

BMJ Open Strategies for reducing pain at dressing change in chronic wounds: protocol for a mapping review

Andrew James Kirkcaldy ,¹ Matthew Wilson,¹ Richard Cooper ,¹ Susan K Baxter ,¹ Fiona Campbell²

To cite: Kirkcaldy AJ, Wilson M, Cooper R, *et al*. Strategies for reducing pain at dressing change in chronic wounds: protocol for a mapping review. *BMJ Open* 2023;**13**:e072566. doi:10.1136/bmjopen-2023-072566

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2023-072566>).

Received 07 February 2023
Accepted 31 August 2023



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹School of Health and Related Research (SchARR), The University of Sheffield, Sheffield, UK

²Evidence Synthesis Group, Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK

Correspondence to

Dr Fiona Campbell;
Fiona.Campbell1@newcastle.ac.uk

ABSTRACT

Introduction Although pain experienced at dressing change has been reported as the worst aspect of living with chronic wounds, UK guidance for their management is primarily tailored to wound healing and only attends to pain as a secondary consideration. Consequently, there is little up-to-date guidance that specifically addresses how patients, carers and healthcare professionals should manage wound-related pain at dressing change. This mapping review will identify, describe and appraise the existing research evidence for strategies used to assess pain intensity and prevent or alleviate pain at dressing change in chronic wounds. In addition, it will highlight areas for future research and inform the development of up-to-date guidance for healthcare professionals.

Methods and analysis We will search MEDLINE and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily (via Ovid SP), Embase (via Ovid SP), Cochrane Central Register of Controlled Trials (via Wiley Cochrane Library), Cumulative Index of Nursing and Allied Health Literature (via EBSCO) and the Web of Science Citation Index Expanded and Social Sciences Citation Index (via Clarivate Analytics). Screening will be undertaken independently by two reviewers, with any disagreements resolved through discussion. Included studies will be subject to coding, using a tested data extraction tool, by two reviewers working independently. The methodological quality of the studies included will be reviewed using quality assessment instruments appropriate for each study design (Cochrane Risk of Bias tool (RoB 2); Risk of Bias in Non-randomised Studies of interventions tool; Critical Appraisal Skills Programme tool). Data will be described narratively and also presented visually in an interactive web-based evidence and gap map.

Ethics and dissemination As this mapping review does not collect original data, ethical approval is not applicable. Findings will be disseminated via a written report, an interactive online mapping tool and in peer-reviewed journals and conference presentations.

PROSPERO registration number CRD42021260130.

INTRODUCTION

In 2017–2018, the National Health Service managed an estimated 3.8 million adults over 18 years of age with a wound, of which 42% were estimated as being chronic wounds.¹ A chronic wound is an open sore in the skin

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We are aiming to produce the most comprehensive review of evidence yet published on strategies for reducing pain at dressing change in chronic wounds.
- ⇒ The results of this review will be reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews statement for reporting items for systematic reviews and meta-analyses.
- ⇒ We will not be excluding studies based on the language in which they were published.
- ⇒ There is a possibility that strategies used in practice, but not evaluated, may be omitted from our review.

that does not heal, or takes a long time to heal, and frequently recurs.² Chronic wounds include pressure ulcers (bed sores) venous (vein-related) leg ulcers and foot ulcers in people who have diabetes.³ While different chronic wounds may have differing aetiology, symptoms and treatments, all share the need for regular dressing changes, sometimes several times per week.^{1,4} Pain associated with chronic wounds is a combination of acute and chronic pain (nociceptive and neuropathic) and dressing change may exacerbate these.⁴

Pain during dressing change has been reported as the worst part of living with a chronic wound,⁵ with dressing removal ‘the time of greatest pain closely followed by wound cleansing’ (p4).⁶ A 2008 cross-sectional international survey (n=2018) reported that almost 15% of patients with wounds experienced dressing-related pain ‘most of the time’ during dressing change, with 17.2% reporting pain ‘all of the time’ during dressing change (p159).⁵ The same study⁵ also reported a significant association between certain wound types (venous, mixed and arterial ulcers) and more frequent pain at dressing change; the time for pain to diminish following dressing change ranged from under 1 hour to over 5 hours.



Other studies have highlighted the varied ways in which healthcare professionals seek to measure and minimise patients' pain.^{7–12} For example, an Irish study investigated nurses' knowledge of wound management in relation to dressing change and pain (n=100).¹² It found that the most common methods used by nurses to assess wound pain at dressing change were talking generally to the patient and monitoring facial expression respectively.¹² Prescribed analgesia prior to dressing change was the most frequently used method to overcome pain, with soaking old dressings before removal the second most used method.¹² Further work^{13–15} echoes the European Wound Management Association's (EWMA's) observation that dried-out dressings, adherent products and gauze are most likely to cause pain and trauma at dressing change, with products such as hydrogels and soft silicone dressings least likely.⁶ However, the EWMA also notes that '[s]upporting the surrounding skin during dressing removal' is not prioritised by many healthcare practitioners, despite indications that 'adhesive wound care products ... [lead] to skin stripping and potential skin trauma and pain' (p5).⁶ This coheres with accounts of 'complacency from healthcare professionals when considering management of pain in people with chronic wounds' (p114)¹⁶ and the resultant 'considerable distress' for patients (p114).¹⁶

To date, there has been no attempt to systematically appraise and review the literature relating to pain at dressing change for chronic wounds, and this proposed review aims to address this using recognised systematic review conduct guidelines.^{17 18} Our primary aim is to identify, describe, map and assess the range of pharmacological (eg, use of pre-emptive analgesic measures) and non-pharmacological interventions (eg, distraction and relaxation techniques) used to assess pain intensity and prevent or alleviate pain at dressing change in chronic wounds. We will outline the measures nurses adopt to assess patients' experience of pain during chronic wound dressing and examine if there are any variations in practice and pain experience that are influenced by wound type or the setting in which care is delivered. We aim, by mapping evidence to all potential interventions, to highlight where further primary research is needed. We also want to create a visual map that provides an overview of the existing evidence to act as a resource to enable relevant evidence to be accessed readily by knowledge users.

METHODS AND ANALYSIS

This systematic mapping review has been registered with the International Prospective Register of Systematic Reviews¹⁹ and is being undertaken in accordance with the general principles recommended in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews statement.¹⁷ Work commenced on the study in April 2021 and the final report is due in September 2024. This protocol has been drafted with reference to Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols.¹⁸

Criteria for study inclusion

Population

Adults who are receiving care for a chronic wound. Consistent with Frykberg and Banks' 2015 description of chronic wounds as those 'wounds that fail to proceed through the normal phases of wound healing in an orderly and timely manner' (p561),²⁰ we are defining chronic wounds as pressure ulcers, venous leg ulcers, arterial ulcers, neurotrophic ulcers and foot ulcers in people with diabetes.

Intervention

Must comprise a pain-relief strategy, or strategies, to prevent and/or alleviate acute pain at dressing change for chronic wounds, and measure or report on pain experienced at dressing change. This will include, but not be limited to, choices of dressings, encouragement of the use of analgesics and alternative therapies. We will include any intervention delivered at any point in the dressing change process, including preparation of the patient prior to the dressing change, interventions during dressing change and those delivered at completion of the dressing change.

Comparator condition

Patients receiving usual care, placebo or an alternative treatment.

Outcomes

The primary outcomes will be: (1) patients' experience of pain and its relationship to both the stage of dressing change (removal, wound preparation, dressing) and the stage of healing, (2) patient-reported pain scores using visual analogue scales, verbal rating scales, numerical rating scales, pictorial rating scales, (3) pain scores from pain questionnaires such as the McGill Pain Questionnaire, Brief Pain Inventory,²¹ (4) subjective global rating of pain relief (better/unchanged/worse), (5) summary measures such as sum of pain intensity differences and total pain relief achieved,²² (6) narrative, behavioural, facial and other expressions. Secondary outcomes will be the use of analgesics and any adverse effects of pain relief strategies for dressing change. While this is not a cost-effectiveness review, any cost data and resource use data that are reported by included studies will also be extracted and summarised.

Study type

For this mapping review we will include both systematic review level evidence and primary studies. Eligible primary study designs include comparative study designs, surveys and qualitative evidence that has sought to gather the views and experiences of patients, carers and/or healthcare professionals. Each included study will have reported interventions and strategies to reduce pain associated with dressing change in patients with chronic wounds and have measured pain at dressing change. We will also include a search for grey literature, including PhD theses.

Search strategy for identification of studies

A comprehensive and systematic search has been conducted for this review. This has comprised a search of major medical, health-related, nursing and allied health professionals and multidisciplinary electronic databases (MEDLINE and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily (via Ovid SP), Embase (via Ovid SP), Cochrane Central Register of Controlled Trials (via Wiley Cochrane Library), Cumulative Index of Nursing and Allied Health Literature (via EBSCO) and the Web of Science Citation Index Expanded and Social Sciences Citation Index (via Clarivate Analytics)). Ongoing trials have been sought from the US National Library of Medicine and the WHO International Clinical Trials Registry Platform. Searches have not been restricted by language, geographical location or date. Where applicable, we will use translation software to translate the title and abstract. If detailed data extraction is needed, we will draw on the support of a wide team of staff fluent in European, South Asian and African languages. If we are unable to successfully complete data extraction we will list the paper and make it clear that it is missing from our analysis and synthesis. The reference lists of included studies will be examined for additional relevant references and, where appropriate, forward citation tracking will be conducted using Web of Science and Google Scholar. Authors will be contacted where additional information is required from publications, and where ongoing trials have been identified. An example of the search strategy for MEDLINE is presented in [table 1](#) and search strategies for other databases are included as online supplemental material S1.

Study selection process

Two reviewers (AJK, FC) will screen identified studies (titles, abstracts or full research papers) using EPPI-Reviewer Web (Beta), a cloud-based software programme for literature review data management and analysis. Any disagreements regarding inclusion are subject to discussion between these two reviewers. Reasons for inclusion and exclusion are being recorded and will be outlined in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.

Quality assessment

We will assess the methodological quality of studies included in the evidence review using quality assessment instruments appropriate for each study design. Version 2 of the Cochrane risk-of-bias tool for randomised trials is a recommended tool to assess the risk of bias in randomised trials and is structured into a fixed set of domains of bias, focusing on different aspects of trial design, conduct and reporting.²³ For non-randomised studies we will apply the ROBINS-I (Risk of Bias In Non-randomised Studies of interventions) tool.²⁴ The ROBINS-I is a tool developed to assess risk of bias in the results of non-randomised studies that compare

Table 1 Search Strategy

#	Searches
1	exp Foot Ulcer/
2	exp Diabetic Foot/
3	(diabet* adj3 ulcer*).tw.
4	(diabet* adj3 (foot or feet)).tw.
5	(diabet* adj3 wound*).tw.
6	exp Leg Ulcer/
7	((varicose or venous or leg or stasis or crural or cruris or cruris) adj3 ulcer*).tw.
8	exp Pressure Ulcer/
9	(pressure adj3 (ulcer* or sore* or injur*)).tw,kw.
10	(decubitus adj3 (ulcer* or sore*)).tw,kw.
11	(bed next sore* or bedsore).tw,kw.
12	exp Skin Ulcer/
13	((skin or foot or arterial or neuropathic) adj3 ulcer*).tw.
14	((ischaemic or ischemic) adj3 (wound* or ulcer*)).tw.
15	(chronic adj3 wound*).tw.
16	(chronic adj3 ulcer*).tw.
17	r/1–16
18	exp Analgesia/
19	exp Analgesics/
20	exp Analgesics, Opioid/
21	pioid*.ti,ab.
22	exp Anti-Inflammatory Agents, Non-Steroidal/
23	(non steroidal anti-inflammator* or nsaid*).tw.
24	exp Anesthetics, Local/
25	((topical or local) adj3 (anaesthe* or aneste*)).tw.
26	((topical or local) adj3 analges*).tw.
27	exp Pain/
28	pain*.ti,ab.
29	r/18–28
30	exp Wound Healing/
31	wound care.mp.
32	exp Bandages/
33	dressing*.mp.
34	(hydrocolloid* or alginate* or hydrogel* or foam or bead or film* or tulle or gauze or non-adherent or non adherent of silver or honey or matrix or paste*).mp.
35	r/30–34
36	17 and 29 and 35

health effects of two or more interventions.²⁴ For other study designs (eg, systematic reviews, cohort studies, case-control studies, qualitative studies) we will apply the appropriate CASP (Critical Appraisal Skills Programme) tool (CASP checklists).²⁵ Study quality will be assessed by two independent reviewers (AJK, FC) and any disagreements will be resolved through discussion.



Data extraction

Data describing the details of the intervention and at what stage in the dressing process it was used will be coded. We will also describe how pain was assessed and by whom. Study design and its quality will also be appraised. Any associated factors such as wound type and characteristics which may be relevant to the pain experienced at chronic wound dressing change and associated strategies will also be described. The data will be coded using a data extraction tool that will be designed and tested by the review team and in consultation with stakeholders. Coding of the data will be performed by two reviewers (AJK, FC) working independently. Differences will be resolved by discussion. The process will be managed in Eppi-Reviewer.²⁶

Data synthesis

The data will be described narratively and presented in numerical, tabular and textual format. A coding framework will be created informed by a 'dressing change pathway' that was designed in consultation with stakeholders. This will enable gaps in the evidence base, where strategies in use may have been poorly evaluated. An interactive web-based tool will be used to show the review findings. The matrix will comprise column headings (methods of pain assessment and by whom) and the row headings will represent the interventions. An interactive evidence and gap map will be created using Eppi-Mapper.²⁷

Ethics and dissemination

This mapping review does not collect original data and ethical approval is not applicable. Findings will be disseminated via a written report, an interactive online mapping tool and in peer-reviewed journals and conference presentations.

Patient and public involvement

Members of our patient and public involvement group have been consulted and involved in the design of this review protocol. In particular, via regular online meetings, patients and their family members have been involved with designing the 'dressing change pathway' and potential interventions to alleviate pain that might be implemented. They have provided expert insights that have shaped our approach to this review and will receive electronic copies of any outputs relating to it.

CONCLUSION

This systematic review directly responds to calls for academic inquiry to investigate the efficacy of interventions which aim to prevent or reduce pain in chronic wounds at dressing change.²⁸ Its results will offer an up-to-date overview of both pharmacological and non-pharmacological interventions that have the potential to ease the pain of individuals with chronic wounds at dressing change, and will also outline the range of

measures used by healthcare professionals to assess pain at dressing change in this population. A limitation of this approach is the need for regular updating of the review in order to remain useful and relevant. We will be exploring methods to support regular updates of the review during the progress of the review. By conducting what we anticipate will be the most comprehensive exploration of this topic to date, we will present an invaluable synthesis of the extant knowledge in this field.

Twitter Richard Cooper @richard__cooper

Contributors FC conceptualised and designed the protocol and is the guarantor of this review. AJK drafted the initial manuscript. AJK, FC, RC, MW and SKB all approved and contributed to the final written manuscript. We thank the members of our PPI group for their invaluable contribution to the study.

Funding This research was funded by the National Institute of Health Research (NIHR), grant number: 131023.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Andrew James Kirkcaldy <http://orcid.org/0000-0002-8455-8786>

Richard Cooper <http://orcid.org/0000-0001-5110-0384>

Susan K Baxter <http://orcid.org/0000-0002-6034-5495>

REFERENCES

- 1 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:e045253.
- 2 Siddiqui AR, Bernstein JM. Chronic wound infection: facts and controversies. *Clin Dermatol* 2010;28:519–26.
- 3 Frade MAC, Das PK. Chronic ulcers: updating epidemiology, pathophysiology, and therapies. *Ulcers* 2013;2013:1.
- 4 Price P, Fogh K, Glynn C, et al. Managing painful chronic wounds: the wound pain management model. *Int Wound J* 2007;4:4–15.
- 5 Price PE, Fagervik-Morton H, Mudge EJ, et al. Dressing-related pain in patients with chronic wounds: an international patient perspective. *Int Wound J* 2008;5:159–71.
- 6 European Wound Management Association. Position document: pain at wound dressing changes; 2002.
- 7 Palao i Domenech R, Romanelli M, Tsiftsis DD, et al. Effect of an ibuprofen-releasing foam dressing on wound pain: a real-life RCT. *J Wound Care* 2008;17:342.
- 8 Durante C, Scalise A, Maggio G. Reducing wound pain with an ibuprofen dressing in real life settings. Poster 162,72. 17th conference of the european wound management association; Glasgow, Scotland.2007

- 9 Aparicio Gallego E, Castilla Peris C, Díez García MT, *et al*. Therapeutic behavior of a hydrocolloid dressing. Its evolution in the treatment of acute and chronic dermal ulcers. *Rev Enferm* 2005;28:49–55.
- 10 Barrett S, Callaghan R, Chadwick P, *et al*. An observational study of a superabsorbent polymer dressing evaluated by clinicians and patients. *J Wound Care* 2018;27:91–100.
- 11 Cunningham D. Addressing the pain. Treating venous insufficiency ulcers with soft silicone dressing. *Ostomy Wound Management* 2004;50:8–10.
- 12 Bell C, McCarthy G. The assessment and treatment of wound pain at dressing change. *Br J Nurs* 2010;19:S4,
- 13 Brett DW. Impact on pain control, epidermal stripping, leakage of wound fluid, ease of use, pressure reduction, and cost-effectiveness. *J Wound Ostomy Continence Nurs* 2006;33(6):S15–9.
- 14 Bechert K, Abraham SE. Pain management and wound care. *J Am Col Certif Wound Spec* 2009;1:65–71.
- 15 Woo KY, Harding K, Price P, *et al*. Minimising wound-related pain at dressing change: evidence-informed practice. *Int Wound J* 2008;5:144–57.
- 16 Acton C. Reducing pain during wound dressing changes. *Wound Essentials* 2008;3:114–22.
- 17 Tricco AC, Lillie E, Zarin W, *et al*. PRISMA extension for scoping reviews (PRISMA-SCR): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
- 18 Shamseer L, Moher D, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 2015;350:g7647.
- 19 Campbell F, Martyn-St James M, Wong R. Pain relief strategies for dressing change in chronic wounds: a mixed-methods systematic review and survey of UK practice 2021, Available: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021260130
- 20 Frykberg RG, Banks J. Challenges in the treatment of chronic wounds. *Advances in Wound Care* 2015;4:560–82.
- 21 Cleeland CS, Ryan KM. Pain assessment: global use of the brief pain inventory. *Ann Acad Med Singap* 1994;23:129–38.
- 22 McQuay HJ, Carroll D, Moore RA. Injected morphine in postoperative pain: a quantitative systematic review. *J Pain Symptom Manage* 1999;17:164–74.
- 23 Higgins JPT, Thomas J, Chandler J, *et al*. Cochrane Handbook for systematic reviews of interventions. In: Thomas J, Chandler J, Cumpston M, eds. *Cochrane Handbook for systematic reviews of interventions*. 2nd edition. Wiley Blackwell, 2019: 205–27.
- 24 Sterne JA, Hernán MA, Reeves BC, *et al*. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ* 2016;355:i4919.
- 25 Nadelson S, Nadelson LS. Evidence-based practice article reviews using CASP tools: a method for teaching EBP. *Worldviews Evid Based Nurs* 2014;11:344–6.
- 26 James KL, Randall NP, Haddaway NR. A methodology for systematic mapping in environmental sciences. *Environ Evid* 2016;5:1–13.
- 27 White H, Albers B, Gaarder M, *et al*. Guidance for producing a Campbell evidence and gap map. *Campbell Syst Rev* 2020;16:e1125.
- 28 Solowiej K, Upton D. Painful dressing changes for chronic wounds: assessment and management. *Br J Nurs* 2012;21:20,

Strategies for reducing pain at dressing change in chronic wounds: search strategies

SOURCES

MEDLINE Epub Ahead of Print, In-Process & Other Non-Indexed Citations, MEDLINE(R) Daily and MEDLINE(R) [via Ovid]

EMBASE [via Ovid]

Web of Science Science Citation Index Expanded (1900-) [via Clarivate]

Conference Proceedings Citation Index - Science (1990-) [via Clarivate]

Cochrane Database of Systematic Reviews [via Cochrane Library]

Cochrane Central Register of Controlled Trials [via Cochrane Library]

Cumulative Index to Nursing and Allied Health Literature [via EBSCO]

SEARCH STRATEGIES

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions 1946 to February 13, 2023

14th February 2023

123 records

#	Searches	Results
1	exp Foot Ulcer/	12522
2	exp Diabetic Foot/	11076
3	(diabet* adj3 ulcer*).tw.	7845
4	(diabet* adj3 (foot or feet)).tw.	12089
5	(diabet* adj3 wound*).tw.	4870
6	exp Leg Ulcer/	25369
7	((varicose or venous or leg or stasis or crural or cruris or cruris) adj3 ulcer*).tw.	10693
8	exp Pressure Ulcer/	13667
9	(pressure adj3 (ulcer* or sore* or injur*).tw,kw.	14833
10	(decubitus adj3 (ulcer* or sore*).tw,kw.	1930
11	(bed sore* or bedsore).tw,kw.	412
12	exp Skin Ulcer/	50245
13	((skin or foot or arterial or neuropathic) adj3 ulcer*).tw.	15151
14	((ischaemic or ischemic) adj3 (wound* or ulcer*).tw.	1766
15	(chronic adj3 wound*).tw.	9475
16	(chronic adj3 ulcer*).tw.	10872
17	or/1-16	84574
18	exp Pain/	450860
19	pain*.mp.	926949
20	18 or 19	1009986
21	exp Bandages/	28044
22	dressing*.mp.	33431
23	21 or 22	47295
24	17 and 20 and 23	992

Embase 1974 to 2023 Week 07**20th February 2023****186 records**

#	Searches	Results
1	exp foot ulcer/	5951
2	exp diabetic foot/	20193
3	(diabet* adj3 ulcer*).tw.	11359
4	(diabet* adj3 (foot or feet)).tw.	17628
5	(diabet* adj3 wound*).tw.	6795
6	exp leg ulcer/	14761
7	((varicose or venous or leg or stasis or crural or cruris or cruris) adj3 ulcer*).tw.	13657
8	exp decubitus/	24403
9	(pressure adj3 (ulcer* or sore* or injur*)).tw,kw.	18817
10	(decubitus adj3 (ulcer* or sore*)).tw,kw.	2238
11	(bed next sore* or bedsore).tw,kw.	315
12	exp skin ulcer/	84298
13	((skin or foot or arterial or neuropathic) adj3 ulcer*).tw.	22182
14	((ischaemic or ischemic) adj3 (wound* or ulcer*)).tw.	2581
15	(chronic adj3 wound*).tw.	12965
16	(chronic adj3 ulcer*).tw.	13193
17	or/1-16	123064
18	*pain/	97154
19	pain*.tw.	1220264
20	18 or 19	1233955
21	exp bandage/	18944
22	dressing*.mp.	52412
23	21 or 22	66375
24	17 and 20 and 23	1564

Cochrane Library21st February 2023

86 records

#	Searches	Results
#1	MeSH descriptor: [Foot Ulcer] explode all trees	1393
#2	MeSH descriptor: [Diabetic Foot] explode all trees	1302
#3	(diabet* NEXT/3 ulcer*):ti,ab,kw	2132
#4	(diabet* NEXT/3 (foot or feet)):ti,ab,kw	3314
#5	(diabet* NEXT/3 wound*):ti,ab,kw	360
#6	MeSH descriptor: [Leg Ulcer] explode all trees	2478
#7	((varicose or venous or leg or stasis or crural or cruris or cruris) NEXT/3 ulcer*):ti,ab,kw	2656
#8	MeSH descriptor: [Pressure Ulcer] explode all trees	921
#9	(pressure NEXT/3 (ulcer* or sore* or injur*)):ti,ab,kw	2432
#10	(decubitus NEXT/3 (ulcer* or sore*)):ti,ab,kw	186
#11	(bed sore* or bedsore):ti,ab,kw	255
#12	MeSH descriptor: [Skin Ulcer] explode all trees	3560
#13	((skin or foot or arterial or neuropathic) NEXT/3 ulcer*):ti,ab,kw	3230
#14	((ischaemic or ischemic) NEXT/3 (wound* or ulcer*)):ti,ab,kw	289
#15	(chronic NEXT/3 wound*):ti,ab,kw	966
#16	(chronic NEXT/3 ulcer*):ti,ab,kw	1376
#17	{OR #1-#16}	10193
#18	MeSH descriptor: [Pain] explode all trees	61673
#19	pain*:ti,ab	202057
#20	{OR #18-#19}	214186
#21	MeSH descriptor: [Bandages] explode all trees	3550
#22	dressing*:ti,ab,kw	7950
#23	{OR #21-#22}	9766
#24	#17 and #20 and #23 with Cochrane Library publication date Between Jan 2021 and Feb 2023, in Cochrane Reviews, Trials	86

CINAHL22nd February 2023

77 records

#	Searches	Results
S1	(MH "Foot Ulcer+")	11,402
S2	(MH "Diabetic Foot+")	10,460
S3	TI (diabet* N3 ulcer*) OR AB (diabet* N3 ulcer*)	4,954
S4	TI ((diabet* N3 (foot or feet))) OR AB ((diabet* N3 (foot or feet)))	8,025
S5	TI (diabet* N3 wound*) OR AB (diabet* N3 wound*)	1,831
S6	(MH "Leg Ulcer+")	17,395
S7	(MH "Leg Ulcer+")	17,395
S8	TI (((varicose or venous or leg or stasis or crural or cruris or cruris) N3 ulcer*)) OR AB (((varicose or venous or leg or stasis or crural or cruris or cruris) N3 ulcer*))	5,205
S9	(MH "Pressure Ulcer+")	15,532
S10	TI ((pressure N3 (ulcer* or sore* or injur*))) OR AB ((pressure N3 (ulcer* or sore* or injur*)))	13,915
S11	TI ((decubitus N3 (ulcer* or sore*))) OR AB ((decubitus N3 (ulcer* or sore*)))	488
S12	TI ((bed sore* or bedsore)) OR AB ((bed sore* or bedsore))	325
S13	(MH "Skin Ulcer+")	34,423
S14	TI (((skin or foot or arterial or neuropathic) N3 ulcer*)) OR AB (((skin or foot or arterial or neuropathic) N3 ulcer*))	7,197
S15	TI (((ischaemic or ischemic) N3 (wound* or ulcer*))) OR AB (((ischaemic or ischemic) N3 (wound* or ulcer*)))	453
S16	TI (chronic N3 wound*) OR AB (chronic N3 wound*)	4,338
S17	TI S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16	44,735
S18	(MH "Pain+")	233,544
S19	TI pain* OR AB pain*	315,261
S20	S18 or S19	391,680
S21	(MH "Bandages and Dressings+")	15,653
S22	TX dressing*	21,496
S23	S21 or S22	22,558
S24	S17 AND S20 AND S23 Limiters - Published Date: 20210101-20231231	77

Web of Science28th February 2023

111 records

#	Searches	Results
# 1	(diabet* NEAR/3 ulcer*) (Topic)	9,178
# 2	(diabet* NEAR/3 (foot or feet)) (Topic)	13,848
# 3	(diabet* NEAR/3 wound*) (Topic)	5,814
# 4	((varicose or venous or leg or stasis or crural or cruris or cruris) NEAR/3 ulcer*) (Topic)	10,252
# 5	(pressure NEAR/3 (ulcer* or sore* or injur*)) (Topic)	14,726
# 6	(decubitus NEAR/3 (ulcer* or sore*)) (Topic)	1,335
# 7	(bed sore* or bedsore) (Topic)	937
# 8	((skin or foot or arterial or neuropathic) NEAR/3 ulcer*) (Topic)	16,582
# 9	((ischaemic or ischemic) NEAR/3 (wound* or ulcer*)) (Topic)	1,699
# 10	(chronic NEAR/3 wound*) (Topic)	10,031
# 11	(chronic NEAR/3 ulcer*) (Topic)	10,660
# 12	#11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1	63,933
# 13	pain* (Topic)	772,386
# 14	bandage* or dressing* (Topic)	42,066
# 15	#12 and #13 and #14	589
# 16	#12 and #13 and #14 and 2023 or 2022 or 2021 (Publication Years)	111

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions

#	Searches
1	exp Foot Ulcer/
2	exp Diabetic Foot/
3	(diabet* adj3 ulcer*).tw.
4	(diabet* adj3 (foot or feet)).tw.
5	(diabet* adj3 wound*).tw.
6	exp Leg Ulcer/
7	((varicose or venous or leg or stasis or crural or cruris or cruris) adj3 ulcer*).tw.
8	exp Pressure Ulcer/
9	(pressure adj3 (ulcer* or sore* or injur*)).tw,kw.
10	(decubitus adj3 (ulcer* or sore*)).tw,kw.
11	(bed sore* or bedsore).tw,kw.
12	exp Skin Ulcer/
13	((skin or foot or arterial or neuropathic) adj3 ulcer*).tw.
14	((ischaemic or ischemic) adj3 (wound* or ulcer*)).tw.
15	(chronic adj3 wound*).tw.
16	(chronic adj3 ulcer*).tw.
17	or/1-16
18	exp Pain/
19	pain*.mp.
20	18 or 19
21	exp Bandages/
22	dressing*.mp.
23	21 or 22
24	17 and 20 and 23