What Can Rehabilitation Engineering Offer Telecare Services?

Final Report of the Rehabilitation Engineering into Telecare Services (RENTS) Project

Birmingham City Council

skillsforcare

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Tunstall

Birmingham Community Healthcare NHS
NHS Trust

Coventry University

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Acknowledgements

This report provides a summary of the findings of a 6 month project known as Rehabilitation ENgineering into Telecare Services (RENTS) funded by Skills for Care. RENTS is led by Birmingham City Council, in partnership with Coventry University, Cardiff & Vale University Health Board, Birmingham Community Health NHS Trust and Tunstall Healthcare (UK) Ltd. The project team were as follows:

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1. Executive Summary

Telecare in the UK is widely viewed as a key element of integrated service provision as we strive to meet the increasing demands placed on social care and health services. This demand is driven by population demographics, the increasing incidence and prevalence of long term conditions such as diabetes, heart disease and COPD and the desire by service users to live independently in their own homes for as long as possible.

Telecare Services have grown rapidly in the UK over the last decade and this has placed demands on the existing workforce to adapt and develop to deliver effective telecare services. In addition there have been a number of new and emerging roles in the telecare field such as technology development officers and telecare specialists. The profession of rehabilitation engineering can offer an existing professional framework for job roles that combine service user facing assessment and provision skills alongside technology based skills and expertise. This view has been tested through this project, Rehabilitation ENgineering into Telecare Services (RENTS), by placing a rehabilitation engineering practitioner into the Birmingham Telecare Service for 3 months.

The findings suggest that rehabilitation engineering (RE) professionals could have a positive impact and add value in areas of Professional Practice, Client Based Competencies, Equipment Management, Service and Equipment Development.

It is recognised that there are a range of skilled and experienced staff working in Telecare Services, either directly employed or as contractors, already delivering many of the functions described in this report. It is believed that the examples of RE professionals' competencies and areas of application highlighted in this report demonstrate that there are opportunities to explore telecare service workforce development and skill mix that would include consideration of such roles within Telecare Services. Such an approach can only lead to improved outcomes for service users.

There are many different models of telecare service delivery across the UK, this report recognises and acknowledges that there can be no one size fits all and recommends collaborative approaches to further exploring opportunities both at national and local level for Telecare Services to make the best use of RE professionals.

2. What is Rehabilitation Engineering?

a. Scope of Practice

Traditionally, Rehabilitation Engineering is the application of engineering principles and technology in the provision of services, design, research and development to meet the needs of disabled people. It may include assessment of an individual's need for assistive technology, recommendations for assistive technology provision, equipment management, and novel technology design, building and testing of bespoke solutions. From this definition it is clear that provision of rehabilitation engineering could extend beyond services for disabled people and include frail elderly and those with long term conditions, where such people require technological solutions as part of integrated health and care services.

b. The Skills and Competencies of Rehabilitation Engineering Professionals

The Skills and Competencies of rehabilitation engineering professionals can be broadly categorised as follows:-

Professional Practice

- Have an appropriate working knowledge of the legal and ethical framework that technology services operate in, be able to communicate appropriately with service users and key service stakeholders.

Client Based Competencies

- Assess service user needs that can be met by technology solutions
- Recommend technology solutions to meet those needs
- Commission/Install/Configure/Integrate technology
- Design technology solutions
- Train Service Users in the use of technology

Equipment Management

- Inspect, repair, manage repair services, manage installation services etc.
- Quality assurance, safety and efficacy of equipment

Service and Equipment Development

- Service and technology innovation, design bespoke solutions for individual service users. Introduce new assessment and measurement technology.

c. The Profession of Rehabilitation Engineering

The profession of rehabilitation engineering has been primarily, but not exclusively, adopted within the NHS. In terms of NHS professional groupings, the rehabilitation engineering profession is one of 52 within the healthcare science umbrella and as such is part of a Department of Health led large scale UK wide strategic modernisation programme for the healthcare science workforce, Modernising Scientific Careers (MSC). The MSC programme has developed career pathways, regulation, standards of education and training, as well as developing education and training programmes.

Through MSC, there are now 5 clearly defined roles in rehabilitation engineering, providing a flexible career pathway structure. Three of the newly defined roles are relevant to this report:-

Healthcare Science Associate

- Undertake routine protocol based activities which can include direct service user contact, may work across a number of specialisms

Healthcare Science Practitioner

- Independent work in specialist technology area, innovative solutions, manage solutions

Healthcare Scientist

- Direct and develop service, conduct research, independent management of service users

Note that this report uses the term rehabilitation engineering professional (RE professional) to denote someone who works in the profession of rehabilitation engineering. Where it is important to identify the level of the role, the terms identified in the above section are used (healthcare scientist, healthcare science practitioner, healthcare science associate). For clarity, in Section 5 rehabilitation engineering professional skills and competences are not separated using the defined roles detailed above as this is beyond the scope of this report.

A key principle of MSC is that there are clear pathways through from each career stage and this is reflected in the education, training and service structure for such posts.

The Institute of Physics and Engineering and Medicine (IPEM) is the UK professional body for Rehabilitation Engineering, (http://www.ipem.ac.uk/). IPEM have worked very closely with the MSC team to ensure that education, training and regulation of the rehabilitation engineering profession will meet service needs now and into the future.

Registration and regulation of the healthcare science profession is currently evolving and the picture is somewhat complex. Healthcare scientists are registered through the Health and Care Professional Council (HCPC). Healthcare science practitioners are currently registered through the Voluntary Register of Clinical Technologists (VRCT). The VRCT is likely to be replaced in due course by the newly established Academy for Healthcare Science which has responsibility for developing coherent and consistent accredited voluntary registers for practitioners and, possibly, associate practitioners.

In addition, the IPEM has a licence from the Engineering Council to award professional registration to its members working in fields such as rehabilitation engineering. There are three routes towards professional registration, which broadly align to the three career pathway roles outlined above:

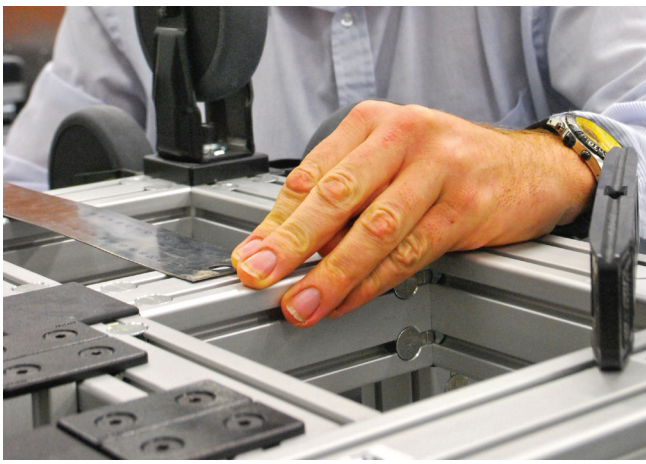
- Engineering Technician (EngTech).
- Incorporated Engineer (IEng), and
- Chartered Engineer (CEng);

Engineering Council registration is generally more transferable in a broader engineering context, both nationally and internationally, than service based registration and both should be encouraged and supported.

The Rehabilitation Engineering Services Management Group (RESMaG) has a strong focus on rehabilitation engineering service based issues and supports those involved in delivering services across the UK. RESMaG (http://resmag.org.uk/) has worked closely with IPEM to produce a series of competency statements, outlining the competencies that can be expected from RE professionals working in a range of services.

"We need to work with local telecare providers to offer our expert RE Services into these emerging new technology services so we can deliver real benefits to service users"

Dave Harrison
Clinical Engineering Services Senior Manager
Posture and Mobility Service,
Birmingham Community Healthcare NHS Trust



d. Education and Training

Education and training for the rehabilitation engineering profession reflects the changing landscape of the profession, driven by the MSC programme.

Healthcare scientists follow a graduate entry process, utilising a specific, funded training programme that includes a relevant, accredited MSc.

Healthcare science practitioners are required to undertake an accredited degree programme in clinical engineering, which has a specialist theme of rehabilitation engineering.

"We need to ensure that education and training in rehabilitation engineering meets the needs of new and emerging services such as telecare and telehealth"

Simon Fielden
Director of HDTI, Coventry University

Recognising the value of recruiting healthcare scientists and practitioners from a diverse range of backgrounds, equivalence assessments are currently being developed by the Academy of Healthcare Science and these will be implemented in due course.

Healthcare science associates are educated and trained through a higher apprenticeship or foundation degree. Many organisations are familiar with developing their wider support workforce using these education routes and already have arrangements in place. Through MSC there is currently a national learning and development framework being created that will provide a national curriculum for healthcare science associates.

e. Assistive Technology Services Currently Supported

Rehabilitation engineering is represented mainly in traditional equipment based services such as:

- Wheeled mobility: chairs and special vehicles;
- Augmentative and Alternative Communication systems;
- Electronic assistive technology, including technology access, customised or modified controls, environmental controls, and integrated systems;
- Functional Electrical Stimulation;
- Biomechanical analysis in rehabilitation;
- Specialised orthoses (including seating) and prostheses;
- Gait analysis

3. Telecare Service Models

Telecare is commonly agreed to mean 'the use of communications technology to provide health and social care directly to the user. This excludes the exchange of information solely between professionals, generally for diagnosis or referral'[1]. It often supports exiting models of care provided to people in their own home. Typically, it may include:-

- Falls detectors
- Medication compliance devices
- Flood detectors
- Gas detectors
- Bed sensors
- Room sensors

These sensor units may be connected to a home hub that manages and controls alarms, warnings and messages into and out of the system, invoking a response normally via a monitoring centre. A service is wrapped around this technology, consisting of:-

- Referral
- Assessment
- Recommendation
- Installation
- Training
- Maintenance and Repair
- Response
- Decommissioning

A wide range of service models are now in operation, with varying levels of integration across social care, health and housing, varying levels of integration across private, public and third sector service provision and varying ranges of equipment and suppliers.

1 J. Barlow, D. Singh, S. Bayer, R. Curry, (2007) *'A systematic review of the benefits of home telecare for frail elderly people and those with long-term conditions'* J Telemed Telecare, 13, pp. 172–179

4. Project Approach

The RENTS project was resourced to work with the Birmingham Telecare Service, which is managed and delivered in a strategic partnership between Birmingham City Council and Tunstall Healthcare.

Birmingham City Council has been working in partnership with Tunstall providing the Birmingham Telecare Service since September 2011 covering a population of 1 million, with approximately 7,000 users. The service is defined as “not technology led” and plans to support 27,000 users by September 2014. The service also has strong links with The Good Governance Institute who are responsible for the delivery of the Birmingham Telecare Services Citizens Quality Assurance Programme.

“Working in Birmingham Telecare Service has opened my eyes to the benefit ands impact that could be realised by REs working in these services”

Kate Jones
Rehabilitation Engineer
Rehabilitation Engineering Unit,
Rookwood Hospital,
Cardiff & Vale University Health Board

The approach taken in the RENTS project was to embed a healthcare science practitioner in the telecare service over a period of 3 months. Practitioner level provided the most appropriate level of expertise and responsibility for this project, in particular being able to work and act independently and communicate with a wide range of stakeholders. The practitioner gained a comprehensive and deep understanding of all aspects of the telecare service. Considerable interaction took place with all staff, both within Birmingham City Council and Tunstall, involved in the provision of the service. Of particular note was the emphasis placed on practitioner interaction and involvement in the assessment, recommendation, and installation and commissioning phases of the service provision for a range of individual service users, which was particularly insightful.

A task framework was developed, in order to analyse each aspect of the telecare service process in detail and identify if the knowledge, skills, understanding and level of an RE professional was applicable to that aspect of the process. For those aspects that RE professional knowledge, skills and understanding were applicable, the benefits of such involvement were explored.

5. Findings

In effect this project has conducted a comprehensive service audit of the Birmingham Telecare Service. This was necessary in order to explore to the full the possible benefits of using RE professional in such a service. However, given the diverse range of telecare service models now in operation in the UK, the RENTS project has synthesised the findings related to the Birmingham Telecare Service into generalised observations that will deliver benefits to all Telecare Services.

For clarity, the generalised findings have been categorised using the RE skills and competencies detailed in Section 2.

a. Professional Practice

RE professionals are competent to communicate with a wide range of service users including those with hearing and speech impairments and service users with learning disabilities. They also have a good working knowledge of ethics, confidentiality, standards and legislation governing AT services.

A RE professional's practise is to identify service user goals and identifying the assistive technology to achieve those goals.

b. Client Based Competencies

RE professionals have the ability to act independently in service user facing situations that require a practitioner to rapidly appraise new circumstances or new information, which will arise from time to time in a telecare service. Examples would include a service user whose needs have changed between the assessment and installation stages. Thus, during installation additional equipment or a different configuration may be required, which would be efficiently managed by a RE professional. Another example would be the ability to fine tune an installation to provide significant performance improvement to meet a users specific needs.

RE professionals are competent to anticipate user needs changing over time and plan for this at first installation, thus ensuring as much as possible, continuity of service provision for such service users.

c. Equipment Management

RE professionals are competent to manage practical issues that arise from the delivery of an equipment provision service, such as infection control measures encountered during equipment installation, maintenance and repair, and providing additional functionality or additional equipment. Another example would be dealing with an adverse incident or safety related incidents with a service user. RE professionals are the highest reporting group to the Medicine and Healthcare products Regulatory Agency (MHRA) in the field of assistive technology.

d. Service and Equipment Development

A key strength of RE professionals is the ability to specify and design bespoke solutions for individual service users. In the context of telecare services this would focus on interoperability of telecare equipment, fine tuning of installations, and minor but significant, adaptations to improve the usability of the technology.

Telecare services often work closely with manufacturers to ensure that equipment innovations and developments are driven by user experiences and user need. RE professionals are well suited to contribute to this process and drive innovation forward at a faster pace. Such an approach would complement telecare manufactures' existing research and development activity.

In other fields, RE professionals have had a significant impact on service innovations and telecare would be no different. Innovation topics could include new approaches to risk management, service quality assurance, techniques to improve service audits and continuous improvement processes.

RE professionals have been successful in collaborating with university research expertise. Such success could lead to closer collaborations between telecare service and academic research in the telecare field. Such research would reflect service and user need and lead to high impact projects.

6. Implications for Service Improvement

The combination of a range of service user facing competences with equipment based competencies offers services the opportunity to improve service provision in a range of areas. These can be summarised as:-

- The roles of assess/recommend and install/commission/train can be combined. This offers a number of opportunities, for example delivering improved continuity of care to the service user. This could deliver both improved service efficiencies and effectiveness as the relationship with the service user will be stronger as will the knowledge of the user's needs and wishes, leading to a reduction in hand-off errors or communication breakdowns.

- Service user facing equipment issues can be managed efficiently, with the service user needs paramount. Equipment abandonment rates can be minimised by ensuring individual equipment recommendations are appropriate to a service user's needs, aspirations and abilities, backed up by suitable service user training.

- Case reviews offer the potential to identify opportunities to fine tune, adapt or replace equipment to meet user needs, to improve the installation effectiveness, or in some cases remove the installation. It offers an opportunity for learning across the whole service and implementing service improvements. RE professionals are well placed to conduct such reviews as they have an understanding and expertise across the whole service provision.

..."those of us working in Telecare services need to embrace further integration and service improvement by seeking expert support from complimentary services such as Rehabilitation Engineering"

Chris Brothwood
Business Relationship Manager
Joint Commissioning Team Adults and Communities Birmingham City Council

RE professionals have wide ranging expertise and skills in delivering person centred services and are ideally placed to work across service boundaries and deliver integrated solutions based on joined up services. Services might consider RE professionals as one of the catalysts for further change in the area of pooled budgets and service integration. This links strongly to the provision of telecare to those service users whose needs fall outside the standard equipment range or performance. This is a key aspect of RE professionals' competence, linking service user needs with appropriate equipment, for the small group of service users who need something beyond the standard equipment configuration.

RE professionals are proficient in all aspects of equipment management, which may offer opportunities for service improvement that could include management of equipment poor performance or failure, minimising equipment abandonment, and decommissioning of equipment.

Rehabilitation engineering offers those services who wish to consolidate or develop an in house technical expertise the opportunity to do this within a regulated profession. Similarly, manufacturers and suppliers of telecare equipment should consider the benefits that RE professionals could bring to their business.

Telecare services clearly need to strive to meet a range of quality standards, in particular the Telecare Services Association (TSA) Code of Practice and the Care Quality Commission Provider Compliance Assessment Outcome 11 (Regulation 16) Safety, Availability and Suitability of Equipment. RE professionals can contribute in particular with service compliance in the areas of equipment management, service user assessment and review. The view that telecare devices are not medical devices, and therefore do not need to comply with the Medical Devices Regulations 2002 (SI 2002 No 618) and the Medical Devices (Amendment) Regulations 2008 (SI 2008 No 2936), is not universally accepted in the UK. However, it is accepted that equipment provision services need to reflect best practice and good governance which would include compliance with the MHRA safety guidance Managing Medical Devices DB 2006(05). RE professionals are able to manage a compliance process against this guidance. What is clear is that telehealth devices are classified as medical devices and if telecare services are expanding into this area of equipment provision they must fully understand and implement policies and procedures that will deliver compliance against the relevant standards, and again this is an area that RE professionals can make a contribution to. Specific contributions will depend on the local telecare service model but could include monitoring compliance, implementing an equipment management system, and managing the system.

7. Implications for Workforce Development

The majority of RE professionals are employed within the NHS and thus the development of the profession is currently heavily associated with the NHS. This has led to the narrow focus of the MSC programme, which is based on NHS service needs. This represents a major challenge to the RE profession as it is clear that significant opportunities to expand this profession lie outside the NHS, either in new areas of service provision such as telecare and telehealth, or through current policy initiatives (such as Any Qualified Provider) which will diversify the current service provision base away from the NHS. The following areas need to be addressed:-

- A key requirement is to showcase the RE profession and identify new service areas and new service providers who can benefit from reshaping their workforce to include RE professionals. Clearly this project is part of this process.

- The current curricula for healthcare scientists and practitioners need to embrace emerging technologies and new service models such as telecare. This is a significant challenge as career opportunities for those entering the RE profession continue to be in the traditional AT fields and mainly in the NHS, thus education and training institutions are focussing on meeting these needs. There are emerging examples of innovation in this market, for example Coventry University, who offer a BSc in Rehabilitation Engineering, has worked with their placement provider, the West Midlands Rehabilitation Centre (part of Birmingham Community Healthcare NHS Trust) to ensure that all students spend one week of a placement in a range of telecare services.

- The process of introducing a new profession into an existing service model, which has no formal infrastructure to support such a profession, is challenging. Further work is required in this area to identify (for example) how existing local RE services could support the development of the profession into telecare. There is no doubt that in many telecare services there are a range of staff (both directly employed and contracted) who are already delivering many of the functions described in this report. It is believed that the examples of RE professionals' competencies and areas of application highlighted in this report demonstrate that there are opportunities to explore telecare service workforce development and skill mix that would include consideration of such roles within Telecare Services.

The RE profession is a small one, RESMaG estimate 500 RE professionals across the UK. This makes the goal of broadening the service base of the profession particularly challenging, with only highly collaborative initiatives likely to succeed in driving the profession forward.

The project has identified a number of competency areas that are not currently within the TSA Code but have a significant impact on service performance and thus there is an opportunity to engage with the TSA to consider developing the code further.

Telecare is only one of a number of emerging service areas that are likely to benefit from the service of RE professionals and consideration needs to be given to workforce development issues for such services, including telehealth.

Clearly, telecare services have established workforces including occupational therapists and if RE professionals are to be incorporated in to telecare services then careful consideration will need to be given to both skill mix and profession mix.

8. Recommendations

At national level

- RESMaG and RENTS project partners engage with Skills for Care, Skills for Health, BHTA and TSA to consider the outcomes from this project and to develop plans to promote and develop the RE profession into telecare and associated services.
- RESMaG and project partners to engage with the MSC programme to ensure that emerging service models and technologies are reflected in training and education curricula and are relevant to the diversity of service providers.
- RESMaG to identify existing technical or engineering staff working in telecare services and develop plans to engage with such staff and offer a professional base for them.

At local level

- Telecare services to review their services against the findings of this project
- Telecare services seek to work with local RE service providers to identify initiatives that can deliver RE expertise into aspects of local telecare services.
- Regional telecare (or telehealthcare) networks should consider the findings and recommendations of this project in the context of partnership activity at regional level. For example, would it be possible to support the development of the RE profession into telecare services by a number of telecare services working in partnership.

For further information and links to local RE services and networks, please email hdti.info@coventry.ac.uk

Supporting Organisations

Rehabilitation Engineering Services Management Group (RESMaG)
www.resmag.org

Institute of Physics and Engineering in Medicine (IPEM)
www.ipem.ac.uk

Health Design & Technology Institute (HDTI) Coventry University
www.coventry.ac.uk/hdti

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