Implementation of knowledge and technologies into the clinical setting

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Wounds and their associated problems have challenged healthcare providers for centuries (Moore and Cowman, 2005). Despite this longevity, they continue to be a problem, with an estimated 1–1.5% of the population suffering with a wound at any given point in time (Posnett et al, 2009). Changing population demographics and the projected increase in the number of older persons suggest that the number of wounds is set to increase correspondingly, considering the association between older age and chronic disease (Moore and Cowman, 2005).

Economic appraisal of the provision of wound care indicates that wounds are a significant drain on healthcare resources. Indeed, it is proposed that 4% of the total healthcare expenditure is spent on the provision of wound care and, interestingly, 41% of these costs are associated with nursing time (Posnett et al, 2009). The majority of wounds are managed in the community setting (Moore and Cowman, 2005), and between 20 and 30% of community nursing time is spent on the provision of wound care (O'Keeffe, 2006).

Wounds also impact negatively on health-related quality of life (HRQoL), with pain being one of the most frequent issues of concern reported by patients (Spilsbury et al, 2007). Other problems experienced include nausea, fatigue, depression, sepsis, psychological disturbances, loss of function, loss of mobility and personal financial cost (Herber et al, 2007). Thus, the presence of a wound is a difficult experience for the individual, which impacts on all activities of daily living.

With limitations in resources and an increasing demand on service delivery, the choice of the most appropriate, effective treatments are paramount to the success of the health service (Levin, 2001).

Healthcare delivery is an ever-evolving system which is constantly striving for 'gold' in terms of being able to meet the changing needs of society, in the midst of rapid growth and development. In aiming to achieve the highest standards, a greater focus on evidence to support clinical decision-making has emerged. This focus on evidence has in itself created challenges, as there is great debate surrounding what actually constitutes evidence. In the midst of this debate are many different voices, all advocating different approaches. For the practising clinician this lack of guidance is largely unhelpful, as clearly we all need to be speaking with one voice in this regard.

Evidence-based practice

The challenges faced by practising clinicians in providing safe, effective, efficient wound care services are numerous and include those mentioned previously such as changing demographics, and the continuing rise in prevalence and incidence of wounds. In addition, health economics are an important concern. Today, more than ever, the economics of healthcare provision exert a huge influence over clinical practice. For example, in Ireland the healthcare budget was 14.6 billion euro in 2009, compared to 11 billion euro in 2006 (Carney, 2010). Such expenditure cannot be sustained and due to the economic downturn serious cuts in this spending will have to be made (Carney, 2010). As a result, clinicians are increasingly being challenged to provide evidence to support the use of different therapeutic options in wound management.

The cornerstone of evidence-based practice (EBP) is the integration of high quality research evidence into clinical decision-making. This evidence is used in combination with clinical judgement and experience to plan the most appropriate patient treatment (Sackett et al, 1996). EBP has grown in popularity and has been adopted as a central tenet in the development of healthcare policy in the UK (Trinder, 2000). There are many influencing factors that have contributed to the rise in EBP, probably none more so than the increasing economic constraints imparted on health service delivery (Reynolds, 2000). With limitations in resources and an increasing demand on

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service delivery, the choice of the most appropriate, effective treatments are paramount to the success of the health service (Levin, 2001). Indeed, it is argued that the achievements of the health service should be measured on scientific evidence rather than expert opinion or anecdotal evidence alone (Levin, 2001). Therefore, those wishing to justify continued investment in current practice, or conversely, development of new innovative methods of care delivery, are expected to be explicit in their requests (Muir Gray, 2000). This explicitness has to include evidence-based material to support arguments appropriately (Muir Gray, 2000).

It is argued that EBP comprises five main components:

- Identifying a clinical problem
- Finding the evidence to answer the problem
- Critically appraising the evidence
- Applying the evidence to the clinical situation
- Evaluating the results of the intervention (Reynolds, 2000).

Central to this process is the identification of research that is of sound methodological quality and critically appraising its merits or limitations (Sackett et al, 1996). The ultimate challenge lies in determining if there is bias present and, if so, whether this influences the results.

Generating new evidence

The generation of new evidence in the wound healing and tissue repair field is fraught with challenges. The randomised controlled trial (RCT) is considered the gold standard for conducting clinical trials and, as such, is one of the most powerful tools in research today (Moore and McCabe, 2006). However, it is also argued that there are many ways in which the RCT may be subject to bias and this should be borne in mind in the design and analysis. The underlying principles of experimental design are control, randomisation and repeatability (Moore and McCabe, 2006):

- Control relates to the minimisation of the effects of confounding variables which may be achieved by randomly selecting study participants
- Random allocation is the key way in which a researcher may ensure that groups are as equal as possible at the beginning of the study
- Repeatability relates to the use of an adequate sample size in order to repeat the measures sufficient times to reduce chance variation in the results.

Fundamentally, research needs to be clinically applicable in order to be of value to practice (Sackett et al, 1996).

The RCT meets these principles in that participants are randomly assigned to one or more treatment groups and the effects of the intervention compared to a control group who have not received the intervention (Moore and McCabe, 2006).

The selection of the most appropriate endpoints or outcomes to measure are also considered to be important quality indicators (Moore and McCabe, 2006). However, in wound management the choice of such endpoints are often not completely within the remit of the researcher, in that regulatory bodies may insist that the study must focus on a particular endpoint (Gottrup et al, 2010). Indeed, complete wound closure is often heralded as the key endpoint to measure. However, other endpoints, such as restoration of bacterial burden, may be clinically more appropriate depending on the product under investigation (Gottrup et al, 2010).

The argument prevails that the way in which evidence is generated in wound care remains challenging because of difficulties in achieving all of the quality markers of the RCT (Gottrup, 2006). As a result of issues such as inadequate sample sizes, non-blinded outcome assessment, inadequate follow-up and lack of clear descriptions of interventions, wound care research often falls short of expectations (Clark and Price, 2005). Therefore, Gottrup (2006) argues that the foundation of the problem lies in the lack of agreement regarding the conduct of research in wound management. Further, Gottrup (2006) argues that the time has arrived for the development of consensus on what parameters are the most important to explore in order to have acceptable evidence. Indeed, Gottrup et al (2010) have moved this debate even further, through the publication of their extensive document exploring outcomes in controlled and comparative studies on non-healing wounds, making specific recommendations to improve the quality of evidence in wound management. As such, the authors (Gottrup et al, 2010) question whether the RCT is the penultimate gold standard, or are there other methodologies such as cohort studies which would provide more robust, clinically applicable evidence for practice?

Implementing best evidence into practice

One barrier to the drive for EBP is the fear of change (Trinder, 2000). The process of changing practice has been described in different stages and an understanding of this is important in terms of human behaviour (Prochaska and Di Clemente, 1984). One stage of change is self-liberation; an individual's ability to choose. Choice occurs when there is more than one alternative; if there is only one choice, there is no freedom (Prochaska and Di Clemente, 1984). An important aspect in choice is the subsequent anxiety felt in taking responsibility for that choice. In other words, the person making the change must accept accountability for the outcome of that change, be it positive or negative. Choosing is made significantly more difficult when there is an insufficient amount of information gained regarding a situation (Prochaska and Di Clemente, 1984). For example, if a clinician is unsure about the value of a clinical trial and its relevance to their specific practice, it may be easier to ignore the evidence and remain with the *status quo*. Therefore, a tendency to cling to ritualistic practice may stem from a fear of change due to lack of knowledge, rather than an unwillingness to change (Prochaska and Di Clemente, 1984).

Challenging the drive for EBP is the notion that there exists inherent

problems in terms of deciphering which research is applicable and which is not (Trinder, 2000). Fundamentally, research needs to be clinically applicable in order to be of value to practice (Sackett et al, 1996). However, the increasing abundance of research has often led to a gap between research and clinical practice (Trinder, 2000). It is argued that there was a time when it was possible to read everything related to a particular specialty, yet now over 6,000 health-related articles are published each day (Levin, 2001). Many clinicians have difficulty in accessing and interpreting the relevance of research, arguing that there is a research overload which compounds their frustrations (Trinder, 2000).

The process of practising EBP is not just simply the production of clinical evidence, be that RCTs, comparative controlled trials (CCTs), cohort studies, or individual case reports. Clinicians want answers to pressing clinical problems, for example, which is the best method of repositioning for the prevention of pressure ulcers, how often should the patient be repositioned and how is this best achieved within the clinical setting? Therefore, implementing existing knowledge needs to take account of both transferability and clinical applicability. To use the repositioning analogy, yes, it is possible to prevent pressure ulcers if individuals are repositioned every 15 minutes. Clinically, this is not feasible and thus not transferrable within the patient care setting.

Conclusion

Health economics is based on the concept of scarcity, which suggests that there will never be sufficient resources to meet the ever-changing health needs of society (Phillips, 2005). Thus, the underlying premise is that the delivery of health care should be founded on equity and efficiency, in other words, making the best use of the resources that are available (Phillips, 2005). Of course this is challenging, particularly when one considers the changing demographic profile and the related challenges in providing adequate health care (Moore and Cowman, 2005).

There are over 1,000,000 people working in wound care and the time has come to decide which wound care outcomes are the most important. After all, the generation of a clinically relevant evidence base is the key to ensuring that the concept of EBP is implemented and remains viable in the field of wound care.

We are the voice of wound care, and, as such, each and every one of us has an obligation to take up the challenge and strive to achieve the best evidence possible. **WUK**

Key points

- The challenges in providing effective, efficient wound management services, include changing demographics, decreasing health resources and an unclear evidence base.
- The appraisal of existing scientific evidence is difficult, and there are many pitfalls which may mask the true nature of the evidence.
- The generation of a clinically relevant evidence base is the key to ensuring that the concept of EBP is implemented and remains viable in the field of wound care.

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