GEMINI: DIGITAL TWINS OF ISCHEMIC AND HEMORRHAGIC STROKE

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INTRODUCTION

The introduction of Digital Twins in Healthcare for stroke opens up unmet opportunities to improve treatment, management, and trial design involving stroke patients.

Digital Twins in Healthcare represent patients by integrating all information for this specific patient. This allows the simulation of (new) treatments giving valuable insight into patient-specific treatment selection and illustrating potential complications such as thrombus fragmentation during thrombectomy.

METHODS

Gemini brings together a consortium of 19 organizations from 12 countries including computer science institutions, hospitals, large industry, and small and medium enterprises.

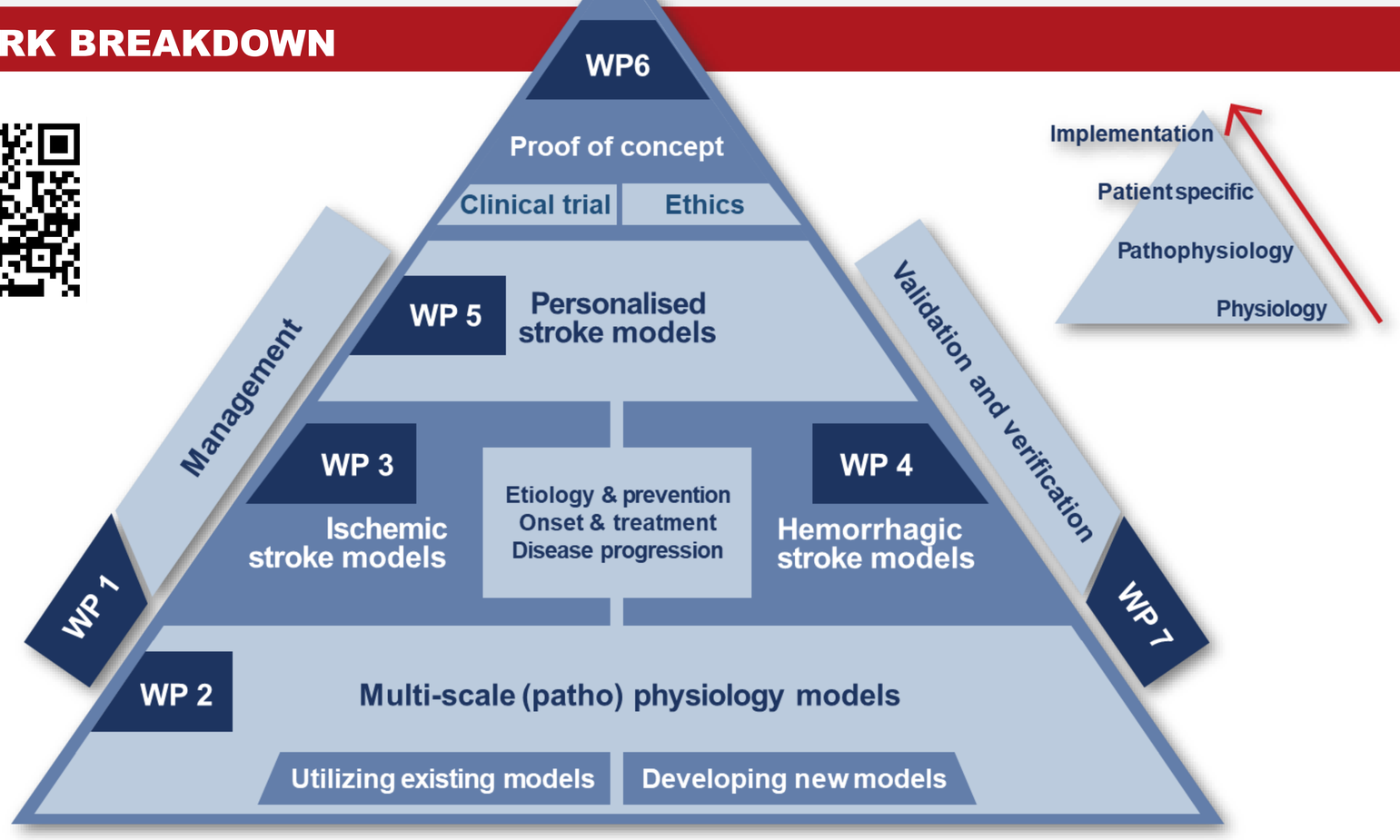
Gemini will address a large scale of aspects of stroke from fundamental physiological cascade initiated with the onset of stroke up to the patient-specific functional deterioration after a treated stroke.

RESULTS

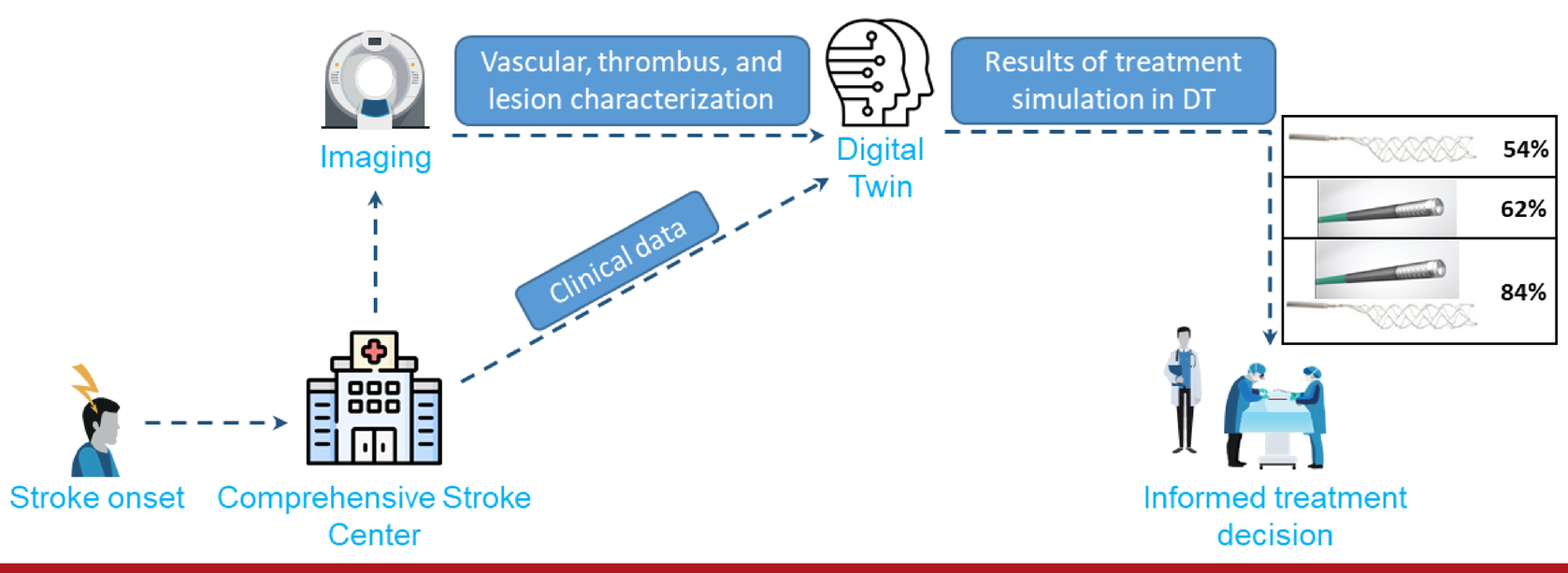
Gemini will bring mechanistic models of cerebral blood flow, brain perfusion and metabolism, and thrombosis to generate population-based stroke digital twins. Population-based digital twins will subsequently be utilized to enable patient-specific digital twin generation.

The value of the availability of a digital twin in clinical practice will be evaluated in a clinical trial in which the outcomes of patients will be evaluated for situations with and without the availability of digital twin results.

WORK BREAKDOWN



IMPLEMENTATION & EVALUATION



CONCLUSIONS

Gemini will establish and make available Digital Twins of stroke patients, which can be used to improve fundamental understanding of the complex physiological processes involved in stroke, the treatment selection of specific patients, the development of novel treatments, and the design of clinical trials.

what is a DIGITAL TWIN

A digital twin in healthcare is a computational simulation that predicts “quantities of interest” supporting decision-making within a specific “context of use” in healthcare.

There are 3 levels of digital twins in healthcare

- Generic: A predicted value is within the range of the values measured experimentally in a reference population
- Population-specific: A predicted value is sufficiently close to some central property (e.g., mean, median) of the range of the values measured experimentally in the reference population.
- subject-specific: A predicted value is sufficiently close to the value measured experimentally in each individual in the reference population

CONTACT INFORMATION

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