

## **Clinical study for the effectiveness of the FORMOSTAR® in depth thermal treatment for weight (and size) loss and degenerative joint and spinal column illnesses. Dr. A Medina and Dr. K. Radtke.**

### **Introduction and literature-practices review**

Heat irradiation, in its most diverse form, has been used in internal medicine, Gynecology and Orthopaedic Medicine. In addition, heat has long been used as a therapeutic measure (2, 6, 12).

Thus it has been used for example in the treatment of partially and chronically degenerative inflammatory since the beginning of the 20th century under more or less clinical conditions (11, 17). And for some years heat has been used even in tumor therapy (10, 13, 20).

The thought to use local heat treatment, in whatever form, for weight reduction is not new. On examination of the metabolic functions of over-weight persons, it was found that the heat effect increased basic conversion and thus higher energy consumption occurs, with a consequent decrease in weight (24).

In more recent times it has been found that local heat therapy finds an even broader application with the treatment of Cellulitis.

The objective of this study was to determine the effectiveness of infrared heat treatment with the help of a commercial deep heat system named FORMOSTAR. At the same time, it is to be examined as to what extent the equipment can be used for other medical purposes. For this, patients with inflammatory joint conditions took part.

First however we would like to review current literature on the subject of heat therapy:

Generally, heat therapy is harmless, as long as it is used in the context of subjective well-being, and no secondary side effects are to be expected (1, 7, 9)

The opinion today, for the effectiveness of heat therapy, is that is the result of a disturbed energy balance (3,14,21,22,24).

One study proved that the mechanism for weight reduction, by the use of heat treatment, is the conversion of the energy from food intake into heat which is then radiated from the body. This appears to be as a result of the fact that the enzyme activity of the fat cells is lowered (4)

Also, the heat treatment results in increased blood circulation and a rise in the body's metabolism leading to a change in cellulose (3,10,14,19,21,22,24).

1. By local heating, the internal thermal receptors lead to increased heat emission steered by the hypothalamus, i.e. more energy consumption (9,19).

2. By the heating up of the skin and the fatty tissue under the skin, the blood circulation is increased up to 3.5 times. (19,20).

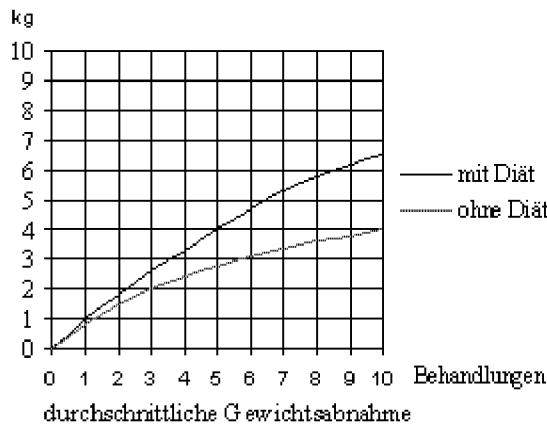
3. Both experimentally with animals and with humans it was shown that there was increased elimination of fats due to local heat therapy (5,12,20).

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Heat therapy has been used effectively on acute and chronic inflammatory illnesses.

Degenerative diseases react well to heat because of the relaxation of the muscles and the analgesic effect of the heat.

The therapy was used to a large extent with older and more difficult to move patients (2, 6, 8, 11, 15, 16, 17, 18, 23).



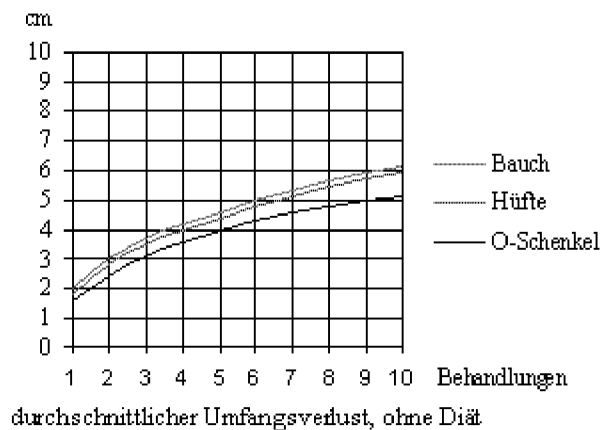
Graph above of average weight reduction - with diet (mit diät) and without diet (ohne diät). In Kg's of weight loss on the Y axis and number of treatments on the X axis.

### Material and method

In the weight study project we used 12 subjects that submitted to the treatment cycle at 10 meetings. Of these 12, six were also subjected to a calorie reduced diet.

In the degenerative joint study, 6 groups submitted to a treatment cycle at 5 meetings. Additionally, two groups were also studied with acute inflammatory illnesses and two groups with no degenerative or inflammatory diseases but with a desire to try the heat treatment.

Graph below of average cm's lost without diet for three patients, Bauche, Hüfte and O-Schenkel. Shows cm's lost on the Y axis and number of treatments on the X axis.



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The disease picture covered 5 degenerative spinal column illnesses and 3 knee joint illnesses, of which 2 was inflammatory. As treatment equipment a FORMOSTAR served as deep heat equipment (manufacturer: electro medical tool-making GmbH Hamburg) with body wraps, with which the groups were wound. A humidity gel was used to avoid skin irritations.

For the weight program, the heat treatment was for 50 minutes at each meeting. The session length for the other group was 30 minutes.

Before and after each treatment, for both groups their pulse rate and blood pressure was recorded. For the weight study, height and weight were recorded and for the degenerative diseases study, joint mobility was also recorded.

Moreover, in order to detect any possible effect of the treatment, the following laboratory parameters were checked:

**Weight Study:**

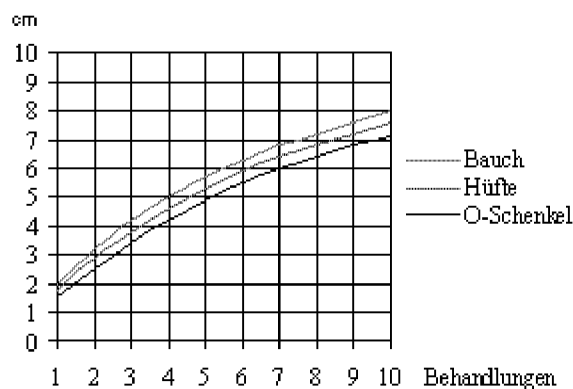
- Blood picture
- Blood sedimentation
- Transaminasen
- Cholesterol
- Triglycerides

**Joint illnesses:**

- Blood picture
- Blood sedimentation

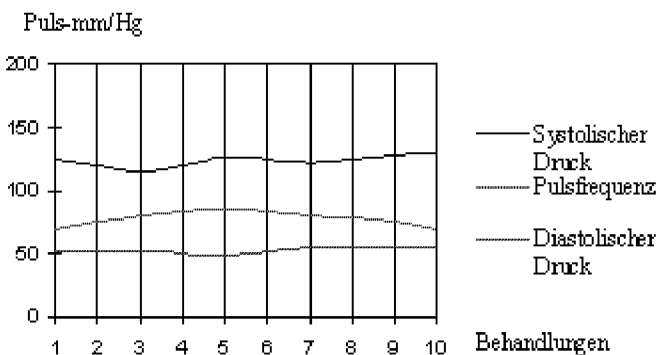
The age of both groups ranged between 25 and 73 years, with mostly males in 5 of the groups and mostly females in 7. The average elapsed time for the weight group was 21 days and 12 days for the other study.

Graph below showing pulse rate and blood pressure readings over the ten treatments. Systolic reading (blue), pulse frequency (pink), diastolic reading (green)



durchschnittlicher Umfangsverlust, mit Diät

Graph of average cm's lost with diet for three patients, Bauche, Hüfte and O-Schenkel. Shows cm's lost on the Y axis and number of treatments on the X axis.



Durchschnittswerte für Puls und Blutdruck während der Behandlungen

## **RESULTS**

### **Group 1 Weight Study**

Clinical laboratory parameters:

Laboratory controls of blood picture and blood sedimentation, trans fatty acids, cholesterol and transglycerides showed that these values were all in the standard range.

### **Group 2 Degenerative illnesses Study:**

Blood sedimentation at the beginning of the study was 15/28 mm water guage and at the end it was almost unchanged at 12/28 mm.

The blood picture remained almost unchanged during the treatment.

Also no rising of the body core temperature was recorded.

## **Discussion**

In this study of deep thermal treatment, weight loss conditions were examined under clinical conditions for the first time.

With a control group, the results present themselves as follows:

With the application of local heat treatment of the subcutaneous fatty tissue, even in a relatively short period of 20 days, a significant weight reduction is reached.

In summary it can be stated that heat treatment for the reduction of weight is effective and problem free. Also, for the treatment of orthopedic conditions, and particularly for athletes, heat treatment provides a meaningful measure of relief.

This deep heat therapy should not be used if the patient has any of the following conditions:

Thyroid hyperactivity, narrowing of the arteries, heart disease, pronounced high or low blood pressure, insulin requiring diabetes, abnormal body function disturbances, heavy general infections, skin diseases, fresh wounds or during pregnancy.

## Summary

12 persons with weight problems and 8 persons with degenerative joint conditions that restricted movement were submitted to a course of treatment with the Formostar infrared, deep heat apparatus.

Under clinical conditions pulse, blood pressure, blood picture, blood sedimentation and body temperature were measured; additionally in the group with weight problems, weight and the extent of the reduction was measured, as well as liver functions and cholesterol measurements. Joint mobility improvements were measured in the second group.

It was proven that the treatment resulted in significant weight reduction and substantial improvements in joint mobility.

For persons with none of the conditions listed above, the treatment caused no measurable side effects.

For the most effective treatment, it is recommended that the weight loss patients submit to a course of 10 sessions of approximately 50 minutes per session, with an interval of 2 to 4 days between treatments.

For mobility and joint problems, 5 sessions are recommended, each of approximately 50 minutes, with an interval of two to three days between sessions.

Bibliography continued on next page

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## Bibliography

1. Albert, E.N.; Sherif, M.F. Interaction OF nonionizing radiation with the nervous system *Biomedical Thermology*; p. 219-25, 1982; Alan R. Liss, Inc., New York
2. Bardwick, PER ANNUM; Swezey, R.L. Physical of therapies in arthritis *Postgraduate Medicine*; Volume. 72, NO.3, 1982, p. 223-34
3. Bar Or, O.; Lundegren, H.M.; Buskirk, E.R. Heat tolerance OF exercising obese and lean women. *Journal OF Applied Physiology*; Volume. 26, NO. 4, April 1969, p. 403-9
4. Bar Or, O.; Lundegren, H.M.; Magnusson, L.I.; Buskirk, E.R. Distribution of heat activated sweat glands into obese and lean men and women *human Biology*; Volume. 40, No.2, 1968, p. 235-48
5. Bell, A.W.; Hales, J.R.S.; King, R.B.; Fawcett, A.A. Influence of heat stress on exercise induced CHANGES in regionally blood flow in sheep *journal OF Applied Physiology*; Volume. 55, NO. 6, 1983, p. 1916-23

## Bibliography (cont)

6. Bianchi, V.; Ballabio C.B. La terapia medica e termale della osteoartrosi Reumatismo; Volume. 20. NO. 5, 1968, p. 529-40
7. Blair, R.M.; Levin, W. Clinical experience OF induction OF whole body hyperthermia in: CAN cerium therapy by hyperthermia and radiation; Streffer, C.(ed.); 1977, p. 318-21; Urban and Schwarzenberg, Munich, 1978
8. Bork Woelwer, L; Buehring, M.; Krippner, H. t-T-Lymphocytopenia during standardized hyperthermia in: CAN cerium therapy by hyperthermia and radiation; Streffer, C (OD.); 1977, p. 306 -8; Urban and Schwarzenberg, Munich, 1978
9. Buehring, M.; Oldhope, P.; Stoerkel, S.; Niegel, J. Temperature dependence OF commonly used parameter in depp and superficial hyperthermia in: CAN cerium therapy by hyperthermia and radiation; Streffer, C (OD.); 1977, p. 299-301; Urban and Schwarzenberg, Munich, 1978
10. Field, S.B. the response OF normally tissue ton hyperthermia alone or in combi nation with x-rays in: CAN cerium therapy by hyperthermia and radiation; Streffer, C (OD.); 1977, p. 37-48; Urban and Schwarzenberg, Munich, 1978
11. Hentschel, H.D.; Nold, F.; Rainhonour, lth observations with the over warming therapy of the ankylosierenden Spondylitis negotiations of the German society for Rheumatologie; 1969, Vol.1, p. 184-8
12. Horni, J. Some metabolic effects of the heat blood circulation of the Pankreas with short waves diathermy. Magazine for Physiotherapie, 1982, volume. 34, NO. 4, p. 247-55
13. Jain, R.K. Temperature distribution in normally and neoplastic tissues during normothermia and hyperthermia in: Annals OF the New York Academy OF Sciences; 1980, 14. Kalsner, J. Mitochondria, body heat and the origins OF obesity in: The Canadian Medical Association journal; 1983, volume. 128, NO. 12, p. 1361-2
15. Magness, i.L.; Garret, T.R.; Erickson, D.I. Swelling OF the more upper extremity during whirlpool baths Archives OF physical medicine and rehabilitation; 1970, volume. 51. NO. 5, p. 297-9
16. Schmidt, K.L. Effect OF hyperthermia on granulation in advice in: CAN cerium therapy by hyperthermia and radiation; Streffer, C (OD.); 1977, p. 227-8; Urban and Schwarzenberg, Munich, 1978
17. Schmidt, K.L.; Ott, V.R. Experimental aspects of hyperthermia treatment of chronic Arthritiden negotiations of the German society for Rheumatologie; 1976, Vol.35, No 4, p. 535-40
18. Schmidt, K.L.; Ott, V.R.; Roecher, G.; Schaller, H. Heat, cold and inflammation magazine for Rheumatologie, 1979, volume. 38, NO. 11-12, p.391-404
19. Schmidt, R.F.; Thews, G. Physiology of humans; p. 492 FF, 592,594; Springer publishing house, Heidelberg 1980
20. Song, C.W.; Kang, M.S.; Rhee, I.G.; Levitt, S.H. Effect OF hyperthermia on vascular fuction in normally and tissue in: Annals OF the New York Academy OF Sciences; 1980, volume. 335, p. 35-47
21. Soerbis, R.; Monti, M.; Nilsson Ehle, P.; Wadsoe, I. Heat production by adipocytes from obese subjects before and after weight reduction Clinical and experimental Metabolism; 1982, volume. 31, NO. 10, p. 973-8
22. Stirling, I.L.; Stick, M.I. Metabolic origins OF thermal genesis induced by diet Nature; 1968, volume. 220; p. 801-2
23. Teppermann, P.S.; Devlin, M. Therapeutic heat and cold, A practitioners guide Postgraduate Medicine; 1983, volume. 73, NO. 1, p. 69-76
24. Zarkorska Markiewicz, B. Thermal and metabolic responses ton heat exposure in obesity. European journal OF applied Physiology and Occupational Physiology; 1982, volume. 48, NO. 3, p. 379-85