An audit to assess the impact of prescribing a monofilament fibre debridement pad for patients with unhealed wounds after six months

Abstract: A monofilament fibre debridement pad has been found to be a rapid and effective mechanical method of removing dry skin, biofilm and debris from acute and chronic wounds with minimal patient discomfort. Evidence of its impact on prescribing and wound healing, however, has been more limited. The aim of this audit was to show evidence of the monofilament fibre debridement pad's impact on wound treatment costs through an analysis of NHS wound-care prescribing data in England. A dataset for 486 uniquely identified patients who had been newly prescribed the monofilament fibre debridement pad was obtained from the NHS Business Services Authority. All data were anonymised. Costs were identified for the six months before and six months after the month of first prescription of the monofilament fibre debridement pad. The total cost of wound-care prescribing fell by 14% or £101,723 in the six months after the intervention compared with the six months before. The average monthly expenditure per patient fell from £244 before the intervention to £209 (n=486) after. These results indicate that use of the monofilament fibre debridement pad could reduce prescribing costs and the use of antimicrobial and negative pressure therapies. Further research is warranted to investigate the clinical role of the monofilament fibre debridement pad in wound healing **Declaration of interest:** This audit was commissioned and funded by L&R, who are suppliers of the Debrisoft range of debridement products. Prescribing data from the NHS Business Services Authority (BSA) were queried using methodology designed by GPrX Data Ltd, who provided data and analysis but were not involved in the writing of this article. Editorial and writing support was provided by the MA Healthcare projects team.

audit • biofilm • chronic • debridement • exudate • hard-to-heal • healing • monofilament fibre • unhealed • wound • wound healing • wounds

ebridement is recommended to remove bioburden from wounds, including necrotic material, eschar, devitalised tissue, serocrusts, infected tissue, hyperkeratosis, slough, pus, haematomas, debris, bone fragments or foreign bodies.¹ It is an important part of wound-bed preparation which creates a 'hygienic', moist environment to induce wound healing.^{1,2} Debridement treats not only the wound bed but is also important to nurture the wound edges and peri-wound skin where biofilm is most

active, since the cells that promote epithelialisation lie around the edges of full-thickness wounds.² Several debridement methods are in use, including sharps, larval, autolytic, enzymatic, jet lavage,

ultrasound and surgical debridement. Mechanical debridement is the process of physically removing devitalised tissue from the wound bed. Historically, this entailed the wet-to-dry technique, where a wet dressing such as gauze was left to dry and then regularly changed, removing devitalised tissue mechanically; however, it could also strip and damage healthy tissue, and can be very painful for the patient.¹ This method is no longer common practice in the UK, and innovative, evidence-based products have been developed to assist with mechanical debridement.³

Mechanical debridement is now typically carried out

using specialised, single-use monofilament fibre debridement pads and debridement cloths. These offer a quick and effective method of debridement that requires no specialist training and can be used in acute and chronic wounds in adults and children.^{1,3}

The Debrisoft monofilament fibre debridement pad is recommended by NICE for use in the community based on evidence of its effectiveness and estimated cost savings.⁴

This monofilament fibre debridement pad is available as either a pad in two sizes for debriding superficial wounds and removing hyperkeratosis from the skin; or as a 'lolly', which has been specially developed to debride hard to reach areas of wounds and skin, including deep surgical wounds.⁵ Since the purpose of this audit was not to distinguish the use of these two variants on different wound types, future references to the intervention are to the monofilament fibre debridement pad.

*Correspondence email: customersolutions@uk.lrmed.com

1 GPrX Data, Cambridge, UK. 2 Lower Limb Consultancy Services Ltd,

© 2021 MA Healthcare

Joanna Burnett,¹ Director*; Andrew Kerr,^{2,3} Director, Honorary Tissue Viability Clinical Nurse Specialist; Margaret Morrison,⁴ Regional Clinical Advisor/Brand Manager; Abbe Ruston,⁴ Brand Manager

UK. **3** Sandwell and West Birmingham Hospitals NHS Trust, UK. **4** Lohmann & Rauscher, Burton on Trent, Staffordshire, UK.

Table 1. Select evaluations of the monofilament debridement pad

	n ent %.	on s and	r. Ved	or 10 Its	ent pad zymatic	aad lement	at the h. All weeks, healing om re	. Of the hange e s, and nge cal	atic hway e int
	und bed) debridem nfort in 55	unds with helializatio totic debri	in, 3 of wh treatmen ent impro	minutes f or 5 patier	nonofilam	afely. The pheric	igested th al of sloug y, for four improved improved fri e wounds PPER sco	essionals s visible c ament fib ound type ound type cound type cound type ound type ound type ound type ound type ound type ound type sible char ith all clin tient had ent techno	wo weeks and non-si ow the path all clinica , 77% we following nal.y patie
	on the wc e for each me discon luration	s, dry wou from epit iyperkera	its had pa rted after Debridem	t time 2–4 minutes f	1 use of n with autol	sily and se se than ot r	bunds sug he removied weekh a achieve a size dec with thre and the U	ealth prof There wa: le monofil in of all w ds with vi sfaction w er and pat debridemu	all after tratic and after the static and not follch the over the the over e patients e patients profession
	tion tissue verage tim ssions, so	nt wound ranulation c layers, ŀ	our patier pain repc patients. vound	bridemen ts and >7	ded after f patients	tively, eas asier to u al or bette	chronic we eficial in t vere clear ient pad tu age woun week four reduced,	by 1129 h on-static. t use of th proportic n of wour tilent satis not the us nent fibre of	unds over ally for bc o did or di isfied' wit <i>i</i> ely. Of th <i>i</i> ely th hea ng health
	% granula sssions. A 45% of se derate pair	eropurule ew vital g i necrolyti	ninutes. F ment. No sed for 11 sment of v	cases. De r 5 patien	und debri 1 38.4% o ts	ebris effec easy or e ated equa	ants with of d was bend ugh and v debridem The aver at at date was nt	answered orted as n after firs y in a high proportic ser and pa nether or r nonofilar	77% of wc Imost equ ionals wh ed' or 'sat ed' or 'sat respectified the treati
	ied as 100 idement se Vo pain in orted moo	udating, s oarating n ounds with d exudate	time 0–5 r re debride isits reduc ind asses	n 95% of minutes fo	ts had wo pared witl over 2 visi	igh and de as equally i efficacy i	of 10 pati ement pa ds had slc offilament ound bed seline to 2 etely. Exu	ons were were repo and/or ski technolog ase in the ase in the nd use. U rience of	hange in ' eported a th profess ely satisfi ely satisfi and 95% and 95%
n results	stive (defin % of debri minutes. h (n=2) rep	ctive in ex crusts sel le, and wo ts of drieo	ridement pain befo nd care v alisation a	mal pain i ents, 5–7 i	of patien visit, com idement o	ioved slou handle w nods, with	se series nd debrid nic woun g the mon a clean w cm ² at ba ing compl oved in ev	ey questi nds, 12% e wound & idement t ther incre the seco omes wer ious expe	e was a c nge was r nds. Heal * 'complet ome 96% ome 96% vay, as re
Mai	Effec 03.4 2.51 4.6%	Effe sero tissu crus	Deb had Wou visu	Mini patie	92% in 1 debr	Rem with mett	A ca wou chro chro usin usin and 8.09 heal	Surv wou debr debr a fur after outc	Ther Char wou were cort cort path
arator(s)	tic, inical with uze, al			cified	tic, atic		rrative	rrative	Irative
Comp	Autoly: mecha wet ga surgica			Unspe	Autoly enzym	n/a	Non- compa	Non- compa	Non- compa
		, tbetic		stiology, s		e ulcers, o, nds in		skin. ? foot her' ås, s,	ed ire (1.7%), unds
		ktremities ad and dia		∕arying a∈ etic ulcer		, pressur nds, deep and wour		d/or scaly ars (10%), diabetic (13%). 'Ot rty wounc rty wounc etic ampu etic ampu etic wounds	hat requir 6), pressu 1 wounds other wou
		ie lower e erial, mixe		ulcers of v cers, diab		oot ulcers gical wou ' wounds, ins		slough an issure ulc unds (3% vounds d acute di iasis, diab i, moistu n, moistu	wounds t sers (67.4% id surgica 7.4%) and
es	spun	unds of th nous, art	Cers	ronic leg aemic ulo		diabetic f d post-sur and cavity ch locatic	s	h visible s 63%), pre irgical wo and other and other s include litis, psori v flaky ski varicose	ion-static it. Leg ulc), dehisce it ulcers (ī
ound typ	Ironic wo	rronic wor cluding ve cers	essure ulo	cluded ch ronic isch		g ulcers, rgical anc perficial <i>a</i> rd-to-rea	ronic wo	ounds wit g ulcers (ihisced su cers (8%) ound type ounds, dry ounds, dry	atic and n bridemen cers (10% abetic foo 3.4%).
Š	ò	E E C	Ϋ́	ch Ch		ls, Le ls su su ha	ò	als buuck	31 (19) (19) (19) (19) (19) (19) (19) (19
ubjects,	Q		N	0	7	3 cliniciaı 55 wounc	0	129 healt rofession	06 health rofession
0	e é é	~ ~		a, e	s, 2 vely	al, 2 nal 1	- -		d d
vpe	ase serie ulticentre omparativ	ase serie	ase serie	ase serie	ase serie trospecti ompared	iternation lulticentre bservation udy	x vivo and linical erforman	linical utcomes ractitione atisfactior udy	utcomes linician an atient atisfactior
F	OFQ	et	12 C	al., C	t O ₩ Q	e sort	цо С	Οοσӝѿ	ပင်တိ
vbu	thr et al., 11 ⁶	, 2011 ¹⁰	ullaghan a ∋phen- ynes, 201 ster) ¹³	hnson et 12 ¹²	etroletti e , 2012 ister) ¹¹	ssemond , 2018 ⁷	thultz et a 18 ²¹	19 ¹⁹	les et al., 19 ²²
St	Ba 20	al.	(p A Ste	Jo 20	Pié al., (pc	al.	20 20	Rc 20	20 20

Table 2. Inclusion criteria

Critorion	Pationalo
Criterion	nationale
Not prescribed Debrisoft in the previous 12 months	To ensure the same wound was shown in the data and the patient had not been treated with Debrisoft for a different wound in the previous 12 months, which the data may have picked up. Also to exclude sporadic use of Debrisoft which has little or no impact
Had been prescribed a wound care item along with Debrisoft in the same month	To ensure that a wound is present. If the patient prescribed Debrisoft only, it is possible that it may have been for a skin condition, e.g. hyperkeratosis or papillomatosis
Had been prescribed a wound care item in each of 6 months before Debrisoft was initiated	To ensure the wound was chronic and to ensure sufficient prescribing history for a comparison on spend and use of different types of wound care items

After being moistened with tap water or saline, the pad's soft, fleecy side is gently wiped over the wound for 2–4 minutes using circular motions on the wound bed and long sweeping strokes on the skin. The monofilament polyester fibres become integrated with surface debris, removing the non-viable tissue as the pad is wiped over the wound.^{6,7}

Until this audit, evidence for the effectiveness of the monofilament fibre debridement pad has been based on a number of small case series, including comparative and non-comparative evaluations in a variety of wound types.¹ Important reviews of the evidence are by NICE,⁴ Madhok et al.⁸ and Meads et al.⁹

Evaluations have previously found the monofilament fibre debridement pad to be equally or more effective than other conventional methods of debridement in a variety of wound types.^{6,7,10} It is quick to use,⁶ may reduce patient consultations by comparison with other methods of debridement,¹¹ and is well tolerated, causing minimal discomfort or pain (Table 1).^{6,12,13}

Existing data on the cost-effectiveness of the monofilament fibre debridement pad are limited. NICE based its cost analysis for its medical technologies guidance on the manufacturer's models.⁴ A health economics perspective is important as the prevalence of acute and chronic wounds and the cost of treating them are rising rapidly. The annual prevalence rose by 71% in the five years between 2012/2013 and 2017/2018, producing a 48% increase in treatment costs in real terms.¹⁴

One cause of rising costs is delayed healing. Guest et al. 2020 estimated the cost of treating the 30% of wounds that fail to heal in a year at £5.6 billion, substantially higher than the £2.7 billion cost of treating wounds that healed within the study year.¹⁴ Delayed healing also increases morbidity and the impairment of patients' quality of life, with physical, emotional and socioeconomic consequences.¹⁵⁻¹⁷

Effective debridement is among the many clinical and non-clinical factors responsible for good wound healing.¹⁸ A better understanding of the impact of the monofilament fibre debridement pad on wound-care prescribing can therefore provide important evidence to inform efforts to improve wound-healing rates and health outcomes for patients.

Aim and objectives

The aim of this audit was to show evidence of the impact of the monofilament fibre debridement pad on treatment costs.

The objectives were to identify patients who were prescribed the monofilament fibre debridement pad for the first time in England, determine their woundcare prescribing costs in the six months before and six months after the introduction of the pad, and account for differences found in the cost of prescribing other dressings.

Methods

This retrospective audit examined an anonymous set of prescribing data from the ePACT dataset of the NHS Business Services Authority (BSA). The data were obtained using a non-academic research request, which allows third parties to request non-identifiable patient data.

Primary inclusion criteria were that patients received prescriptions in England, and had been prescribed wound-care products in seven successive months, month 7 being the month in which they were first prescribed the monofilament fibre debridement pad (Table 2).

Patients were included regardless of whether or not they were co-prescribed compression therapy; however, the cost of all compression garments was excluded. As compression therapy such as hosiery and adjustable wraps is generally prescribed for long-term use rather than every month, it would have unfairly skewed the comparison of the pre- and post-initiation data.

The dataset was selected from prescriptions dispensed in England between April 2018 and September 2019. Patients were 'first prescribed' the monofilament fibre debridement pad between October 2018 and March 2019 (the month zero), and had been prescribed a wound product in each of the previous six

months. The data does not reveal whether any of the patients had been prescribed the monofilament fibre debridement pad more than 12 months previously.

The outcome measure was the difference in the cost of prescribing wound-care products for an English national dataset in the 6 months before and the 6 months after the first month of prescribing the monofilament fibre debridement pad.

Audit protocol

The data output was designed to avoid any possibility that a patient's unique prescribing history might be recognised. All data were provided on an aggregated basis so that no patient-identifiable fields were reported in the output. Research ethics approval was therefore not required as the audit involved no patients and only non-identifiable patient data.

The NHS BSA's full prescribing reimbursement dataset was queried, so that the base dataset was any individual receiving a prescription for any product which had been prescribed and dispensed in England.

The initial query identified prescriptions given to patients who had been prescribed the monofilament fibre debridement pad for the first time, i.e., patients with a prescription item for the monofilament fibre debridement pad, no such prescription in the previous 12 months, and a prescription for an additional wound-care dressing in the initiation month. This excluded patients whose debridement was not prescribed for wound care, for example, for hyperkeratosis.

The analysis was run for six separate initiation months (from October 2018 to March 2019). The data for these initiation months (M0) were combined.

The removal of the actual calendar month by combining the six initiation months produced a larger dataset and further reduced the possibility that a known patient could be identified.

Patients were included only if they had received a prescription for a wound-care product in each of the six months preceding the initiation month. This ensured that patients identified as being prescribed the monofilament fibre debridement pad in M0 had a wound care history. Regular prescriptions for the preceding six months indicated that each patient:

- Had a chronic wound
- Received their wound-care products by prescription
- Would continue to need wound-care prescriptions in subsequent months.

This filter produced a sample of prescribing data for 486 unique patients.

- The requested data fields were:
- Unique monthly patient count
- Monthly reimbursement expenditure on woundcare products (generically listed in Table 3) prescribed per patient in 'M0' (the initiation month), in each of the previous six months ('M-6' to 'M-1') and in each of the subsequent six months ('M1' to 'M6').

Reimbursement expenditure was reported by category: antimicrobial, non-medicated, negativepressure dressings and the monofilament fibre debridement pad.

To ensure as many patients as possible were followed after initiation of the monofilament fibre debridement pad, a broader set of products was used for the postinitiation scan, including topical irrigation, swabs and other debridement products.

For the summary report (M-6 to M-1 grouped, and M1 to M6 grouped) a request was made for the sum of the:

- Number of unique patient prescription months
- Earliest or latest month in which a prescription was received for each patient.

The purpose of these additional fields was to validate the patient coverage and drop-out rate. It represented the maximum level of detail that could be requested according to NHS BSA disclosure control protocols.

Results

Monthly costs for prescribing and dispensing woundcare items excluding compression therapy were extracted for 486 uniquely identified patients who had

Table 3. Cost

Dressing	6 months before Debrisoft (£)	6 months after Debrisoft (£)	Difference (£)	Percentage fall (%)
Antimicrobial dressing	146,611.51	97,566.28	49,045.23	33.45
Antimocrobial other	4565.41	4141.42	423.99	9.29
Negative pressure dressing	14,134.97	10,116.82	4018.15	28.43
Negative pressure other	4370.16	1591.14	2779.02	63.59
Non-medicated dressing	532,910.53	447,457.49	85,453.04	16.04
Non-medicated other	9874.05	7399.37	2474.68	25.06
Total	712,466.63	568,272.52	144,194.11	20.24
Debrisoft	0.00	42,471.76		
Totals incl. Debrisoft Rx	712,466.63	610,744.28	101,722.35	14.28

been newly-prescribed the monofilament fibre debridement pad between October 2018 and March 2019. All 486 patients had been prescribed wound dressings in each of the six months before initiation of the monofilament fibre debridement pad, as well as in month zero in addition to the pad.

In the six months after initiation, 22 patients disappeared from the original dataset, a drop-out rate of 4.5%. Of the remaining 464 uniquely identified patients, the number receiving a wound-care prescription in each month fell steadily from 411 in the first month after the monofilament fibre debridement pad was prescribed, to 376 in the second month and 276 by the sixth month after initiation.

In the six months before month zero, the average expenditure on dressings increased, mainly because of a rise in the use of antimicrobial and negative-pressure dressings. The monthly average was £118,744, climbing from £97,623 six months before month zero to £131,591 in the month before, with a high of £141,349 two months before month zero. The average dressing spend per patient was £1,466, or £244 per patient per month.

Month zero had the highest prescription cost of the audited months: £162,557 or £334 per patient. The initial cost of introducing the monofilament fibre debridement pad was £31,162 in addition to £131,395 for other wound-care products. That equates to an average cost of £64 per patient for the monofilament fibre debridement pad in the initiation month, compared with £270 on other wound-care items.

The cost of prescribing the monofilament fibre debridement pad declined after month zero from £8,714 in the first month after initiation, and a high of £9,922 in month 2, to a low of £5,545 in month 6 after its introduction. The average monthly cost after initiation was £7,078

In the six months after month zero, the overall cost of wound-care prescribing declined to £610,744, an average of £101,791 per month. Costs were £114,368 in month 1 after first use of the monofilament fibre debridement pad, rising to £126,909 in month 2, before falling to £87,867 in month 6.

Comparison

In the six months after the introduction of the monofilament fibre debridement pad, the overall cost of prescribing wound-care items fell from £712,467 in the six months before initiation to £610,744, a reduction of £101,723 or 14% (Fig 1).

If the extra cost of prescribing the monofilament fibre debridement pad is removed from the equation, the cost of prescribing antimicrobial, negative-pressure and non-medicated items fell by £144,194 to £568,272 compared with the previous six months, a 20% reduction.

There were variations among these three categories. There was a fall of 33% for antimicrobial dressings, 28% for negative pressure dressings and 16% for



Fig 1. Reduction in total wound-care spending (excluding compression) (n=486)

Fig 2. Average monthly cost of prescriptions per patient



*Note: if including only the 464 remaining patients, post-Debrisoft costs per patient are £219. This is £25 lower than pre-Debrisoft

non-medicated dressings (Table 3).

The average monthly prescribing cost per patient, including the monofilament fibre debridement pad in the six months after its introduction was £209 (n=486), £35 lower than in the six months before the intervention (Fig 2).

If the 22 patients who dropped out of the dataset are removed from the calculation, the average monthly prescribing cost after the intervention is £219 per patient, £25 lower than in the six months before the monofilament fibre debridement pad was prescribed.

The average spend on the monofilament fibre debridement pad in the post-intervention months was $\pounds 20$ per patient for those still receiving wound care, compared with $\pounds 64$ in the initiation month.

The number of patients who received a wound-care prescription in each month fell from 486 in the first seven audited months to 276 in the sixth month after the intervention, a decrease of 210 or 43% (Fig 3).

Marginal changes in costs per category were observed. The average monthly expenditure per



Fig 3. Wound-care prescribing costs in the 13 audited months

Cohort 3 - tracking patients reciving a woundcare prescription every month M-6 to M-0 (Debrisoft initiation month)

Sum of NIC DEBRISOFT
 Sum of NIC Non-medicated Other
 Sum of NIC Non-medicated Dressing
 Sum of NIC Negative pressure Dressing
 Sum of NIC Antimicrobial Other
 Sum of NIC Antimicrobial Dressing
 Total patient count for time period



Fig 4. Average wound-care prescribing cost per patient all 13 months, separate item groups [slide 10]

Sum of NIC DEBRISOFT
 Sum of NIC Non-medicated Other
 Sum of NIC Non-medicated Dressing
 Sum of NIC Negative pressure Dressing
 Sum of NIC Antimicrobial Other
 Sum of NIC Antimicrobial Dressing

patient on non-medicated wound-care dressings rose, while the average monthly cost per patient of antimicrobial dressings fell (Fig 4).

Effect of drop-outs

A question is raised about the comparability of the two six-month groups of data, given that 22 patients dropped out after month zero, and many of the 464 who remained did not receive a wound-care prescription in every month as they had in the six months before the monofilament fibre debridement pad was prescribed.

The 4.5% drop-out rate may be considered small compared with the reduction in overall costs. The

22 patients might have dropped out because their wounds healed or before healing was complete. It is possible they had left England and were treated elsewhere.

One way to test the comparability of the two sixmonth sets of data is to compare the results for unique patient months. A unique patient month refers to the prescribing costs in an audited month for one of the 486 patients uniquely identified in the dataset. Before the intervention, there were 2916 patient months (n=486 x 6 months). For the six months after the monofilament fibre debridement pad was prescribed, unique patient months fell to 2,035 because the remaining 464 patients did not receive a prescription

every month. That equates to receiving a prescription in an average of 4.4 distinct months, approximately once every 46 days.

The fall in unique patient months from 2916 to 2035 is 30%, which might indicate incompatibility between the two sets of data. However, the sum of maximum patient months was 2321, meaning that the average patient was still receiving prescriptions in month 5 after the intervention. This shows that a majority of the 464 patients in the post-intervention dataset were being treated throughout the six months after the intervention, suggesting broad compatibility of the two datasets.

Discussion

The fall in total prescribing costs for the audited patient dataset after the introduction of the monofilament fibre debridement pad suggests that the intervention had a positive impact. The cost of treatment for the patients in the dataset not only fell as a whole, but reversed the upward trend in costs in the six months before the intervention (Fig 3).

Substantially fewer antimicrobial and negativepressure products were prescribed after the introduction of the monofilament fibre debridement pad, which reversed the increased need for these products that was observed in the 6 months before the intervention.

Roes et al.¹⁹ recently published the findings of a non-comparative, open label evaluation conducted on static/non-healing acute and chronic wounds with visible slough and/or scaly skin that required debridement. The monofilament fibre debridement pad was applied in 1-2 sequential applications during normal clinical practice which followed local practice, guidelines or formularies. Following the clinical phase of the evaluation, 1129 health professionals completed an online survey of the clinical outcomes and their satisfaction with them. This highlighted positive changes in the wound and/or skin after first use of the monofilament fibre debridement pad in a high proportion of all wound types. This was significant for both static and non-static wounds, and included:¹⁹

• Healing progression and/or skin improvement

- Reduction in Exudate
- Reduction in production of slough and debris
- Improvement in granulation tissue and /or skin
- No signs of infection
- Overall clinical outcome.

You may therefore hypothesise that the introduction of the monofilament fibre debridement pad may reduce the clinical need for antimicrobial therapy.

Although there was an initial additional cost for introducing the monofilament fibre debridement pad in month zero, this declined over the subsequent six months. The monofilament fibre debridement pad added only marginally to the average prescribing cost per patient, while the overall prescribing cost for the dataset fell. It is difficult to explain the disappearance of 22 patients from the post-intervention data, but some theoretical possibilities might be proposed. One is that they left England and received treatment in another part of the UK or abroad. Another is that their wounds healed soon after the intervention. If their wounds had healed, they might have been prescribed compression therapy in the months after the intervention. However, if they had been prescribed compression, they would not have appeared in the data unless they had also been prescribed one of the non-compression wound-care items included in the post-intervention data, since compression costs were excluded. The 22 absent patients might also have received prescriptions later than 6 months after the pad's introduction.

The relatively constant level of the average monthly prescribing cost per patient for those who continued to receive prescriptions suggests that, despite the intervention, most of the 464 patients remaining in the post-intervention data continued to require a similar level of spending on wound-care items after the monofilament fibre debridement pad was prescribed, although the pattern of product use changed.

A variety of reasons other than the introduction of the monofilament fibre debridement pad might have been responsible for the changes in prescribing costs observed in this audit. There are many requirements for good and timely wound healing. An expert, evidence-based wound assessment must include a holistic assessment of the patient's needs and preferences, as well as the wound's aetiology and the patient's comorbidities. This will ensure optimal exudate management, the selection and use of appropriate wound-care products, and the enhancement of patients' concordance with the chosen treatment regimen. The nurse-patient relationship is therefore critical.^{2,20} Such factors will have influenced the wound healing of the patients whose prescribing data are examined by this audit, but it is not possible to be conclusive about how they might have contributed to the results observed. The data does not make it possible to determine the extent to which the results observed were due to the intervention, or to other factors such as wound healing, improved concordance with treatment and changes in psychosocial factors.

Although positive reductions were observed in overall prescribing costs, the number of patients receiving a monthly wound-care prescription, and the use of antimicrobial dressings, it is not possible to draw conclusions about the clinical effectiveness or impact on wound healing of the monofilament fibre debridement pad on the basis of these results.

The data examined did not include the clinical factors that might have been involved in producing these results, such as whether some patients might have benefited more than others from use of the monofilament fibre debridement pad, nor how outcomes might have been influenced by factors such as concordance with treatment, wound aetiology or comorbidities. Measurements that were out of the scope of this audit included: reduction of bioburden; accelerated healing; and reduction of clinician time and health resource.

Limitations

The data available for analysis are limited to overall prescribing costs per month for each patient. It is therefore not possible to determine in greater detail the number of prescriptions dispensed for each patient, nor the number of wound care items dispensed. In addition, the necessary anonymisation of the data prevents correlations with details of patients' wound aetiologies, comorbidities and sociodemographic factors, and changes in the course of treatment that might enable further conclusions to be drawn about the impact of the intervention on wound healing. Caution is therefore needed in interpreting the observed reductions in total and monthly prescribing costs, and the number of patients receiving woundcare prescriptions each month following the intervention.

Conclusions

More research is needed to determine how the introduction of the monofilament fibre debridement pad reduced the cost of prescribing, led to a reduction in antimicrobial treatments, and how it might have promoted wound healing. Future studies could be

References

1 Strohal R, Dissemond J, Jordan O'Brien J, Piaggesi A, Rimdeika R, Young T, et al. EWMA Document: Debridement. An updated overview and clarifi cation of the principle role of debridement. J Wound Care. 2013;22:S1–52

2 Murphy C, Atkin L, Swanson T, Tachi M, Tan YK, de Ceniga MV, et al. Defying hard-to-heal wounds with an early antibiofilm intervention strategy: wound hygiene. J Wound Care. 2020;29(Sup3b):S1–26.
3 Edmunds B. Wound debridement in the community. Journal of Community Nursing. 2018;32(4 Sup)

4 National Institute for Health and Care Excellence. The Debrisoft monofilament debridement pad for use in acute or chronic wounds. NICE Medical technologies guidance 17. Last updated March 2019 [Internet]. 2014. www.nice.org.uk/guidance/mtg17 [accessed 05/03/2021] 5 L&R, Debrisoft. https://lohmann-rauscher.co.uk/woundcare/debrisoft/ debrisoft [accessed 05/03/2021]

6 Bahr S, Mustafi N, Hättig P, Piatkowski A, Mosti G, Reimann K, et al. Clinical efficacy of a new monoflament fibre-containing wound

debridement product. J Wound Care. 2011;20(5):242–8
7 Dissemond J, Eberlein T, Bültemann A, Riepe G, Stoffels I, Stephen-Haynes J, et al. A purpose-designed monofilament-fibre pad for debridement of hard-to-reach wounds: experience in clinical practice. J Wound Care. 2018;27(7):421–5

8 Madhok BM, Vowden K, Vowden P. New techniques for wound debridement. Int Wound J. 2013;10(3):247–51

9 Meads C, Lovato E, Longworth L. The Debrisoft Monofilament

Debridement Pad for Use in Acute or Chronic Wounds: A NICE Medical Technology Guidance. Appl Health Econ Health Policy. 2015;13(6):583–94.

10 Haemmerle G, Duelli H, Abel M, Strohal R. The wound debrider: a new monofilament fibre technology. Br J Nurs. 2011;20(Sup2):S35–42
11 Pietroletti R, Capriotti I, Di Nardo R, Mascioli P, Gonzales M, Ermolli R. Economical comparison between three different types of debridement (autolytic and enzymatic vs mechanical debridement with polyester fibres) [poster]. Wounds UK Conference, November 2012, Harrogate, UK
12 Johnson S, Collarte A, Lara L, Alberto A. A multi-centre observational

designed to investigate which patients with which aetiologies and comorbidities respond best to debridement with the monofilament fibre debridement pad.

Guest et al. 2020 advocated three measures to address the burden of wounds: more accurate diagnosis, infection prevention, and improvement of woundhealing rates.¹⁴ This study shows the need for further research to investigate the positive impact of the monofilament fibre debridement pad on prescribing costs. Additional studies including RCTs could provide more evidence about the monofilament fibre debridement pad's impact on wound healing and answer questions about the role of debridement in wound healing more generally.

Overall, this retrospective audit found a reduction in total and average monthly wound care costs (including debridement but excluding compression) in the six months following introduction of the monofilament fibre debridement pad, compared with the six months before. The number of patients receiving a wound-care prescription (other than compression) and receiving antimicrobial dressings also fell. This audit provides important evidence about the impact of the monofilament fibre debridement pad on wound-care prescribing costs and product use for patients whose wounds were not healing after six months treatment. These results warrant additional studies designed to clarify the clinical role of the monofilament fibre debridement pad in wound healing. JWC

study examining the effects of a mechanical debridement system. Journal of Community Nursing. 2012;26(6):43–7

13 Callaghan R, Stephen-Haynes J. Changing the face of debridement in pressure ulcers [poster]. Wounds UK Conference, November 2012, Harrogate, UK

14 Guest JF, Fuller GW, Vowden P. Cohort study evaluating the burden of wounds to the UK's National Health Service in 2017/2018: update from 2012/2013. BMJ Open. 2020;10(12):e045253

15 Goodridge D, Trepman E, Sloan J, Guse L, Strain LA, McIntyre J, et al. Quality of life of adults with unhealed and healed diabetic foot ulcers. Foot Ankle Int. 2006;27(4):274–80

16 Olsson M, Järbrink K, Divakar U, Bajpai R, Upton Z, Schmidtchen A, et al. The humanistic and economic burden of chronic wounds: A systematic review. Wound Repair Regen. 2019;27(1):114–25

17 Wounds UK. Best practice statement: improving holistic assessment of chronic wounds. 2018. https://www.wounds-uk.com/resources/ details/best-practice-statement-improving-holistic-assessment-chronicwounds faccessed 05/03/20211

18 Vowden KR, Vowden P. Wound debridement, Part 1: non-sharp techniques. J Wound Care. 1999;8(5):237–40

19 Roes C, Calladine L, Morris C. Rapid debridement with monofilament fibre debridement technology: clinical outcomes and practitioner satisfaction. J Wound Care 2019; 28(8):534–541. https://doi.

org/10.12968/jowc.2019.28.8.534 20 Atkin L, Bučko Z, Montero EC, Cutting K, Moffatt C, Probst A, et al. Implementing TIMERS: the race against hard-to-heal wounds. J Wound Care. 2019;28(Sup3a):S1–50

21 Schultz GS, Woo K, Weir D, Yang Q. Effectiveness of a monofilament wound debridement pad at removing biofilm and slough: ex vivo and clinical performance', J Wound Care 2018; 27(2):80–90. https://doi.org/10.12968/jowc.2018.27.2.80

22 Roes C, Calladine L, Morris C. Biofilm management using monofilament fibre debridement technology: outcomes and clinician and patient satisfaction. J Wound Care 2019; 28(9):608–622. https://doi.org/10.12968/jowc.2019.28.9.608