Supporting physical activity as part of intelligent digital management of chronic conditions

P. Curzon, N. Fenton, D W R Marsh and A Alomainy
Queen Mary University of London

Presented at the
GetAMoveOn Network+ workshop: Using technology to support physical activity in older people,
London, June 2017.

A major impact of chronic disease is often that it restricts physical activity. Intelligent sensor-based technology may be able to help clinicians and patients better manage conditions together to improve this situation. The EPSRC Funded project, PAMBAYESIAN, starting in the summer of 2017 aims to help patients with chronic diseases take day-to-day decisions about their care and activity and so rely less on advice from medical staff. Increasingly, there are low cost and highly portable sensors that can measure a wide range of physiological values. The project will explore how such 'wearable' sensors and other inputs might be combined to improve the way that chronic conditions are managed. Remote monitoring of patients is already in use for some conditions but there are barriers to its wider use: it relies too much on clinical staff to interpret the sensor readings; patients, confused by the information presented, may become more dependent on health professionals, whose work may be increased rather than reduced. The project seeks to overcome these barriers by addressing two weaknesses of the current systems. First is their lack of intelligence which we will address using a method called Bayesian Belief Networks. The second weakness is in mismatches between the design of the technical system and the way the people - patients and professionals - interact. We will work on these two weaknesses together. Case studies include diabetes in pregnancy, which can be alleviated through exercise, and the management of rheumatoid arthritis, which both restricts physical activity, and where the person's ability to do physical activity and the pain involved is likely to be a critical input to the system.