

MANUAL ICC COMPRESSION QUESTIONNAIRE

Purpose of the ICC Compression Questionnaire

The purpose of the ICC compression Questionnaire is to evaluate the effect of different kinds of compression materials and systems and its acceptance and experience by the patient.

The compression questionnaire can be used for longitudinal comparative studies (not for cross-sectional studies). It should neither replace a quality of life-instrument nor a study protocol in which several outcome parameters may be specified, but should help to make patient orientated feelings with different compression modalities comparable.

Description of the questionnaire

The original language of the ICC Compression questionnaire is Dutch.

The ICC Compression Questionnaire consists of two parts. The first part has to be filled out by the health care provider (ICC-CQ-H). The second part has to be filled out by the patient (ICC-CQ-P).

The ICC Compression Questionnaire for the Health care provider consists of two subsections. The first subsection has to be filled out before the start of the study (before the first application of the compression device/ system to be tested). In this section, the health care provider **describes the patient and the compression device/ system**. In addition, he/ she performs an evaluation of the skin of the limb, which will be treated with the compression device/ system.

The second subsection has to be filled out by the health care provider immediately after application and at follow up visits as requested in the study protocol. The health care provider performs an **evaluation of the covering of the limb by the compression** on the one hand and an **evaluation of the skin under the compression** on the other hand.

In the appendix, an overview of reliable and valid general and disease-specific quality of life questionnaires is given. It is recommended to use one or more of these questionnaires in addition to the compression questionnaire.

The ICC Compression Questionnaire for Patients consists also of two subsections.

The first subsection has to be filled out before the start of the study. Firstly, the patients have to evaluate their **physical functioning** without the tested compression. This involves questions about the joint mobility, about using the limb and about the ability to perform activities. Secondly, the patients have to rate their **disease-related symptoms**.

The second subsection has to be filled out by the patient at follow up visits as requested in the study protocol. First some general information is collected. Thereafter following information is collected:

- Dosage of compression
- Application and removing of compression
- Compression and comfort
- Complications related to compression
- Physical functioning in relation to compression

- Disease-related symptoms
- General experience

Processing the questionnaire and calculation of domain scores

A lot of data is collected with the ICC Compression Questionnaire.

From the health care provider questionnaire following data is obtained:

- 1) General information about the patient (date of birth, body length, body weight)
- 2) Information about the compression to be tested
- 3) Patient's history of compression
 - a. Past week
 - b. General history
- 4) (Tested) compression material (= domain)
- 5) Skin (under compression) (= domain)
- 6) Adherence (= domain)

From the patient questionnaire following data is obtained:

- 1) General information about patient (professional, sport and leisure time activities and family situation)
- 2) Dosage of compression (= domain)
- 3) Application and removing of compression (= domain)
- 4) Compression and comfort (= domain)
- 5) Complication of compression (= domain)
- 6) Physical functioning in relation to compression (= domain)
- 7) Disease-related symptoms (= domain)
- 8) General experience

The calculation of the score on each domain is demonstrated in table 1. De score on each domain ranges between 0 and 10.

Table 1. Formula for calculation of the score for each domain

Domain	Calculation score
ICC-CQ-H	
Covering limb	= [sum of questions 2-4] / [3 – number of questions not answered]
Skin condition	= ([sum of questions 2.1 – 2.10] / [10 – number of questions not answered]) x 5
Adherence	= score on question
ICC-CQ-P	
Dosage of compression	= question 1 x (question 2 + question 3)
Application and removing of compression	= ([question 1 x 2] + question 2b) + ([question 3 x 2] + question 4b) / 6
Compression and comfort	= [sum of questions 1-6] / [6 – number of questions not answered]
Complication of compression	= [sum of questions 1-13] / [13 – number of questions not answered]
Physical functioning in relation to compression	= [sum of questions 1-9] / [9 – number of questions not answered]
Disease-related symptoms	= [sum of questions 1-7] / [7 – number of questions not answered]
General experience	= score on question

To calculate the different domain scores automatically, the data can be entered in the provided excel-file (added to this document).

Measuring properties of the ICC Compression Questionnaire

Published in Lymphatic Research and Biology: Devoogdt et al 2021.(1)

Reliability of the ICC Compression questionnaire for Patients

Test–retest reliability for the domains “dosage of compression” and “physical functioning in relation to compression” is very strong and for the domains “application and removal of compression material,” “compression and comfort,” and “complications of compression” it is strong. For the domains “disease-related symptoms” and “general experience,” test–retest reliability was moderate.

Internal consistency of different domain scores ranged from moderate to very strong. Scoring on the different domains had an acceptable variability (SEM between 0.4 and 10.8). The greatest variability was found for the scoring on the domain “general experience.” Except for the domain dosage of compression, Smallest Real Difference (SRD) of all domains ranged between 1.2 and 5.0 (on 10). For the domain dosage of compression, the SRD was 30 (on 168).

Reliability of the ICC Compression questionnaire for Health care providers

Interrater reliability was strong for the “compression material” score, was moderate for the “skin” score, and was weak for the “adherence” score. Internal consistency of the domain scores was moderate to strong scores. SEM and SRD were small.

Validity of the ICC Compression questionnaire for Patients

All patients filled out the questionnaire for assessing face and content validity. Of all patients, 70 patients (89%) indicated that the questionnaire was completely understandable. The other 9 patients (11%) found one or more questions unclear or found the scoring system unclear. In addition, 69 patients (87%) indicated that the questionnaire was complete and had no other remarks regarding the content of the questionnaire. In none of the domain scores, floor effect was present and 3 on 7 domain scores showed a ceiling effect. Regarding construct validity, for 10 on 11 (or 91%) hypotheses, the Pearson correlation coefficient was interpreted as moderate to strong (r between 0.40 and 0.90) and was accepted

Validity of the ICC Compression questionnaire for Health care providers

Nineteen health care providers filled out the questionnaire for assessing face and content validity. Of all health care providers, 14 (74%) found the questionnaire completely understandable. The other five health care providers found one question unclear (N= 4) or the scoring system unclear (N= 1). Moreover, all except one health care provider (95%) found the questionnaire complete. Neither floor nor ceiling effects of the domain scores were present.

Languages

The ICC Compression Questionnaire for patients has already been translated into French and English. The ICC Compression Questionnaire for Health care providers has already been translated into English.

The cross-cultural validity of the translated version has not yet been investigated.

A guideline on how to investigate the cross-cultural validity of the ICC Compression Questionnaire has been written (see pdf 'investigation cross-cultural validity of the ICC Compression Questionnaire').

Reference

1. Devoogdt N, Partsch H, Heroes AK, De Vrieze T, De Groef A, Geraerts I, et al. The ICC Compression Questionnaire: A Comprehensive Tool to Evaluate Compression Materials or Devices Applied in Subjects with Lymphedema or Chronic Venous Disease. *Lymphat Res Biol*. 2021.