

# An integrated IT-platform for personalized healthcare in oncologic ENT treatment

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## Introduction

Treatment of head and neck malignomas is a patient individual long-term process, which requires collaboration of interdisciplinary departments. An appropriate handling and interpretation of diverse information such as pretherapeutic imaging, histologic findings, molecular properties of the individual tumor, specialized therapy decisions and a precise planning due to the complex anatomy are required. However, current IT systems and paper based records do not reflect the actual clinical data flow sufficiently.

## Methods

A web-based clinical information system *Tumor Therapy Manager* (TTM) has been designed and implemented as modular software architecture. TTM has bidirectional interfaces to existing hospital information systems and surgical planning software. The system integrates a large set of aspects from heterogeneous data sources so that a personalized patient model is created. The patient model allows different views and structured queries, which are not possible with existing systems today. It supports the individual treatment process by intelligent document handling and electronic information exchange over the perioperative process phases as well as between departments (e.g. radio therapy or surgery).

## Results

The TTM system efficiently combines conventional text and image-based information with 3D patient models to support the entire diagnostic and treatment process comprising panendoscopy, therapy decision within tumor board, surgical intervention, radio(chemo)therapy, and follow up. 3D models of the individual anatomy for diagnosis and intervention planning improve the spatial assessment of small and complex structures and in particular the distance to risk structures. Additional modules build a scientific research platform (onkoFlow) that enables scientific evaluations, clinical study management and quality management.

## Conclusion

The proposed system forms the basis for a completely integrated and personalized oncologic treatment process. Patient data from heterogeneous sources are integrated into a consistent patient model that is accessible with well-designed user interfaces and offers a structured view onto the patient to foster personalized medicine.