

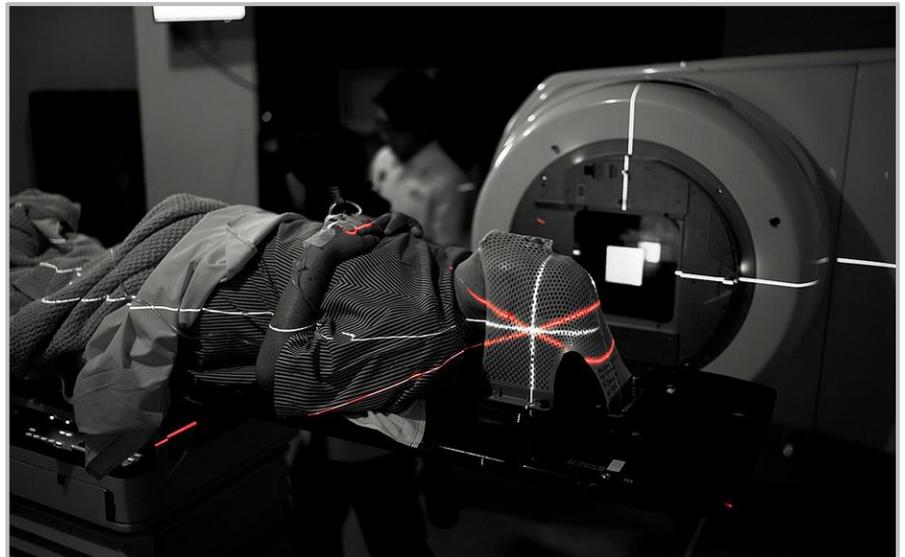
TECHNOLOGY OFFERS

Rapid Prototyping Produced Patient Mask for Precise Positioning in Radiotherapy (P-806)

Automated manufacturing of fixation devices for patients head during radiotherapy of brain tumors

EXECUTIVE SUMMARY

The novel technology describes a noninvasive procedure, where the patient mask is produced by rapid prototyping based on data derived from previous digital imaging data from computer tomography (CT) or magnetic resonance imaging (MRI), positron emission tomography (PET) as well as optical, ultrasound (US) or laser-based scanners. First the reproduction of individual head surface from CT/MRI images is obtained. Subsequently the reprint of anatomical structures has to be established. Here it is important to eliminate all possible artifacts in order to create a proper surface contour of the head. The imaging data is transmitted to a rapid prototyping apparatus as readable data. With this readable data the rapid prototyping apparatus establishes a surface model, which can be used as a patient fixation device (mask).



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https://commons.wikimedia.org/wiki/File:Positioning_verification_radiotherapy.jpg

<p>Category</p> <p>Devices, Software</p>	<p>Indication</p> <p>Radiotherapy</p>	<p>Development stage</p> <p>Prototype</p>	<p>Seeking</p> <p>Licensing, Development Partner</p>
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BENEFITS

- Less manpower required due to automatic software producing the mask
- Mask can be produced in advance to the radiotherapy treatment
- No direct involvement of the patient required

TECHNOLOGY BACKGROUND

Radiotherapy is a well-established method to treat certain tumor types in particular brain tumors. In order to direct the beam at the correct spot of the lesion it is necessary during treatment to keep the head of the patient positioned exactly at the same position. For fixation a “mask” is used, which is connected to the plate where the patient is located on. To manufacture the mask the patient has to be involved in a procedure for the plaster cast, which is uncomfortable and painful.

Development of a software suitable for reproduction of CT/MRI images, establish contour of the head as well as transmitting data to a rapid prototyping printer to manufacture the patient’s mask.

DEVELOPMENT STAGE

A prototype has been tested successfully with patients. For market launch the software has to get certificate.

APPLICATIONS

Software can be used for automated manufacturing of fixation device of patients head for radiotherapy of brain Tumors.

INTELLECTUAL PROPERTY

Patent application submitted. Patented.

- US Provisional (US 08154476.9) “Method to Derive Anatomical and/or Pathological Structures from Data of Imaging Technologies” has been filed April 14th in 2008.
- A subsequent PCT application was published as WO2009127389A1, which was nationalized in Europe (EP2273923A1) and USA (US8369925B2- granted).

PUBLICATIONS & REFERENCES

- Haefner MF, Giesel FL, Mattke M, et al. 3D-Printed masks as a new approach for immobilization in radiotherapy - a study of positioning accuracy. *Oncotarget*. 2018;9(5):6490–6498. Published 2018 Jan 8. doi:10.18632/oncotarget.24032

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Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg.