The compatibility of INTRASITE® Gel and ACTICOAT®: An *In-Vivo* and *In-Vitro* assessment
An *In-Vivo* and *In-Vitro* assessment of the compatibility of ACTICOAT and ACTICOAT 7 with INTRASITE Gel dressings in the management of chronic wounds

Introduction

ACTICOAT and ACTICOAT 7(with SILCRYST™ Nanocrystals) are effective antimicrobial barrier dressings which are indicated for use on partial and full thickness wounds such as pressure ulcers, venous ulcers, diabetic ulcers, burns, donor and recipient graft sites. *In-Vitro* data has demonstrated that the nanocrystalline coating of silver rapidly kills a broad spectrum of bacteria in as little as 30 minutes.

ACTICOAT must be kept moist to be effective. When exposed to moisture it can maintain bactericidal activity for at least 3 days. With ACTICOAT 7 bactericidal activity can be maintained for up to 7 days. This bactericidal activity will help to prevent and reduce infection of wounds.

Keeping ACTICOAT and ACTICOAT 7 dressings moist, may require re-wetting of the dressing with sterile water. However, some clinicians are using INTRASITE Gel together with ACTICOAT and ACTICOAT 7 in order to keep the dressings, and the wound moist for longer periods of time.

Case studies have been undertaken to show the effectiveness of this combination in the treatment of chronic wounds. To support these an *In-Vitro* test has also been carried out to investigate the compatibility of the two dressings.
The use of ACTICOAT on a severe trauma wound in a paediatric patient

This case study demonstrates the use of ACTICOAT in combination with reconstructive surgery and tissue replacement in a paediatric patient with severe trauma.

The patient was a 3 and a half year old boy with a trauma wound as a result of a traffic accident. Originally, the patient suffered an open femur fracture to the left leg with injury to the femoral artery, femoral vein and sciatic nerve.

After reconstruction of the sciatic nerve and blood vessels, the patient presented with a blood clot of the femoral artery and tissue destruction of the muscles of the thigh, lower leg and the front of the foot (Figures 1, 2 & 3).

Treatment

ACTICOAT was applied along with INTRASITE™ Conformable for 8 days to avoid desiccation and infection of the bone (Figures 4 & 5). Integra™ was applied (Figure 6) and covered with ACTICOAT to prevent infection.

After 5 months of treatment (Figures 7 & 8), despite sciatic paralysis, the patient could walk without assistance.
Background
The patient was a 67 year-old female with a small ulcer on the top of her right foot, which had been present for approximately 6 months.

On examination on 19th December 2001, the ulcer measured 2.0cm x 1.5cm x 0.4cm, with slough present in the ulcer bed. The skin surrounding the ulcer, measuring approximately 16cm x 10cm was reddened. Considerable pain was experienced by the patient. The cause of the ulcer was classified as a combination of arterial and venous disease, complicated by an allergic reaction around the ulcer.

Treatment
The ulcer was first debrided under local anaesthetic. Following debridement the ulcer site was treated with INTRASITE Gel and ACTICOAT 7, whilst the allergic reaction was treated with hydrocortisone 1% ointment. The dressing was removed, and the ulcer assessed once a week.

The Outcome
On examination of the ulcer on 19th January 2002, granulation tissue was present in the wound bed, and the ulcer had reduced in size to 1.0cm x 0.8cm x 0.1cm (see fig. 2). The reddening of the skin surrounding the ulcer had improved considerably, and the patient experienced less pain.

A further examination on the 25th February 2002 showed that the ulcer had further reduced in size, and now measured 0.3cm x 0.3cm with granulation tissue reaching the edges of the ulcer (see fig. 3). The reddened skin surrounding the ulcer had shown further improvement, and the patient no longer was experiencing any pain.

At this point, the treatment with ACTICOAT 7 was stopped, and local therapy continued using hydrocolloid dressings. At a final examination on 16th April 2002 the ulcer had healed completely with just a scar and signs of hyper-pigmentation present.

An ulcer which earlier had not shown any signs of progression, despite various treatment therapies, progressed well, and without complications when ACTICOAT 7 (in conjunction with INTRASTE Gel) was used. This treatment regime provided a high degree of patient comfort.
The use of ACTICOAT 7 and INTRASITE Gel on a patient’s trauma wound with venous insufficiency

Background
This case study is about an 81 year old lady who fell in her home in March 2002 and suffered a large wound in the area medial to the kneecap. She had previously been a patient at the Outpatient Wound Clinic due to a large ulcer on her right leg. This had been treated with, among other things, skin grafting and treatment was completed on 5 March 2002. The patient was known to have venous insufficiency.

Wound evaluation
The patient came to the Outpatient Wound Clinic on the 15 April 2002 (Figure 1). Examination showed a large necrotic wound medial to the patella with the dimensions 8.0 x 3.5 x 1.5 cm. The ulcer did not probe to bone. There were evident signs of infection. There was no doubt that the wound was in the inflammation stage. The patient was admitted to the hospital.

Treatment
Debridement was performed surgically, and a 10-day course of systemic antibiotic therapy was started. This was done to prevent the infection spreading into the joint.

ACTICOAT 7 moistened with sterile water was used in combination with INTRASITE* Gel as local therapy. The wound was assessed every other day while the patient was in the hospital, just by lifting up the ACTICOAT 7 dressing. This allowed us full control of the wound.

The patient was sent home after one week at the hospital on 22 April 2002 (Figure 2). The wound was now granulating. The treatment continued at the Outpatient Wound Clinic where a new ACTICOAT 7 dressing was applied once a week. The patient reported the dressing as being very comfortable and allowed her to continue her daily activities as normal.

Examination on 27 May 2002 (Figure 3) showed an ulcer reduced from 8.0 x 3.5 x 1.5 cm to 4.0 x 2.2 cm. Granulation tissue was present on the wound bed and there were no signs of infection. The ulcer margins showed signs of re-epithelialisation. Skin grafting proved to be unnecessary. Use of ACTICOAT 7 was stopped, and the ulcer was treated locally with ALLEVYN*.

Conclusion
This case study shows the successful use of ACTICOAT 7 on a patient with venous insufficiency and an infected traumatic wound.
**In-Vitro assessment of the compatibility of ACTICOAT and INTRASITE Gel dressings**

**Introduction**
To support the use of ACTICOAT in conjunction with INTRASITE Gel an *in-vitro* test has been undertaken to investigate the compatibility of the two dressings.

**In-Vitro Test Method**
Eight samples of ACTICOAT dressing were coated with INTRASITE Gel. INTRASITE Gel was applied at 2mm/cm² (equivalent to 20g over a 10x10cm dressing). Samples were aged at 32°C for up to seven days sealed in light/moisture impregnable foil pouches. After 0, 1, 2 and 7 days, duplicate samples were removed from storage. Samples coated with INTRASITE were scraped and the gel rheology determined. The standard specification oscillation and flow tests were performed in attempts to determine whether the INTRASITE was being adversely affected by anything that the ACTICOAT was excreting or absorbing. In addition, a creep test was performed, measuring the displacement that the sample made under a suitable low load. Also, a more complex oscillation test was used to try and determine the limit of elasticity when oscillated at “zero” frequency.

All tests were performed on TA AR 500 Rheometer with temperature 25°C/ Parallel plate with a 2mm (2000µm) gap.

**In-Vitro Results**
The INTRASITE Gel that was removed from ACTICOAT dressings during the test did become discoloured as it absorbed silver, however this discolouration diminished over time taking on a brownish yellow colour after 7 days. The subjective texture and appearance of the INTRASITE Gel after removal from the ACTICOAT dressings did not feel different from between the fingers of the operator.

The rheological data showed that over the course of the test, the INTRASITE Gel did show a slight increase in viscosity and elasticity (see fig 1), but this was not evident subjectively.

*Figure 1 Elasticity of Intrasite gel after contact with Acticoat dressings for up to 7 days. Elasticity (G') and Dynamic Viscosity (η) @ 5Hz/50 Pa*
There is little noticeable rheological effect on the INTRASITE Gel from being in contact with ACTICOAT for a one day, two day, or seven day period. Over the 7 day period of this experiment, the INTRASITE Gel is subjectively the same to the touch, although rheological data shows it to be slightly thicker and stiffer. The results of this test suggest that ACTICOAT and INTRASITE Gel are compatible for use together.

Conclusions
Clinicians do use ACTICOAT and ACTICOAT 7 in conjunction with INTRASITE Gel in the treatment of chronic wounds, and this is supported by both In-Vitro and In-Vivo data. An In-Vitro test suggests that although discolouration of the gel is observed the two dressings are compatible for use together, and case study results provide evidence that when used together, ACTICOAT and ACTICOAT 7 with INTRASITE Gel can provide an effective treatment regime for chronic wounds that may be susceptible to infection.