



## **REPORT ON AIR NOTE**

This report is on one case study and 2 small evaluation. The aim is to determine the claim that the product reduces the malodour from the wound.

### **Introduction to the writer of the report**

- 1 I am Sylvie Hampton and I have been involved with wound care for almost 30 years, first as Research and Tissue Viability Nurse Specialist, in Eastbourne DGH and then commenced an independent tissue viability company (in 1999) with the long-term vision of opening a centre of excellence in wound care, (these aims were achieved). This centre was acquired by the American company, Healogics. From then, I have worked as an independent Tissue Viability Nurse Consultant across the UK.
- 2 Written over 400 articles and posters for wound care written two books and many book chapters on wound care. I speak at national and international conferences and study days and organised national tissue viability conferences. Lectured at the Arab World Health Conference in Dubai in January 2016. Invited to speak in Prague, Japan, Australia, Stockholm and Paris and invited to lecture throughout the UK at conferences and at universities.
- 3 I act as Expert Witness for the Courts, Coroners, NMC, CPS and for Trusts having written in excess of 250 reports and have set up services in tissue viability in Hospital Trusts such as Newham Hospital, and PCTs. I also teach and undertake competency assessments for hospital Trusts and PCTs.

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**Company No. 09217829** Mobile: 07909520401.

Cherrytrees. 74 Battle Road. Hailsham. BN27 1DY

Website: [www.woundcareconsultants.co.uk](http://www.woundcareconsultants.co.uk) [woundconsultants9@gmail.com](mailto:woundconsultants9@gmail.com)

- 4 Now acting as an independent Tissue Viability Consultant Nurse and running two GP clinics (privately – funded by research) and, as such, I undertake research in tissue viability, reviewing the use and application of products.
- 5 I have worked with the Department of Health, reviewing Any Qualified Provider (AQP) and producing protocols for them in leg ulceration prevention and treatment.
- 6 I also act as Consultant for the Lindsay Leg Club Foundation, producing documents, reports and educating the nursing staff, as Consultant for Marie Curie Hospices, setting up their tissue Viability Service in Palliative Care, for London Irish Rugby Club and have worked for CQC as inspector of nursing homes. I am DBS checked and my CV is at the end of this report.

### **Understanding infection and relationship of malodour**

- i. It is important to this report to understand clinical infection, colonisation and how this creates the problem of malodour.
- ii. Historically, it was thought beneficial if pus was found in patients wounds and clinical infection was unknown or not considered. Gaalen's, theory of 'laudable pus', and the practice of transferring pus from one patient's unclean wound to another patient's clean wound, survived in the folklore of wound management for many centuries (Bidding, 1986). However, it is now known that pus is not a desired part of wound healing, and it is also widely accepted that the presence of pus is not necessarily an indication that the wound is clinically infected (Griffiths-Jones 1993) but may simply be colonised or contaminated. To enable understanding of the difference between clinical infection and colonisation, a clear definition is required, and this can be found in the glossary definition of terms.
- iii. All chronic wounds contain bacteria and carry a very high risk of clinical infection. The bacteria produce toxins which can poison organs in the body, and these can, and often do, lead to death.
- iv. There is a difference between a wound that is colonised with bacteria and a wound that is clinically infected. All individuals are covered by a range of bacteria, known as normal body flora, which generally live quite harmlessly in various body sites

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without causing any active disease or ill health and actually offer protection from more harmful or pathogenic organisms (Wilson, 2001).

- v. There are more bacteria on the human body than there are people on earth, and they see an open wound as a 'swimming pool' and will, of course, inhabit the wound.
- vi. Wound colonisation is defined as the presence of multiplying bacteria on the surface of a wound, but with no immune response from the host (Ayton, 1985) and with no associated clinical signs and symptoms. This is a normal state and is not associated with active disease, ill health or delayed wound healing and does not require antibiotics. A wound that has become 'chronic' is prepared for bacterial invasion due to a natural reduction in the inflammatory process and the warm, moist, protein rich environment provided through wound exudate. Therefore, contamination or colonisation, particularly through skin flora, is an almost certain consequence. Nevertheless, the organisms will often live within wound exudate and not clinically infect the host tissues.
- vii. Clinical infection, however, is the presence of pathogenic bacteria which overwhelm the body's immune system resulting in spreading cellulitis (inflammation or redness of the tissues) (Kingsley, 2001). Any wound infection results in active disease, increasing pain and feeling of illness. Clinical infection will delay the wound healing process and is determined by clinical diagnosis. Antibiotics are required.
- viii. There is an increased risk of infection in those who have compromised immune systems, undergone surgery, or suffered an injury. People with diabetes mellitus, blood vessel disease, cancer, and tumours are also more prone to bacterial infections.
- ix. There are many different types of bacteria. Important to this report is the difference between anaerobic bacteria and aerobic bacteria. An anaerobic organism or anaerobe is any organism which cannot successfully grow in the presence of oxygen which is toxic to them. The most appropriate site for their growth is in dead tissue where there is a lack of oxygen. That is the problem in

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this case. The gentleman had a wound covered in necrotic (dead) tissue which would be expected to contain anaerobic bacteria. It is their natural environment.

- x. The malodour is caused by Putrescine and Cadaverin which are two chemicals that are a bacterial breakdown of amino acids. These names sound like a joke until the odour associated with chronic necrotic wounds as this is associated with decaying flesh or meat. (<https://www.acsh.org/news/2018/01/06/putrescine-and-cadaverine-two-chemicals-earned-their-names-12368> ). The odour is so powerful it would never be forgotten.
- xi. Therefore, anyone with necrotic tissue in their wound can expect to have a foul odour associated with the wound and managing these wounds with such a powerful odour can be problematic for both patients and clinicians.
- xii. The gentleman in this case study has Pyoderma Gangrenosum (PG) which is thought to be caused by an overactive immune system and is an inflammatory neutrophilic disease, often associated with autoimmunity, and with chronic inflammatory and neoplastic diseases. The wound will always contain the necrotic tissue and that is associated with the intense odour.

### The case

- i. Mr B is a 38-year-old gentleman who knocked his leg and developed a small wound which became PG (see fig 1). This is a wound that is very typical of PG. Full of necrotic tissue, inflammation showing clearly around the wound margins, circular in shape and a dark line around the wound margins.
- ii. Pyer means fire and Pyo is pus. Derma is skin. PG is associated with pus and with extreme pain which is often described as if the wound is being burned and so it is a distressing condition.
- iii. Added to this distress is the extreme malodour that is associated with the cadaverine, putrescine and the anaerobic (oxygen-phobic) bacteria, which also give off an unpleasant odour.



Figure 1

- iv. Having to live with this wound is terrible. It is an autoimmune disease that is very difficult to diagnose but simple to treat with immunosuppressants. The condition is mainly identified through experienced practitioners as there is no test available. Therefore, Mr B is finding it a minefield trying to be given the appropriate treatment because many nurses and doctors do not recognise this condition.
- v. Mr B's wound duration is over six months and it is worsening by the day. Mr B would find it difficult working or traveling on a bus because of the embarrassment that the odour would cause.
- vi. In order to deal with one this part of his care, **AIR NOTE** (ProQure UK) was used in order to deal with the odour.
- vii. A supply was provided for Mr G who found that it definitely dealt with the odour.
- viii. The other concern was removing the necrotic tissue. Everything was tried over several months. Debridement pads. Gel dressings. Cleansing etc. Nothing helped and the wound worsened.
- ix. Eventually larvae (sterile maggots) were used to clean the wound along with hospitalisation and intravenous antibiotics. Maggots are excellent for removing necrotic tissue.
- x. The outcome was positive but, although the wound was cleaned and now showed signs of healing (fig 2), there was still malodour and so **AIR NOTE** continues to support Mr B.



## AIR NOTE

- xi. This is a patch that is attached to the outside of the dressing and is effective against unpleasant odours for at least 6 hours.
- xii. For those patients who have malodorous wounds, (any wound with bacteria will be odorous), and any patient with stomas etc will welcome this product into their daily life.
- xiii. One professional group who wished to obtain the **AIR NOTE** for their patient stated: "*We trialled the patches with one of our incontinence customers who went out for dinner with her partner this weekend for the first time in months. She felt much more confident as there was no scent and she wasn't concerned anyone would notice. She is looking forward to many more trips out without any worries!*"
- xiv. This is a product that is very needed. Until now, the only way of reducing the odour was to use activated carbon dressings. The molecules (described above) that are responsible for the production of the odour are attracted to the surface of the carbon and are held there (adsorbed) by electrical forces. However, this is not always successful and poorly used.
- xv. AIR NOTE will revolutionise the lives of those patients who commonly suffer isolation because of their odorous wounds. It is a progressive and modern answer to a very old problem.



This case study was undertaken independently and was not funded.

Sylvie Hampton  
Tissue Viability Nurse Consultant.  
Director of Wound Care Consultants Ltd.