



IAPM Young Investigator's Grant 2012 Report

Project Title:

Expanding the Role of the Medical Physics and Bioengineering Department in the Clinical Environment: Development of an mHealth mobile Application (Apps) Resource for Clinician-Led Initiatives.

Opportunity:

Medical Physics and Bioengineering (MPBE) departments have an important role within hospitals to meet and improve standards of healthcare as well as conducting innovative research. With the advent of mobile smart-device technology (e.g. iPad) many physicians across the world have integrated these into their professional work - even at the point-of-care. One of MPBE's objectives is to be a forerunner in the support and development of Apps for clinician-led initiatives within St. James's Hospital in order to develop new methods of healthcare delivery, supported by technology.

Aim/Objectives:

A successful feasibility study had been conducted by the Applicant prior to the onset of this project. The Applicant aimed to then establish MPBE as a leader of a clinical App development resource at the hospital. This aim was to be addressed via the development of two Apps which could be used by clinical personnel - particularly those in the geriatric/ageing field.

Methods:

Two Apps were designed and prototyped. The first App, with working title "iGaitTUG"; and the 2nd with working title "SHARE-FI". The Irish Longitudinal Study on Ageing (TILDA) provided data for the 1st App giving population normative data of adults over 50 years of age (controlled for age, height, and gender).

The literature was assessed to identify data/algorithms required for the Apps to work from. The Apps were designed (paper based) in parallel and consultation took place with experts in the field as to the suitability of the functionality and capabilities of the Apps. Task analysis of both were used to give a skeleton of the App features, functions, and screens. Devices were purchased to allow testing of the Apps. Apps were coded for "Apple" devices and iterations of the designs took place after consultations. The 1st App (iGaitTUG) went through for feedback testing with potential expert users - a physiotherapist, a bone health specialist, and a research nurse in mobility and ageing. A further iteration of the design was completed and the App is now in clinical trials (headed by Tim Foran at MPBE, St. James's Hospital) for >6months as part of a larger research study.

Outcome & Discussion:

The 1st App has been developed into a full working App and is undergoing clinical trials. The design of the 2nd App is being finalised and prepared for feedback studies. More importantly, a new process has been created for developing Apps in the clinical environment as well as having attained improved design skills for new Apps in the future. Preliminary work has been presented at the Innovation Strand of the IAPM ASM 2013.

Other Apps are currently being designed in parallel, with close collaboration between MPBE with other clinical groups at the hospital who have expressed needs. As such, we have found a scaling demand for Apps within the hospital environment. Industrial collaborators will also be required to meet the demand, although it is important that the full design for outsourced Apps is worked up first between MPBE and the clinical group (with prototypes) before having Apps programmed by industry. That is, while some Apps can be completely designed and developed into working Apps in-house, others can have their programming aspect outsourced.

MPBE have easy access to clinical staff who can be more readily available than if they were interfacing directly with outside industry. We also tend to be in close proximity on a daily basis giving opportune informal encounters to discuss design points. We also have a shared understanding/language and can be flexible to specific design requirements as they arise. These all provide arguments in favour of an in-house App design and development resource which is in operation at St. James's.

Closing:

I wish to express my thanks to the Irish Association of Physicists in Medicine (IAPM) for providing funding through the Young Investigator's Grant 2012. This grant has given me valuable experience in grant writing (as other successful applicants have noted) and further developed other technical and research skills. The funding provided for essential equipment needed for developing not only the Apps in this project, but also infrastructure and resources to be carried forward for the continued development of the "mHealth App Development (MAD)" Service in the MPBE department at St. James's. As such, a number of additional projects are already underway from interested clinical groups at the hospital.

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