TALLINN UNIVERSITY OF TECHNOLOGY

Pulsilaine signaali kasutamine une- ja kardiovaskulaar-meditsini rakendustes

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Background

- 20% of the population have some type of sleep problems
- Over 65% of children ages 10 and under have experienced some type of sleep problem
- The average infant mortality rate is ca 5 per 1000 live birth
  - 22% of all post-neonatal deaths are caused by Sudden Infant Death Syndrome

Background

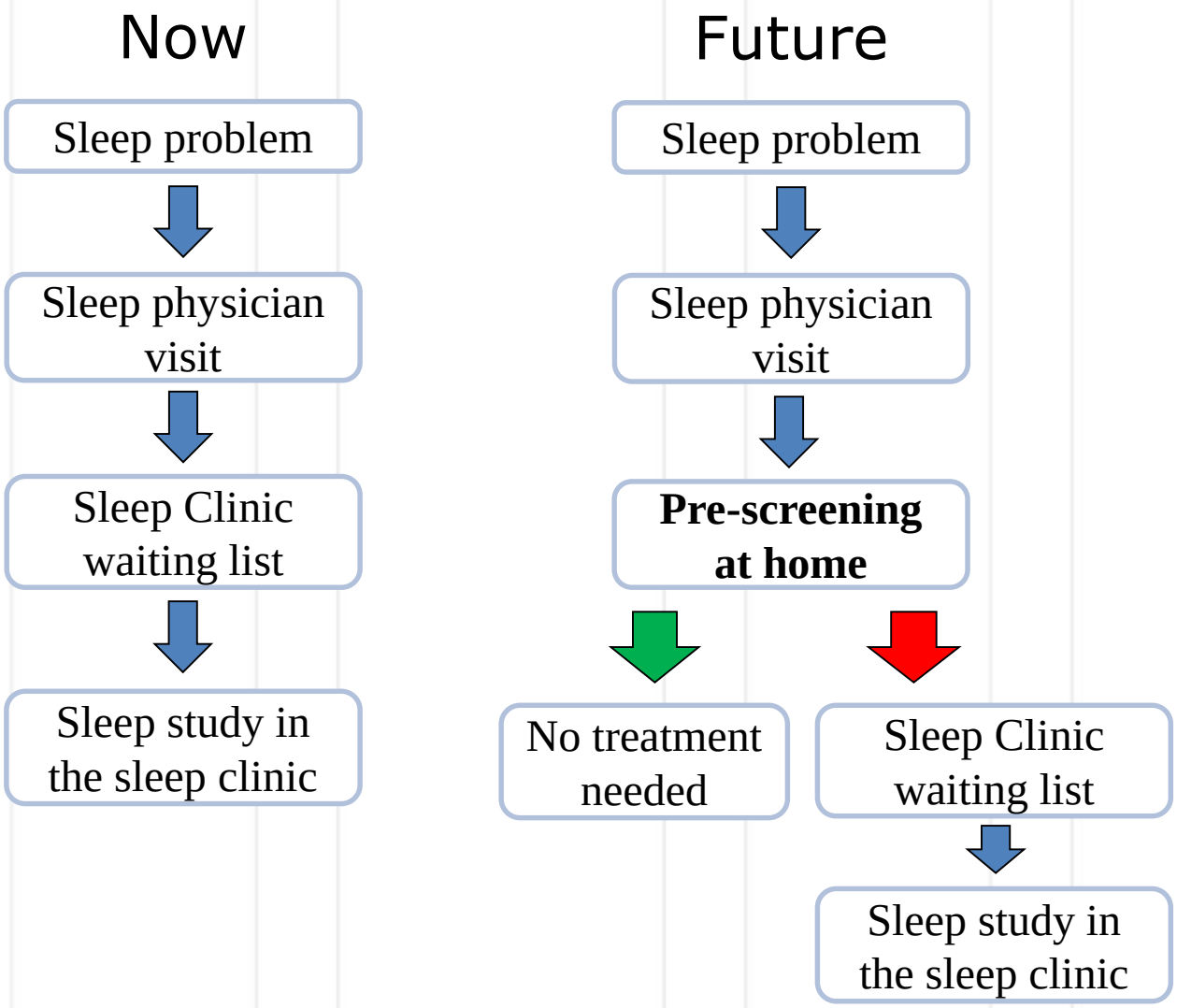
- Main types of sleep disorders
  - Sleep-Apnea
    - About 7% of the population
    - 2% to 4% of children
  - Restless legs syndrome
  - Insomnia
  - Narcolepsy
- Diagnosis
  - Plysomnography
  - Expensive and time-consuming
    - The cost of one night in sleep clinic
      - Estonia: ca 500€
      - Finland: ca 1000€
  - Average waiting time 1 to 4 years

Sleep Study vs Pre-Screening

Full Sleep Study

Pre-screening

Analysis of sleep problems

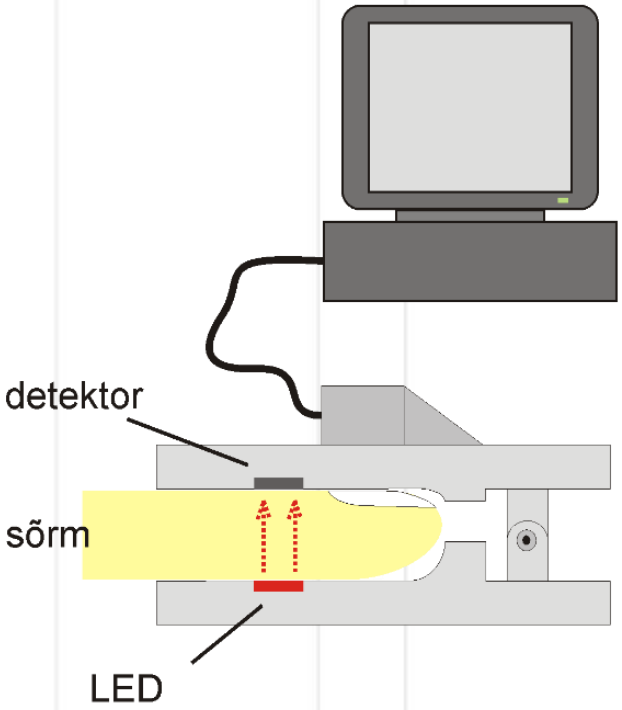


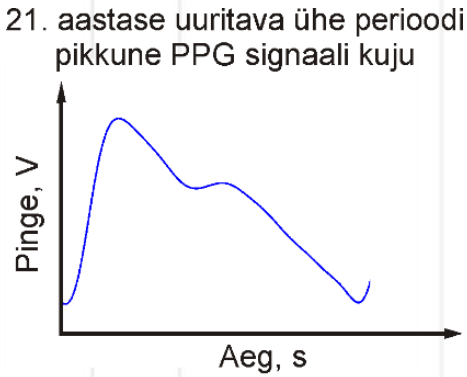
Proposed Pre-screening System

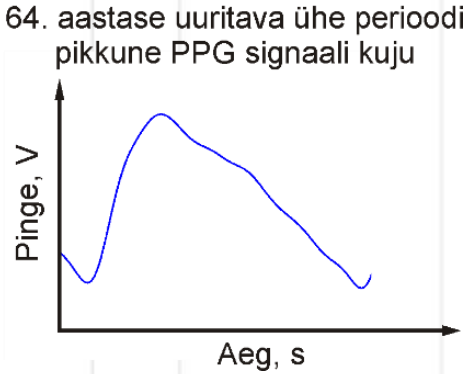
- Modular system for wide range of diseases
  - Sleep disease research
  - Estimation of arterial stiffness
  - Prediction of Sudden Infant Death Syndrome
- Mobile platform for pre-screening
  - Designed for children
  - Small weight (~30 grams)
  - Wireless data transfer
  - Real-time data analysis
  - Automatic data collection and analysis

Other Application Areas

- Estimation of arterial stiffness







Cooperation

- Ongoing
  - Technomedicum, TTU
    - Estimation of adult arterial stiffness, lead by Margus Viigimaa
  - North Estonia Medical Centre
    - Requirements from sleep clinician, Dr. E. Sõõru
- Under discussion
  - SomnoMedics, Germany
    - Optical signal quality
  - Tallinn Children's Hospital
    - Clinical trials with children
  - Clinicum of Tartu University
    - Clinical trials with children, Dr. H. Vaher