Institution: The University of Huddersfield

Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy

Title of case study: Influencing policy and practice in the field of surgical site infections and wound care

1. Summary of the impact

Research by the University of Huddersfield has helped shape policy and practice in the field of surgical site infection (SSI) and wound management. It has contributed to best practice guidance and helped to raise practitioner, industry and public awareness of the importance of effective clinical interventions in infection prevention, tissue viability and wound care. These efforts, recognised by numerous awards, have been supported by significant industry engagement and the successful development and use of on-line tools to share best practice, promote evidence-based care and highlight the value of an inter-disciplinary approach to the problem of SSI.

2. Underpinning research

Surgical site infection (SSI) is a major healthcare concern. Over 5% of patients undergoing surgery acquire an SSI, with the deaths of around three quarters of these directly attributable to the infection. SSI accounts for an estimated 15% to 20% of all healthcare-associated infections (HAI) (NICE, 2008; HPA, 2010), leading to increased morbidity and mortality, additional costs and longer stays in hospital. The Patient Association (2010) has estimated the cost of treating HAIs in hospital at approximately £1bn and the cost of treating pressure ulcers at £1.4bn.

Studies by the University of Huddersfield have sought to help address these concerns by promoting effective clinical care in tissue viability and wound care. Much of this work has focused on how wound complication rates, post-operative surgical blisters and the healing and infection of chronic wounds (exacerbated by extended healing times in immunosuppressed patients, such as those with spinal metastases) are affected by wound dressing choice. Recent research has come under the unifying umbrella of the Skin Interface Sciences (SIS) group, established in 2011 as a university-wide unit including academics from the Schools of Applied Sciences, Human and Health Sciences and Computing and Engineering.

Dr Karen Ousey (Reader in Advancing Clinical Practice, 2005-present) has led much of Huddersfield's work in this field. In 2011 she carried out a full systematic review of the use of negative pressure wound therapy (NPWT) in the treatment of spinal wounds, for which SSI incidence can reach up to 20%. Finding that no retrospective study reported the use of NPWT as a preventative measure, Ousey argued for larger randomised controlled trials to further assess the method's effectiveness in treating complications and to establish its prophylactic efficacy [1]. She concluded that, despite growing evidence to suggest NPWT might help reduce healing times, there remained a paucity of evidence regarding its impact – whether positive or neutral – on patients' quality of life [2].

With colleagues Dr Warren Gillibrand (Senior Lecturer, Division of Podiatry, 2008-present) and Dr John Stephenson (Senior Lecturer/Statistician, 2010-present), Ousey subsequently conducted an on-line survey of international experts producing best practice guidance for the prevention of surgical wound blistering. Based on contributions from (among others) respondents in Scandinavia, India, Australia and the US, the consensus emerged that an ideal wound dressing should easily conform to the wound, allow for swelling, have simple application and removal, thus minimising pain [3].

Following her arrival at Huddersfield in 2010, Professor Barbara Conway (Professor of Pharmaceutics, 2010-present) built on earlier research by investigating the factors controlling the release and effectiveness of chlorhexidine gluconate (CHG) from a drug-impregnated intravascular catheter site gel dressing with collaborators at University Hospital Birmingham and Aston University. Antiseptics often exhibit restricted penetration into the skin, limiting their efficacy against microorganisms when the protective skin barrier is breached during surgery, and can also

contaminate invasive medical devices such as catheters. CHG is among the antiseptics most commonly used prior to invasive procedures. The study revealed CHG gel dressing could maintain detectable antimicrobial activity for up to seven days, potentially suppressing bacterial growth [4].

SIS has also explored the use of on-line tools to meet the learning needs of mentors in clinical healthcare practice. In 2010 research by Ousey demonstrated how such a package, evaluated by almost 1,500 respondents, encouraged engagement, saved time and promoted a multidisciplinary approach by providing educational updates with regard to practice [5].

3. References to the underpinning research

1. Ousey, K, Atkinson, RA, Williamson, JB, and Lui, S (2013): Negative pressure wound therapy (NPWT) for spinal wounds: a systematic review, *The Spine Journal*. 10.1016/j.spinee.2013.06.040

2. Ousey, K, Cook, L, and Milne, J (2012): Negative pressure wound therapy – does it affect quality of life? *Wounds UK* 8(4), 18-28. http://eprints.hud.ac.uk/16122/

3. Ousey, K, Gillibrand, WP, and Stephenson, J (2013): Achieving International Consensus for the Prevention of Orthopaedic Wound Blistering: Results of a Delphi Survey, *International Wound Journal*, 10(2), 177-184. http://eprints.hud.ac.uk/13126/

4. Karpanen, TJ, Casey, A, Conway, BR, Lambert, PA, and Elliott, TSJ (2011): The Antimicrobial Efficacy of a Chlorhexidine Intravascular Catheter Site Gel Dressing, *Journal of Antimicrobial Chemotherapy*, 66(8), 1777-1784. http://eprints.hud.ac.uk/8847/

5. White, S, and Ousey, K (2011); Effectively using an on-line multidisciplinary tool to update healthcare mentors: a comparative evaluative study, *International Journal On Advances in Life Sciences*, 3 (3/4), 39-46. http://eprints.hud.ac.uk/15855/

Grants awarded:
A pilot study exploring quality of life experienced by patients undergoing negative pressure wound therapy as part of their wound care treatment. Principal Investigator Dr Karen Ousey, Co-Investigators: Dr Warren Gillibrand, Leanne Cook, Jeanette Milne. Funders: Smith and Nephew Health Care; funding received: £15,000; dates of project: May 2011 - September 2012

Benchmarks for effective wound dressing choices to prevent blistering and infection: an international Delphi study. Principal Investigator Dr Karen Ousey, Co-Investigators: Dr Warren Gillibrand, Dr John Stephenson. Funders: Mölnlycke Health care; funding received: £15,000; dates of project: November 2010 - May 2011

Awards:
Assessing Key Risk Factors for Wound Healing in Patients Undergoing Surgery for Spinal Metastases. Principal Investigator Mr Ross Atkinson, Co-Investigators: Dr Karen Ousey, Linda Upton, Mr Brad Williamson. URGO Foundation £19,000 (November 2011).

4. Details of the impact

University of Huddersfield research has shown that prevention and management of SSI and chronic wounds in clinical practice is variable and could have detrimental outcomes for patients. As such, it has helped shape policy and practice in areas including planning interventions, quality of life and well-being – which are vital if patients are to receive evidence-based, cost-effective treatment in both the primary and secondary healthcare sectors.

The research has made a significant contribution to a series of influential Best Practice Statements, all of which either cite SIS's work or benefited from expert review by members of the team.

The first, *The Use of Topical Antiseptic/Antimicrobial Agents in Wound Management*, was originally

published in 2010, with a second edition following in 2011 [a]. It is intended to "support the appropriate use of topical antiseptic/antimicrobial agents and... clinical decision-making that ensures their prescription only when clinically indicated" and to "give guidance to clinicians who have to make daily judgments which impact on the quality of care patients receive". It has had more than 2,500 individual downloads and has been used as evidence to support NHS Trust formulary development and the use of appropriate dressings for the management of wound infection. Ousey served as a member of the peer-review panel.

The second statement, *Care of the Older Person's Skin*, was produced to "provide relevant and useful information to guide those active in the clinical area who are responsible for the management of skin care in an ageing patient population" [b]. Its second edition (2012) cites research by Ousey, who also served as a member of the peer-review panel.

The third statement, *Effective Exudate Management*, was published in June 2013 to "provide relevant and useful information to guide those managing highly exuding wounds" [c]. Ousey was again involved in the peer-review process, which cites her work on negative pressure wound therapy.

Within Mölnlycke Healthcare, results and conclusions from (3) have been used to educate employees and provide evidence for the use of Safetech dressings, citing clinical advantages over alternative products that may be used inappropriately due to lack of education or perceived cost implications [d].

With increasing high-level clinical evidence of the benefits of CHG in antisepsis and prevention of catheter and exit -line site infections, the significance of Conway's work has provided "important details on the applicability and dynamic mode of action of chlorhexidine on human skin" and helped clinicians understand the outcomes of clinical trials in this challenging area [e].

SIS's work has further contributed to best practice through Challenges in Wound Care (CIWC), http://challengesinwoundcare.hud.ac.uk, an e-learning resource drawing on various elements of the group's SSI-related research and building on the success of the team's multidisciplinary on-line healthcare update tool. Originally launched in 2008 and subsequently revised throughout the impact period, CIWC has been released in various formats, ensuring compatibility with the NHS's VLE. Using a problem-based structure to address questions surrounding the assessment, diagnosis and management of various wound care scenarios, it promotes the importance of working in a multidisciplinary team to achieve optimum outcomes for patients. Users during the impact period included 350 clinical practitioners employed by Yorkshire and Humber Strategic Health Authority, which adopted CIWC as best practice, making it available via its own e-learning platform, and more than 120 members of clinical staff at Kent Strategic Health Authority. Feedback specifically emphasised its suitability and ease of use by current wound care practitioners [f].

SIS has communicated its research to a wide range of stakeholders through the successful development of strong collaborative links with the health service sector. In September 2012 it hosted an event to showcase its expertise for an industry audience, leading to Ousey's appointment as a national advisory panel member for 3M and Coloplast [g]. The industry has further acknowledged the value of SIS's studies through a number of awards [h]. Ousey's research into reducing the risk of SSI in cancer patients after spinal surgery won first prize in the Hard-to-Heal Wounds category of the 2012 Wounds UK Awards [i], and she was also highly commended in the Patient Experience category of the 2013 Journal of Wound Care Awards.

Members of the public have also benefited from the research team's expertise, with SIS promoting healthy living and well-being by holding two "Leg Awareness" days at the University. These events took the form of drop-in sessions providing diagnosis of potential tissue viability problems, such as peripheral vascular disease, lymphoedema and oedema. Attendees were offered compression hosiery, physiotherapy, advice and reassurance as appropriate, with referrals to GPs or podiatry services for further investigation and/or treatment also made as necessary. The first event, held in 2011, attracted 54 people, while the second, staged in 2012, attracted 37. All attendees were

asked to complete a questionnaire, and 100% of those who responded said they were satisfied with their visit [j].

5. Sources to corroborate the impact

a. *Best Practice Statement: The Use of Topical Antiseptic/Antimicrobial Agents in Wound Management*, Wounds UK, 2011 (see page 2)
http://www.wounds-uk.com/pdf/content_9969.pdf

b. *Best Practice Statement: Care of the Older Person's Skin*, Wounds UK, 2012 (see pages 2, 16 and 24)
http://www.wounds-uk.com/pdf/content_10649.pdf

c. *Best Practice Statement: Effective Exudate Management*, Wounds UK, June 2013 (see page 2, 6, 19 and 23)
http://www.wounds-uk.com/pdf/content_10816.pdf

d. Global Medical Marketing Director, Mölnlycke Healthcare

e. Consultant in Clinical Microbiology, Vienna

f. Managing Director, Healthcare Solutions

g. Partnership Development Manager (formerly of Coloplast, current Urgo Medical)

h. Clinical Strategy Director and Member of Foundation Urgo award board

i. Wounds UK 2012 Awards
http://www.hud.ac.uk/research/researchcentres/sis/news/uniteamimprovequalityoflifeforcancerpatients.php

j. "Leg Awareness Day" feedback

Outcome	Frequency of response
Compression hosiery	6
Referral to GP	8
Physiotherapy	1
University podiatry clinic referral	11
Advice	17
Reassurance	20