

# An Evaluation of the Zorflex® carbon fibre dressing in managing bacterial load and aiding healing of chronic wounds

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**INTRODUCTION:** Activated carbon cloth has been successfully used as an odour filter in wound care over many years. Recently, in vitro tests, undertaken by UK Health Protection Agency, demonstrated that Zorflex® dressing was both antiviral and virucidal, with virus kill rates of up to 98%. Prompted by the textile's in vitro performance against viruses as evidenced by the UK HPA study, Wound Healing Centres UK decided to undertake an in vivo evaluation to identify if Zorflex® would demonstrate any antibacterial performance in colonised chronic wounds, and promote healing.

**Aim:** To ascertain the antimicrobial and overall performance of Zorflex® Long Fibre Active Carbon cloth with non-healing colonised wounds.

**Method:** 10 Subjects were identified by specialist clinicians as having chronic wounds, highly colonised by microbes, identified by malodour, colour of wound exudate, confirmed by swab results.

Subjects were recruited and treated with a primary dressing of Zorflex® plus secondary standard absorptive dressings (foam or superabsorbent), plus compression when appropriate, for 4 weeks. Swabs of their wounds were taken on days 1, 3 and 7 for microscopy and culture to provide a dynamic projection of bacterial loading; pH levels were also taken at each visit to appraise any correlation with bacterial loading and hydrogen ion levels. Photographs taken at each visit monitored any changes to wound appearance to compare with clinical findings. Each patient was assessed by the same senior clinician at each visit.

**The Product:** The black textile (now known as Zorflex®) has been used for many years in wound dressings, but only for odour reduction and, before this evaluation, never with the aim of reducing bacterial colonisation through the activated carbon.

Conventionally, carbon based dressings are used primarily for odour control and are commonly applied over a primary dressing to filter the odours. Most malodour is caused by the presence of bacteria rather than the wound itself and therefore, if the bacterial load is reduced the associated odour will diminish. Zorflex® is an activated carbon cloth with a microporous structure allowing for greater adsorption kinetics which encourages migration of bacteria from the wound bed on to the dressing where it becomes ensnared by the fibres preventing reintroduction to the wound.

**Project Objectives and Investigations:** Colonised wounds previously deemed as non-healing, had shown signs of healing after Zorflex® activated carbon cloth was applied directly to them. The HPA study in 2009 demonstrated the textile's antimicrobial performance in vitro. Therefore a clinical evaluation was undertaken to establish the basis for any change in healing status in vivo. It was hypothesised that a difference in healing status could be associated with a reduction in bacterial loading, given the wider evidence that bacteria can delay healing.

## Results:

Fig. 1: Bacteria incidence on swabs taken days 1, 3 and 7

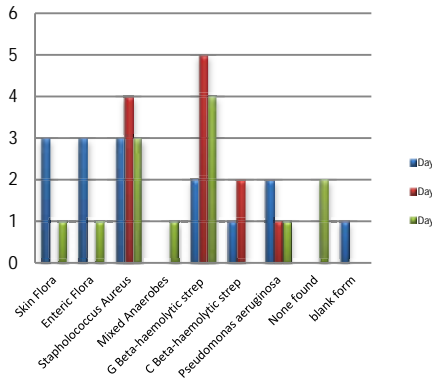


Fig. 2: Exudate level on days 1, 3 and 7

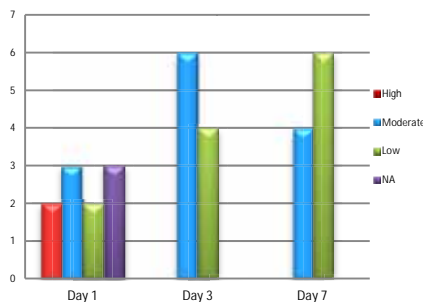
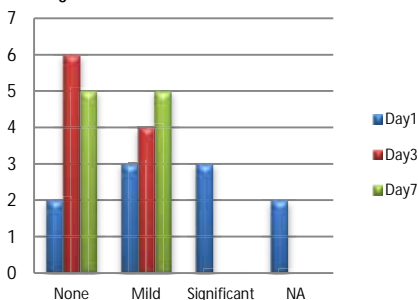


Fig.3: Malodour incidence of the first week



**Conclusion:** In this evaluation, Zorflex® demonstrated a strong ability to lessen and change the bacterial loading and this reduced associated pain, malodour and effectively 'cleaned' the wound bed to allow healing to occur over 7 to 14 days of use. This makes Zorflex® an extremely exciting product that would be a cost effective method of treating colonised and infected wounds, as it would appear to have the ability to change a static wound environment to one which is conducive to healing.

**Case Study 1:** 84 year old with 2 year chronic wound. Painful, malodorous and non healing



Following 14 days treatment with Zorflex®. The wound is clean, healthy and granulating and no longer painful

**Case Study 2:** 36 year old gentleman whose addiction led to terrible leg wounds which had remained unhealing for 18 months. As the wound progress was excellent with Zorflex®, despite the issue of concordance, a decision was made to continue with the treatment. One non attendance meant that Zorflex® was left in situ for 2 weeks. The bandage and secondary dressing were soaked and extremely malodorous but the wound was astoundingly very clean and granulating very well.



Following 14 days treatment with Zorflex®. The wound is clean, healthy and granulating and no longer painful

This evaluation was funded by Chemviron Carbon Cloth Division