

## 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.

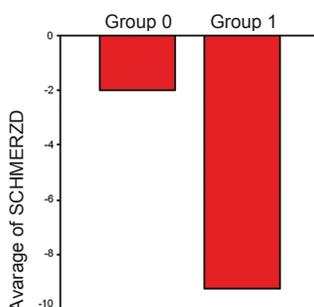


Figure 3: Graphical representation of the medians of the difference of the subjective pain-score-points. The tested parameters illustrate the median difference of the established pain-score-points prior and after the intervention of both sub-groups.

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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# biomed



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.

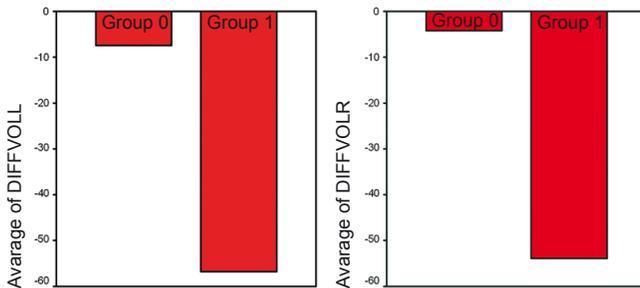


Figure 1: Graphical representation of the medians of the difference prior and after the intervention. The tested parameters illustrate the median difference of the calculated volumes for the left leg (DIFFVOLL) and the right leg (DIFFVOLR) of the two subgroups (Group 0 - Placebo-Group, Group 1 - Effect-Group).

**„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).

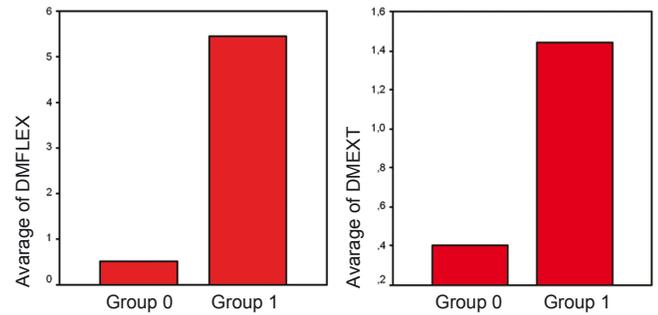


Figure 2: Graphical representation of the medians of the difference prior and after the intervention. The tested parameters illustrate the median difference of the joint flexibility in movement-plain flexion (DMFLEX) and the extension (DMEXT) of the two sub-groups (Group 0 - Placebo-Group, Group 1 - 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  $r = -.76$  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.