

Information brochures for Legal guardians

"Therapy Trial to Determine the Safety and Efficacy of Heavy Ion Radiotherapy in Patients with Osteosarcoma"

Patient:

Dear Mrs/Mr.....,

Your child was diagnosed with a nonresectable osteosarcoma which means that there is no possibility of surgical removal of the tumor without threatening essential organs. Alternatively, you /your child may have refused a possible surgery for personal reasons. In this case, we have to stress that complete surgical removal of the tumor is the method of choice for the treatment of osteosarcoma. Efficacy of *heavy ion radiation therapy* (HIT) has not yet been shown to be as effective as a surgery.

However, HIT might be suitable to treat the tumor in the bones of your child.

In principle, HIT is a kind of radiotherapy which is very effective for the treatment of nonresectable tumors or tumors with critical localization.

HIT consists of high energetic ionic beams (heavy ions), which deposit a high biological effective dosage with high precision in the tumor bed and with causing only minimal damage to the surrounding normal tissue.

Currently, only a small number of HIT institutions are available worldwide. Currently, the HIT facilities in Heidelberg are the unique place in Europe where patients can be treated with heavy ions. For that reason, there is no long standing experience for HIT in bone tumors.

Objectives of the study:

The aim of this study is an improvement of the long term outcome of patients with nonresectable osteosarcoma and to simultaneously minimize therapy related side effects.

Heavy ions are charged particles which enhance local tumor control in comparison to photon radiation.

Participation to this study may have an advantage for your child, because HIT can probably achieve better local control than conventional photon radiation. But there is no guarantee for this advantage.

Realization of HIT:

Before start of Radiotherapy a so called radiation precision mask has to be made. Further MRI and CT-scans are necessary. The whole planning time will be about 1 week. The whole radiotreatment series will last about 6 weeks (5 to 6 days per week) with a total dosage of 72 CGE.

We will start to treat the tumor with protons ((PT) established radiotreatment with particles that are as effective as photons, but have a better dose profile) and then switch to heavy ion radiotreatment for the last approximately 6 sessions. Every single Radiotreatment session will take 20 minutes. Young or very anxious children may have to be anesthetized during radiation, which means that your child must be fasting before radiotreatment.

Position controls of PT / HIT will be done daily with imaging to reach most optimal precision.

Evaluation of tumor response will be done 2-3 weeks before and 6 weeks after HIT using imaging with MRI, PET and Tc-99 bone scan.

Furthermore, regularly follow-up investigations will be done involving bone scans, MRI, CT, blood tests and clinical examination.

The first **follow-up investigation** will be done **6 weeks after** HIT. Further investigations have to be done **6, 12, 24, 36, 48 and 60 months after** HIT.

In the context of the follow-up acute and late toxicity of HIT will be recorded.

If you agree, we offer to include your child in this study.

Risk and side effects:

Side effects (acute and late) of HIT depend on the localization of the tumor and the radiation.

Possible **acute side effects** can be:

- Depression of **hematopoiesis**
- **Mucosa:** ulcers, chronic inflammation, colic, diarrhoea, bowel stenosis, urinary bladder inflammation, contracted bladder
- **Skin:** erythema, epitheliolysis
- **CNS:** sickness, vomiting, central nerve palsy, elevated intracranial pressure, headache, dizziness

- **skeletal system:** necrosis, fracture, joint dysfunction, disturbance of growth

Most side effects disappear after the end of HIT.

Possible **long term defects** include:

- **Bowel:** stenosis or perforation with need for surgical intervention, chronic inflammation
- **CNS:** central nerve palsy, cerebral palsy, impaired vision, defective hearing (rare)
- Disturbance of growth
- secondary malignancies
- arteriosclerosis
- Incontinence (rare)
- Impotence (rare)

Long term side effects might be irreversible. In case of radiation induced side effects your child must be seen by a radiologist or adequate specialist.

Further information:

The study data will be collected by the principal investigators of the study. The medical data of your child will be used for evaluation of the study.

Participation in the study is voluntary. You can withdraw from the study at any time without declaration of reasons and without disadvantages in further medical treatment.

In case of withdrawal of the study, existing personal data can be destroyed if desired.

If you want to change your decision at a later time, please contact the study office.

There will be no disadvantages for your child concerning further therapy.

Legal requirement concerning confidential medical communication and data protection will be complied with in this study. Only pseudonymized data i.e. without using names will be used for study purposes. Third parties will not gain insight into original medical records or study data.