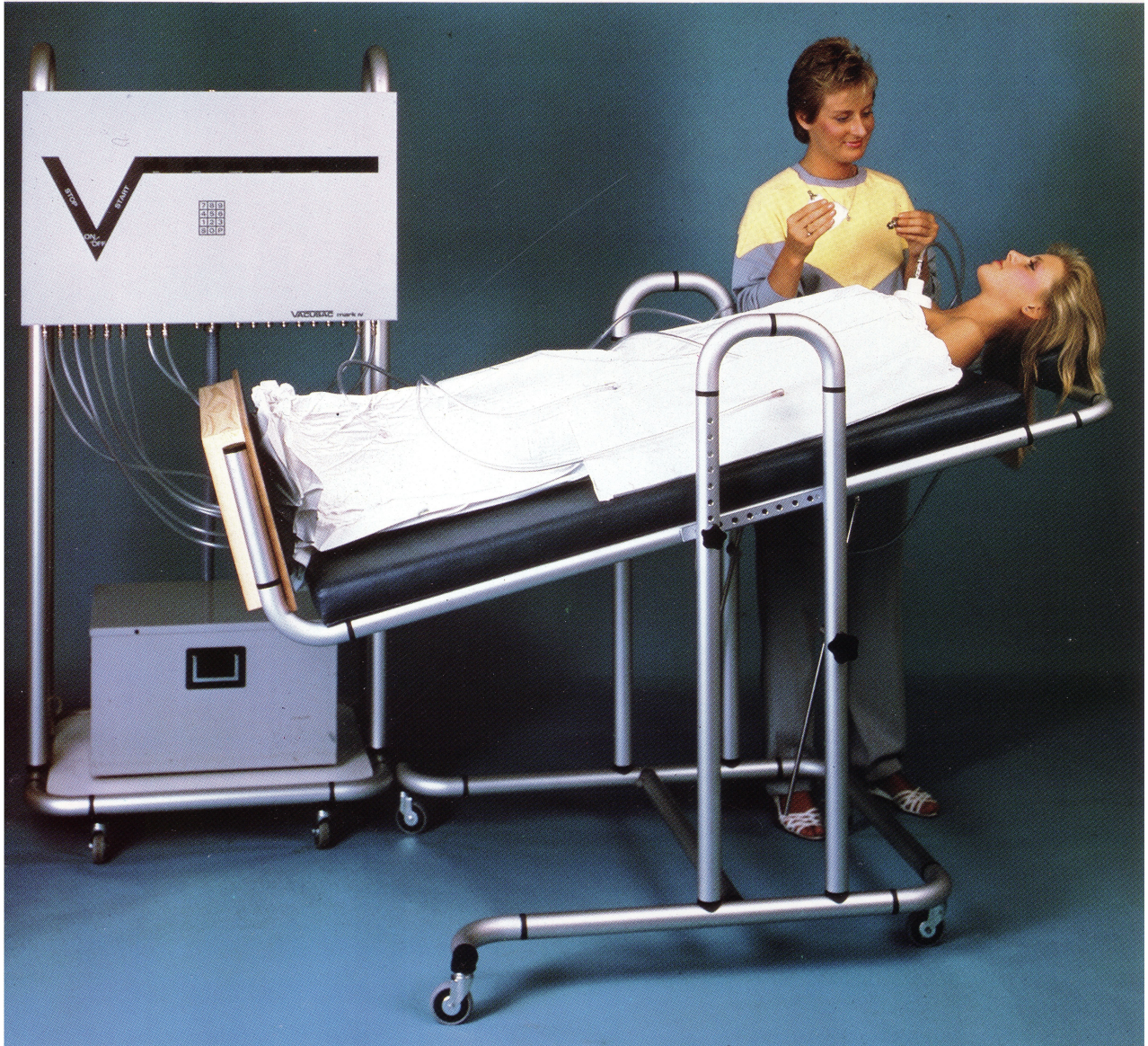


***The future answer
to medical rehabilitation***



Vacusac[®]

A VACUSAC® treatment takes only 15 minutes

This is how it is done

Start by undressing yourself. You can keep your underpants and your socks on. Then step into the felt boots that the VACUSAC® therapist has made ready for you. A special foam cushion is placed between your knees and the lower parts of your legs to make sure that the VACUSAC® effect will be applied to every part of your legs.

The VACUSAC® therapist will now pull a cotton bag up around your body and fasten it with Velcro tape.

Around your body is then placed a blanket made from a special air-penetrable felt. The blanket is held in position by means of a ribbon of Velcro tape placed around your hips. You can ease the work of the VACUSAC® therapist by holding the blanket in position while the ribbon is being placed.

The airtight VACUSAC® bag is now pulled up around the felt blanket and fastened tight with Velcro tape. The bag has built in valves through which the air can be evacuated.

The VACUSAC® therapist will now roll the specially designed couch up to your back. The couch is constructed in such a way that it takes a minimum of effort to tilt it, even with a heavy person.



Lean back as you are tilted to a horizontal position. Tell the VACUSAC® therapist how you want the headpiece adjusted so that you feel the most comfortable.

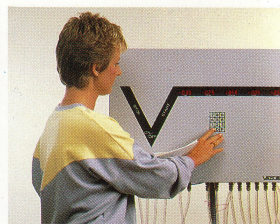
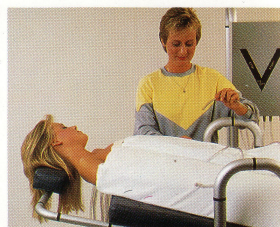
Then put your arms into the special bags with a built in felt layer and suction valves. The bags will be fastened with Velcro tape and you are now ready for treatment.

The VACUSAC® therapist will now place the suction tubes on the valves in the body bag and the arm bags. Different degrees of vacuum will be applied to the arms and the body.

The chosen treatment is then programmed into the electronic control system. The VACUSAC® therapist is trained to design individual programs in order to give you maximum benefit.

Finally the VACUSAC® therapist can place a number of suction cups on the big muscles on the front and back of your shoulders ...

... and all you have to do is to relax and feel how your body is restored with new strength and energy.



Introduction

During the last fifty years there has been a steady increase in the incidence of all forms of peripheral vascular diseases. The gradual improvement in our lifestyles has been a major contributory factor to the formation of these diseases, and the various forms of rehabilitative treatment measures introduced during this time have brought only minor improvements with some of the conditions. Also during this time there has been a steady increase in the participation in professional sport amongst the populus, bringing with it the associated problems arising through injuries. These problems are not only restricted to the »professional« athlete. The treatment of these unassociated medical situations have several things in common:

1. The indications within the general diagnosis are multiple.
2. There is a need for an effective, non-invasive treatment modality that can be easily utilized.
3. This form of treatment modality will have to be acceptable to the majority of patients treatable.
4. The treatment modality must be cost effective not only to the recipient but also to the administrative environment, purchasing the treatment modality.

How do we then treat the preceeding conditions at present?

Peripheral vascular disease is being treated with a host of pharmaceutical medications of one sort or another. The physical rehabilitation of these patients tending to be a slow and sometimes unsuccessful process. At times, the condition is discovered too late and the possibility of conservative therapy is long past. Various physical treatment modalities have surfaced over the past years, each one unfortunately having its own major contraindications. For some time applications of vacuum type systems were tried with limited success although the application of vacuum has been appreciated for over three thousand years. Various manufacturers then followed down the path of the application of pressure type systems again with their particular drawbacks. Finally, some manufacturers have approached the treatment of these conditions by alternating first the vacuum and then the pressure effect on the body.

Recently, other forms of physical therapy equipment have been introduced. These utilize the effects of electro-therapy, which may have some effect on the aforesaid conditions, but initially we should list the following considerations before setting out to develop such a new treatment modality.

1. It must be non-invasive.
2. It must be safe to the organism being treated.
3. It must have a minimum of contraindications to its application.
4. It must have technical proof as to its application.
5. It must have substantiated scientific and clinical research to back it up.
6. Its mode of action on the organism should be known.

These were the principle considerations made before the design of the Vacusac Treatment System was undertaken.

During the preceeding six years we have followed these criteria very carefully to produce what we and many of your colleagues in various medical establishments in Europe believe to be one of the most significant break-throughs during this century.

As we have mentioned previously the application of vacuum in an enclosed system has been known for over three thousand years and researchers have gone further by alternating it with pressure within the closed system (Vasotrain, Vasculator), but have, each time, stumbled across the problems of contraindications for a large number of treatable patients because of other complications.

We at Vacusac decided to travel down another road. We wanted to find a way of combining the beneficial effects of vacuum and pressure simultaneously within the same system and by controlling the system to create a »pumping« effect within the organism.

It was also our aim to improve the function of the microcirculation and bring about a re-distribution of available oxygen within the system.

The first thing we had to do was to test the validity of our theories and to do this we enlisted the assistance of the Institute of Technology in Denmark to check our system independently to ensure that we were in fact creating the effect we were stating.

Introduction

This being proved, the first objection that we encountered was:

»VACUSAC could have a damaging effect on the organism«

To check this out, we approached both the University of Copenhagen (Denmark) and the University of Liverpool (England) to undertake extensive medical research to see if there could be any possible problem. Both of these respected institutions found independently that there were no significant changes occurring in heart rate, arterial blood pressure, cardiac output nor respiration during Vacusac treatment and that the system had no harmful effects on any of the important physiological functions of the body.

The second objection raised was:

»Is VACUSAC a beneficial treatment at all?«

This was the start of a long process of medical trial and evaluation of the treatment system by many of the top medical research centres around Europe:

University of Copenhagen, Frederiksberg Hospital
University of Liverpool, Institute of Sports Medicine
University of Vienna, Institute of Sports Medicine
University of Vienna, Boltzmann Institute of Physical Medicine

University of Belgrade, Institute of Sports Medicine
University of Belgrade, Clinical Hospital Centre, Zemun

University of Belgrade, Rehabilitation Hospital, Gamzigradska

University of Zagreb, Clinical Centre for Traumatology

Medical Rehabilitation Centre, Dobrna, Slovenia

The results obtained from these various centres have left us with no doubt that:

- a) The Vacusac process is very beneficial in treating Vascular disease.
- b) The Vacusac process is very beneficial in treating Sport Injuries.

With the back-up of the results from over 100,000 treatments, it is interesting to note that we have never experienced any side effects to the Vacusac treatment process what so ever!

The final objection raised was:

»Well, what is the mode of action of VACUSAC?«

This is the point where the Vacusac Treatment System streaks out in front in comparison with other treatment modalities. Thanks to the long and painstaking research done by Prof. Nikola Dekleva at the University of Belgrade and Head of the Eastern N.A.S.A. research laboratories, he discovered the following facts about the method of action of the Vacusac Treatment System.

The object of Prof. Dekleva's first research was to look at the effect of the Vacusac on the perfusion of oxygen and carbon dioxide in the peripheral tissues. His interest in this very important area was aroused during his involvement in taking measurements on behalf of a clinical study on Vacusac that was being conducted at another hospital centre. The results of his research showed that in virtually all of the cases he investigated, he found a substantial increase in the level of oxygen perfusion in the peripheral tissue and a substantial decrease in the level of carbon dioxide perfusion in the same tissue. To further support these findings Prof. Dekleva conducted an in depth experiment using monkeys to quantify his measurements and also to further investigate if there had been any distortion in the cells, platelets etc.

So now we knew that the Vacusac was causing a re-distribution of oxygen from the proximal areas of the body to the distal areas of the body.

He also discovered that the action of the Vacusac had brought about a restabilisation of the blood metabolism and that in certain cases where there had been a disturbance in the thrombeolic factors of blood these, too, had also restabilised. The PH of the blood had returned to normal and at the sites of blockage, there had been an increase in the production of collateral arteries around the blockage.

At this point Prof. Dekleva decided that if the system was creating these effects, then he should also look at what was happening at a cellular level because, when you are increasing the distribution of oxygen to the

Introduction

extremities this does not imply that the cells are in any shape to absorb the extra nutrition of oxygen.

Thus Prof. Dekleva began his second experiment.

The purpose of this experiment was to measure the power of diffusion of a material through a cellular membrane. The membrane he chose was a placental amniotic membrane and he then designed a diffusion chamber which would be placed either side of the membrane. He then diffused Iodine J125 through the membrane and measured the diffusion kinetic (force), first without Vacusac and then with Vacusac connected. The results were astonishing: there was approximately an increase of four times in diffusion kinetic (force) created through the membrane when the Vacusac system was applied (Sicot 88).

So here we have a totally unique new treatment modality for treating what?

The scientific research completed, preliminary results from research projects in hospitals and universities all over Europe, compared to practical experience from more than 200 hospitals and clinics, have beyond any reasonable doubt proved the following indications for the Vacusac treatment:

Arteriosclerosis of the Lower Extremities
Angiopathia Diabetica
Mb. Buerger
Mb. Raynaud
Varices Extremitas Inferiores
Non-infectious Lymphatic Oedema
Disopaties
Distorsions, Distensions
Contusions
Sinuitis Chronica
Arthrosis
Myosis Varias
Lower Back Syndrome
Periarthrosis Coxae
Sacroiliac Syndrome
Tendovaginitis
Epicondylitis
Ulcers
Rheumatism
Sudecs Syndrome

As mentioned above we have not yet experienced any contraindications or side effects, however, until we have scientific proof the following indications are stated to be contraindicated:

Diseases with abnormal haemostasis
Pregnancy
Cancer
Acute myocardial infarction
Embolism of the pulmonary artery

Conclusion:

Therefore, the Vacusac Treatment System must seriously be considered as *the* answer in the successful treatment of a whole range of cardiovascular diseases, sports medical conditions and traumas. Not only in a remedial role but also as a preventative and rehabilitation method. In the near future, the Vacusac Treatment System will find itself situated in any and all of the following facilities:

Hospitals
Rehabilitation Centres
Nursing Homes
Sports, Physiotherapy and Medical Centres
Sports and Health Clubs

based throughout the world.

One of the optimizing factors of this notion is that the Vacusac Treatment System offers many benefits:

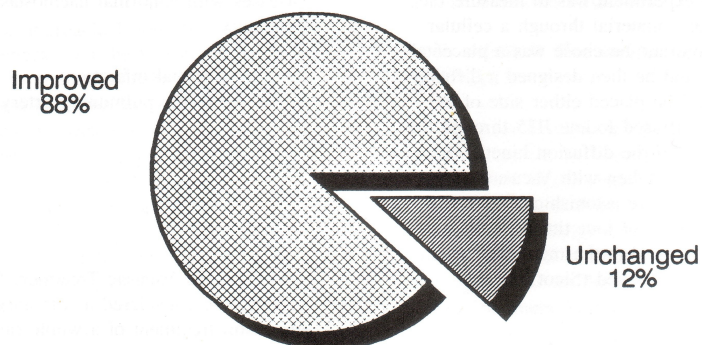
Inexpensive acquisition.
Cost effectiveness in operation
Wide base of application

and in some cases the reduced period of rehabilitation of just a single patient has justified the Vacusac Treatment Systems investment.

Vacusac Research Laboratories
David Hallam

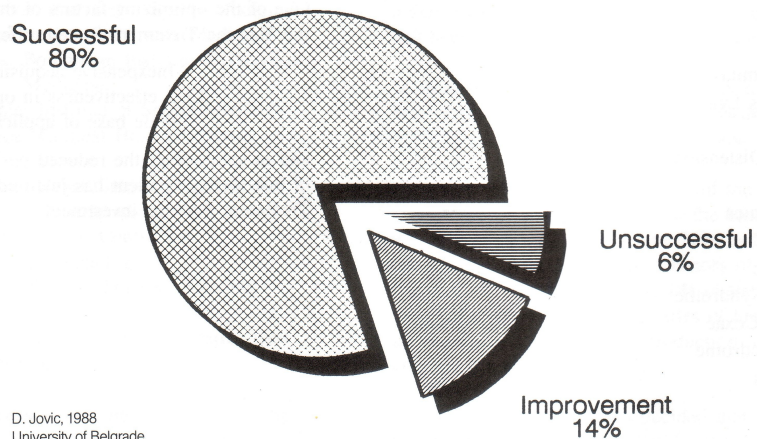
VACUSAC[®] in peripheral vascular disease

effect on intermittent claudication



H. Himmelstrup, 1987
University of Copenhagen

VACUSAC[®] in sports injuries



D. Jovic, 1988
University of Belgrade

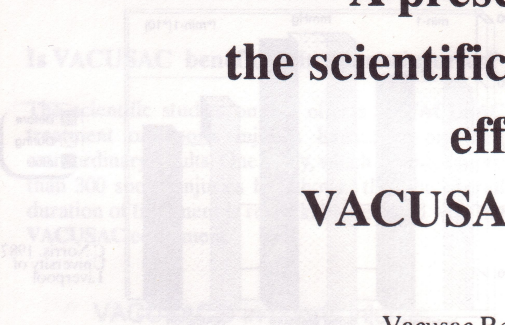
A new treatment modality based on negative pressure

VACUSAC is beneficial in vascular disease

Does VACUSAC produce harmful effects?
 The first studies made on healthy subjects have shown that the VACUSAC equipment does not produce any potentially harmful effects on important physiological functions. These results have been confirmed in patients with peripheral vascular disease, arterial hypertension, heart rate, arterial blood pressure, cardiac output and in respiration during VACUSAC treatment.

• Post-thrombotic syndrome

• Electrophysiological treatment



Is VACUSAC beneficial in vascular disease?
 Several studies on the effect of VACUSAC treatment on peripheral vascular disease have shown remarkable results. Approximately nine out of ten patients with intermittent claudication of long duration achieved a significant increase in walking distance. One out of three patients are totally relieved of their incapacitating symptoms.

VACUSAC® in peripheral vascular disease
 Effect on intermittent claudication

Does VACUSAC affect other diseases?

VACUSAC treatment has an impressive effect on many diseases, but only those which have been documented by scientific studies are mentioned here. Scientific studies have shown that VACUSAC treatment has no effect on the following diseases:

VACUSAC is beneficial in sports injuries

What does VACUSAC offer?
 The VACUSAC equipment offers the possibility to affect the majority of the body surface with negative pressure vacuum, and this new treatment modality has shown remarkable results in a number of scientific investigations.

• Distension

• Contusion

How is VACUSAC used?
 During VACUSAC treatment subjects place their feet in a pair of foot pumps. A plastic bag is pulled over the feet and the pumps are started. The pumps create a vacuum of approximately 760 mmHg. The vacuum is maintained for 15 minutes. The treatment is repeated every 2-3 days. The treatment is continued until the symptoms are completely relieved.

Does VACUSAC have side effects?

The technical properties of the VACUSAC equipment have been thoroughly tested at the Institute of Technology in Copenhagen, Denmark. These tests have confirmed the presence of the vacuum levels and vacuum modes as claimed by the manufacturer. The tests have also provided a model explaining why it has been possible to obtain a combination of negative pressure on different points of the body surface through the unique construction of the VACUSAC equipment.

• Pregnancy

• Malignancies

Has VACUSAC been tested in clinical trials?
 A large number of clinical trials have been performed on the effects of the VACUSAC equipment, and additional studies are being conducted. These investigations have primarily been focused on the effects of VACUSAC treatment on peripheral vascular disease, in subjects with peripheral vascular disease and in subjects with sports injuries.

A new treatment modality based on hyperbaric vacuum

What does VACUSAC offer?

The VACUSAC equipment offers the possibility to affect the majority of the body surface with alternating hyperbaric vacuum, and this new treatment modality has shown remarkable results in a number of scientific investigations.

How is VACUSAC used?

During VACUSAC treatment subjects are dressed in a hygiene bag, having placed their feet in a pair of felt boots. A layer of felt is secured around the body, and a plastic bag is pulled up to the thorax. Head, neck and shoulders can be treated in a similar manner using the "hood" and "cups", which are a part of the treatment system.

The air is then evacuated from the plastic bag in order to produce a change in vacuum. This vacuum change can be altered with respect to the vacuum level and with respect to the vacuum mode. The latter is made possible through three built-in programmes producing different oscillations in the selected vacuum levels.

Does VACUSAC work - technically?

The technical properties of the VACUSAC equipment have been thoroughly tested at the Institute of Technology in Copenhagen, Denmark. These tests have confirmed the presence of the vacuum levels and vacuum modes as claimed by the manufacturers. The tests have also provided a model explaining how it has been possible to attain a combination of hyperbaric vacuum on different points of the body surface through the unique construction of the VACUSAC equipment.

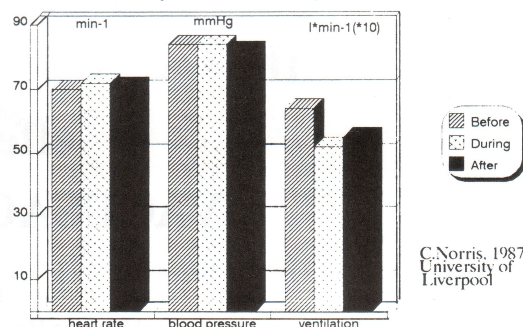
Has VACUSAC been tested?

A large number of scientific studies have been performed on the effects of the VACUSAC equipment, and additional studies are in progress. These investigations have primarily been focused on the effects of the VACUSAC equipment in healthy subjects, in subjects with peripheral vascular diseases and in subjects with sport injuries.

Does VACUSAC produce harmful effects?

The first studies made on healthy subjects have shown that the VACUSAC equipment does not produce potentially harmful effects on important physiological functions. Thus, no major changes are seen neither in heart rate, arterial blood pressure, cardiac output nor in respiration during VACUSAC treatment.

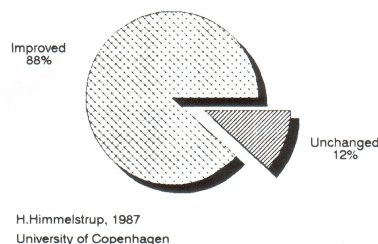
Effects of VACUSAC® treatment on haemodynamics and respiration



Is VACUSAC beneficial in vascular disease?

Several studies on the effect of VACUSAC treatment on peripheral vascular diseases have shown remarkable results. Approximately nine out of ten patients with intermittent claudication of long duration acquire a significantly increased walking distance, and one out of three patients are totally relieved of their incapacitating symptoms.

VACUSAC® in peripheral vascular disease
effect on intermittent claudication



Effects of VACUSAC are document by scientific research

VACUSAC is beneficial in vascular disease

- Arteriosclerosis of the extremities
- Diabetic angiopathy
- Thromboangiitis obliterans
- Raynaud's disease
- Post-thrombotic syndrome
- Non-infectious lymphatic oedema

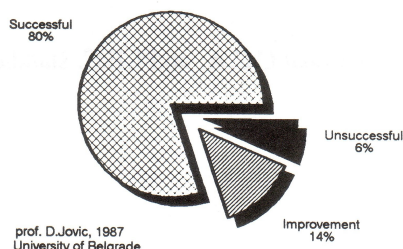
VACUSAC is beneficial in sports injuries

- Disopaties
- Rheumatism
- Distorsio
- Distensio
- Contusio
- Sinuitis chronica
(as seen in waterpolo)

Is VACUSAC beneficial in sports injuries?

The scientific studies on the effects of VACUSAC treatment on sports injuries have also provided extraordinary results. One study, which included more than 300 sports injuries has shown, that the overall duration of treatment is remarkably reduced with the VACUSAC equipment.

VACUSAC® in sports injuries



Does VACUSAC affect other diseases?

VACUSAC treatment has an impressive effect on many diseases, but only those in which the effects have been documented by scientific studies are mentioned. Scientific studies are in progress at different university clinics investigating the effects of VACUSAC treatment on other diseases.

The mechanism-of-action in VACUSAC ?

The effectiveness of the VACUSAC equipment is likely based on a removal of accumulated interstitial fluid through the hyperbaric vacuum. This removal of fluid would improve the microcirculation, thus normalizing the metabolic state in diseased areas. This hypothesis is currently being thoroughly investigated, and the preliminary results are compatible with the theoretical considerations.

Does VACUSAC have side effects?

The scientific investigations performed so far have not registered any side effects, and have thus not provided any contraindications to the use of the VACUSAC equipment.

VACUSAC should not be used in

- ✧ Pregnancy
- ✧ Malignancies
- ✧ Acute myocardial infarction
- ✧ Embolism of the pulmonary artery
- ✧ Therapy with anticoagulants
- ✧ Diseases with abnormal haemostasis

Specifications

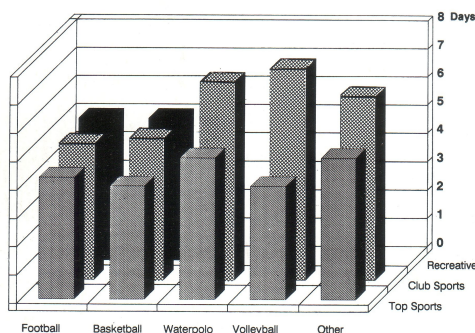
Name	Vacusac Mk 4 Treatment System
Description	Oscillating Vacuum Therapy unit comprising of Computer Control Unit, Patient Handling System and High level Vacuum Pump.
Supply requirement	Single phase 220/240 or 110/120 volt, 50/60 Hz. 1.3 kw.
Control system	Discreet Computer Controlled feedback system with four (4) isolated channels of operation. Security inbuilt safety system to ensure automatic shut down at end of treatment.
Maximum vacuum	70 % (−0.70 bar)
Main chamber	−0.70 bar
Buffer tanks	Variable from −0.05 bar to −0.55 bar
Pump unit	750 watt 220/240 or 110/120 volt, 50/60 Hz self adjusting, self lubricating, dry seal system. VT3.16 (16 M3/H).
Standards	All equipment produced to international C.C.A. and I.E.C. standards.

Vacusac[®] in sports rehabilitation



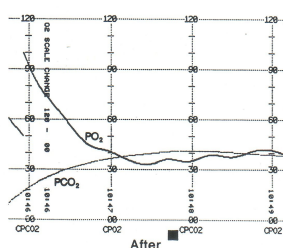
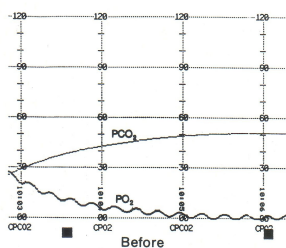
Faster recovery from sport injuries.

Length of VACUSAC[®] therapy in relation to sport level



Research material obtained from international sports competitions where more than 500 athletes received VACUSAC[®] treatment for sport injuries have shown a remarkable reduction in recovery time. The mean recovery period was reduced to only 5 days. Therefore, injuries sustained during your training period will not necessarily force you to alter your training schedule.

Improved oxygen distribution.



A VACUSAC[®] treatment shortly before a competition will improve the metabolism of the muscle cells and increase the energy level with several percent.

Vacusac[®]

Augustenborg Landevej 61
6400 Sønderborg. Tlf. 04 42 78 15

Remember!

2 things are necessary in any sport to obtain a maximum result:

- that the form curve peaks at the time of performance
- that all muscles in the body have optimum function during the competition

VACUSAC[®] therapy helps you with both