

## Practical Example

John is a 27 year old civil servant who has been suffering from episodes of panic since the age of 14 when he was extremely stressed in his boarding school. He reported a sudden feeling of anxiety, and palpitations, while his girlfriend described that he would go pale and sweaty with dilated pupils, and on occasions he would faint. These episodes occurred randomly but also after stress. A diagnosis of epilepsy was initially considered, but the symptoms were highly atypical, his routine and sleep EEG and brain MRI were normal while a 10-days video telemetry as inpatient did not capture any event. ECG, echocardiography, exercise test and Holter for 48 hours were normal, while continuous loop monitoring captured only one episode of tachycardia that was not deemed causal. Tilt table test and several autonomic tests at a tertiary center were unremarkable. He had psychiatric treatment for 7 years. He lost his job but never stopped driving. At the age of 24 years he was monitored at home with an ambulatory personal health system. Habitual attacks were analyzed on line and were identified as epileptic seizures manifested with potentially life threatening autonomic symptoms. The patient was treated with antiepileptic medication and has been seizure-free for three years. He has a new job, drives safely and is no longer at risk of sudden death in epilepsy.

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### Partners:



[www.armor-project.eu](http://www.armor-project.eu)



**Advanced Multi-parametric Monitoring and Analysis for Diagnosis and Optimal Management of Epilepsy and related Brain Disorders**

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European Commission  
Information Society and Media



SEVENTH FRAMEWORK  
PROGRAMME

## ARMOR

**An ambulatory, non-intrusive personal health system**

**To address the needs of people with epilepsy and healthcare professionals by providing accurate diagnosis, monitoring and analysis.**

Epilepsy is the commonest serious brain disorder, affecting up to 1% of the population worldwide.

The ARMOR project will combine clinical and basic neuroscience research with advanced data analysis, medical management tools and to develop novel applications for the management of epilepsy.

## Project Description

ARMOR will design a more holistic, personalized, medically efficient and economical monitoring system for people with epilepsy. The system will provide a flexible monitoring capability optimized for each patient and it will be tested in several case studies and evaluated as a wide use ambulatory monitoring tool for efficient diagnosis and management of seizures including possibilities for detecting premonitory signs and feedback to the patient.

In this project we will manage and analyze a large number of data from brain and body activities of epileptic patients and controls. New methods and tools will be developed for multimodal data pre-processing and fusion, real-time and offline data mining to discover patterns and associations. This system will incorporate models derived from data analysis based on existing communication platform solutions emphasizing on security issues and required adaptations to meet ARMOR specifications.

## Expected Results

- **Increase our understanding** of Epileptic seizures and eventually epilepsy; Other non-epileptic paroxysmal events (NEPE) and their underlying mechanisms; Relationship between epilepsies and various types of NEPE; Macro- and micro-structure of sleep and the general state of vigilance.
- **Advance novel holistic monitoring and analysis approach** by combining feasibility with advanced data analysis, medical management tools and telecommunication.
- **Guidance of diagnostic workout** before treatment and accurate assessment of treatment response.
- **Detect life threatening seizures** by acquiring relevant data at individual level and at the patient's home so that seizures could be prevented from occurring by intervening in the person's immediate environment.