“Effect of Air compression Physiotherapy”
What is the Physiotherapy?

What is the Physiotherapy? It is a kind of orthopedic treatment for a patient who needs the physical therapy to reduce the pain or to improve the movement before or after a surgery. The many physical therapists treat mainly their patient by air compression, heat, cooling, laser, electronic waves, or gravities.
The principle of Air compression therapy

• All human bodies are managed by smooth circulation of blood and lymph.

• The Doctor Life compression system can assist many patients to recover from their disease by promoting their blood circulation and lymphatic drainage, and by stimulating metabolism for both of. The “Doctor Life health care” offers advanced technologies and is of high quality, and hence it can satisfy all users across medical, beauty and home care markets.
The principle of Air compression therapy

Lymphatic motion & Pressure Gradient

Blood capillaries ➔ Interstitial Fluid ➔ Lymph Veins ➔ Lymph Ducts ➔ Large circ. Veins

Continuous air compression increases the not only blood stream, but also extend micro vessel under patient’s skin. It means air compression therapy is the best solution for smooth blood and lymph circulation.
Lymphatic motion & Pressure Gradient

Blood capillaries ➔ Interstitial Fluid ➔ Lymph Veins ➔ Lymph Ducts ➔ Large circ. Veins
Medical Care

• DVT (Deep Vein Thrombosis)
• Lymph edema
• Diabetes
• Post-paralytic
• Limb convulsion
• Phlebosclerosis
• Varicose
• Chronic venous insufficiency (CVI)
• Arterial insufficiency
• Post-mastectomy
• Post-traumatic
• Spinal cord injury
• Sciatica
• Sprains
Deep vein thrombosis (DVT), is a blood clot that forms in a vein deep in the body (thrombus). Blood clots occur when blood thickens and clumps together. Some clots can disappear naturally, or with the aid of certain drugs.

Most deep vein blood clots occur in the lower leg or thigh. They also can occur in other parts of the body.

A blood clot in a deep vein can break off and travel through the bloodstream. The loose clot is called an embolus. When the clot travels to the lungs and blocks blood flow, the condition is called pulmonary embolism (PE).

Knee and hip surgery patients have the highest risk of developing DVT and PE in the surgical setting.
PE is a very serious condition. It can damage the lungs and other organs in the body and cause death. Blood clots in the thigh are more likely to break off and cause PE than blood clots in the lower leg or other parts of the body.

DVT occurs most frequently among people who are immobilised. For example, the condition has been long recognised as a risk for people confined to bed. Immobility for even short periods can cause DVT. For this reason, preventive measures are frequently taken when people, particularly the elderly, undergo surgical operations, where they are immobilised by a general anaesthetic.

The increased proportion of PE are in association with identified risk factors for DVT, which include increasing age, obesity, smoking, pregnancy, the use of oral contraceptives or hormone replacement therapy, cancer, lower limb injury or surgery, family history of DVT, and previous thrombosis or embolism.

**Treatment / prophylaxis**

- Anticoagulants
- Antiplatelet Drugs
- IPC system
About half of all DVT cases are asymptomatic, with no obvious self-consciousness or clinical symptoms.

In symptomatic cases, the affected (diseased) area can become swollen, thickening periodically resulting in pain or compression. Skin color / composure may be compromised.

Clinical symptoms of PE

- Breast pain
- Hemoptysis
- Dyspnea
Air is injected periodically and orderly from the malleolus and the calf to the thigh.

DVT is prevented by two principles.

- The blood flow of the crural vein is accelerated in order that venous congestion can be rapidly removed. The pressure is periodically increased or reduced, and thus pulsating blood flow runs through the deep vein systems of telomeric sites and crural blood is favorably circulated. Coagulant factors are prevented from swarming and sticking to the tunica intima, and as a result thrombosis is prevented.

- The fibrinolysin system is more activated, and the activation of fibrous proteinlysis caused by internal causes is stimulated after use whether they are the normal or patients with phlebothrombosis. It appears that the mechanism works because the plasminogen activator inhibitor-1 is decreased and the tissue plasminogen activator is more activated.
## The comparison of IPC and Compression stocking

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| **DVT prevention effects** | - It is evidenced as the most effective from physiological prevention of DVT.  
- As it is lesser than anticoagulant drugs but higher effects than stocking, for high risk group, it is better to use with anticoagulant drugs. | - It is effective for DVT prevention but it is lesser than IPC from clinical studies. |
| **Strong point**     | - It is evidenced as the most effective from physiological treatments.  
- As a patient can feel refresh by soft compression massage, the satisfaction is higher than bandage or stocking from clinical studies.  
- Complication has no nearly in comparison with stocking or coagulant. (It is required prevention treatment for a patient who can have any complication of bleeding by coagulant drug like heparin or warfarin.)  
- It can be used optionally with stocking or coagulant drug. | - It is easy for a patient who is movable to use stocking and inexpensive.  
- It can be used with IPC or coagulant drug. |
| **Weakness**         | A patient should use it at the only bed.                             | - A patient can feel discomfort by itchy or heated.  
- It can make a side effect like homeostasis effects.  
- It is not recommended for serious edema, diabetic, diseases related to a peripheral nerve or venous.  
- It can be used for the only low risk group. |
(IPC Lymph edema effects )
Stimulation of lymphatic flow by sequential pneumatic compression
Pneumatic compression in postmastectomy lymphedema - maintenance study results

Pneumatic compression in postmastectomy lymphedema - Acute TX results
Diabetic Foot

According to statistical data, the symptoms of the diabetic foot occur in 15% of patients, 10 to 14.5% of whom undergo excision. The patients, who come to die within 30 days after excision, account for 10%.

According to national and overseas data, the patients with the diabetic foot account for 47% of all the inpatients related to diabetes.

Cause of Diabetic Foot

Diabetic crural anemia is the principal cause of the diabetic foot. Diabetes may cause pathologic changes in peripheral nerves and blood vessels and causes hypoesthesia in the diseased limb. A complication, caused by the blood circulation disorder, may cause pathologic changes and malnutrition in brachiocrural tissues.

The diabetic foot blood is usually accompanied with deficiency, neuropathologic changes and infection.
IPC treatment for Diabetic Foot

- The air cuff of IPC is filled orderly from the distal end to the proximal end, which remarkably promotes venous return. When it is deflated, intra-arterial infusion may be more strengthened.

- IPC is an internationally-authorized apparatotherapy to prevent coagulation, thrombin-like enzyme and thrombokinesis, and is effective to improve blood circulation.

- IPC can helpful to rapidly supply blood to peripheral nerves when it is booted orderly from the proximal end to the distal end. And it has the inductive effect on the artery.

- IPC is effective to remove inflammatory pain-inducing substances in the process of venous return. Also in the process of arterial perfusion, it causes vasodilatation and increases oxygen consumption.

“Running water is not corrupt, and working axis is not moth-eaten.”
Diabetic foot By IPC

Patient case 1
- 36 y.o. male, 20+ years type I diabetes
- Retinopathy and peripheral neuropathy
- Renal failure, 6 years on hemodialysis
- Left below knee amputation
- Large right heel necrotic ulcer
  No runoff vessels for bypass surgery

Past Therapies
- Surgical debridement
- IV, oral and topical antibiotics
- Standard wound care treatment

DOCTOR LIFE (alternative medicine)
- Applies compression to foot, ankle, calf and thigh at 120mmHg pressure level.
- Home use for 30 min per a day.
- Increases blood circulation
- Ulcer size decreased substantially and limb was improved.
**Patient case 2**

- 66 Year Old Male
- 35 Year Hx of diabetes
- Renal Failure
- Contralateral Tibial Bypass
- Poor Ambulation
- Small Vessel Disease

**Past Therapies**

- Amputation Great Toe/Metatarsal I
- Platelet Released Growth Factors
- IV and Oral Antibiotics
- Topical Antibiotics
- Surgical Debridement

**DOCTOR LIFE (alternative medicine)**

- Applies Compression to Foot, Ankle and Calf
- Up to 100 mmHg
- Home use for 30 min. QID
- Improved Circulation of the prepared foot for revision Surgery
Patient case 3

- 68 y.o. male with diabetes
- 4-month history of rest pain and progressive necrosis
- PVR's were diminished, flat wave form at toe level
- No run-off towards the toe

DOCTOR LIFE (alternative medicine)

- Applied intermittent compression to foot, ankle and calf at 120mmHg
- Home use 1 hour, q.i.d.
- Metatarsal PVR-amplitude increased
- The lesions are almost healed (second toe completely healed)
Using DOCTOR LIFE only

12 Steps

6 Steps

4 Steps
Why DOCTOR LIFE air compression therapy is a popular treatment in Physiotherapy?

The most of physiotherapy devices usually accompanies pain when patients using their devices. But, the other way, Air compression therapy makes users refreshed and patient’s pain decreased by soft air compression massage besides treatment of prescription. Air compression therapy is also so safe from any shock, pain or stress of fatigue. Also, It can be used by itself or with other physiotherapy systems together optionally according to a doctor’s guidance.
Why DOCTOR LIFE is a popular in Physiotherapy?

- **DOCTOR LIFE** treatment does not provide any pain or stress - by the only air compression and the adjustable pressure controller according to a patient’s condition.

- **Very Safe** - No electronic shock and No electromagnetic wave. Sometimes patients skin can be wounded or be burned when they get physiotherapy treatment such as hot pack or infrared light therapy.

- **Comfortable treatment** - DOCTOR LIFE does not need any movement from the patients. They just be required lay down on bed or sitting on the chair.

- **Can be used with other physiotherapy devices** - Air compression therapy can be used to relax patients muscle with so soft sequential compression when patients get other physiotherapy, before or after.

- **Almost No side effect** - The only air compression doesn’t provide nearly a side effect.

- **Easy to use** – It’s a very hard work for a physiotherapist to treat patients but DOCTOR LIFE makes them released from any hard manual working of manual drainage by automatic operation.

- **The optional nursing home care** – DOCTOR LIFE has various models. After treatment in a hospital, anyone can use our portable model in their home safely.
DOCTOR LIFE with other physiotherapy

“Air compression device **only or with** other physiotherapy devices!”

- Air compression therapy
- Thermotherapy / Cryo therapy
- Electronic stimulator
- Rehabilitation Exercise
- CPM
With CPM physiotherapy like a traction in which weights and pulleys are used to gently pull or stretch uninjured part of the body for a period of time.

The physiotherapist tied up injured part of patient’s body after that pulled up and stretch over and over as the above picture. The patients can suffer from the device under the traction treatment and can get abnormal circulation of lymph or blood. DOCTOR LIFE can be used after CPM treatment to release any side effects like edema, pain or abnormal blood circulation.
Example)

**Low frequency wave therapy can be used with Air compression therapy.**

1. There are 2 kind of treatment electronic stimulator, for pain and paralysis.
2. The electronic wave stimulates muscle and skin so the treatment fast to relieve pain.
3. Some patients who afraid of electronic shock could be uncomfortable, it cause side

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Before electronic waves therapy, the physiotherapist can provide air compression therapy with patients for relax their part of injured.
DOCTER LIFE + Thermotherapy or Cryotherpay

Thermotherapy: RF, Hot pack, Infrared warming,

Above thermotherapy / cryotherapy are so related to decrease of pain, trauma, muscle conglomeration..

In the case of lymphatic drainage, it more effective to use DOCTOR LIFE after thermotherapy. Cryo therapy is also more effective with compression therapy for pain, trauma, strain or sprain.
Home Care

- Lymph edema
- Diabetic foot
- Diseases by interruption in blood circulation
- Cellulite (Fat dissolution)
- Pregnant woman’s limb management
- Benumbed feet or hands
- Cold feet or hands
- Settlement of stress
- Exercise effects
- Old age, weakness and fatigue
- Insomnia
- For healthier body and elastic skin
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