal within four weeks of surgery were included in the BofW study. By their nature these wounds may be complex

and can require high level resources including hospitalisation. Although the number and impact of surgical site infection is widely reported (Tanner et al, 2012; Leaper et al, 2004), the true magnitude, diversity and cost of the care of surgical wound complications outside of hospital had not been previously recognised.

NICE guidance CG74 on surgical site infections (NICE, 2008) is limited in the scope and concentrates on prevention rather than chronic surgical wound complication management.

#### Recommendation

- ▶ Outcome data should be reported as part of clinical governance and this information should be used to reduce unwanted variation
- ▶ Healing rates should be mapped over time
- ▶ Staff should be aware of published healing rates and assess the effectiveness of care against these standards
- ▶ The impact of the non-healing surgical wound should be recognised and referral pathways developed to optimise care and reduce costs
- ▶ Further work is required to extend SSI guidance to ensure the community works with the surgical teams to reduce the impact of this condition.

### WOUND TREATMENT, STAFF INVOLVEMENT AND DRESSING USE

The BofW study highlighted inconsistencies in care, staff involvement and dressing choice with an apparent lack in many cases of a patient-specific treatment plan. In this study dressing products represents only 14% of the care costs with non-healing being a major driver for increased product costs. The BofW study also highlighted the range of nursing staff (Practice/Community, trained and untrained) involved in the delivery of care with an increasing involvement of Practice nursing staff in care delivery.

#### Recommendation

- ▶ A consistent care plan needs to be established for each wound highlighting appropriate dressing selection, which may involve the use of advanced wound care products, targeting early cost-effective wound healing as the primary outcome
- ▶ Change in staff involvement needs to be

**Table 2. Total NHS cost attributable to managing 2.2 million wounds (Guest et al, 2016)**

Wound Type	Total annual NHS cost (£ million)		Total annual NHS cost per patient					
	Attributable to wound care and associated comorbidities		Attributable to wound care after adjustment for comorbidities		Attributable to wound care and associated comorbidities		Attributable to wound care after adjustment for comorbidities	
	Healed	Unhealed	Healed	Unhealed	Healed	Unhealed	Healed	Unhealed
Abscess	£191.34	£98.17	£187.71	£94.67	£1,625	£2,325	£1,594	£2,242
Burn	£70.46	£19.09	£42.91	£35.68	£933	£1,719	£568	£3,211
Diabetic foot ulcer	£128.41	£425.73	£181.70	£444.61	£1,864	£4,258	£2,638	£4,447
Leg ulcer (arterial)	£0.00	£46.45	£0.00	£46.57	£0.00	£5,226	£0.00	£5,239
Leg ulcer (mixed)	£35.53	£78.16	£41.48	£187.12	£3,998	£5,025	£4,667	£12,031
Leg ulcer (unspecified)	£324.03	£512.59	£250.94	£408.25	£1,657	£2,284	£1,283	£1,819
Leg ulcer (venous)	£136.25	£804.88	£103.35	£655.89	£1,039	£5,488	£788	£4,472
Open wound	£182.22	£227.51	£126.38	£135.27	£1,065	£3,303	£739	£1,964
Pressure ulcer	£176.25	£354.88	£156.17	£362.67	£2,644	£4,095	£2,343	£4,185
Surgical wound	£584.57	£398.33	£582.74	£388.85	£3,132	£5,976	£3,122	£5,833
Trauma	£96.20	£63.05	£60.04	£50.00	£698	£3,153	£436	£2,500
Unspecified	£187.94	£175.68	£124.25	£131.21	£984	£2,196	£650	£1,640
Total	£2,113.20	£3,204.52	£1,857.68	£2,940.78	£1,564	£3,679	£1,375	£3,376

recognised and accommodated in resource and educational support provision.

**TISSUE VIABILITY NURSE REFERRAL**

The BofW study highlighted the lack of senior involvement (both the tissue viability teams and the other specialist health care professionals) in clinical wound care, and there appeared to be no correlation between wound complexity, wound duration and senior involvement. This may have had a negative impact on outcomes and therefore costs, particularly those associated with delayed wound healing. Ousey et al (Ousey et al, 2014; Ousey et al, 2015) highlight the lack of a clear definition, and therefore confusion regarding the role of tissue viability nurses (TVN). The clinical role of TVN has changed in line with the ongoing target requirements related to pressure ulcer prevention (Pagnamenta, 2014) and the role of the GP and other community-based staff in wound care delivery is inconsistent.

**Recommendation**

▶ The BofW study demonstrates that the clinical role of senior staff needs to be clearly

defined and their role linked closely to an ‘escalation of care ladder’ for wound care with clearly defined referral criteria

▶ Wound care role of the GP in particular and medical staff in general needs to be defined.

**RESPONSIBILITY**

It was difficult to define who has responsibility for care of the individual patient’s wound and the management of any associated comorbidities. Although impossible to directly infer from the BofW study clinical experience suggests that communication between practitioners is often poor and there is no clear role allocation.

**Recommendation**

▶ The role of health care professionals including nurses, TVN, podiatrists, GPs and other medical professionals needs to be clearly defined within the patient care pathway

▶ Multi-disciplinary communication in relation to wound care needs to be improved

▶ Responsibility for achieving optimum outcome for the patient needs to be allocated to an individual practitioner.

## CONCLUSION

The BofW study has highlighted opportunities for commissioners and practitioners to improve wound care delivery, reduce costs and improve outcomes. Implementing the recommendations suggested above will enhance patient care, more effectively use the existing workforce and reduce overall dressing product use without compromising on quality or product availability.

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