„The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundeir®
"The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei®
Type I, Type II or Type III according to Dr. Grundei®

A new form of care for people with leg or arm amputations

"The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei®
the latest evolution of his 15-year-old prosthetic care concept for people with amputations, at which may be waived the conventional socket prosthesis. The concept takes the anatomy of the human body as a model and, as in the case of the lower extremity, puts the burden of walking back onto the femur and the hip joint.

The benefits of "the stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei®
are obvious:

No prosthetic socket
- The forces are transmitted directly from the bone over the prosthesis stem
- Precise control of the prosthesis
- Safe and smooth gait pattern
- The hip joint is claimed in a natural way

Mobility
- Complete freedom of movement of the stump at all levels
- No disturbing marginal areas of a prosthetic socket
- Achievement of complete freedom of movement in 6 - 9 months

Easy To Use
- Can be put on and taken off completely seated in a few seconds
- Any fluctuations in volume of the stump have no influence on the fit of the Exo-prosthesis
- No skin irritation caused by friction, sweat or heat
- Extended period of wearing the prosthesis is possible

The Exo-Fix®-stem | three components

The Endo-stem is implanted directly into the bone stump and ensures, through the spongy metal surface developed 30 years ago by "Dr. Grundei", a permanent secure connection between bearing bone and Exo-stem.
Long-term developments and innovative ideas come together to create „the stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei“:

1. **Exo-Fix® -stem (e.g. Type I)**
   Patent number DE 10 2009 027 255 B4

2. **Bridge module (e.g. Type I)**

3. **Silicone cap used as stoma protection**

4. **Bridge cylinder with drag disc used as mobility zone**
   Patent number DE 10 2010 028 964 B4

5. **Connection adapter for the knee or suitable foot piece**
   Patent number DE 10 2010 039 698

**Structure**

„The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei“ is composed of several modules: the internal (Endo - medical activity) and external (Exo - orthopaedic activity) modules. The Endo-module, the so called implant stem, is for example implanted in the femur. The healing time is between 6 to 8 weeks.

What makes the Exo-Fix® stem implant special is the spongy metal surface. This three-dimensional lattice structure bonds with the bone around it and guarantees (proven by 30 year warranty) a solid anchoring for the Endo-Fix stem in the bone.

The bridge module provides the connection between the Endo-Fix stem and Exo modules. It’s anchored inside, protruding through the stump and equipped from the outside with the bridge cylinder and other connection pieces.

The silicone cap serves to protect the exit point (stoma).

The bridge cylinder and the drag disc serve for development and alignment of the connection adapter for the knee or suitable foot piece.

This structure is critical for the static and dynamic of the prosthesis care and is the responsibility of the qualified and certified prosthetist.
“The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei® has been applied for more than 15 years

The implantation of the Exo-Fix®-stem and the bridge module is performed in two operations that are carried out under general anaesthesia.

**STEP I**

In the first operation, e.g. in trans femoral amputees, the lower end of the femur is exposed and the Exo-Fix® prosthesis stem implanted. The implant is fixed in the correct position and the stump is closed again. Then comes the osseo integration which, from experience, lasts 4 to 8 weeks. The hospital stay is usually 5 to 8 days. This is done under medical supervision.

**STEP II**

In the second operation, the circular skin passage (stoma) is applied. Through this stoma the bridge module is connected to the inner femoral stem.

**STEP III**

The qualified and certified prosthetist has to, after a predetermined structure specification (Trochantersagittaline - flexion angle degree of mobility), determine the knee joint position.

This happens a few days after the second operation and the prosthetist can initiate a partial weight load monitoring.

In addition, after successful implantation each patient receives his/her own Exo-prosthesis pass from their attending doctor to follow up and control „the stem adapted Endo-Exo prosthesis care according to Dr. Grundei®. This also includes the details of the Exo-prosthetic fitting and should always be carried in case of flying.
What should you remember?

„The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei® in practice"

The practical experience of more than 200 satisfied stem adapted „Endo-Exo“® prosthesis users shows that significant advantages are gained over conventional socket prostheses. Through a responsible and attentive use of „the stem adapted Endo-Exo prosthetic care concept according to Dr. Grundei®“ complications can be largely avoided.

Care

Particular attention must be paid to the stoma, through which the bridge module leaves the body. With normal hygiene and regular daily care of the stoma and the exo-modules, the risk of infection is very low.

Load

Excessive twisting of the prosthesis should be avoided. However, should greater than normal strains occur, a shear pin on the inner side of the double conus adapter will protect the bone from breaking. The system yields and the bone remains undamaged.

Material

The implants are made of a cobalt-chromium-molybdenum alloy forging (CoCrMo), which is sealed with a titanium-niobium layer (TiNb). These materials, when used in the endo prosthetics, are considered to be very compatible with the body and only in extremely rare cases cause allergic reactions. Medication is not necessary in connection with „the stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei®“.
**Direct billing**

Surgery and Endo-stem are charged by the clinics directly to the insurance provider.

The Exo-fitting is then done by qualified and certified Prosthetist who then submits a cost estimate to the health insurance company.

**In development**

“The stem adapted Endo-Exo prosthesis care concept according to Dr. Grundei® type I is currently available for patients with transfemoral and transtibial amputations.

Other care possibilities for the arm amputees are currently in development and testing.

**The Exo-prosthesis component**

The exo-fitting is made by the prosthetist who only uses certified fitting parts for knee and foot of selected manufacturers. A classification of the mobility grades is done like in all standard fittings. In our experience, the best results can be achieved with computer-controlled joints.

**Endo-Exo® Association**

The association was founded in November 2009 and aimed primarily the technical development of the Endo-Exo® prosthetic idea as well as to develop the clinical application and to support the Endo-Exo® prosthesis patients.

More Information – Tel.: +49 (0) 451 6116 8778

Endo-Exo® is a trade mark owned by Schütt & Grundei Orthopädiotechnik GmbH and can be used by the association until revocation.
Clinics

So far, in Germany we work with the following clinics where Endo-Exo® operations are being performed. More to follow soon.

- Sana Kliniken Lübeck GmbH
- Berufsgenossenschaftliche
  Unfallklinik (Clinic for Trauma
  Surgery) Ludwigshafen
- Berufsgenossenschaftliche
  Unfallklinik (Clinic for Trauma
  Surgery) Murnau
- Klinikum rechts der Isar der
  Technischen Universität (Technical
  University of Munich) München

Patients' experiences

“In the past, when I was mowing the lawn, I had to sit down three times in an hour because I was in no condition to do it. Today I mow the lawn at once and can still go for a walk afterwards!”

Says Thomas N..

Petra J.

“The stem adapted Endo-Exo® prosthesis is the best thing that came from the given situation,” says Petra J. "With the surgery I’m taking no great risk, because I can still change my mind. If so, only the adapter must be removed, the implant stays inside and the stump is sewn up again."

“I got my leg back”, says Robert P.

Literature

New awareness of life after the Endo-Exo® prosthesis care
The residual limb treatment without shaft is on the rise
www.handicap.de
Contact

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