



Summary of the study concerning the lymphatic drainage of Andullation massages

Time-frame:
July to September 2004

Implementation:
Outpatients suffering from lymphatic congestions
were treated in a dedicated rehabilitation centre

Supervision:
Prof. Dr. phil. Roland Stutz

Approach

40 outpatients suffering from lymphatic congestions were selected to take part in a cross-sectional analysis. They were randomly distributed amongst two groups: 20 patients served as a control-group, while the remaining 20 patients were subject to actual intervention.

All patients were subject to the same treatment-plan. The difference between the two groups was that the Effect-Group (1) was subjected to a 20 minute application of the lymphatic drainage program, while the Placebo-Group (0) spent the same amount of time on a massage bed that superficially appeared to be identical to the real device. They were not informed about the supposed effect of said treatment. In the spirit of a double-blind study, the supervisor of the treatment was also not informed about the immediate effect of the placebo-mat.

Methodology

Prior to the study, the circumference of the leg, the subjective sensation of pain, the flexibility of the knee-joint, and the composition of the body were measured and combined.

Subsequently, the patients were subjected to the appropriate treatment in accordance with the randomisation-plan. Afterwards, all the parameters were remeasured.

Age	Group 0	40,1	years
	Group 1	37,3	
Height	Group 0	179,8	cm
	Group 1	177,4	
Weight	Group 0	79,6	kg
	Group 1	76,5	
Percentage of body-fat	Group 0	20,8	%
	Group 1	18,8	

Due to the manifold methodological approaches applicable to tests for lymphatic drainage, all possible parameters which could possibly indicate a redistribution of fluids were taken into account.

Amongst others, the flexibility of the knee-joint was tested with an isokinetic diagnosis-station, the fluid redistribution was established with an eight channel analysis device based on impedance-measuring, while the circumference of the legs was measured with a tape measure.

Subsequently, the total volume of the legs was calculated according to the Hanavan model, and finally, the subjective pain-score was registered to find any possible change.

Results

Summing up the results of the final study, the beneficial results of applying Andullation massage-programs become quite apparent in regards to the human lymphatic system - this holds especially true for those test-subjects suffering from lymphatic congestions of the lower extremities due to orthopaedic traumas and injuries as well as surgeries in these areas.

The results of the presented study proved a significant change of original figures in most tested parameters. These changes offer clear indications that the tested Andullation massage bed had a lymphatic drainage effect on test-subjects suffering from congestions in the lower extremities. Amongst the positive effects, a redistribution of fluids towards the torso, a reduction of the circumference and volume of the whole extremity-section (i.e., the legs) as well as an appropriate improvement of the flexibility of the knee-joint are particularly worth mentioning.

Object of the study

hhp Andullation Therapy System



Lymphatic congestions

According to the graphic representation of figure 1, it becomes quite apparent that a reduction of fluids took place in both sub-groups. The Effect-Group showed a significant reduction of body-fluids in the legs, while the change in the Placebo-Group is clearly not significant.

This illustrates the effect of Andullation massages on the lymphatic system in a most impressive manner.

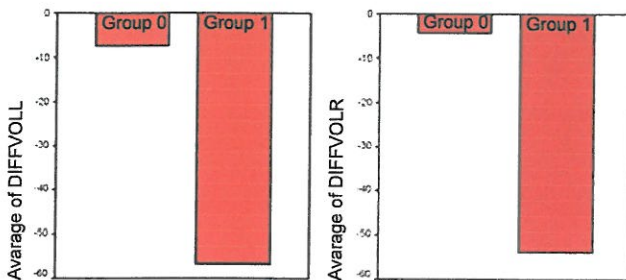


Figure 1: Graphical representation of the medians of the difference prior and after the intervention.

The tested parameters illustrate the median difference of the calculated volumes for the left leg (DIFFVOLL) and the right leg (DIFFVOLR) of the two subgroups (Group 0 - Placebo-Group, Group 1 - Effect-Group).

„Applying the lymphatic drainage program of the hhp Massage Bed to patients suffering from lymphatic congestions of the lower extremities leads to a significant reduction of the fluid volume in the afflicted leg.“

Flexibility

The reduction of fluids in the legs due to reduced circumference also fits the changes caused by the trend indicated by the body fluid analysis: Body fluids are redistributed from the legs into the torso.

The improved flexibility of the knee joint of the afflicted leg underlines the lymphatic drainage caused by the treatment; no measurable effect could be registered in the Placebo-Group (Figure 2).

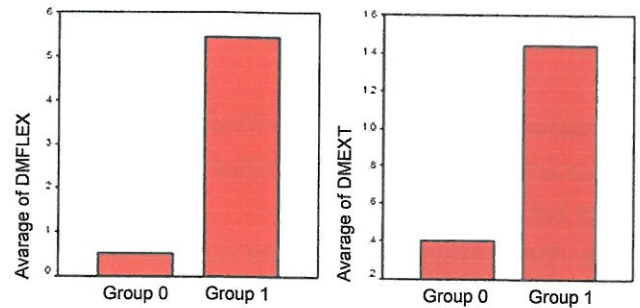


Figure 2: Graphical representation of the medians of the difference prior and after the intervention. The tested parameters illustrate the median difference of the joint flexibility in movement-plain flexion (DMFLEX) and the extension (DMEXT) of the two sub-groups (Group 0 - Placebo-Group, Group 1 - Effect-Group).

Applying the lymphatic drainage program of the hhp Massage Bed to patients suffering from lymphatic congestions of the lower extremities improves the flexibility of the knee joint.

After establishing individual differences, a distinct regulation effect due to the application of Andullation massages becomes apparent. The two graphs (figure 2) of the Placebo-Group (Group 0) illustrate no marked difference; the Effect-Group (Group 1) has a significant improvement of joint flexibility in both plains flexion (left graph) as well as extension (right graph).

This marked difference can be traced directly to the intervention of the massage bed, as no difference between the sub-groups was apparent and the only difference in the treatment-plan was said intervention.

The increased flexibility of the knee joint, especially in flexion, indicates a decongestion of the knee interior, caused by a stimulation of the lymphatic flow due to the intervention. Accordingly, a trend towards a fluid increase in the torso of test-subjects in the Effect-Group becomes apparent.

In this regard, a significant connection between the reduced pain and the increased flexibility of the knee joint towards flexion with a correlation value of $r = -0.76$ becomes apparent.

Therefore, after the dissolution of the lymphatic congestions in the Effect-Group, an improved flexibility of the knee joint as well as a reduction of the pain in the joint were noted.

Reduction of Pain

A statistical evaluation of the hypothesis shows a significant reduction of pain caused by the application of the hhp Massage Bed.

The Placebo-Group regulated their sensation of pain in a similar manner, but these minor changes were not significant (Figure 3). Prior to the treatment, no difference in the subjective sensation of pain was apparent between the two groups.

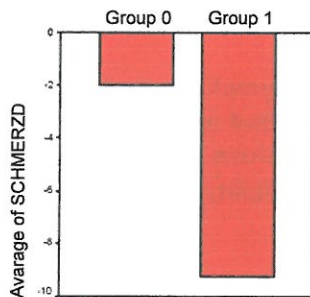


Figure 3: Graphical representation of the medians of the difference of the subjective pain-score-points. The tested parameters illustrate the median difference of the established pain-score-points prior and after the intervention of both sub-groups.

The manifold results of a stimulated lymphatic system are not really researched yet. Therefore, it could be very well the case that the Andullation hhp Massage Bed probably helps to alleviate a variety of other afflictions. Furthermore, it is suggested that the effect of Andullation on different layers of the skin should be investigated in the future. Fundamental research in this regard seems to hint at promising results.

Applying the lymphatic drainage program of the hhp Massage Bed to patients suffering from lymphatic congestions of the lower extremities will influence the sensation of pain in a positive manner.



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**Excerpt from the study about the
effect of vibration massages in
combination with thermal infrared
on congestions in blood- and
lymph- vessels**

Approved Bachelor Thesis of Florian Klein

Consultant:

Prof. Dr. Sports Scientist Hanno Felder
Mai 2005

Focus

The hhp Andullation Therapy System with infrared deep heat



Interrogating

The aim of the study was to determine the effect of oscillating vibration massages in combination with thermal infrared on the lymphatic system.

The following significant variables were tested:

- 1 Subjective sensation of pain
- 2 Amount of movement
- 3 Swellings
- 4 Distribution of body fluids

Procedure

The participating test subjects are randomly distributed between two test groups. The survey group was subjected to 15 minute applications of the medical hhp Andullation Therapy System with a special combination program treating the whole body and facilitating lymphatic outflow (Andullation massage). The test group was subjected to a placebo bed with neither vibrations nor infrared for the same time period.

Just prior to the treatment, all test subjects had to take part in a survey to register their personal detail and contraindications as well as additional details like medication regimes. Afterwards, four of the participants' dependent variables

- Subjective sensation of pain
- Amount of movement
- Swellings
- Distribution of body fluids

were tested as an entry test for the empirical study.

Test group in treatment with the hhp Andullation Therapy System. Basic Program 6 (Pain reduction, treatment of circulatory disorders of the lower legs and feet, stimulation of lymphatic flow and blood circulation, strengthening of the immune system):

10 probands

Test group (without treatment):

10 probands

Instruments and methods



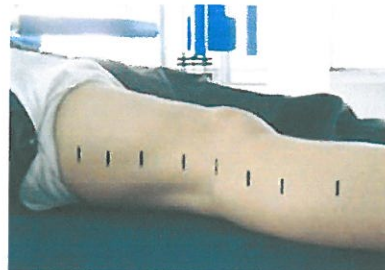
Analysis of the body



Body Composition Analyser
Inbody 3.0 Biospace



Approach to
measurement



Principle of the
„4-cm disk model,“
according to Kuhnke

Conclusion

Due to proven physiological reactions of the human body,
Andullation massages offer a wide variety of applications:

- Srehabilitative application for patients suffering from disturbances of the lymphatic outflow
- pre-emptive measures to prevent dysfunctions of the circulatory system
- tensions
- headaches and shooting pains
- regeneration enhancing countermeasures to sore muscles and other results of residual metabolites



SEA-SICKNESS

Possible treatment of
sea-sickness without medication

Concerning the effect of the Andullation
method to combat sea-sickness

Performance of study:
biomed GbR



Introduction of the problem

Sea-sickness (kinetosis) is commonly understood to be the reaction of the human body to the unfamiliar rocking motion and acceleration of vessels. Sea- and travel-sickness can afflict anybody; in about 90% of the cases the symptoms dissipate within two to three days, however. A number of household remedies and a simple code of conduct can be helpful in many cases, but using medication of any kind to treat the symptoms is a disputed topic amongst experts.

Due to the large number of people afflicted amongst members of the navy, there has been an extensive amount of research on sea-sickness. Despite these research projects, the exact cause and effect relations have yet to be identified. It has been established that conflicting sensations from the eyes and vestibular apparatuses combined with cerebral misinterpretations of said sensations apparently play a pivotal role in the onset of sea-sickness. Other factors can make sea-sickness even more prevalent, though: a heightened sensibility of the vestibular apparatus responsible for the sense of balance (statistically speaking, Asians are afflicted more often) as well as unfavourable general conditions like anxiety or stomach contents seem to be the most important factors. Other factors such as consumption of alcohol during transit (or even on the eve of a journey), smoking, lack of sleep, stress due to conflicts onboard and physical discomfort due to heat, cold, influenza and menstruation can aggravate the symptoms.

To investigate the physiological processes involved in sea-sickness, the Hershey Medical Center in Pennsylvania (among other similar institutions) makes use of special simulators to cause sea-sickness intentionally. After evaluating the adaptive reactions during and after a patient suffers from sea-sickness

the research-group tries to employ Eastern acupuncture and acupressure methods to soothe the symptoms of sea-sickness.

Research approach

Despite the attempts of the pharmaceutical industry to dominate the treatment of travel-sickness with numerous products, a number of experts suggest that sea- and travel-sickness should not be treated with medication but rather with dedicated preparatory therapies, i.e. codes of conducts to lessen the symptoms of sea-sickness or even prevent it altogether.

One of these methods involves irritating body sensors. Pain, pressure and proprioception sensors can be desensitized by short-term irritations. The application of andullations and vibrations has proven to be very effective in this regard. High-frequency vibrations can be applied to the human body for a few minutes while standing (Galileo) or while lying down (hhp Andullation Massage). At frequencies in excess of 25 Hertz, the organism's biological sensors are overloaded, therewith granting an immediate resistance to pain. Experiments with male adult volunteers have demonstrated the effectiveness of prior Andullation treatments at granting a resistance to the mechanisms causing sea-sickness.

Methodology

86 healthy volunteering students took part as subjects in this study. These test subjects were distributed amongst three sub-groups. Sub-Group 1 served as a control group and did therefore not receive any treatment. For ten days, Sub-Group 2 was desensitized with a daily 15 minute application of Andullations while standing - for this desensitizing process, an apparatus developed by Human Mobility was used. Sub-Group 3 was desensitized daily while lying down using an Andullation bed by hhp. At the beginning as well as at the end of the ten day interval, all members had to visit a simulator/drum (in the style of the experiments undertaken by the Hershey Medical Center, Pennsylvania) to cause

Immediately after the symptoms of sea-sickness caused by the simulator set in, physiological parameters were recorded and a questionnaire was filled out by the participants.

The direct interference statistical comparison of the three sub-groups was calculated with an analysis of variance. This analysis was based on differential values which in turn resulted from comparison of values before and after the ten day interval.

All physiological parameters like heart rate, blood pressure, coordination and skin temperature were checked by licensed nurses under supervision of a medical doctor.

The questionnaire tested the subjective reactions of the participants in regards to tiredness, weakness, nausea, vertigo and sickness with intervallic scale levels using a visual analogue scale. The results of the re-testing after the culmination of the ten day interval were noted with no knowledge of prior results.

Presentation of results

Physiological parameters

While the control group containing those subjects who had not undergone any desensitizing measures at all displayed more or less the same results in the second round of testing following the intentional induction of sea-sickness, it became evident that in both groups whose members were subjected to desensitizing measures using Andulation the physiological parameters had improved significantly. The steep increase of heart rate and blood pressure, which accompanied the initial onset of sea-sickness, could be diminished to a satisfactory degree. This effect is demonstrated by a reduction of the medial heart rate in sub-groups 2 and 3 by 19,3 and 18,7 heartbeats per minute, respectively (figure 1). The same applies to the rise of blood pressure, which was lowered by -42,7 in sub-group 2 and -39,8 in sub-group 3.

Figure 1: Presentation of the difference in heart rate after a ten day interval of desensitizing with Andulations.

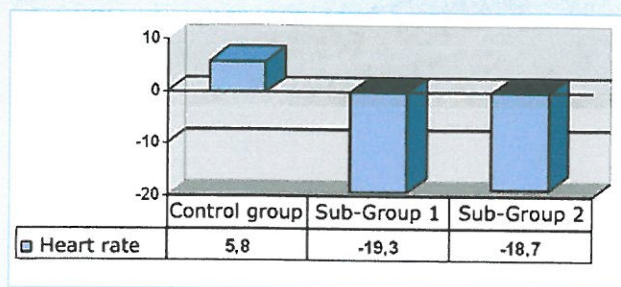
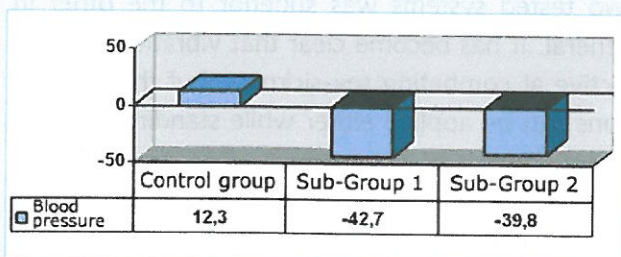
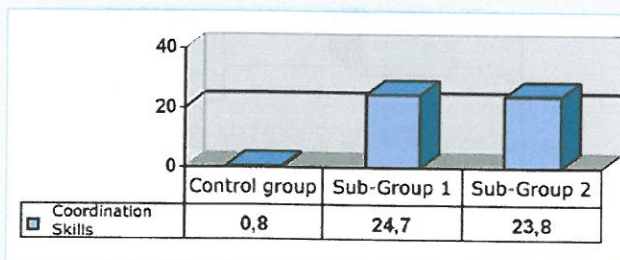


Figure 2: Presentation of the change in medial blood pressure after a ten day interval of desensitizing with Andulations.



While there were no changes evident in coordination skills of the control group, both treatment groups showed significant improvement during testing. The desensitizing phase (with the application of Andulation while lying down or standing) led to a marked resistance to a decrease of coordination skills while suffering from sea-sickness.

Figure 3: Presentation of the change in coordination skills test results after a ten day interval of desensitizing with Andulations.



The evaluation of the subjective reactions of the test-subjects in regards to tiredness, weakness, nausea, vertigo and sickness proved to be less articulated as only minor increases below the point of significance could be found.





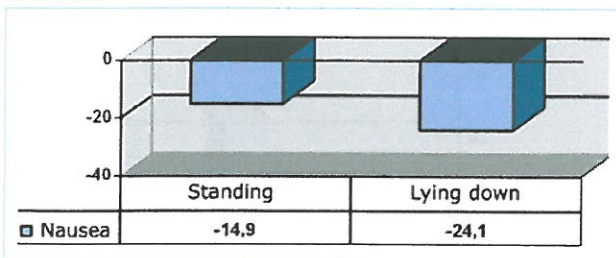
Conclusion

Up to now, the results of a desensitizing process with Andullations are very promising in regards to the physiological parameters, but neither of the two tested systems was superior to the other in general. It has become clear that vibrations are effective at combating sea-sickness, but these vibrations can be applied either while standing or lying down. Time is of the essence when desensitizing, however; therefore, treatment should be applied a short time before the actual journey. Once symptoms of sea-sickness set in (see control group), Andullations while lying down seem to grant patients greater relief. In a subsequent study, members of the control group recovered significantly quicker while being oscillated on hhp Andullation Therapie System. These results speak in favour of a treatment employing the hhp Andullation Therapie System provided that sea-sickness has already set in.

The hhp Andullation Therapie System



Figure 4: Recovery from the symptom of nausea by different types of Andullation.



For applications at home or onboard, the foldable hhp Andullation Therapie System seems to be superior to heavy and cumbersome Galileo-Devices, which can be stowed only with great difficulty due to their considerable size. Despite these striking results, additional studies will be necessary to shed more light on the phenomenon of sea-sickness and the possible ways of combating it.

Performance of study:



biomed GbR
Laboratory for biomechanical Diagnosis
2006

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Study on the influence of the hhp Massage System on existential orientation

Time period: March 14, 2005 to April 9, 2005
Place: Fitness Company, Karlsruhe Postgalerie
Studienteilnehmer: 629 test subjects

Study participants: Prof. Dr. Alexander Woll

Completed by::

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Study objective:

The study was aimed at clarifying whether the use of the hhp Massage System by people without a clearly defined diagnosis leads to an improvement in general well-being.

Summary and Analysis

The goal of the study was to explore whether the hhp Massage System has an influence on the existential orientation of users. Based on the data gathered, the answer is a clear yes: use of the massage mat had a positive influence on the existential orientation of the test subjects.

The study also conclusively proved that, with respect to the improvement in existential orientation, the self-evaluations of the male and female test subjects were statistically significant. Of particular interest: the data under "before/after" at point three: "How relaxed are you," where relaxation increased 153% across the entire sample. This is particularly striking when one considers the fact that citizens in our performance oriented society seem to have lost the ability to relax. "Tense" has become the general state of being, setting off a terrible chain reaction: Tension causes pain, initially without any clear physical cause. Processing pain can cause long-lasting changes and, if not successful, can lead to chronic adverse conditions. These may include emotional changes (insecurity, depression, fear) or socioeconomic changes (reduced social contact, limited ability to work). And this is exactly where the study reveals the potential of the mat:

it helps people relax.

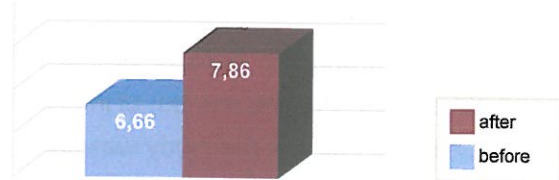
Conclusion

The mat is not only, as has been proven time and time again, optimal for use in rehabilitation, but also an important tool in the area of prevention. After just one application, the mat can lead to an increased sense of well-being. It has been effectively proven that use of the mat helps users achieve a state of relaxation quickly and highly effectively.

1. Mobility of spinal column

Here the average increased from 6.66 before (N = 628) to 7.86 after (N = 626), which is an increased of 1.2 or of 118%

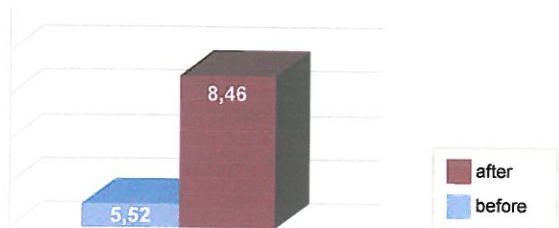
Conclusion: The mobility of the spinal column improves after the first treatment.



2. How relaxed are you?

The average of 5.52 before (N = 627) increased by 2.94 to 8.46 after (N = 626). This corresponds to an improvement of 153%.

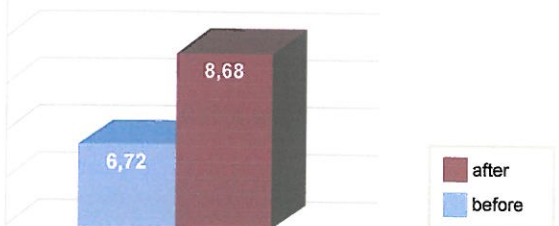
Conclusion: The hhp Massage System helps users to reach a state of healthy relaxation very quickly.



3. I feel good!

The average before treatment was 6.72 (N = 628), after treatment it was 8.68 (N = 625), an improvement of 1.96 or 129%.

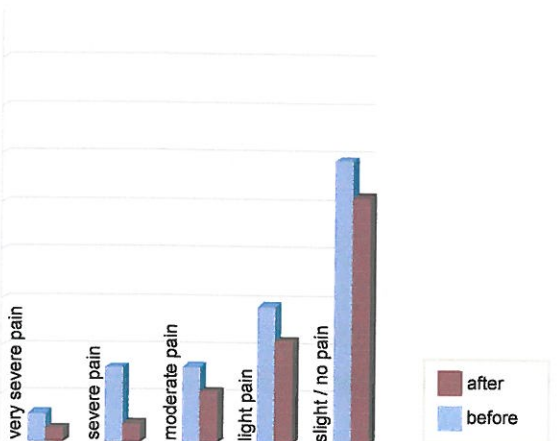
Conclusion: The patient experiences a pleasant sense of well-being after treatment.



4. Are you in pain?

The change in the fifth category is truly exceptional: before it contained only 47.2 % (corresponds to 294 answers before for this question where N = 623) of those questioned, after 68.8% (corresponds to 426 responses after to this question where N = 619). The graph shows the positive migration quite clearly.

Conclusion: Patients in pain experience an immediate reduction after use.



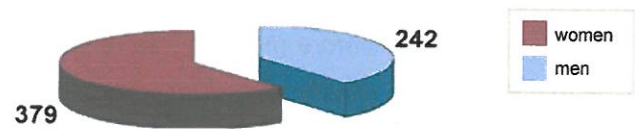
Results

Foreword

In this study, not only the number of test subjects was of interest, but also the number of interventions. This is due to the fact that the study was done using an existential orientation questionnaire. Answers about existential orientation from the same person can provide different results on different days. The questionnaires were analyzed with SPSS. During this process, the information provided by people before the intervention was compared to information provided after the intervention. This was accomplished by comparing the averages of the individual before/after values.

Evaluation

In the time period from March 15 to April 9, a total of 629 interventions were completed, 242 on men (38.5%) and 379 on women (60.3%) (remainder of 8 = missing information; corresponds to 1.2%)



III.: Distribution of the samples on men and women (N=621)
Comparison of the averages of the whole study

The following averages arise from the four previous questions:

	Average	Standard Deviation
Are you in pain?	7,494	2,609
Is your spine mobile?	6,663	2,139
How relaxed are you?	5,521	2,346
I feel fine!	6,720	2,276

The following averages arise from the four subsequent questions:

	Average	Standard Deviation
Are you in pain?	8,568	2,001
Is your spine mobile?	7,863	1,849
How relaxed are you?	8,458	1,668
I feel fine!	8,684	1,583