



**Walter Reed National Military Medical Center**

## Osseointegration FAQs

### **What is Osseointegration?**

The term “osseointegration” refers to the direct connection of bone to a metal implant (usually titanium). The term is used to describe trans-dermal implants that attach to the bone, and exit the skin. These implants are used for permanent anchorage of artificial limbs to the human skeleton. In general, a titanium implant is inserted into the long bone of the arm (humerus) or thigh (femur). A trans-dermal post, or abutment, attaches to the bone-anchored implant and penetrates through the skin. The external prosthesis is attached to this abutment and eliminates the need for a traditional socket.

### **Who is a candidate for osseointegration surgery?**

Osseointegration is suitable for patients with above elbow (transhumeral) and above knee (transfemoral) amputations with documented difficulty using a socket (perspiration, skin problems, ulcerations, pain), or where prosthetic use and functionality is limited due to pain, fatigue, and socket fit issues.

### **Who is not a good candidate for osseointegration surgery?**

In general, runners with lower extremity amputations are likely not going to gain functionality with osseointegration. Patients with below knee (transtibial) or forearm (transradial) amputations are not currently being treated using osseointegration in the United States. Those with socket fit issues and functional issues, including patients with transtibial amputations, should contact us ([Osseointegration Program](#)) for consideration of osseointegration on a case-by-case basis.

### **Which implants are FDA approved for osseointegration in the United States?**

Currently, the only FDA approved osseointegration implant for transfemoral amputations is the OPRA implant system, manufactured by Integrum AB in Sweden; pioneers in the field of osseointegration that developed the first dental implants and cochlear implants.

### **Which implants are available at Walter Reed Bethesda?**

For transfemoral and transhumeral amputations, we currently utilizing the OPRA implant system and the Compress™ trans-dermal implant system. For unique anatomic considerations, contact us ([Osseointegration Program](#)).

### **What are the immediate limitations?**

Depending on the implant type, there will be a period of non-weight bearing and recovery from the surgical procedure(s). For the OPRA device, the procedure is completed in two stages. Patients may resume wearing a socket between the stages after recovery from the initial surgery (usually 2-3 weeks). After 3-4 months, the second stage surgery is conducted where the trans-dermal abutment is attached. Full weight bearing is typical between 3-5 months after the second surgery, and is preceded by rehabilitation/ physical therapy and gradual weight bearing. The Compress™ device is implanted in a single surgical procedure. Rehabilitation, physical therapy, and partial weight bearing can begin once the sutures are removed. There may be significant variation in patient progress due to patient anatomy, compliance with therapy regimens, and medical history.

**How is the Compress™ implant system different from the OPRA implant system?**

The Compress™ is implanted using a single surgical procedure. The implant is placed in the long bone canal similarly to the OPRA device, but is loaded with up to 800lbs of force such that it is stable immediately after surgery. True osseointegration (bone ingrowth with the implant surface) takes several months with both implants.

**What are the long term physical limitations / expected limitations?**

With an osseointegrated prosthesis, you can do all daily life activities including taking a bath, shower, walking, hiking, and cycling. With the absence of a socket, the prosthesis always fits, always attaches correctly, and is always firmly held in place. Patients with osseointegrated prostheses report improved mobility, improved functionality, as well as reduced pain and discomfort. Care must be taken to clean the skin penetration site daily with regular soap and water.

**What is the risk of infection?**

Osseointegration is a safe treatment. Based on over 25 years of patient experience and over 400 patients, deep infection is relatively rare using the current OPRA protocol. On average, patients have had one superficial infection every other year, and these are typically treated with oral antibiotics. Some patients have never had an infection.

**How much rehab is going to be required?**

As with any major surgery, rehabilitation and physical therapy are required in order to gain the most benefit from the procedures. Timelines and therapy regiments will vary between individuals. Patients report initial discomfort and pain related to the utilization of new and long inactive muscle groups. Patients with longer residual limbs seem to have less initial issues transitioning to the new, osseointegrated prosthesis.

**What kind of prosthetic (arm/leg) will I get and when will I get it?**

Choice of the external prosthetic is a personal choice of the patient based on the patient's individual functional needs and personal preferences and should be a conversation with your prosthetist to get the most benefit, comfort, and range of motion from the components.

**How much will the osseointegration surgery care cost?**

If Tricare eligible, there is no cost to the patient for the surgical procedures or implants. Currently, WRNMMC is the only DoD facility performing osseointegration surgeries. Contact the WRNMMC Osseointegration Program for details and further discussions ([Osseointegration Program](#)).

**What questions should I ask the surgeon about possible osseointegration surgery?**

Osseointegration surgery is a major surgical procedure and can have life changing effects. It is important to be fully informed prior to any undertaking.

- How much bone will have to be removed to insert the implant?
- What happens if the implant has to be removed, or breaks?
- If the implant has to be removed, will I be able to have osseointegration again or will my ability to walk be affected?
- What is stress shielding and does a history of osteoporosis or bone infection impact the likelihood of long term success?
- How many procedures have you done with this implant, and how many patients total?
- How and where will I get follow-up care for my osseointegrated limb should I need it?
- Ask to see X-rays, pictures, and talk to other patients.

**I had osseointegration surgery elsewhere and have problems. Can Walter Reed help me?**

Our orthopaedic and plastic surgeons at Walter Reed have surgical experience with every osseointegration implant system in the world. We recognize that patients with trans-dermal implants have unique challenges, and (occasionally) have unique complications. We can consult with any patient with concerns and are ready to provide thoughtful, innovative solutions. Contact us here [Osseointegration Program](#).

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