

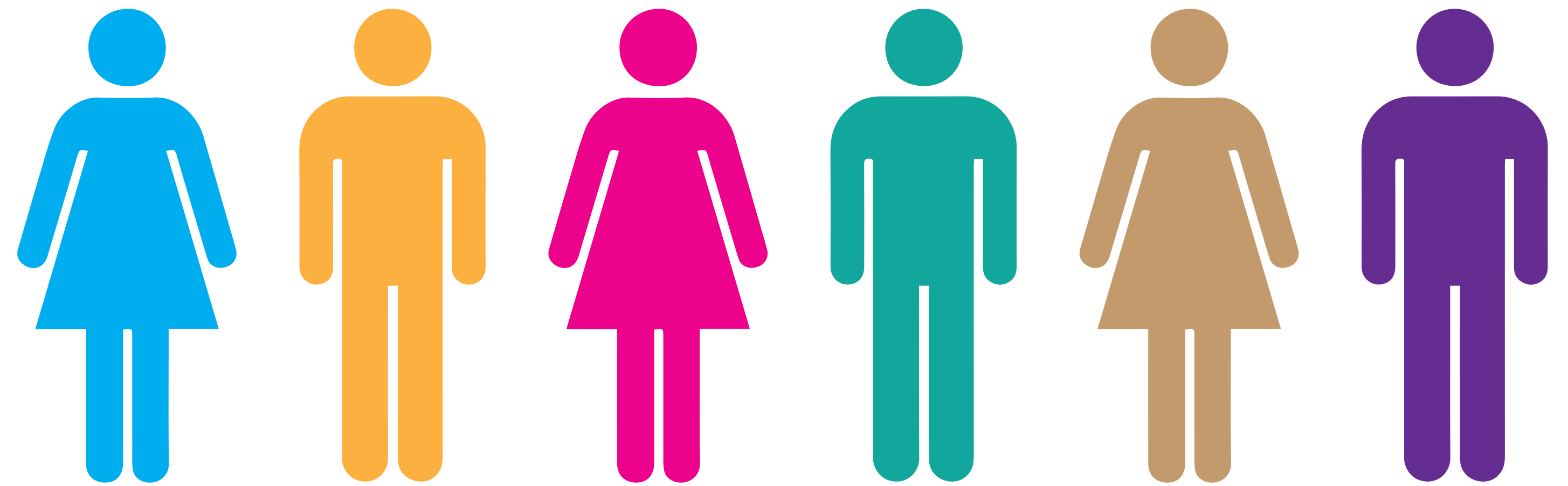
Improving quality of life in physical rehabilitation

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UNIVERSES OF ONE

Persons in need of physical rehabilitation often form a so-called ‘*universe of one*’: their condition, needs and potential are so specific that each individual requires a personalized solution for optimal treatment.

However, healthcare is becoming more expansive rapidly. Not only because of an aging population, but also because of more expensive treatments and higher treatment standards.



META-

DESIGNING REHABILITATION TECHNOLOGY THAT WORKS

Often, technology is heralded as the panacea to increasing healthcare costs. However, current rehabilitation technology is often designed in a rigid fashion, not sufficiently taking into account the needs of individuals.

We have applied the *meta-design*¹ framework in the design of TagTrainer.

TagTrainer is an interactive table-top technology for upper-limb rehabilitation training after stroke and spinal-cord injury.

It offers, beyond a pre-defined set of about 50 exercises, the possibility for therapists to modify, extend or even create new exercises.

1. G. Fischer and E. Scharff. 2000. Meta-design: design for designers. In Proc. DIS '00 (DIS '00), 396–405.



DESIGN & DEPLOYMENT TRADE-OFFS TAGTRAINER

In four deployment studies performed with TagTrainer at different clinics in The Netherlands and Belgium², we found a number of interesting tradeoffs that emerged from our design:

Therapist time vs. personalization

The prime objective of therapists is to provide the best possible care to their patients.

At the same time, their time is limited, and personalization of rehabilitation technology often doesn't fit their schedule.

Replacing vs. complementing medical professionals

Therapists were strongly opposing the substitution of regular therapy with technology supported solutions, such as TagTrainer.

However, they were in favor of complementing regular training with the use of TagTrainer, for example at home.



What helps vs. what matters

Therapists in our studies remarked that the personalized therapy exercises were highly valued by their patients. Even if an exercise would not result in a direct improvement, the increase in patient motivation itself was considered a valuable gain.

Personalization vs. validation

Law and ethics enforce the use of validated, gold-standard treatments in rehabilitation. However, it is not feasible to formally validate each personalized therapy exercises individually.

2. D. Tetteroo, P. Vreugdenhil, I. Grisel, M. Michielsens, E. Kuppens, D. Vanmulken, and P. Markopoulos. 2015. Lessons Learnt from Deploying an End-User Development Platform for Physical Rehabilitation. In Proc. CHI '15, 4133–4142.

RELEVANCE FOR SYMPOSIUM

Research on rehabilitation technology is all about improving the quality of people's lives. A major driver in my research is the question how we can create technology that better fits the needs of the individual. Specifically, my research connects to the topics ‘methodological implications’ and ‘work/life balance’. My contribution is in the experience of applying meta-design as a design methodology to increase the value of technology for the individual, especially within the field of physical rehabilitation.