

Medical device usability and safety through design

Scope:

Designing a Single-Use Tip mechanism for medical sensing devices to prevent cross-contamination and enhance usability.

Background:

In medical diagnostics, particularly in wound care, single-use components are critical to prevent cross-contamination and ensure reliable measurements. However, due to cost pressures or user habits, these components are often reused, compromising hygiene and data integrity. This thesis addresses the challenge of enforcing single-use behaviour through mechanical design, focusing on a handheld device used to measure bacterial presence in wounds or wound dressings.

Objectives:

- Analyse user interaction and the ergonomics of the existing Odinwell's device.
- Develop and prototype two or more tip interfaces and ejection concepts.
- Ensure the design is manufacturable, cost-effective, and compatible with existing device architecture.

Methodology:

The project will be conducted in collaboration with the product development team at Odinwell and Supervisor at Chalmers.

- Conduct user research and workflow analysis in clinical environments.
- Explore mechanical locking, tolerances, hygiene requirements and regulatory considerations.
- Use CAD modelling (SolidWorks) and rapid prototyping (e.g., 3D printing) to iterate designs.
- Validate usability and safety through simulated use scenarios and feedback.

Expected Outcomes:

- A validated design concept for two or more single-use tip mechanisms that enforces correct usage behaviour.
- Documentation of design process, usability testing, and engineering analysis.
- Recommendations for integration into future product development.

About Odinwell

Odinwell is a start-up based in Mölnlycke driven by a small multi-disciplinary team. They focus on developing innovative solutions for wound care, using fiber optics and fluorescent light.

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