Agitation and aggression monitoring in dementia

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A rapidly aging population means an increased likelihood of the diseases of old age becoming more prevalent and more problematic for those afflicted with such illnesses, their family and carers, and overburdened healthcare services. In particular, dementia, of which Alzheimer's disease is perhaps the most well-known form, requires long-term care to manage the negative behavioural symptoms. These are notoriously agitation and aggression.

The prevalence of dementia in the under-70s is relatively low, but incidence approximately doubles from the early 70s to the late 70s, into the 80s and late 80s and by the early 90s incidence is 41 percent. Almost half of people in their late 90s have dementia of one form or another.

Now, Philip Moore of Birmingham City University, UK, and colleagues elsewhere in the UK, in Japan and Spain have studied how processing patient monitoring data might be used to identify when newly diagnosed patients are entering a phase of their illness where agitation and aggression will begin to cause problems. The tools they are developing and the discussion they hope to instigate focuses on the potential for secure monitoring and assessment. This might allow those with the early stages of the disease or who are relatively symptom free to carry on with independent assisted living (IAL) without there being an increased risk of the sufferers harming themselves or others.

The team points out that modern "smart" phones, which have movement sensors and gaming consoles, such as the Microsoft Kinect system with

its cameras and microphones could be used to non-invasively monitor a patient's movements and voice patterns. It could theoretically distinguish between everyday movements and sounds and otherwise uncharacteristic violent movements or shouting.

The team's preliminary findings suggest that the main challenges lie in the effective realisation of IAL. However, achieving this is a primary objective of multi-disciplinary research involving both clinicians and computer scientists who are developing the software and non-invasive sensor technologies that can be implemented in mobile systems. The team points out that regardless of whether specialized sensors are involved in monitoring or a gaming console with its camera and microphone, the issue of processing and tagging the large amounts of data generated for each patient being monitored is an important one for those looking at the context and knowledge locked within.

More information: "Detection of the onset of agitation in patients with dementia: real-time monitoring and the application of big-data solutions" in *Int. J. Space-Based and Situated Computing*, 2013, 3, 136-154.

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