

Institution: Cardiff University
Unit of Assessment: UoA3
Title of case study: Wound care management and disease-specific quality of life measures
<p>1. Summary of the impact (indicative maximum 100 words).</p> <p>The work of Cardiff University's Wound Healing Research Unit revealed a need for, and led the development of, a disease-specific Health-related Quality of Life (QoL) instrument; the Cardiff Wound Impact Schedule (CWIS). CWIS is able to quantify in a psychometrically sound manner the impact of chronic non-healing wounds upon a patient's QoL. The tool, a first of its type, is accurate and sensitive to changes in the healing status of chronic wounds, particularly those of the lower limb. CWIS has been adopted internationally advantaging QoL assessments in both commercial and practice settings to yield economic and practice impacts as well as direct patient benefits.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>Patients have different experiences of coping with a chronic non-healing wound; for example, constant pain, frequent infections and restricted mobility. These are key determinants of a patient's health-related Quality of Life (QoL), which is an essential outcome measure when assessing the benefits arising from a clinical intervention.</p> <p>The Wound Healing Research Unit in Cardiff University is an internationally renowned clinical research facility managing an extensive commercial and practice research portfolio with Professor Keith Harding (Professor and Head of Wound Healing Research Unit 1991- present) and Professor Patricia Price (Senior Lecturer 1996-2003, Professor and co-Director Wound Healing Research Unit 2002-2006) both having leadership roles. Professor Price remains a research investigator in the Unit with additional Cardiff University appointments as Head of Health Care Studies 2003-13 and Pro-Vice Chancellor 2013-present). The work of the Unit revealed a lack of suitable tools to accurately and reliably measure QoL in patients suffering from chronic wounds of the lower limb, e.g. diabetic foot or leg ulcers. No research had validated any systematic method to document and guide clinicians on the extent to which the symptoms of a chronic wound specifically affected a patient's QoL; it was felt that QoL would be too difficult to measure due to multivariable factors, e.g. typically older patients suffering multiple pathologies.</p> <p>Designing the QoL instrument</p> <p>In 2002 Price (Cardiff University) began a research project to develop a condition-specific clinical research instrument (a decision-tree questionnaire) that captured patient-reported health-related QoL outcomes. The first phase involved a series of focus group investigations (semi-structured patient and clinician interviews) to identify suitable items for the instrument, later called the Cardiff Wound Impact Schedule (CWIS). This led to the development of a 28-item patient-reporting QoL questionnaire^[3.1]. Unlike other standard QoL questionnaires, CWIS uses a weighting mechanism letting patients indicate how much a particular symptom impacts their lives; patients apply their own weighting to each item to indicate the level of associated stress.</p> <p>Condition specificity and validation in clinical research settings</p> <p>A pilot clinical study in 2003 (124 patients) showed CWIS to be psychometrically robust and identified three domains of patient priority: physical symptoms and daily living; social life; well-being^[3.1]. A three-month follow-up study in a separate group of 135 patients demonstrated CWIS was a reliable and valid measure of QoL in patients with chronic non-healing wounds^[3.1]. It was able to differentiate accurately QoL issues associated with wound healing from other co-morbidities and chronic conditions^[3.2].</p> <p>The utility of CWIS was further assessed in several clinical settings: For example, Price and Harding worked (2003-08) with diabetes specialist Jeffcoate (Nottingham) on an NIHR-funded multicentre (nine centre) randomised clinical trial in diabetic patients suffering chronic ulceration of the foot. The Cardiff team devised the study, and collected and analysed the entire data set. The results confirmed the utility of CWIS in measuring improvements in QoL arising from the effectiveness of clinically established dressings^[3.2]. Supported by 3M (2007) the Cardiff team led a UK multicentre (10 centre) randomised controlled crossover clinical trial using CWIS to evaluate the improvement in QoL for patients with non-healing venous leg ulcers treated with new advanced multi-layer compression dressings^[3.3]. While the study results revealed that the actual wound</p>

healing can be marginal between various dressings, CWIS was able to identify distinct patient reported QoL benefits associated with certain products.

Preparing for international adoption

Recognising the international demand for adoption of CWIS, Price collaborated (2004-2005) with wound healing researchers in Germany and France to translate the CWIS instrument into other European languages as well as adapt the instrument for the USA. This research involved “forward and backward” translation approaches and investigations on the linguistic and cultural validation of the tool ^[3.4]. A systematic review (Price as co-author) objectively substantiated CWIS as a valid wound-specific tool in assessing patient-reported QoL outcome measures ^[3.5].

3. References to the research (indicative maximum of six references)

[3.1] Price, P. and Harding, K. Cardiff Wound Impact Schedule: the development of a condition specific questionnaire to assess health-related quality of life in patients with chronic wounds of the lower limb. *Int. Wound J.* (2004) 1: 10-17. <http://dx.doi.org/10.1111/j.1742-481x.2004.00007.x>

[3.2] Jeffcoate, W.J., Price, P.E., Phillips, C.J., Game, F.L., Mudge, E., Davies, S, Amery, C.M., Edmonds, M.E., Gibby, O.M., Johnson, A.B., Jones, G.R., Masson, E., Patmore, J.E., Price, D., Rayman, G. and Harding, K.G. Randomised controlled trial of the use of three dressing preparations in the management of chronic ulceration of the foot in diabetes. *Health Technology Assessment* (2009) 13: 54. <http://www.hta.ac.uk/project/1357.asp>

[3.3] Moffat, C., Edwards, L., Collier, M., Treadwell, T., Miller, M., Shafer, L., Sibbald, G., Brassard, A., McIntosh, A., Reyzelman, A., Price, P., Merkel Kraus, S., Walters, S. and Harding, K. A randomised controlled 8-week crossover clinical evaluation of the 3MTM Coban™ 2 Layer Compression System versus Profore™ to evaluate the product performance in patients with venous leg ulcers. *Int. Wound J.* (2008) 5: 267–279. <http://dx.doi.org/10.1111/j.1742-481X.2008.00487.x>

[3.4] Acquadro, C., Price, P. and Wollina, U. Linguistic validation of the Cardiff Wound Impact Schedule into French, German and US English. *J. Wound Care* (2005) 14: 14-17. <http://www.ncbi.nlm.nih.gov/pubmed/15656458>

[3.5] Hogg, F.R.A., Peach, G., Price, P., Thompson, M.M. and Hinchliffe, R.J. Measures of health-related quality of life in diabetes-related foot disease: a systematic review. *Diabetologica* (2012) 55: 552-565. <http://dx.doi.org/10.1007/s00125-011-2372-5>

Between 2003-13 the Cardiff University Wound Healing Research Unit has attracted over £5 million in research grants. For example: Jeffcoate, **Price**, Phillips, Game, **Mudge**, Davies, Amery, Edmonds, Gibby, Johnson, Jones, Masson, Patmore, Price, Rayman, **Harding**. *Randomised controlled multicentre trial of the use of three dressing preparations in the management of chronic ulceration of the foot in diabetes*. 2003-2005. Department of Health HTA programme. £678K.

4. Details of the impact (indicative maximum 750 words)

Cardiff research to develop CWIS is delivering impacts on an international scale in commercial and practice settings leading to economic and direct patient benefits.

QoL improvements in patients with chronic wounds of the lower limb

Approximately 2.6 million people have diabetes in the UK with up to 5% (ca. 150,000) suffering a chronic lower limb ulceration requiring lengthy treatment with dressings that need to be kept dry. Other patient populations also suffer leg ulcers facing similar demands of dressing care. Many such patients accidentally wet their dressings whilst bathing which, if left unchanged, risks infection to the wound. These wounds can take months or years to heal and the impact upon patient QoL is a very real concern ^[5.1].

Prior to the current assessment period Price (2005) used CWIS in a multicentre study (90 UK centres, 2300 patients) commissioned by the Prescription Pricing Authority to assess the disease-specific QoL of patients living with chronic wounds and specifically the benefits of a waterproof wound care dressing protector (Seal-Tight®). The Cardiff team quantified improvements in QoL for those patients using Seal-Tight® and its evidence was submitted as part of a successful Drug Tariff application (2005) for what became the first ever product to be accepted for NHS prescription based on formal QoL measures ^[5.2,5.3]. The distinct QoL research from Cardiff underpinned later

dissemination to practitioners and patient groups on the benefits of Seal-Tight[®] culminating in a transformation in the scale of product use in the assessment period ^[5.1,5.2]. Specifically, between 2005 and 2007 inclusive ca. 50,000 Seal-Tight[®] units were prescribed (17,000 p.a.). The period 2008-2013 has seen year-on-year increases in prescriptions with over 200,000 units prescribed during this period (equating to 38,000 units p.a.)^[5.2]. As each individual generally requires only a single unit throughout the course of their wound healing the above data reflects interventions to a corresponding number of patients ^[5.1]. Reflecting its very real QoL benefits Seal-Tight[®] won the 2010 Nursing Times Product Gold Award.

Independent analysis has highlighted the economic savings that can be realised from keeping wound dressings dry. For example, up to a quarter of the working week for district nurses caring for patients with chronic non-healing wounds is taken up changing dressings that have become accidentally wet (ca. 500,000 every month) at an estimated NHS cost of £22 million per month ^[5.3].

The UK experience has also impacted in the Sweden healthcare system with Seal-Tight[®] recently (2013) approved for reimbursement on prescription^[5.2]. The Swedish company submitting the application cites the UK QoL data on its website (<http://www.twim.se/>) {translated}: “*Seal-Tight is clinically tested and evaluated and is the first shower protection that is approved for prescription by the National Health Service (NHS) in England. It has been proven to raise the quality of life for the patient and reduced the burden of care of bandage changes. In England, the clinical trials of patients with foot / leg ulcers who used Seal-Tight demonstrated elevated quality of life values.*”

Adoption and influence in clinical trials

Empowerment of patients in healthcare decision-making has fostered a need for disease specific tools that are meaningful to patients and which can be used to assess the benefit of new treatments. International healthcare companies and other sponsors use CWIS in clinical trials (60 since 2008; Cardiff Wound Healing Research Unit database) assessing the benefits of new dressings and wound healing technologies, including, for example:

Celleration Inc. (Minneapolis, USA) is a SME (50 employees) whose sole asset is the MIST Therapy device; a non-contact ultrasound wound healing therapy. The device gained FDA approval in August 2012 but in its application to the UK NICE requested evidence of health benefits (including health-related QoL) of the MIST regimen compared to the UK standard of care for chronic venous leg ulcers ^[5.4]. This was the first example arising from NICE’s medical technology guidance recommendations requiring additional clinical evidence. This led to an independent clinical trial (08/2012-11/2013, NCT01671748) conducted in Cardiff’s Wound Healing Unit using CWIS to evaluate QoL performance. The study results (pending) are fundamental to Celleration’s \$7M round of funding (Jan 2013) to expand its product indications and UK sales ^[5.5].

Founded as a spinout from the NHS in 2005, ZooBiotic Ltd became the only UK company specialising in the use of medicinal-quality larvae (maggots) for the treatment of chronic infected and necrotic wounds. In 2009-10 the Cardiff Wound Healing Unit led a ZooBiotic-sponsored multi-centre (eight-centre) randomised clinical trial (200 patients) evaluating the benefits of maggot therapy in wound healing. The QoL outcomes in this particular therapy presented additional challenges (e.g. patients may find maggots distasteful or suffer uncomfortable sensations) but were also well defined by CWIS together with QoL benefits from the healing process itself. The positive outcomes of the trial were instrumental in reinforcing ZooBiotic’s business development plans to acquire the German rival company BioMonde GmbH (BioMonde is now the trading name of ZooBiotic), and the company’s ability to attract further rounds of investment. The acquisition of BioMonde GmbH allowed ZooBiotic’s therapies to access European markets boosting its annual turnover by over 100% from £2 million p.a. prior to acquisition to £5 million post-acquisition ^[5.6].

Best practice and uptake

CWIS has gained recognition and uptake by practitioners as a reliable and accurate mechanism by which shared decisions on patient treatments can be appropriately balanced. It is seen as an exemplar of good practice for managing patients with chronic wounds of the lower limb.

CWIS is acknowledged in a number of Best Practice Consensus, Clinical Guidelines and Position Documents, for example: NHS National Prescribing Centre Guiding Principles for prescribing of dressings (2012) ^[5.7]; International consensus statement ‘Optimising Well Being in Patients with

Chronic Wounds' (2011) ^[5.8]; The American Center for Medical Technology Policy and Effectiveness Guidance Document (2012) ^[5.9]; The European Wound Management Position Paper on Hard to Heal Wounds (2008).

The take up of the CWIS instrument has been world-wide (20 different countries) with the tool translated and validated in 10 languages: English, Welsh, US English, Sinhalese, Tao, German, French, Portuguese (Brazil), Swedish and Spanish (Mexico) and is currently undergoing translation and verification in Italian, Norwegian, Swedish and Greek. Over 100 different organisations now use the questionnaire for audit or quality improvement programmes. For example, UK healthcare facilities adopt the instrument to measure health-related QoL improvements in service provision for patients with chronic wounds (e.g., Bradford Royal Infirmary; University College Hospital; Ealing PCT; NHS East Lancashire Community Services). Further afield, CWIS has been used to improve treatment priority setting and patient experience in, for example, Australia (Northern Sydney Central Coast Community Nursing Service; Sydney South West Area Health Service) and Canada (South West Ontario Regional Wound Care Service, Participation and Quality of Life (Par-QoL) project in Toronto ^[5.10]). The CWIS (the instrument, scores and coding schedule) is provided on a non-cost licence basis to non-commercial organisations.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[5.1] Statement from National Diabetes Foot Co-ordinator Scotland and leading International practitioner. Hairmyres Hospital, East Kilbride, Scotland. The detrimental effects upon QoL of patients who suffer from chronic wounds. The demand this patient group has upon community practitioners and the NHS. The clinical impact of tools to effectively measure QoL.

[5.2] Statement from Managing Director AutonoMed Ltd., the UK company who sought Drug Tariff listing of Seal-Tight[®]. The role of CWIS research to underpin approval by the Prescription Pricing Authority of Seal-Tight[®]. Sales of Seal-Tight[®] units and an International dimension in Sweden.

[5.3] Article describing the role of CWIS in gaining Drug Tariff approval and the cost-effectiveness of the product. Lindsay, E. Bandages and difficulty with bathing: Introducing Seal-Tight. An independent practitioner product focus in Br. J. Community Nurs. (2005) Jun (Suppl): S32-S34.

[5.4] NICE medical technology guidance recommendations for MIST Therapy system requiring additional clinical evaluation including QoL measures (p 3 bullet point 1.3).

<http://www.nice.org.uk/nicemedia/live/13548/55637/55637.pdf>

[5.5] Celleration's \$7 million round of financing to expand product sales into the UK.

http://www.bizjournals.com/twincities/blog/in_private/2013/01/wound-healing-firm-celleration-closing.html?page=all

[5.6] Statement from non-executive Chairman of Zoobiotic Ltd on how clinical research in Cardiff, including QoL assessments by CWIS, evidenced the patient benefits of larval therapy and reinforced Zoobiotic's business expansion plans.

[5.7] NHS National Prescribing Centre Guiding Principles for prescribing of dressings (2012) stating (p 21) the need to adopt the use of patient reported measures of health-related quality of life and recommending CWIS. http://www.npc.nhs.uk/qipp/resources/Prescribing_of_dressings.pdf

[5.8] International Consensus on Optimising Well Being in Patients with Chronic Wounds (2011) recommending CWIS as a condition-specific HRQL instrument (p 6) and citing Cardiff research [see 3.1 above] on p 13 ref. 32. http://www.woundsinternational.com/pdf/content_10309.pdf

[5.9] Center for Medical Technology Policy - Methodological Recommendations for Comparative Effectiveness Research on the Treatment of Chronic Wounds (2012). Recommendation 10 for conduct of clinical research on chronic wounds is the use of CWIS in QoL assessment for wounds of the lower limb (pp 21-22) with Cardiff research (see [3.1]) on p 34. <http://www.cmtynet.org/wp-content/uploads/downloads/2012/10/Wound-Care-2012.pdf>

[5.10] Participation and Quality of Life (Par-QoL) project in Toronto uses CWIS and encourages patients with chronic wounds of the lower limb to evaluate themselves the impact of their condition on their QoL. <http://www.parqol.com/page.cfm?id=74>

All documents, testimony and webpages saved as PDFs are available from the HEI on request.