

**The Foot and Ankle Online Journal 10 (2): 4 - TABLES SUPPLEMENT**

Questions/assessments (instructions) (threshold value)	Risk grade (1-4)	Category and reason for being included in D-Foot	References	Revision considered for D-Foot version 2
<u>Neuropathy</u>				
Do you have a numbing/tingling sensation in your feet?	2	Signs of peripheral neuropathy	[1, 4, 12, 22, 50-52]	
Are your feet less sweaty now compared with recent years?	2	Signs of peripheral neuropathy	[1, 22, 51-56]	
Positive Ipswich Touch Test	2	Signs of peripheral neuropathy	[4, 38, 51, 52, 57]	Clarify the instructions
<u>Angiopathy</u>				
		Signs of peripheral angiopathy	[1, 4]	Add assessments of peripheral angiopathy
<u>Foot deformities</u>				
Charcot deformity	3-4	Foot deformities and altered biomechanics are related to an increase in PP.	[1, 4, 21, 22, 39, 51, 57-59]	One assessment for acute Charcot foot (risk grade 4) and another assessment for manifest Charcot foot (risk grade 3)
Toe height (measure the toe with the greatest height in a standing position) (>25mm)	3	A quantitative measurement of the presence of hammer toes. Hammer toes give an increase in PP at the toe tip, metatarsal phalangeal joint and the dorsal aspect of the toe if the toe box is too low.	[1, 4, 21, 51, 52, 57, 58, 60]	
Hallux valgus/hallux varus	3	Foot deformities and altered biomechanics are related to an increase in PP.	[1, 4, 21, 22, 51, 57, 58, 60]	
Calcaneus valgus/varus	3	Foot deformities and altered biomechanics are related to an increase in PP.	[1, 4, 21, 22, 51, 52, 57]	
Abduction/adduction of the forefoot	3	Foot deformities and altered biomechanics are related to an increase in PP.	[1, 4, 21, 22, 51, 52, 57]	
Passive range of dorsal flexion at metatarsal phalangeal joint 1 (<35°)	3	Foot deformities and altered biomechanics (limited range of motion) are related to an increase in PP.	[1, 4, 21, 51, 52, 57, 60, 61]	Clarify the instructions
Maximum dorsal flexion in the ankle joint (standing with the knee in extension and the contralateral knee in an anterior position) (<0°)	3	Limited range of motion and altered biomechanics are related to an increase in PP.	[1, 4, 22, 51, 52, 57, 60, 61]	
Prominent, superficial bony structures on the plantar area	3	Foot deformities and a hypotrophic fat pad are related to an increase in PP.	[1, 4, 51, 57, 58, 60]	
Navicular drop test (>10 mm)	3	Foot deformities, such as low forefoot arch, produce altered biomechanics, which are related to an increase in PP.	[4, 10, 62]	Exclude
Gait deviation, foot flap or toe drag	3	Gait deviation increases the risk of PP on the toes, for example, in the presence of toe drag.	[1, 52]	
Medial/lateral collapsed heel counter	3	Signs of altered alignment of the lower extremities and increased PP on the feet	[4, 52]	

Excessively worn-out sole	3	Signs of altered alignment of the lower extremities and increased PP on the feet	[4, 52]	
		<u>Skin</u>		
Areas of excessive pressure with callosities	3	Skin pathology. Callus formation due to excessive pressure is related to an increase in PP.	[1, 4, 21, 22, 57, 63-65]	Exclude
Callosities medial/lateral/dorsal	3	Skin pathology. Callus formation due to excessive pressure is related to an increase in PP.	[1, 4, 21, 22, 52, 57, 63, 65, 66]	
Ulcer	4	Increased risk of complications and amputation	[1, 4, 22, 57]	
		<u>History</u>		
Have you had foot ulcers on your right/left foot?	3	Increased risk of ulcer recurrence	[1, 4, 21, 51, 52, 58, 59, 67, 68]	
Amputation	3	Increased risk of ulcer recurrence and amputation	[1, 4, 21, 22, 51, 52, 57]	
<u>Assessment, clinically relevant</u>				
What level of pain do you perceive in your right/left foot?*		Pain is a sign of peripheral neuropathy. No threshold value was available.	[1, 4, 51, 54]	
Inappropriate footwear*		Inappropriate footwear (too short, too narrow or too low in the toe box) increases PP on the feet.	[4, 52]	
Insufficient function of the toes and metatarsal phalangeal joints*		Altered biomechanics due to motor neuropathy or reduced function	[69]	Exclude
Gait deviation, affected from hip/knee right and left respectively*		Gait deviation increases the risk of PP in the presence of leg discrepancy, for example.	[70]	Exclude
Foot length*		Foot length exceeding the normal size of conventional shoes increases the risk of an increase in PP.	[71]	
Foot width*		Foot width exceeding the normal size of conventional shoes increases the risk of an increase in PP.	[71]	

**Table 1** The D-Foot, an eHealth tool for risk stratification in diabetes with the patients' self-report questions, the foot assessments and the corresponding references.

\* Further research and development of this measurement is needed.

PP: peak pressure

In the first column, the four questions and the 22 assessments are presented together with basic instructions and threshold values. Assessments with an asterisk were included because the expert group felt that they were clinically relevant and of interest in future research and development. The risk column shows the level of risk for each separate assessment. The risk factor is categorised and the reason for including these foot assessments is explained. The references supporting the assessment being defined as a risk factor are listed. The final decision to include the assessment was based on scientific publications, national guidelines and clinical experience. The improvements to the D-Foot version 2 can be found in the column to the right.

Category of risk factor and assessments	Inter-rater								Intra-rater							
	Prev.	Agreement			kappa				Agreement			kappa				
	(%)	(%)	± CI	DPO <sub>A</sub>	DPO <sub>R</sub>	DPO <sub>C</sub>	DPO <sub>D</sub>	Pooled		(%)	± CI	DPO <sub>A</sub>	DPO <sub>R</sub>	DPO <sub>C</sub>	DPO <sub>D</sub>	Pooled
<b>Neuropathy</b>																
Positive Ipswich Touch Test	50	0.79	0.08	0.78	-0.24	0.65	0.61	0.56		0.80	0.09	0.40	0.66	0.73	0.85	0.60
<b>Foot deformities</b>																
Amputation	0	1.00	0.00	1.00	1.00	1.00	1.00	1.00		1.00	0.00	1.00	1.00	1.00	1.00	1.00
Charcot deformity	1	1.00	0.20	1.00	1.00	0.00	1.00	0.76		0.99	0.02	1.00	1.00	0.00	1.00	0.73
Hallux valgus/hallux varus	26	0.86	0.07	0.57	0.32	0.65	0.74	0.59		0.94	0.05	0.71	1.00	1.00	1.00	0.88
Calcaneus valgus/varus	33	0.75	0.09	0.32	0.59	0.23	0.00	0.26		0.83	0.09	0.34	0.75	0.69	1.00	0.61
Abduction/adduction of the forefoot	35	0.74	0.09	-0.32	1.00	0.36	0.00	0.10		0.90	0.06	0.34	1.00	0.00	1.00	0.46
Prominent, superficial bony structures on the plantar area	35	0.75	0.09	0.59	0.42	0.50	0.14	0.44		0.74	0.09	0.44	0.31	0.40	0.38	0.40
Gait deviation, foot flap or toe drag	10	0.88	0.07	0.22	1.00	0.00	0.00	0.23		0.95	0.05	1.00	1.00	0.00	0.28	0.61
Medial/lateral collapsed heel counter	29	0.74	0.09	0.09	0.43	0.62	0.33	0.32		0.78	0.09	0.41	0.40	0.00	0.44	0.30
Excessively worn-out sole	28	0.72	0.09	0.31	0.12	0.78	-0.14	0.29		0.82	0.09	0.55	0.47	0.33	0.76	0.52
<b>Skin</b>																
Areas of excessive pressure with callosities	45	0.77	0.08	0.26	0.05	0.78	0.58	0.42		0.82	0.08	0.35	0.64	0.64	0.76	0.54
Callosities	45	0.73	0.09	0.08	0.39	0.28	0.74	0.32		0.80	0.09	0.15	0.64	0.78	0.81	0.50
Ulcer	11	0.92	0.06	0.42	1.00	0.00	0.00	0.31		0.93	0.06	0.48	1.00	0.00	1.00	0.52
<b>Risk level</b>																
Risk level 1	1	0.94	0.05							0.99	0.02					
Risk level 2	1	1.00	0.00							0.99	0.02					
Risk level 3	84	0.83	0.08							0.88	0.07					
Risk level 4	14	0.89	0.06							0.90	0.06					
Risk level total	100	0.83	0.08	0.32	1.00	0.16	0.00	0.31		0.88	0.07	0.42	1.00	0.52	1.00	0.63
<b>Assessment, clinically relevant</b>																
Inappropriate footwear	31	0.74	0.09	0.23	0.12	1.00	0.39	0.44		0.83	0.08	0.57	0.31	1.00	0.15	0.58
Insufficient function of the toes and metatarsal phalangeal joints	34	0.59	0.10	0.02	0.07	0.04	0.25	0.08		0.72	0.10	0.49	0.38	0.35	0.09	0.37
Gait deviation, affected from hip/knee right and left respectively	36	0.68	0.37	-0.14	0.37	0.36	0.28	0.28		0.80	0.09	0.68	0.82	0.32	0.34	0.55

**Table 2** Inter-rater and intra-rater reliability of the discrete variables in the D-Foot.

Prev.: prevalence as a percentage of the risk factor assessed by Observer 1 at the first session

P: (agreement) of the observations

CI: 95% confidence interval

kappa: Cohen's kappa calculated for each pair of observations made at the four departments of prosthetics and orthotics: DPO<sub>A</sub>, DPO<sub>B</sub>, DPO<sub>C</sub> and DPO<sub>D</sub>

Pooled: Cohen's kappa calculated as a pooled kappa, with the weights reflecting the number of patients at each DPO.

Low kappa, described as a limitation in the kappa statistics, occurs when observers are likely to choose one alternative and not the other, resulting in a high level of agreement but a low kappa [29].

Category of risk factor and assessments	Inter-rater								Intra-rater							
	N	Mean	Diff. mean	P <sub>r</sub> ICC				N	Mean	Diff. mean	P <sub>r</sub> ICC					
		(SD)	(SD)	DPO <sub>A</sub>	DPO <sub>B</sub>	DPO <sub>C</sub>	DPO <sub>D</sub>	Pooled		(SD)	(SD)	DPO <sub>A</sub>	DPO <sub>B</sub>	DPO <sub>C</sub>	DPO <sub>D</sub>	Pooled
<b>Foot deformities</b>																
Maximum toe height (mm)	97	26.7 (5.4)	0.5 (5.4)	0.62 0.60	0.81 0.81	0.76 0.74	0.10 0.10	0.57 0.56	80	25.9 (4.6)	-0.1 (4.3)	0.58 0.52	0.83 0.70	0.93 0.91	0.01 0.02	0.62 0.58
Passive range of dorsal flexion at metatarsal phalangeal joint 1 (degree)	97	54.0 (23.9)	-0.4 (13.4)	0.75 0.75	0.16 0.17	0.74 0.75	0.54 0.55	0.61 0.62	82	56.4 (23.4)	-0.2 (12.1)	0.75 0.74	0.82 0.74	0.82 0.82	0.52 0.49	0.74 0.72
Maximum dorsal flexion in the ankle joint (degree)	97	22.2 (7.9)	1.3 (6.0)	0.75 0.70	0.71 0.42	0.82 0.79	0.60 0.61	0.72 0.66	82	22.5 (7.5)	-0.7 (6.0)	0.78 0.77	0.41 0.38	0.57 0.57	0.55 0.50	0.63 0.61
Navicular drop test (mm)	95	8.3 (4.3)	0.6 (4.6)	0.28 0.25	0.67 0.64	0.15 0.14	0.42 0.40	0.33 0.32	81	8.1 (3.8)	0.7 (4.7)	0.01 -0.00	0.56 0.46	0.58 0.54	0.00 0.42	0.25 0.23
<b>Assessment, clinically relevant</b>																
Foot length (mm)	96	258.3 (19.9)	-0.2 (3.7)	1.00 0.99	1.00 1.00	0.99 0.99	0.95 0.95	0.98 0.98	82	257.2 (20.4)	0.3 (3.1)	0.98 0.98	1.00 1.00	1.00 1.00	0.99 0.99	0.99 0.99
Foot width (mm)	97	101.5 (8.9)	-0.7 (3.7)	0.90 0.89	0.92 0.92	0.93 0.93	0.94 0.94	0.92 0.92	82	100.2 (8.1)	0.1 (3.1)	0.94 0.94	0.92 0.92	0.95 0.95	0.83 0.84	0.92 0.92

**Table 3** Inter-rater and intra-rater reliability of the continuous variables in the D-Foot.

The assessments for the right foot are numbered as they appear in the D-Foot (Table 1).

N: number of valid measurements for the calculation of the mean and SD assessed by Observer 1 at the first session

SD: standard deviation

Diff. mean: mean difference between Observer 1 and Observer 2

P<sub>r</sub>: Pearson's correlation coefficient calculated for each pair of observations made at the different departments of prosthetics and orthotics, namely DPO<sub>A</sub>, DPO<sub>B</sub>, DPO<sub>C</sub> and DPO<sub>D</sub>

ICC: intra-class correlation coefficient calculated first for each pair of observations made at the different departments of prosthetics and orthotics

Pooled: Pearson's correlation coefficient and ICC as a pooled value, with the weights reflecting the number of patients at each DPO

Questions		Observer								SUS score per question	
Question (English)	Question (Swedish)	1	2	3	4	5	6	7	8	Total	M (±SD)
1. I think that I would like to use this system frequently.	Jag tror att jag kommer vilja använda D-Foot ofta	4	4	2	1	1	1	2	4	59	
2. I found the system unnecessarily complex.	Jag tyckte D-Foot är onödigt komplicerat	3	4	3	1	1	3	3	3	66	
3. I thought the system was easy to use.	Jag tyckte D-Foot var enkelt att använda	4	4	3	1	3	3	3	3	75	
4. I think that I would need the support of a technical person to be able to use this system.	Jag tror jag kommer behöva teknisk support för att kunna använda D-Foot	4	4	4	3	3	3	3	3	84	
5. I found that the various functions in this system were well integrated.	Jag tyckte att de olika funktionerna i D-Foot var välfungerande	4	4	3	3	1	3	3	3	75	
6. I thought there was too much inconsistency in this system.	Jag tyckte att D-Foot var ologiskt uppbyggt	2	4	1	2	3	3	1	2	56	
7. I would imagine that most people would learn to use this system very quickly.	Jag tror att de flesta snabbt kommer kunna lära sig att använda D-Foot	4	3	3	3	4	3	3	2	78	
8. I found the system very cumbersome to use.	Jag tyckte att D-Foot var besvärligt att använda	4	4	3	2	3	3	3	3	78	
9. I felt very confident using the system	Det kändes pålitligt att använda D-Foot	3	4	3	1	2	1	3	3	63	
10. I needed to learn a lot of things before I could get going with this system.	Jag behövde lära mig många nya saker innan jag kunde börja använda D-Foot	4	3	3	1	2	3	1	3	63	
Total SUS score per observer		90	95	70	45	58	65	63	73	697	70 (10)
M (±SD) SUS score per observer											70 (16)

**Table 4** Results of the usability test.

M; mean

SD; standard deviation

The table presents the answers from the System Usability Scale (SUS) test. The results for the 10 questions are summarised vertically and the results for the observers are summarised horizontally. The SUS score was calculated per person and per question respectively [31]. Each question was answered with a score (strongly disagree = 1 to strongly agree = 5). First, from the responses with an odd number, "one" was subtracted. Second, from the responses with an even number, subtract their value from "five". The value

obtained per question and per person ranged from 0-4, with four as the highest response. By multiplying the sum of the converted responses by 2.5, a score for all 10 questions, ranging from 0-100, was obtained. By multiplying the total score for each question by 3.125, a score ranging from 0-100 was obtained for the eight observers.

The 10 questions in the SUS have been translated into Swedish, from the original English text. The Swedish response format was: 1) Håller absolut inte med, 2) Håller inte med, 3) Håller varken med eller inte med, 4) Håller med and 5) Håller fullkomligt med.

The English response format was:

<b>Strongly Disagree 1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Strongly Agree 5</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>