

# DEVELOPMENT OF A NOVEL CONNECTION DEVICE FOR PATIENTS ON PERITONEAL DIALYSIS (PD)

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## INTRODUCTION & OBJECTIVE

The dialysis population has changed significantly with an increasing age, multi morbidity and frailty<sup>1</sup>. At the same time, home care is a major trend in health care systems for clinical and financial reasons. Overall PD usage is decreasing due to difficulties preparing elderly patients<sup>2,3,4</sup> for PD without additional support.

A first need finding<sup>5</sup> suggested that there exists the need to develop a novel auto-connect device for PD patients, to overcome current hurdles to PD use. The aim was to understand how such a device could support home care patients and what functionalities would be required to better standardize the therapy.

## METHODS

The user interface of functional prototypes were tested with more than 30 PD patients, nurses and doctors. Based on the feedback of the test persons, the functional prototypes were optimized and iterated six times over a period of 18 months.



Figure 1: Iterations of device design

## RESULTS

Designed through the patients' eyes: Eye Tracking Technology used during entire development

During the tests we identified the following needs for an auto-connect device:

- 1 a connecting mechanism to accommodate both continuous ambulatory PD (CAPD), as well as automated PD therapy,
- 2 a therapy guidance that leads the patient through drain, flush, fill, preventing user errors,
- 3 an antiseptic environment that may better protect the patients from infections
- 4 a user interface that was suited for the respective users.



Figure 2: Final design of the device

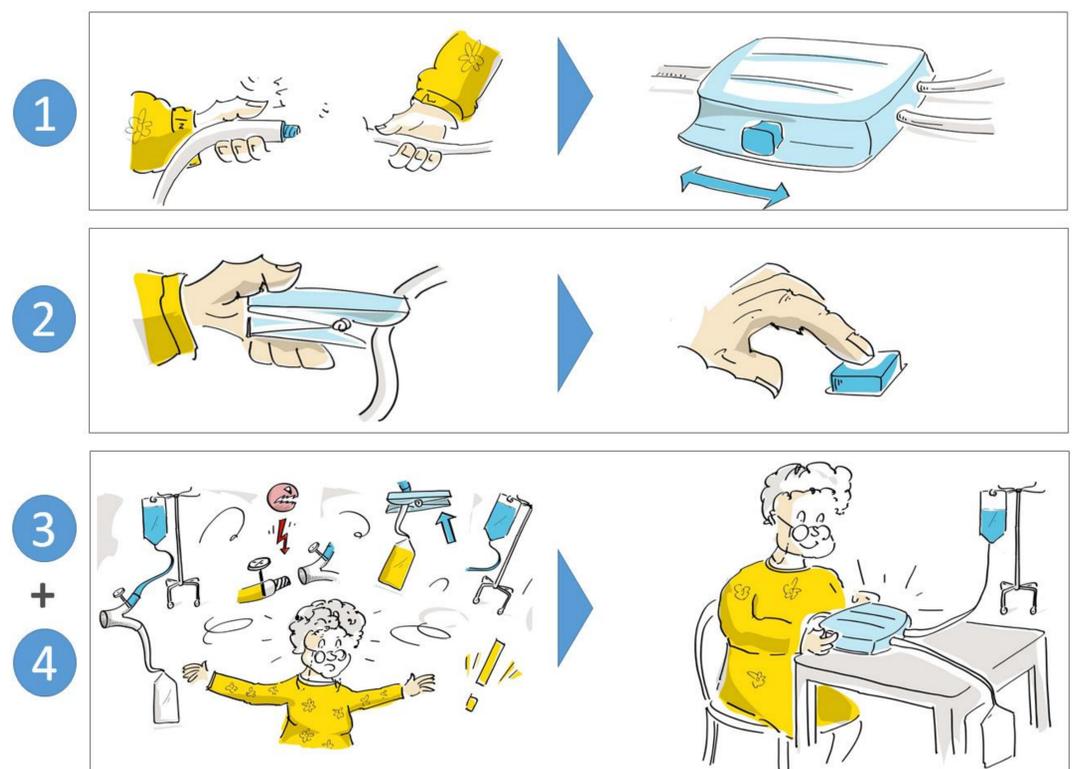


Figure 3: Showing design elements of the new device, such as replacing manual connection with a sliding mechanism operated by the patient, replacing manual clamps with buttons to push, and running entire therapy within a secluded device area, hence better protecting patients from infections.

After six generations, it was decided that these were merged in a final product design: a mechanical device, no electricity or extra software, working for CAPD and APD. Device was tested with PD patients at University Hospital Zurich, AKH Vienna, QEB Birmingham.

## DISCUSSION

The novel device could allow more patients to be treated at home, better protect these patients from infections, further standardize the PD therapy, and support assisted home care models. Further data should be collected to understand the effectiveness of the device in:

- Establishing ease of use and ease of mind for patients
- Reducing early dropout from PD therapy
- Allowing patients to PD previously not eligible
- Better protecting patients from infections
- Enabling assisted care models, relief of caregiver burden
- Standardizing training and reducing training times

## ACKNOWLEDGMENTS

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## REFERENCES

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