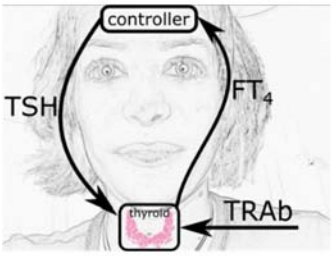
TECHNOLOGY OFFER

Computer-Aided Thyroid Treatment

Increasingly complex medical treatments and an ageing society are creating major challenges and time pressures for healthcare professionals. In addition, patients are becoming more and more health-conscious and, especially in the case of chronic diseases, have a great level of willingness or even expectation to make use of digital devices. Computer-assisted procedures have proven to significantly enhance the quality of treatment in a huge number of medical applications. However, the treatment of thyroid dysfunctions traditionally follows a manual care procedure. Exploiting the recently developed Computer-Aided Thyroid Treatment (CATT), patients suffering from a thyroid disease also are enabled to receive a more accurate, independent, personalized and time-saving high-quality treatment.

BACKGROUND

Thyroid hormones influence the metabolism in the human body. Consequently, thyroid disorders show a huge variety of symptoms and typically are restricting the quality of life. The course of thyroid dysfunctions and their treatment using appropriate drug dosing for achieving accurate desired thyroid hormone levels are highly individual. Up to now, there are no specific, universally valid treatment recommendations available and doctors have to rely on their subjective experience. Furthermore, computer-assisted digital assistants or point-of-care devices exemplarily used in the treatment of diabetes do not yet exist for thyroid diseases.



Antibodies (TRAb) stimulating the thyroid and causing hyperthyroidism. Using the developed CATT an improved therapy can be performed.

TECHNOLOGY

CATT's primary innovation involves transferring knowledge from the fields of automatic control and data science into the medical domain by describing the specific thyroid disease of a patient with the help of a so-called digital twin. Based on measurement data received with the course of the disease, the quality of the digital twin is improved. Consequently, the digital replica mirrors the actual disease progression and can be exploited to improve the applied treatment.

The digital description enables computer-assisted dosage recommendations. A first software prototype system used for dosage calculations has performed significantly better than endocrinological experts. Moreover, there is an approval from an ethics committee for the use of this recommender system within a clinical study.

Furthermore, the developed algorithms can be utilized within a digital health care device of patients or physician. It is possible to transform "simple" point-of-care devices into "digital assistants", which can be used at home, in drug stores, or in specialist practices in order to monitor the course of the disease and adapt the medication according to the patient's needs.

ADVANTAGES

- Accurate, independent, personalized high-quality treatment of thyroid dysfunctions
- Time and resource-efficient (for doctors and patients)
- Transparent and deterministic (unlike a standard treatment based on subjective experience)
- Improved quality of life

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Ref.no.: E_958

KEYWORDS:
Point-Of-Care
Drug Recommendation System
Personalized medicine
Digital Twin

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COOPERATION OPTIONS:
Licensing
Sale
Technical cooperation

DEVELOPMENT STATUS:
Prototype
Ethics Approval

STATUS OF PATENTS:
PCT Patent (EP2021073620W) application has been filed
Published (WO 2023/025388) on 02.03.2023
positive research report

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