

# Danish multicentre study on reference values for sensory evoked potentials

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## Introduction

## Methods

## Results

### Side differences

All latencies, latency differences, amplitudes and distances were checked for side differences.

#### Median nerve

Side differences were found for the following parameters, all with right-sided values larger than left-sided:

Latency wrist-elbow:	in average 0.07 msec (t-test: $t=-2.7$ , $N=61$ , $p=0.0102$ )
Latency wrist-Erbs:	in average 0.1 msec (t-test: $t=-3.3$ , $N=60$ , $p<0.001$ )
Latency wrist-N14:	in average 0.2 msec, (t-test: $t=-4.2$ , $N=63$ , $p<0.0001$ )
Latency wrist-N20:	in average 0.16 msec, (t-test: $t=-3.0$ , $N=61$ , $p<0.001$ )
Distance wrist-Erbs:	in average 3.2 mm, (t-test: $t=-2.3$ , $N=61$ , $p=0.02$ )

Further calculations on median nerve parameters were performed on right-sided values.

#### Tibial nerve

For the parameters P40' and CSCT (P40') side differences were found, left-sided values larger than right-sided:

Latency ankle-P40':	in average 0.50 msec (t-test: $t=3.6$ , $N=65$ , $p<0.001$ )
CSCT (P40'):	in average 0.52 msec (t-test: $t=3.6$ , $N=56$ , $p<0.001$ )

Further calculations on tibial nerve parameters were performed on left-sided values, except for P40' and CSCT (P40') where values were calculated on both sides.

Reference intervals for side-differences are shown in Table 1 for median nerve parameters and in Table 3 for tibial nerve parameters.

### Intercentre differences

An ANOVA was used to check for intercentre difference before the parameters were corrected for age, height, temperature and conduction distance.

#### Median nerve

Temperature: (N=60,  $p=0.017$ , Centre 1 in average 0.37 degree larger values)

#### Tibial nerve

Latency ankle-fossa: (N=66,  $p=0.045$ , Centre 4 in average 0.54 msec larger values)

NCV ankle-fossa: (N=66,  $p=0.0011$ , Centre 4 in average 4.0 m/sec smaller values)

Ampl': (N=66,  $p=0.0086$ , Centre 4 in average 1.1 microvolts smaller values)

Temperature: (N=66,  $p<0.0001$ , Centre 2 and Centre 4 in average 0.65 and 1.23 degree smaller values, respectively)

Distance Th12-vertex: (N=67,  $p=0.029$ , Centre 4 in average 34 mm smaller values)

Distance ground-Th12: (N=67,  $p=0.001$ , Centre 4 in average 80 mm larger values)

Distance ground-ankle: (N=67,  $p=0.0009$ , Centre 3 in average 12 mm smaller values)

Distance ankle-Th12: (N=67,  $p=0.0012$ , Centre 4 in average 74 mm larger values)

## Correlations

All parameters were checked for correlations with age, squared age, height, temperature and if relevant also for conduction distance. Results of regression analyses are shown in Table 3 for median nerve and in Table 4 for tibial nerve.

### Median nerve specific comments

Latency wrist-elbow: Conduction distance explained more of the variation than height. When corrected for length or height there were correlations with age/squared age, slightly stronger with squared age. There was no correlation with temperature and there were no intercentre differences after the above corrections.

Latency wrist-Erbs: Height explained slightly more of the variation than distance. When corrected for length or height there were correlations with age/squared age, slightly stronger with age. There was no correlation with temperature and there were no intercentre differences after the above corrections.

NCV wrist-elbow: There were inverse correlations with age and squared age, slightly stronger with squared age. There was no correlation with height or temperature and there were no intercentre differences after the above corrections.

NCV wrist-Erbs: There were inverse correlations with age and squared age, slightly stronger with squared age. After correction for age/squared age there were inverse correlations with height. Hereafter the inverse correlation with age was stronger than with squared age. There was no correlation with temperature and there were no intercentre differences after the above corrections.

Latency wrist-C7: Conduction distance explained slightly more of the variation than height. Squared age explained slightly more of the variation than age when there was not corrected for conduction distance or height. When corrected for conduction distance or height age explained slightly more of the variation than squared age. There was no correlation with temperature and there were no intercentre differences before or after the above corrections.

Latency wrist-Onset: There were no correlations with age/squared age regarded in isolation. When corrected for height and conduction distance there were correlations with age. Conduction distance explained slightly more of the variation than height when there was not corrected for age, however, with correction for age height explained slightly more of the variation than conduction distance. There was no correlation with temperature and there were no intercentre differences before or after the above corrections.

Latency wrist-N20: There were weak correlations with age/squared age. Height explained slightly more of the variation than conduction distance. There was no correlation with temperature and there were no intercentre differences.

Latency wrist-P26: There were weak correlations with age/squared age. There were no correlations with height or conduction distance. There was no correlation with temperature and there were no intercentre differences.

Latency wrist-N32: There were no correlations with age/squared age, height or conduction distance. There was no correlation with temperature and there were no intercentre differences.

Latency wrist-P42: There were no correlations with age/squared age, height or conduction distance. There was no correlation with temperature and there were no intercentre differences.

CSCT (P20-N14): There were no correlations with age/squared age, height or conduction distance. There was no correlation with temperature and there were no intercentre differences.

Amplitude (N20-P26): Values did not follow a normal distribution. Regression was done on logarithmically transformed values (natural logarithm). There was no correlation with age or squared age. There was a slight inverse correlation with height. There were no intercentre differences.

Amplitude (peak to peak)': Values did not follow a normal distribution. Regression was done on logarithmically transformed values (natural logarithm). There was no correlation with age or squared age. There was a slight inverse correlation with height. After correction for height there was a small intercentre difference (Centre 1 in average 0.28 corresponding to 1.3 microvolts larger values,  $p=0.03$  or Centre 4 in average 0.40 corresponding to 1.5 microvolts smaller values).

#### Tibial nerve specific comments

Latency ankle-fossa: Height explained slightly more of the variation than conduction distance. When corrected for height there were no correlations with other parameters and no intercentre differences.

NCV ankle-fossa: Without considering intercentre differences there was an inverse correlation with height but no correlation with age/squared age unless there was also corrected for temperature. Considering intercentre differences Centre 4 and Centre 2 had smaller values (Centre 4: mean 5.5 m/sec,  $p=0.0001$ ; Centre 2: mean 3.6 m/sec,  $p=0.014$ ) when corrected for height and squared age. When corrected for height, squared age and temperature Centre 4 had smaller values (mean 3.5 m/sec,  $p=0.02$ ).

Latency ankle-N24: Height explained more of the variation than conduction distance. When corrected for height and squared age there were no intercentre differences. There was no correlation with temperature either before or after correction for height and age/squared age.

Latency ankle-Onset: Height explained slightly more of the variation than conduction distance. When corrected for height and squared age there were no intercentre differences. There was no correlation with temperature either before or after correction for height and age/squared age.

Latency ankle-P40: Height explained slightly more of the variation than conduction distance. When corrected for height and squared age there was a correlation with temperature ( $p=0.023$ ), i.e. in the opposite direction of expected. When corrected for height and squared age there were no intercentre differences.

CSCT (Onset-N24): There was no correlation with conduction distance or with temperature. There were correlations with age/squared age and height. There were no intercentre differences either before or after correction for height and age/squared age.

CSCT (P40-N24): Conduction distance explained more of the variation than height. There was no correlation with height alone, after correction for age/squared age there was a weak correlation with height. Corrected for age/squared age or conduction distance or both there were no intercentre differences. Corrected for squared age and height there was one intercentre difference (Centre 4 in average 1.3 msec shorter,  $p=0.017$ ).

Latency ankle-Onset': Height explained slightly more of the variation than conduction distance. When corrected for height and squared age there was a small intercentre difference (Centre 1 in average 1.0 msec shorter ( $p=0.011$ )). There were no correlations with temperature, either before or after correction for height and age.

Latency ankle-P40' (left and right): Height explained slightly more of the variation than conduction distance. There were no intercentre differences.

CSCT (Onset'-N24): Before and after correction for age/squared age there was no correlation with conduction distance or with temperature. There was no correlation with height alone, only after correction for age/squared age there was a correlation with height. There were some intercentre differences after correction for height and squared age (Centre 1 in average 1.2 msec shorter ( $p=0.0025$ ) and Centre 3 in average 1.2 msec shorter ( $p=0.033$ )).

CSCT (P40'-N24) (left and right): Before and after correction for age/squared age there was no correlation with conduction distance or with temperature. There was no correlation with height alone, only after correction for age there was a correlation with height. There were no intercentre differences.

Amplitude: Values did not follow a normal distribution. Regression was done on logarithmically transformed values (natural logarithm). There were inverse correlations with age and with squared age, the correlation with age was strongest. After correcting for age there was an inverse correlation with height. After correction for age and height there was an intercentre difference (Centre 4 in average 0.70 corresponding to 2.0 microvolts smaller values,  $p=0.0005$ ).

Amplitude': Values did not follow a normal distribution. Regression was done on logarithmically transformed values (natural logarithm). There was an inverse correlation with age, but not with squared age. After correcting for age there was an inverse correlation with height. After correction for age and height there was an intercentre difference (Centre 4 in average 0.58 corresponding to 1.8 microvolts smaller values,  $p=0.0002$ ).

### **General comments and recommendations**

For most parameters the correlations with height were slightly stronger than those with conduction distance. There were a few exceptions from this rule (Latency wrist-elbow, Latency wrist-N14 and CSCT (P40-N24)). The general pattern with stronger correlations with height than with conduction distances may be explained by a larger variation on measuring of conduction distances than the variation on measuring the height. Another explanation may be differences on methods used to measure the conduction distances, which is supported by the finding of intercentre differences on some of the conduction distances. As a consequence of the above we recommend the use of height in regression equations and that measuring of individual conduction distances can be avoided.

The latencies wrist-elbow, wrist-Erbs and ankle-fossa can be used instead of the calculated nerve conduction velocities of the segments.

Most intercentre differences were small, and at least some of them may be explained by mass-significance and by the limited number of patients at each centre. Others may be caused by minor systematic differences in technique, e.g. temperature differences. We find that the intercentre differences are of such a small magnitude that the presented regression equations can be used in all centres.

For tibial nerve stimulation both cortical montages Cz'-Fz (Onset and P40) and C3'-C4'/C4'-C3' (Onset/P40') can be used. For the C3'-C4'/C4'-C3' montage there were some intercentre differences and some side-differences. It is suggested that each laboratory choose one montage as standard and only uses the other montage if there are not well-defined responses at the standard montage. The CSCT calculated as Onset-N24 had a lower variation than the CSCT calculated as P40-N24. We recommend that the former CSCT to be used as the standard and only in case there is not a well-defined Onset, the CSCT can be calculated as P40-N24.

**Table 1. Side differences median nerve parameters**

	N	Unit	Mean	SD	Mean +2SD	Median	95%	99%
Latency wrist-elbow	61	msec	0.16	0.15	0.46	0.1	0.4	0.7
Latency wrist-Erbs	60	msec	0.18	0.16	0.50	0.1	0.5	0.5
NCV wrist-elbow	61	m/sec	2.90	2.56	8.02	2.1	8.2	12.1
NCV wrist-Erbs	60	m/sec	1.61	1.20	4.00	1.25	3.5	5.1
Latency wrist-N14	63	msec	0.32	0.28	0.88	0.3	0.9	1.2
Latency wrist-Onset	61	msec	0.57	0.52	1.60	0.4	1.5	2.4
Latency wrist-N20	61	msec	0.35	0.27	0.88	0.3	0.8	1.3
Latency wrist-P26	61	msec	0.75	0.99	2.73	0.4	2.3	6.4
Latency wrist-N32	58	msec	1.21	1.39	3.99	0.85	4.3	7.4
Latency wrist-P42	51	msec	1.55	1.63	4.81	1.0	4.3	8.4
CSCT (N20-N14)	61	msec	0.29	0.29	0.87	0.2	0.9	1.2
Ampl. (N20-P26)	61	μV	1.42	1.91	5.24	0.9	3.9	13.4
Ampl. (peak-peak)	61	μV	1.68	1.98	5.63	1.3	4.4	13.4
	N	Unit	Mean	SD	Mean -2SD	Median	5%	1%
Ampl. (N20-P26)	61	%	78.1	15.2	47.6	81.3	52.5	38.5
Ampl. (peak-peak)	61	%	78.4	15.3	47.8	79.5	52.9	39.8

Table 1. Side differences between left and right-sided values for median nerve parameters. Values calculated as the absolute value of the difference. Differences of amplitudes in percent are calculated as lowest values divided by highest value multiplied by 100.

**Table 2. Side differences tibial nerve parameters**

	N	Unit	Mean	SD	Mean +2SD	Median	95%	99%
Latency ankle-fossa	63	msec	0.25	0.26	0.8	0.2	0.9	1.0
NCV (ankle-fossa)	63	m/sec	2.27	2.3	6.9	1.6	7.1	10.2
Latency ankle-N24	56	msec	0.34	0.31	1.0	0.2	1.0	1.0
Latency ankle-Onset	64	msec	0.87	0.77	2.4	0.7	2.7	3.5
Latency ankle-P40	64	msec	1.19	1.01	3.2	1.0	3.1	5.0
CSCT Onset-N24	54	msec	0.81	0.75	2.3	0.7	2.4	3.7
CSCT P40-N24	55	msec	1.07	0.92	2.9	1.0	3.1	3.7
Latency ankle-Onset'	65	msec	0.95	0.78	2.5	0.8	2.2	4.0
Latency ankle-P40'	65	msec	0.91	0.80	2.5	0.6	2.2	4.2
CSCT Onset'-N24	56	msec	0.91	0.64	2.2	0.8	2.4	2.7
CSCT P40'-N24	56	msec	0.91	0.78	2.5	0.8	2.3	3.2
Amplitude	63	μV	0.63	0.75	2.1	0.5	1.7	4.3
Amplitude'	64	μV	0.79	0.74	2.3	0.6	2.2	3.1
	N	Unit	Mean	SD	Mean -2SD	Median	5%	1%
Amplitude	63	%	79.2	17.1	45.0	83.9	47.5	27.8
Amplitude'	64	%	75.5	16.5	42.5	77.3	43.8	28.2

Table 2. Side differences between left and right-sided values for tibial nerve parameters. Values calculated as the absolute value of the difference. Differences of amplitudes in percent are calculated as lowest values divided by highest value multiplied by 100.

**Table 3. Regression equations median nerve**

Latency	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	Distance
wrist-elbow		(%)	(msec)		(years)	(years*years)	(cm)	(degree)	(wrist-elbow (mm))
	64		3.46	0.41					
	64	67	0.58	0.23					0.01301 ***
	64	75	-0.12	0.20	0.006775 ***				0.014658 ***
	64	75	0.06	0.20		0.000068 ***			0.014533 ***
	64	56	-1.34	0.27			0.028697 ***		
	64	63	-2.40	0.25	0.006807 ***		0.033005 ***		
R	64	64	-2.21	0.25		0.00007 ***	0.032772 ***		
Latency	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	Distance
wrist-Erbs		(%)	(m/sec)		(years)	(years*years)	(cm)	(degree)	(wrist-Erbs (mm))
	62		8.75	0.79					
	62	66	0.17	0.46					0.01422 ***
	62	80	-1.99	0.36	0.016832 ***				0.016539 ***
	62	80	-1.51	0.36		0.000167 ***			0.016334 ***
	62	67	-1.93	0.46			0.061677 ***		
R	62	81	-4.63	0.34	0.017588 ***		0.072578 ***		
	62	81	-4.04	0.35		0.000172 ***	0.071422 ***		
NCV	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	
wrist-elbow		(%)	(msec)		(years)	(years*years)	(cm)	(degree)	
	64		64.88	4.28					
	64	26	70.54	3.67	-0.122742***				
	64	27	67.96	3.65		-0.001252 ***			
NCV	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	
wrist-Erbs		(%)	(msec)		(years)	(years*years)	(cm)	(degree)	
	62		69.17	3.53					
	62	36	74.53	2.83	-0.116696***				
	62	48	97.92	2.55	-0.142779***		-0.128148***		
	62	36	72.05	2.82		-0.001181 ***			
	62	46	93.21	2.58		-0.001405 ***	-0.119041 ***		
Latency	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	Distance
wrist-N14		(%)	(msec)		(years)	(years*years)	(cm)	(degree)	(wrist-C7 (cm))
	64		13.84	1.16					
	64	6	13.03	1.12	0.017541 *				
	64	7	13.38	1.12		0.000185 *			
	64	43	1.34	0.88			0.072087 ***		
	64	49	3.13	0.83					0.015733 ***
R	64	74	-4.59	0.59	0.038009 ***		0.096141 ***		
	64	73	-3.36	0.60		0.000373 ***	0.093888 ***		
	64	75	-0.77	0.58	0.033528 ***				0.019179 ***
	64	77	-3.16	0.56	0.036331 ***		0.046074 ***		0.010774 ***
Latency	N	R <sup>2</sup>	Constant	SD	Age	Age*Age	Height	Temp	Distance
wrist-Onset		(%)	(msec)		(years)	(years*years)	(cm)	(degree)	(wrist-vertex (cm))
	64		16.15	1.15					
	64	41	4.06	0.88			0.069723 ***		
	64	42	6.13	0.88					0.010772 ***
R	64	65	-1.12	0.68	0.033206 ***		0.090736 ***		
	64	63	2.14	0.70	0.031078 ***				0.013522 ***
	64	67	-0.46	0.66	0.033204 ***		0.053702		0.0062 *

**Table 3. Continued**

Latency wrist-N20	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (wrist-vertex (cm))
	64		19.56	1.29					
	64	11	18.42	1.22	0.024645 **				
	64	11	18.95	1.22		0.00025 **			
	64	35	6.92	1.04			0.072863 ****		
	64	32	9.58	1.06					0.010728 ***
R	64	73	-0.31	0.67	0.04641 ****		0.102233 ****		
	64	70	1.28	0.70		0.000447 ****	0.099029 ****		
Latency wrist-P26	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (wrist-vertex (cm))
	64		25.13	2.49					
	64	7	23.28	2.40	0.040044 *				
	64	9	24.06	2.38		0.000436 *			
Latency wrist-N32	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (wrist-vertex (cm))
	64		32.01	4.40					
Latency wrist-P42	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (wrist-vertex (cm))
	64		38.69	7.58					
CSCCT N20-N14	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (C7-vertex (cm))
R	64		5.72	0.54					
Amplitude N20-P26	N	R <sup>2</sup> (%)	Constant exp(μV)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	
	64		1.50	0.690					
R	64	7	4.83	0.664			-0.01919 *		
Amplitude peak-peak	N	R <sup>2</sup> (%)	Constant exp(μV)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	
	64		1.70	0.551					
	64	5	3.93	0.538			-0.012843 *		

Table 3. Regression equations for different parameters obtained by stimulation of the median nerve.  
 \*\*\*\*: p<0.001, \*\*: p<0.01, \*: p<0.05, R: recommended for Keypoint users.



**Table 4. Regression equations tibial nerve**

Latency ankle-fossa	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-fossa (mm))
	66		7.46	0.97					
	66	53	-1.04	0.66					0.019221 ***
R	66	62	-5.49	0.60			0.07413 ***		
NCV ankle-fossa	N	R <sup>2</sup> (%)	Constant (m/sec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	
	66		59.74	5.22					
	66	14	94.12	4.85			-0.196901 **		
	65	19	57.79	4.70			-0.173206 **	1.000691 *	
	65	25	62.08	4.54	-0.084988 *		-0.210759 ***	1.189734 **	
	65	25	59.41	4.52		-0.000916 *	-0.208806 ***	1.208615 **	
Latency ankle-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-Th12 (cm))
	60		24.29	2.27					
	60	6	23.43	2.20		0.000394 *			
	60	50	4.01	1.60					0.187463 ***
	60	67	-1.34	1.31	0.05838 ***				0.213356 ***
	60	71	-0.70	1.23		0.000683 ***			0.2173 ***
	60	54	-3.60	1.54			0.159967 ***		
	60	79	-13.38	1.03	0.073473 ***		0.197687 ***		
R	60	81	-11.45	0.99		0.000787 ***	0.195177 ***		
Latency ankle-Onset	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-vertex (cm))
	65		35.62	2.99					
	65	8	33.24	2.87	0.052821 *				
	65	9	34.28	2.85		0.00058 **			
	65	46	3.46	2.20					0.191783 ***
	65	78	-10.92	1.41	0.105699 ***				0.249127 ***
	65	78	-8.21	1.39		0.001093 ***			0.246307 ***
	65	48	0.85	2.16			0.199431 ***		
	65	81	-14.11	1.31	0.106385 ***		0.257742 ***		
R	65	81	-11.35	1.30		0.001099 ***	0.254802 ***		
Latency ankle-P40	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-vertex (cm))
	65		41.84	3.40					
	65	9	38.90	3.24	0.065378 **				
	65	12	40.12	3.20		0.000742 **			
	65	33	10.64	2.79					0.186073 ***
	65	64	-5.49	2.05	0.118521 ***				0.250374 ***
	65	66	-2.83	1.98		0.001261 ***			0.248979 ***
	65	34	8.25	2.76			0.192678 ***		
	65	65	-8.48	2.00	0.118973 ***		0.257889 ***		
R	65	68	-5.79	1.94		0.001265 ***	0.256395 ***		
	64	69	-19.09	1.88		0.00119 ***	0.260293 ***	0.398775 *	

**Table 4. Continued**

CSCT Onset-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (Th12-vertex (cm))
	59		11.22	1.52					
	59	7	10.06	1.47	0.026703 *				
	59	8	10.58	1.46		0.000297 *			
	59	7	3.80	1.47			0.042599 *		
	59	23	-1.48	1.34	0.039659 ***		0.062972 ***		
R	59	23	-0.35	1.34		0.000418 ***	0.061199 ***		
CSCT P40-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (Th12-vertex (cm))
	59		17.29	1.83					
	59	7	15.90	1.77	0.03188 *				
	59	10	16.45	1.74		0.000389 **			
	59	12	10.07	1.72					0.121053 **
	59	24	6.80	1.59	0.041356 **				0.145397 ***
	59	25	8.16	1.58		0.000447 **			0.136575 ***
	59	14	6.05	1.70	0.041916 **		0.054 *		
R	59	17	6.94	1.67		0.000482 **	0.053357 *		
Latency ankle-Onset'	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-vertex (cm))
	67		34.58	3.20					
	67	11	31.60	3.02	0.065579 **				
	67	13	32.89	2.99		0.00072 **			
	67	36	3.42	2.56					0.185825 ***
	67	72	-13.18	1.69	0.118957 ***				0.252582 ***
	67	73	-10.30	1.65		0.001236 ***			0.250269 ***
	67	37	1.42	2.54			0.19019 ***		
	67	73	-15.86	1.66	0.119454 ***		0.258134 ***		
R	67	75	-12.98	1.61		0.001243 ***	0.255969 ***		
Latency (l) ankle-P40'	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-vertex (cm))
	67		40.98	3.27					
	67	14	37.59	3.04	0.074563 **				
	67	16	39.06	3.00		0.000817 ***			
	67	29	12.14	2.75					0.171955 ***
	67	68	-5.42	1.86	0.125823 ***				0.242564 ***
	67	70	-2.43	1.80		0.001313 ***			0.240403 ***
	67	31	9.70	2.71			0.179341 ***		
	67	70	-8.68	1.78	0.127078 ***		0.251622 ***		
R	67	72	-5.67	1.72		0.001327 ***	0.249575 ***		
Latency (r) ankle-P40'	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (ankle-vertex (cm))
	65		40.40	3.05					
	65	17	36.95	2.78	0.077441 ***				
	65	19	38.48	2.74		0.000848 ***			
	65	32	12.64	2.51					0.165241 ***
	65	76	-4.77	1.50	0.128404 ***				0.234798 ***
	65	78	-1.73	1.44		0.001348 ***			0.232629 ***
	65	33	10.64	2.50			0.170464 ***		
	65	77	-6.71	1.47	0.126853 ***		0.237455 ***		
	65	78	-3.62	1.42		0.00133 ***	0.234939 ***		

**Table 4. Continued**

CSCT Onset'-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (Th12-vertex (cm))
	61		10.08	1.67					
	61	10	8.60	1.58	0.033475 **				
	61	12	9.24	1.56		0.000377 **			
	61	21	-1.99	1.48	0.044324 ***		0.057971 **		
R	61	22	-0.81	1.47		0.000477 ***	0.056366 **		
CSCT (l) P40'-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (Th12-vertex (cm))
	61		16.45	1.58					
	61	15	14.77	1.45	0.038094 **				
	61	17	15.51	1.44		0.000421 ***			
	61	25	5.11	1.37	0.047982 ***		0.052837 **		
R	61	26	6.44	1.35		0.00051 ***	0.050849 **		
CSCT (r) P40'-N24	N	R <sup>2</sup> (%)	Constant (msec)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	Distance (Th12-vertex (cm))
	58		15.96	1.46					
	58	36	13.67	1.17	0.053142 ***				
	58	39	14.75	1.14		0.000572 ***			
	58	44	5.46	1.09	0.062074 ***		0.044756 **		
	58	47	7.00	1.06		0.000656 ***	0.043295 **		
Amplitude peak-peak	N	R <sup>2</sup> (%)	Constant exp(μV)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	
	65		0.76	0.802					
	65	17	1.67	0.729	-0.020097***				
	65	10	1.15	0.758		-0.000165 **			
R	65	27	6.50	0.687	-0.025751***		-0.026279 **		
Amplitude' peak-peak	N	R <sup>2</sup> (%)	Constant exp(μV)	SD	Age (years)	Age*Age (years*years)	Height (cm)	Temp (degree)	
	66		0.87	0.606					
	66	6	1.32	0.587	-0.009935 *				
	66	13	4.83	0.564		0.00012**	-0.021138 **		
R	66	19	5.61	0.544	-0.014993***		-0.023317 **		

Table 4. Regression equations for different parameters obtained by stimulation of the tibial nerve.  
 \*\*\*: p<0.001, \*\*: p<0.01, \*: p<0.05, R: recommended for Keypoint users.