SCIENTIFIC RESEARCH PROJECT PROPOSAL – TEMPLATE – PLS WRITE DOWN IN ENGLISH

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Title of SRP project: Predicting recovery of functioning following oncological surgery

Location of SRP project: Amsterdam UMC, dept Rehabilitation Medicine (location VUmc)

Introduction

For patients diagnosed with lung, oesophageal or gastric cancer surgical, removal of the tumor provides the best chance of long term survival. Surgery is in many cases supported by systemic therapies, such as chemotherapy or immune therapy, radiation therapy or combinations of them.

Both the disease and treatments impact the functioning of patients and, when not properly addressed, might lead to long term loss of function or the ability to live independently.

When acknowledged and addressed in time deterioration of function might be prevented. To date we have only little insight in which factors contribute to long term loss of function. Data analysis may provide early predictions of loss of functioning allowing for timely interventions such as tailored exercise programs or dietary intervention.

Description of the Problem and SRP Project
This SRP project is part of several larger studies in the field of peri operative research aiming to optimize functioning following cancer treatment. We are particularly interested in the value of functional status derived from healthcare professionals' notes.

Both cleaned and raw datasets, containing approximately 2250 patients will be available to the student. There are a secured research cloud (Mydre) and a High Performance Computer (HPC) in place to perform the data analysis. We make use of structured and unstructured data. The datasets consist of highly detailed, manually filled and cleaned surgical datasets containing over 100 variables for each individual patient spanning the complete care trajectory with over 10 years of data. One of the datasets has structured information on the functioning of patients over their complete care trajectory. This is the result of a predeveloped finetuned Bert model (MedRoBerta) that extracts information on functioning from the clinical notes in the electronic health record of the patient. For additional information we also have access to the raw text- and structured data of all patients.

All data will be accessible for the students and medical ethics approval has been acquired.

Research objective and research questions
RQ1: Can different recovery trajectories be identified from the patient data following oncological surgery?

RQ2: Which patient characteristics are associated with the different recovery trajectories?

Expected results
A list of patient characteristics to optimize the care pathways and an SRP report answering the research questions.

The results of the SRP reports will be used to further our research and optimize the care pathways.

References

Meskers CGM, van der Veen S, Kim J, Meskers CJW, Smit QTS, Verkijk S, Geleijn E, Widdershoven GAM, Vossen PTJM, van der Leeden M. Automated recognition of functioning, activity and participation in COVID-19 from electronic patient records by natural language processing: a proof- of-concept. Ann Med. 2022 Dec;54(1):235-243. doi: 10.1080/07853890.2021.2025418. PMID: 35040376; PMCID: PMC8774059.

Chen, S., & Vossen, P. T. J. M. (2026). A cheap lunch: Synthetic annotation with reduced human effort for medical text mining. In Proceedings of the 15th Language Resources and Evaluation Conference (pp. 813–822). European Language Resources Association (ELRA). Aclanthology.org

A-PROOF | AI based Prediction of Recovery of Functioning

GenAI Authenticity Statement

I accept my responsibility to follow the SRP Rules and Guidelines document fully, including its Generative AI (GenAI) policy (in Section 16.3). I also certify that I am fully responsible for all the content in this document and that I only used GenAI tools (if any) for the purposes I disclose below.

I did not use any GenAI tool in any way as part of my SRP proposal.