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## The Eckart Klobe Vacuum Bell for Non-Invasive Lifting of Funnel Chest

To be applied only after medical examination and in accordance with medical guidance.

### Manufacturer:

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### Designated Use:

Non-invasive lifting of funnel chest. **Please note:** This device is NOT designed for intra-operative use and must NOT be used in the presence of open operation wounds.

### Attributed Effect:

Non-invasive lifting of the funnel chest and sustaining of the raised funnel chest in a raised position.

The Eckart Klobe Vacuum Bell lifts the rib cage by means of a partial vacuum. In most cases this effect may be observed directly by looking through the viewing glass. Thereafter the task of the applied Vacuum Bell is to sustain the raised funnel in a raised position.

### General Remarks:

The Vacuum Bell in general easily overcomes the resistance of those bones, cartilages and ligaments which are involved in shaping the funnel. However, internal muscles like the Diaphragm tend to perpetuate the condition of funnel chest by pulling the ribcage inward. So a further task of the Vacuum Bell is to stretch these muscles in order to weaken their pull.

For a successful correction of the funnel chest it is necessary to apply the Vacuum Bell persistently over a long period of time. After removal of the Vacuum Bell at the end of a treatment unit the funnel will fall back partially into its sunken position. This partial falling back of the funnel may last for some minutes or hours. The shape of the funnel after some days without any application of the Vacuum Bell may already be considered as a permanent progress.

The Vacuum Bell can be used throughout long parts of the day without interfering with common daily activities: For instance lying, sitting, standing, walking, running, attending school, working in the office, doing housework and participating in some types of physical work or sports. This allows to have long daily treatment times which enable the new shape of the chest to adapt to the biomechanical demands of daily living.

### **Possible course of therapy:**

In advance of the first application of the Vacuum Bell the patient must be examined by a physician (medical doctor) to make sure that there are no contraindications (see page 4).

The first application of the Vacuum Bell should be supervised by medical personnel: The patient learns to position the Vacuum Bell and to apply it in a way which is snug and comfortable. The patient learns to pump well-dosed. He may feel the pull of the Vacuum Bell, but he should not feel hurtful discomfort. With the Vacuum Bell applied, the patient may stand up cautiously and walk around. An application time of 15 minutes might be sufficient for the first treatment unit.

In accordance with the physician's recommendations the subsequent treatment units may be conducted by the patient at home. Typical application times for teenagers and adults are between one and three hours per day, in case of small children maybe shorter.

Medical control check-ups usually take place once every three months or according to the patient's needs.

Physiotherapeutic exercises, designed to straighten the posture, may contribute to improve the physical appearance of the funnel chest patient.

### **Design and Application of the Vacuum Bell:**

There are 5 types of Eckart Klobe Vacuum Bells:

- **The Large Vacuum Bell**, approx. 10" (26 cm). For male persons taller than approx. 5' 7" (1.70 m)
- **The Small Vacuum Bell**, approx 7.5" (19 cm). For persons taller than approx. 4' 7" (1.40 m)
- **The Small Vacuum Bell Type Bodybuilder**, approx. 7.5" (19 cm). For bodybuilders and special applications. For persons taller than approx. 4' 7" (1.40 m)
- **The Small Vacuum Bell Type Women**, approx. 7.5" (19 cm). For women and girls after beginning of the breast development. For persons taller than approx. 4' 7" (1.40 m)
- **The Mini Vacuum Bell**, approx. 6.3" (16 cm). For children taller than approx. 3' 5" (1.05 m)

**The Small Vacuum Bell Type Bodybuilder (19 cm)** has thinner and softer lateral flanks as the Small Vacuum Bell (19 cm) without add-on of type. So it may be put more comfortable over big chest muscles or sensitive chest nipples. In case of a horizontal indentation along the diaphragm line, initially it may bend out the rib cage along this line and thus open an anatomically favourable way for further lifting of the funnel.

**The Small Vacuum Bell Type Women (19 cm)** is lateral concave to relieve the female breast. It is usually sufficient until bra size A and B, sometimes until C (German size).

**The selection of a suitable Vacuum Bell type** for the individual patient requires a certain experience. The selection considers several different criteria such as sex, age, height, bodyweight, posture, funnel shape, funnel depth and potential sensitivity of the chest nipples. In case of female patients moreover the size and shape of the breasts as well as the question whether there is enough space to put a Vacuum Bell between the breasts.

The Vacuum Bell should be large enough to be supported by the area outside of the funnel. On the other hand the Vacuum Bell should be small enough to prevent throat and abdomen from being touched painfully and to avoid a loss of vacuum at its sides. In case of women it should not press painfully on their breasts.

**The positioning of the Vacuum Bell** in most cases is performed advantageously over the middle of the funnel. In case of asymmetrical funnel shapes it is oriented to the middle of the funnel as well.

In most cases the Vacuum Bell is applied with the hose nozzle over the upper area of the breastbone.

**In order to attach the Vacuum Bell**, its sides are to be spread and slightly pressed to the body. The Vacuum Bell should tighten itself with its inner flanks on the skin. After applying vacuum the Vacuum Bell should stick to the body by itself. A filled or partially filled stomach may support the sealing in the area of the upper abdomen.

**The suction effect** is created when releasing the suction bulb which was pressed previously. In most cases it is sufficient to press the suction bulb just once again when it has regained its round form.

**The re-aeration** of the Vacuum Bell, for example at the end of a treatment sequence, should be made by turning the air inlet valve of the suction bulb in order to avoid abrupt aeration.

**Advantageous application times** are those without subsequent muscle work. Preferably before sleeping, or if tolerable, while sleeping. Better after sports than before doing sports.

Chest hair may impede the tight sealing of the Vacuum Bell. For this reason it might be necessary to keep it short by occasional shaving.

#### **Technical Remarks:**

**The elastic body of the Vacuum Bell** is made of orthopaedic silicone. This material is comfortably soft and very compatible to the skin. Its chemical and mechanical characteristics are very good as well.

**The viewing glass of the Vacuum Bell** is made of polycarbonate and thus sensitive to bases, ammonia, some organic dilutions and vapour sterilisation. (The manufacturer does not have information regarding other methods of sterilisation and, consequently, cannot give any warranties concerning this matter.)

**The hose nozzle** is made of polyamide. The screw-coupling between hose nozzle and viewing glass has a limited stability. Broken or over-torqued hose nozzles may be replaced by the manufacturer. Screw threads within the viewing glass which have been distorted by heat cannot be repaired.

**The suction bulb and the suction hose** are made of PVC. For safety reasons the power of the suction bulb is limited. For safety reasons the Vacuum Bells are only to be operated with the suction bulbs provided by the manufacturer.

**The Vacuum Bell may be cleaned** by using a soft cloth. The cloth may be moistened by using

- pure water
- soap water
- ethanol (as well known as drinking alcohol or ethyl alcohol)
- 1-propanol (as well known as propyl alcohol or propanol)
- 2-propanol (as well known as isopropyl alcohol or isopropanol)

Be careful with other disinfectants. They might cloud the viewing glass.

**Before each application** the Vacuum Bell must be checked for proper operation.

### **Specific mode of functioning:**

**Bending moments:** The vacuum performed by the Vacuum Bell pulls the breastbone from its concave position into a raised position, including the cartilaginous rib ends and costal arches which are attached to the breastbone. With equivalent force the inner flanks of the Vacuum Bell press on the human body. These forces create bending moments, predominantly in the breastbone area and at the funnel edges. The bending moments at the funnel edges are counterbalanced by the anchorage of the ribs to the spinal column.

**Lifting of the funnel** may involve 3 types of deformation at the bones, cartilages and ligaments of the ribcage:

- a reversible elastic deformation, predominantly occurring at children,
- potential (micro-) ruptures, mainly occurring at the beginning of the treatment. Before they are healed, the patient's ribcage may experience a temporary loss of firmness
- a gradual growing transformation which may be regarded as permanent.

**A partial return of the funnel into its concave position** after removal of the Vacuum Bell may be understood as a competition between the stability of the lifted ribcage and those muscles which pull from the inside, a competition which is still not yet won.

**A skilful treatment** will be to lift the funnel slowly and gradually in order to minimise the temporary loss of firmness in the ribcage. Even 2 or 4 weeks of treatment time before the funnel is finally lifted close to the viewing glass is normally well spent. Over the whole time of treatment the patient should avoid unnecessarily strong vacuum or extreme variations in vacuum force.

**The inward-pulling muscles**, such as the Diaphragm and Musculus Transversus Thoracis, are stretched by lifting the chest wall. As a result, these muscles adapt to their new position and after removal of the Vacuum Bell they do not pull back that far or that strong any more. In many cases, this adapting process takes longer than any other part of the treatment.

### **Contraindications (When the Vacuum Bell is not to be used):**

- **In case of skeletal diseases** which affect the firmness of the bones, such as Osteogenesis Imperfecta (glass bones) and Osteoporosis (diminution of the compact bone tissues).
- **In case of Angiopathy**, for instance resulting from Marfan syndrome or an Aneurysm (abnormal extensions of the arteries).
- **In case of Coagulation Dysfunctions**, including Thrombopathy or Haemophilia (bleeding disorder).

### **Medical warnings, advices and measures of precaution**

**Warning:** By using the Vacuum Bell against funnel chest a temporarily reduced firmness of the ribcage may occur. Consequently work or sports, involving extreme stress to the ribcage such as boxing or wrestling, have to be avoided over the whole period of treatment.

**Vertigo (dizziness)** at the beginning of a treatment unit should be avoided by lying on the back and by pumping slowly. With the Vacuum Bell applied, the patient may stand up cautiously and walk around.

**The Vacuum Bell is not to be applied in situations** which may involve over-saturation of the blood with dissolved gas: For example after dives or in means of transportation which bring travellers into extreme heights within a short time like planes, high-mountain railways, etc.

**Pronounced chest muscles or other bulks of soft tissue** may affect the Vacuum Bell's fit. Moreover

they are susceptible of being drawn into the Vacuum Bell by the vacuum, where they consume available space and constrict the effectiveness of the Vacuum Bell.

**Bone fractures:** If the patient has reached an age where fractures of the breastbone or ribs have to be taken into consideration, adequate check-ups and provisions are indispensable.

**Haematoma (bruises, black and blue marks):** Might indicate (micro-) ruptures of bones or cartilage. They might be caused solely by the suction effect as well. In the case of dark (black) haematoma the patient should seek medical attention.

Prevention: Shorter treatment times and reduced vacuum force.

**Sensibility of the chest like aching muscles:** May appear by stretching some muscles between the ribs by changing the position of the ribs. May require a few days of rest.

Prevention: Shorter treatment times and reduced vacuum force.

**Temporary backache:** May result from the bending moments being counterbalanced at the spinal column.

Prevention: Shorter treatment times and reduced vacuum force.

**Skin appears red under the Vacuum Bell (dark red to violet):** May appear.

Supposed origination: Temporary blood congestion under the Vacuum Bell.

Remedy: Take off the Vacuum Bell after approximately 20 minutes, wait some minutes and, if required, apply the Vacuum Bell again. Use reduced vacuum force.

**Droplets of blood appearing on the skin:** May appear by means of the partial vacuum.

Prevention: Shorter treatment times and reduced vacuum force.

**Flabby skin:** May be caused by accumulation of fluid in body tissue.

Prevention: Shorter treatment times and reduced vacuum force.

**Abraded skin:** May be caused by contact of skin with the viewing glass, especially if the Vacuum Bell is applied while doing physical activities. It is necessary to stop treatment for several days until the abraded skin has healed. Otherwise the skin tends to bleed when vacuum is applied.

Prevention: Shorter treatment times, reduced vacuum force, and less physical activity while applying the Vacuum Bell.

**Prickle in the arms:** A sensation similar to slight numbness. More often in the extensor muscles of the upper arms, less common in the lower arms.

Prevention: Shorter treatment times and reduced vacuum force.

**Irritated nipples:** May happen by contact with the Vacuum Bell. It is more likely to occur when the edge of the Vacuum Bell is crossing the nipple.

Prevention: Apply the Vacuum Bell in a way avoiding the Vacuum Bell's edge to cross the nipple. For example completely cover one nipple with the Vacuum Bell and leave the other nipple totally uncovered.

**Gynaekomastia (enlarged nipples, enlarged breasts):** In individual cases adolescent and young adult males have experienced an enlargement of their nipples and/or of their breasts, possibly as a result of using the Vacuum Bell.

Supposed origination: The repeated contact of the Vacuum Bell with the nipples might have stimulated a growth process.

Corrective: The patient should seek medical attention. Depending on the situation, the medical doctor

may decide whether it is sufficient to stop applying the Vacuum Bell for some weeks or whether supplemental medication is necessary.

**Febrile bronchitis:** This has been observed in one case after the very first application. The nature of the correlation is unclear; perhaps it is only a common winter cold resulting from exposing the naked upper part of the body.

Prevention: No undercooling, shorter treatment times and reduced vacuum force, especially at the very beginning of the treatment.