Measuring functional activities of patients in a stroke unit: Comparison of a sensor based Real Time Location System with the Observational Behaviour Mapping Technique

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Introduction:

To overcome the limitations of the current activity monitoring methods and to effectively investigate early stage functional activities post stroke, we are developing a new computerised Real Time Location System (RTLS).Having previously established excellent RTLS reliability (Intraclass Correlation Coefficients≥0.90), this study aims to determine its validity by comparing it to the Observational Behaviour Mapping Technique (OBMT).

Methods:

All rooms routinely accessed by patients are fitted with infra-red room locators which send their location codes to specialised Radio-Frequency Identification (RFID) tags. The RFID tags that have in-built motion sensors transmit their location and movement signals to a computer. All participating patients and staff members wear the tags and additional tags are attached to equipment like walking-aids and wheelchairs.
Simultaneously, on various days, OBMT is being used to record patients' location, interaction and activity every ten minutes.
Descriptive statistics and Pearson's Correlation Coefficients (PCCs) are being used for statistical analysis.

Results:

So far, we have analysed the results for the location category of three patients and have observed only small differences between the two systems for mean time spent in own room (diff=7min; OBMT=550, RTLS=557) and in therapy room (diff=4min; OBMT=90, RTLS=86).
Further analysis will involve comparing the methods for time spent in categories like interacting with staff members, doing therapeutic and non therapeutic activities and using equipment.

Conclusion:

Based on results, we hope to determine that the RTLS is a valid system for continuous, unobtrusive patient activity measurement and can provide much needed quantifiable information about functional recovery post stroke.