

Innovative ideas in Medical Technology

Smart Ambulant Monitoring of Pain

Pain in vulnerable patients is often not recognized, as pain diagnosis depends heavily on self-report and attentive caregivers who need to have intensive knowledge of the normal (baseline) behavior of the patient. Unfortunately, neither are usually the cases in nursing homes. The patient is often unable to communicate adequately and the nursing staff typically has high turnover rates. Creating a multimodal toolkit using wearable biosensors such as smartwatches and ambulant EEG devices, combined with smart software algorithms into a mobile toolkit that can be accessed through an app, we aim to overcome this problem.

My colleagues and I have extensive experience in applying biosensors in geriatric research, developing novel assessment techniques including the needed software, and of course, a lively network within the geriatric clinical research community. A company interested in this idea can co-develop the toolkit, from the proof-of-concept phase until we enter the market.

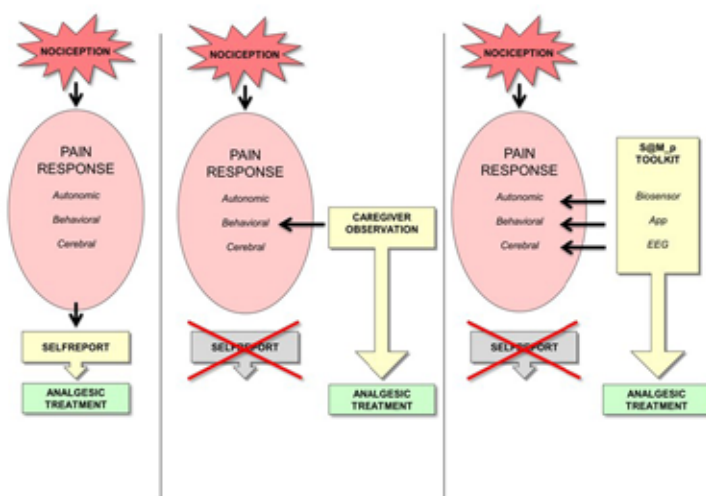


Figure 1. The response to nociception and its assessment. Nociception causes a pain response, which includes changes in autonomic, behavioral and cerebral systems. Left panel: Self-report by the patient, either spontaneous or prompted, is considered the gold standard for pain assessment and treatment. Middle panel: Observation of typical 'pain behaviors' by a caregiver is the commonly used alternative if self-report is impossible. Right panel: A toolkit comprising a wearable biosensor, an interactive software application and ambulant EEG will more closely approximate self-report.



Roxane Weijenberg, Academic Center for Dentistry Amsterdam (ACTA)