

## **The effect of a nanocrystalline silver dressing, Acticoat<sup>TM</sup>, on wound healing in full-thickness excisional wounds in a porcine model.**

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Nanocrystalline silver (NCS) dressings have antimicrobial and anti-inflammatory effects which aid healing, particularly in burns and chronic wounds. However, they are cytotoxic and may delay healing in acute wounds. Therefore, this study aimed to assess the effect of a NCS dressing on wound healing in full-thickness excisional wounds in a porcine model.

Healing of porcine skin was assessed on day 3, 6, 9 and 15 post-wounding. Five wounds dressed with NCS and five untreated wounds dressed with polyurethane film (the control) were assessed per day (n=40 wounds). The rate of healing was measured using digital photographs. The inflammatory response, restoration of the epithelium and blood vessel formation were evaluated using haematoxylin and eosin stained sections. Picrosirius red staining and confocal microscopy were used to assess collagen formation. Proliferation of keratinocytes was calculated using sections immunolabelled for Ki-67. Additionally, the quality of the re-epithelialised wounds was assessed using a Clinical Assessment Score.

There was no difference in the rate of healing between wounds treated with NCS and those dressed with polyurethane film. Inflammation was increased in NCS-treated wounds on day 3 post-wounding. However, compared to controls, on day 15 post-wounding the epithelium of NCS-treated wounds more closely resembled normal epithelium. Additionally, a greater number of mature blood vessels were seen in NCS-treated wounds. Differences were also observed in the deposition of collagen in NCS-treated wounds compared to controls.

These results suggest that NCS may be beneficial for scar formation. Further investigation is needed into the effect of NCS and its role in the treatment of wounds, including novel uses such as the prevention of scarring.