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# GAIT ANALYSIS

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Patient: **Mario Rossi**

Exam Date: **17 gen 2023**

Operator:

## PERSONAL DATA

Name: **Mario** Birth Date: **01 gen 1990** (33 years)  
Surname: **Rossi** Birth Place: **Rome**

## PHYSICAL DATA

Height: **175 (cm)** Gender: **Male**  
Weight: **70.0 (kg)** BMI: **22.9**

## INFO

Job: \_\_\_\_\_  
Sport: \_\_\_\_\_  
Hobby: \_\_\_\_\_

## FEATURES

Dominant Side: **Right** Injured Limb: **No one**

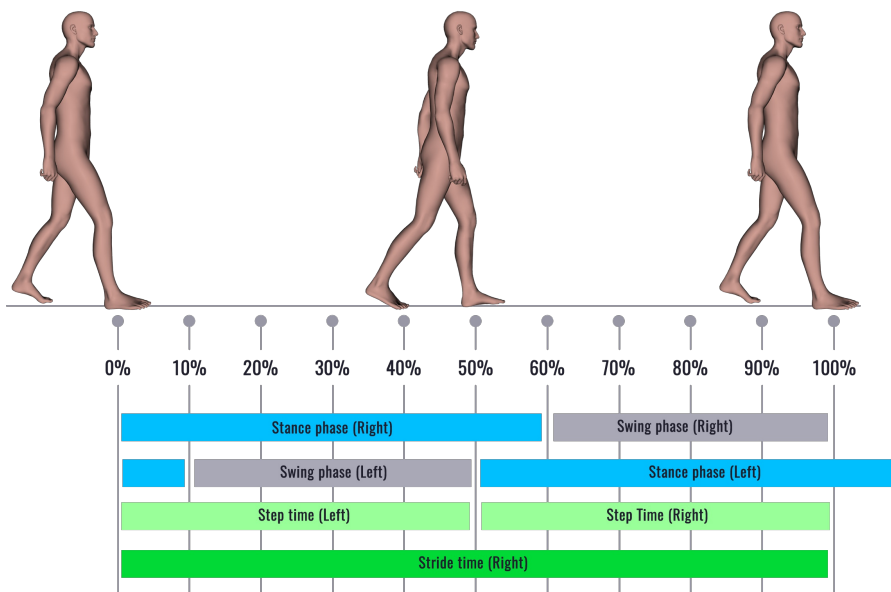
## STORY

Referring doctor: \_\_\_\_\_  
Diagnosis: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Medical question: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## TEST PARAMETERS

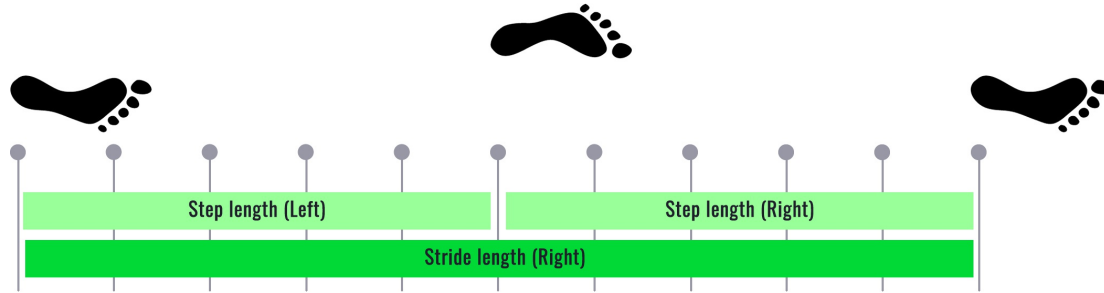
	VALUE
Test duration(s):	<b>6.0</b>
Total number of steps:	<b>5</b>
Mean Cadence (steps/min):	<b>79.0</b>
Mean speed (m/s):	<b>0.6</b>

## SPATIO - TEMPORAL PARAMETERS



	RIGHT	LEFT	NORMAL RANGE
	HEALTHY LIMB	HEALTHY LIMB	
Stride time (s):	<b>1.50 ± 0.03 **</b>	<b>1.55 ± 0.11 **</b>	<b>0.99 - 1.20</b>
Stance phase time (s):	<b>0.96 ± 0.00 **</b>	<b>0.99 ± 0.09 **</b>	<b>0.59 - 0.73</b>
Swing phase time (s):	<b>0.53 ± 0.03 **</b>	<b>0.56 ± 0.01 **</b>	<b>0.40 - 0.48</b>
Single support time (s):	<b>0.55 ± 0.01 **</b>	<b>0.55 ± 0.03 **</b>	<b>0.40 - 0.48</b>
Double support time (s):	<b>0.41 ± 0.01 **</b>	<b>0.45 ± 0.06 **</b>	<b>0.17 - 0.27</b>
Step time (s):	<b>0.74 ± 0.06 **</b>	<b>0.77 ± 0.03 **</b>	<b>0.49 - 0.60</b>
Stance phase percentage (%):	<b>64.41 ± 1.30 **</b>	<b>64.01 ± 1.76 **</b>	<b>57.70 - 62.00</b>
Swing phase percentage(%):	<b>35.59 ± 1.30 **</b>	<b>35.99 ± 1.76 **</b>	<b>38.00 - 42.30</b>
Single support percentage (%):	<b>37.01 ± 1.69 **</b>	<b>35.24 ± 0.39 **</b>	<b>37.94 - 42.30</b>
Double support percentage (%):	<b>27.40 ± 0.39 **</b>	<b>28.77 ± 2.15 **</b>	<b>15.90 - 23.54</b>
Step time percentage (%):	<b>49.67 ± 2.94</b>	<b>49.49 ± 2.04</b>	<b>48.51 - 51.27</b>

## SPATIO - TEMPORAL PARAMETERS



	RIGHT	LEFT	NORMAL RANGE
	HEALTHY LIMB	HEALTHY LIMB	
Stride length (m):	<b>0.99 ± 0.04 **</b>	<b>0.97 ± 0.04 **</b>	<b>1.18 - 1.44</b>
Step length (m):	<b>0.42 ± 0.02 **</b>	<b>0.55 ± 0.05</b>	<b>0.57 - 0.73</b>
Speed (m/s):	<b>0.66 ± 0.04 **</b>	<b>0.63 ± 0.02 **</b>	<b>1.04 - 1.34</b>
Cadence (steps/min):	<b>80.26 ± 1.56 **</b>	<b>77.68 ± 5.41 **</b>	<b>100.43 - 120.96</b>
Arm swing velocity forward (°/s):	<b>18.24 ± 5.76</b>	<b>55.75 ± 42.17</b>	-
Arm swing velocity backwards (°/s):	<b>15.66 ± 6.87</b>	<b>55.99 ± 40.59</b>	-
Arm range of motion (°):	<b>6.47 ± 1.90</b>	<b>19.79 ± 15.02</b>	-
Shock impact shank (g):	<b>1.74 ± 0.10 **</b>	<b>1.74 ± 0.41 **</b>	<b>2.81 - 4.88</b>
Shock impact foot (g):	<b>2.14 ± 0.44 **</b>	<b>2.73 ± 1.23 **</b>	<b>3.40 - 5.97</b>

## COORDINATION

The trunk - pelvis coordination indicates whether the trunk and pelvis rotate at the same time in the transverse plane or not. It varies from 0 to 100% (0% = maximum phase shift - 100% = perfect synchrony).

Arm-hip coordination indicates whether the hip and the contralateral arm rotate at the same time in the sagittal plane or not. It varies from 0 to 100% (0% = maximum phase shift - 100% = perfect synchrony).

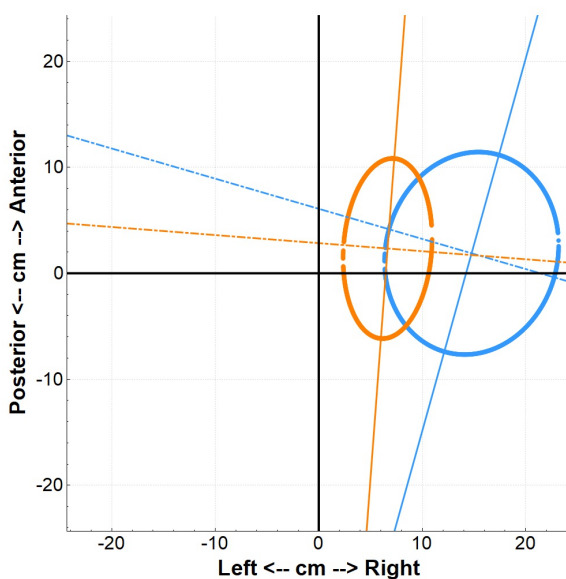
In the case of a right step, the coordination between right hip and left arm is considered.  
In the case of a left step, the coordination between left hip and right arm is considered.

	RIGHT	LEFT	NORMAL RANGE
	HEALTHY LIMB	HEALTHY LIMB	
Trunk - pelvis coordination index (%):	<b>99.46 ± 0.12</b>	<b>91.63 ± 4.00</b>	-
Arm - hip coordination index (%):	<b>80.77 ± 1.12</b>	<b>31.76 ± 6.16</b>	-

## SYMMETRY INDICES

	RIGHT	LEFT	NORMAL RANGE
	HEALTHY LIMB	HEALTHY LIMB	
Stride time:	—	+ 3.6 % **	< 2.10 %
Step time:	—	+ 3.0 %	< 7.44 %
Stance phase time:	—	+ 3.1 %	< 5.08 %
Single support time:	+ 1.4 %	—	< 6.48 %
Double support time:	—	+ 9.2 % **	< 7.00 %
Stride length:	+ 1.6 %	—	< 4.10 %
Step length:	—	+ 32.5 % **	< 10.90 %
Arm swing velocity forward:	—	+ 205.6 %	< -
Arm swing velocity backwards:	—	+ 257.6 %	< -
Arm range of motion:	—	+ 205.9 %	< -
Trunk - pelvis coordination index:	+ 8.5 %	—	< -
Arm - hip coordination index:	+ 154.3 %	—	< -
Shock impact shank:	—	+ 0.3 %	< 36.88 %
Shock impact foot:	—	+ 27.3 %	< 25.76 %

## POSTURE



### TRUNK

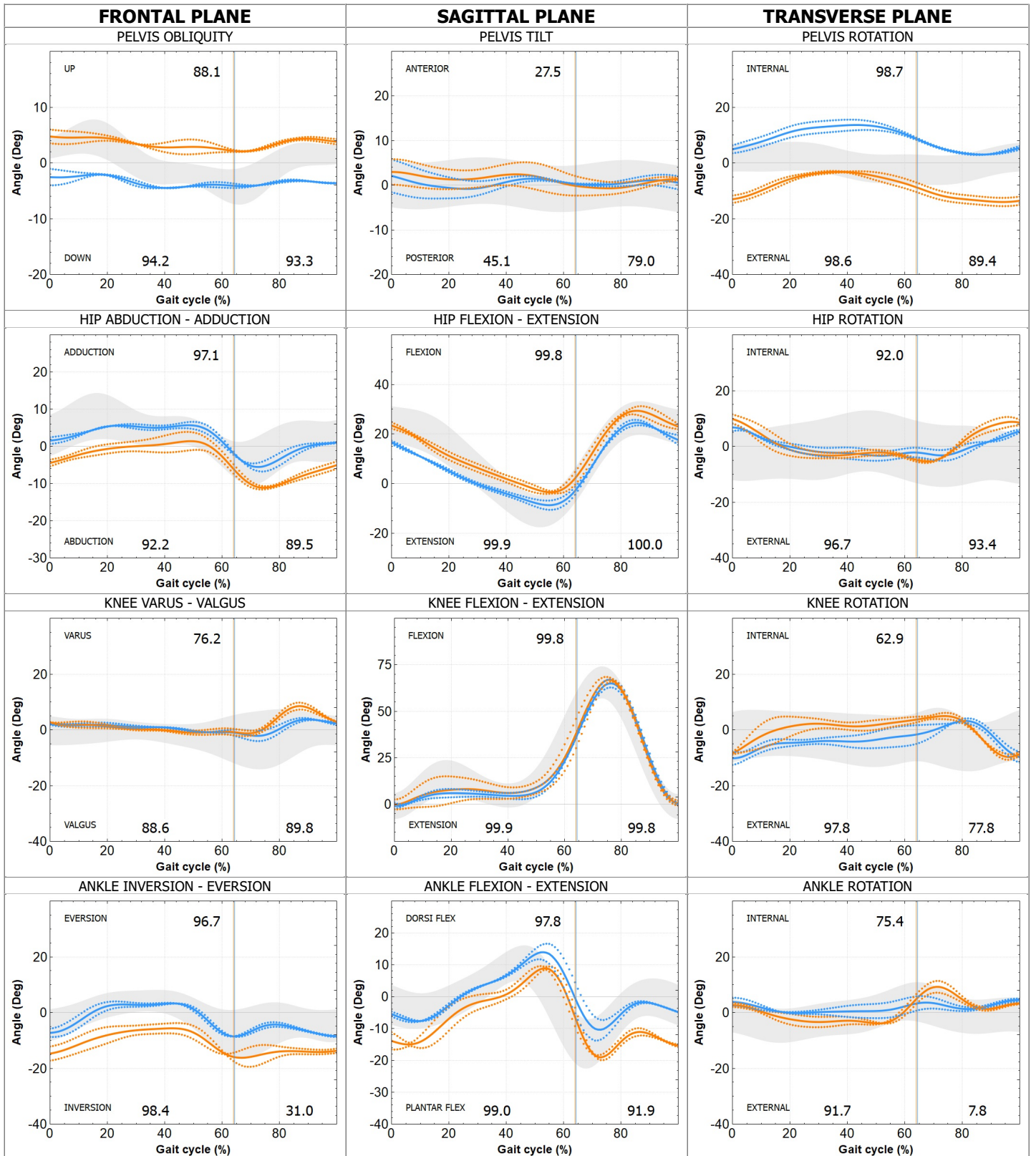
Anterior - posterior position (cm):	1.9
Medial - lateral position (cm):	14.8
Ellipse area (cm <sup>2</sup> ):	251.5
Control strategy:	Ant - post

### PELVIS

Anterior - posterior position (cm):	2.3
Medial - lateral position (cm):	6.6
Ellipse area (cm <sup>2</sup> ):	114.0
Control strategy:	Ant - post

Trunk - pelvis distance (cm):	8.1
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# JOINT ANGLES



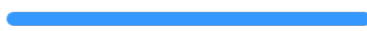
**RIGHT**

HEALTHY LIMB

**LEFT**

HEALTHY LIMB

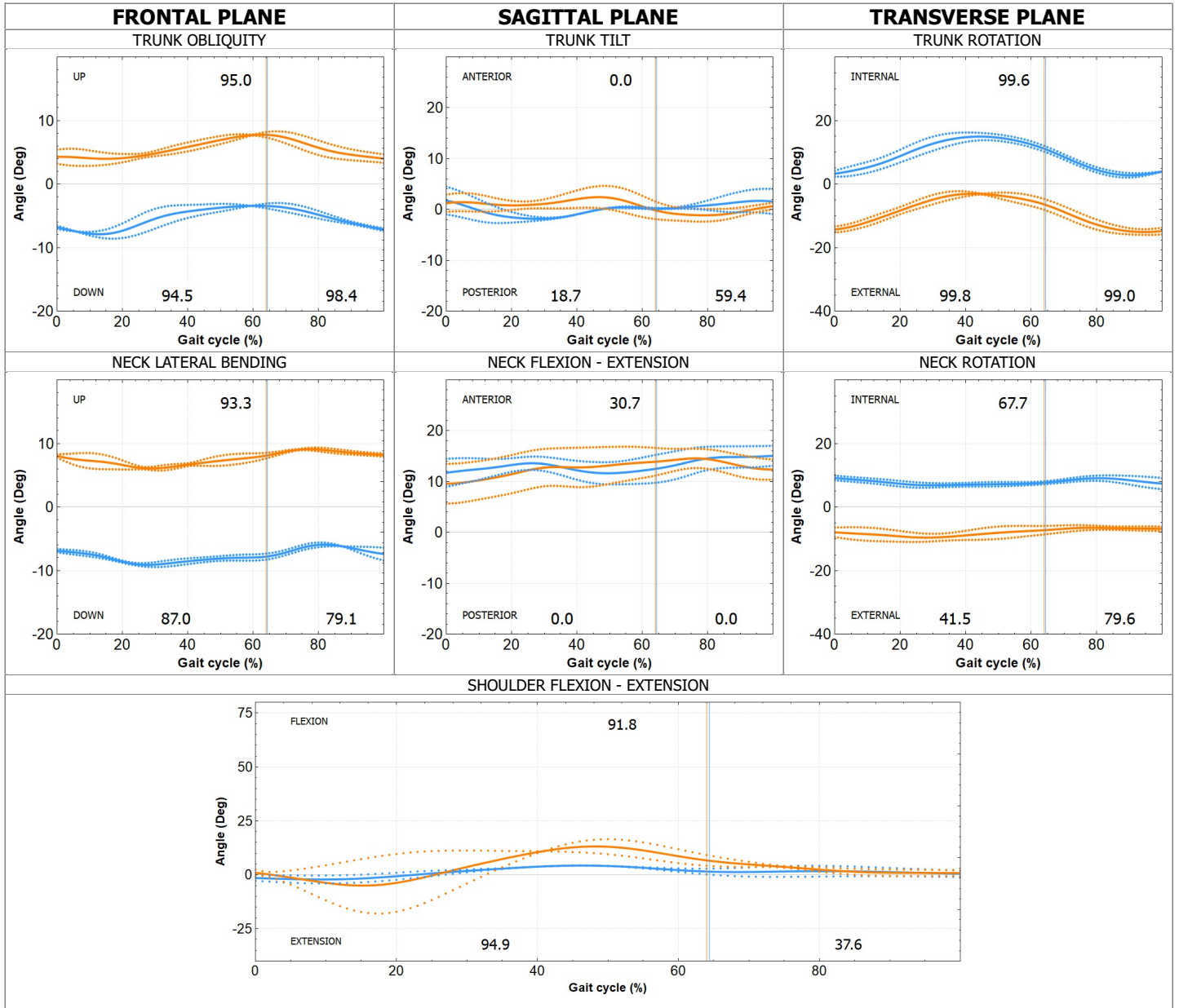
Mean :



Standard deviation :



# JOINT ANGLES



**RIGHT**

**LEFT**

HEALTHY LIMB

HEALTHY LIMB

Mean :



Standard deviation :



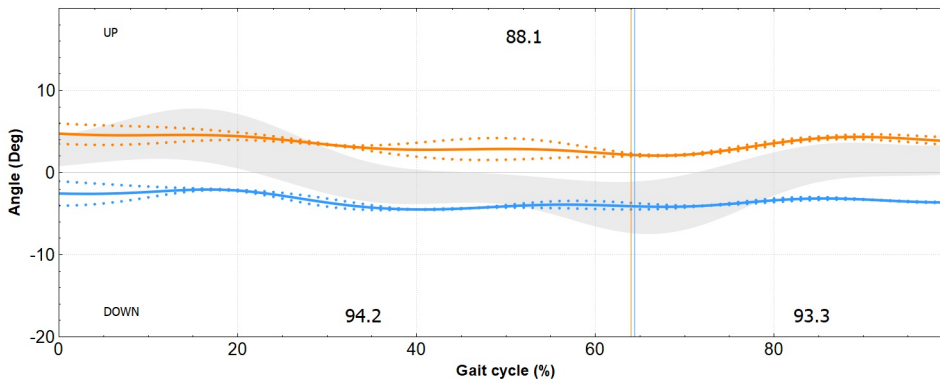
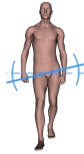
## ANGULAR SYMMETRY INDICES

	TOTAL	STANCE PHASE	NORMAL RANGE
Pelvis obliquity:	88.1 %	94.2 %	> 90.48 %
Pelvis tilt:	27.5 %	45.1 %	-
Pelvis rotation:	98.7 %	98.6 %	-
Hip abduction - adduction:	97.1 %	92.2 %	-
Hip flexion - extension:	99.8 %	99.9 %	> 97.76 %
Hip rotation:	92.0 %	96.7 %	-
Knee varus - valgus:	76.2 %	88.6 %	-
Knee flexion - extension:	99.8 %	99.9 %	> 94.46 %
Knee rotation:	62.9 %	97.8 %	-
Ankle inversion - eversion:	96.7 %	98.4 %	-
Ankle flexion - extension:	97.8 %	99.0 %	> 89.96 %
Ankle rotation:	75.4 %	91.7 %	-
Trunk obliquity:	95.0 %	94.5 %	-
Trunk tilt:	0.0 %	18.7 %	-
Trunk rotation:	99.6 %	99.8 %	-
Neck lateral bending:	93.3 %	87.0 %	-
Neck flexion - extension:	30.7 %	0.0 %	-
Neck rotation:	67.7 %	41.5 %	-
Shoulder flexion - extension:	91.8 %	94.9 %	-



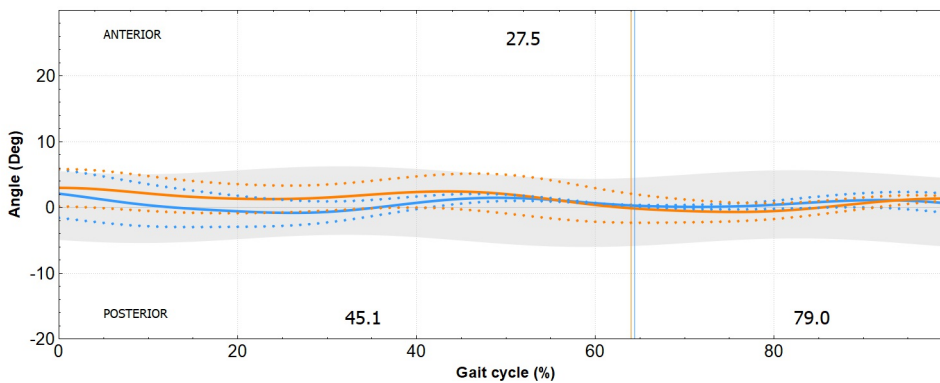
# PELVIS ANGLES

## OBLIQUITY



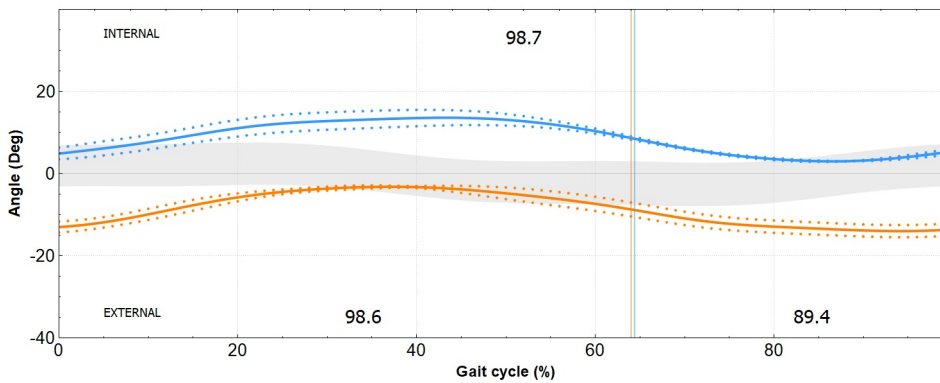
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-4.5°	2.2°
MAX:	-2.1°	4.7°
RANGE:	2.4°	2.6°
STD:	0.4°	0.8°
SWING PHASE:		
MIN:	-4.2°	2.1°
MAX:	-3.2°	4.3°
RANGE:	1.0°	2.3°
STD:	0.1°	0.3°

## TILT



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-0.8°	-0.1°
MAX:	2.1°	3.0°
RANGE:	2.9°	3.1°
STD:	1.7°	2.5°
SWING PHASE:		
MIN:	0.1°	-0.7°
MAX:	1.1°	1.4°
RANGE:	1.0°	2.1°
STD:	0.8°	1.2°

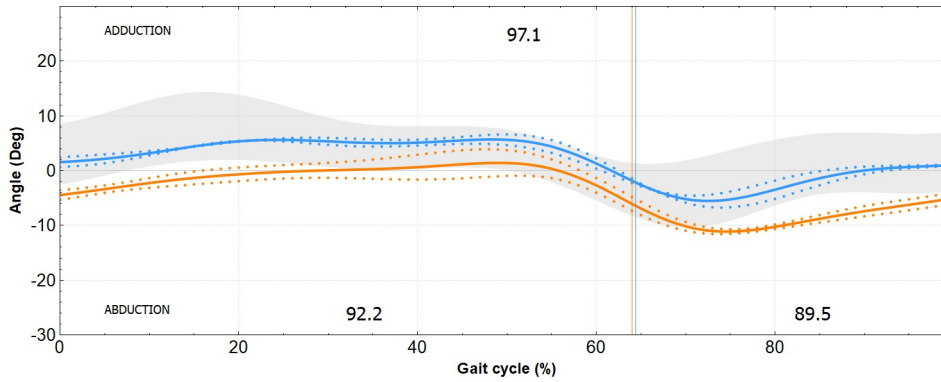
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	4.9°	-13.0°
MAX:	13.6°	-3.2°
RANGE:	8.7°	9.8°
STD:	1.7°	1.1°
SWING PHASE:		
MIN:	3.0°	-14.0°
MAX:	8.2°	-9.1°
RANGE:	5.2°	4.9°
STD:	0.3°	1.5°

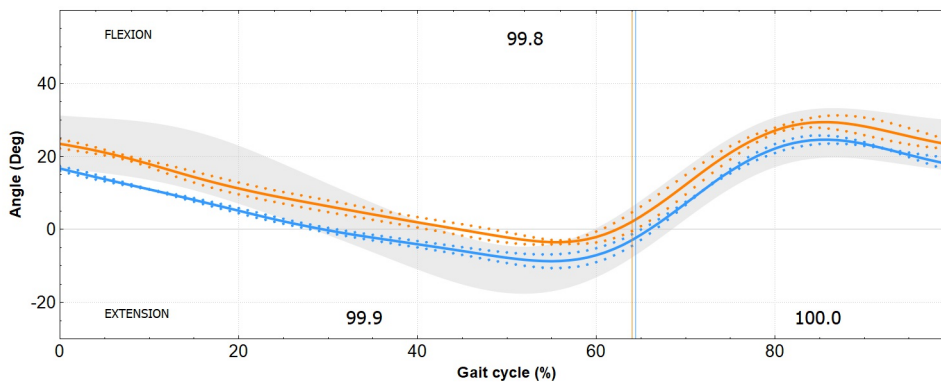
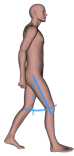
# HIP ANGLES

## ABDUCTION - ADDUCTION



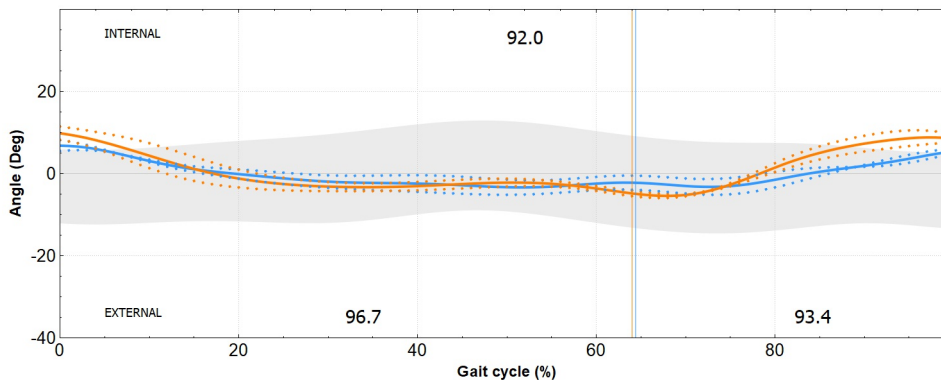
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-1.9°	-6.1°
MAX:	5.7°	1.4°
RANGE:	7.5°	7.5°
STD:	0.6°	1.5°
SWING PHASE:		
MIN:	-5.5°	-11.1°
MAX:	1.0°	-5.0°
RANGE:	6.6°	6.1°
STD:	0.9°	0.8°

## FLEXION - EXTENSION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-8.7°	-3.5°
MAX:	16.7°	23.4°
RANGE:	25.4°	26.9°
STD:	1.0°	1.4°
SWING PHASE:		
MIN:	-1.5°	3.5°
MAX:	24.5°	29.4°
RANGE:	26.0°	25.8°
STD:	0.9°	1.9°

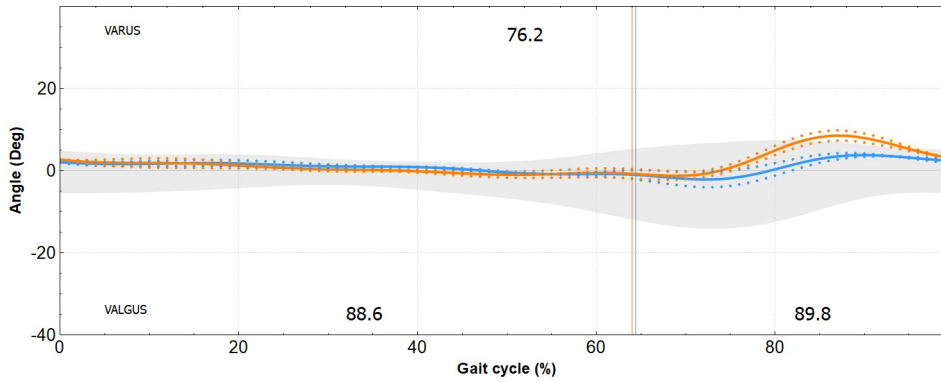
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-3.4°	-4.8°
MAX:	6.8°	9.8°
RANGE:	10.2°	14.7°
STD:	1.4°	1.5°
SWING PHASE:		
MIN:	-3.2°	-5.5°
MAX:	5.4°	8.8°
RANGE:	8.7°	14.2°
STD:	1.3°	1.1°

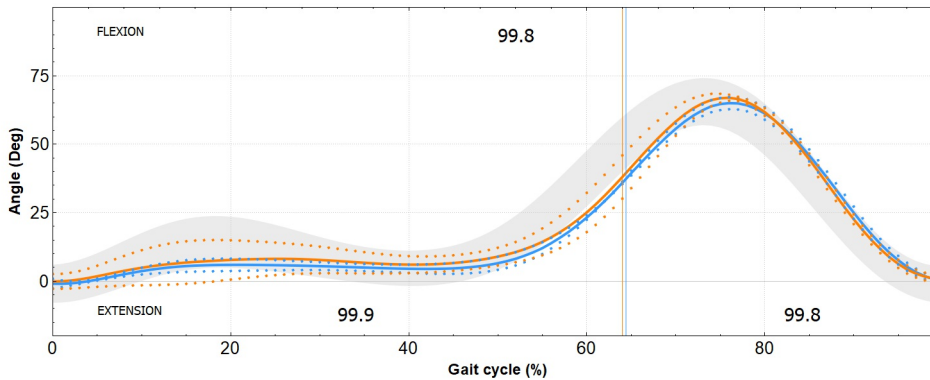
# KNEE ANGLES

## VARUS - VALGUS



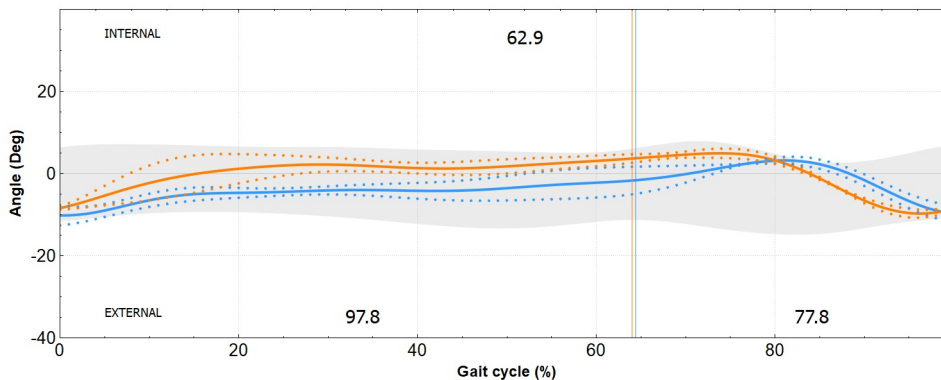
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-1.0°	-1.0°
MAX:	2.0°	2.7°
RANGE:	3.0°	3.7°
STD:	0.4°	0.7°
SWING PHASE:		
MIN:	-2.2°	-1.3°
MAX:	3.8°	8.5°
RANGE:	5.9°	9.8°
STD:	1.1°	0.9°

## FLEXION - EXTENSION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-1.0°	-0.2°
MAX:	35.9°	38.0°
RANGE:	36.9°	38.2°
STD:	1.6°	5.2°
SWING PHASE:		
MIN:	-0.1°	0.6°
MAX:	65.0°	66.9°
RANGE:	65.1°	66.3°
STD:	1.9°	2.6°

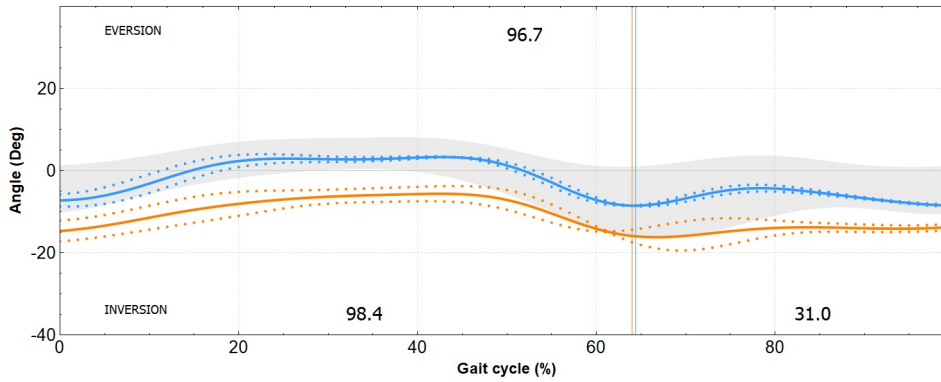
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-10.2°	-8.4°
MAX:	-1.7°	3.7°
RANGE:	8.5°	12.1°
STD:	2.1°	2.2°
SWING PHASE:		
MIN:	-9.8°	-9.8°
MAX:	3.2°	4.9°
RANGE:	13.0°	14.7°
STD:	1.5°	0.8°

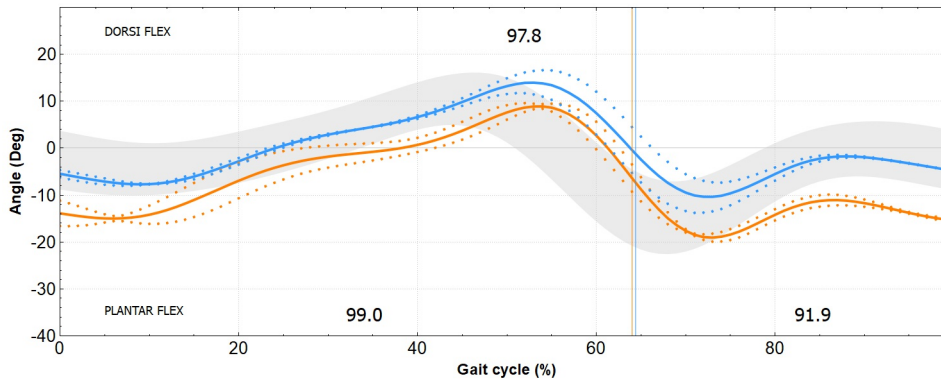
# ANKLE ANGLES

## INVERSION - EVERSION



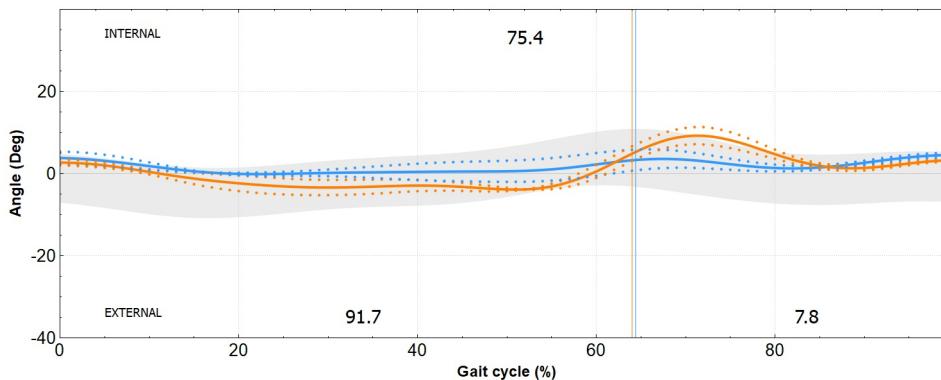
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-8.6°	-15.9°
MAX:	3.3°	-5.7°
RANGE:	11.9°	10.3°
STD:	1.1°	2.2°
SWING PHASE:		
MIN:	-8.5°	-16.2°
MAX:	-4.3°	-13.7°
RANGE:	4.2°	2.5°
STD:	0.5°	1.8°

## FLEXION - EXTENSION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-7.7°	-15.0°
MAX:	13.9°	8.9°
RANGE:	21.7°	23.9°
STD:	1.2°	2.3°
SWING PHASE:		
MIN:	-10.4°	-19.1°
MAX:	-1.8°	-8.8°
RANGE:	8.6°	10.3°
STD:	1.6°	0.9°

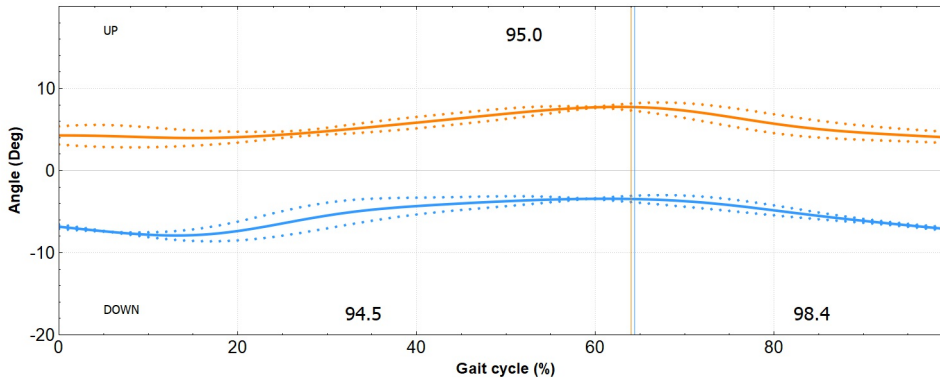
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-0.1°	-3.9°
MAX:	3.8°	4.8°
RANGE:	3.9°	8.7°
STD:	1.6°	1.3°
SWING PHASE:		
MIN:	1.3°	1.3°
MAX:	4.5°	9.2°
RANGE:	3.3°	7.9°
STD:	1.0°	1.1°

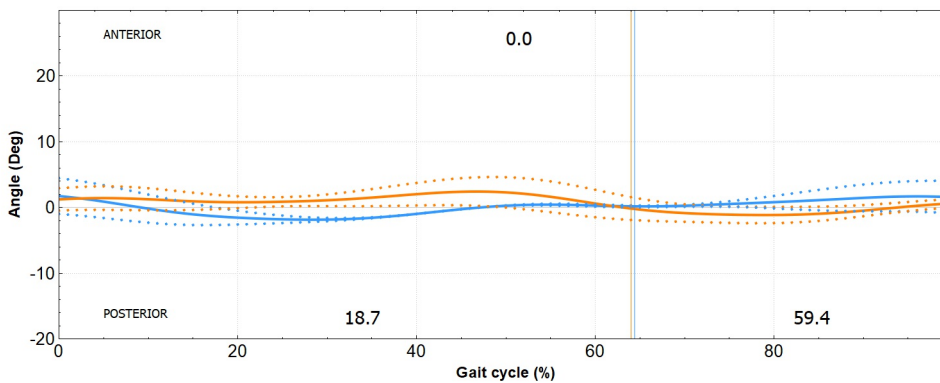
# TRUNK ANGLES

## OBLIQUITY



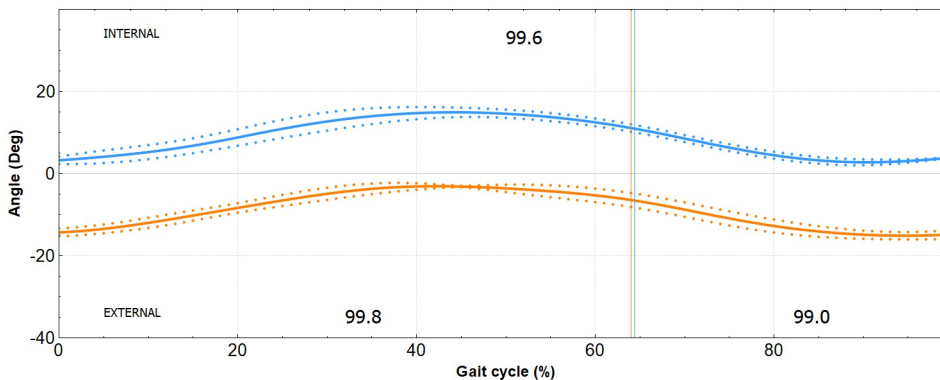
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-7.9°	4.0°
MAX:	-3.4°	7.8°
RANGE:	4.5°	3.8°
STD:	0.8°	0.7°
SWING PHASE:		
MIN:	-7.2°	4.0°
MAX:	-3.5°	7.7°
RANGE:	3.7°	3.7°
STD:	0.4°	0.9°

## TILT



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-1.9°	-0.2°
MAX:	1.7°	2.4°
RANGE:	3.6°	2.6°
STD:	0.8°	1.6°
SWING PHASE:		
MIN:	0.2°	-1.2°
MAX:	1.7°	0.6°
RANGE:	1.5°	1.8°
STD:	1.2°	1.1°

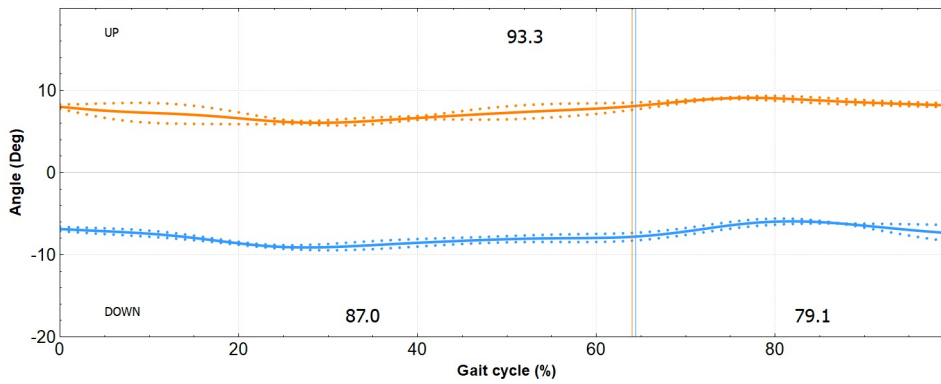
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	3.2°	-14.3°
MAX:	14.9°	-3.1°
RANGE:	11.7°	11.3°
STD:	1.6°	1.2°
SWING PHASE:		
MIN:	2.7°	-15.1°
MAX:	10.7°	-6.8°
RANGE:	8.0°	8.4°
STD:	0.7°	1.4°

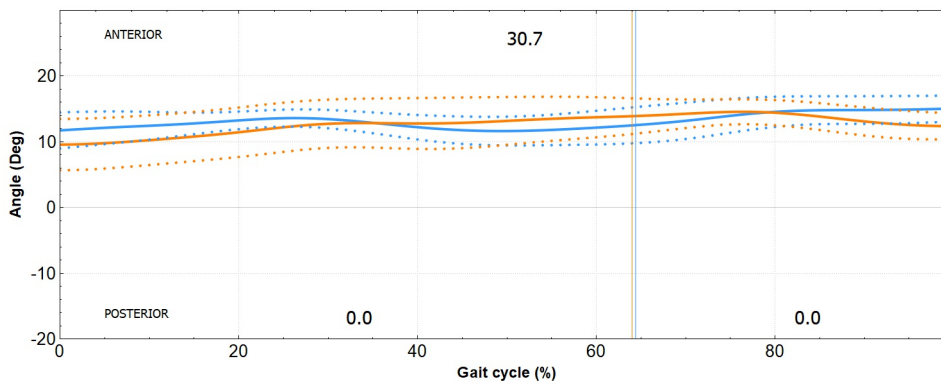
# NECK ANGLES

## LATERAL BENDING



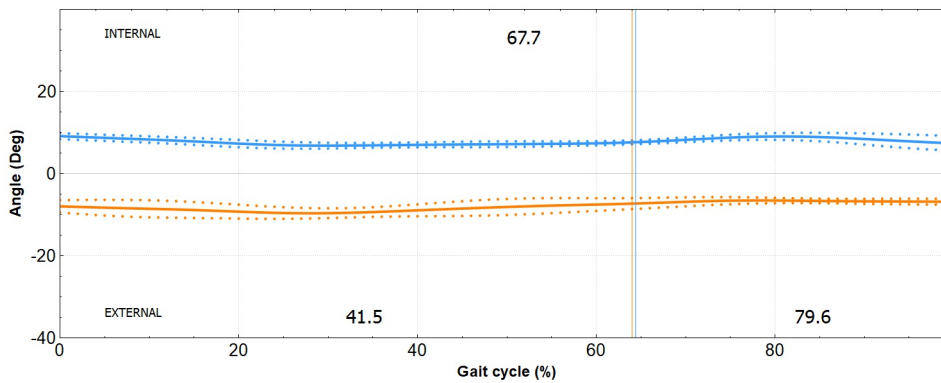
	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-9.1°	6.1°
MAX:	-6.9°	8.1°
RANGE:	2.2°	2.0°
STD:	0.4°	0.6°
SWING PHASE:		
MIN:	-7.8°	8.2°
MAX:	-5.9°	9.1°
RANGE:	1.8°	0.9°
STD:	0.4°	0.3°

## FLEXION - EXTENSION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	11.6°	9.6°
MAX:	13.6°	13.9°
RANGE:	2.0°	4.3°
STD:	2.0°	3.7°
SWING PHASE:		
MIN:	12.6°	12.4°
MAX:	15.1°	14.5°
RANGE:	2.5°	2.2°
STD:	2.3°	2.1°

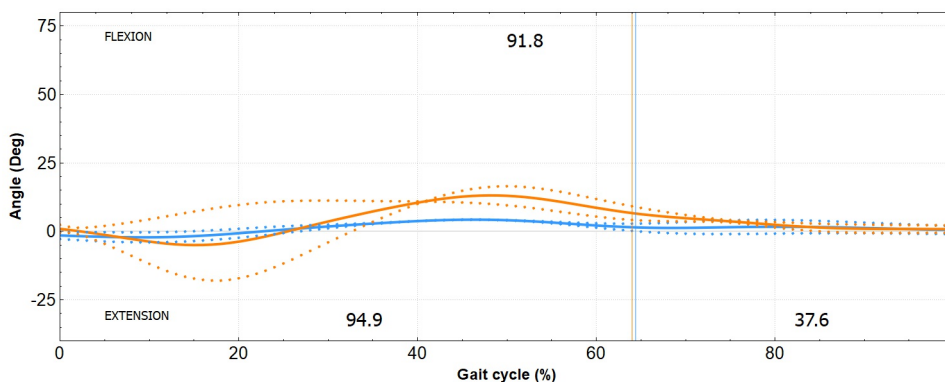
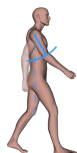
## ROTATION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	6.8°	-9.7°
MAX:	9.1°	-7.3°
RANGE:	2.3°	2.3°
STD:	0.7°	1.7°
SWING PHASE:		
MIN:	7.4°	-7.3°
MAX:	9.0°	-6.6°
RANGE:	1.7°	0.7°
STD:	1.0°	0.8°

# SHOULDER ANGLES

## FLEXION - EXTENSION



	RIGHT HEALTHY LIMB	LEFT HEALTHY LIMB
STANCE PHASE:		
MIN:	-2.2°	-5.0°
MAX:	4.3°	13.1°
RANGE:	6.5°	18.1°
STD:	0.9°	5.8°
SWING PHASE:		
MIN:	0.4°	0.8°
MAX:	1.7°	6.3°
RANGE:	1.2°	5.5°
STD:	2.1°	1.3°