

Table 1: Participant demographics and anthropometrics

Collar	n	Age	Height $\pm$ SD [m]	Weight $\pm$ SD [kg]	BMI $\pm$ SD [kg/m <sup>2</sup> ]	M/F	Neck Height [mm]	Neck Circumference [mm]
<b>Miami J</b>	13	25 (18-38)	1.73 $\pm$ 0.12	74.2 $\pm$ 18.7	24.4 $\pm$ 3.1	7/6	103 $\pm$ 19	371 $\pm$ 48
<b>Stiffneck</b>	13	24 (20-38)	1.74 $\pm$ 0.10	72.5 $\pm$ 16.2	23.7 $\pm$ 3.1	7/6	104 $\pm$ 21	375 $\pm$ 44
<b>Philadelphia</b>	13	21 (18-26)	1.71 $\pm$ 0.09	65.0 $\pm$ 14.2	22.0 $\pm$ 3.3	3/10	113 $\pm$ 21	345 $\pm$ 30
<b>Aspen</b>	11	21 (20-27)	1.74 $\pm$ 0.12	71.6 $\pm$ 17.1	23.1 $\pm$ 3.5	3/8	116 $\pm$ 21	352 $\pm$ 28

Table 1: Mean range of motion for all collars in flexion, extension, rotation to the right, rotation to the left

	<b>Miami J</b>	<b>Stiffneck Select</b>	<b>Philadelphia</b>	<b>Aspen</b>
<b>Flexion (mean ± SD) [deg]</b>	12.1 ± 6.3	10.9 ± 7.5	11.6 ± 6.6	12.8 ± 6.5
<b>Extension (mean ± SD) [deg]</b>	15.1 ± 8.5	10.9 ± 7.2	13.2 ± 4.9	16.5 ± 8.8
<b>Rotation Right (mean ± SD) [deg]</b>	26.7 ± 10.9	20.3 ± 12.4	23.7 ± 10.0	28.0 ± 12.7
<b>Rotation Left (mean ± SD) [deg]</b>	30.2 ± 13.0	22.0 ± 12.6	31.0 ± 9.5	32.3 ± 14.8
<b>Total Flexion Extension (mean ± SD) [deg]</b>	27.2 ± 12.5	21.8 ± 13.1	24.8 ± 8.4	29.2 ± 11.6
<b>Total Transverse Rotation (mean ± SD) [deg]</b>	56.9 ± 23.1	42.3 ± 24.3	54.7 ± 18.3	60.3 ± 27.0

Table 1: TEWL and hydration measurement before and after (pre and post) collar application for each collar

Outcome measure	Miami J		Stiffneck		Philadelphia		Aspen	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
TEWL (g/hm <sup>2</sup> ) mean ± SD	14.4 ± 5.5	13.5 ± 3.6	16.0 ± 7.6	14.8 ± 4.4	15.0 ± 3.0	16.5 ± 3.3	14.0 ± 3.2	14.3 ± 2.8
Hydration (AU*) mean ± SD	49.7 ± 19.2	48.7 ± 18.6	55.9 ± 14.3	57.3 ± 15.4	59.2 ± 13.8	59.2 ± 14.8	53.1 ± 14.9	52.3 ± 14.5

\*Arbitrary units



A



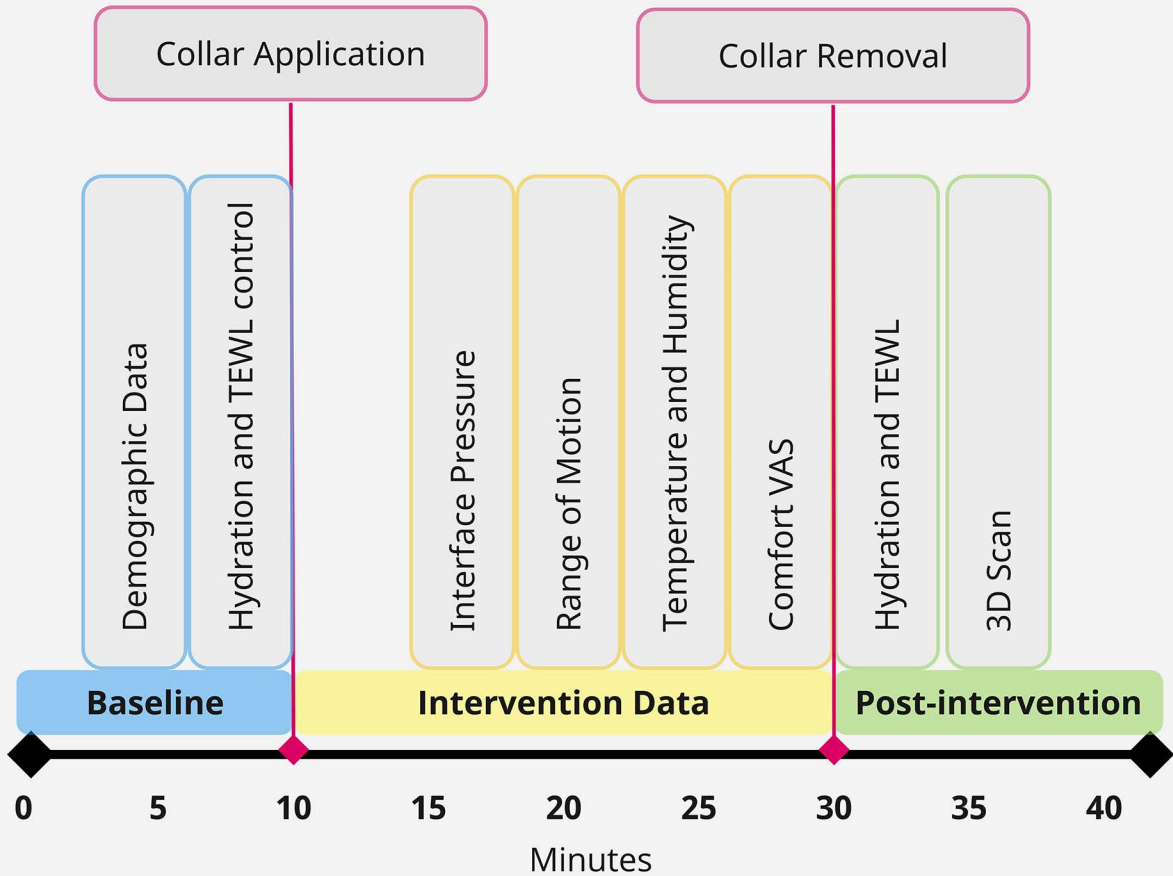
B



C



D



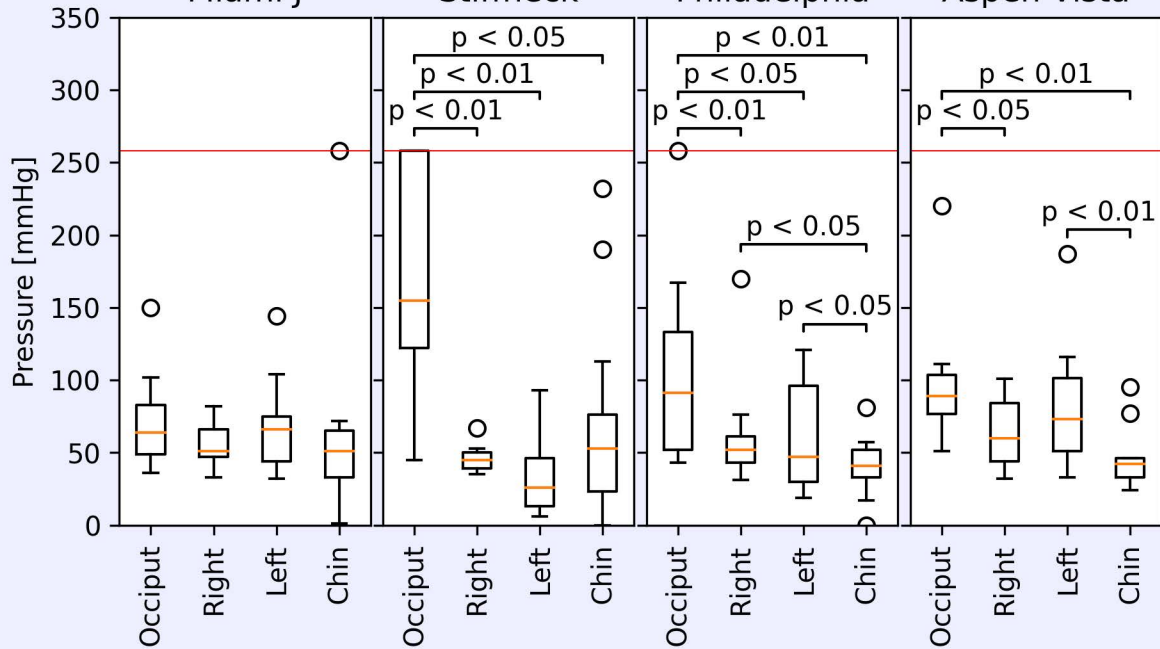


Miami J

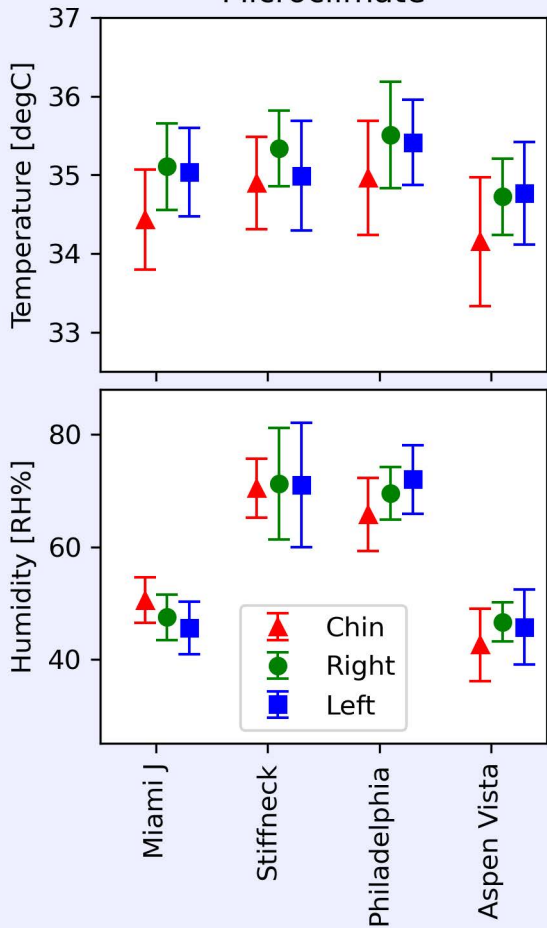
Stiffneck

Philadelphia

Aspen Vista

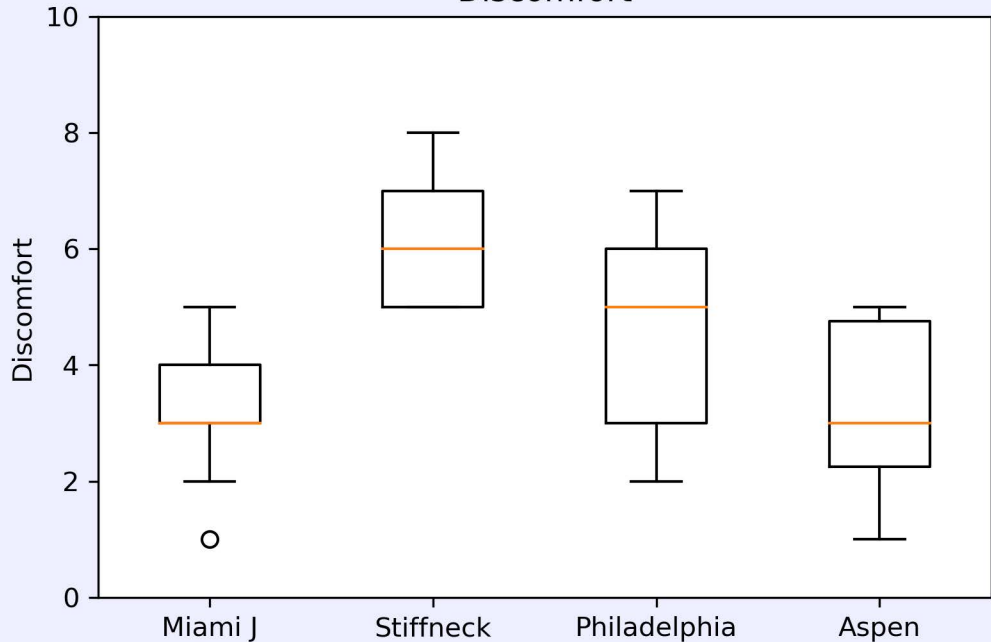


# Microclimate





# Discomfort



	Comprehensive Health and Performance Metrics																	
	Hieght	Weight	BMI	Neck Height	Neck Width	Jaw Width	Neck Circumference	Discomfort	Extension-flexion Range	Rotation Range	Pressure Occiput	Pressure Right Mandible	Pressure Left Mandible	Pressure Chin	Humidity Mean	Temperature Mean	Hydration Difference	TEWL Difference
Hieght		0.81	0.46	0.11	0.8	0.6	0.73	0.34	0.36	0.4	-0.22	-0.2	-0.18	-0.24	0.08	0.24	0.12	0.15
Weight	0.81		0.86	-0.04	0.91	0.85	0.93	0.19	0.26	0.24	-0.07	-0.04	-0.03	-0.12	0	0.24	-0.08	0.02
BMI	0.46	0.86		-0.19	0.77	0.79	0.85	0.11	0.09	0.04	0.08	0.09	0.09	-0.01	-0.03	0.2	-0.2	-0.05
Neck Height	0.11	-0.04	-0.19		-0.01	-0.15	-0.08	-0.04	0.1	0.13	-0.21	-0.05	-0.08	-0.07	-0.01	0.13	0.04	-0.1
Neck Width	0.8	0.91	0.77	-0.01		0.79	0.97	0.34	0.34	0.37	-0.05	-0.06	-0.09	-0.09	0.09	0.28	-0.04	0.06
Jaw Width	0.6	0.85	0.79	-0.15	0.79		0.87	0.08	0.27	0.25	-0.04	0.18	0.05	-0.04	0.05	0.19	-0.12	-0.04
Neck Circumference	0.73	0.93	0.85	-0.08	0.97	0.87		0.27	0.29	0.29	-0.02	0.01	-0.07	-0.03	0.06	0.29	-0.1	0
Discomfort	0.34	0.19	0.11	-0.04	0.34	0.08	0.27		-0.21	-0.18	0.41	-0.22	-0.26	-0.04	0.53	0.29	0.28	0.1
Extension-flexion Range	0.36	0.26	0.09	0.1	0.34	0.27	0.29	-0.21		0.73	-0.41	0.24	0.32	-0.18	-0.25	0.05	0.03	0.12
Rotation Range	0.4	0.24	0.04	0.13	0.37	0.25	0.29	-0.18	0.73		-0.47	0.14	0.22	-0.09	-0.25	-0.11	-0.07	0.14
Pressure Occiput	-0.22	-0.07	0.08	-0.21	-0.05	-0.04	-0.02	0.41	-0.41	-0.47		0.04	-0.05	0.1	0.42	0.27	0.03	-0.01
Pressure Right Mandible	-0.2	-0.04	0.09	-0.05	-0.06	0.18	0.01	-0.22	0.24	0.14	0.04		0.57	0.08	-0.15	0.05	-0.24	-0.1
Pressure Left Mandible	-0.18	-0.03	0.09	-0.08	-0.09	0.05	-0.07	-0.26	0.32	0.22	-0.05	0.57		0.07	-0.28	-0.02	-0.06	0.02
Pressure Chin	-0.24	-0.12	-0.01	-0.07	-0.09	-0.04	-0.03	-0.04	-0.18	-0.09	0.1	0.08	0.07		0.05	0.05	-0.35	-0.11
Humidity Mean	0.08	0	-0.03	-0.01	0.09	0.05	0.06	0.53	-0.25	-0.25	0.42	-0.15	-0.28	0.05		0.54	0.02	-0.06
Temperature Mean	0.24	0.24	0.2	0.13	0.28	0.19	0.29	0.29	0.05	-0.11	0.27	0.05	-0.02	0.05	0.54		-0.01	0.06
Hydration Difference	0.12	-0.08	-0.2	0.04	-0.04	-0.12	-0.1	0.28	0.03	-0.07	0.03	-0.24	-0.06	-0.35	0.02	-0.01		0.36
TEWL Difference	0.15	0.02	-0.05	-0.1	0.06	-0.04	0	0.1	0.12	0.14	-0.01	-0.1	0.02	-0.11	-0.06	0.06	0.36	