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## **Who benefits from a cochlear implant? Using artificial intelligence and machine learning to predict hearing outcome after cochlear implantation**

Introduction: To date, there is little evidence on the interaction of pre- and intraoperative factors that influence hearing outcome after CI implantation. Predictive models are a way to consider a large amount of heterogeneous data and combine them in an appropriate way. This is done using multi-modal machine learning techniques as a form of artificial intelligence (AI) in medicine.

Aim: The aim of this project is to develop and validate a predictive model for patients with cochlear implants. This should enable an objective indication and preoperative prediction of the postoperative hearing outcome.

Material and methods: To achieve the project goal, five work packages were created in which an analysis of potential individual influencing factors is calculated using machine learning. On this basis, an AI-supported explainable prediction model will be developed that learns to perform a preoperative selection of patients by retrospectively analysing pre-, intra- and postoperative data as well as hearing outcome.

Outlook: The great innovation potential of the project at the interface between medicine, IT, and computer science is an opportunity to significantly objectify and improve the cochlear implantation process.