Supplement to: Whole-body-vibration to prevent intensive care unit acquired weakness (ICU-AW): safety, feasibility and metabolic response

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From study execution to the results

Intervention: As shown in figure 1, we performed a series of interventions for each patient.

1. There was a 10-minute resting period where we assessed baseline values prior to the intervention.
2. A physiotherapist moved the patient according to their passive range of motion as a warm up before the start of WBV. This physiotherapeutic session lasted 6 minutes.
   a. A small 90-second pause, without any special intervention, followed the physiotherapeutic session. This time was required to position the vibration device and prepare to start the WBV.
3. We performed the WBV itself. The duration of the WBV phase was 15 minutes. Within these 15 minutes, there was a net vibration time of 9 minutes, intercalated with small resting times totaling 6 minutes. Since WBV is such an intensive stimulus, and according to the manufacture's guidelines, we performed this trial with "interval" stimulation.
4. Patients were monitored for nearly one hour following WBV.

Data assessment: Due to technical reasons, we had different frequencies recording our data.

1. Vital signs were recorded online with a frequency of 50 hertz for a total time of 90 minutes. The Phillips Intellivue monitoring and the Pulsion PICCO system generated 3,000 values per minute, which amounted to 270,000 values for the 90 minutes recording, for each parameter.
2. We used the Deltatrac to perform indirect calorimetry for the same 90 minutes, calculating a mean value per minute that were automatically recorded by the Datex software. This resulted in 90 values for 90 minutes of indirect calorimetry.
3. Blood samples were collected intermittently during the recording time. A total of four BGAs were obtained per patient, each within the last minute of the following phases: baseline, WBV, early resting time, and late resting time. Additionlly, three blood samples for laboratory analyses were obtained, each within the last minute of the following phases: baseline, early resting time, and late resting time.

Analysis: We analyzed the large data sheets and combined the data of different devices into useful data sets.

1. During collection, as well as retrospectively, we screened the full data sets to detect any adverse events, or parameters reaching the abort criteria.
2. For each phase (baseline, physiotherapy, WBV, early rest, late rest), we used predefined intervals with a duration of five minutes. These 5 minutes for each phase serve two purposes. On the one hand, they reflect the different phases of intervention or observation, and on the other hand, they are similar in duration and number of values, which is essential for longitudinal analyses, as recommended by statisticians.
   o The five minute interval was predefined by timescale and similar for all patients, so that the selected five minutes reflect equal timeslots within the intervention series. This allows us to compare the different phases to each other under consideration of their different duration.

- In order to utilize the data without risk of over interpretation, we calculated a mean value for every ten seconds of the high frequency data (50 hertz) for each parameter and for each patient.

For example: The recorded 500 heartrate values (50 hertz recording) obtained in ten seconds were used to calculate a mean heartrate value for each time interval of ten seconds. So out of the 15,000 values per 5-minute interval, we calculated 30 mean values every 10 seconds. These 30 intervals were used to perform the longitudinal data analysis. For all parameters measured by indirect calorimetry, which were already recorded as mean per minute, we used the 5 values for 5 minutes to perform the analyses.

Statistical analyses: Investigation of longitudinal dependent samples was performed according to the algorithm published by Brunner. Within the statistical analysis, this model uses 30 values for 5 minute baseline, 30 values for 5 minute physiotherapeutic phase, 30 values for 5 minute WBV phase, 30 values for 5 minute early resting time, and 30 values for 5 minute late resting time, for all parameters measured by 50 hertz. Similarity, for the indirect calorimetry, 5 values for 5 minute baseline, 5 values for 5 minute physiotherapy phase, 5 values for 5 minute WBV phase, 5 values for 5 minute early resting time, and 5 values for 5 minute late resting time, for all parameters measured by indirect calorimetry were used. In contrast to this longitudinal, repeated, and sequential approach, the blood samples were tested by Wilcoxon range test due to sequential, but single (non-repeated), measurements for each parameter within the individual phases.

Plots: To clearly present the movement through the intervention series and to provide a simplified view of the changes caused by WBV and recovery, we calculated one mean value per 5 minute interval per patient, showing these values in the figures of the main manuscript. The given significances were calculated as described above.

Statistical methods:

Three-factorial-designs in longitudinal analyses:

Including different vibration devices into the evaluation, the above defined multivariate nonparametric analysis of longitudinal data in the two-factorial design has been extended by a third (independent) factor "vibration device".

Two-factorial designs in longitudinal subgroup analyses:

The two-factorial design from the main manuscript was used in subgroup analyses for every device [Galileo (GAL-Group) and Vibroshpere (VIB-group)] separately, comparing selected phases.

Blood parameters were analyzed over the phases using a nonparametric test (Paired Wilcoxon Signed Rank Test).

A two-tailed p-value < 0.05 was considered statistically significant. All tests were conducted in the area of exploratory data analysis. Therefore, no adjustments for multiple testing have been made.

Descriptive data is presented as mean with standard deviation (SD).

Relative effect p$_{is}$:

The relative effect of a clinical parameter for a certain group of treatments does not represent the measured values of that parameter, but presents (in a scale between 0 and 1) the treatment effect of the regarded group, relative to all other groups, therefore to a "mean " treatment effect. Accordingly, a greater relative effect of one group compared to another group means a higher treatment effect of the regarded group and therefore greater values of the corresponding parameter.

Outcome Parameters:

The following outcome parameters were evaluated in the statistical analyses:

Multiple Primary Outcome Measure:

- *Vital parameters "systolic blood pressure" and "heart rate" as measures of hemodynamic stability to show safety and tolerability in the sense of no change (equivalence)[Time Frame: Continuous record for 90 minutes - within 4 blood samples - vibration therapy compared to baseline]*
[Designated as safety issue: Yes]

Secondary Outcome Measures:

- *Changes in heart rate, arterial blood pressure, saturation of peripheral pulse oximetry, intracranial pressure, mechanical ventilation parameters, electrolytes, blood sugar and lactate levels, blood pH, PICCO-parameters, body temperature as well as pO2 und pCO2 partial pressure."*

Definition of passive and active physiotherapy:

Passive physiotherapy: Any physiotherapeutic treatment, which does not depend on patients alertness, cooperation or the ability to contract muscles voluntarily. Techniques can be used in the sedated patient.

Typical and often used techniques are passive movements of the limbs to maintain or improve range of motion of the joint or reduce pain, the application of heat to reduce pain, cryotherapy to reduce inflammation, chest therapy (including body positioning, turning) leading to an easier breathing. Massage techniques are also helpful to reduce muscular tonus.

Active physiotherapy: Any physiotherapeutic treatment, which needs the participation and cooperation of the patient. The patient is able to contract the skeletal muscles voluntarily, even if contraction is poor

Active physiotherapy techniques involve the movement of the limbs to maintain and improve muscle strength and range of motion. Stretching techniques can be considered to reduce muscular tonus and improve range of motion. Walking on the treadmill or cycling can enhance stamina. Chest therapy includes relaxing positioning and turning in bed. "

Extended Results

Two-factorial design (1ˢᵗ factor (dependent): phases, 2ⁿᵈ factor (dependent): Time)

Two-factorial design (1st factor (dependent): phases, 2nd factor (dependent): Time)

Heart Rate

Relative Effects

Legend:
- PhaseA
- PhaseB
- PhaseC
- PhaseD
- PhaseE

	Statistic	df	p-value
Phase	2.432608	2.187372	0.08254886
Time	0.720644	4.650189	0.59796173
Phase:Time	1.165566	7.754063	0.31646039

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.

p_{IS} / Time

Baseline vs. Physiotherapy

Relative Effects

Legend:
- PhaseA
- PhaseB

	Statistic	df	p-value
Phase	2.112824	1.000000	0.1460696
Time	1.190075	4.172268	0.3126326
Phase:Time	1.252211	4.728239	0.2830553

Baseline vs. WBV

Relative Effects

Legend:
- PhaseA
- PhaseC

	Statistic	df	p-value
Phase	1.9295996	1.000000	0.1648023
Time	0.9977171	4.788779	0.4154152
Phase:Time	1.4832591	5.131321	0.1898376

Baseline vs. Early Rest

Relative Effects

Legend:
- PhaseA
- PhaseD

	Statistic	df	p-value
Phase	0.4823035	1.000000	0.4873808
Time	1.3131939	5.178115	0.2535879
Phase:Time	0.5565871	4.595149	0.7185958

Baseline vs. Late Rest

Relative Effects

Legend:
- PhaseA
- PhaseE

	Statistic	df	p-value
Phase	1.2552176	1.000000	0.2625583
Time	0.8408221	3.660027	0.4904319
Phase:Time	1.0867848	4.565197	0.3637382

Systolic Blood Pressure

Relative Effects

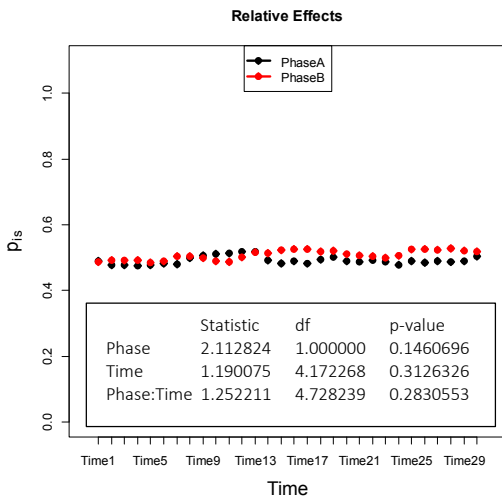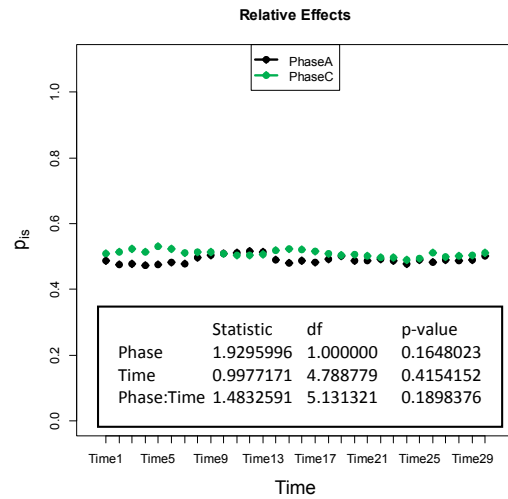|	Statistic	df	p-value
Phase	1.5301433	2.606376	0.2096131
Time	0.9804304	4.175000	0.4189314
Phase:Time	0.8754923	8.843370	0.5448234

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
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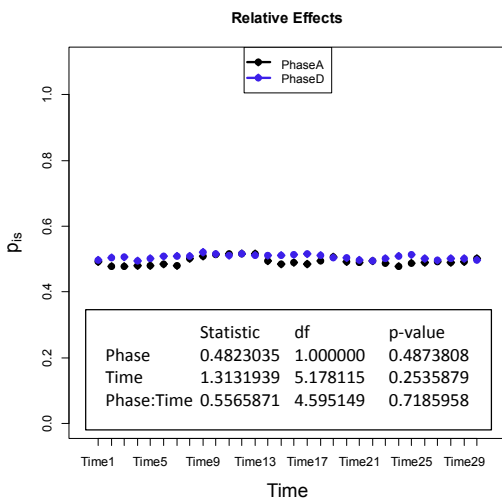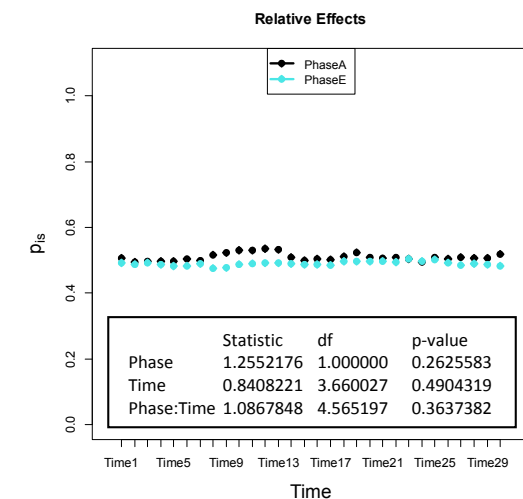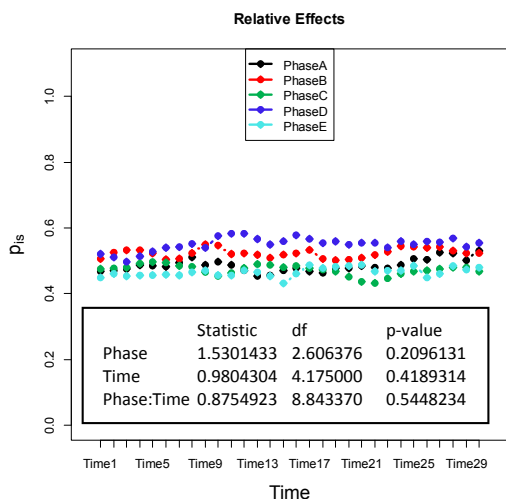
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.5588985	1.000000	0.2118266
Time	1.7117986	3.967900	0.1447381
Phase:Time	0.6656549	5.047787	0.6509665

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	0.4850026	1.000000	0.4861651
Time	1.6532379	5.380096	0.1366275
Phase:Time	1.0850979	4.268869	0.3633151

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.690485	1.000000	0.19353702
Time	1.854988	5.378424	0.09295423
Phase:Time	1.163492	4.015706	0.32469204

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.07085685	1.000000	0.7900933
Time	0.85097527	3.785695	0.4875270
Phase:Time	0.77384549	5.212872	0.5733777

Diastolic Blood Pressure

Relative Effects

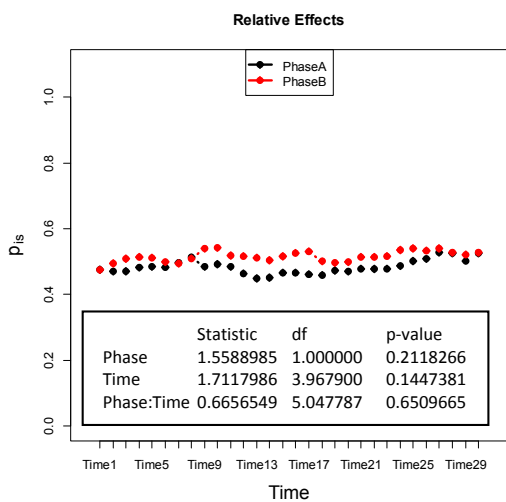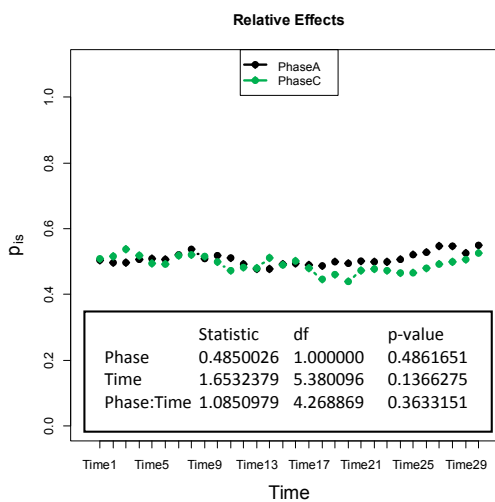|	Statistic	df	p-value
Phase	1.8666180	2.655132	0.1401697
Time	0.9478291	4.454846	0.4416103
Phase:Time	1.0046610	7.942069	0.4296078

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
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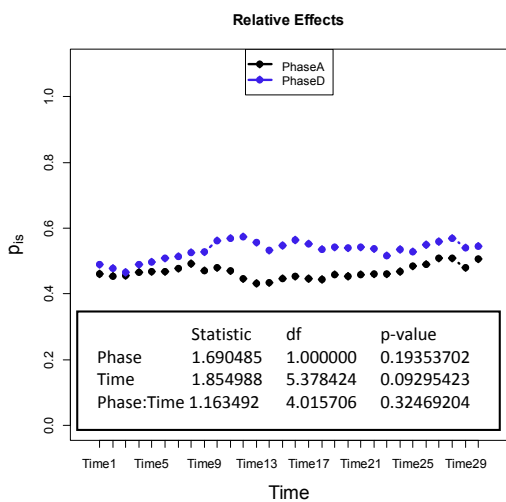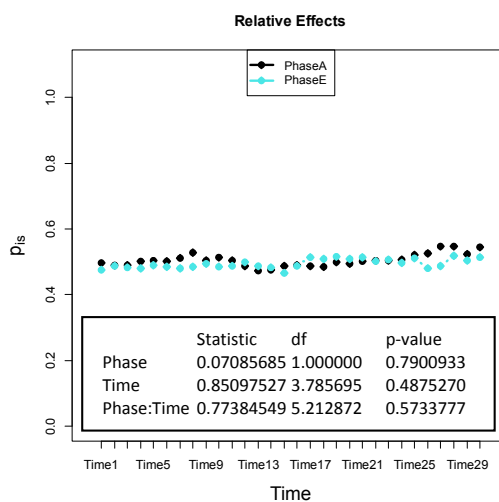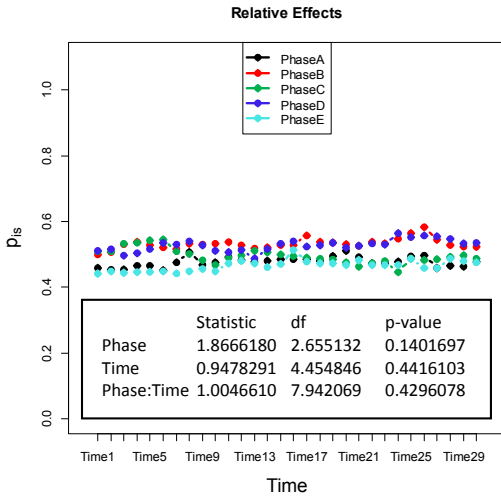
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	6.1004607	1.000000	0.01351466
Time	1.5044565	4.465654	0.19160242
Phase:Time	0.6732104	4.846867	0.63907223

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	0.7278086	1.000000	0.3935944
Time	0.7724951	5.403997	0.5787206
Phase:Time	1.8107201	4.150622	0.1209271

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.8490933	1.000000	0.1738889
Time	1.5556321	4.165194	0.1807248
Phase:Time	0.6370649	3.760400	0.6262930

Baseline vs. Late rest

Relative Effects

	Statistic	df	p-value
Phase	0.1253118	1.000000	0.7233434
Time	0.8564891	3.117664	0.4664186
Phase:Time	0.4294153	3.202124	0.7447255

Intracranial Pressure

Relative Effects

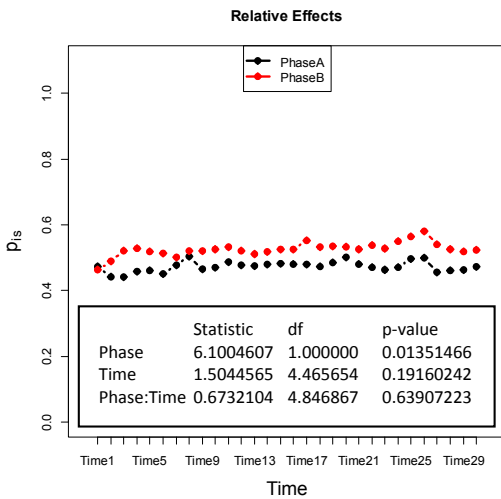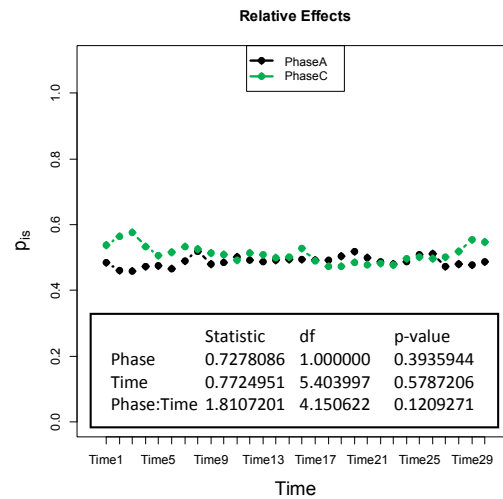|	Statistic	df	p-value
Phase	1.5006981	1.787288	0.2243621
Time	0.7504053	3.331717	0.5348616
Phase:Time	1.0710013	4.270821	0.3706126

- ● Phase A – Baseline
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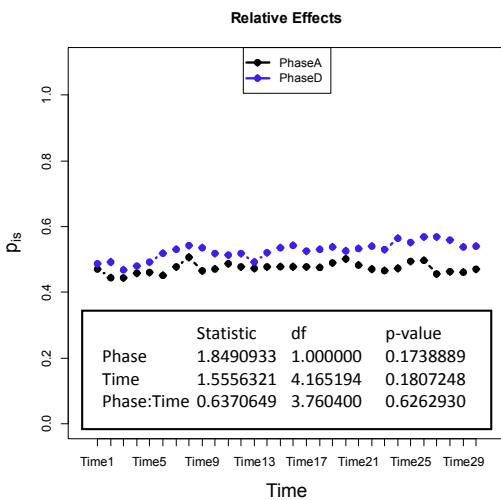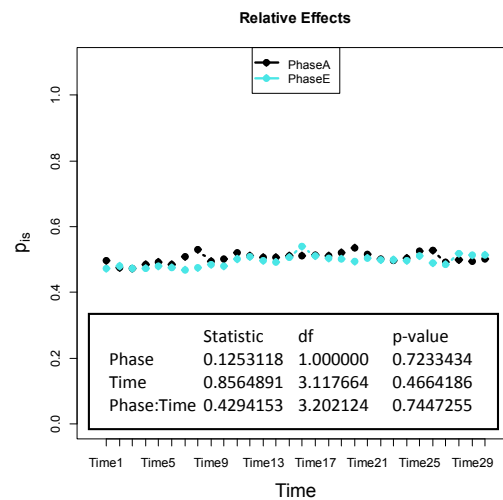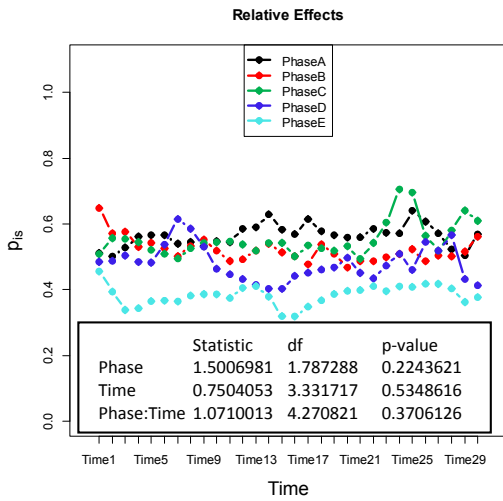
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.1328154	1.000000	0.2871756
Time	0.4671754	3.137167	0.7137629
Phase:Time	1.2261536	3.366150	0.2983579

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	0.4300180	1.000000	0.5119801
Time	1.3774798	3.972450	0.2391183
Phase:Time	0.7208165	3.602613	0.5635873

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.2474892	1.000000	0.2640326
Time	0.6045306	3.588322	0.6413945
Phase:Time	1.6419793	3.385253	0.1707587

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	1.9756414	1.000000	0.1598503
Time	0.9735103	3.538793	0.4137135
Phase:Time	0.8539548	3.640848	0.4821407

Peripheral Oxygen Saturation (SpO₂)

Relative Effects

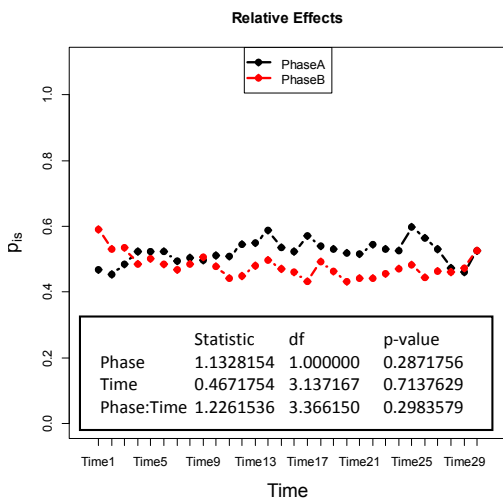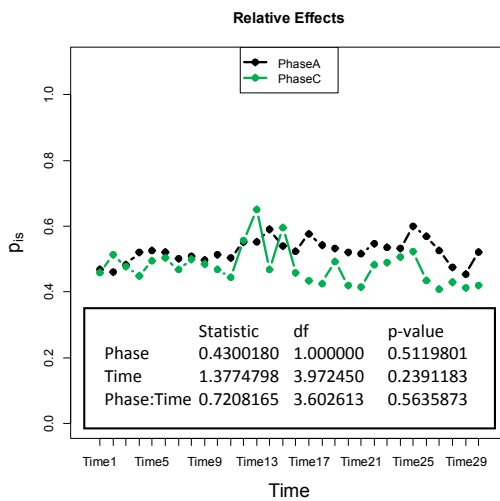|	Statistic	df	p-value
Phase	0.1508295	1.798408	0.83807661
Time	2.1767694	5.222536	0.05087242
Phase:Time	0.7922676	7.044105	0.59439172

● Phase A – Baseline
● Phase B – Physiotherapy
● Phase C – WBV (whole-body-vibration)
● Phase D – Early Rest
● Phase E – Late Rest

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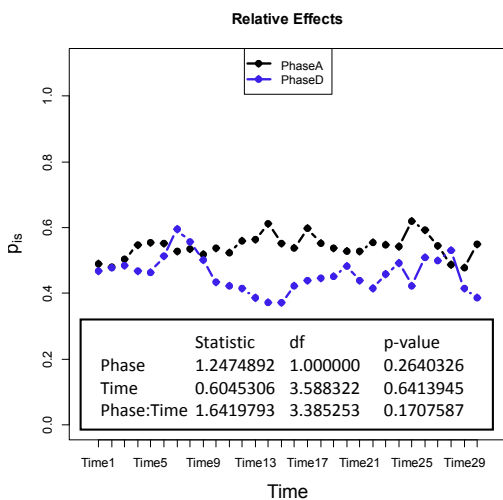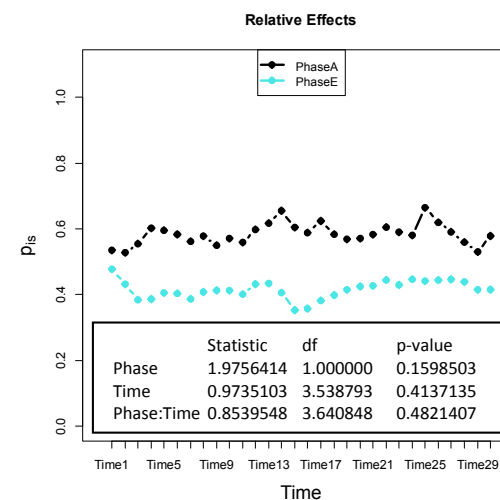
Baseline vs. Physiotherapy

Relative Effects
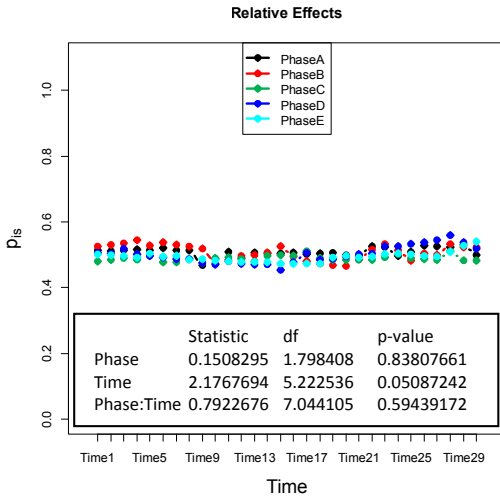

	Statistic	df	p-value
Phase	0.03099012	1.000000	0.8602624
Time	1.09444513	5.620146	0.3622732
Phase:Time	0.63873224	5.642442	0.6894810

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	2.0941457	1.000000	0.1478643
Time	0.5253753	4.491459	0.7380350
Phase:Time	1.2410530	4.917342	0.2871534

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.7560997	1.000000	0.3845519
Time	1.8663254	3.092703	0.1309021
Phase:Time	0.6977220	3.431660	0.5719468

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.2251526	1.000000	0.6351416
Time	1.1331112	3.341500	0.3361778
Phase:Time	0.7558798	2.795929	0.5101977

Mean Arterial Pressure

Relative Effects

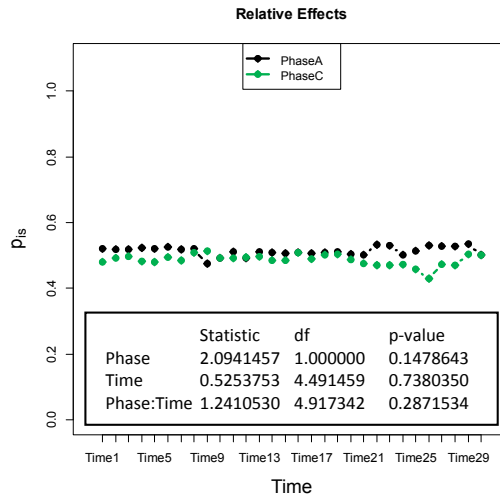|	Statistic	df	p-value
Phase	1.3099911	2.683406	0.2701497
Time	1.4677276	4.548741	0.2021891
Phase:Time	0.9346592	8.190804	0.4875440

- ● Phase A – Baseline
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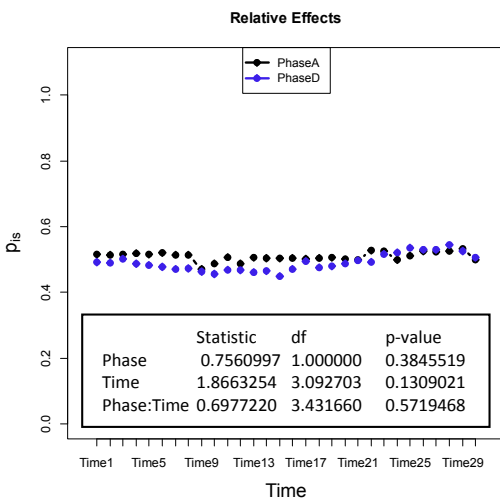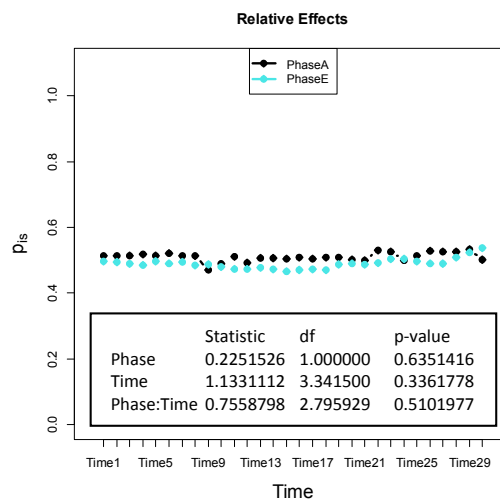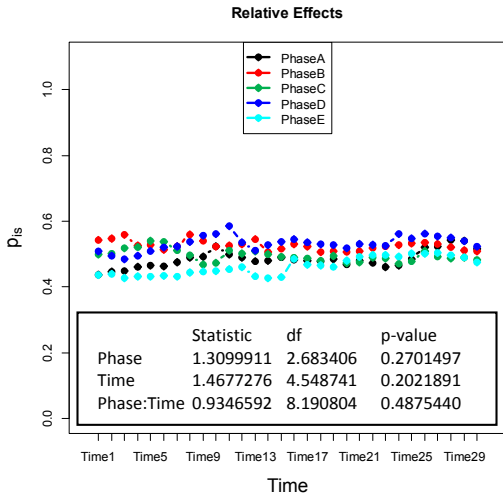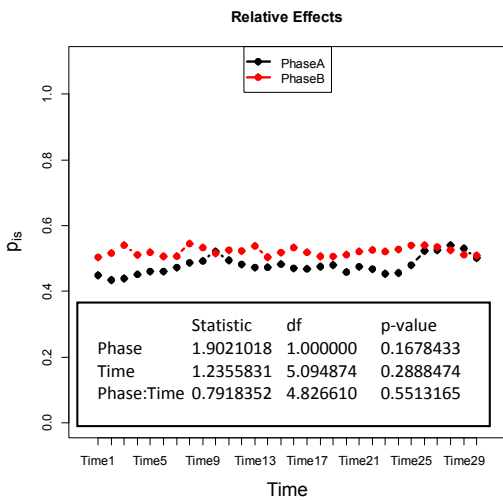
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.9021018	1.000000	0.1678433
Time	1.2355831	5.094874	0.2888474
Phase:Time	0.7918352	4.826610	0.5513165

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	0.01897754	1.000000	0.89043088
Time	1.31144672	5.153748	0.25452165
Phase:Time	2.05510704	3.805607	0.08738575

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.6088314	1.000000	0.435228162
Time	3.4454352	4.263378	0.006713066
Phase:Time	0.3348895	4.094249	0.858759023

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.0471649	1.000000	0.8280721
Time	1.6403927	3.445524	0.1701177
Phase:Time	0.6092205	3.691415	0.6427784

Hemodynamic Parameters

Two-factorial design (1st factor (dependent): phases, 2nd factor (dependent): Time)

Cardiac Power Index (CPI)

Relative Effects

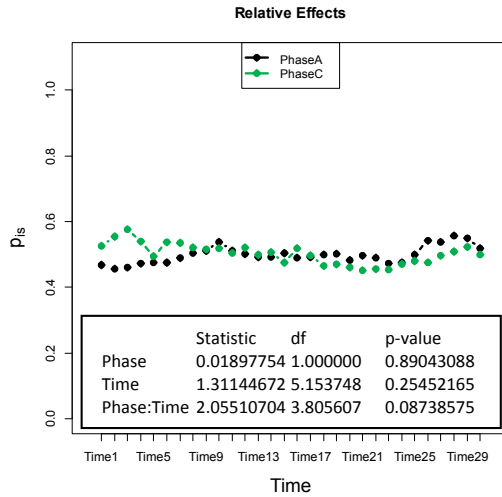|	Statistic	df	p-value
Phase	2.374391	2.945293	0.06925377
Time	1.160710	4.936307	0.32587003
Phase:Time	1.086813	7.436828	0.36864502

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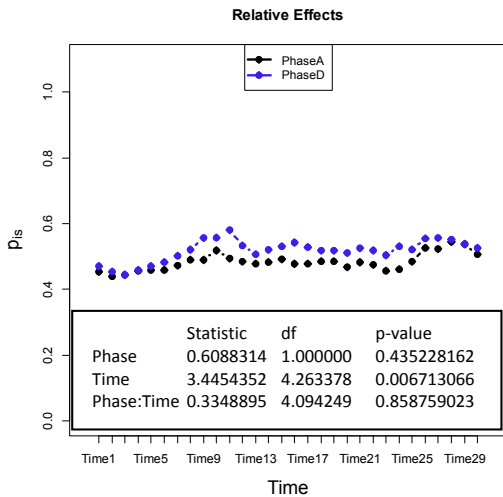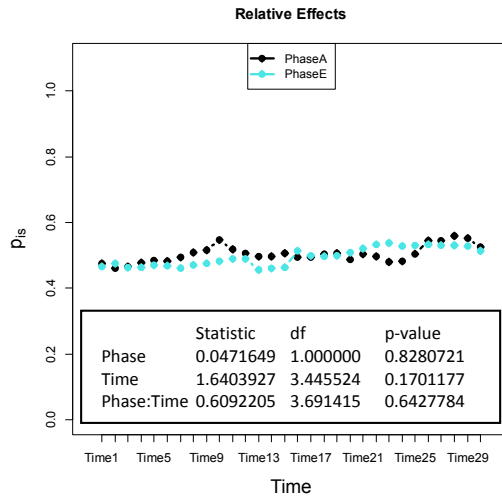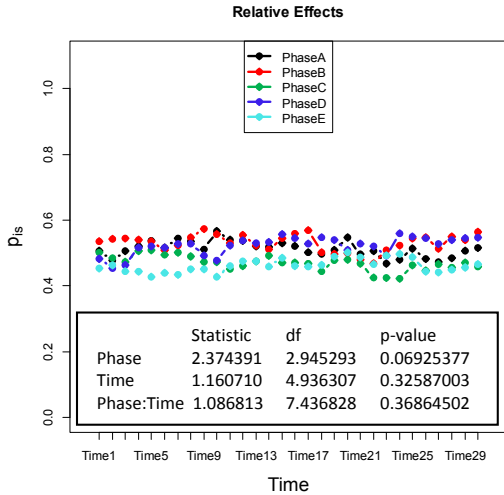
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.01802544	1.000000	0.89319790
Time	2.08988995	6.897209	0.04197365
Phase:Time	1.52674501	6.210662	0.16216564

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	3.684477	1.000000	0.0549212
Time	1.023174	5.519833	0.4051964
Phase:Time	1.831734	5.559533	0.0946583

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.3562089	1.000000	0.55061930
Time	1.5024773	5.160373	0.18317894
Phase:Time	1.8214515	5.479338	0.09774603

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	2.7117286	1.000000	0.0996130
Time	0.6307614	4.203960	0.6484488
Phase:Time	1.2683020	4.621471	0.2766033

Cardiac Power Output (CPO)

Relative Effects

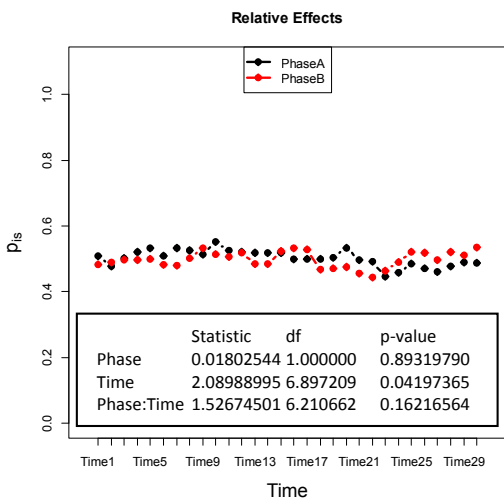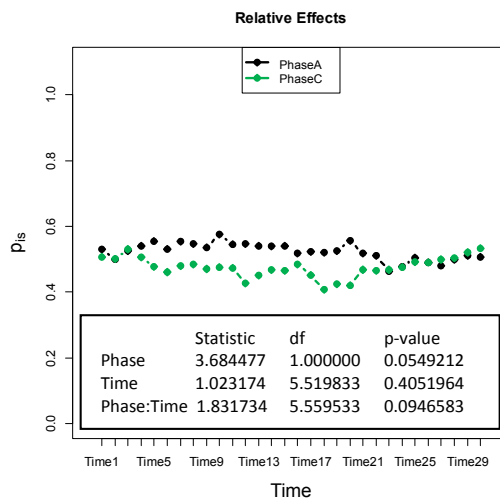|	Statistic	df	p-value
Phase	2.1309036	2.833495	0.09777035
Time	0.8665933	4.521065	0.49373770
Phase:Time	1.2451601	7.469742	0.27090572

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
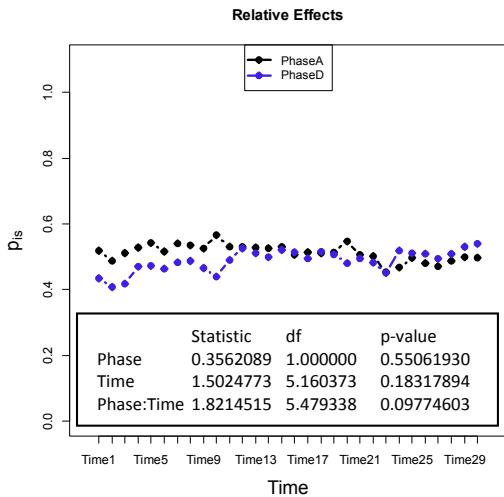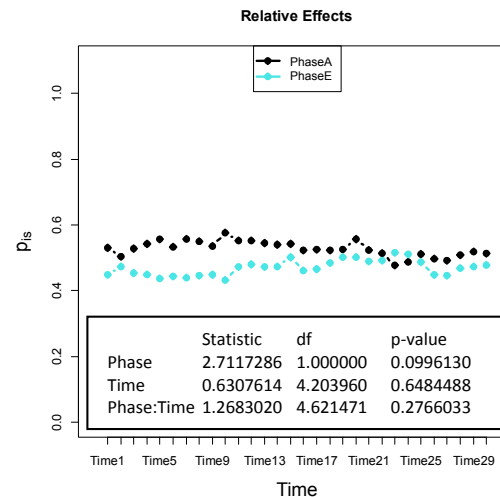
Baseline vs. Physiotherapy

Relative Effects
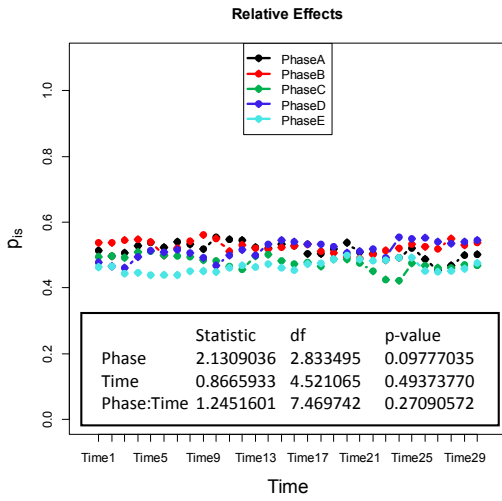

	Statistic	df	p-value
Phase	0.005156552	1.000000	0.9427538
Time	1.551928559	4.434584	0.1778998
Phase:Time	1.299317100	4.260077	0.2659841

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	3.965417	1.000000	0.04644401
Time	1.281848	5.019999	0.26827795
Phase:Time	1.801920	5.198616	0.10566455

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.5056061	1.000000	0.47704714
Time	1.1566068	4.588736	0.32811373
Phase:Time	1.8998970	4.727857	0.09497187

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	3.6686252	1.000000	0.0554459
Time	0.7492323	3.624218	0.5460288
Phase:Time	1.2151623	3.304013	0.3026381

Cardiac Index (CI)

Relative Effects

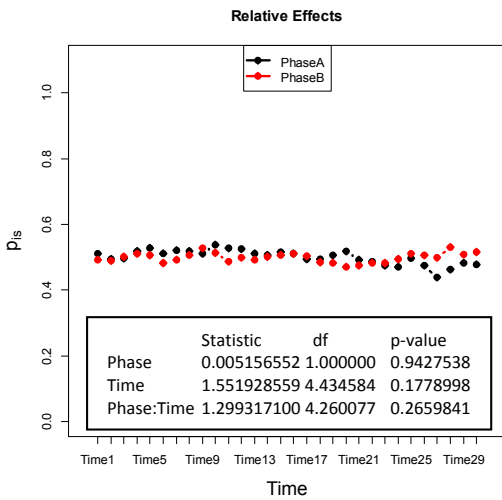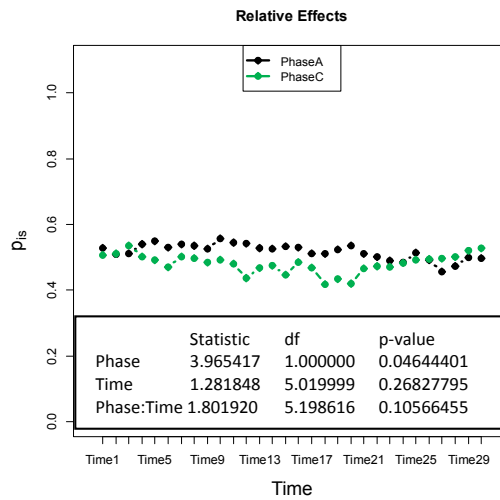|	Statistic	df	p-value
Phase	0.6724581	2.862436	0.5619962
Time	0.8245169	3.953153	0.5080454
Phase:Time	1.2830409	.544834	0.2501559

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
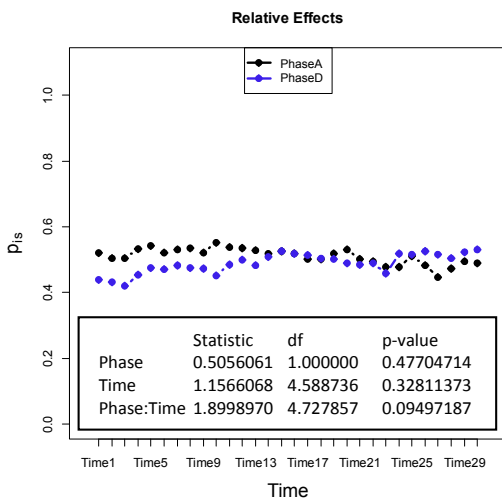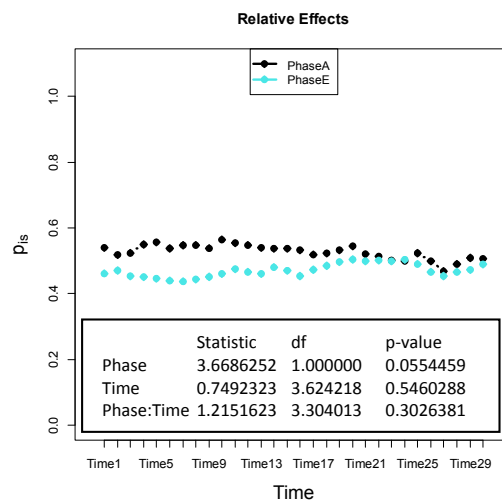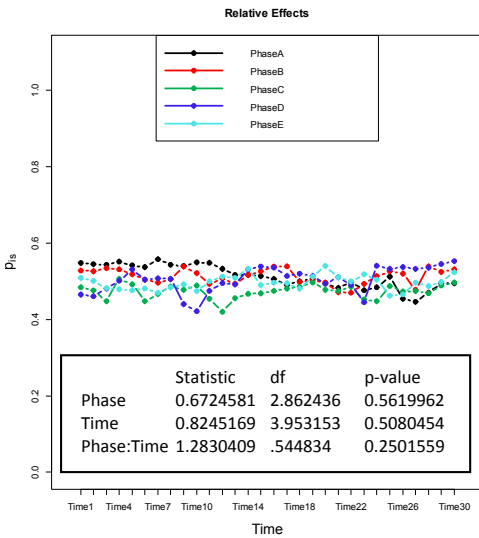
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.4205867	1.000000	0.51664445
Time	2.5651280	5.340716	0.02213436
Phase:Time	1.3221702	4.420780	0.25579668

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	1.6872029	1.000000	0.19397010
Time	0.8319779	4.932481	0.52528154
Phase:Time	2.1486692	5.263155	0.05327755

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.422520	1.000000	0.23298914
Time	1.112301	4.210892	0.34937974
Phase:Time	2.827582	4.650959	0.01729083

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.9097651	1.000000	0.3401768
Time	1.4233946	3.777524	0.2256712
Phase:Time	1.6649257	4.912631	0.1405418

Cardiac Output (CO)

Relative Effects

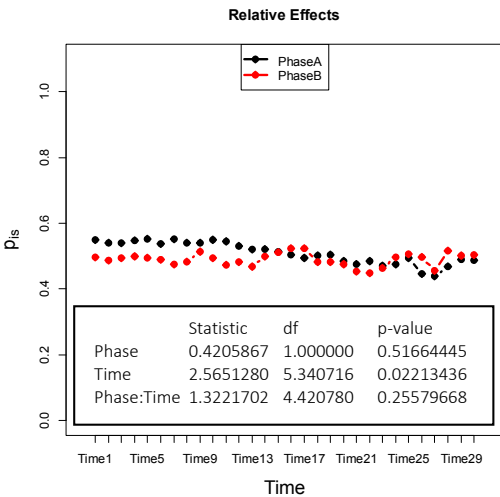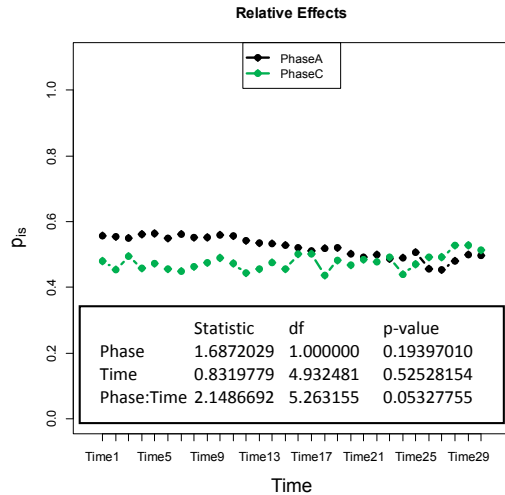|	Statistic	df	p-value
Phase	1.0672936	2.954330	0.3609659
Time	0.9050773	3.703995	0.4539827
Phase:Time	1.5757514	7.057775	0.1366301

● Phase A – Baseline
● Phase B – Physiotherapy
● Phase C – WBV (whole-body-vibration)
● Phase D – Early Rest
● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
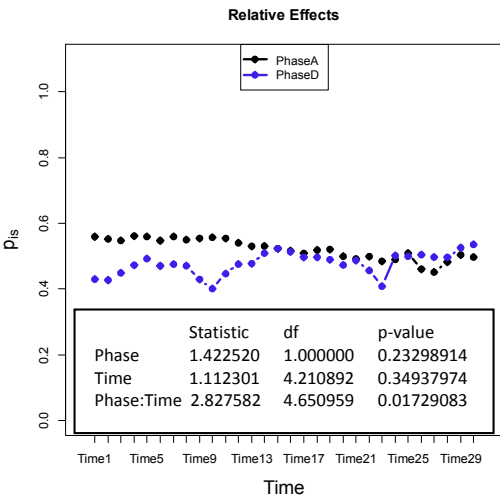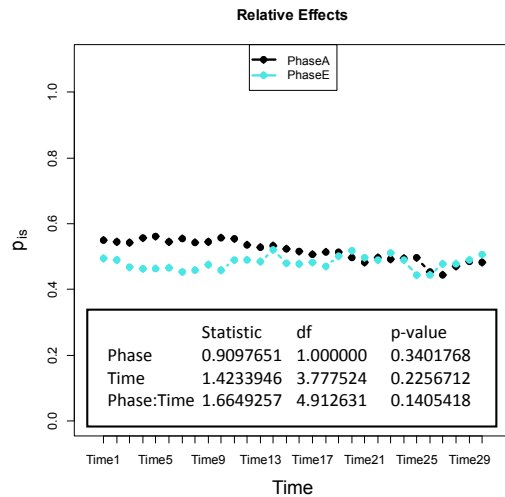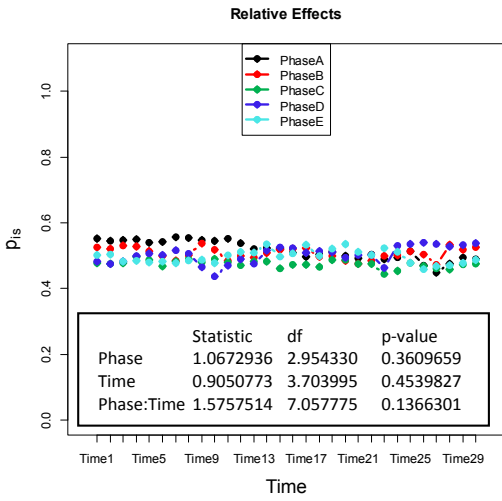
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.105985	1.000000	0.29295646
Time	2.749013	4.528173	0.02118719
Phase:Time	1.340138	4.172709	0.25086891

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	3.669467	1.000000	0.05541792
Time	1.014391	4.058650	0.39888709
Phase:Time	3.066643	4.166704	0.01413806

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.6977276	1.000000	0.19258542
Time	0.8775025	3.951272	0.47532400
Phase:Time	3.1161333	3.881526	0.01518769

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	2.354470	1.00000	0.12492435
Time	2.893346	4.15899	0.01928691
Phase:Time	1.812217	3.56237	0.13139551

Stroke Volume (SV)

Relative Effects

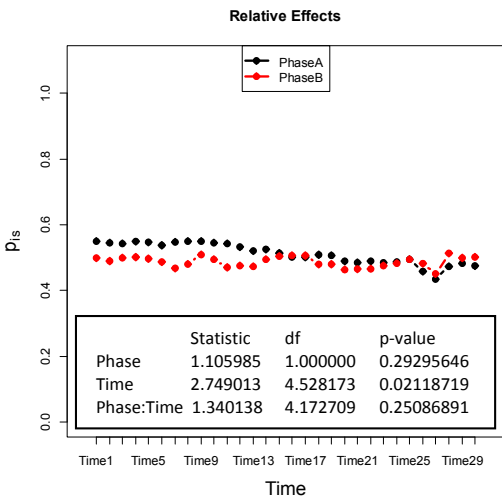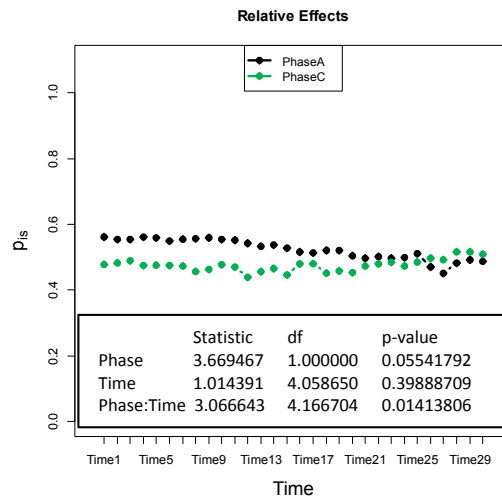|	Statistic	df	p-value
Phase	0.6902913	2.399629	0.5266638
Time	1.2666395	3.405266	0.2829160
Phase:Time	1.8080493	4.271688	0.1193451

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
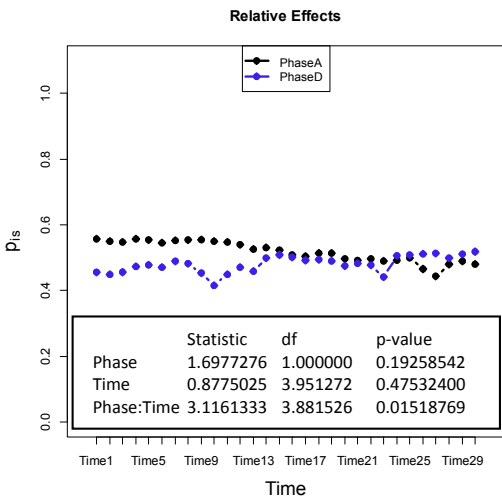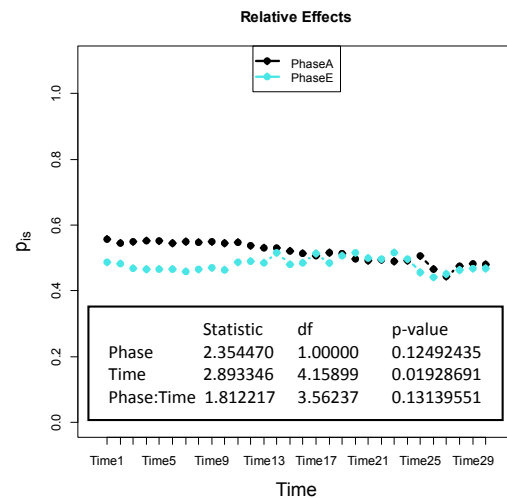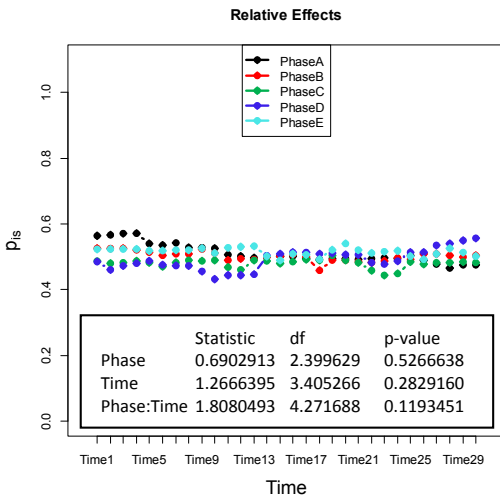
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.033737	1.000000	0.30928260
Time	3.055971	3.873355	0.01687658
Phase:Time	0.960047	3.887836	0.42639284

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	2.155662	1.000000	0.14204520
Time	1.228511	4.418840	0.29489606
Phase:Time	2.021004	4.470709	0.08047226

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.9754233	1.000000	0.32333135
Time	0.7223705	2.879478	0.53308206
Phase:Time	3.1682380	2.588931	0.02967159

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.001588111	1.000000	0.96821182
Time	2.236819032	3.326149	0.07483457
Phase:Time	1.651171336	3.134281	0.17291692

Stroke Volume Index (SVI)

Relative Effects

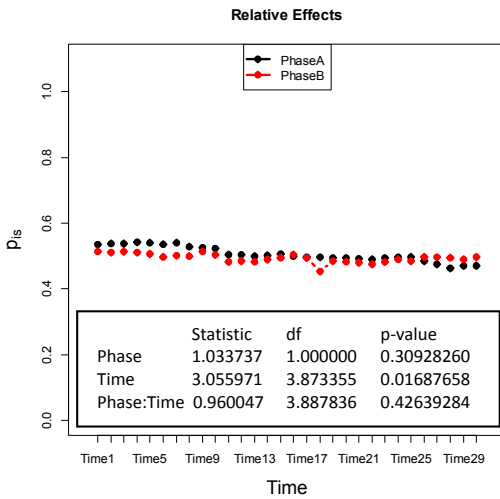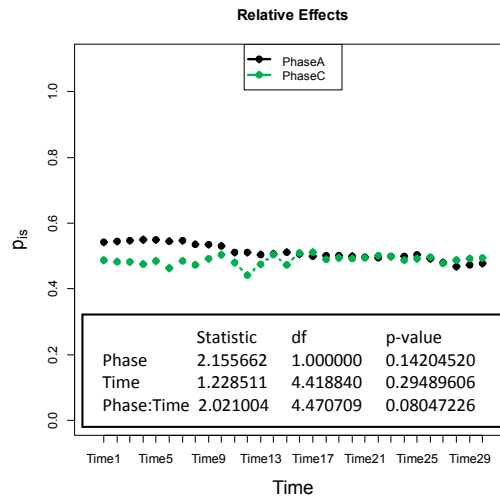|	Statistic	df	p-value
Phase	1.287567	2.577682	0.2773568
Time	1.557914	3.269414	0.1933323
Phase:Time	1.558236	4.128492	0.1805311

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
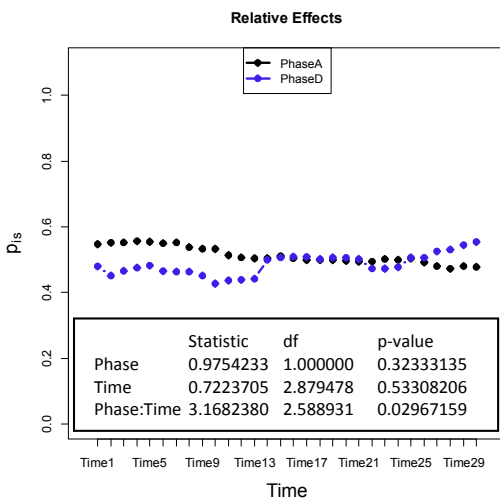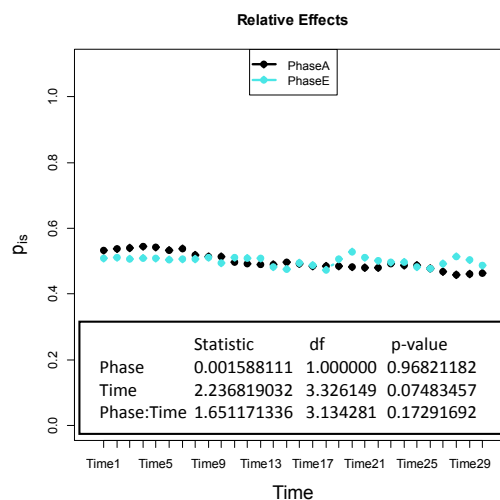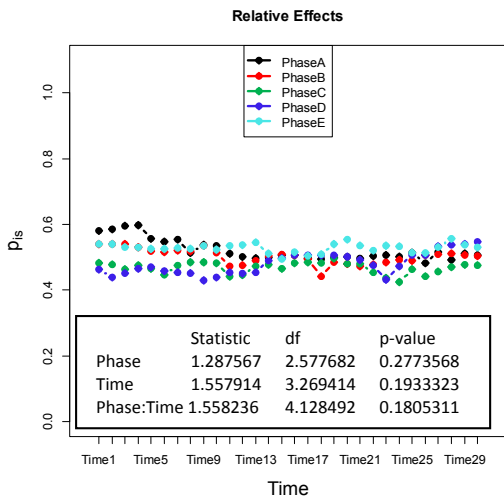
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.8208291	1.000000	0.36493788
Time	3.0169884	4.051269	0.01640534
Phase:Time	0.4842445	4.141839	0.75382278

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	1.928522	1.000000	0.1649202
Time	0.827317	3.612686	0.4972444
Phase:Time	1.664162	3.818502	0.1582127

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.5376519	1.000000	0.21496765
Time	0.9224265	2.379076	0.41132572
Phase:Time	2.7017338	2.381561	0.05706386

Baseline vs. late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.1595059	1.000000	0.6896119
Time	1.3619725	3.675612	0.2471491
Phase:Time	1.4775222	4.578113	0.1986431

maximum Stroke Volume SVmax

Relative Effects

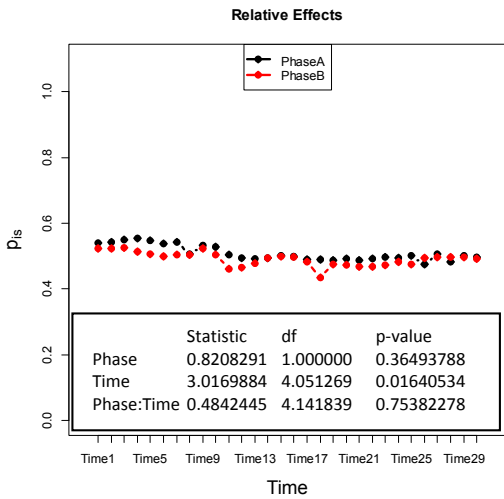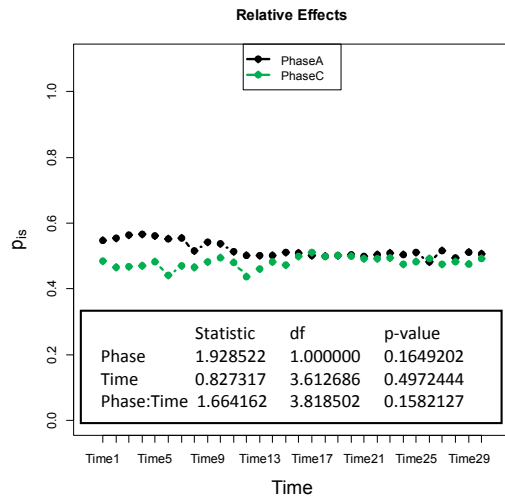|	Statistic	df	p-value
Phase	1.4875373	2.209551	0.2242509
Time	0.6180702	4.331121	0.6625559
Phase:Time	1.4114787	5.728610	0.2085901

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
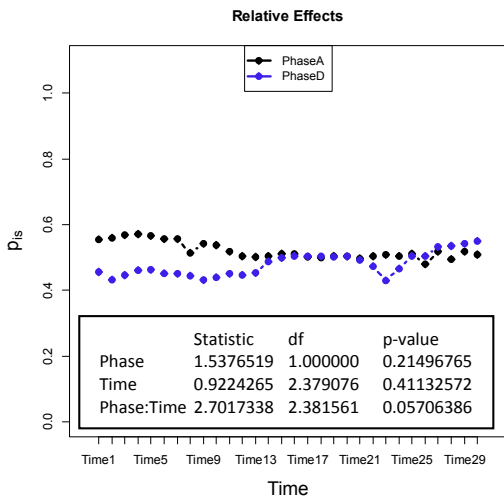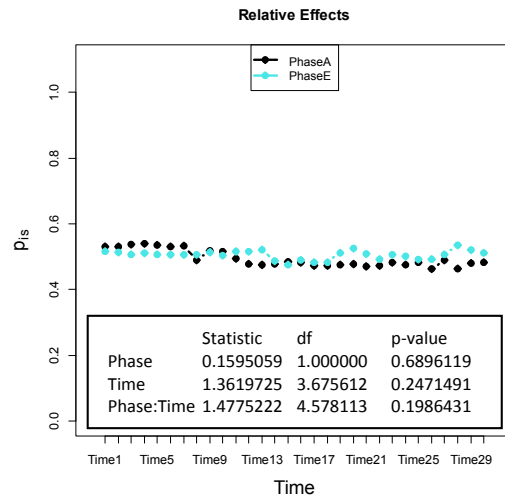
Baseline vs. Physiotherapy

Relative Effects
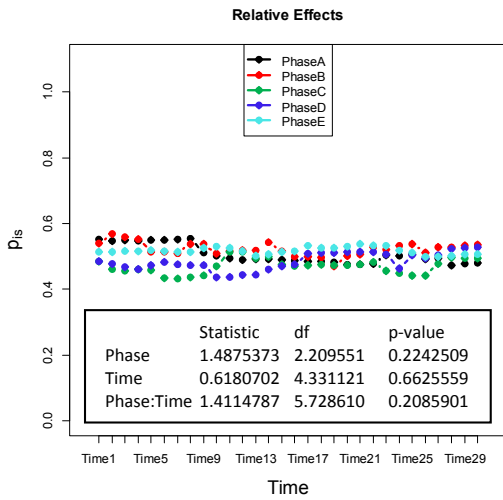

	Statistic	df	p-value
Phase	0.8343298	1.000000	0.3610235
Time	1.1432112	3.475280	0.3324557
Phase:Time	0.6458672	3.765204	0.6203733

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	2.387335	1.000000	0.1223220
Time	1.104503	3.634626	0.3505070
Phase:Time	1.263119	4.914907	0.2771997

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.3984757	1.000000	0.23697895
Time	0.9149345	3.705544	0.44843366
Phase:Time	2.2879587	2.844705	0.07983678

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.1413343	1.000000	0.7069582
Time	1.6697715	3.258795	0.1665512
Phase:Time	2.2775245	3.154090	0.0741273

minimum Stroke Volume (SVmin)

Relative Effects

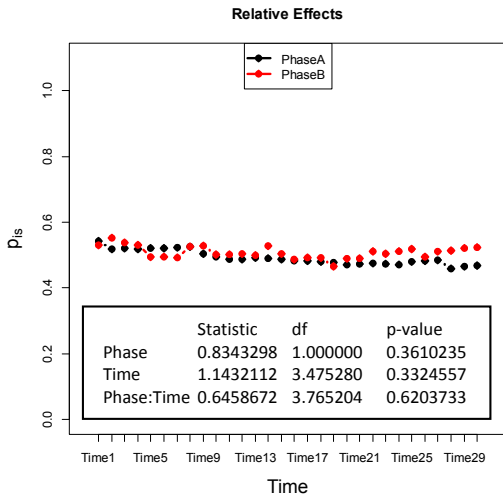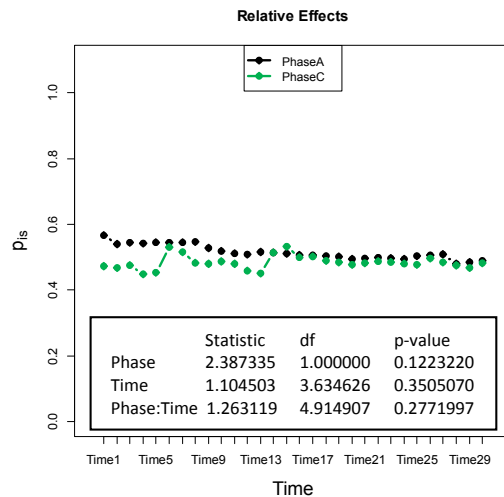|	Statistic	df	p-value
Phase	1.020692	2.648662	0.3759413
Time	1.267785	4.521684	0.2773825
Phase:Time	1.593993	6.673994	0.1357779

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
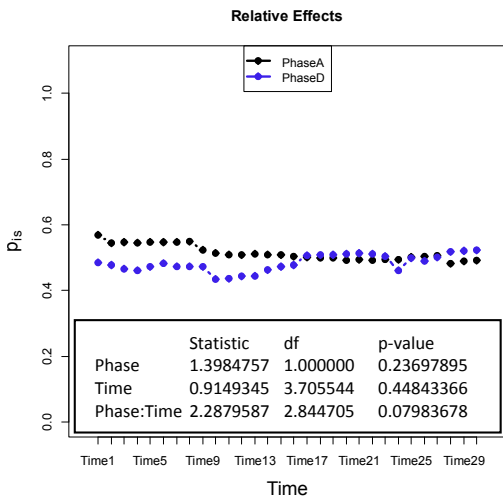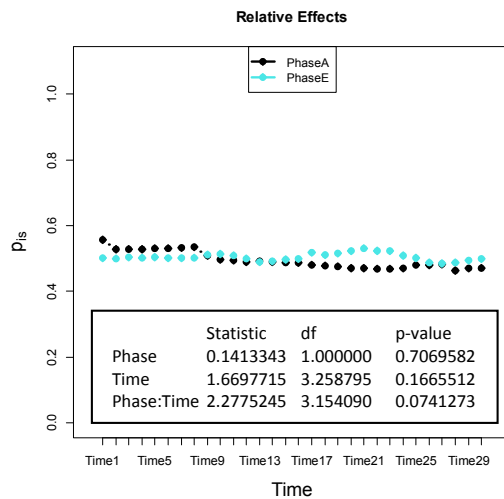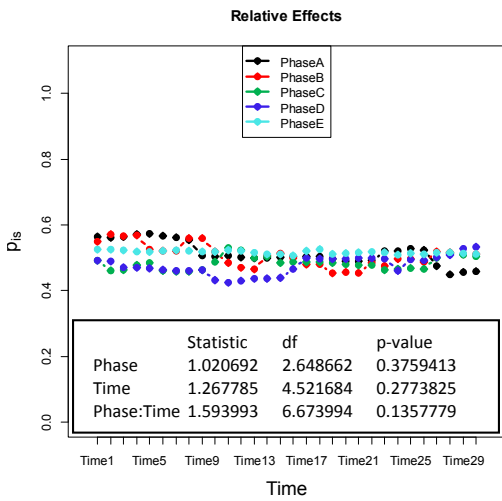
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.04862136	1.000000	0.82547981
Time	2.56020667	4.582787	0.02949123
Phase:Time	0.89109378	3.843451	0.46495765

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	1.424726	1.000000	0.2326270
Time	1.610636	4.805104	0.1561744
Phase:Time	1.171025	4.900019	0.3207224

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.658943	1.00000	0.19774609
Time	1.216467	3.52863	0.30204821
Phase:Time	3.083531	2.59875	0.03271359

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.1559325	1.000000	0.69292933
Time	2.1751597	3.132246	0.08577148
Phase:Time	1.9786532	2.792677	0.11938785

Stroke Volume Variance (SVV)

Relative Effects

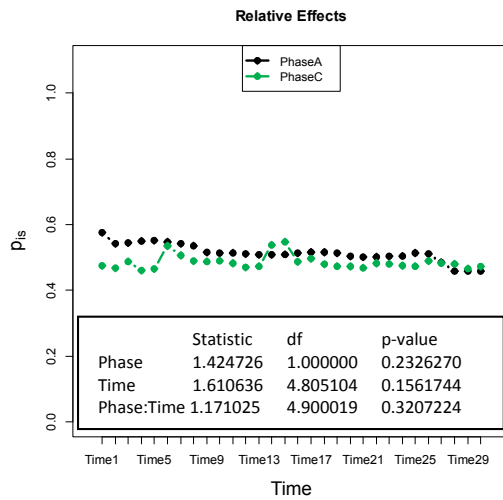|	Statistic	df	p-value
Phase	3.196805	2.677761	0.02716485
Time	1.272229	5.139966	0.27177691
Phase:Time	1.016957	8.187258	0.42093836

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
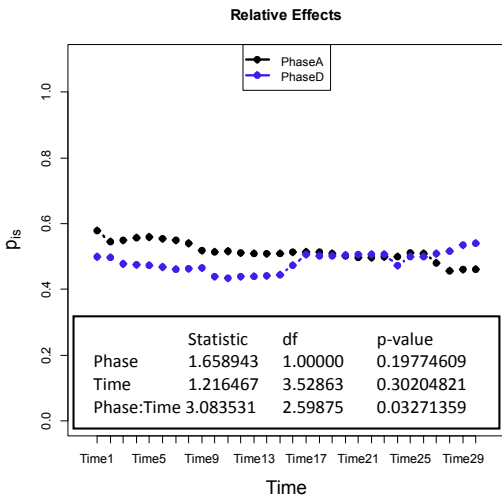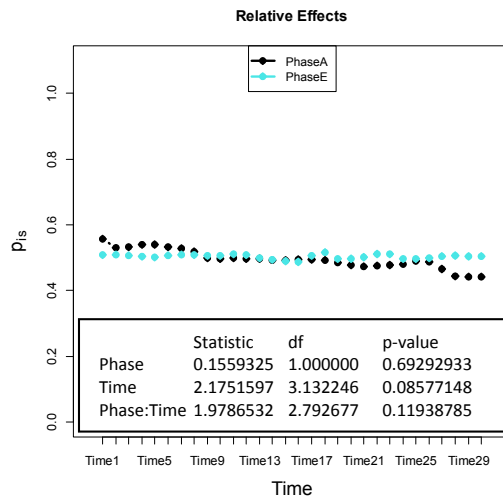
Baseline vs. Physiotherapy

Relative Effects
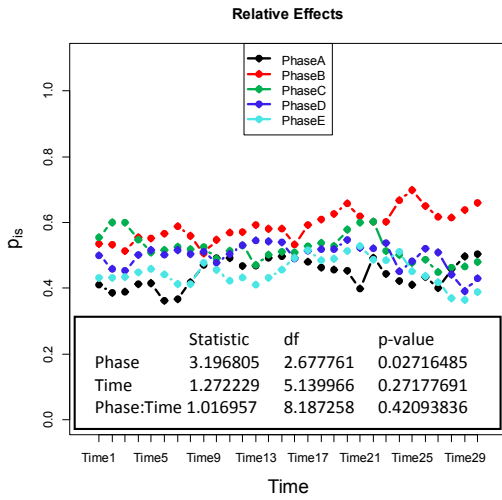

	Statistic	df	p-value
Phase	11.535065	1.000000	0.000682956
Time	0.8376370	5.640224	0.534429500
Phase:Time	0.7056621	5.450400	0.631323939

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	3.1193278	1.000000	0.0773687
Time	0.6772013	7.210295	0.6961464
Phase:Time	0.7344303	5.771091	0.6166053

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	1.3568009	1.000000	0.2440927
Time	0.9116166	6.613610	0.4919989
Phase:Time	0.9705313	5.951094	0.4428847

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.04034332	1.000000	0.8408108
Time	1.23265118	5.828570	0.2866597
Phase:Time	1.03672251	6.361696	0.4004204

Temperature

Relative Effects

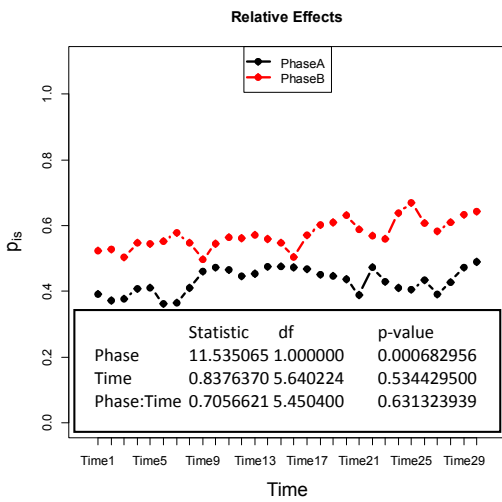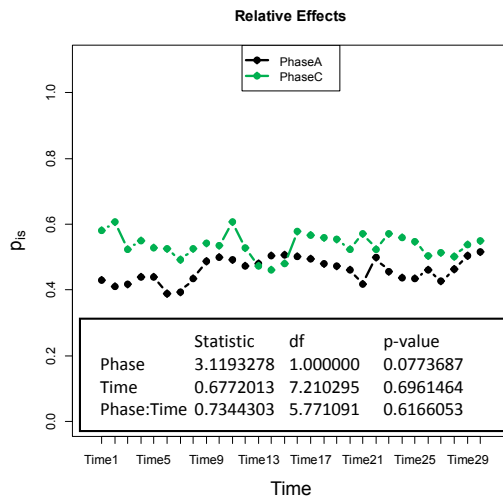|	Statistic	df	p-value
Phase	1.199745	2.197773	0.3035088
Time	1.239053	2.324586	0.2920424
Phase:Time	1.057658	2.540718	0.3587875

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 30 sequential mean values (6 per min) during the compared phases.
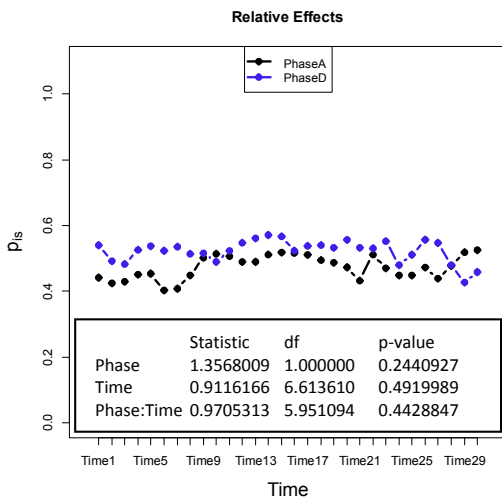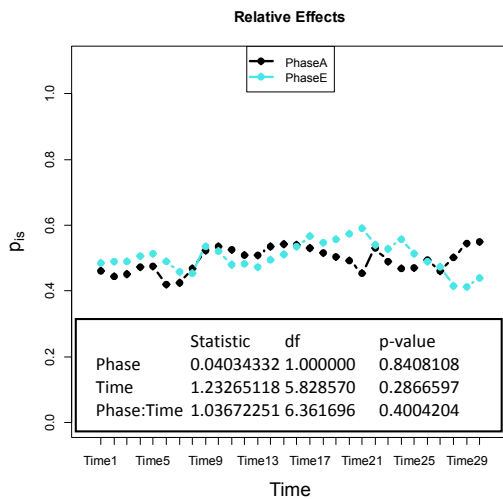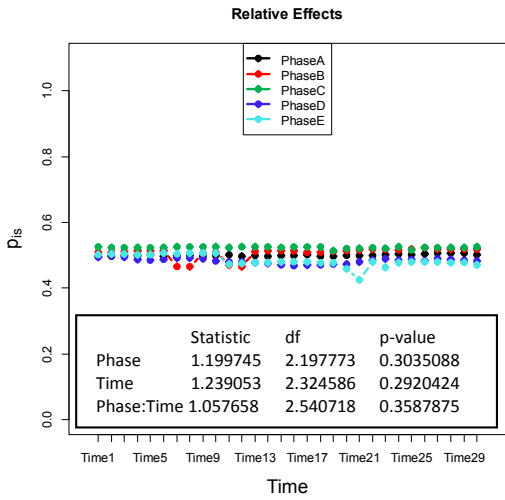
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.9617774	1.000000	0.3267395
Time	1.4384325	1.546350	0.2376705
Phase:Time	0.9895948	1.428901	0.3480597

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	1.148373	1.000000	0.2838900
Time	1.041193	2.244203	0.3591999
Phase:Time	1.688104	2.043687	0.1841516

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.3266468	1.000000	0.5676403
Time	1.7387619	2.370861	0.1687701
Phase:Time	0.6637681	2.705195	0.5589764

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.01100186	1.000000	0.9164633
Time	0.73315003	2.190923	0.4919857
Phase:Time	1.06917054	2.107918	0.3458582

Energy metabolism

Two-factorial design (1st factor (dependent): phases, 2nd factor (dependent): Time)

Respiratory Rate

Relative Effects

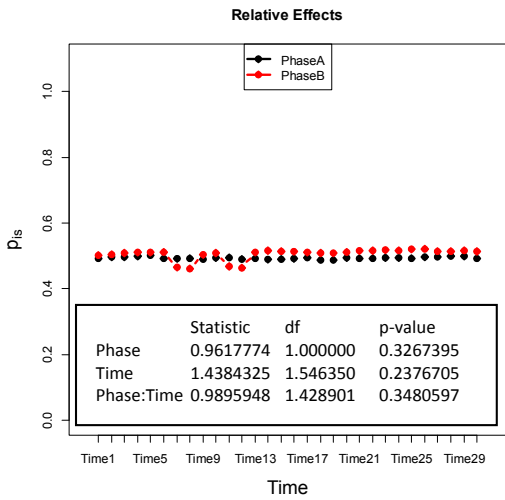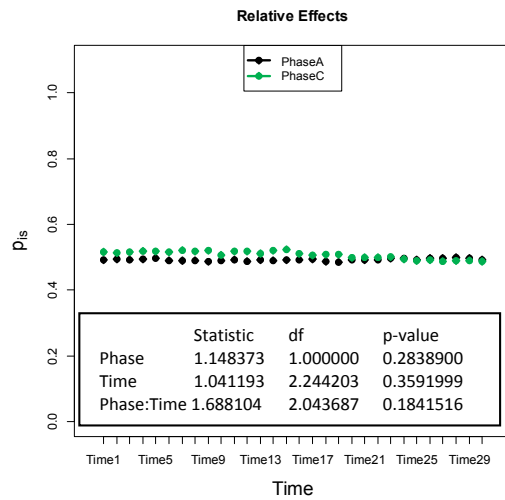|	Statistic	df	p-value
Phase	3.0123453	3.269660	0.02495961
Time	0.8841610	2.906644	0.44568271
Phase:Time	0.6583911	6.891265	0.70512130

- Phase A – Baseline
- Phase B – Physiotherapy
- Phase C – WBV (whole-body-vibration)
- Phase D – Early Rest
- Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 5 sequential mean values (1 per min) during the compared phases.
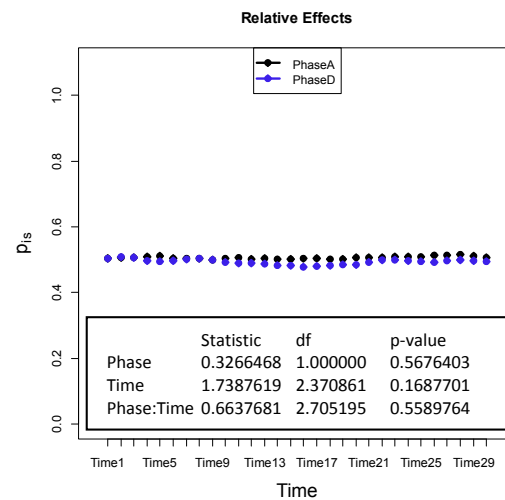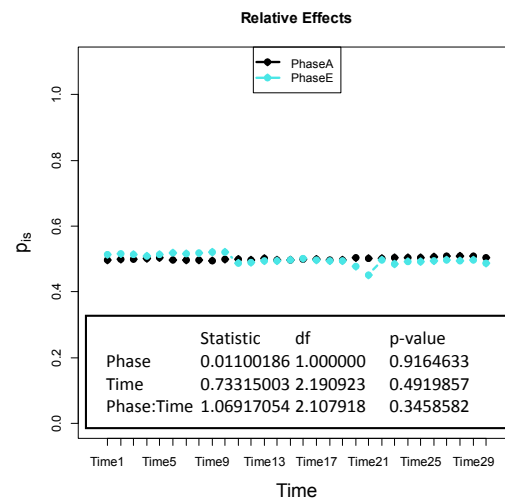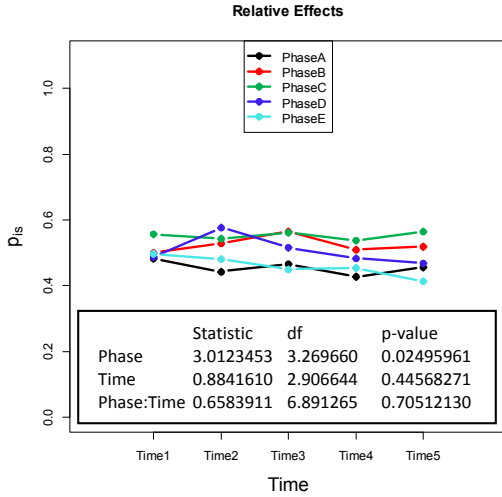
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	6.5360213	1.000000	0.01057115
Time	0.3585064	3.117828	0.79066448
Phase:Time	0.3846737	2.975594	0.76241648

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	11.9123855	1.000000	0.00055761
Time	0.8575774	3.521155	0.47696373
Phase:Time	0.2694472	2.963793	0.84515770

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	2.4822665	1.000000	0.1151362
Time	0.6230852	2.684558	0.5824005
Phase:Time	1.0193960	3.026666	0.3831686

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.06985146	1.000000	0.7915532
Time	0.68230092	3.396564	0.5804935
Phase:Time	0.36836492	3.027839	0.7776927

Energy Expenditure

Relative Effects

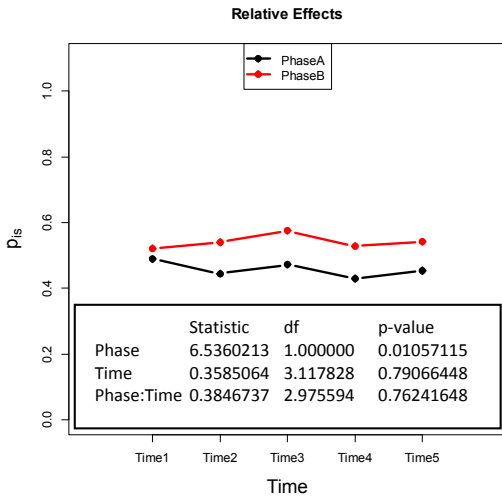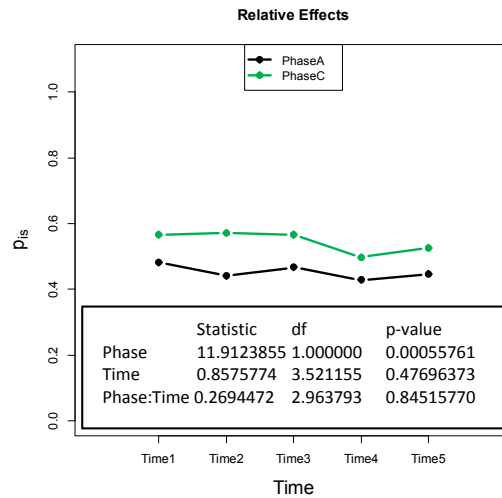|	Statistic	df	p-value
Phase	3.629248	2.775058	0.01465271
Time	1.696194	3.327920	0.15947161
Phase:Time	1.107316	6.248496	0.35511974

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 5 sequential mean values (1 per min) during the compared phases.
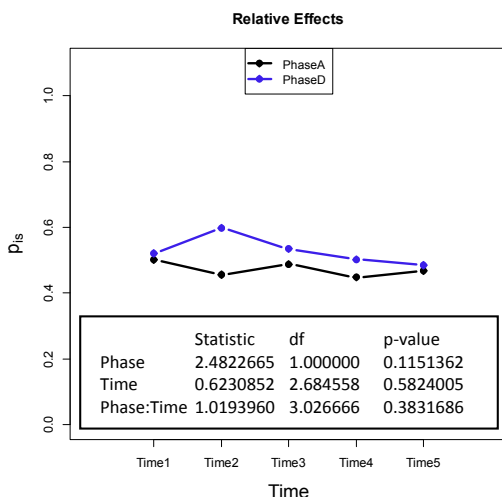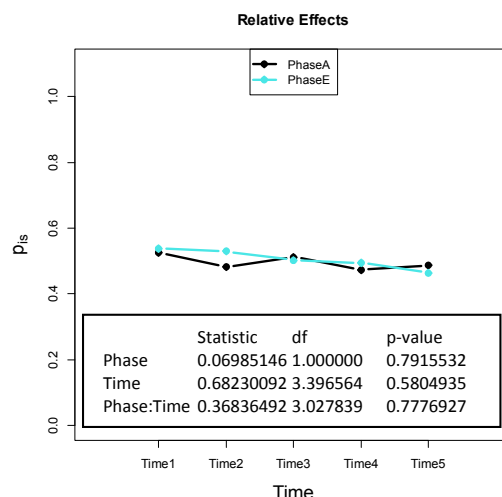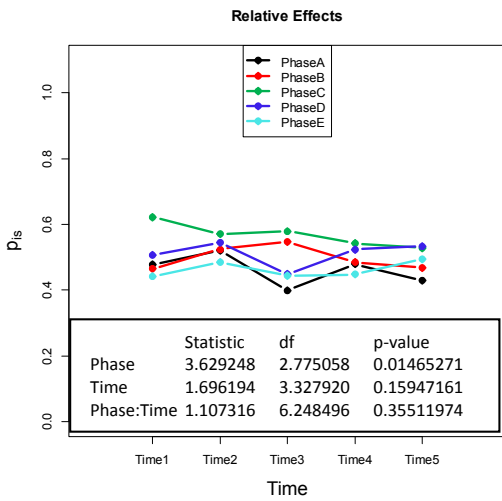
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	1.832210	1.000000	0.1758667
Time	1.294403	2.410172	0.2752156
Phase:Time	1.873653	3.038749	0.1307658

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	7.400005	1.000000	0.006522369
Time	2.501751	2.730838	0.063202570
Phase:Time	1.797040	2.519985	0.155113879

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	3.242337	1.000000	0.07175820
Time	2.457847	2.924664	0.06248537
Phase:Time	0.350541	2.226430	0.72717505

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.01563763	1.000000	0.90048356
Time	2.23093747	2.314175	0.09892084
Phase:Time	1.30551145	2.260235	0.27178157

Respiratory Quotient (RQ)

Relative Effects

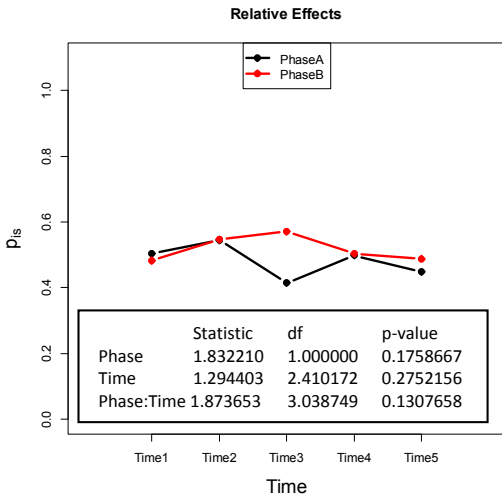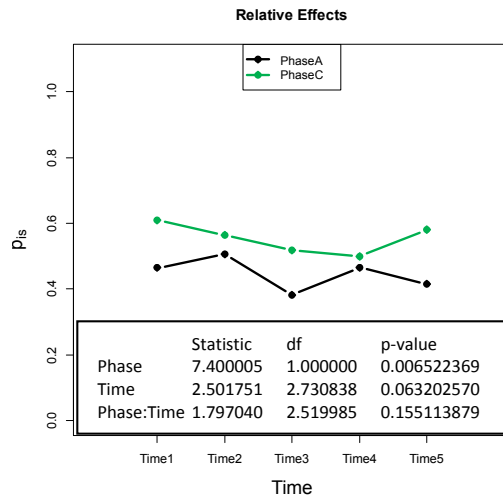|	Statistic	df	p-value
Phase	2.5488209	2.782011	0.05846579
Time	1.5938698	2.735394	0.19263420
Phase:Time	0.8348789	5.886832	0.54073117

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 5 sequential mean values (1 per min) during the compared phases.
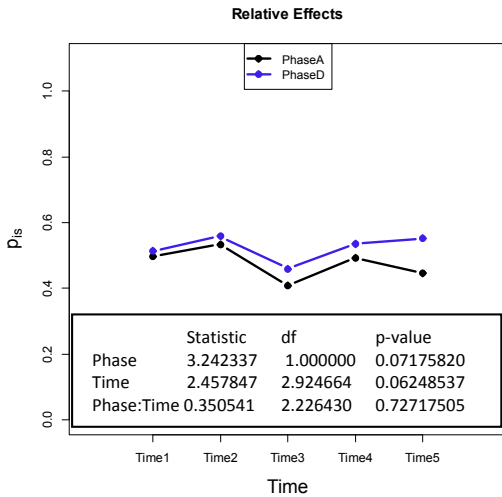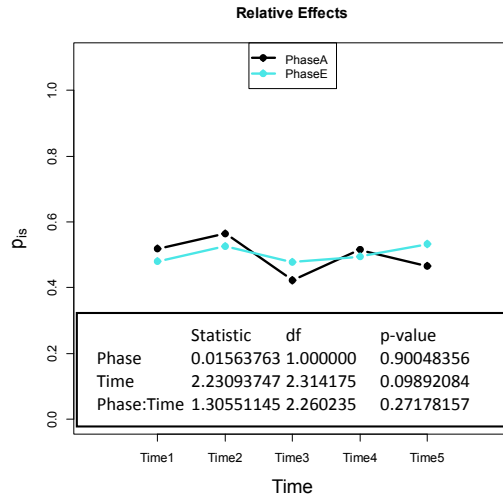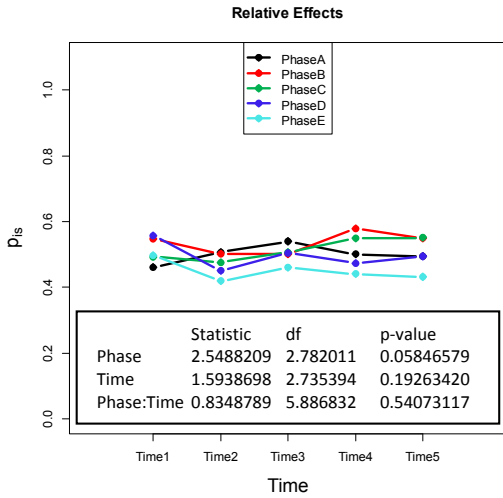
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	4.594006	1.000000	0.03208395
Time	0.351171	2.915654	0.78258035
Phase:Time	1.216717	2.519298	0.30030410

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	0.1345627	1.000000	0.7137474
Time	1.2363363	2.169390	0.2919013
Phase:Time	0.2441286	2.649854	0.8420081

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	0.02096297	1.000000	0.8848799
Time	0.49932545	2.468738	0.6462698
Phase:Time	1.32993421	3.316836	0.2607754

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	2.7898746	1.000000	0.09486165
Time	0.3572444	2.662255	0.75966512
Phase:Time	1.3423142	2.838156	0.25944147

CO₂ Elimination (VCO₂)

Relative Effects

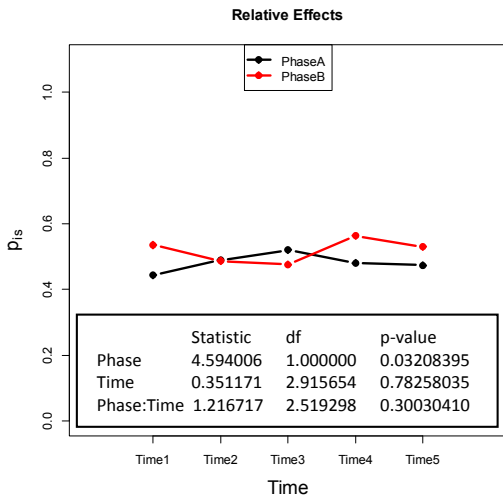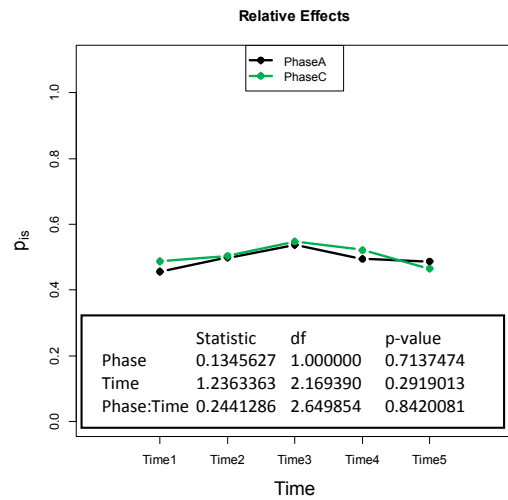|	Statistic	df	p-value
Phase	5.279562	2.563422	0.002274459
Time	0.837291	2.920131	0.470504944
Phase:Time	1.401267	5.449933	0.215443225

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 5 sequential mean values (1 per min) during the compared phases.
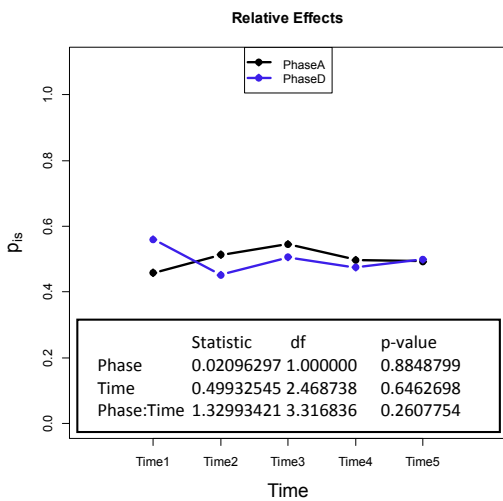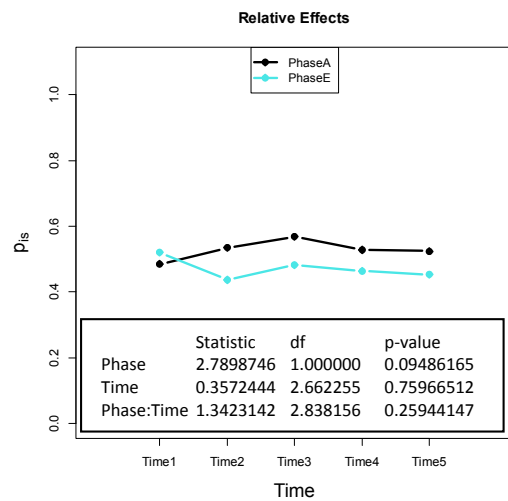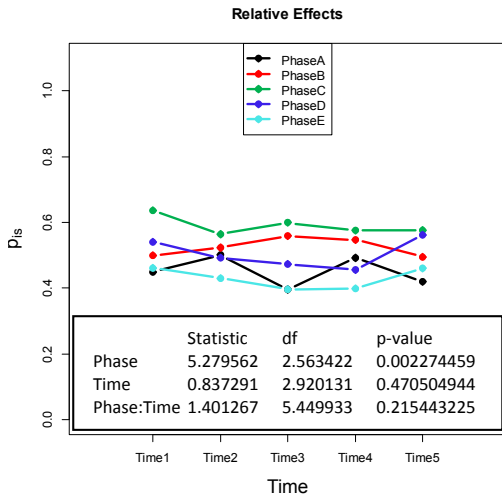
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	4.213163	1.000000	0.04011147
Time	1.149585	1.848010	0.31391600
Phase:Time	1.527760	2.619958	0.21002188

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	12.574870	1.000000	0.000390969
Time	2.004102	2.732328	0.117049648
Phase:Time	1.575622	2.676387	0.197774336

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	6.781249	1.000000	0.009212043
Time	1.455516	3.661914	0.216889621
Phase:Time	1.601311	2.519088	0.194265949

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.1082436	1.000000	0.7421527
Time	1.2937798	2.826628	0.2750318
Phase:Time	1.7365633	1.842215	0.1789065

Oxygen Uptake (VO₂)

Relative Effects

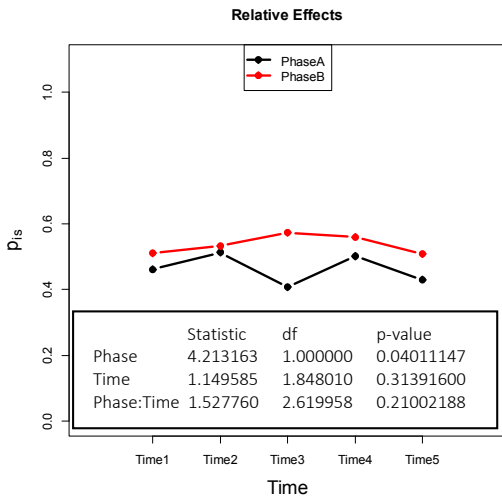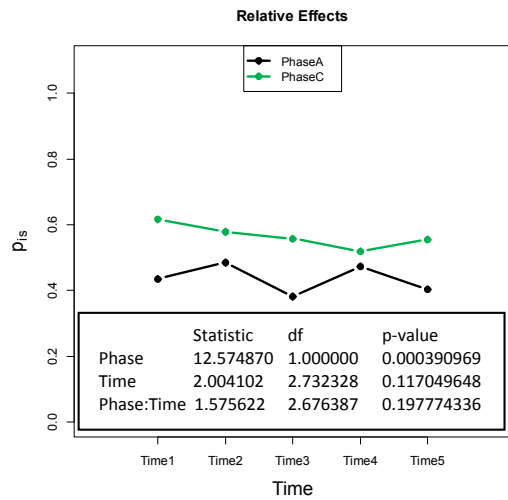|	Statistic	df	p-value
Phase	3.209560	2.598637	0.02804891
Time	1.951264	3.417016	0.11018672
Phase:Time	1.039581	6.229993	0.39802688

- ● Phase A – Baseline
- ● Phase B – Physiotherapy
- ● Phase C – WBV (whole-body-vibration)
- ● Phase D – Early Rest
- ● Phase E – Late Rest

Detailed data presentation and statistical results for longitudinal data assessment. Algorithm of Brunner used for calculation. Time indicates 5 sequential mean values (1 per min) during the compared phases.
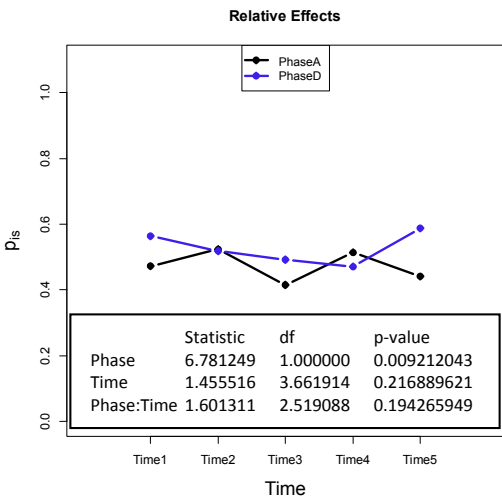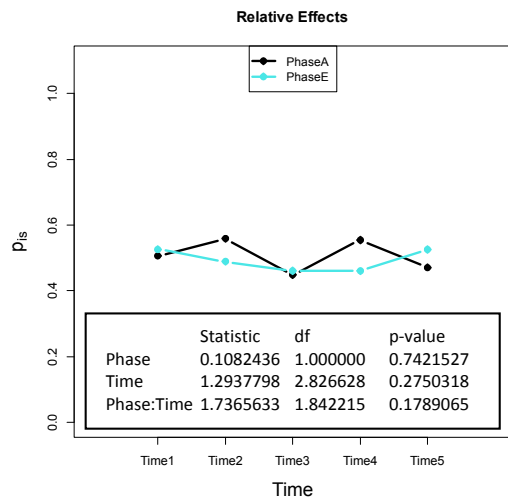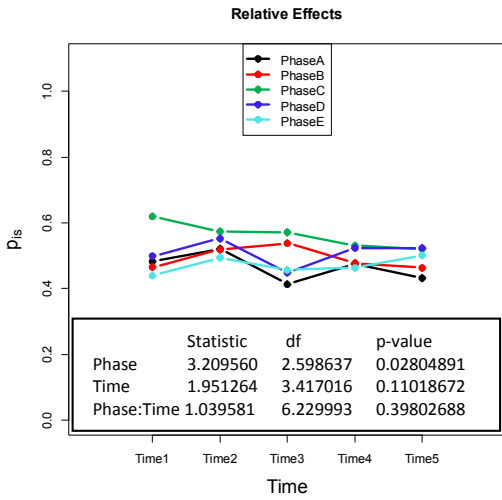
Baseline vs. Physiotherapy

Relative Effects

	Statistic	df	p-value
Phase	0.9775956	1.000000	0.3227931
Time	1.1484235	2.722943	0.3259506
Phase:Time	1.4095458	3.070798	0.2371682

Baseline vs. Vibration

Relative Effects

	Statistic	df	p-value
Phase	6.451323	1.000000	0.01108698
Time	2.368122	2.616941	0.07736231
Phase:Time	1.689013	2.602877	0.17416691

Baseline vs. Early Rest

Relative Effects

	Statistic	df	p-value
Phase	2.565721	1.000000	0.10920275
Time	2.295431	2.906512	0.07767998
Phase:Time	0.283189	2.203778	0.77446840

Baseline vs. Late Rest

Relative Effects

	Statistic	df	p-value
Phase	0.05144982	1.000000	0.8205594
Time	1.60340013	2.261029	0.1976445
Phase:Time	1.54155024	2.616848	0.2067101

Three-factorial designs (1st factor (independent): Device, 2nd factor (dependent): Phase, 3rd factor (dependent): Time)

Table S1a Vital signs

	1st Factor (independent) Device	2nd Factor (dependent) Phase	3rd Factor (dependent) Time
HR	0.980	0.657	0.312
SpO$_2$	0.207	0.833	0.117
TEMP	0.122	0.335	0.295
ICP	0.923	0.134	0.371
RR	0.698	**0.013**	0.490

Given corresponding p-values

Table S1b Hemodynamic parameters

Parameter	1st Faktor (independent) Device	2nd Factor (dependent) Phase	3rd Factor (dependent) Time
CI	0.486	0.681	0.571
MAP	0.390	0.308	0.313
CO	**0.047**	0.402	0.490
SV	0.247	0.593	0.267
SVI	0.972	0.415	0.211
SVV	0.346	0.054	0.320
SVMAX	0.151	0.286	0.616
SVMIN	0.235	0.379	0.385
CPI	0.697	0.065	0.260
CPO	0.538	0.121	0.401
SYSTOLE	0.670	0.123	0.527
DIASTOLE	0.902	0.184	0.458

Given corresponding p-values

Table S1c Indirect calorimetry

Parameter	1st Faktor (independent) Device	2nd Factor (dependent) Phase	3rd Factor (dependent) Time
EE	**0.0003**	**0.024**	0.090
RQ	0.210	0.051	0.166
VCO$_2$	**0.002**	**0.007**	0.623
VO$_2$	**0.001**	**0.043**	0.055

Given corresponding p-values

Two-facorial designs in subgroup analyses for GAL and VIB separately

Two-facorial designs (1st factor (dependent): 2 phases each, 2nd factor (dependent): time)

Table S2a Vital signs comparing baseline and the following phases for the two devices

Parameter	VIB n	GAL n	BL vs. PT VIB	BL vs. PT GAL	BL vs. INT VIB	BL vs. INT GAL	BL vs. ER VIB	BL vs. ER GAL	BL vs. LR VIB	BL vs. LR GAL
HR	12	7	**0.033**	0.875	0.175	0.752	0.172	0.366	0.649	0.135
SpO$_2$	12	6	0.609	0.526	0.235	0.107	0.630	0.742	0.692	0.871
TEMP	10	6	**0.041**	0.394	0.341	0.235	0.717	0.817	0.587	0.992
ICP	5	2	0.121	0.781	0.582	0.107	0.299	0.591	0.390	**0.029**
RR	11	5	0.081	**0.010**	0.005	0.050	0.646	**0.008**	0.186	0.092

Vital signs comparing baseline and the following phases for the two devices, given p-values.

Table S2b Vital signs in different phases for the two devices

Parameter	Device	BL	PT	INT	ER	LR
HR	VIB	82.0 (17.3)	83.2 (17.5)	83.7 (17.9)	84.2 (17.6)	80.7 (19.6)
(beats min^{-1})	GAL	86.7 (19.5)	85.9 (18.5)	86.9 (21.2)	84.1 (18.7)	83.0 (19.6)
SpO$_2$	VIB	98.6 (2.7)	98.6 (2.6)	98.5 (2.4)	98.2 (3.0)	98.5 (3.1)
(%)	GAL	97.8 (2.2)	97.8 (2.9)	98.0 (2.2)	97.9 (2.0)	97.8 (2.0)
TEMP	VIB	37.0 (0.6)	37.0 (0.5)	37.0 (0.5)	37.0 (0.5)	37.0 (0.6)
(Celsius)	GAL	37.5 (0.5)	37.5 (0.6)	37.5 (0.5)	37.5 (0.6)	37.6 (0.6)
ICP	VIB	12.0 (5.0)	11.1 (5.4)	11.4 (3.7)	10.0 (4.3)	9.8 (5.4)
(mmHg)	GAL	12.0 (3.7)	10.6 (0.2)	11.4 (3.2)	12.0 (3.0)	7.9 (0.7)
RR	VIB	17.1 (6.2)	17.7 (6.4)	18.2 (5.5)	17.1 (6.0)	16.4 (5.4)
(breaths min^{-1})	GAL	16.2 (4.4)	19.6 (4.8)	19 (5.4)	18.7 (5.5)	18.8 (5.9)

Vital signs, shown in mean ± SD, of the VIB-and GAL-Groups in different phases.

Table S3a Hemodynamic parameters comparing baseline and the following phases for the two devices

	VIB	GAL	BL vs. PT		BL vs. INT		BL vs. ER		BL vs. LR	
	n	n	VIB	GAL	VIB	GAL	VIB	GAL	VIB	GAL
CI	9	6	0.866	0.478	0.056	0.771	0.121	0.541	0.666	0.284
MAP	12	7	**0.012**	0.733	0.312	0.030	0.176	0.730	0.884	0.602
CO	9	6	0.363	0.460	0.058	0.830	0.118	0.930	0.175	0.444
SV	9	6	0.055	0.458	**0.016**	0.251	**0.018**	0.373	0.888	0.737
SVI	9	6	0.278	0.448	**0.037**	0.458	**0.006**	0.267	0.557	0.603
SVV	9	6	**0.009**	0.131	0.189	0.420	0.306	0.888	0.928	0.822
SVMAX	9	6	0.729	0.153	**0.002**	0.168	**0.003**	0.538	0.832	0.694
SVMIN	9	6	**0.044**	0.526	**0.027**	0.324	**0.005**	0.606	0.753	0.954
CPI	9	6	0.256	0.357	0.314	0.049	0.509	0.293	0.800	**0.023**
CPO	9	6	0.509	0.397	0.309	0.103	0.812	0.208	0.526	**0.045**
SYSTOLE	12	7	0.075	0.743	0.958	**0.044**	0.287	0.910	0.850	0.490
DIASTOLE	12	7	**0.002**	0.433	0.130	0.372	0.068	0.959	0.724	0.919

Hemodynamic parameters comparing baseline and the following phases for the two devices, given p-values.

Table S3b Hemodynamic parameters in different phases for the two devices

Parameter	Device	BL	PT	INT	ER	LR
CI	VIB	3.85 (1.08)	3.85 (1.21)	3.73 (1.14)	3.75 (1.12)	3.81 (1.05)
(L/min/m^2)	GAL	3.94 (0.54)	3.90 (0.71)	3.95 (0.60)	3.87 (0.69)	3.72 (0.56)
MAP	VIB	87.1 (19.2)	90.1 (17.0)	88.3 (15.2)	91.3 (17.2)	86.6 (18.6)
(mmHg)	GAL	83.9 (24.9)	91.8 (35.8)	79.8 (25.6)	82.7 (24.3)	85.1 (32.8)
CO	VIB	7.16 (2.54)	7.13 (2.80)	6.93 (2.65)	6.95 (2.59)	7.11 (2.47)
(l/min)	GAL	8.65 (2.66)	8.64 (3.06)	8.80 (2.69)	8.56 (2.96)	8.17 (2.56)
SV	VIB	87.7 (25.2)	85.4 (26.6)	82.9 (23.6)	82.4 (22.4)	88.2 (27.2)
(ml)	GAL	107.6 (38.0)	107.5 (43.2)	110.2 (46.4)	110.0 (43.9)	107.3 (40.8)
SVI	VIB	47.2 (11.5)	46.0 (12.2)	44.7 (11.1)	44.5 (10.8)	47.5 (12.7)
(ml/min/m^2)	GAL	49.1 (12.2)	48.6 (14.1)	49.5 (16.2)	49.8 (14.5)	48.7 (13.2)
SVV	VIB	7.99 (6.47)	9.37 (5.03)	10.10 (6.21)	9.26 (6.70)	7.22 (5.56)
(%)	GAL	11.5 (8.6)	13.1 (7.4)	11.99 (7.71)	11.1 (6.5)	10.8 (6.6)
SVMAX	VIB	91.1 (25.8)	90.3 (28.4)	87.38 (25.51)	88.1 (26.5)	91.7 (26.9)
(ml)	GAL	113.3 (38.9)	113.5 (44.4)	116.37 (45.09)	115.6 (46.6)	112.4 (41.2)
SVMIN	VIB	83.6 (25.4)	79.7 (26.3)	79.78 (23.21)	80.9 (23.5)	85.7 (25.5)
(ml)	GAL	103.0 (39.0)	101.2 (41.7)	105.04 (44.62)	104.4 (41.8)	102.4 (40.5)
CPI	VIB	0.72 (0.25)	0.75 (0.26)	0.69 (0.22)	0.75 (0.26)	0.72 (0.22)
(W/m^2)	GAL	0.71 (0.19)	0.68 (0.21)	0.67 (0.22)	0.67 (0.15)	0.61 (0.16)
CPO	VIB	1.35 (0.49)	1.39 (0.54)	1.28 (0.45)	1.38 (0.57)	1.35 (0.47)
(W)	GAL	1.53 (0.56)	1.48 (0.59)	1.47 (0.57)	1.44 (0.44)	1.31 (0.44)
SYSTOLE	VIB	139.2 (25.1)	141.0 (23.0)	138.6 (21.0)	142.5 (20.4)	138.9 (26.8)
(mmHg)	GAL	137.2 (28.2)	136.9 (29.5)	134.37 (29.2)	137.2 (30.4)	131.3 (27.1)
DIASTOLE	VIB	59.3 (13.6)	62.0 (12.7)	60.5 (11.6)	62.1 (13.2)	58.1 (13.3)
(mmHg)	GAL	67.5 (29.5)	67.1 (26.3)	64.5 (29.1)	65.8 (23.4)	64.8 (25.7)

Hemodynamic parameters, shown in mean ± SD, of the VIB- and GAL-Groups during different phases.

Table S4a Parameters of IC comparing baseline and the following phases for the two devices

Parameter	VIB	GAL	BL vs. PT		BL vs. INT		BL vs. ER		BL vs. LR	
	n	n	VIB	GAL	VIB	GAL	VIB	GAL	VIB	GAL
EE	11	5	0.515	0.291	**0.049**	0.051	0.185	0.278	0.888	0.829
RQ	11	5	**<0.001**	0.298	0.687	0.838	0.934	0.942	0.255	**<0.001**
VCO$_2$	11	5	**0.009**	0.333	**0.001**	**0.060**	**0.027**	0.327	0.763	0.255
VO$_2$	11	5	0.947	0.315	0.079	0.051	0.261	0.303	0.928	0.741

Parameters of IC comparing baseline and the following phases for the two devices, given p-values

Table S4b Parameters of IC in different phases for the two devices

Parameter	Device	BL	PT	INT	ER	LR
EE (kcal per day)	VIB	1923 (289)	1925 (332)	2079 (468)	1989 (341)	1916 (336)
	GAL	2483 (476)	2704 (574)	2800 (625)	2605 (462)	2443 (353)
RQ	VIB	0.74 (0.11)	0.76 (0.11)	0.75 (0.13)	0.73 (0.12)	0.72 (0.10)
	GAL	0.67	(0.08)	0.69 (0.10)	0.67 (0.10)	0.66 (0.08)
VCO2 (ml)	VIB	208 (29)	213 (30)	225 (42)	213 (30)	202 (25)
	GAL	251 (56)	269 (49)	284 (53)	262 (58)	243 (37)
VO2 (ml)	VIB	288 (47)	287 (54)	311 (75)	298 (46)	289 (55)
	GAL	376 (71)	410 (92)	423 (100)	395 (70)	372 (46)

Parameters of IC, shown in mean ± SD, of the VIB-and GAL-Groups in different phases.

Table S5a Parameters of BGA comparing baseline and the following phases for the two devices

Parameter	VIB n	GAL n	BL vs. INT VIB	BL vs. INT GAL	BL vs. ER VIB	BL vs. ER GAL	BL vs. LR VIB	BL vs. LR GAL
pH	9	6	0.789	0.091	0.349	0.310	0.146	0.398
pCO$_2$	12	7	0.666	0.075	0.307	0.345	**0.019**	1.000
pO$_2$	9	6	0.125	0.176	0.182	0.735	0.756	0.612
HCO$_3^-$	9	6	0.072	0.527	0.593	0.233	0.582	0.308
ABE	9	6	**0.031**	0.596	0.410	0.236	0.624	0.553
HB	9	6	0.116	0.611	0.346	0.340	**0.037**	**0.028**
HCT	9	6	0.195	0.233	0.350	0.043	0.289	0.866
Na$^+$	9	6	0.096	0.317	0.096	1.000	0.206	0.705
K$^+$	9	6	**0.020**	0.564	0.119	0.157	0.340	0.059
GLC	9	6	0.721	0.292	0.875	**0.028**	0.239	0.058
LAC	12	7	0.160	0.783	0.856	0.739	0.959	0.058

Parameters of BGA comparing baseline and the following phases for the two devices, given p-values

Table S5b Parameters of BGA in different phases for the two devices

Parameter	Device	BL	INT	ER	LR
pH	VIB	7.43 (0.04)	7.43 (0.04)	7.43 (0.04)	7.43 (0.03)
	GAL	7.43 (0.05)	7.44 (0.05)	7.44 (0.05)	7.44 (0.05)
PCO$_2$ (mmHg)	VIB	39.8 (3.7)	38.8 (5.8)	40.2 (3.8)	41.2 (3.1)
	GAL	40.1 (6.0)	39.1 (5.8)	39.4 (5.8)	39.9 (6.7)
PO$_2$ (mmHg)	VIB	117.6 (28.4)	108.6 (33.2)	111.6 (28.5)	115.0 (31.3)
	GAL	101.4 (39.1)	116.3 (67.1)	115.6 (77.8)	110.0 (53.8)
HCO$_3^-$ (mmol l^{-1})	VIB	26.5 (2.2)	26.7 (2.0)	26.5 (2.1)	27.4 (3.6)
	GAL	26.4 (2.2)	26.5 (2.5)	26.4 (2.6)	27.7 (2.3)
ABE (mmol l^{-1})	VIB	2.2 (2.4)	2.5 (2.2)	2.3 (2.3)	2.3 (2.3)
	GAL	2.4 (2.3)	2.3 (2.6)	2.1 (2.7)	2.7 (2.6)
HB (g dl^{-1})	VIB	9.4 (0.9)	9.9 (1.0)	9.9 (1.1)	10.0 (1.1)
	GAL	9.3 (0.7)	9.7 (1.2)	9.7 (1.1)	9.9 (1.1)
HCT (%)	VIB	30.0 (3.1)	30.5 (3.4)	30.5 (3.5)	30.8 (3.4)
	GAL	30.0 (3.1)	29.6 (3.1)	29.3 (2.8)	29.7 (1.8)
Na$^+$ (mmol l^{-1})	VIB	142.2 (7.1)	141.8 (6.9)	141.7 (6.7)	141.8 (7.1)
	GAL	143.6 (9.2)	143.4 (6.9)	143.6 (9.2)	143.4 (9.3)
K$^+$ (mmol l^{-1})	VIB	4.2 (0.3)	4.3 (0.1)	4.3 (0.3)	4.3 (0.3)
	GAL	4.3 (0.4)	4.3 (0.3)	4.3 (0.3)	4.2 (0.4)
GLC (mg dl^{-1})	VIB	126.8 (24.9)	128.8 (28.0)	129.0 (28.5)	135.0 (30.9)
	GAL	134.9 (23.6)	133.1 (23.4)	127.7 (18.2)	128.1 (25.2)
LAC (mmol l^{-1})	VIB	11.7 (4.8)	11.3 (5.0)	11.8 (5.1)	11.7 (5.0)
	GAL	16.9 (13.2)	16.7 (14.1)	16.7 (13.8)	15.3)

Parameters of BGA, shown in mean ± SD, of the VIB-and GAL-Groups in different phases.

Abbreviations

BL = Baseline; PT = Physiotherapy; INT = Intervention; ER = Early Rest; LR = Late Rest; VIB = Vibrosphere; GAL = Galileo; CI = Cardiac index; MAP = Mean arterial pressure; CO = Cardiac output; SV = Stroke volume; SVI = Stroke volume index; SVV = Stroke volume variation; SVI = Stroke volume index; SVMAX = Maximal stroke volume; SVMIN = Minimal stroke volume; CPI = Cardiac power index; CPO = Cardiac power output; HR = Heart Rate; SpO2 = Peripheral capillary oxygen saturation; Temp = Temperature; ICP = Intracranial pressure; RR = Respiratory rate; IC = Indirect calorimetry; EE = Energy expenditure; RQ = Respiratory quotient; VCO_2 = Rate of elimination of carbon dioxide; VO_2 = Oxygen uptake; BGA = Blood gas analysis; pH = Pondus hydrogenii; pCO_2 = Partial pressure of carbon dioxide; pO_2 = Partial pressure of oxygen; HCO_3^- = Bicarbonate; ABE = Current base excess; HB = Hemoglobin; HCT = Hematocrit; Na^+ = Sodium; K^+ = Potassium; GLC = Glucose; LAC = Lactate