Topical antimicrobial dressings, including those that contain silver, are currently used to prevent or treat infection in a wide range of acute and chronic wounds. Although silver dressings are being used extensively, a published randomised controlled trial (RCT) (1) and two Cochrane reviews (2,3) concluded that there is insufficient evidence to show that silver dressings improve healing rates. The overall effect of these reports has been to cast doubt into the minds of healthcare purchasers, which has led to restrictions in the availability of silver dressings worldwide. There is growing concern amongst clinicians, who are involved in wound care, that arbitrary withdrawal of silver dressings could lead to their patients having increased morbidity and prolonged treatment time relating to uncontrolled wound bioburden.

Because of this conflict of opinion, a group of experts from Europe, North America, the Far East, South Africa and Australia met at the end of 2011 to provide internationally recognised guidance on the appropriate use of silver dressings, based on their experience in clinical practice and all the available published evidence. Additional international experts were also consulted to reflect practice across different parts of the world. Following this exercise, a consensus document was published that presents the mechanisms by which silver dressings work, the relationship of in vitro and in vivo evidence to clinical practice, and provides a rationale for cost-effective management (4).

Many common misperceptions concerning the use of silver dressings were identified by the group. In contrast to the negative findings of the RCT and two meta-analyses (1–3), the experience of many clinicians and other meta-analyses have confirmed positive effects of silver dressings when they are used appropriately (5–7). This disparity is based on the use of complete healing as an endpoint, which is insisted upon by regulatory bodies such as the Food and Drug Administration of the USA in clinical trials of this nature. However, the use of silver dressings was never intended to directly promote wound healing but to control or reduce the bioburden of wounds, which if not addressed, does lead to delayed healing. The use of this more appropriate endpoint, control of bioburden, has been supported by many (8–12). Silver dressings are often perceived to be expensive, and although dressing unit costs are highly variable, their beneficial effects on overall cost of wound management and quality of life parameters are clear (13–17). Other misperceptions addressed in the consensus document are that silver dressings are unlikely to cause toxic local or systemic effects (although caution is suggested for use in large wounds, in children and in pregnancy/lactation), and that the risk of acquired antimicrobial resistance to silver (or to antibiotics) was negligible.

Therefore, the appropriate use of all topical antiseptic dressings, such as those containing silver, is to reduce bioburden in wounds that are recalcitrant and often accompanied by progression of critical colonisation to infection. The antimicrobial effect of silver is mediated by the presence of the Ag⁺ ion which is disruptive to many aspects of micro-organism metabolism. This accounts for the broad spectrum of activity...
of silver dressings and their potential to destabilise biofilm matrices, thereby reducing the risk of acquired resistance (18–22). The identification of critical colonisation and infection is a clinical one and should be made by experienced clinicians (12). The use of all topical antiseptic dressings ought to be accompanied by not just an assessment of the wound but also the management and re-assessment of underlying comorbidities; for which the aphorism of ‘treat the patient as a whole, not just the hole in the patient’ is entirely appropriate. In the consensus document it is recommended that silver dressings should be used for 2 weeks initially and then the wound, the patient and the management approach should be re-evaluated. The consensus group suggested that this initial 2-week period be seen as a ‘challenge’ period, during which the efficacy of the silver dressing can be assessed: when there is improvement, but persisting signs of infection, continue treatment without change; when there is improvement, but no signs of infection, discontinue all topical antimicrobials (including silver dressings); and when there is no improvement consider changing to a different antiseptic dressing, lavage/irrigant or gel, or if the patient is unwell, consider using systemic antibiotics and re-evaluating underlying comorbidities.

In the absence of clear, level I evidence-based criteria, the choice of a silver dressing is likely to be based on availability and familiarity, the additional needs of the patient and the wound (such as the level of exudate production and condition of the wound bed), whether a secondary dressing is required and, of course, if there is an agreed patient preference. A current and comprehensive list of RCTs, and systematic reviews, of the use of the range of silver dressings and their indications for acute and chronic wounds is tabulated in the consensus document. In vitro tests of antimicrobial efficacy of silver dressings are less likely to influence the choice of silver dressing than published clinical studies. RCTs in this field have been criticised for being underpowered, with varied and sometimes inappropriate endpoints (such as complete healing) and poor randomisation, which have led to the varied findings of the meta-analyses alluded to earlier. Clinical endpoints of control of infection are more relevant, but microbiological endpoints can be confusing (23). However, RCTs are expensive and time consuming, and so are more likely to be undertaken by the manufacturers of silver dressings with all the attendant claims of conflicts of interest, which are perceived by many, despite the strict adherence to the code of good practice. Pragmatically, efficacy also needs to examine other evidence, such as observational studies, and expert and patient opinion (24).

Areas where further experimental research and clinical trials may be directed could include:

(i) Clarification of the relationship between dressing formulation and the levels and rate of silver release. The sustained high release of Ag⁺ from dressings using nanocrystalline technology shows good short-term success.
(ii) Greater understanding of the release of silver, which needs to be balanced with perceived, but possibly unwarranted, concerns of silver release and potential for systemic toxicity. To deny high-release silver dressings from management of large, burn wounds or children may be unjustified.
(iii) Further studies of silver dressings using more appropriate endpoints, related to bioburden and clinical indicators of infection, must be a priority for future RCTs.
(iv) Clarification of how to choose between different silver dressings, based on these factors, needs to be added to protocols and guidelines for wound management. An improved understanding of the optimal use of silver dressings, for the prevention of infection or re-infection, in wounds would help in the writing of such protocols and guidelines.
(v) Development of reliable diagnostic tests for critical colonisation and infection in wounds.
(vi) An improved understanding of biofilms, again with a simple and low cost diagnostic, and how they should be managed, particularly with regard to debridement.

Assessment of the cost-effectiveness of a healthcare intervention is complicated and needs to consider many factors including resource use, quality of life issues and economic
parameters such as ability to work (25). Ideally, they should be conducted separately from clinical trials (26). However, a number of studies have shown that silver dressings are also associated with factors that may be beneficial in terms of cost-effectiveness, such as: reduced healing times (27,28); shorter hospital stay (15,16); reduction in the frequency of dressing changes (13,14); reduced pain at dressing changes (15); and less methicillin resistant *Staphylococcus aureus* (MRSA) bacteremia related to MRSA-infected wounds (29). Clearly, and to use another well-known aphorism, ‘more research is needed’ particularly regarding cost-effective analyses of silver dressings. Healthcare reimbursement tends to be compartmentalised and costs of clinician time are kept separate from resource costs. In particular, resource and procurement managers may choose to restrict reimbursement to simple low cost dressings, even if a dressing is shown to save money by reducing time to healing, hospital stay or nursing time. Perhaps, they should consider more strongly the potential for wider cost savings by selecting dressings that offer clinical and cost benefits when used as part of an appropriate treatment regimen.

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REFERENCES


