

WELSH WOUND INNOVATION CENTRE



ANNUAL REPORT

June 2018

Leading the Field in
Wound Prevention & Treatment



Annual Report
June 2018

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Note: WWII Ltd is the formal registered name of the organisation, which trades as WWIIL and is also affectionately known as WWIC, which is the name of the premises.

Foreword from the Chair



Fiona Peel DL, OBE

I am pleased to introduce the third Annual Report from the Welsh Wound Innovation Centre (WWIC). As with previous years, this report summarises the key achievements over the last year and highlights our future aspirations.

The Welsh Wound Innovation Centre was formally launched in September 2014 to create a centre of excellence in skin health, wound prevention and treatment. WWIIL uniquely brings together the key voices on wounds in Wales, spanning government, NHS, academia, business, industry and the Third Sector, all of whom play key roles in overcoming the challenges of wound healing and the maintenance of skin health.

We recognise that we are a unique organisation in Wales, sitting alongside the NHS, academia and indeed commercial enterprises. As a result of the transfer of the deed of novation from Cardiff University to WWIIL, I am pleased to report that we are formally expanding the

membership to include more partners, in order to benefit from a greater depth of expertise and knowledge, representing the academic, NHS and commercial triumvirate of WWIIL and its role as the pathfinder for clinical innovation in Wales.

2017 has been another successful year for the organisation. The team continue to consolidate their reputation. We continue to work with others to collaborate, inform, innovate and educate on best practice in wound prevention and healing.

It is important to note that this report and WWIIL's achievements and notable successes are a by-product of our collaborative working. My continued thanks go to Professor Keith Harding for his ambition to set up the WWIIL; were it not for his vision and persistence we would not be here. My thanks go to all the directors and most importantly the team, whose enthusiasm, dedication and unwavering commitment to both preventing and improving wound care is commendable.

The Welsh Wound Innovation Centre: The First National Wound Healing Centre Worldwide

The Welsh Wound Innovation Centre (WWIC) was created in 2014 to provide leadership for wound prevention and healing in Wales. It emerged from the self-funded Wound Healing Research Unit in Cardiff University that had raised around £55m over its 24-year life span. WWIC is the first National Wound Healing centre worldwide and has already begun to demonstrate its value to Wales and the NHS through inward investment that has supported the creation of at least 74 new jobs and the performance of national wound audits, education and training.

Among the first actions WWIC undertook was to identify both the current cost of wounds to NHS Wales and the number of hospital patients in Wales with wounds. The conservative cost of wound care in the community sector for 2013-14 in NHS Wales was calculated from Swansea University's Secure Anonymised Information Linkage (SAIL) databases to be around £330 million pounds annually, 6% of the budget of NHS Wales.

WWIC led the Chief Nursing Officer commissioned national audit which focused on pressure ulcers and incontinence-associated dermatitis across all hospitals in Wales. Almost 9% of all hospital patients were identified as having pressure ulcers, 50% of these being acquired in the hospital setting, with inaccuracies in recording and categorisation of pressure ulcers also being identified.

The benefits of improved wound healing

WWIC considers that a system approach to value based wound care could have significant impact across the health economy through a focus upon three key areas – improved wound prevention, early intervention and optimisation of care and finally access to specialist care (Figure 1) and is working with NHS Wales to inform a value based wound care strategy.

Value-based wound care - a system approach

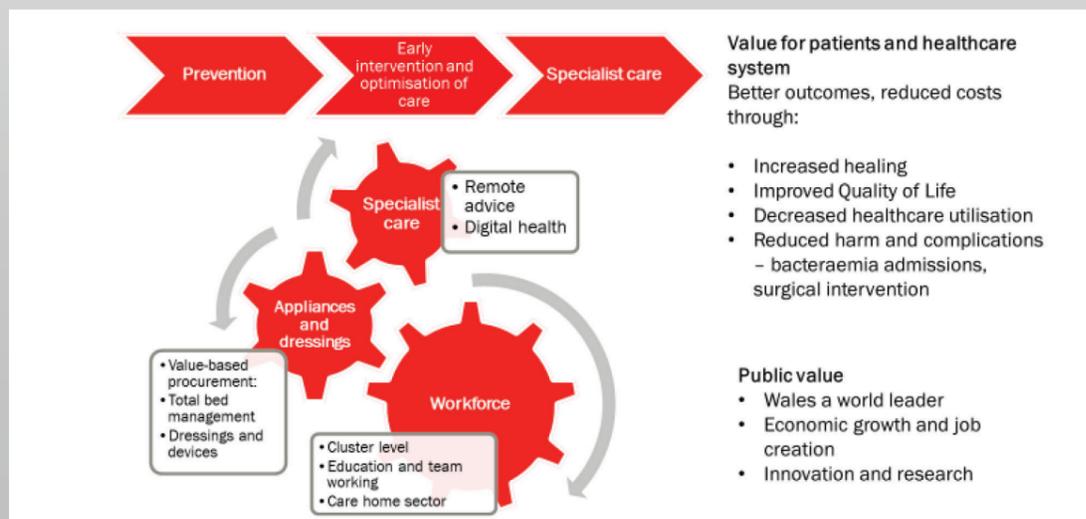


Figure 1: Value-Based wound care – a system approach

Understanding technology in wound healing

The role of innovative technologies in wound healing has increased dramatically from scenarios in the 1980's where most wounds were left uncovered or dressed using simple gauze dressings, to a complex environment. Did you know that there are almost 2,000 products that can be used to help prevent and heal wounds? WWIC provides an important role in the assessment of the new and existing interventions to inform wound prevention and healing.

WWIC staff have many years of experience around the technical and clinical evaluation of medical devices used in wound prevention and healing. Indeed, we have contributed to the development of several successful products and devices including Silastic foam and Intrasite dressings, the Repose mattress overlay and the Dyna-Form static air mattress.

Evaluation of wound technologies doesn't only focus upon new products; within a pilot project across four care homes in South Wales, WWIC identified that 40 of 117 mattresses (34%) failed visual inspection, where either the mattress did not provide support to the resident or was a potential source of infection, being soiled or stained. This finding suggests many care home residents may have inadequate mattresses and highlights maintenance challenges. Further work in this area is highlighted in the Mattress Test Laboratory Section.

Improving wound healing through education

Improving wound prevention and treatment is not just about the correct use of technology. In fact the largest proportion of the costs of wound care rest upon the time invested by a wide range of NHS staff to tackle wounds. Improving the skills and knowledge of NHS staff around wound healing is a pivotal aspect of WWIC's work.

A third (34%) of the pressure ulcers identified during the national wound audit had either not been reported by ward staff or reported with an incorrect classification. The cost of the treatment of a pressure ulcer varies according to the classification of its severity with the average cost of treatment of a category I pressure ulcer (the least severe form of this wound) costing £1,214, while a category IV pressure ulcers costs, on average, £14,108.

Where a pressure ulcer is incorrectly classified (for example a category II pressure ulcer is incorrectly described as a category III wound) the cost of treatment will rise. The additional costs due to misclassification arise from more frequent nursing intervention and the use of more complex wound care products. The typical cost of getting the classification of a pressure ulcer wrong by a single category is £4,298. With 152 misclassified pressure ulcers seen during the single week of the wound audit the likely minimum cost to NHS Wales was £653,296.

Where pressure ulcers were not reported (158 pressure ulcers across the national audit) there exists the potential for delayed wound healing (and increased costs) within NHS Wales, reduced patient satisfaction with their care, whilst also exposing NHS Wales to potential claims for clinical negligence. This is especially true in the case of 16 patients with unreported severe pressure ulcers (Category III or unstageable wounds). WWIC has also worked with GP Practices in South Wales documenting the outcomes of wound treatment and associated costs before and after the introduction of standardised wound management practices and access to support from experienced clinicians within WWIC. Prior to the intervention of utilising a 'buddy' from WWIC to work with individual practice nurses, 13/39 (33%) patients healed within the GP Practice, post-intervention the healing rate increased to 33/49 (67%); and to an impressive 74% in one practice.

Learning from the first national wound centre.

As the pathfinder for clinical innovation in Wales and the only body that connects NHS, academic and commercial organisations, WWIC is a catalyst that creates the right conditions to facilitate clinically effective change across the health economy as well as energising a climate for inward investment. We maximise opportunities for health and wealth creation in Wales and beyond through;

- Leading and supporting the development and adoption of wound healing innovation to include diagnostics, technologies and care pathways,
- Driving the adoption and spread of evidence-based practice to include an MSc in Wound Healing, bespoke clinical courses, e-learning, publications and presentations.
- Enhancing economic growth through collaboration and partnership with industry and the NHS.

Tackling the burden of wounds requires focused skills in wound prevention, early correct treatment and the safety net provided by access to specialist care. WWIC, as the first national wound centre provides these three key pillars to NHS Wales and believes the benefits already seen in Wales can also be realised by others. WWIC looks forward to the day when it no longer is the only national wound centre worldwide, as all patients deserve excellence in wound prevention and treatment.



#1 in Prevention & Treatment

Infographic – Our year in numbers

The following infographic highlights our key achievements in 2017. Points to note include:

1. 50 new jobs created against a milestone target of 14, demonstrating the positive impact on the economy, and to the life sciences sector in particular.
2. With over 22,000 Wound Registry entries, we have now built up an extensive registry, and are leading the way in terms of wound data to inform clinical practice as well as to support future investigative/exploratory research.
3. Our education and training programme continues to flourish with 54 people achieving an MSc, 6 completing modular components and 3 a PhD. We have also provided a significant amount of training to NHS and industry colleagues with over 100 workshops being provided. Included within this number has been the provision of training for staff in Care Homes and Social Services and excitingly a number of staff from overseas undertaking a clinical attachment with us.
4. Our clinical trial programme continues to grow, with over 560 patients recruited to a number of clinical trials/ product evaluation studies. Our growth in recruitment potential has been supported by the inclusion of the Aneurin Bevan and Cwm Taf University Health Boards as new participating sites.
5. Sustainable income is a key milestone for WWIC's continued success and this has been supported through the achievement of commercial contracts and successful Grant applications.
6. The team at WWIC continue to share and advance wound healing through their publications and presentations.



Leading the Field in Wound Prevention & Treatment



Key Achievements in 2017

The key pillars of our operational plan include:

- Sustainable funding, partnerships and collaboration
- Engaged customers
- Culture and behaviours
- Education and training
- Research and development.
- The following sections highlight key achievements in each of these areas.

Sustainable Funding: Commercial Update

Table 1 summarises the achievements to date vis-a-vis the agreed metrics for economic development and business led innovation in wound care:

As Table 1 demonstrates, WWIIL has met its agreed metrics and indeed has already surpassed 2018/19 requirements in respect of Jobs created; Products/Services registered, Business re/co-locations and Research Funding metrics.

WWIIL has clearly demonstrated a record of accomplishment in attracting inward investment to Wales. Of significance, we believe, is the inward investment by the Direct Healthcare Group and the further developments within the successful Frontier Group and Animal Ethics being of economic importance to the Welsh economy.

Jobs created:

WWIIL has certainly played a vital role in supporting job creation within the vibrant life sciences sector. The Grant

Award over the 2014/19 period proposed a total of 25-45 jobs. As a result of WWIIL's collaborative partnerships, with two companies in particular, a further 74 jobs have been created as a direct result of company associations with WWIIL.

Innovation (Academic) research funding:

WWIIL submitted a scalability bid to support the adoption of the integrated pressure ulcer application across the Care Home Sector and possibly community nursing sector in Wales.

As well as delivering on the economic metrics our overarching goal is to deliver better outcomes for patients and citizens. We are supporting the development of national centres, based on the WWIIL model both locally in other clinical specialty areas and we collaborate and share best practice to increase the rate of adoption of teaching, research, clinical programmes and commercial offerings available.

	2016/17 Target	2016/17 Actual	2016/17 Target	Actual as at 31/1/18
New Inward Investments facilitated	5	5	5	0
Business Re/Co-locations to Wales	1	1	1	2
New Business Starts	1	1	1	0
Products/Services Registered (Commercialisation of wound prevention & treatment products)	1	2	1	1
Jobs Created	5-10	26	3-4	24
Innovation (academic) research funding	1	3	1	2

Table 1: Achievement of Metrics

Partnerships & Collaboration: Care Home Pilot

The development and implementation of an integrated pressure ulcer reporting system within the Care Home Sector in Wales – a feasibility project.

Background

The publication of Dr Margaret Flynn’s seminal report: ‘In Search of Accountability – A review of the neglect of older people living in care homes investigated as Operation Jasmine’ (2015) sent shock waves through the health and social care system in Wales. Its twelve recommendations were accepted without redaction by Welsh Government. WWIC, in 2016, developed and submitted a successful bid to the Efficiency Through Technology Fund to support the development and testing of an integrated pressure ulcer reporting system to support recommendation 2 of the report. The initial project involved the development and testing of a novel reporting system, in the form of a wound registry, in care homes. See Figure 2.

The web-based system was designed to encompass education, recording and reporting functionality to:

1. Aid pressure area category recognition and support treatment and referral pathways in accordance with the All Wales Tissue Viability Nurse Forum (AWTVNF) Guidance;
2. Provide a concurrent assessment and treatment record to include wound photography; 3. Deliver a self-populating reporting form to meet the requirements of Regulation 60 – Regulation and Inspection of Social Care (Wales) Act, 2016.

WWIC, in conjunction with a specialist digital data capture company, co-produced the bespoke platform which is accessible through a web-based application. The system was piloted in 9 Care Homes, 7 in Aneurin Bevan and 2 within the Cardiff & Vale University Health Boards over the October 2017 to March 2018 period.

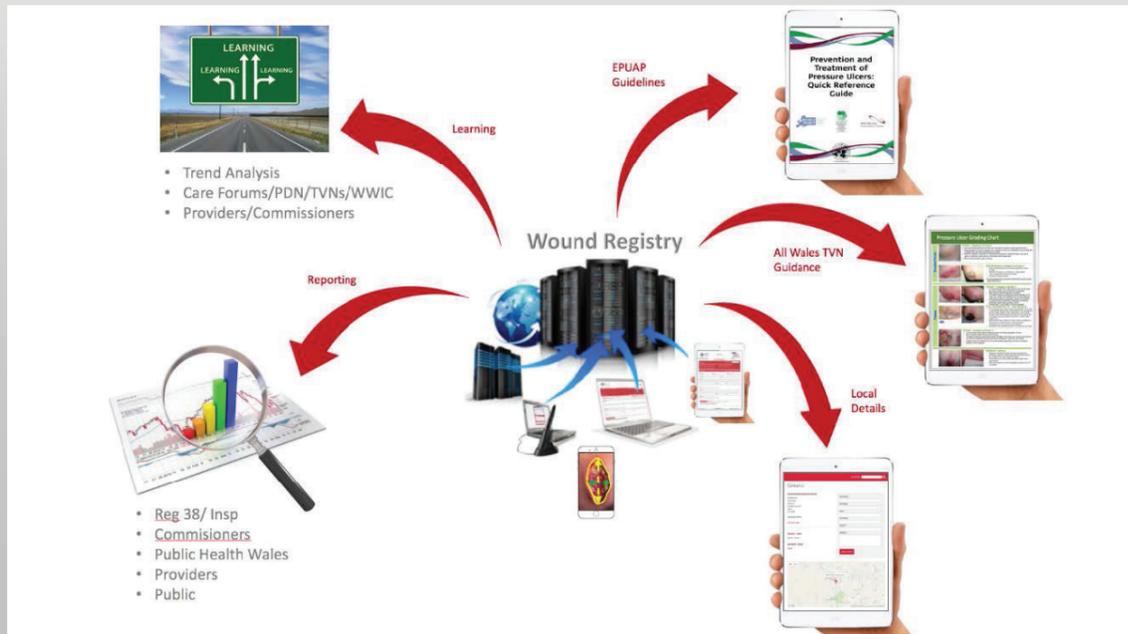


Figure 2: A diagrammatic representation of an integrated wound registry.

Project Benefit

The purpose of the integrated reporting system is to assist the practitioner in pressure ulcer category recognition, provide a standardised approach to assessment with appropriate treatment guidance, and production of a self-populating reporting form to meet Health Board and Care Inspectorate Wales (CIW) requirements. The efficiency benefits for each of the project drivers are summarised in Figure 3.

found the system easy to navigate, with 28% finding it not so easy. 100% of people who commented on the system had used it, and 43% used the wound glossary to clarify their understanding on the wound terminology. 57% felt that their knowledge of pressure ulcer care and treatment had improved considerably. The majority found the device easy to navigate.

The overwhelming feedback from the Care Home staff involved in the pilot project confirmed the benefits and utility of the standardised assessment and treatment form and the importance of wound photography. 57%

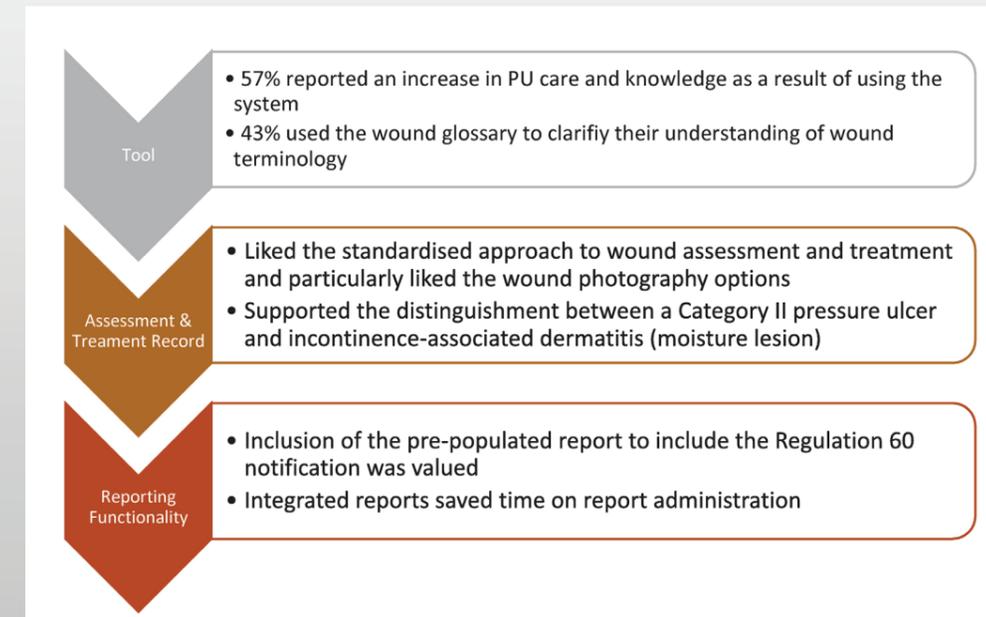
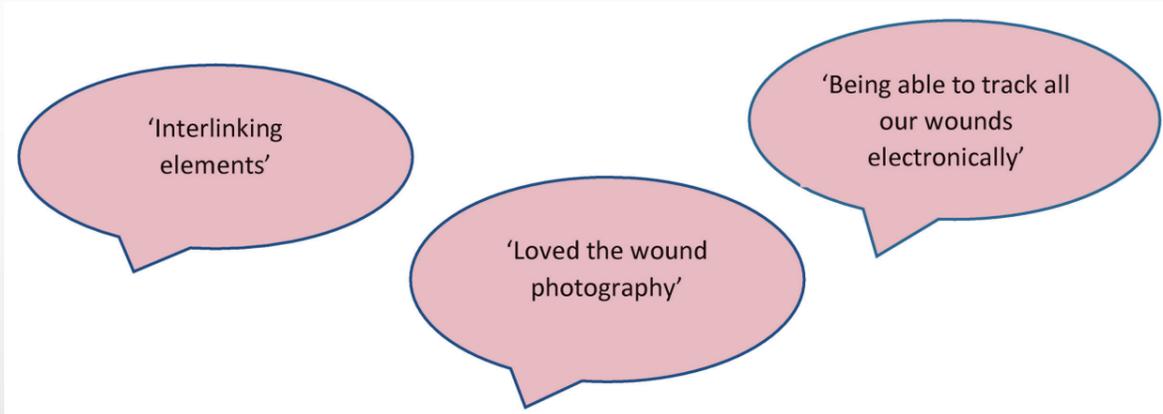


Figure 3: Reported benefits of the integrated pressure ulcer reporting system

Feedback from users about what they liked from the system included:



Importantly, 85% of people who provided feedback said that they would continue to use the system beyond the pilot. The one's that didn't were not comfortable with app technology.

Lessons Learnt & Next Steps

The overall experience of this project was overwhelmingly positive. The critical success factors included stakeholder engagement; choosing the right developer and effective project management arrangements.

- Spending time scoping out the project and importantly engaging the Care Home users at the outset ensured that the system was fit for purpose.
- Due to the developer's interest in the utility of the system, a significant amount of inkind support was achieved including refinements to the system, particularly the photography function, and the weekly reporting summaries.
- Project management to include a robust project plan, a risk log, regular project team meetings and the Steering Group, was also critical to ensuring that milestones were achieved.

All these factors combined have resulted in a viable system and has given us the confidence to submit a scaling up application to fully test its capabilities and importantly its integration capacity with both local and national digital platforms.

Second audit of wound care within the catchment area of an English Clinical Commissioning Group

In our 2016 Annual Report we described work previously undertaken by WWIL to audit wound care practices and documentation within a Clinical Commissioning Group (CCG) in England. This audit formed part of a quality improvement project that sought to identify current wound care practice within the CCG, introduce a series of initiatives intended to improve practice and then re-audit the service a year later. In 2017 WWIL returned to the CCG to complete the second audit of wound care practice and documentation.

Between the first and second audits the CCG had an eight-step improvement plan;

- Review, and standardisation of local wound policies
- Regular team meetings between staff
- Increased access to study days and training
- On-going training on leg ulcer management
- New system for assessing and reviewing patients, with all new patients' initial assessments undertaken by a suitably qualified nurse
- Notes in the patients' home with a communication and treatment document, which was completed, signed and dated at each visit
- Improved access to the Tissue Viability Service
- Increased provision of cameras and wound measurement equipment.

In September 2017, WWIL and CCG staff observed the wound care provided to 77 patients, with 34 patients receiving wound care in GP Practices and 43 attended to in their own home. Of the 77 patients, 10 were observed to have healed wounds at the time of the audit (7 in GP Practices; 3 in patients' homes). All healed wounds were located on the foot or lower leg, bar one pressure ulcer located on the buttock. Patients with healed wounds at the time of the audit were excluded from subsequent analysis.

Marked improvements in the delivery of wound care were observed in both GP Practices and in patients' homes. Table 2 illustrates that across key elements of wound care delivery, improvements were achieved; this was particularly evident in the delivery of wound care within patients' homes.

	GP Practices		Patients' Homes	
	2016	2017	2016	2017
Skin assessed	65.3%	85.2%	43.2%	77.5%
Appropriate wound care advice provided	84.9%	100%	35.8%	82.1%
Comprehensive wound assessment/care plan	49.1%	81.5%	29.4%	77.5%
Appropriate primary dressing	86.0%	92.6%	39.8%	87.2%

Table 2: Percentage of wound care practices seen to be performed.

The interaction between WWIIL and the CCG has demonstrated WWIIL's expertise in conducting independent audits of practice that highlight improvements in wound care practice following implementation of recommended initiatives. WWIIL and the CCG intend to publish the project within the

healthcare literature, thus making the specific project results accessible to the wider wound care community. Publication of the audit results will also enable WWIIL to market its capabilities in supporting quality improvement projects and wound audits in the future.

	GP Practices		Patients' Homes	
	2016	2017	2016	2017
Skin assessment documented	55.1%	81.5%	36.7%	57.5%
Correct aetiology documented	79.2%	90.9%	50.0%	94.4%
Wound size documented	17.3%	57.1%	11.9%	42.5%
Wound bed condition documented	67.3%	92.6%	33.0%	82.5%

Table 3: Percentage of wound care documented.

Healthy Volunteers and Mattress Test Laboratory

In the last annual report, we reported the initiation of laboratory-based test services designed to investigate the likely clinical effects of new mattresses, cushions and compression therapies to prevent and treat pressure ulcers and venous leg ulcers. The report outlined our intention to extend this test service to develop a National Mattress Test Centre.

In 2017 we have continued to provide test services based upon characterising the mechanical loads applied to the skin of healthy volunteer subjects as they sit or lie on a variety of patientsupport surfaces.

- We have worked with a UK bed and mattress company who manufacture part of their range in Wales to understand the effects of lying on a range of foam and hybrid mattresses on the pressures applied to the areas of the body that are likely to develop pressure ulcers (including the sacral area at the base of the spine and the heels). Hybrid mattresses are made of combinations

of foam and air-filled plastic cells, some of these mattresses can be attached to a pump to enable the air-filled cells to regularly deflate and inflate, so changing the parts of the body that bear weight when lying in bed. This work allowed the manufacturer to gain greater insights into the likely effect of their products when used in clinical practice, as well as helping identify areas for future product development. Such studies are approved by Cardiff University School of Medicine Ethics Committee and following approval can be completed in rapid time periods, for example one month, providing manufacturers with rapid feedback on their products and prototypes.

- In 2016 we referenced WWIIL's contribution to a project that explored the effect of hybrid mattresses when connected to a pump to inflate the air cells. This project was initiated by Abertawe Bro Morgannwg and Hywel Dda University Health Boards and was

supported by WWIIL and the Pressure Ulcer Prevention and Intervention Service (PUPIS). In 2017 the two powered hybrid mattresses that performed best in the laboratory were clinically evaluated in Hywel Dda University Health Board. Both mattresses performed well during the clinical evaluation, highlighting that a combination of laboratory and clinical evaluations can help identify those products most likely to work well in clinical practice, with this then verified through clinical tests. During the clinical tests, an unexpected challenge emerged when some orthopaedic patients began to develop heel pressure ulcers; this was traced to the use of special wedges used to maintain the legs and hips in a correct alignment, but the wedge use left the heels supported by the edge of the mattress and not the inflatable cells. Discussion with the manufacturer led to a rapid product re-design, illustrating that partnership between the laboratory test service, the clinicians involved in the real-world evaluation and the commercial manufacturer can rapidly identify and resolve challenges to the effective use of patient support surfaces.

- In 2017 we widened our pool of healthy volunteers. This will enable us to offer different groups of volunteers to undertake a wider range of laboratory services at a quicker completion rate. Part of this work has involved developing new relationships with other South Wales based laboratory test companies. These new collaborations will allow WWIIL to offer an extended range of non-invasive laboratory tests.

- We have continued to work towards hosting a National Mattress Test Laboratory, although this has slowed as the ISO work groups have yet to release the final test standards. Regardless, we have identified space and staff to undertake mattress testing and anticipate that we will see the first test results issued by the new laboratory by the end of May 2018. WWIIL has strengthened links with the School of Engineering at Cardiff University. This will enable us to develop partnerships that will allow academic investigations into areas such as pressure ulcer aetiology. WWIIL supported an academic bid, along with the creation of

a Cardiff Materials Network, helping to bring together multiple departments and faculties with interests in materials performance.

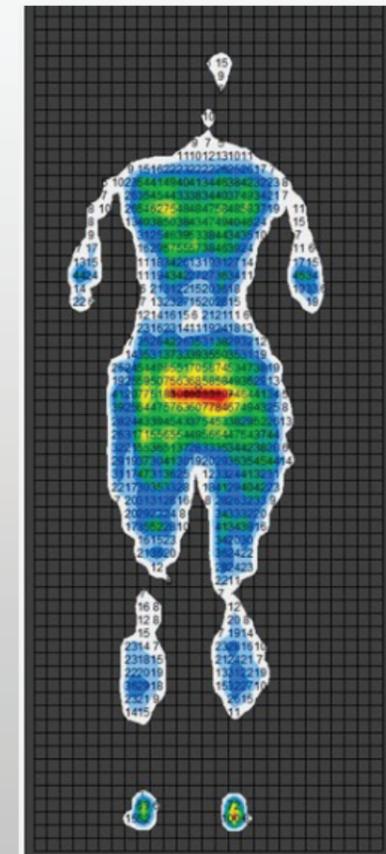


Figure 4: Example of a pressure map, red colour marking the highest pressures on the body

Development of a Complex Wound Clinic for Cwm Taf Residents

The WWIC team recently undertook a pilot scheme with our neighbours at Cwm Taf University Health Board to develop a local complex wound clinic for its residents. The pilot was for five clinics and involved a collaboration between WWIC and Cwm Taf clinical staff. The following infographics outline some of the impacts, (Figure 5).

The patients seen in clinic demonstrated the wide range of cases frequently seen in a complex wound clinic, to include pressure ulcers, venous leg ulcers, foot ulcers and

surgical wounds. A number of patients attended more than once, enabling WWIC staff to measure progress over time. Figure 6 describes some of the positive outcomes, with all patients who attended more than once seeing an improvement in their wound healing. Many patients also reported a significant increase in their Quality of Life (QoL) scores, demonstrating the wider impact of wound healing.

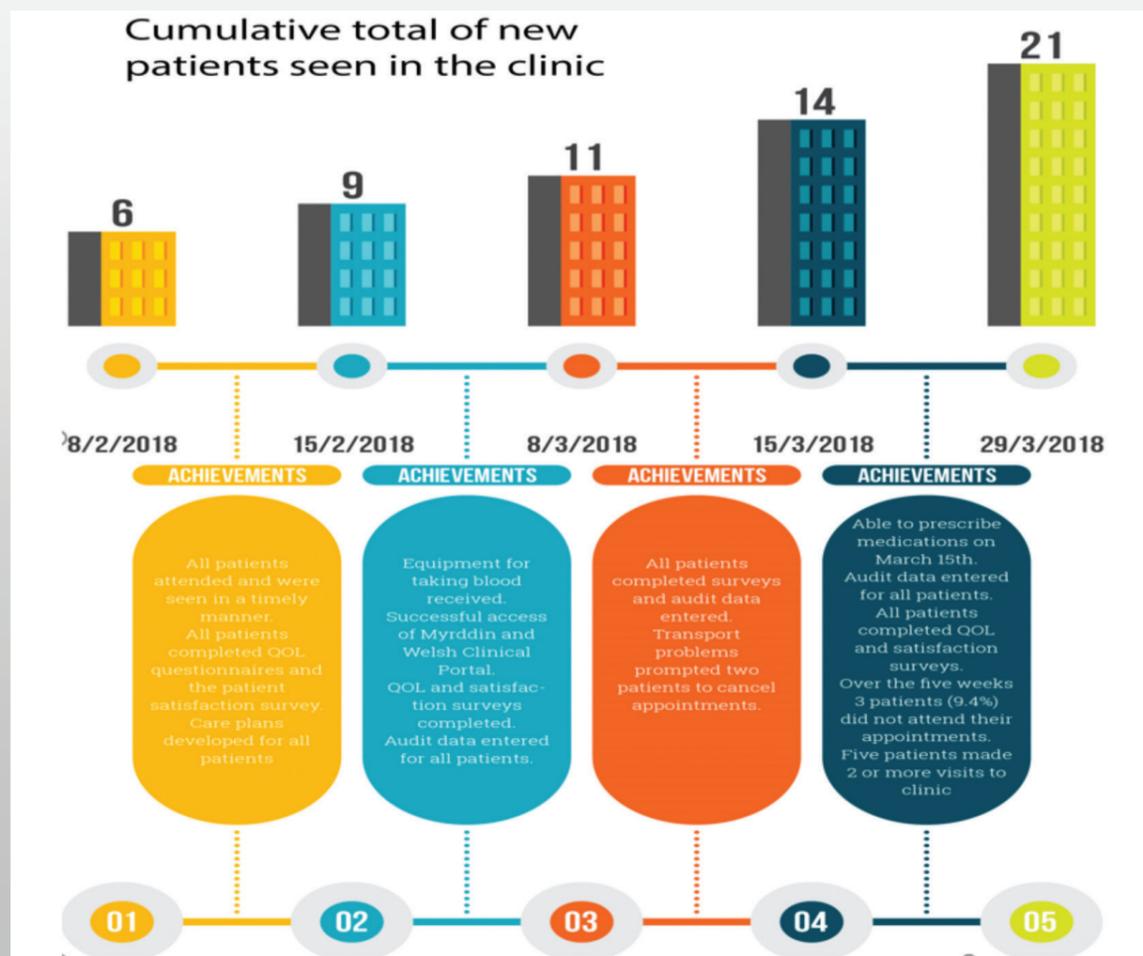


Figure 5: Cwm Taf Clinic Infographic

OUTCOMES AND BENEFITS OF THE WOUND CLINIC

Of the 21 patients seen in the wound clinic, 5 made more than one visit allowing progress to be recorded..



Figure 6: Outcomes and Benefits of the Wound Clinic

Feedback was also sought from patients on their experience, and it was extremely positive. The outcomes were fed back to Cwm Taf University Health Board to assist them in planning for future wound care services for their residents.

Research and Development Update

Research activity has centred on collaborative working with the Research and Development departments across Cardiff and Vale, Cwm Taf and Aneurin Bevan University Health Boards. A summary of key activity in each Health Board is included.

Aneurin Bevan University Health Board

Since September WWIC has recruited a high number of patients into a wound fluid sampling study, which has resulted in Aneurin Bevan reaching their research activity target, thus enabling the Health Board to receive the required level of reimbursement based on activity-based costing submissions. We have been congratulated by the R&D Director on our contribution to their research activity profile.

A Research for Patient funded project commenced recruitment in October. This study is a randomised controlled trial comparing the use of a low friction boot and standard care in the prevention of damage to the heels of patients restricted to bed. Recently, Aneurin Bevan UHB has offered the support of two research nurses based in the ITU care setting, to help facilitate recruitment and develop the research profile of wound care in this clinical setting.

The clinic in the Research and Innovation Centre at St Woolos Hospital continues to operate two to three times weekly

Research activity is ongoing at the Ysbyty Ystrad Fawr Hospital with excellent support from the nurses on Penallta ward.

Cwm Taf University Health Board

Funding was provided by the Director of Research and Development to support the employment of a Healthcare Support Worker for one year to assist with the clinical activities associated with the low friction boot study. We also have the support of 2 research nurses.

The orthopaedic wards in Royal Glamorgan and Prince Charles Hospitals are keen to support and enhance the profile of wound related research activity in these areas, supported by Lisa Williams, Consultant in Orthopaedics.

The ITU Department in Cwm Taf has also agreed to become involved in research activity with WWIC and this is scheduled to begin in May.

Excitingly, we are broadening our reach into the community settings and the innovative wound Community Cluster within Cwm Taf have agreed to identify suitable patients for research. Indeed, 3 patients were recruited to clinical evaluations from the pilot clinic.

Cardiff and Vale University Health Board

Following discussions with the Consultant Nurse Older Vulnerable Adults it was agreed to start recruitment to the low friction boot study at St David's Hospital.

WWIC are working closely with the Community Tissue Viability team, led by Kirsty Mahoney who is actively screening patients who may be suitable for research. Kirsty has conducted a small-scale evaluation in the community which provided data to help with a local company's FP10 application, to enable its product to be prescribed for patients.

The Podiatry Professional Clinical Lead for Cardiff and Vale University Health Board is keen to collaborate and set-up a joint research project with the WWIC team, as there are a number of patients that might benefit from the experience of being involved in research.

Changes in the WWIC research team

Two research nurses have been successfully recruited to the WWIC team. A senior research nurse Tracy Smith brings experience in conducting research projects in primary care (Health Care Research Wales) and will oversee the day to day activities of the research nurses. Hayley O'Leary previously worked on a frailty ward and was the wound link nurse, and she is currently leading on the low friction boot study.

Nia Jones was successful in becoming a senior research nurse within the WWIC team. Nia is also managing several ongoing projects and mentoring the new members of the team.



WWIC Clinical Team with Community Tissue Viability Nurses from Cardiff and Vale LHB

Summary of our research activity

We are very grateful to all the patients that have been involved in different projects throughout the 12-month period enabling us to undertake product evaluations; diagnostic and efficacy studies; clinical trials and healthy volunteer studies. The results of three projects have been presented at the Wounds UK conference and the annual Tissue Viability conference, with further submissions planned for the Summer and Autumn programmes.

In summary, research activity is taking place and growing in terms of population reach to include community cluster clinics, ITU's and other inpatient clinical settings where appropriate, which hopefully will result in patients being offered the opportunity to participate in research. This approach is both novel and exciting for WWIC and is testament to the growing collaboration that we have with our local Health Boards.

Overseas Clinical Attachments

WWIC strengthened its educational role last year through the development of new links with external organisations. WWIC has welcomed eight tissue viability clinical nurse specialists (CNS) from Hong Kong. They undertook a four-week placement, experiencing the theory and practice of wound healing within WWIC and its clinics. Due to the nature of our clinics, the students were able to see a multi-disciplinary team approach to the delivery of wound care and the value that each clinician brings to the whole patient experience. The working relationship WWIC has built with the wound care-based industry in Wales also provided a unique opportunity for the students to see pressure redistributing equipment and wound dressings being developed and manufactured.

All the clinical placements were extremely successful. Feedback such as “I was attracted to the Welsh Wound Innovation Centre by the positive feedback from previous program participants” has highlighted the profile of WWIC, and we have been approached by another health organisation (Kwong Wah Hospital) in Hong Kong to send further students in 2018

at the Queen Mary Hospital in Hong Kong in November 2017. This was an intensive exposure for the education that WWIC can deliver both nationally and internationally, along with recognition of the ‘centre of excellence’ status that is attributed to WWIC by international healthcare organisations.



Following the success of the initial Hong Kong programme, WWIC's Director of Education and Training was invited to participate in the 'Annual Pressure Ulcer Injury Program'

Hong Kong has not been the only destination to attract clinical visitors, with an Advanced Practice Nurse visiting from Singapore for 6 weeks in Autumn 2017 and a Lieutenant from the Hellenic Naval Academy spending a weeks placement in early 2018. In addition, a placement from Chinese medical students along with Norwegian wound care specialist nurses are visiting in 2018. We are also planning to welcome more visitors from Singapore later in 2018, confirming our international reputation.

In addition to the clinical placements, we continue to facilitate workshops for the healthcare industry, holding 14 workshops which included personnel from the UK, United Arab Emirates and Sweden. The popularity of these workshops is evident in the examples of feedback received in Figure 7, with three new multinational companies contracting with WWIC to benefit from the educational opportunities we offer.



Figure 7: Feedback from educational placements



Clinical Placements & Educational Programmes

WWIC already provides clinical placements for pre-registration nursing students from the University of South Wales. From April 2018 we will be providing clinical placements for preregistration student nurses from Swansea University. This is an exciting opportunity to provide a valuable bespoke experience for the students. Furthermore, we have been approached to provide clinical placements by nursing students in England with the first students arriving in July 2018.

WWIC provides education and support to other health and social care organisations with training provided in early 2018 to Care Inspectorate Wales (CIW). The aim of this educational initiative was to support care home inspections by focusing on pressure ulcer prevention and management strategies adopted within the care home environment.

E-learning

WWIC continues to develop its e-learning educational portfolio with the addition of scholarly articles placed on the WWIC website. These include a series of 'back to basics' articles that have been published in the Wounds UK journal. These are freely available for access via the WWIC website (www.wwic.wales/publications-and-posters/published-articles). Our social media statistics confirm that these publications are of significant interest to the wider healthcare community.

WWIC's current collaboration with the Welsh Podiatry group to produce a course on wound debridement. In conclusion, we are developing our educational component by engaging with healthcare organisations both within Wales and worldwide. Forging new relationships strengthens our reputation as a centre for wound care excellence.

WWIC continues to support Health Boards in Wales, and an example of this was presenting at the Betsi Cadwaladr University Health Board's annual 'Stop Pressure Ulcer study day'. Education in the field of wound care has a multidisciplinary focus. An exciting example of this is

Masters in Wound Healing and Tissue Repair

The Masters (MSc) in Wound Healing and Tissue Repair is a three-year, inter-disciplinary, parttime, distance-learning course. The course attracts a wide range of healthcare professionals and the pharmaceutical industry and offers the opportunity to study alongside an international group of professionals. The programme encourages exploration and analysis of existing and developing theories and concepts that underpin wound healing and tissue repair so facilitating professional and personal growth. The MSc consists of three stages outlined in Figure 8. The programme is delivered via blended learning, face-to-face contact for the study blocks and via Cardiff University's virtual learning environment (VLE).

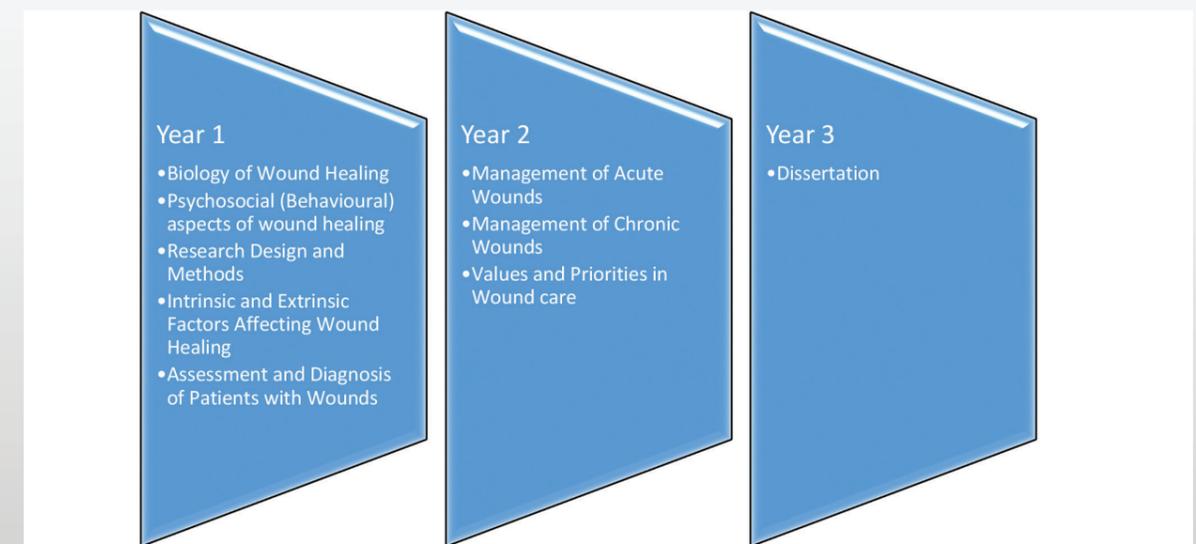


Figure 8: Structure of the Master in Wound Healing and Tissue and Repair Programme

Between March and April 2017, 26 students who had graduated from the MSc programme in the last three years were contacted to take part in a cross-sectional survey of to determine the impact of postgraduate study on their professional practice and personal development, 19 responded (73% response rate). As outlined in Figure 9, the results identified that most graduates reported a

positive impact on knowledge acquisition, employability, adaptability, leadership and management, research or audit and life-long learning as well as intellectual stimulation, relevance to work, application of learning, ability to make changes and impact on the workplace.

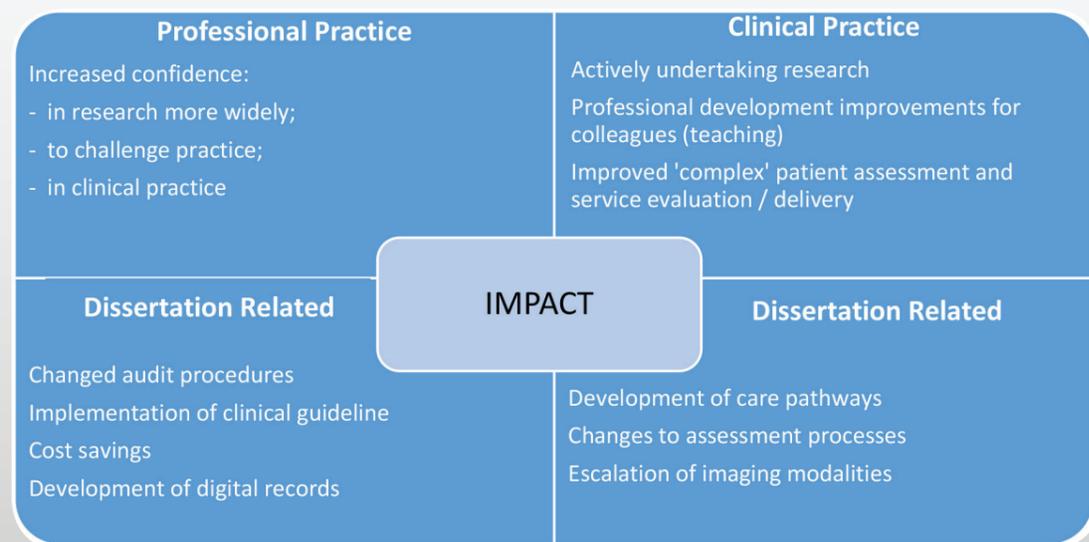


Figure 9: Thematic analysis for achievements and impact on professional and clinical practice of the MSc course in Tissue Repair and Wound Healing

Finance

The following section outlines the report of the Independent Auditors to the Board.

Opinion

We have audited the financial statements of WWII Limited (a company limited by guarantee) for the year ended 31 July 2017. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including Financial Reporting Standard 102 'The Financial Reporting Standard applicable in the UK and Republic of Ireland' (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the Company's members those matters we are required to state to them in a Report of the Auditors and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and the company's members as a body, for our audit work, for this report, or for the opinions we have formed.

In our opinion the financial statements:

- Give a true and fair view of the state of the company's affairs as at 31 July 2017 and of its surplus for the year then ended;
- Have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- Have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditors' responsibilities for the audit of the financial statements section of our report. We are independent of the company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Conclusions relating to going concern

We have nothing to report in respect of the following matters in relation to which the ISAs (UK) require us to report to you where:

- the directors' use of the going concern basis of accounting in the preparation of the financial statements is not appropriate; or
- the directors have not disclosed in the financial statements any identified material uncertainties that may cast significant doubt about the company's ability to continue to adopt the going concern basis of accounting for a period of at least twelve months from the date when the financial statements are authorised for issue.

Other Information

The directors are responsible for the other information. The other information comprises the information in the Report of the Directors, but does not include the financial statements and our Report of the Auditors there on. Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion there on.

In connection with our audit of the financial statements, our responsibility is to read the other information and in doing so, consider whether the other information is

materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Opinion on other matters prescribed by the Companies Act 2006

In our opinion based on the work undertaken in the course of the audit:

- The information given in the Report of the Directors for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- The Report of the Directors has been prepared in accordance with the applicable legal requirements

Matters on which we are required to report by exception

In the light of the knowledge and understanding of the company and its environment obtained in the course of the audit, we have not identified material misstatements in the Report of the Directors. We have nothing to report in respect of the following matters where the Companies Act 2006 requires us to report to you if, in our opinion:

Adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or

- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit; or
- the directors were not entitled to prepare the financial statements in accordance with the small companies' regime and take advantage of the small companies' exemption from the requirement to prepare a Strategic Report.

Responsibilities of directors

As explained more fully in the Statement of Directors' Responsibilities, the directors are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the directors determine necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the company or to cease operations, or have no realistic alternative but to do so.

Our responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue a Report of the Auditors that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our Report of the Auditors.

Nigel Williams BCOM FCA (Senior Statutory Auditor)
for and on behalf of Graham Paul Limited (Statutory Auditor)

Court House
Court Road
Bridgend
CF31 1BE

**WWII LIMITED (A COMPANY LIMITED BY GUARANTEE)
(REGISTERED NUMBER: 08760652)**

**TRADING AS WELSH WOUND INNOVATION
INITIATIVE**

ABBREVIATED BALANCE SHEET 31 JULY 2017

	Notes	2017 £'000	£'000	2016 £'000	£'000
FIXED ASSETS					
Tangible assets	4		46		69
CURRENT ASSETS					
Debtors	5	234		119	
Cash at bank		503		697	
		<u>737</u>		<u>816</u>	
CREDITORS					
Amounts falling due within one year	6	397		346	
NET CURRENT ASSETS			<u>340</u>		<u>470</u>
TOTAL ASSETS LESS CURRENT LIABILITIES			<u>386</u>		<u>539</u>
ACCRUALS AND DEFERRED INCOME			<u>386</u>		<u>539</u>
NET LIABILITIES			<u>-</u>		<u>-</u>
RESERVES			<u>-</u>		<u>-</u>

The financial statements have been prepared and delivered in accordance with the special provisions of Part 15 of the Companies Act 2006 relating to small companies.

In accordance with Section 444 of the Companies Act 2006, the income statement has not been delivered.

The financial statements were approved by the Board of Directors on 6th February 2018 and were signed on its behalf by Fiona Peel, Chair of WWII Limited.

**NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 31 JULY 2017**

1. STATUTORY INFORMATION

WWII Limited (a company limited by guarantee) is a private company, limited by guarantee, registered in England and Wales. The company's registered number and registered office address can be found on the Company Information page.

2. ACCOUNTING POLICIES

Basis of preparing the financial statements

These financial statements have been prepared in accordance with the provisions of Section 1A "Small Entities" of Financial Reporting Standard 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" and the Companies Act 2006. The financial statements have been prepared under the historical cost convention.

The directors believe that preparing the financial statements on the going concern basis is appropriate because:

- the company has secured grant funding to 31 March 2018 and the cash flow forecast to 31 December 2018 projects that funds will be available for the 2017/18 financial year and for the rest of the 2018 calendar year;
- the Company will continue full trading in the 2017/18 financial year and is forecasting significantly increased revenue from that trading.

Income

Welsh Government grant income is accounted for when received from Welsh Government. The contributions from Welsh Local Health Boards are accounted for on the accruals basis.

Other operating income consists of commercial income from running education and training courses.

Tangible fixed assets

Depreciation is provided at the following annual rates in order to write off each asset over its estimated useful life.

Plant and machinery etc - 25% on cost, 20% on cost and 10% on cost.

Taxation

Taxation for the year comprises current and deferred tax. Tax is recognised in the Income

Statement, except to the extent that it relates to items recognised in other comprehensive income or directly in equity.

Current or deferred taxation assets and liabilities are not discounted. Current tax is recognised at the amount of tax payable using the tax rates and laws that have been enacted or substantively enacted by the balance sheet date.

Deferred tax

Deferred tax is recognised in respect of all timing differences that have originated but not reversed at the balance sheet date.

Timing differences arise from the inclusion of income and expenses in tax assessments in periods different from those in which they are recognised in financial statements. Deferred tax is measured using tax rates and laws that have been enacted or substantively enacted by the year end and that are expected to apply to the reversal of the timing difference.

Unrelieved tax losses and other deferred tax assets are recognised only to the extent that it is probable that they will be recovered against the reversal of deferred tax liabilities or other future taxable profits.

**NOTES TO THE FINANCIAL STATEMENTS - continued
FOR THE YEAR ENDED 31 JULY 2017**

2. ACCOUNTING POLICIES – continued

Hire purchase and leasing commitments

Rentals paid under operating leases are charged to surplus or deficit on a straight line basis over the period of the lease.

3. EMPLOYEES AND DIRECTORS

The average number of employees during the year was NIL

4. TANGIBLE FIXED ASSETS

	Plant and Machinery etc £'000
COST	
At 1 August 2016	110
Additions	1
	<hr/>
At 31 July 2017	111
DEPRECIATION	
At 1 August 2016	41
Charge for year	24
	<hr/>
At 31 July 2017	65
	<hr/>
NET BOOK VALUE	
At 31 July 2017	46
	===
At 31 July 2016	69
	===

5. DEBTORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

	2017 £'000	2016 £'000
Trade debtors	65	116
Other debtors	169	3
	<hr/>	<hr/>
	234	119
	====	====

6. CREDITORS:

	2017 £'000	2016 £'000
Trade creditors	321	199
Amounts owed to group undertakings	56	60
Other creditors	20	87
	<hr/>	<hr/>
	397	346

7. DISCLOSURE UNDER SECTION 444 (5B) OF THE COMPANIES ACT 2006

The report of the Auditors was unqualified.

Nigel Williams BCOM FCA (Senior Statutory Auditor) for and on behalf of Graham Paul Limited.

8. RELATED PARTY DISCLOSURES

During the period the company paid Cardiff University for the following items:

The controlling party is Cardiff University.

	£'000		
Salaries incurred by Cardiff University	351		
	<hr/>		
		2017	2016
		£'000	£'000
Amount due to related party at the balance sheet date	56	56	60
	<hr/>	<hr/>	<hr/>

The directors regard Cardiff University to be the ultimate parent company by virtue of being the sole member subject to guarantee.

The directors do not consider there to be an ultimate controlling party of the company.

9. COMPANY STATUS

The company is a private company limited by guarantee and consequently does not have share capital. The sole member for the purposes of the guarantee is Cardiff University.

What's New in Wound Healing: Thoughts from the Medical Director

There have been many developments in wound healing over the past year that all have the potential to impact on WWIC. They can be divided into 5 broad headings as outlined below.

Products

In addition to the incremental growth of dressings and bandages there has been increasing interest in new drugs that may enhance healing, particularly in North America, where there has been an explosion of usage of biologically based therapy for wound healing problems. This is in addition to devices that collect data from patients, either through using apps or machines, that record and calculate important parameters that are associated with healing.

Processes

The collection and collation of data related to aspects of wound healing practice have increased in profile during the past year. This includes epidemiological studies through to prevalence audits and on to development of wound registries. It would appear that having data to support development of wound practice is really starting to influence decision makers.

Provision of Care

The number of dedicated wound clinic services is increasing globally as is the use of TeleHealth, particularly in remote areas. The interest and awareness of the problem of wounds is now at a point where many groups are looking at how to provide new services to patients. Also being seen with increasing frequency is the use of Multi or Inter disciplinary team working to deal with patients suffering from complex wound problems.

Proof of Effect

There is now an increasingly mature way to look at evidence that particular technologies, services and systems can be shown to be effective. Until recently complete healing in the shortest period of time was often seen as the only measure of success. Now we are seeing decisions made on not only evidence of healing but also improving Health Related Quality of Life and Patient outcome measures that may be specific to individual patients. Increasingly, evidence of cost effectiveness is being asked for and a recognition that unit cost of a wound product is an inappropriate way to demonstrate value of interventions in wound practice.

Profile of Subject

The profile of the subject is increasing through a variety of means. The creation of a European qualification in wound healing for both doctors and nurses should be seen as significant. The request for us to produce a practical guide for use of dressings in Leg Ulcers by the BMJ is another indicator that the profile of the subject is increasing. This coupled with debates in the House of Lords on the subject are measures that show that the tide is finally turning. Internationally the increasing number of visitors that are looking at WWIC as a potential model for creating additional National Centres of Wound Innovation signals a change overseas too. Much has been achieved in the past year but much more is needed for the subject of wound healing to receive the recognition it needs and deserves.

Much has been achieved in the past year but much more is needed for the subject of wound healing to receive the recognition it needs and deserves.



Professor Keith Harding CBE, FRCGP, FRCP, FRCS, FLSW

@wwic_wales

Welsh Wound Innovation

www.wwic.wales

Annual Report

June 2018



#1 in Prevention & Treatment

Leading the Field in Wound Prevention & Treatment



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