



STRETCHABLE ELECTRONICS ENABLING **Tumescence Measuring Wearable Patch**

INTRODUCTION

Impotence, or male erectile dysfunction (ED), is defined as the inability to get and keep an erection adequate for the performance of sexual intercourse. Worldwide, around 50% of all men above the age of 50 years old suffer from ED.

Our in-house developed smart patch enables a continuous quality assessment of the rigidity and/or tumescence of a penis during a penile tumescent event. The device would assist people who have continuous or intermittent inability to achieve or maintain an erection for satisfactory sexual penetration, and thus having an ED.

STATE-OF-THE-ART

Nowadays a few measurement techniques exist to monitor ED. This is done by subjective questionnaires or sub-optimal devices. As a 'wearable' device the Rigiscan® is best known. Although it is the first real non-invasive and standardized tool to evaluate erectile function in males, up till now, it is rarely used in practice due to a variety of issues: painful cyclic contraction of the loops, disconnection of the loops, blockage of the engine inside, low quality sleep (REM), ... resulting in low quality measurements.

TECHNOLOGY

Our proposed smart patch is a joint development of researchers at the institute for material sciences of Hasselt University (IMO-IMOMEC) and the Limburg Clinical Research Center (LCRC), a structural collaboration between Hasselt University, Jessa Hospital (Hasselt) and Ziekenhuis Oost-Limburg (ZOL, Genk). Using an in-house developed flexible and stretchable strain gauge, both the tumescence and rigidity of the penis can be continuously monitored, generating reliable data. The silicon based sensor is user-friendly and easy to use and tackles the current conventional problems of existing methods to assess ED. By the use of state-of-the-art communication technology, the urologist has quick access to the obtained data.

OUR RESEARCH AND DEVELOPMENT

The technology has been experimentally validated in a lab setting (TRL 4). First, individual silicone based strain gauges were tested and calibrated in the lab to investigate patch properties like elasticity, gauge factor, sensitivity, etc. Next, a combination of two silicone strain gauges was used to assess the rigidity and tumescence on an artificial penis. The rigidity and tumescence of the artificial penis could be altered using hydrostatic pressure. These measurements were used to assess the most appropriate form factor of the patch, thickness and other material properties next to its influences on sensitivity, reproducibility, interpatch variability etc. Based on these results an optimal design of the sensor was defined. The silicone based sensors used have been internally developed in a parallel project and can be replaced by other materials that are commercially available or in development for medical applications.

OUR UNIQUE OFFER FOR YOU

The TUWA technology offers the following unique advantages:

- User friendly erectile function measurement
- Optimal design for reliable measurements
- Combination of tumescence and rigidity measurement
- Continuous monitoring, generating a reliable dataset for interpretation by the urologist

We are looking for strategic partners to bring this technology to the market, envisioning an improvement of the diagnosis and treatment of ED patients. We are looking for partners with experience in electronics for medical applications, medical device companies and/or other organizations that can help move forward this technology to the market.

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