

ONLINE SUPPLEMENTARY MATERIAL

Supplementary Table 1. TAWiC from knee and ankle ROI in children with JIA group and healthy children using only joint exam as gold standard

Variables, Mean ± SD	Inflamed joints (JIA)	Uninflamed joints (JIA & control)	p value
Analyses of Knees and Corresponding Mid Tibia			
	N=49	N=149	
Knee			
95 th absolute (Anterior)	34.53 ± 1.16	33.76 ± 1.24	<.001
95 th absolute (Lateral)	34.12 ± .99	33.54 ± 1.04	<.001
95 th absolute (Medial)	34.12 ± .98	33.58 ± 1.19	<.001
95 th absolute (Posterior)	34.36 ± 1.04	34.27 ± .99	.63
95 th TAWiC (Anterior)	1.01 ± .86	-.06 ± .51	<.001
95 th TAWiC (Lateral)	1.17 ± .90	.19 ± .50	<.001
95 th TAWiC (Medial)	1.28 ± .79	.30 ± .60	<.001
95 th TAWiC (Posterior)	1.91 ± .80	1.67 ± .57	.08
Mean absolute (Anterior)	33.37 ± 1.23	32.70 ± 1.31	.002
Mean absolute (Lateral)	32.83 ± .98	32.56 ± 1.11	.12
Mean absolute (Medial)	32.99 ± 1.00	32.63 ± 1.17	.05
Mean absolute (Posterior)	33.08 ± 1.08	33.0 ± 1.1	.68
Mean TAWiC (Anterior)	.60 ± .98	-.37 ± .57	<.001
Mean TAWiC (Lateral)	.69 ± .72	-.11 ± .54	<.001
Mean TAWiC (Medial)	.87 ± .74	.03 ± .61	<.001
Mean TAWiC (Posterior)	1.51 ± .69	1.23 ± .54	.02
Mid tibia			
95 th absolute (Anterior)	33.52 ± 1.21	33.83 ± 1.19	.15
Mean absolute (Anterior)	32.77 ± 1.24	33.08 ± 1.25	.16
Analyses of Ankles and Corresponding Mid Tibia			
	N=25	N=173	
Ankle			
95 th absolute (Anterior)	33.84 ± 1.55	33.54 ± 1.76	.40
95 th TAWiC (Anterior)	.62 ± 1.17	-.28 ± 1.11	.001
Mean absolute (Anterior)	32.07 ± 1.65	32.23 ± 1.72	.68
Mean TAWiC (Anterior)	-.43 ± .94	-.84 ± .95	.04
Mid tibia			
95 th absolute (Anterior)	33.22 ± 1.43	33.83 ± 1.15	.05
Mean absolute (Anterior)	32.50 ± 1.37	33.07 ± 1.22	.05

TAWiC: Temperature After Within-limb Calibration, ROI: region of interest,

Supplementary Table 2. Area under the curve and threshold when using TAWiC from knee and ankle only using joint exam as gold standard

Variables	AUC	Youden-maximizing threshold (C)	Youden index	sensitivity	specificity
Knee					
95 th TAWiC (Anterior)	0.847	0.540	0.621	0.735	0.886
95 th TAWiC (Lateral)	0.830	0.795	0.537	0.612	0.925
95 th TAWiC (Medial)	0.836	0.950	0.605	0.714	0.891
95 th TAWiC (Posterior)	0.595	1.940	0.214	0.489	0.725
Mean TAWiC (Anterior)	0.808	0.305	0.481	0.592	0.899
Mean TAWiC (Lateral)	0.824	0.210	0.524	0.796	0.728
Mean TAWiC (Medial)	0.811	0.265 or 0.310	0.483	0.796 or 0.776	0.673 or 0.707
Mean TAWiC (Posterior)	0.608	1.450	0.243	0.511	0.732
Ankle					
95 th TAWiC (Anterior)	0.703	0.130	0.321	0.720	0.601
Mean TAWiC (Anterior)	0.624	-0.345	0.253	0.600	0.653

TAWiC: Temperature After Within-limb Calibration, AUC: area under the curve, Youden index=sensitivity + specificity -1

Supplementary Table 3. Correlation of gender, age, height, weight, BMI and body temperature with TAWiC_knee and TAWiC_ankle by using joint exam as gold standard

Variable	Healthy control	Uninflamed joint (JIA)	Inflamed joint (JIA)
Anterior Knee	N=96	N=53	N=49
Gender	.71 (.493)	.163 (.243)	.164 (.260)
Age	.0698 (.509)	-.119 (.397)	-.121 (.407)
Height	.090 (.383)	-.175 (.211)	-.077 (.597)
Weight	.128 (.215)	-.178 (.202)	.060 (.684)
BMI	.068 (.510)	-.168 (.229)	.095 (.518)
Lateral Knee	N=94	N=53	N=49
Gender	-.108 (.298)	.191 (.170)	.289 (.044)
Age	.032 (.757)	-.243 (.079)	-.252 (.081)
Height	.123 (.238)	-.236 (.089)	-.224 (.121)
Weight	.158 (.129)	-.192 (.168)	-.144 (.322)
BMI	.109 (.297)	-.070 (.618)	-.113 (.439)
Medial Knee	N=96	N=53	N=49
Gender	.094 (.368)	-.039 (.780)	-.001 (.997)
Age	.142 (.171)	.057 (.683)	.130 (.372)
Height	.130 (.213)	.016 (.912)	.201 (.167)
Weight	.059 (.571)	.068 (.627)	.318 (.026)
BMI	-.062 (.553)	.023 (.870)	.254 (.078)
Posterior Knee	N=96	N=53	N=47
Gender	.236 (.020)	-.041 (.773)	-.240 (.104)
Age	.077 (.454)	-.011 (.940)	.113 (.451)
Height	.067 (.517)	-.049 (.730)	.195 (.190)
Weight	.035 (.737)	.080 (.567)	.239 (.105)
BMI	-.040 (.696)	.097 (.491)	.080 (.594)
Anterior Ankle	N=96	N=77	N=25
Gender	-.206 (.045)	.099 (.393)	.035 (.867)
Age	-.220 (.031)	-.285 (.012)	-.453 (.023)
Height	-.089 (.386)	-.266 (.019)	-.406 (.044)
Weight	.145 (.159)	-.141 (.221)	-.133 (.526)
BMI	.307 (.002)	.093 (.423)	.106 (.613)

Values were expressed as correlation coefficient (p value). TAWiC: Temperature After Within-limb Calibration, US: ultrasound, JIA: juvenile idiopathic arthritis

Supplementary Table 4. Total pixels within each region of interest

Variable	Healthy control	Uninflamed joint (JIA)	Inflamed joint (JIA)
Anterior Knee	N=96	N=46	N=45
Knee	2130 (558)	2096 (550)	3242 (741)
mid-tibia	896 (249)	869 (217)	966 (319)
Lateral Knee	N=94	N=46	N=45
Knee	2348 (767)	2227 (608)	2599 (909)
mid-tibia	942 (281)	938 (256)	1065 (365)
Medial Knee	N=94	N=46	N=45
Knee	2407 (792)	2352 (643)	2705 (857)
mid-tibia	1000 (240)	1016 (243)	1106 (338)
Posterior Knee	N=96	N=43	N=43
Knee	2448 (674)	2399 (625)	2726 (847)
mid-tibia	1049 (289)	1018 (257)	1172 (411)
Anterior Ankle	N=96	N=72	N=20
Ankle	859 (217)	884 (255)	892 (226)
mid-tibia	896 (249)	929 (297)	871 (193)

Values were expressed as means and standard deviation. JIA: juvenile idiopathic

Supplementary Table 5. TAWiC from knee and ankle ROI in children with JIA group and healthy children using only ultrasound as gold standard

Variables, Mean ± SD	Inflamed joints (JIA)	Uninflamed joints (JIA & control)	p value
Analyses of Knees and Corresponding Mid Tibia			
	N=55	N=143	
Knee			
95 th absolute (Anterior)	34.40 ± 1.19	33.78 ± 1.25	.003
95 th absolute (Lateral)	33.99 ± 1.00	33.56 ± 1.05	.01
95 th absolute (Medial)	34.02 ± 1.04	33.60 ± 1.19	.03
95 th absolute (Posterior)	34.32 ± 1.02	34.28 ± 1.00	.86
95 th TAWiC (Anterior)	.81 ± .89	-.03 ± .56	<.001
95 th TAWiC (Lateral)	.96 ± .86	.23 ± .60	<.001
95 th TAWiC (Medial)	1.15 ± .84	.31 ± .61	<.001
95 th TAWiC (Posterior)	1.92 ± .80	1.64 ± .55	.05
Mean absolute (Anterior)	33.22 ± 1.30	32.73 ± 1.30	.03
Mean absolute (Lateral)	32.76 ± 1.03	32.57 ± 1.10	.30
Mean absolute (Medial)	32.92 ± 1.08	32.64 ± 1.15	.18
Mean absolute (Posterior)	33.05 ± 1.04	33.01 ± 1.09	.81
Mean TAWiC (Anterior)	.43 ± 1.05	-.35 ± 0.57	<.001
Mean TAWiC (Lateral)	.57 ± .75	-.09 ± .55	<.001
Mean TAWiC (Medial)	.80 ± .77	.03 ± .60	<.001
Mean TAWiC (Posterior)	1.55 ± .69	1.21 ± .52	.005
Mid tibia			
95 th absolute (Anterior)	33.58 ± 1.26	33.82 ± 1.18	.30
Mean absolute (Anterior)	32.80 ± 1.29	33.08 ± 1.23	.24
Analyses of Ankles and Corresponding Mid Tibia			
	N=19	N=179	
Ankle			
95 th absolute (Anterior)	33.96 ± 1.50	33.54 ± 1.76	.23
95 th TAWiC (Anterior)	.71 ± 1.11	-.26 ± 1.13	<.001
Mean absolute (Anterior)	32.21 ± 1.55	32.21 ± 1.73	.98
Mean TAWiC (Anterior)	-.39 ± .74	-.84 ± .97	.01
Mid tibia			
95 th absolute (Anterior)	33.25 ± 1.46	33.80 ± 1.16	.09
Mean absolute (Anterior)	32.60 ± 1.42	33.04 ± 1.23	.16

TAWiC: Temperature After Within-limb Calibration, ROI: region of interest,

Supplementary Table 6. Area under the curve and threshold when using TAWiC from knee and ankle only using ultrasound as gold standard

Variables	AUC	Youden-maximizing threshold (C)	Youden index	sensitivity	specificity
Knee					
95 th TAWiC (Anterior)	0.781	0.600	0.488	0.600	0.888
95 th TAWiC (Lateral)	0.763	0.710	0.426	0.582	0.844
95 th TAWiC (Medial)	0.778	1.065	0.526	0.618	0.908
95 th TAWiC (Posterior)	0.597	2.210	0.202	0.315	0.887
Mean TAWiC (Anterior)	0.743	0.305	0.447	0.545	0.902
Mean TAWiC (Lateral)	0.763	0.385	0.444	0.600	0.844
Mean TAWiC (Medial)	0.778	0.385	0.442	0.655	0.773
Mean TAWiC (Posterior)	0.643	1.485	0.275	0.500	0.783
Ankle					
95 th TAWiC (Anterior)	0.723	0.130	0.445	0.842	0.603
Mean TAWiC (Anterior)	0.654	-0.310	0.302	0.632	0.670

TAWiC: Temperature After Within-limb Calibration, AUC: area under the curve, Youden index=sensitivity + specificity -1