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## [Behaviour of titanium middle ear implants at 1.5 and 3 Tesla field strength in magnetic resonance imaging]. - PubMed

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2 Minuten

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### **BACKGROUND:**

Investigations into the MRI compatibility of middle ear implants made from titanium alloys with 1.5 and 3.0 tesla MRI systems which are frequently used for imaging diagnostics.

### **METHOD:**

17 different middle ear (ME) implants (ossicular replacement prosthesis (ORP) and ventilation tubes) made from titanium were tested in vitro. Potential warming was determined via an MRI-compatible fibre optic temperature sensor under the influence of sequences with high-level high frequency impulses. An assessment of the attractive force of the implants was carried out placed on a Petri dish under vibration and floating on rubber-sponge (RS) in a water bath.

### **RESULTS:**

No significant warming of the implants was observed with any of the used sequences at either 3 or 1.5 Tesla field strength (TF). With 3 TF, all 17 implants changed their position on the surface of the water and moved at a slow speed (0.0004-0.0014 m/s) towards the magnetic field. With 1.5 TF, the tested ME implants moved at a maximum speed of 0.0002 m/s and in the case of the ventilation tubes at 0.0005 m/s.

### **CONCLUSION:**

No warming occurred in any of the tested middle ear implants at either 1.5 or 3 TF. The attractive forces exerted through the static magnetic field were overall low at 1.5 and 3 TF, indicating that no dislocation is to be expected if intraoperative anchoring is correctly conducted. Nevertheless, the indication for examination at 3 TF should be carefully considered due to the anatomically sensitive region.