

Modern dressings: healing surgical wounds by secondary intention

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There is a lack of robust research evidence on many aspects of wound care. The inaugural Professional Select Committee on Wound Care, held at the Royal College of Surgeons, explored the relative value of modern and traditional dressings in treating wounds healing by secondary intention. This article outlines its main findings.

This article reports the findings of an initiative to assess the role of 'modern' as opposed to 'traditional' (i.e. gauze based) dressings in the care of surgical wounds healing by secondary intent. It outlines the process used to facilitate the investigation of this issue in as reflective and unbiased a manner as possible, via what is termed a 'Professional Select Committee' (PSC). This was in part designed to reflect principles and techniques pioneered in the field of public and patient participation in health-care policy formation, such as those embodied in the establishment of 'citizen's juries'.

A balanced appreciation of the role of modern moist wound healing products and their value in the context of current pressures for patient-centred care and improved surgical outcomes demands an initial understanding of the history of surgical wound management, and of how dressings have evolved to meet today's requirements. Up to two centuries ago patients were lucky to survive even minor surgical interventions without contracting life-endangering infections, and having to endure extreme distress. But in the 19th century a process of fundamental innovation began.

This progress was in part heralded by advances in military surgery, and the treatment of soldiers and naval officers needing limb amputations and gunshot and shrapnel wound repairs. The pioneering antiseptics research of Lister, Pasteur and Semmelweis was arguably even more important in terms of its long-term impact on surgical practices and outcomes.

Such advances highlighted the importance of clean dressings and sterility. Lint, gauze and cotton rapidly replaced older types of dressing. Gamgee was particularly notable among sur-

geons for his attention to dressings. In the second half of the 19th century he developed the 'absorbent and antiseptic' material still known as Gamgee tissue. His contribution helped to establish a discipline of wound care within the domain of surgeons, centred on improving the surgical wound healing.

Almost a century later another major advance occurred when Winter defined the phenomenon of moist wound healing (Winter, 1962). This work led to a new generation of dressings such as films, hydrocolloids, and foams. However, while some areas of surgery – notably burns and plastics – have been relatively eager to adopt such dressings, others have been slower to change practice. A significant proportion of surgeons continue to prefer dry, gauze-based materials (Chaloner et al, 1996; Moore and Foster, 1998).

PATIENT EXPERIENCE

In many instances such dressings are fit for their purpose. But they are nevertheless prone to adhere, and can cause potentially avoidable pain and trauma upon removal (Hollinworth and Collier, 2000), even in the case of wounds healing by primary intent. There is evidence that 'softer' wound care outcomes such as patient comfort, reduced pain on dressing change and enhanced freedom to bathe are not always regarded with due priority when wounds are first dressed in theatre.

The widespread use of dressings such as proflavine-impregnated gauze in the packing of excision wounds left to heal by secondary intention is testimony to this observation (Foster and Moore, 1997a,b). The use of such materials in dressing surgical cavities often results in serious, albeit also normally short-lived, discomfort to

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the patient. They typically harden in the wound and need softening by bathing before extraction. This at best is time consuming, and at worst general anaesthesia is required and/or the use of potent analgesics such as pethidine.

Research on modern dressings has demonstrated that pain on dressing change need not be endured (Hollinworth and Collier, 2000). The Royal College of Surgeons of England issued a report on postoperative pain control (Commission on the Provision of Surgical Services, 1990). It argued that 'failure to relieve pain is morally and ethically unacceptable'. While this statement related primarily to avoidable postoperative pain rather than to pain on dressing change, treatment objectives should be consistent. Dressings policies ought also to be aimed at avoiding needless distress, within reasonable boundaries of affordability and relative cost effectiveness.

Experienced pain levels cannot be predicted by operation type. They must be assessed individually, and treatment strategies planned to minimize them with the framework of each service user's concerns and wishes. But there is a growing body of evidence about appropriate dressing selection (Thomas, 1997). It can be argued that it is now time for a radical review of the available body of information on the use of alternative dressings in the treatment of surgical wounds.

REQUIREMENTS FOR AN IDEAL SURGICAL WOUND DRESSING

Turner (1985) outlined the general requirements for an ideal wound dressing. His work was subsequently expanded upon by Morgan (1998). In the last 5 years a number of further developments have been made in dressing technologies and understanding of the healing process.

For example, one important dimension of modern dressing quality is that of wear time. There has been a move towards longer wear time, particularly in the context of treating and protecting chronic wounds such as leg ulcers in community settings. This has been fuelled by attempts to demonstrate 'cost-effectiveness', but it has sometimes left patients with leaking dressings and wound maceration.

Other important dimensions of surgical wound dressing quality include:

- Conformability
- Cohesiveness, in both 'wet' and 'dry' situations
- (Non) adherence
- (Non) toxicity
- Absorbency
- The degree to which bathing is permitted

- The provision of a moist healing environment, where required

- Ease of use

- Capacity to prevent cross infection

- Availability in the community

- Demonstrable cost-effectiveness.

Given variations in the context of use, high ratings on all these performance criteria cannot be met by any one dressing in every clinical situation. Different dressings or combinations of dressings may well be required during different stages of the healing process. Limitations in the research evidence available and differing patient experiences and priorities help explain why there are still marked variations in practice between surgical teams.

However, proponents of modern (non-gauze-based) dressings believe that there is now compelling evidence for their use in many contexts, for reasons relating not only to the apparent benefits of moist healing (Hulten, 1994; Cannavo et al, 1998) but also for infection control (Bowler et al, 1993, 1999), and patient comfort and satisfaction. Hydrocolloid-based products have, for example, been shown to reduce the airborne distribution of organisms at dressing change through preventing aerosol formation (Lawrence, 1994). It has also been demonstrated that occlusive dressings are associated with a lower overall wound infection rate than non-occlusive dressings (Hutchinson and Lawrence, 1991; Hutchinson, 1993).

Conventional gauze-based dressings can, by contrast, be associated with problems such as leaving contaminating fibres that act as foci for infection. On removal their traumatic detachment may spread bacteria by aerosol formation (Lawrence et al, 1992). Nevertheless, many surgeons still favour use of gauze. This is in part because there are no robust data supporting the use of modern dressings to promote faster healing of acute surgical wounds. They may also be aware of its relatively low cost, and believe that this necessarily makes it a more cost-effective choice.

THE PROFESSIONAL SELECT COMMITTEE ON SURGICAL WOUNDS HEALING BY SECONDARY INTENTION

Such variations in approach highlight the question 'what role do modern wound dressings appropriately have to play in the management of surgical wounds?' The objective of the PSC – a concept piloted in conjunction with the Royal College of Surgeons of England, and sponsored by the dressings manufacturer ConvaTec – was to answer this and associated concerns.

The PSC built on experience gained in areas such as the organization of consensus conferences and citizen's juries to clarify health-care issues. It considered qualitative and quantitative evidence relating to the use of modern and conventional wound dressings within the acute surgical setting for wounds healing by secondary intention.

The PSC involved a panel of five independent professionals – two surgeons, two health economists and a wound care specialist – and was chaired by a professor of health policy. It was emphasized to all participants that its purpose was to generate balanced, objective conclusions based on the best available evidence. Everyone contributing (including observers and wider audience members) was encouraged to declare relevant interests. An undertaking was given that the report of the PSC and any associated articles would reflect faithfully its content and conclusions. The purpose of the initiative was to create an atmosphere of mutual trust in which issues could be honestly discussed.

The PSC members received oral evidence from a range of witnesses. They included a consultant general surgeon, a consultant vascular surgeon, a surgical assistant, a tissue viability nurse and a former theatre sister with a special interest in this area of wound care. The panel had also previously been provided with written evidence gathered via a semi-structured literature review conducted for this investigation.

A number of those contributing noted that a significant proportion of the evidence presented focused mainly on the performance of products produced by the company sponsoring the PSC. But there was universal agreement that its conclusions were based fairly on the information available. They are summarized in the panel statement on this page.

KEY EVIDENCE

Work published by Peter Moore and Lorraine Foster (Foster and Moore, 1997a; Foster et al, 2000; Moore and Foster, 2000) illustrates the information analysed. (Other evidence received is not summarized in full here, but is presented in the full PSC final report (2003).) They conducted an independent (NHS trust funded) prospective randomized controlled trial which compared the performance of conventional proflavine-soaked gauze and modern hydrofibre dressing in the management of wounds healing by secondary intent. The outcomes assessed included:

- Patient experience of pain
- The ease of dressing change from the nursing perspective
- Overall service costs.

Mr Moore described the methodology used to assess pain (a 4-point self-reported score, plus recorded analgesia use) to the PSC panel. Modern dressings were found to have clear advantages in this context. Because of this, and their associated ease of changing (*Figures 1–4*), he and his colleagues concluded that:

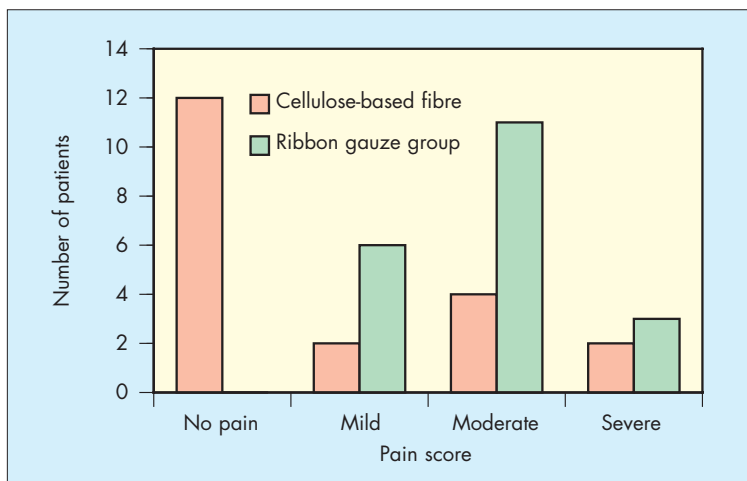
- To a statistically significant extent, modern as opposed to conventional dressing use allowed an increased proportion of surgery on open wounds to be conducted on a day-case basis, with consequent cost savings
- The nursing time required to change the hydrofibre dressing was about half that needed in the proflavine gauze cases
- That in an area with a population of 300 000 (equivalent to that of many primary care trusts),

Panel statement

The importance of issues such as pain control and dressing comfort is still not always fully appreciated in relation to surgical wound care. Research in this area has been neglected for a variety of social, economic and technical reasons. Surgeons and other professionals with a special interest in wound care and tissue viability should work together to improve outcomes as assessed from the patient as well as a technical perspective, using a range of indicators to measure individual and team performance. Patients should, where possible, be prospectively involved in therapeutic decision making. This requires a shared focus on quality, mutual professional respect and mature interpersonal relationships. Effective communication of information gained at every stage of the patient care pathway is vital. It is poor practice to be insensitive to patients' ongoing needs after they have left theatre, or to cause avoidable pain. Surgeons and other professionals involved in wound care should not limit their attention only to conventionally defined endpoints like time to healing.

The National Institute for Clinical Excellence (NICE) have advised that in managing difficult to heal surgical wounds dressing choice should be determined by factors such as experienced patient (dis)comfort and related determinates of acceptability – like wound odour – together with overall rather than item by item costs. The panel agreed that these principles should apply in relation to all surgical wounds healing by secondary intention. It accepted that the evidence base remains incomplete, and that wounds may require different types of dressings as healing progresses. However, they concluded that there is sufficient information to show that the use of modern wound dressings (as opposed to traditional impregnated or plain gauze) can confer significant patient benefit. When used appropriately they can free resources through saving nurse time and allowing more day surgery. If modern dressings are never used in the operating theatre to manage wounds healing by secondary intent, the individuals and teams responsible should consider carefully the quality of their clinical practice and communication.

Figure 1. Pain on removal at first dressing change.



the appropriate use of modern as opposed to conventional dressings on acute (general) surgical wounds healing by secondary intent will save in the order of 100 bed days a year, in addition to other patient benefits.

Figure 2. Pain on repacking wound at first dressing change.

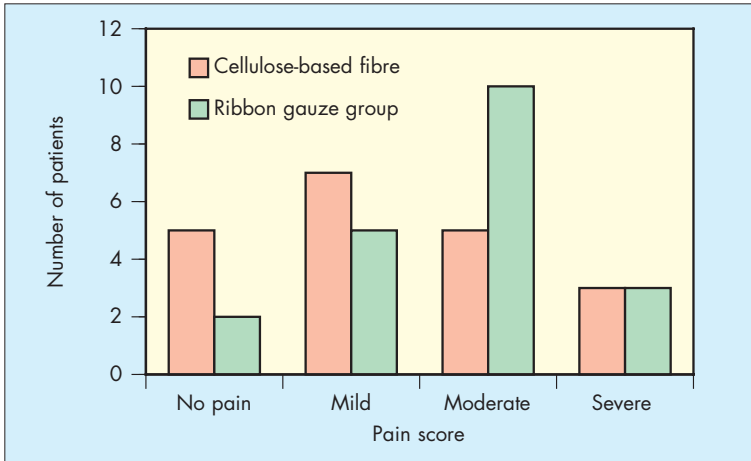


Figure 3. Ease of removal at first dressing change.

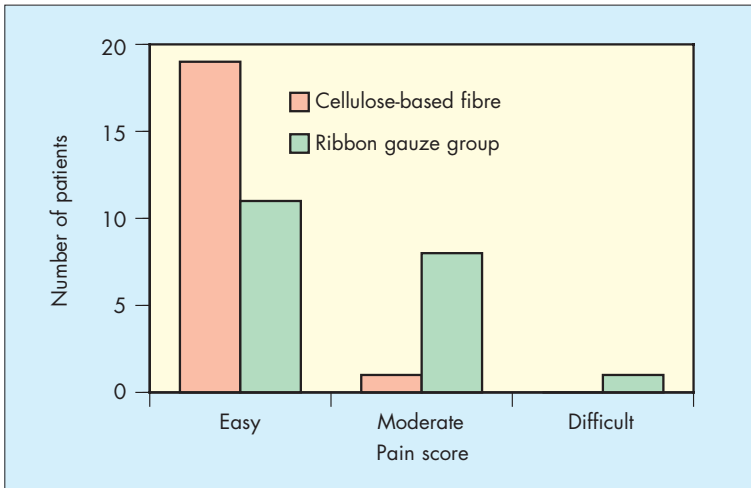
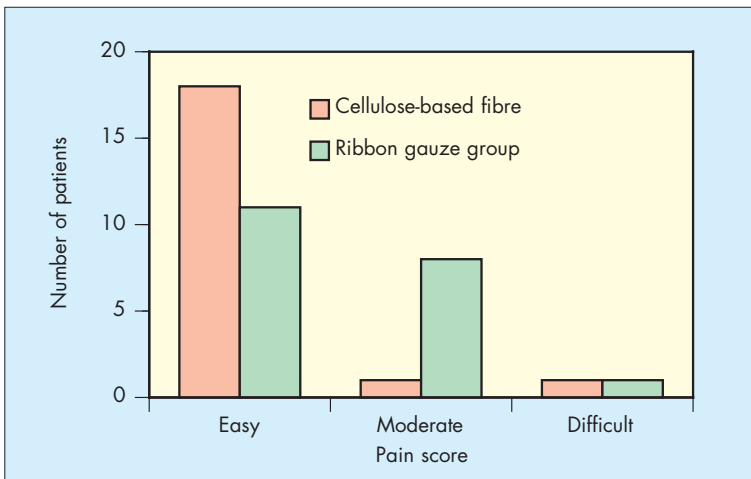


Figure 4. Ease of application at first.



As a result of this research, the local Trust policies changed. Mr Moore's professional colleagues continue to use modern dressings.

A second illustration of relevant evidence was provided by a prospective audit conducted by the Manchester Healthcare Trust conducted by Ms Jill Biggins and her colleagues (personal communication, 2002). This too found that patients whose wounds had been dressed with a modern (hydrofibre-based) product as opposed to a conventional gauze dressing experienced significantly less pain, and had shorter average lengths of stay in hospital.

Ms Biggins and her surgical colleagues were particularly concerned to audit the incidence of post-surgical bleeding. One of the reasons why surgeons may prefer gauze-based products relates to their beliefs regarding its haemostatic properties. The audit found that post-surgical bleeding control was unimpaired when a modern hydrofibre dressing was used. The witness and her colleagues had therefore stopped using conventional gauze-based dressings in wounds healing by secondary intention such as incised abscesses and excised pilonidal sinuses.

In terms of the cost effectiveness of modern dressings, attention was drawn to work submitted to the National Institute for Clinical Excellence (NICE) (ConvaTec, unpublished submission to NICE for Technology Appraisal Guidance 24, 2000; Health Technology Assessment, 2001) and the conclusions of the Institute's subsequent report (NICE, 2001). This suggested that on the basis of an estimated total of around 20 000 general surgical wounds left to heal by secondary intent a total of £7 million could be saved by the NHS annually if appropriately selected modern as opposed to gauze-based dressings were used. Savings were anticipated in relation to every surgical wound type (described as difficult to heal wounds healing by secondary intent) considered by an expert 'Delphi panel' assembled to evaluate this issue (Figure 5).

In the face of such findings witnesses suggested a number of reasons why a significant number of surgeons continue to use gauze-based products. They included:

- The fact that ribbon gauze inserted in operating theatres is removed later by nurses working on wards. This inevitably means that avoidable patient distress is not witnessed by those primarily responsible for the wound. If theatre and ward staff are insulated and isolated from one another, individual and organizational learning is inhibited

■ The way budgets are structured militates against managers and clinicians taking a well-integrated approach to case management across whole treatment episodes.

It was agreed by the panel and others attending the PSC that although such factors might understandably have served to inhibit changes to established practice, well-managed teams and organizations committed to patient care should be able to identify and overcome them.

CONCLUSION

As a pilot venture, the PSC initiative was judged by its participants to have been a useful and balanced way of reviewing the available evidence.

It is hoped that in future the process that the PSC embodies can be further developed as a vehicle for allowing clinicians, industry and others involved in health care to share and assess information, and work constructively together towards their common goal of improving patient welfare. **HM**

*The Professional Select Committee was supported by an educational grant from ConvaTec.
Conflict of interest: none.*

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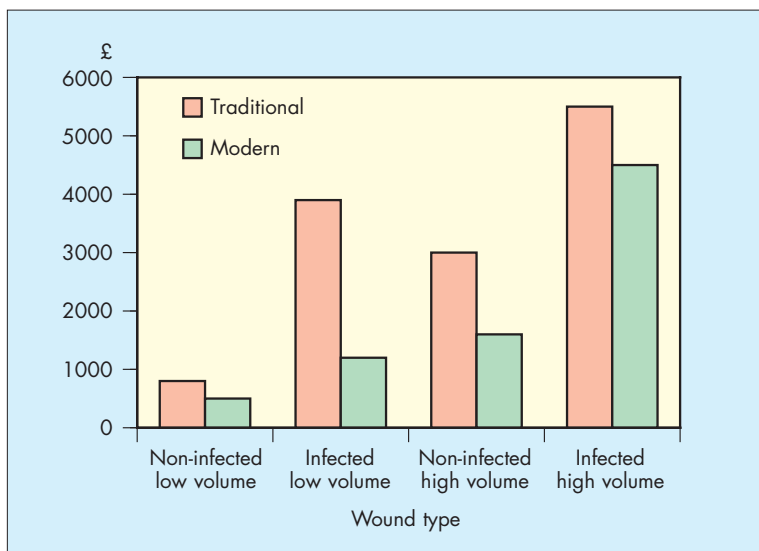
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Figure 5. Median cost per wound healed: modern vs traditional dressings.



KEY POINTS

- Wound care is often based on habit and arbitrary professional preference, rather than objectively considered evidence relating to patients' experiences and health outcomes.
- In determining wound care costs and benefits, factors like patient comfort and pain levels experienced during dressing changes should be considered alongside evidence relating to healing times.
- Modern hydrocolloid-based dressings can be ten times more expensive than gauze-based alternatives, but there is evidence that in treating wounds healing by secondary intention they may reduce overall costs, through savings in nurses' time and reductions in inpatient stays.
- 'Silo budgeting' (i.e. separate budgets for specific departments or functions, which do not properly take organization- or community-wide costs and savings into account) and failures to share responsibility for care quality beyond the immediate operative setting can result in avoidable financial costs and patient distress.
- Surgical care excellence in part relates to the quality of communication between surgeons and nurses within teams, and between staff working in theatre and ward settings.