



The right tools

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By Oscar Mayora - 31st January 2011

Bipolar disorder, also known as manic-depressive illness, is the sixth leading cause of disability in the world, according to the World Health Organisation. Statistics show that people affected by bipolar disorder lose on average 13.1 years of their productive life as a consequence of the illness. Moreover, unipolar major depression is considered the leading cause of disability worldwide, with 43 years lost in terms of productivity. Therefore, there is a clear need to manage and reduce the negative impact that depressive diseases have on social and economic spheres.

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Bipolar disorder is diagnosed in around one per cent of the European population, 2.6 per cent of the American, and at least one alternate manic-depressive episode occurs in around 10 per cent of the world population during their life time, according to the national institute of mental health's data. For these reasons, the European commission decided to finance research efforts targeted at supporting therapy and self-management of people suffering from bipolar disorder.

MONitoring, treAtment and pRediCtion of bipolar disorder episodes (Monarca) coordinated by [Create-Net](#) research centre with the collaboration of several international partners (EC funding of near €4m), is an example of recently funded EU projects in this field. Monarca is investigating aspects of bipolar disorder disease by adopting a holistic approach to its assessment, treatment and self-management. The project focuses on objective assessment and prediction of bipolar disorder episodes and aims to advance the discovery of new markers for this disease...

Monarca is based on an innovative system, which consists of five main components: a sensor-enabled mobile phone, a wristworn activity monitor, a novel - sock integrated – physiological sensor (GSR, pulse), a stationary electroencephalography system for periodic measurements and a home gateway. Monarca will combine GPS location traces, physical motion information, and recognition of complex activities into a continuously updated behavioural profile that will be provided to doctors in a meaningful way to support the treatment. The information based on sensing technologies will be used as an objective basis for discovering trends and predicting episodes of bipolar disorder.

As a result, the patient's medical record will correspond more accurately to the patient's condition and the medical staff can elaborate their diagnosis based not only on self-reported experiences by the patient, but also on objectively measured information, sourced from the physical and physiological sensors.

Monarca includes a system where people affected by bipolar disorder will be aided by mechanisms of self-assessment, provision of warnings and risk profiles through persuasive coaching to support self-treatment. On the other hand, the medical staff will also have access to interfaces for interpreting patient data, therapy assessment, medication planning and scheduling visits tools.

Monarca's research effort is based on close collaboration with two hospitals serving as partners of the project, allowing patients and doctors to be involved from the early stages. In this way, patients and therapists can cooperate with researchers and provide their feedback and requirements about usability and interaction in order to maximise system adoption and give patients an active role in the decision-making and self-management of their disease.