



ESTi™ Measurement

Me-Mover Trial

29th Oct 2015

Owner: Jonas Eliasson – Me-Mover



## Me-Mover Trials: 29<sup>th</sup> of October 2015

### Background:

AMG sensors were placed on eight selected muscles on the right-hand side of the subject, and both Me-Mover and normal exercise activities were tested for a period of a few minutes, for the purpose of comparison.

Me-Mover exercise activities included:

- normal step- half pace
- normal step full pace
- normal step double pace
- small steps double step
- small steps sprint
- big steps half intensity
- bigsteps full push
- big steps lean forward + push
- kangaroo jumps
- kangaroo jumps with push ups
- carving

Normal exercise activities included:

- jogging
- natural running
- squats
- launches
- high knees
- step ups
- sit ups
- sit ups cross
- push ups
- the plank
- side plank

The muscles selected were both core and peripheral, and included the upper body muscles Biceps, Pectoralis, Latissimus dorsi and Rectus abdominus; addressing such movements and arm rotation and flexion, spinal rotation and flexion of the trunk and lumbar region. The lower body muscles were represented by Gluteus maximus, Rectus femoris, Vastus lateralis and Gastrocnemius; addressing such movements as rotation and extension of the hip, hip flexion, extension of the knee and plantar flexion.



### Results:

In the tables below, you will find the Me-Mover and the Normal exercise activities compared by means of the ESTi™ Score, unique to the CURO and MyoDynamik (ApS) – for further details see the last page of this report.

MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Biceps brachii</b>									
Normal step- half pace	-	-	-	-	Jogging	-	8,3	9,8	-
Normal step- full pace	3,3	8,3	9,7	7,1	Natural running	-	8,2	9,4	-
Normal step- double pace	-	-	-	-	Squats	-	8,6	9,7	-
Small steps – double step	-	-	-	-	Launches	1,5	8,1	8,7	6,1
Small steps- sprint	4,4	8,5	9,6	7,5	High knees	1,5	7,2	7,9	5,5
Big steps- half intensity	3,2	8,1	9,4	6,9	Step ups	1,9	7,7	6,4	5,3
Big steps – full push	-	7,8	9,4	-	Sit ups	-	8,6	9,1	-
Big steps- lean forward & push	4,1	7,6	9,0	-	Sit ups cross	2,4	8,4	8,7	6,5
Kangaroo jumps	-	7,6	-	-	Push ups	1,5	7,5	8,4	5,8
Kangaroo jumps with push ups	2,4	7,9	7,8	6,0	The plank	-	-	-	-
Carving	-	-	-	-	Side plank	-	-	-	-

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Big steps – half intensity” most closely correlates with “Sit ups cross” and that “Kangaroo jumps with push ups” is very closely correlated with ‘Launches’ in so far as activation of m. Biceps brachii.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Pectoralis</b>									
Normal step- half pace	-	-	-	-	Jogging	-	8,0	9,0	-
Normal step- full pace	1,7	7,4	8,7	5,9	Natural running	-	7,9	9,1	-
Normal step- double pace	-	6,9	9,4	-	Squats	-	7,0	8,6	-
Small steps – double step	-	8,9	9,6	-	Launches	1,1	7,2	7,6	5,3
Small steps- sprint	4,2	8,2	9,2	7,2	High knees	0,5	6,9	8,7	5,3
Big steps- half intensity	1,3	7,8	7,5	5,5	Step ups	1,3	7,9	9,0	6,0
Big steps – full push	-	-	-	-	Sit ups	1,7	8,1	8,1	5,9
Big steps- lean forward & push	1,2	7,6	8,7	5,8	Sit ups cross	2,4	7,4	7,0	5,6
Kangaroo jumps	1,6	7,8	8,4	5,9	Push ups	1,8	7,1	6,9	5,2
Kangaroo jumps with push ups	3,2	7,4	5,9	5,5	The plank	-	-	-	-
Carving	-	3,9	9,5	-	Side plank	-	-	-	-

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Normal step – full pace” most closely correlates with “Step ups” and that “Kangaroo jumps” is very closely correlated with ‘Sit ups’ in so far as activation of m. Pectoralis.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Latissimus dorsi</b>									
Normal step- half pace	-	-	-	-	Jogging	1,3	8,8	9,7	6,6
Normal step- full pace	4,4	8,6	9,5	7,5	Natural running	0,6	8,5	9,4	6,1
Normal step- double pace	-	8,9	9,6	-	Squats	0,6	7,8	9,0	5,8
Small steps – double step	-	8,9	9,9	-	Launches	0,5	6,3	9,0	5,2
Small steps- sprint	3,5	8,3	9,7	7,1	High knees	0,9	6,3	8,8	5,3
Big steps- half intensity	1,2	8,6	9,4	6,4	Step ups	0,8	6,3	8,7	5,2
Big steps – full push	-	-	-	-	Sit ups	1,5	8,4	9,4	6,4
Big steps- lean forward & push	1,3	7,8	9,2	6,1	Sit ups cross	0,4	7,5	9,1	5,7
Kangaroo jumps	-	8,0	8,6	-	Push ups	0,7	6,0	8,8	5,1
Kangaroo jumps with push ups	2,4	8,1	8,9	6,4	The plank	2,2	8,8	9,8	6,9
Carving	-	8,9	9,9	-	Side plank	1,7	8,5	9,2	6,4

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Big steps – half intensity”, “Big steps – lean forward & push”, “Kangaroo jumps with push ups” most closely correlates with “Jogging” and with “Side plank” in so far as activation of m. Latissimus dorsi.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Rectus abdominus</b>									
Normal step- half pace	-	-	-	-	Jogging	1,7	8,4	8,7	6,2
Normal step- full pace	4,5	7,5	9,6	7,2	Natural running	1,2	8,3	8,7	6,0
Normal step- double pace	-	-	-	-	Squats	1,3	8,0	8,6	5,9
Small steps – double step	-	-	-	-	Launches	1,0	6,8	8,4	5,4
Small steps- sprint	6,3	8,6	9,8	8,2	High knees	0,5	5,1	8,3	4,6
Big steps- half intensity	1,6	7,4	8,6	5,8	Step ups	0,8	6,7	8,4	5,3
Big steps – full push	-	3,6	7,9	-	Sit ups	1,3	8,4	8,8	6,1
Big steps- lean forward & push	1,7	8,0	9,2	6,3	Sit ups cross	1,5	6,6	8,5	5,5
Kangaroo jumps	0,6	5,7	8,4	4,9	Push ups	1,5	7,5	8,4	5,8
Kangaroo jumps with push ups	1,2	7,2	8,4	5,6	The plank	-	-	-	-
Carving	0,6	8,7	9,2	6,1	Side plank	-	-	-	-

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Big steps – lean forward & push” most closely correlates with “Jogging”, “Natural running” and “Sit ups” and that “Kangaroo jumps with push ups” and “Big steps – half intensity” is very closely correlated with “Squats”, “Launches” and “Push ups” in so far as activation of m. Rectus abdominus.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Gluteus maximus</b>									
Normal step- half pace	1,4	6,8	9,4	5,8	Jogging	0,3	2,5	3,4	2,0
Normal step- full pace	1,9	6,6	9,7	6,0	Natural running	0,4	2,6	4,6	2,5
Normal step- double pace	1,1	6,1	9,2	5,4	Squats	1,7	7,1	9,9	6,2
Small steps – double step	0,7	6,1	9,2	5,3	Launches	1,1	4,5	9,1	4,9
Small steps- sprint	0,6	5,2	8,9	4,9	High knees	0,7	3,7	7,3	3,9
Big steps- half intensity	2,2	6,4	9,7	6,1	Step ups	1,8	3,7	8,1	4,5
Big steps – full push	2,5	6,4	9,7	6,2	Sit ups	-	-	-	
Big steps- lean forward & push	1,6	6,1	9,5	5,7	Sit ups cross	-	-	-	
Kangaroo jumps	1,3	6,0	8,7	5,3	Push ups	-	-	-	
Kangaroo jumps with push ups	1,4	6,0	8,8	5,4	The plank	-	-	-	
Carving	1,1	6,6	9,9	5,8	Side plank	-	-	-	

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Normal step- double pace” most closely correlates with “Launches” and that “Big steps – full push” is very closely correlated with ‘Squats’ in so far as activation of m. Gluteus maximus.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Rectus femoris</b>									
Normal step- half pace	0,9	5,4	10,0	5,4	Jogging	0,8	2,7	7,0	3,5
Normal step- full pace	1,1	6,1	9,4	5,5	Natural running	0,4	2,9	6,3	3,2
Normal step- double pace	1,0	4,5	9,0	4,8	Squats	5,6	5,9	9,9	7,1
Small steps – double step	1,5	4,5	9,1	5,0	Launches	3,0	4,9	9,0	5,6
Small steps- sprint	0,5	4,6	8,7	4,6	High knees	1,0	2,1	0,7	1,2
Big steps- half intensity	0,8	6,4	9,6	5,6	Step ups	2,7	2,6	3,3	2,8
Big steps – full push	1,1	5,9	9,4	5,4	Sit ups	-	-	-	
<b>Big steps- lean forward &amp; push</b>	<b>1,2</b>	<b>5,6</b>	<b>9,4</b>	<b>5,4</b>	Sit ups cross	-	-	-	
Kangaroo jumps	0,3	5,9	9,2	5,1	Push ups	-	-	-	
Kangaroo jumps with push ups	2,1	6,1	9,4	5,8	The plank	-	-	-	
Carving	1,6	6,5	9,4	5,8	Side plank	-	-	-	

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.*

*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Big steps – lean forward & push” most closely correlates with “Launches” in so far as activation of m. Rectus femoris.





MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Vastus lateralis</b>									
Normal step- half pace	2,7	5,1	8,2	5,3	Jogging	0,5	0,9	6,0	2,4
Normal step- full pace	1,3	4,9	8,4	4,8	Natural running	0,7	1,2	4,1	2,0
Normal step- double pace	1,1	2,4	7,4	3,6	Squats	1,5	6,4	9,9	5,9
Small steps – double step	0,7	2,5	7,4	3,5	Launches	1,3	4,2	8,9	4,8
Small steps- sprint	1,5	1,1	6,7	3,1	High knees	0,7	0,4	6,5	2,5
Big steps- half intensity	0,8	5,0	8,1	4,6	Step ups	0,8	5,6	7,5	4,6
Big steps – full push	0,9	4,0	8,0	4,3	Sit ups	-	-	-	
Big steps- lean forward & push	1,5	3,7	7,8	4,3	Sit ups cross	-	-	-	
Kangaroo jumps	0,9	3,4	8,0	4,1	Push ups	-	-	-	
Kangaroo jumps with push ups	1,4	4,0	8,0	4,4	The plank	-	-	-	
Carving	0,9	6,5	8,9	5,4	Side plank	-	-	-	

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*- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Carving” most closely correlates with “Squats” and that “Small steps – double step” is very closely correlated with ‘Jogging’ in so far as activation of m. Vastus lateralis.



MUSCLE	Me-Mover				Normal activity				
	E	S	T	ESTi™ Score		E	S	T	ESTi™
<b>m.Gastrocnemius</b>									
Normal step- half pace	2,3	6,9	10,0	6,4	Jogging	1,0	3,1	8,4	4,1
Normal step- full pace	1,8	6,5	10,0	6,1	Natural running	1,4	3,1	7,1	3,8
Normal step- double pace	0,9	5,9	9,4	5,4	Squats	2,9	6,1	9,4	6,1
Small steps – double step	1,1	5,9	9,2	5,4	Launches	1,6	3,0	8,2	4,2
Small steps- sprint	1,2	5,2	9,2	5,2	High knees	0,6	3,3	3,6	2,7
Big steps- half intensity	1,1	6,4	10,0	5,8	Step ups	1,3	4,3	8,9	4,8
Big steps – full push	1,5	5,8	9,7	5,6	Sit ups	-	-	-	
Big steps- lean forward & push	3,4	6,3	9,5	6,4	Sit ups cross	-	-	-	
Kangaroo jumps	1,3	6,8	9,7	5,9	Push ups	0,9	6,1	9,8	5,6
Kangaroo jumps with push ups	3,6	6,4	9,9	6,6	The plank	-	-	-	
Carving	2,0	6,1	9,6	5,9	Side plank	-	-	-	

*The frequency (Hz) of the muscle sound is converted into a T-score and the amplitude (mV) of the muscle sound is converted into a S-score, for more details of the E, S and T parameters see the last page of this report.  
- indicates a signal below threshold (very weak muscle activity)*

It can be seen from this table that the Me-Mover exercise activity of “Big steps – lean forward & push” most closely correlates with “Squats” and that “Normal step – double pace” is very closely correlated with “Push ups” in so far as activation of m. Gastrocnemius.

### Conclusion:

In summary, this trial with the Me-Mover comparing various exercise activities with Normal exercise activities, shows:

- That many of the Me-Mover exercise activities can be directly compared, in terms of their E, S and T parameters, with an array of Normal exercise activities: e.g. lower body – squats, launches, jogging and push-ups, and upper body – sit-ups, sit-ups cross, natural running, launches and jogging.
- That use of a Me-Mover activates not only peripheral muscles, but also core body muscles such as back and abdomen.
- That the type of activity can be intense when the user wishes a good work-out, but also gentle on joints such as the knees and hips, being free from impact related problems associated with running and jogging on hard surface for example.
- That an array of exercise techniques can be combined into one device – the Me-Mover.
- That a more sustained work-out can be achieved with a Me-Mover, activating a greater number of body muscles more of the time.



### ESTi™ INTERPRETATION

The CURO system is unique in that unlike other muscle assessment systems, it measures the number of fibers active (spatial amplitude; S) and the frequency with which they contract (temporal summation; T) and the way in which the Central Nervous System (CNS) recruits and uses the active fibers in a muscle (timing/efficiency – E). It is only by combining the timing aspect of muscle fiber contraction that one can start to assess the synchrony with which the CNS recruits active fibers in a muscle – and in so doing, more accurately determine the significance of both the spatial amplitude and frequency.

**E - Efficiency:** the E-parameter refers to the period of muscle fiber activity during a recorded period of exercise – muscle efficiency. A high score obtained during moderate to high levels of exercise is a sign of a very well trained and highly coordinated / efficient muscle movement.

**S – Spatial amplitude:** the S-parameter refers to the number of muscle fibers recruited during a movement, as part of exercise or a muscle contraction. A low score obtained during moderate to high levels of exercise is a sign of a very well trained and highly coordinated muscle movement.

**T – Temporal summation:** the T-parameter refers to the speed with which muscle fibers are activated repeatedly during a movement, as part of exercise or a muscle contraction. A low score obtained during moderate to high levels of exercise is a sign of a very well trained and highly coordinated muscle movement.

- Balance:
- ± 10% from ZERO = MILD IMBALANCE
  - ± 20% from ZERO = MODERATE IMBALANCE
  - > ± 20% from ZERO = SERIOUS IMBALANCE

