WOUND-Q©

A User's Guide for Researchers and Clinicians

Information in this document is subject to change without notice. Complying with all applicable copyright laws is the responsibility of the user. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Memorial Sloan-Kettering Cancer Center. © 2021 Anne Klassen, Memorial Sloan-Kettering Cancer Center, Memorial Hospital for Cancer and Allied Diseases, Sloan-Kettering Institute for Cancer Research, Brigham and Women's Hospital. All Rights Reserved.

Printing History: January 2023
January 2025

Trademarks: WOUND-Q™ is a trademark of Memorial Sloan Kettering Cancer Center, 1275 York Avenue, New York, NY 10065. Other products and company names mentioned herein may be the trademarks of their respective owners. While every precaution has been taken in the preparation of this User's Guide, the publisher assumes no responsibility for errors or omissions, or for damages resulting from the use of information contained herein.

Licensing: The WOUND-Q patient-reported outcome measure was authored by Drs Andrea Pusic, Anne Klassen, and Lily Mundy. The copyright to the work is owned by Anne Klassen, Memorial Sloan-Kettering Cancer Center, Memorial Hospital for Cancer and Allied Diseases, Sloan-Kettering Institute for Cancer Research, Brigham and Women's Hospital, McMaster University, Johns Hopkins University, and Duke University. Users must sign a Licensing Agreement. The WOUND-Q can be used free of charge for non-profit purposes (e.g., clinicians, researchers and students). For-profit users (e.g., pharmaceutical companies and organizations carrying out studies sponsored by for-profits) are required to pay a licensing fee. For more information, contact: qportfolioteam@gmail.com

Table of Contents

1. What is the WOUND-Q? 2

2. How was the WOUND-Q Developed and Validated? 2

3. How has the WOUND-Q Evolved Over Time? 3

4. WOUND-Q Scales Qualified as Medical Device Development Tools 3

5. WOUND-Q Scales 8

6. Administration of the WOUND-Q 10

7. Scoring the WOUND-Q 11

8. Conditions of Use 12

9. Frequently Asked Questions 14

10. Acknowledgements 16

11. Publications Related to WOUND-Q Development and Validation 16

1. What is the WOUND-Q?

The WOUND-Q is a rigorously developed patient-reported outcome measure (PROM) that measures outcomes important to patients with any type of chronic wound located in any anatomical location. The WOUND-Q can be used to measure outcomes and experience of care in research and clinical practice from the perspective of patients.

2. How was the WOUND-Q Developed and Validated?

The WOUND-Q represents a new generation of PROMs developed using a modern psychometric approach called Rasch Measurement Theory (RMT). In RMT, scales that compose a PROM are each designed to measure and score a unidimensional construct. In scale development, data that meet the requirement of the Rasch model provide interval-level measurement. When a scale has high content validity and is targeted to measure a concept as experienced by a sample, accurate tracking of clinical change can be achieved. In addition to their use in research studies, WOUND-Q scales can be used with individual patients to inform clinical care.

Figure 1 shows the multiphase mixed-methods approach we used to develop the WOUND-Q. We followed internationally recommended guidelines for PROM development to ensure that the WOUND-Q meets requirements of regulatory bodies. A detailed description of the protocol that was followed to develop the WOUND-Q has been published [1].

The qualitative phase took place between January 2016 and March 2017 [2-3]. Table 1 shows characteristics of the qualitative study sample. We conducted 60 concept elicitation interviews with patients with more than 11 different types of wounds that had lasted 3 months to 25 years. Analysis led to the development of a conceptual framework and a set of scales that measure concepts important to patients. The qualitative dataset included 2776 codes that covered four top-level domains: wound (726 codes); health-related quality of life (510 physical codes, 329 social codes, and 257 psychological codes); experience of care (572 codes); and treatment (382 codes). A set of independently functioning scales was developed from the coded material. The WOUND-Q conceptual framework is shown in Figure 2.

Content validity for WOUND-Q scales was established through 20 cognitive debriefing interviews with people with chronic wounds. These interviews were conducted between September 2017 and March 2018. The scales were also shown to 12 plastic surgeons, four vascular surgeons, two general surgeons, and three nurse practitioners. Experts were based in Australia, Belgium, Canada, Denmark, Germany, the Netherlands, the USA, and the UK. An additional five plastic surgeons attending a wound conference took part in one-on-one interviews. Based on patient and expert input, the scales were further refined.

Teams in Denmark and the Netherlands performed translation and cultural adaptions of the WOUND-Q in preparation for field-test data collection [4]. The field-test study took place in Canada, Denmark, the Netherlands, and the USA between August 2018 and May 2020 [5]. Data were collected from 881 patients with a broad range of chronic wounds. Table 1 shows characteristics for the field-test sample. Most participants reported having drainage from their wound in the past week, and many reported their wound smelled in the past week. The sample provided 1020 WOUND-Q assessments. Research Electronic Data Capture System (REDCap) was used for data entry in Canada, Denmark, and the USA. Data collection in the Netherlands used the Castor database. Some data were collected using paper booklets. The WOUND-Q (see Table 2) measures 4 domains: wound; health-related quality of life; experience of healthcare; and treatment. Each domain has multiple independently functioning scales. RMT analysis provided evidence of reliability and validity for 13 scales.

3. How has the WOUND-Q Evolved Over Time?

The modular structure of the WOUND-Q means it is possible to add new scales and modules to address gaps that are identified. A gap that was identified was the lack of scales to measure lower extremity function and symptoms. Our team hypothesized that scales from the LIMB-Q [6-9] for lower extremity trauma would have content that is relevant to people with lower extremity chronic wounds. To this end, we performed cognitive debriefing interviews with 10 people with current or previous wounds and determined the scales have content validity for the wound population. Three LIMB-Q scales were field-tested in an international sample of 421 people with lower extremity wounds recruited from an online platform (i.e., Prolific). Psychometric properties (reliability, validity, responsiveness) of the original scales and the new scales have been published [10-11]. For the LIMB-Q Function and Symptoms scales, the analysis was based on a subset of 233 people in the sample with lower extremity wounds [12]. The Financial Impact scale was field-tested in the full sample of 421 participants; a psychometric publication of this scale will be published separately.

4. WOUND-Q Scales Qualified as Medical Device Development Tools

In November 2024, 7 WOUND-Q scales were qualified by the USA Food and Drug Administration (FDA) as Medical Device Development Tools (MDDT). The qualified scales measure wound characteristics (assessment, drainage, smell) and health-related quality of life (life impact, psychological, sleep, and social). For more information see the summary of evidence provided by the USA FDA: https://www.fda.gov/media/183648/download.

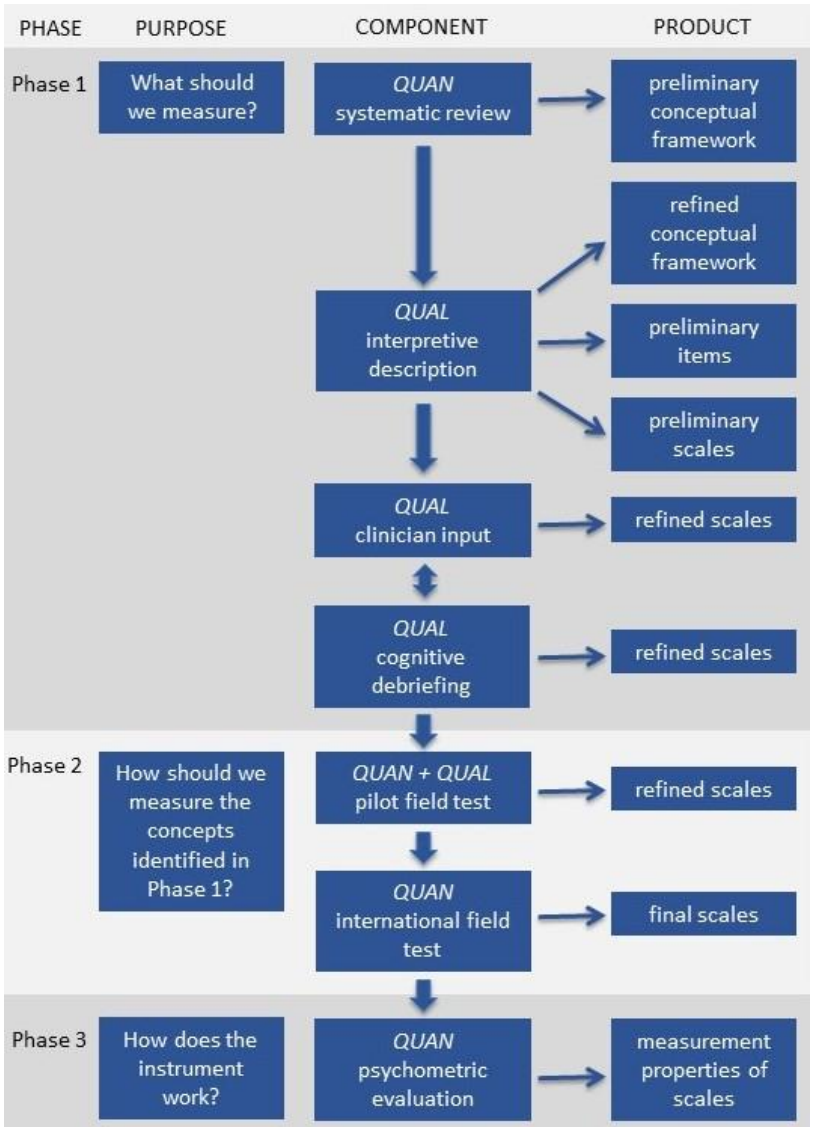


Figure 1: The multiphase mixed-methods approach our team follows to develop PRO measures (Reprinted from Klassen A, van Haren ELWG, Cross K, et al. International multiphase mixed methods study protocol to develop a patient-reported outcome measure for all types of chronic wounds (the WOUND-Q). BMJ Open. 2020;10:e032332. doi:10.1136/bmjopen-2019-032332)

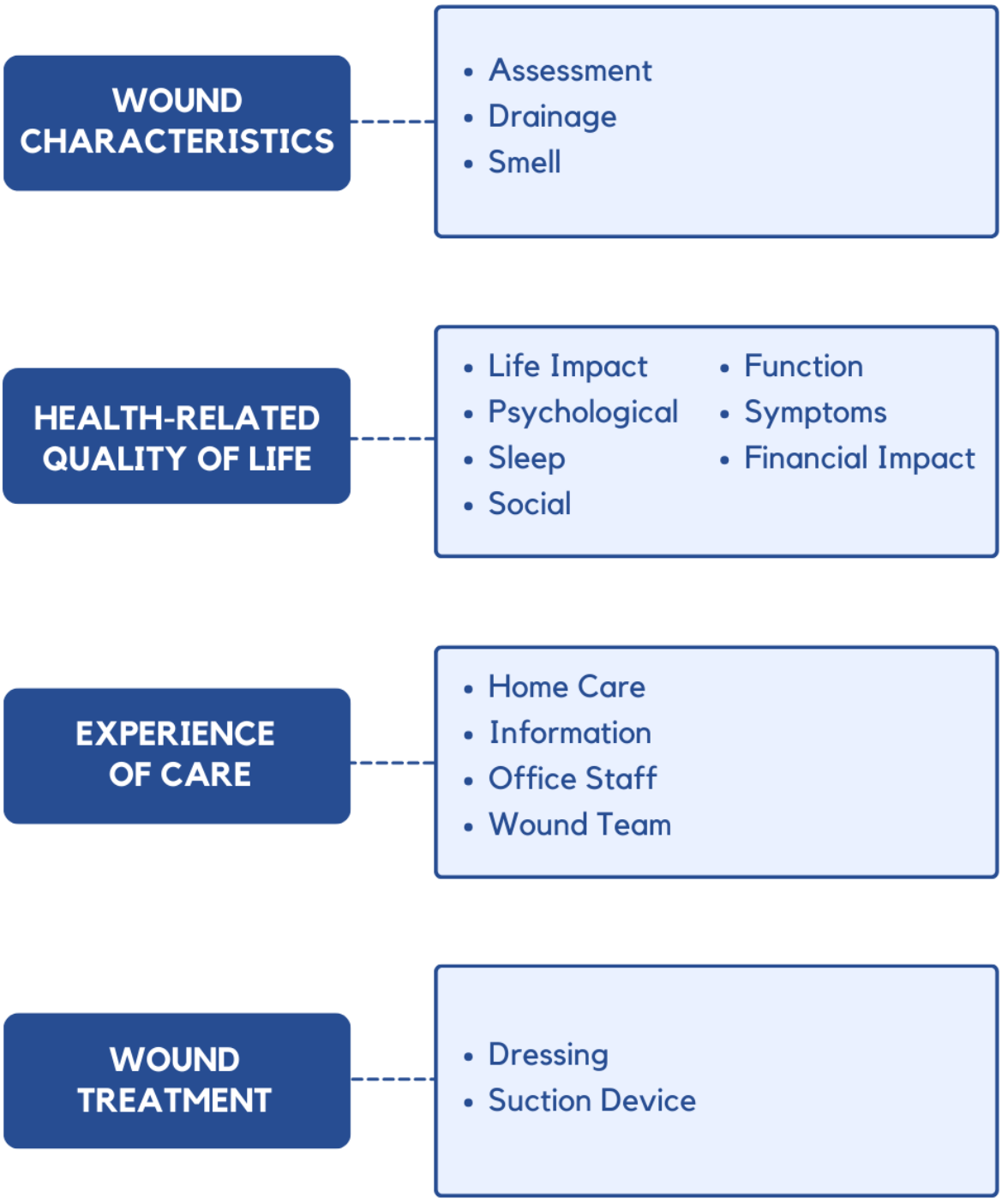
Table 1: Characteristics of participants in phase 1 (N=60) and phase 2 (N=881)

		Phase 1		Phase 2	
		N	%	N	%
Country	Canada	21	35	128	14.5
	Denmark	12	20	299	33.9
	The Netherlands	15	25	221	25.1
	USA	12	20	233	26.4
Gender	Male	35	58	519	58.9
	Female	25	42	357	40.5
	Other	0	0	2	0.2
	Missing	0	0	3	0.3
Age in years	18-49	17	28	145	16.5
	50-59	13	22	183	20.8
	60-69	15	25	243	27.6
	70-79	15	25	207	23.5
	80-95	0	0	102	11.6
	Missing	0	0	1	0.1
BMI	Under/normal weight	15	25	263	29.9
	Overweight	24	40	257	29.2
	Obese	14	23	328	37.2
	Missing	7	12	33	3.7
Number of wounds	Healed	0	0	11	1.2
	1	40	67	553	62.8
	2	10	17	162	18.4
	3+	10	17	155	17.6
Wound type or cause	Diabetic foot ulcer	8	14	152	17.3
	Pressure ulcer	15	25	130	14.8
	Surgical wound	9	15	142	16.1
	Venous Ulcer	12	20	111	12.6
	Trauma/injury	1	2	96	10.9
	Arterial ulcer	0	0	31	3.5
	Hidradenitis	5	8	23	2.6
	Radiation necrosis	2	3	14	1.6
	Infection	0	0	9	1.0
	Cancer	1	2	7	0.8
	Pyoderma gangrenosum	0	0	6	0.7
	Pilonidal abscess	2	3	6	0.7
	Other/unknown	3	5	136	15.5
	Multiple	2	3	10	1.1
	Missing	0	0	8	0.9

		Phase 1		Phase 2	
		N	%	N	%
Location of wound	Leg or knee	17	28	270	30.6
	Foot, ankle	14	24	227	25.8
	Toe(s)	0	0	70	7.9
	Buttocks	12	20	62	7.0
	Abdomen, genitals, chest, back	4	8	59	6.7
	Arm, shoulder, armpit, hand	0	0	18	2.1
	Face or neck	0	0	6	0.7
	Other	0	0	5	0.6
	Multiple	0	0	121	13.7
	Missing	0	0	43	4.9
Age of wound	3 to 6 months	14	23	318	36.1
	7 to 12 months	13	22	166	18.9
	1 to 2 years	16	27	181	20.5
	3 to 4 years	6	10	88	10.0
	5 to 10 years	5	8	49	5.6
	More than 10 years	6	10	36	4.1
	Missing	0	0	43	5.0
Wound size, cm length x width	<0.1	7	12	206	23.4
	1 to 2.4	15	25	146	16.6
	2.5 to 4.9	10	17	98	11.1
	5 to 9.9	14	24	94	10.7
	10 to 24.9	10	17	136	15.4
	≥25	0	0	138	15.7
	Missing	3	5	63	7.2

Note: Table 1 is adapted from Klassen AF, van Haren ELWG, van Alphen TC, Cano S, Cross KM, van Dishoeck A, Fan KL, Hoogbergen MM, Orgill D, Poulsen L, Sørensen JA, Squitieri L, Tsangaris E, Vasilic D, Pusic AL. International Study to Develop the WOUND-Q Patient-Reported Outcome Measure for all Types of Chronic Wounds. Int Wound J. 2021; 1-23.

Figure 2: WOUND-Q conceptual framework



5. WOUND-Q Scales

Table 2 shows the WOUND-Q scales including number of items, response options, recall period, and Flesch-Kincaid (FK) grade reading level. Below Table 2 is a brief description of the content of each scale.

Table 2: Description of WOUND-Q scales

Name of scale	Items	Response options	Recall period	FK
Wound				
Assessment	11	very much → not at all	past week	1.5
Drainage	8	very much → not at all	past week	4.6
Smell	8	very much → not at all	past week	4.0
Health-Related Quality of Life				
Financial Impact	10	very much → not at all	n/a	4.1
Physical Function	15	extremely → not at all difficult	past week	3.9
Life Impact	8	very much → not at all	past week	8.6
Psychological	10	always → never	past week	12.0
Sleep	5	always → never	past week	5.2
Social	5	agree → disagree	past week	7.5
Lower Limb Symptoms	10	severe → none	past week	4.9
Patient Experience				
Information	10	dissatisfied → satisfied	n/a	6.8
Home Care	10	disagree → agree	most recent	4.6
Wound Team	10	disagree → agree	most recent	5.5
Office Staff	8	disagree → agree	most recent	5.1
Treatment				
Dressing	9	dissatisfied → satisfied	most recent	4.7
Suction Device	9	dissatisfied → satisfied	most recent	5.6

WOUND

Assessment: This 11-item scale measures how concerned (very much, quite a bit, a little bit, not at all) someone has been with their wound(s) over the past week. If a person has more than one chronic wound, they are asked to answer based on the wound that concerns them the most. Items ask about the wound in terms of its size, shape, how it smells, and the amount of drainage, as well as specific symptoms including pain, burning, swelling, and bleeding.

Drainage: This 8-item scale measures how bothered (not at all, a little bit, quite a bit, very much) someone has been in the past week by drainage from their wound(s). If a person has more than one chronic wound, they are asked to answer based on the wound that bothers them the most. Items ask about the color, thickness, smell, and amount of

drainage, as well as how noticeable the drainage is, how often dressings need to be changed, and how much the drainage interferes with their ability to enjoy life.

Smell: This 8-item scale measures how bothered (not at all, a little bit, quite a bit, very much) someone has been in the past week by the smell from their wound(s). If a person has more than one chronic wound, they are asked to answer based on the wound that smells the worst. Items ask about the smell itself, i.e., how unpleasant it is and how strong it is with and without a dressing. Other items ask about any impact on social life, close relationships, and people commenting on the smell.

HEALTH-RELATED QUALITY OF LIFE

Financial Impact: This 10-item scale measures how much (not at all, a little bit, quite a bit, very much) a person's chronic wound and treatment has caused a financial burden or stress. Items ask about housing costs, living expenses, and costs associated with medication, supplies, and medical bills, etc.

Physical Function: This 15-item scale is for ambulatory patients. The scale asks how difficult (not at all, a little, moderately, extremely) it was for someone to use their lower limb (e.g., foot, ankle, knee, leg) in the past week. Items ask about taking a step to the side, carrying something while walking, walking up or down a flight of stairs, or walking on a slippery surface.

Life Impact: This 8-item scale measures how much (not at all, a little bit, quite a bit, very much) in the past week someone's quality of life has been affected by their wound(s). Items ask about close relationships, emotional wellbeing, social life, ability to be independent, etc.

Psychological: This 10-item scale measures how often (never, sometimes, often, always) in the past week someone's wound(s) has affected their psychological function. Items ask about feeling hopeless, depressed, anxious, self-conscious, frustrated, etc.

Sleep: This 5-item scale measures how often (never, sometimes, often, always) in the past week someone's wound(s) has affected their sleep. Items ask about trouble falling asleep, finding a comfortable position to sleep in, staying asleep, etc.

Social: This 5-item scale measures the impact of a person's wound(s) on their social life. The scale is based on the past week and items ask respondents to indicate how much they agree/disagree that they felt isolated, found it hard to get out, missed out on social events, etc.

Lower Limb Symptoms: This 10-item scale measures severity (not at all, mild, moderate, severe) of symptoms a patient has experienced in the past week in their lower limb (e.g, foot, ankle, knee, leg). Items ask about pain at rest and when touched, symptoms affecting sleep, swelling, tingling, and numbness.

EXPERIENCE OF CARE

Information: This 10-item scale measures satisfaction with information a person has received about chronic wounds from the wound care team and how it was given. Items ask about who would be involved in their care, how easy it was to understand the information, what they could do to promote healing, etc.

Home Care: This 10-item scale measures satisfaction with wound care delivered by homecare nurses. Items ask respondents to indicate how much they agree/disagree that the nurses treated them with respect, made them feel comfortable, were attentive, had the right amount of experience, etc.

Wound Team: This 10-item scale measures satisfaction with members of the wound care team (e.g., doctors, nurses). Items ask respondents to indicate how much they agree/disagree that the wound team treated them with respect, talked to them in a way that was easy to understand, worked together as a team, etc.

Office Staff: This 8-item scale measures satisfaction with members of the office staff (e.g., secretaries, receptionists). Items ask respondents to indicate how much they agree/disagree that the office staff treated them with respect, were attentive to their needs, were available when they had concerns, etc.

TREATMENT

Dressing: This 9-item scale measures satisfaction with wound dressing. Items ask about how easy the dressing was to put on and remove, how often it needed to be changed, how comfortable it was to wear, etc.

Suction Device: This 9-item scale measures satisfaction with the use of a suction device (e.g., vacuum pump device, negative pressure therapy dressing). Items ask about how well the device removed drainage, how much noise it made, and the ability to socialize, enjoy life and be physically active when the device was used, etc.

6. Administration of the WOUND-Q

The WOUND-Q was designed for patients with chronic wounds to complete on their own (self-report). Each scale is independently functioning, which means that only scales relevant to the clinical situation or research question need be completed. Patients can thus be asked to complete a subset of scales relevant to their situation. Brief instructions are provided at the start of each scale. The WOUND-Q was field-tested using two modes of data collection, i.e., online data collection using Research Electronic Data Capture System (REDCap) and paper-and-pencil. You may use the paper and pencil format or create an online version for ease of administration in non-profit academic research (e.g., REDCap) and in clinical care (e.g., hospital EMR such as Epic). If you plan to have an ePRO company capture and manage WOUND-Q data collection, the ePRO company may need

a license. If you have had or plan to have an ePRO company convert WOUND-Q scales into an electronic format, e-conversion review and certification is required, please email qportfolioteam@gmail.com.

7. Scoring the WOUND-Q

There is no overall or total WOUND-Q score. Instead, the WOUND-Q is composed of independently functioning scales that are scored separately.

To score a scale, the item responses are summed to produce a total raw score. Where responses are missing, we recommend that a scale can be scored provided at least 50% of its items have been completed. Missing responses can then be imputed using the within-person mean of the completed item responses, rounded to the nearest integer.

For example, for a 10-item scale, if a respondent completes 5 or more items, the missing responses can be imputed using the mean of their completed responses, and a total raw score calculated. If fewer than 5 items are completed, a total raw score should not be calculated and the scale score should be classified as missing.

Once the total raw score has been calculated, the appropriate Conversion Table is used to transform it into a score ranging from 0 to 100. This transformation is based on the Rasch measurement theory (RMT) analysis and produces a linearised score.

The choice of how to handle missing data ultimately rests with the end user. However, this recommended approach is consistent with methods used in established patient-reported outcome measures, including the SF-36 [13-14].

Higher scores for WOUND-Q scales reflect a better outcome. The Conversion Tables for changing raw scores into 0 to 100 scores are available after a licensing agreement is signed.

Below is an example of how to compute a scale score using the WOUND-Q Drainage Scale. First, you compute the **sum score** by adding the raw scores for items 1 to 8. In the example below, the sum score = 18. Second, you will find the sum score in the WOUND-Q Drainage Conversion Table, which is shown below. The sum score of 18 is then converted to 45.

DOES YOUR WOUND(S) HAVE DRAINAGE? Drainage is fluid produced by a wound.

Note: If you have more than 1 wound, please answer thinking of the wound that bothers you the most. With your wound in mind, in the PAST WEEK, how BOTHERED have you been by:

	Very much	Quite a bit	A little bit	Not at all
1. The color of the drainage?	1	2	3	**4**
2. How thick the drainage is?	1	2	**3**	4
3. The smell of the drainage?	1	2	**3**	4
4. Someone noticing the drainage?	1	**2**	3	4
5. Any drainage soaking through your clothes?	1	**2**	3	4
6. The drainage interfering with your ability to enjoy life?	1	**2**	3	4
7. The amount of drainage?	**1**	2	3	4
8. How often you need to change the dressing?	**1**	2	3	4

Copyright©2018 Memorial Sloan Kettering Cancer Center, New York, USA and Brigham and Women's Hospital, Boston, USA. All rights reserved.

WOUND-Q™ – DRAINAGE CONVERSION TABLE

Instructions: Higher scores reflect a better outcome. If missing data is less than 50% of the scale's items, for each missing item, insert the mean of the completed items. Use the Conversion Table below to convert the raw scale summed score into a score from 0 (worst) to 100 (best).

SUM SCORE	EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	SUM SCORE	EQUIVALENT RASCH TRANSFORMED SCORE (0-100)
8	0	21	50
9	18	22	52
10	24	23	54
11	28	24	56
12	32	25	59
13	35	26	62
14	37	27	65
15	39	28	68
16	41	29	73
17	43	30	79
18	45	31	88
19	47	32	100
20	49		

8. Conditions of Use

Anne Klassen, Memorial Sloan-Kettering Cancer Center, Memorial Hospital for Cancer and Allied Diseases, Sloan-Kettering Institute for Cancer Research, Brigham and Women's Hospital, McMaster University, Johns Hopkins University, and Duke University hold the copyright of the WOUND-Q and all of its translations (past, ongoing, and future). To avoid any copyright infringement, please ensure that the copyright notice of the WOUND-Q is included in the questionnaire. If you're unsure of the copyright notice for the WOUND-Q, our website lists the copyright and trademark notice: https://qportfolio.org/copyright-information/

Use of the WOUND-Q questionnaire requires completion of a licensing agreement. The use of the WOUND-Q and its modules in non-profit academic research and in clinical care is free of charge. The use of the WOUND-Q by 'for-profit' organizations (e.g., pharmaceutical companies or sponsored by pharmaceutical companies, contract research organizations, ePRO companies) is subject to a licensing fee.

Non-profit users can access the WOUND-Q using the following link:

https://qteam.mcmaster.ca/surveys/?s=9X73E834MCH4LPY3

For questions regarding fees to be paid by 'for-profit' organizations, please contact:

Licensing Manager
Office of Technology Development
Memorial Sloan Kettering Cancer Center
633 3rd Ave, 4th Floor, New York, NY 10016
qotdtrm@mskcc.org

PLEASE NOTE

When you sign a WOUND-Q license, you agree to the following terms:

- **You will not modify, adapt, or create another derivative work from the WOUND-Q**
- **You will not sell, sublicense, rent, loan, or transfer the WOUND-Q to anyone**
- **You will not reproduce any WOUND-Q scales in publications or other materials**
- **You will not translate the WOUND-Q without permission from our team**

For questions regarding study design and optimal use of WOUND-Q scales, contact:

Andrea Pusic, MD, MHS, FACS, FRCSC
Brigham and Women's Hospital
Boston, MA 02115
USA
apusic@bwh.harvard.edu

Anne Klassen, DPhil (Oxon)
McMaster University
Hamilton, Ontario
Canada
aklass@mcmaster.ca

9. Frequently Asked Questions

Do I have to use all the scales?

Each scale functions independently; therefore, patients can be asked to complete some or all the WOUND-Q scales. It is not necessary for a patient to complete all of the scales as there is no overall or total WOUND-Q score. A researcher or clinician may therefore select a subset of scales depending on the particular purpose of the study or use.

Can I delete or add or change any items or response options of the WOUND-Q?

You cannot delete or add or change the wording of any items or response options of the WOUND-Q. Any modification to the content of the WOUND-Q is prohibited under copyright laws. Making changes to the WOUND-Q would invalidate its psychometric properties.

Can I reproduce WOUND-Q scales in a publication or other public document (e.g., PhD thesis)?

According to the licensing agreement, you cannot reproduce the content of WOUND-Q scales verbatim in a publication. However, it is possible to show shortened versions of items. The short forms of items that can be used in a publication are shown in Table 3 below. These short forms are from the publication that described the international WOUND-Q field-test study [3].

Can I translate the WOUND-Q into a new language?

Yes, with permission, you can translate the WOUND-Q into different languages. Before starting a translation, check our translations list on www.qportfolio.org to see if there is a translation in the language you need. If there is not a translation in the language you need, you will need to obtain permission from our team, sign a translation licensing agreement, and receive information on the method you need to follow. Email us at qportfolioteam@gmail.com for more information. Please note that the developers of the WOUND-Q own the copyright of all translations of the WOUND-Q.

Are there specific time points when patients complete the scales?

A researcher or clinician can decide the time points they would like to administer the scales.

Does it cost money to use the WOUND-Q?

Use of WOUND-Q scales is free for non-profit users, including the use by hospitals in patient care. For-profit users should contact Memorial Sloan Kettering Cancer Center for information about fees (gotdtrm@mskcc.org).

Table 3: Shortened items for WOUND-Q scales to use in a publication

ASSESSMENT	leisure	**PSYCHOLOGICAL**	stiff	available
bleeding	help at home	hopeless	**INFORMATION**	**OFFICE STAFF**
smell	accessible	desperate	ask questions	respect
burning	debt	overwhelmed	team members	comfortable
holes	living	sorry for self	easy to understand	caring
swelling	medications & supplies	depressed	time to discuss	professional
edges	medical bills	self-conscious	written information	thorough
colour	other bills	anxious	promote healing	attentive
drainage	**PHYSICAL FUNCTION**	irritated	wound products	questions
pain	step to side	frustrated	timing of information	available
deep	change directions	worried	consistent	**DRESSING**
size	step down	**SLEEP**	expectations	put on
DRAINAGE	carry	falling asleep	**HOME CARE**	looks
colour	backwards	enough sleep	respect	absorb
thick	sudden movement	staying asleep	spent time	smell
smell	moderate exercise	position	attentive	remove – easy
noticing	downhill	woken up	careful	change
clothes	quickly	**SOCIAL**	decisions	comfortable
enjoy life	up stairs	isolated	professional	remove – felt
amount	uneven	meet people	questions	active
dressing	down stairs	missed out	right experience	**SUCTION DEVICE**
SMELL	slippery surface	cut down	knowledgeable	drainage
relationships	jump	enjoy life	knew what to do	looks
comments	intense exercise	**LOWER LIMB SYMPTOMS**	**WOUND TEAM**	sleep
social life	**LIFE IMPACT**	at rest	respect	noise
dressing on	relationships	touched	understand	carry
noticing	relax	cramps	professional	comfortable
stopping	emotional	disturbing sleep	questions	socialize
unpleasant	social life	swelling	knowledgeable	enjoy life
dressing off	independence	shooting sensation	right experience	active
FINANCIAL	move around	tingling	worked together	
housing	activities enjoy	numb	high level care	
change in income	physically active	pain putting weight	decisions	

10. Acknowledgements

Development of the WOUND-Q has involved hundreds of people with chronic wounds and the collaboration of numerous health care professionals and researchers around the world. We are truly grateful for their dedication and help with our research. The WOUND-Q study has been generously funded by the following grants:

Qualitative Phase: Pusic A, Klassen A, (co-PI). A Qualitative Phase I Study to Develop a New Patient-Reported Outcome Instrument for Acute and Chronic Wounds: The WOUND-Q. The Plastic Surgery Foundation, January 2016 – July 2017.

Quantitative Phase: Pusic A, Klassen A, (co-PI). Development and Validation of a New Patient-Reported Outcome Instrument for Chronic Wounds: The WOUND-Q Phase II study. The Plastic Surgery Foundation, March 2018 – February 2020.

11. Publications Related to WOUND-Q Development and Validation

1. Klassen AF, Cross K, Gibbons C, Hoogbergen MM, Longmire N, Poulsen L, Squitieri L, Tsangaris E, van Alphen T, van Haren ELWG, Pusic AL. International mixed methods study protocol to develop a patient-reported outcome instrument for all types of chronic wounds: The WOUND-Q. BMJ Open. 2019; 10(3):e032332. doi: 10.1136/bmjopen-2019-032332.
2. Tsangaris E, van Haren ELWG, Poulsen L, Squitieri L, Hoogbergen MM, Cross K, Sørensen JA, van Alphen TC, Pusic A, Klassen AF. Identifying health-related quality of life concepts to inform the development of the WOUND-Q. J Wound Care. 2024 Jan 2;33(1):28-38. doi: 10.12968/jowc.2024.33.1.28.
3. Squitieri L, Tsangaris E, Klassen AF, van Haren ELWG, Poulsen L, Longmire NM, van Alphen TC, Hoogbergen MM, Sorensen JA, Cross K, Pusic AL. Patient-reported experience measures are essential to improving quality of care for chronic wounds: an international qualitative study. Int Wound J. 2020; 17(4):1052-1061. doi: 10.1111/iwj.13374.
4. van Alphen T, Poulsen L, van Haren E, Lind Jacobsen A, Tsangaris E, Sørensen JA, Hoogbergen M, van der Hulst R, Pusic A, Klassen A. Danish and Dutch linguistic validation and cultural adaptation of the WOUND-Q, a PROM for chronic wounds. Eur J Plast Surg. 2019; 10:1-0. doi.org/10.1007/s00238-019-01529-7.
5. Klassen AF, van Haren ELWG, van Alphen TC, Cano S, Cross KM, van Dishoeck A, Fan KL, Hoogbergen MM, Orgill D, Poulsen L, Sørensen JA, Squitieri L, Tsangaris E, Vasilic D, Pusic AL. International Study to Develop the WOUND-Q Patient-Reported Outcome Measure for all Types of Chronic Wounds. Int Wound J. 2021; 1-23. doi.org/10.1111/iwj.13549.
6. Mundy LR, Klassen A, Grier J, Carty MJ, Pusic AL, Hollenbeck ST, Gage MJ. Development

of a patient-reported outcome instrument for patients with severe lower extremity trauma (LIMB-Q): Protocol for a Multiphase mixed methods study. JMIR Research Protocols. 2019; 17;8(10):e14397. doi: 10.2196/14397.

7. Mundy LR, Klassen A, Grier AJ, Gibbons C, Lane W, Carty MJ, Pusic AL, Hollenbeck ST, Gage MJ. Identifying factors most important to lower extremity trauma patients: Key concepts from the development of a patient-reported outcome instrument for lower extremity trauma: the LIMB-Q. Plast Reconstr Surg. 2020; 145(5):1292-1301. doi: 10.1097/PRS.0000000000006760.
8. Mundy LR, Klassen A, Sergesketter AR, Grier AJ, Carty MJ, Hollenbeck ST, Pusic AL, Gage MJ. Content validity of the LIMB-Q: A patient-reported outcome instrument for lower extremity trauma patients. J Reconstr Microsurg. 2020; 36(9):625-633. doi: 10.1055/s-0040-1713669.
9. Mundy LR, Klassen AF, Pusic AL, deJong T, Hollenbeck ST, Gage MJ; LIMB-Q Development Team. The LIMB-Q: reliability and validity of a novel patient-reported outcome measure for patients with lower extremity trauma. Plast Reconstr Surg. 2024; 154(6):1332-1340. doi: 10.1097/PRS.0000000000011293.
10. Simonsen NV, Klassen AF, Rae C, Dalaei F, Cano S, Poulsen L, Pusic AL, Sørensen JA. Further psychometric validation and test-retest reproducibility of the WOUND-Q. Int Wound J. 2024 Jan;21(1):e14354. doi: 10.1111/iwj.14354.
11. Gallo L, Rae C, Voineskos S, Simonsen NV, Pusic AL, Poulsen L, Sørensen JA, Klassen AF, Cano SJ. Further psychometric evaluation of the WOUND-Q: A responsiveness study. Wound Repair Regen. 2024; 32(4):451-463. doi: 10.1111/wrr.13179.
12. Simonsen NV, Klassen AF, Rae C, Mundy LR, Poulsen L, Pusic AL, Fan KL, Sørensen JA. The WOUND-Q Function and Symptoms scales for chronic lower extremity wounds: A validation study. Adv Wound Care (New Rochelle). 2024 Jul 10. doi: 10.1089/wound.2024.0035.
13. Ware JE, Kosinski MA, Keller SD. SF-36 physical and mental health summary scales: a user's manual. Boston, Massachusetts, Health Inst, New England Med. Center. 1995.
14. Ware JE, Snow KK, Kosinski M, Gandek B. SF-36 Health Survey manual and interpretation guide. Boston, Massachusetts, Nimrod Press. 1993.
15. Simonsen NV, Möller S, Rae C, Klassen AF, Poulsen L, Pusic AL, Sørensen JA. Patient and wound factors associated with WOUND-Q scales measuring health-related quality of life: An international cross-sectional study. Wound Repair Regen. 2025; 33(1):e13245. doi: 10.1111/wrr.13245.