

Technology and Innovation in Health and Social Care

(Additional Written Submission)

Strathclyde Institute of Medical Devices

Following giving evidence to the Health and Sport Committee at the Scottish Parliament last Tuesday (3 October) we would like to take the opportunity to make some additional non-confidential written comments:

1. In our (Strathclyde Institute of Medical Devices (SIMD)) written evidence to the committee we alluded to an, as yet, unfunded proposal (dated December 2015) for the founding of a National Centre for Medical Technology (NCMT) for Scotland. This organisation is perhaps best, if inelegantly, described as an “lccelerator” (Innovation Centres cum Accelerator Programme) which uniquely addresses all stages of Medtech development from the early research phases through prototyping, regulatory approval, CE-marking, product launch and post-market surveillance. In technology development circles this is referred to Technology Readiness Levels (TRL) 1-9. This “one-stop shop” approach addresses several issues identified during the Committee evidence session - namely development/product pipeline, NHS adoption/diffusion and expanding international market opportunities. The last of these being facilitated by the adoption of domestically developed products by the NHS in Scotland. The NCMT was deliberately not conceived as a “conventional” Innovation Centre, covering low to mid TRLs, as Medtech, of which e-health/m-health are part, is a highly regulated activity with a bench to bedside timescale of often 7+ years particularly benefitting from our commercialisation-time reduction lccelerator approach. The “one-stop shop” approach, drawing upon academic groups across Scotland, NHS Scotland, industry (large and small, domestic and overseas), the 3rd sector and patients, resonates strongly with Scotland’s Health and Wealth agenda as it has the potential to cost effectively and timely deliver Medtech products to the NHS and overseas markets. The Scottish Medtech sector currently generates ca. £1bn in turnover and equates to circa 190 companies and represents about 40% of Life Science activity in Scotland. Ambitious future targets will be difficult to achieve based on current practices; implementing a new way thinking, as embodied by NCMT, offers just such an opportunity.
2. Those less familiar with Medtech, of which e-health/m-health are an increasingly important part, may wish to understand on what authority SIMD decided to propose the establishment of the NCMT. SIMD was established in 2006 as a business/clinical engagement and commercialisation support for the University of Strathclyde’s long term funded EPSRC Centre for Doctoral Training (CDT) in Medical Devices and Health Technologies. The CDT itself was founded in 2003 and has been continuously funded (>£12M) since then through 3 funding rounds. The CDT is currently funded until 2022 and remains unique in the UK. Over 100 academics within the university, across more than

a dozen academic departments, work with clinical advisors from the NHS and industry advisors on interdisciplinary Medtech CDT research projects. SIMD, 11 years on from its establishment, is now recognised internationally in its field and is promoted as such through SDI in Scotland and UKTI on a UK basis.

Although SIMD is based in the University of Strathclyde my experience as Director is not that of a typical academic - having worked at senior technical/management roles in Italy and Switzerland in multinational Medtech companies and founder/CEO of the Medtech spin-out company, Ohmedics Ltd, founded in 2009. Through these roles I have personally taken devices from the lab to commercial use in the NHS and overseas markets and am familiar with the challenges and strategies for addressing them, many of which have been incorporated into the NCMT business plan. SIMD's industry and clinical facing staff (Dr. Alan Lindsay and Ms. Rachael Halifax respectively) have extensive industry and clinical/NHS knowledge and experience. Ms. Halifax as a registered nurse has great familiarity with the NHS, not least its strengths and weaknesses.

3. We stated above that e-health/m-health are an increasingly important part of the Medtech portfolio of products. An example of this is Woundsense™, the lead product for the University of Strathclyde spin-out Ohmedics Ltd. This product is a wound management diagnostic device which can be used to determine when a wound dressing needs changed without disturbing the dressing. Patients can check dressings in a few seconds in their own home or the device can be used in walk in clinics to check dressings. The system can be used with the NHS Florence texting system (now licenced by most NHS Boards in Scotland) to alert community nurses to the need for a dressing change. More importantly it is likely to lead to significantly fewer dressing changes saving money on dressings, home visits and staff time and helping patients avoid unnecessary discomfort. We have projected significant cost and time savings from removing even one dressing change per week from the care programme for a chronic wound care patient. The projected costs savings and commentary on this is given in a document attached to this email (DOH Narrative Wound Care). Section 6 of this presents a table that allows the local community savings to be specifically calculated if 3 wound dressings changes per week become two instead. You can expect that other technology companies with home care or wearable products will also have Cost Benefits Analysis with time and cost savings for the NHS. The challenge is in driving the uptake of these systems and integrating them into patient care. As we said during the evidence session one way of doing this would be to encourage patients to get more involved in self-management which can work very well for both patient quality of life and the patient's perception of the care they are receiving.

We hope this additional evidence proves useful to the Committee and we would be happy to provide other information that you may need.

Best regards

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Wound Care Costs in the UK & Potential Savings using NHS Florence and WoundSense™ in Telehealth Home Monitoring

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Executive Summary

There are an estimated 200,000 patients with chronic wound care conditions in the United Kingdom at a cost to the NHS for regular nursing care of £2.153 billion per annum. This paper outlines how this cost can be reduced by £261.2 million per annum by introducing telehealth to home wound care. This is based on the WoundSense™ wound monitoring system (developed by the University of Strathclyde) combined with the NHS Florence telehealth texting application (developed by NHS Stoke and already licensed to many NHS regions).

Key Figures

No of Chronic Wound Care patients in the UK	200,000
Average number of home visits by community nurses per patient per week	3
Estimated number of home visit staff hours and wound clinic hours per annum	31.2 Million hours
Estimated cost of staff time per annum	£1.997 Billion
Estimated Costs of dressing per annum	£0.157 Billion
Total wound care costs in the UK	£2.153 Billion
Savings per patient per annum if visits reduced to 2 per week using telehealth system	£2612
Annual costs saving from enrolling 100,000 patients on scheme and reducing from 3 home visits per week to 2	£261.2 Million
Annual savings in staff time , 3 home visits per week reduced to 2 for 100,000 patients	6.07 million staff hours or 2918 Nurses
Annual costs saving from enrolling 100,000 patients on scheme and reducing from 3 home visits per week to 1	£0.52 Billion
Annual savings in staff time , 3 home visits per week reduced to 1 for 100,000 patients	12.14 million staff hours or 5836 Nurses
Number of nurses estimated by RCN to be working in community services	45,000 (15% of nurses)

The report explains the how the proposed home telehealth system for wound care works and how the above costs and savings were calculated.

1.0 Introduction

There are at least 200,000 chronic wound care patients in the UK and the costs of dressing changes and community nurse visits is substantial but not well reported or analysed within health boards. For example, one NHS region in the North East of England, serving a patient population of around 800,000, has implemented an electronic work log for community nurses. From this they are able to see that their community nurses made 20,000 home visits in the month of January alone and that they have around 250,000 hours of community nursing for home wound care per annum. This means that the cost of wound care in this one region

amount to 250,000 contact hours of staff time per annum with additional follow on costs of transport, dressings, overheads etc.

This document assesses the situation for the UK as a whole, estimating the costs of wound care for chronic wound patients and suggesting a telehealth regime that could significantly cut staff hours spent on wound care, leading to much greater efficiency in community nursing. Cost comparisons are given between current and telehealth methods.

2.0 Costs of home visits / clinic visits per annum in the UK for Wound Care

The UK population is current estimated at 63.2 million people. Of these, the 200,000 or more chronic wound care patients in the UK will average 3 home visits per week if they are in the community, alternatively or additionally they will be brought into clinics once or twice a week.

We have estimated the maximum annual number of home care and clinic visits at 3 per week or 3 hours of staff contact time per week over 52 weeks of the year. For the clinic visits this might include ambulance time, prep time, Tissue Viability Nurse time etc rather than just the Community Nurse involvement. The estimated number of wound care hours /visits is given in 2.1 below.

2.1 Number of estimated home and clinic visits (hours) per annum in the UK for 200,000 chronic wound care patients

= 3 x 52 x 200,000

= 31.2 million Visits

= **31.2 million Community Nurse / Clinic Staff hours per annum**

The PSSRU 2011 summary of Community Health and Social care costs estimated a home nurse visit as taking 1 hour of staff time at a cost of £64 / hour (included travel time, prep, overheads etc).

If we assume each dressing is attended to be a community or practice nurse then we can have an estimate of total wound care **nursing** costs for chronic wound in the UK as given in 2.2 below.

2.2 Total Wound Care Nursing Costs for Dressing Changes in the UK per annum

= £64 x 31.2 million

= **£1.997 billion pounds**

3.0 Costs of dressings per annum in the UK for Wound Care

Similarly the number of dressings used in total can be estimated. We can average 3 dressings per week for most conditions.

Total dressings / visits per annum in the UK = 200,000 x 3 x 52 = 31.2 million dressings

There are many dressing types and a vast range of costs from advanced moisture control dressings to compression bandaging and negative pressure dressings.

If we allocate a modest cost of £5 per dressing pack to include the dressing, gloves, cleansing solutions etc we can arrive at a reasonable estimate given in 3.1 below.

3.1 Total Costs for Dressings for Wound Care in the UK per annum

= £5 x 31.2 million

= £156 million or £0.156 billion

This resonates with the comments from Procurement in all NHS Boards regarding the high amounts of money spent in the dressings' budget.

4.0 Total costs of home wound care in the UK

Between dressing costs and staffing in the UK we can estimate a cost of **£2.153 billion pounds per annum** for home wound care

This is the cost for regular nursing only and **excludes** costs of treating infected wounds, pressure ulcers, negative pressure therapies, hospital stays etc and thus the actual wound care costs for the UK will be much higher.

The notable point here is that much of this cost is in staff time and again resonates with the fact that it is known that 90% of the NHS budget is spent on staff. This area is thus ripe for the application of telehealth and new medical technologies and the scenario below relates to technologies and software already available and being piloted on a small scale in NHS England.

5.0 The Telehealth Solution – NHS Texting Software and a Sensor for Monitoring Dressings

In the proposed telehealth solution the normal practice of a district nurse visit for a dressing change is replaced with the use instead of the WoundSense™ dressing sensor available from Ohmedics Ltd, placed in a dressing to read dressing moisture (without disturbing the dressing). This allows the dressing to be checked for moisture, leaving the dressing in place if it is moist and not wet. This is best practice for healing most types of wounds. In this scenario the daily district nurse visit is replaced by instructing a patient how to make a dressing moisture reading using a hand held meter. The reading takes only 30 seconds and the result is given in a simple '5 drop ' scale where 1 drop is very dry and 5 drops is wet. The patient is prompted for that reading to be texted via the mobile phone application known as NHS Florence. NHS Florence came from NHS Stoke and is simple to use with no large equipment installation, requiring the patient or carer to simply be able to text from their mobile phone. Most patients will be found not to have wet dressings that require daily dressing changes but will need a dressing change only every 3 days or less. This means the community nurse can plan her visits remotely simply by logging in to NHS Florence from her computer, smartphone or tablet. The NHS Florence app allows other questions to be automatically fed to the patient regarding other information the clinician thinks is important to that wound such as pain or dressing state (e.g. loose or in place). Thus the boundaries for not changing the dressing can be set with some confidence and the system texts back automatically and lets the patient know that they do not have to wait at home for a district nurse visit that day. If the wound type needs to be dry (such as in some diabetic foot treatments) then NHS Flo boundaries can be moved for that patient to ensure that the system triggers intervention if a wet or moist reading is received. Overall a much smaller proportion of patients will have wetter dressings that do require daily changing – this wetness will also be measured by the WoundSense moisture reading and will trigger visits and efficient changes that avoid skin maceration. The WoundSense sensor is available from Ohmedics Ltd who are already working with the NHS Florence app in pilots in SOTW and Nottingham.

6.0 Cost comparisons – Traditional home wound care .v. Telehealth home wound care

We have assumed a very modest change in the number of home wound care visits per week, from 3 to 2 in the scenario below. However we believe that; (1) in many areas visits are more frequent than 3 times per week and (2) our approach might require some dressings to be

confirmed as needing changed only once a week e.g. for leg ulcers in compression. Table 1 below lays out the costs comparison for one patient.

Table 1 Cost comparison for one patient on traditional or telehealth care

Costs Over 7 day patient treatment period		Normal Practice Use 3 dressings packs	WoundSense & NHS Flo telehealth Protocol 2 dressing packs + 2 sensors
Dressings and Associated Consumables	Dressing	£15	£24
	+ Gloves		
	+ Wound care disposable set		
Cost of nursing time	District Nurse visits	£195 (3 x £65))	£130.00 (2 x£65)
District Nurse time used)	Actual staff time used (driving + dressing change = 40 mins) + writing up records	210 mins	140 mins
Amortisation of reusable WoundSense meter over 2 years			£4.75
NHS Florence access per patient per week			£0.35
Total cost over 7 days		£210	£158.10
Costs per patient for <u>6 weeks</u> of home treatment		£1250	£948.60
District Nurse time used over 6 weeks of home treatment per patient		21 hours	14 hours

Thus in any one six-week period of wound care for one patient the telehealth system will save £301.40 of costs and 7 hours of Community Nurse time (or a working day) if the dressing change simply goes from 3 times a week to 2.. This is an annual cost saving of £301/6 x 52= £2612 per patient per annum and 60.7 staff hours per wound care patient even with this small change in home visits.

6.1 Annual cost savings

If we take the cost savings above for 1 patient and assume that 50% of home wound care patients are enrolled in telehealth rather than traditional treatment then we can project the annual cost savings:

Annual cost savings by enrolling 50% of home wound care patients on NHS Flo and WoundSense if home visits change from 3 to 2 per week
= £2612 x 100,000
=£261.2 Million

If the visits go from 3 to 1 per week then the cost savings double to £0.52 Billion

6.1 Annual Staff time Savings

Perhaps more important is the saving in staff time in a stretched NHS that is struggling to cope with a growing elderly population and an increase in chronic disease conditions and patients with co-morbidities. The use of wound care telehealth will free an enormous amount of community nursing time where we estimate that about 50% of nurse time is devoted to woundcare,

Annual time savings for 3 home visits being reduced to 2 visits per week if 100,000 patients are enrolled in wound care telehealth with WoundSense and NHS Flo
= 60.7 x 100000
= 6.07 million staff hours saved

To put this in perspective assuming a 40 hour week and 52 week per year staff provision this frees up about 2918 nurses in the UK for other duties in the community or ward.

The RCN estimated in 2012 that 15.1% of a total of 306,346 qualified nurses worked in Community Nursing in the UK or around 45,000 nurses.

If visits go from 3 times a week to once a week then 12.14 million staff hours are saved or 5836 nurses become deployable in other community or ward duties.

7.0 Barriers to adoption

The strongest barriers to adoption of this solution lie in the clinical staff who are used to a certain clinical pathway and business process. Thus nurses need to be introduced to the telehealth concept and shown that it can help to ease the burden of patient care and increase efficiency in care. Clinical benefits to patients will also increase as there will be less dressing change pain and trauma, reduced opportunity for infection and wounds should heal better if left undisturbed. We are preparing a document in collaboration with Rachel Cashman, Head of Innovation for NHS England for discussion with the Nursing Directorate on how telehealth adoption by nurses can be properly supported.
