

# IFA Copenhagen 2016 Summit



*Expert Papers:*  
**Reablement**  
and Older People

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## **Reablement and Dementia Discussion Paper**

Expert Working Group on Dementia

IFA Global Think Tank on Ageing 2015

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### **The Case for Reablement**

The prevalence of dementia will increase over coming decades [2]. Global population ageing also means that people are living longer with multiple morbidities, placing increasing demands on the healthcare system [18]. Even though considerable research into Alzheimer's disease is occurring, it is unrealistic to assume that we will be able to prevent, or that an early cure will be found, for all the dementias and other neurodegenerative disease. Consequently we cannot continue with the current nihilistic view that society's only response to dementia and neurodegenerative disease is the provision of supportive care.

We need therefore to adopt a philosophy of enablement, based on a bio-psycho-social model, which allows people to 'live well' with these conditions and also to reduce reliance on supportive care, both in the community and in residential settings. The *enablement* philosophy embraces the maintenance of function and the regaining of functional capacity in people with dementia and neurodegenerative disease. It supports both episodic *rehabilitation* following illness or injury and as episodes of *reablement* or rehabilitation to help people regain lost functional capacity as their disease progresses<sup>1</sup>. It is something that should be practised at all levels of care, supported by dementia friendly environments and health and other public policy.

There is an existing evidence base that supports the notion that people with dementia can respond to rehabilitation interventions following significant illness or injury [11,16,1,15,14,17,13]. Yet, in current practice, people with dementia often do not receive rehabilitation due to a belief that a diagnosis of dementia or other neurodegenerative disease, makes the person unable to participate effectively and benefit from a rehabilitation program [12].

There is also emerging evidence that people with dementia can respond to rehabilitation strategies that consider cognitive and physical approaches that aim to improve their intrinsic capacity and functional ability [7,8].

Rehabilitation and reablement should be person-centred, goal-directed and include episodes of specific interventions based on the need to improve or maintain function, achieve new goals, or adapt to the consequences of declining function. This might be triggered by changes in personal circumstances, the environment, or decreases in cognitive or functional reserve.

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<sup>1</sup> It must be acknowledged that there are no universally agreed definitions for the terms 'reablement' and 'rehabilitation'. What may be considered in one jurisdiction as 'reablement', may in another be considered as 'rehabilitation'. Differences in terms may relate to the intensity of the program or the skillset of the team member delivering the service.

Assistive technology can support these approaches by helping people achieve their individual goals, by monitoring changes in behaviour or function that indicate the need for further interventions, and by facilitating new capacity [9,10].

### **Key Questions with Respect to Reablement in Dementia and Other Neurodegenerative Diseases**

#### **1. What are the gaps in knowledge and practice that need to be addressed for reablement to be considered a viable policy strategy?**

While there is evidence to support a reablement approach, there remain some important gaps in knowledge. These gaps do not necessarily mean that policy cannot be developed in the interim; rather, this suggests a need for ongoing program evaluation.

These gaps can be summarised in terms of the need to identify:

- Consistent and accepted definitions of the terms 'enablement', 'rehabilitation' and 'reablement' and how these apply to progressive conditions such as dementia and other neurodegenerative disease;
- Clear evidence for the effectiveness of reablement for people with dementia and other neurodegenerative disease;
- Information regarding how best to positively influence the knowledge, skills, attitudes and behaviours of people with dementia, caregivers, care staff and society generally, regarding the potential gains to be had with the adoption of an enablement philosophy;
- How services should be set up to identify, monitor and deliver appropriate and timely reablement and rehabilitation for people with dementia and other neurodegenerative disease within this framework, and how assistive technology can support this.

#### **2. Why should a reablement approach be used by stakeholders (government, funders, individuals and caregivers)?**

An enablement philosophy supports the human rights of people with dementia and their carers. From a values perspective, it focuses positively on what people can do, with appropriate support. It is person-centred and wherever possible supports self-determination and involvement in decision-making.

Given the increase in the number of people with dementia due to population ageing, and the paucity of upstream services available to keep older people healthy and independent in their communities, this is a priority area for policy. A reablement approach is one way to keep people with dementia functioning at their optimal capability.

From a policy perspective it fits with the aspiration to enable people to live well with dementia, and it offers a proactive approach that contributes to continued wellbeing and the prevention of crises. Further, from a financial perspective, enabling people to function at their optimal level, reducing dependency and reliance on long term care, should help to reduce costs and carer burden.

#### **3. What does a reablement model look like, including what supports are needed?**

Despite evidence that people with dementia can successfully be rehabilitated following an acute event through rehabilitation [13]; current health care provision for people with dementia is often fragmented and limited. In addition, reablement services are at an early stage of implementation and evaluation.

An enablement philosophy should serve as an organizing principle for the care and support of people with dementia. The key aim is to enable the person with dementia to function at his/her optimal



level given their impairments resulting from dementia, and to remain engaged within an appropriate and supportive social context.

This philosophy encompasses targeted, time-limited, person-centred, goal-directed reablement and rehabilitation interventions addressing loss of functioning, as well as rehabilitation following illness or injury. The focus is on regaining or managing the impact of functional loss and promoting independence. What is undertaken will depend on the wishes of the person and family, on the setting (e.g. own home vs. residential care) and on the stage of dementia.

Because dementia and neurodegenerative disease are progressive conditions, reablement or rehabilitation addressing loss of functioning will be an iterative process, applied as needed in the light of functional decline.

In general, this approach will have the following characteristics:

- It will be individualized and goal-oriented, taking into account social, psychological and environmental factors, and undertaken collaboratively with the person with dementia and their caregiver or care staff, if appropriate;
- Goals may relate to cognition, activity (mobility, basic activities of daily living, instrumental activities of daily living and leisure activities), behaviour, emotion, physical symptoms (e.g. pain), or communication;
- Goals are operationalized based on a careful understanding of the person's abilities, to ensure that the aims are achievable and realistic, as well as meaningful and worthwhile;
- Strategies to enable the person to work towards the goal are put in place, drawing on a range of evidence-based methods which may include physical training, learning or re-learning skills or behaviours (*restorative methods*) or finding ways around a difficulty (*compensatory methods* – including adapting the environment or using assistive technology). *See Text Box.*

#### **4. What are the implementation challenges pertaining to reablement in dementia and other neurodegenerative diseases?**

In supporting an enablement philosophy, there are a number of challenges:

- The enablement philosophy must be understood and adopted by stakeholders. The message needs to be 'living well with dementia' with a focus on retention of abilities and effective adaptation to the loss of functional ability;
- Service delivery and care of persons with dementia and neurodegenerative diseases must be reoriented such that reablement and rehabilitation are integrated into routine care, and that the necessary reallocation of resources must be made. In order for reablement to be sustainable, responsibility for delivery must extend beyond solely the health care system and it must have a community focus;
- Care management must be consistent across the continuum. This may be facilitated by a case management approach;
- Care staff require knowledge about how to assess and build upon the remaining abilities of the person with dementia taking into consideration any co-morbidities. Being able to understand and improve intrinsic capacity and functional ability are essential skills for all;
- The model must be adaptable to different cultural contexts and situations.

#### 5. What are the societal and individual implications of the reablement approach globally?

- The societal implications are that we need to move away from a negative discourse around dementia and towards a perspective that focuses on functional ability and intrinsic capacity. This should support changes at a policy level;
- There needs to be an understanding that people with dementia can adapt, adjust, and change, so that reablement is seen as worthwhile;
- Medical and non-medical training curricula need to be updated to reflect the enablement philosophy, so that professional attitudes in meeting the challenge of dementia are more positive and reablement becomes embedded throughout the community and health care systems;
- The individual implications are that people with dementia and other neurodegenerative diseases and their carers will need to see themselves as actively managing their health rather than being passive recipients of treatment;
- There needs to be a recognition that reablement should be able to be delivered in the community, in people's homes (including nursing homes), supported by dementia friendly environments.

**Restorative** approaches build on retained abilities and use a range of instructional or prompting techniques to promote new learning or relearning, whether of information, habits or strategies; examples include the application of the spaced retrieval method to support retention of information [5].

**Compensatory** methods use a range of aids and adaptations to support functioning and overcome limitations resulting from cognitive impairments; examples include the use of memory books to support engagement in conversation [4].

*Source: Clare et al, 2013.*

### **Case Study 1: An example of cognitive rehabilitation in a person with dementia**

Sandra had become isolated as she no longer felt confident about being able to go out alone. One consequence of this was that while she wanted to be able to go shopping independently, she and her husband were both worried that she would get lost. Sandra thought that she would feel more confident if she could contact her husband while out. She did have a mobile phone, and could receive calls, but was not able to use it to make calls; however, the therapist's assessment indicated that Sandra did have the ability to learn to do this.

As part of a community-based cognitive rehabilitation intervention for people with early-stage dementia, Sandra chose as her goal 'I will be able to use my mobile phone to call my husband when I am out shopping'.

There were four main aspects to address in working on this goal:

1. Sandra needed to learn how to make calls on the mobile phone. An action-based procedural learning approach was adopted. Together with the therapist, Sandra wrote out each of the steps involved in making a call and then practised this sequence of steps, initially with the prompts in front of her and then gradually fewer and fewer prompts. Once she was able to carry out the whole sequence without any prompts, the intervals between practices were gradually lengthened (the 'spaced retrieval' technique). Having mastered this, Sandra began to practise when out of the home, following an agreed plan, until she felt fully confident.
2. Sandra needed to remember to take the phone with her. A compensatory strategy was adopted, with visual prompts placed close to the front door to remind Sandra to pick up her phone.
3. Sandra needed to be able to use the phone without difficulty. A bag with a shoulder strap was selected so that Sandra could have both hands free to use the phone when needed. Sandra was encouraged to find a quiet place to make calls.
4. Sandra needed to be able to cope if she became anxious and worried while out shopping. She practised a relaxation exercise based on breathing that she could use if she felt anxious.

Sandra was successful in learning to use her mobile phone, and was able to go out alone knowing that she could call her husband whenever she needed. As a result she felt more independent and less isolated, and her confidence increased.

*Source: Professor Linda Clare*

### **Case Study 2: An example of rehabilitation post hip fracture in a person with dementia**

Mrs. Jones, a retired nurse, has lived in a retirement home independently for the past 10 years. She has Alzheimer's Dementia, is legally blind and has left-side hearing loss. While at home alone she had a fall resulting in a left intertrochanteric hip fracture and was taken to hospital by ambulance for surgery, followed by a period of inpatient rehabilitation. Mrs. Jones has no family, but she has friends who live nearby. Prior to the fall she was independent in most self-care activities and light homemaking. She was also independent with transfers and mobility with a rollator walker.

In addition to intensive physical therapy consistent with post hip fracture surgery, Mrs. Jones's rehabilitation program had the following additional elements to cater for her dementia and visual and hearing loss:

#### **1. Relational strategies:**

- Calling her by her preferred name
- Daily verbal reminders of where she is and why
- Consistent team members working with her
- The use of a calm voice and calm body language
- Speaking to her right (good) ear
- Use of one-step sentences
- Ensuring eye contact and "gentle" touch for physical cueing
- The use of cueing (verbal and physical) for all self-care activities

#### **2. Environmental strategies:**

- Ensuring adequate ward lighting and contrast, and using large print
- Ensuring that walkways were de-cluttered
- The use of orientation signage
- Consistent scheduling by her care team
- Therapy and activities were spread consistently throughout the day so that there were no large gaps in her day

#### **3. Retaining abilities strategies:**

- The focus was on "functional activities" during therapy, rather than standard exercises
- Consistent daily communication and encouragement by staff of Mrs. Jones in "what she can do" to gain and maintain independence
- Consistent performance of mobility and self-care activities with Mrs. Jones by all staff
- Mrs. Jones was a nurse and was subsequently invited to perform "admin" activities at nursing station and to converse with staff and volunteers about experiences

After 25 days, Mrs Smith was able to return to her retirement home.

*Source: Dr Kathy McGilton and Toronto Rehab team*

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## **Reablement and Diabetes Discussion Paper**

Expert Working Group on Diabetes  
IFA Global Think Tank on Ageing 2015

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The paper is based on discussions among experts participating in the IFA Global Think Tank on Ageing and on the preparatory paper on diabetes and reablement.

### **Key Facts about Diabetes in an Ageing Society**

**Box 1** <sup>1-3, 10, 15-17, 21, 33-37</sup>

- Diabetes is the world's fastest growing chronic disease.
- In 2014, diabetes affected an estimated 387 million people around the world (43% of whom were undiagnosed), a number that is predicted to grow 205 million more by the year 2035. Approximately 316 million people had impaired glucose tolerance, placing them at significant risk of developing diabetes, and this group is expected to increase to 471 million by 2035.
- More than 25% of people over the age of 65 years around the world have diabetes, and approximately 50% have pre-diabetes. Both type 1 and type 2 diabetes occur in older people. Type 2 accounts for more than 90% of cases.
- Long-term complications of diabetes cause immeasurable physical and emotional suffering and account for high mortality rates— for example, 5.1 million diabetes-related deaths globally in 2013.
- Diabetes-related co-morbidities include: cardiovascular and cerebrovascular disease, peripheral nerve dysfunction, diabetic retinopathy that can lead to blindness, foot ulceration leading to amputation, kidney dysfunction leading to renal failure, and both neurodegenerative and vascular dementia. Treatments for diabetes can cause frequent episodes of hypoglycaemia in older people which can lead to physical injury, falls and hospitalisation.
- All co-morbidities (both diabetes-related and age-related) undermine independence, capacity for self-care and quality of life.
- Diabetes is an independent risk factor for the development of functional impairment and mobility disorder and approximately 25% of community-dwelling older adults with diabetes are frail
- USD 612 billion—or 1 in every 9 healthcare dollars—was spent on diabetes treatment and care in 2014 globally, 76% of which was consumed in the care of people with diabetes between 50 and 79 years of age. Approximately 35% to 40% of diabetes-related expenditure is associated with the management of vascular complications, such as heart and kidney disease, and hospitalisation.

- Costs of care for older individuals with diabetes who are unable to maintain their independence are three-fold higher in the community and nine-fold higher in institutional care.
- In view of this evidence, it is surprising that older people are not mentioned in the Millenium Goals (Global Report on Ageing)!

## **Introduction and Background**

### Treatment and care of older people with diabetes

The current clinical and scientific view of diabetes in older people is as a preventable insulin resistance syndrome and cardiovascular disorder, a premature ageing syndrome, a cause of unsuccessful ageing and a disabling syndrome [1]. Modern management of the disease is informed by the 2014 International Diabetes Federation (IDF) Global Guideline pertaining to the care of older adults with type 2 diabetes [2].

Key guideline principles underlying this document are: individualised care planning based on holistic principles; proactive risk identification and risk minimisation strategies; early detection of deterioration through comprehensive screening and assessment; and education and support for older people with diabetes, their caregivers and the multidisciplinary health team.

Adopting a healthy diet and increasing physical activity levels are key to achieving optimal metabolic control of diabetes and preventing the development of complications. This requires the person with diabetes and/or their caregiver to be well-educated in these lifestyle aspects of self-management. In addition, where appropriate they require medication for diabetes and associated morbidities such as hypertension, hyperlipidaemia and vascular disease [2]. A multidisciplinary approach is essential to ensure optimal care. Care models should be founded on comprehensive geriatric assessment, because it has been demonstrated to improve health status and increase quality of life, fewer admissions to institutional care facilities and a reduces mortality rates [3,4].

The increasing effect of type 2 diabetes on age-related functional capacity necessitates a clear focus on detecting and ameliorating frailty. Frailty is a pre-disability biological syndrome that has a higher reversibility in the early stages than disability. It is highly predictive of adverse outcomes in older people than a chronic disease and may be accompanied by the presence of sarcopaenia [3,5].

This paper describes a reablement model specific to managing diabetes mellitus in older adults within the context of literature related to the treatment and prevention of diabetes and its longer-term complications. The reablement health and social care model for older people is relatively new; consequently research is not yet strong, particularly in the area of reablement interventions in older people with diabetes. Introducing a reablement model into modern diabetes care will need to include strategies to alter the mindset of care professionals away from a glucocentric model towards an individualised approach that aims to maintain functional performance with quality of life and well-being at the centre of this individualised care approach.

The principles underpinning the reablement model of community health and social care align with the principles described in the 2014 IDF Global Guideline, particularly in the focus on multi-disciplinary, whole-of-person, whole-of-life individualised care planning and on education and emotional support for the older person and their caregiver/s [2,6,7]. Reablement is known as 'restorative care' in Australia, New Zealand and the United States. It encompasses non-pharmacological strategies and interventions to support and achieve the attainment of positive physical and mental/ emotional health outcomes to enable older people to (re)gain a level of independence in ADLs and IADLs and quality of life acceptable to them. Reablement also aims to reduce rates of morbidity and mortality and to stabilise public health expenditure by reducing the need for long-term home care [6,7].

When required, reablement interventions are usually delivered as an intensive (multiple visits), duration-specific (commonly between six and twelve weeks), multidisciplinary home care service

that may include physical exercise and mobility support, education about nutrition, lifestyle and self-management of chronic conditions, adapting and/or redesigning within the home, providing assistive devices, and strategies to manage anxiety and depression in the person with diabetes and the family caregiver [6,7,8]. Peer support to improve positive health behaviours and physical performance in people with diabetes is another option in the reablement approach but results are presently inconsistent and its applicability to older people is limited [9].

Diabetes can be an extremely variable condition; therefore a reablement model for people with diabetes needs to be tailored to complement highly individualised and regular INDIVIDUALISED comprehensive assessment (the individual, carers and social situation). The approach needs to be realistic about the person's ability to live independently or with services in the context of their age, degree of disability and functional status, recognising that quality of life is variable and deeply personal, so that even small gains can make a large difference [10]. While outcome indicators from the body of literature around diabetes self-management (not specific to older people) are largely positive, researchers note the adverse impact on an individual's capacity to self-care caused by significant levels of frailty and cognitive deficit [11]. These conditions are more likely to be present in older people with diabetes than in younger people with the disease.

A reablement model for diabetes will share several common features to the recommendations arising from the IFA Frailty and Dementia working groups. It will emphasise the need for: behaviour change among care professionals towards the reablement concept; agreement on measures of physical activity and how these can be used to monitor the effects of reablement interventions; and how health and social care reablement systems can be better adapted to people with cognitive impairment and dementia. Consequently, evaluation and outcome measures need to reflect these issues.

The paper is structured according to five key questions formulated by the International Federation on Ageing (IFA) and DaneAge:

### **Question 1: What does a reablement model look like, including what supports are needed?**

#### Elements of a diabetes reablement model

The following represents some of the key elements that would characterise a diabetes reablement care model and form the basis of our recommendations in this area:

- It should be safe, cultural sensitive, and adaptable in all health and social care contexts
- It should be applicable in any stage of the disease from pre-diabetes to end of life and be adaptable to varying states of functional status
- People with diabetes and their caregivers should be involved in planning the model and also in planning their own goals and treatment
- It should be an integral part of clinical practice guidelines, policy and service models
- It should encompass existing diabetes guidelines such as those on healthy eating and physical activity and "enable people to be and to do what they have reason to value" (WHO, 2015[12])
- It should enable care goals and the care plan to be tailored to the individual person with diabetes
- It should use non-pharmacological options when safe and evidence supports their value
- It should incorporate effective use of assistive technology to enhance and improve the delivery of diabetes care and to support diabetes self-management and physical and mental function
- It should involve outcomes that can be assessed and measured in different clinical domains and effectively integrated into existing clinical pathways [38,39,2] and that take account of the individual's personal goals and targets.

### Defining the reablement outcomes

Reablement outcomes should include the following:

- Functional assessment including measures of basic ADL, instrumental ADL, and frailty
- Physical capacity including mobility
- Cognitive and behavioural outcomes
- Psychosocial measures including quality of life, well-being and spirituality
- Metabolic parameters including HbA1c, blood glucose, blood pressure, lipid levels (HDL)
- Pharmacovigilance including medication review and medicine adherence and therapeutic effectiveness with a focus on stopping medicines where possible
- Service usage and presentation to hospital and emergency services
- Carer burden
- Clinical- and cost-effectiveness of interventions

#### *Box 2: Healthy Ageing and Functional Ability*

The WHO World Report on Ageing and Health (2015) defined Healthy Ageing as the process of developing and maintaining the functional ability that enables well-being in older age. Functional ability comprises the health-related attributes that enable people to be and to do what they have reason to value. It is made up of the intrinsic capacity of the individual, relevant environmental characteristics and the interactions between the individual and these characteristics. Intrinsic capacity is the composite of all the physical and mental capacities of an individual. Environments comprise all the factors in the extrinsic world that [4] form the context of an individual's life.

*WHO World Report on Ageing and Health 2015 [12]*

Illness trajectories [13] such as those developed for palliative care can nevertheless illustrate the benefit of reablement: Reablement aims to shift the older person with diabetes up the curve by maximising functional ability throughout the illness trajectory. In some cases, it is possible to initiate preventative medical actions during an illness phase to reduce the likely need for a full reablement clinical service being required.



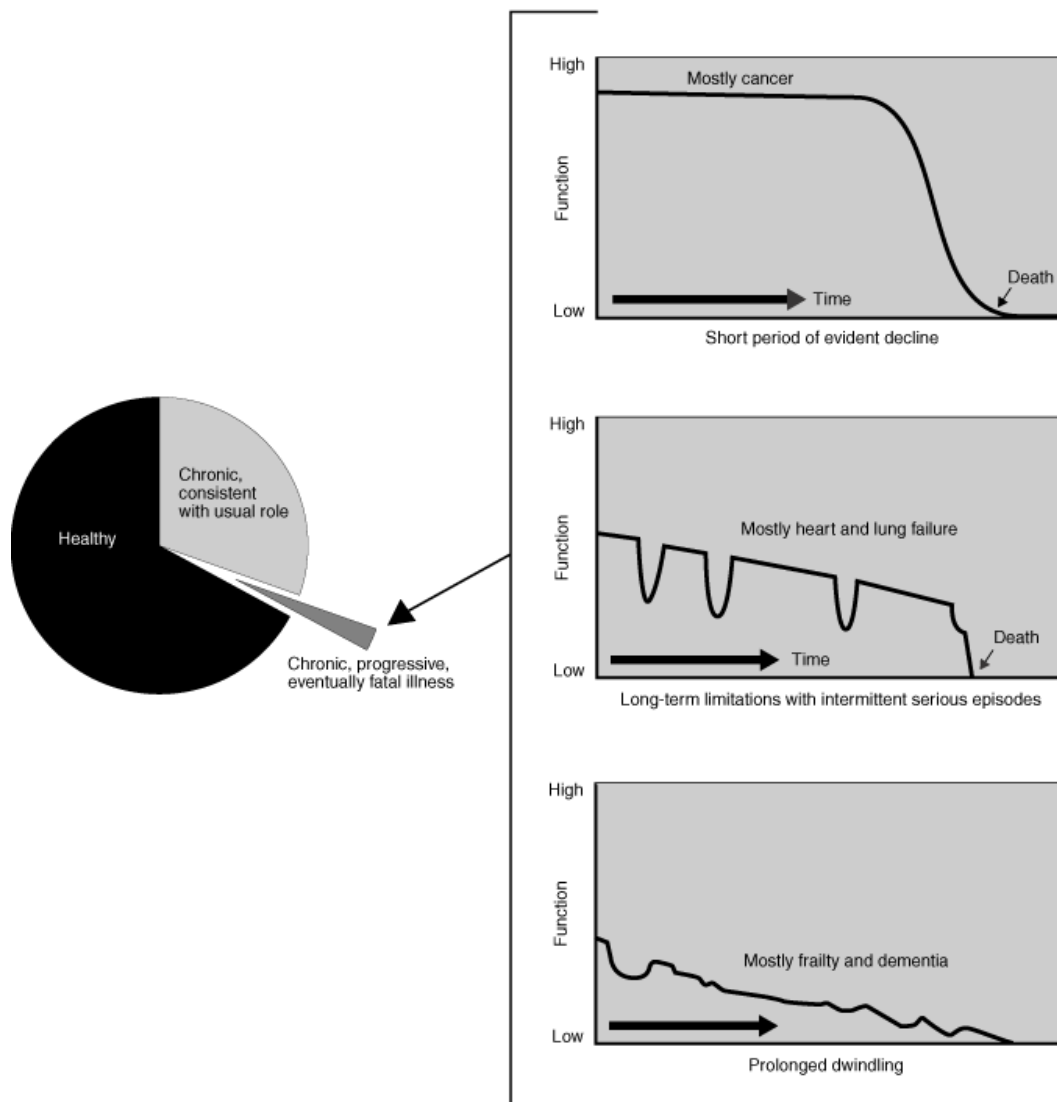


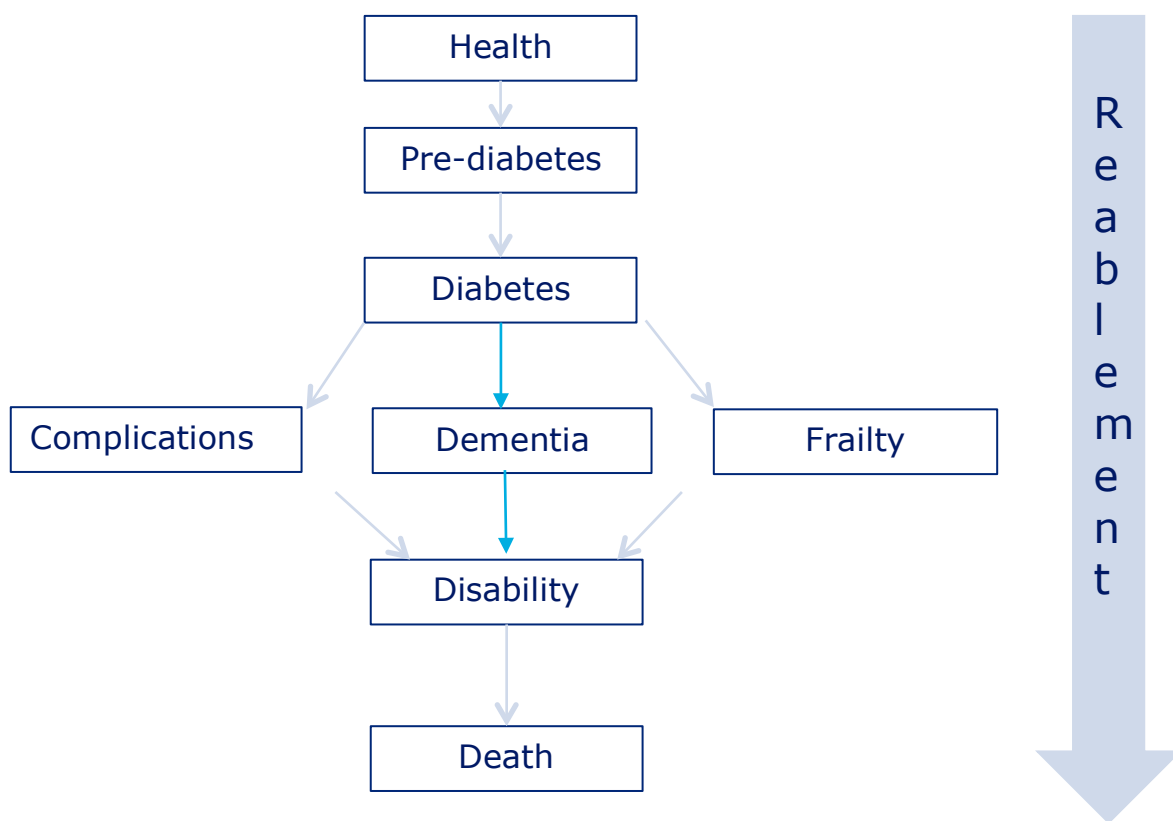
Figure 1: Illness trajectories for chronic, progressive, and eventually fatal illness [14]

Diabetes trajectories are represented by the middle and lower diagrams. Functional reserve declines with age (0.5 % each year from 35 years). Diabetes increases the risk of loss of functional reserve. When you approach the functional threshold small changes/declines in functional reserve have large health effects.

Goals of reablement are to:

- Maximise the functional ability throughout life including during palliative and end of life care
- Support and enable the transition towards higher functional states
- Improve or maintain autonomy. The ability to cope with the environment through mobilising the individual's intrinsic capacity.

The diabetes reablement model can be aligned with the following pathway leading from robust health to disability and death and is outlined in the following diagram.



*Figure 2:* The reablement pathway can apply at any stage from pre-diabetes to beyond the state of disability. Apart from the classic vascular and neuropathic complications of diabetes functional status can be significantly influenced by the development of frailty and dementia. Many of these processes can be bi-directional but for the purposes of this diagram are shown in a unidirectional manner.

#### Supporting background information to interpret the reablement pathway

##### Reablement

Reablement is a short and intensive service, usually delivered in the home, which is offered to people with disabilities and those who are frail or recovering from an illness or injury. Reablement is not always clinician-led as it may have a greater social care component. Reablement focuses on restoring independent functioning and is an active process of regaining skills and confidence. It does not require a specific acute event or illness but can be implemented in someone with lower health and social needs or who have experienced a gradual decline in their health status.

##### Rehabilitation

Rehabilitation is a more acknowledged health and social care intervention delivered by one or more members of a multidisciplinary team and may be defined as the process of restoration of skills to regain maximum self-sufficiency and function in a normal or as near normal manner as possible after experiencing an illness or injury. Rehabilitation services often operate in hospital settings but can be seen in the community and delivered at the patient's home. Rehabilitation is often prescribed for many types of injury including chronic disease, including amputations, arthritis, cancer, cardiac and neuro-orthopaedic problems, traumatic brain injury and stroke.

##### Pre-diabetes

Pre-diabetes is an early stage of type 2 diabetes where the blood glucose level is elevated above the normal range, but the individual is free of any signs or symptoms of diabetes. It may include the

metabolic state of impaired glucose tolerance and impaired fasting glucose. This stage should be a target for health promotion approaches including lifestyle change and will benefit from a reablement approach.

### Diabetes diagnosis

The onset of both type 1 and type 2 diabetes in older people can be insidious and difficult to diagnose on the basis of symptoms. Symptoms that do occur may be confused with the “normal ageing” process [1,15]. Thus, older people are often quite unwell by the time their disease is confirmed and less able to cope with the diagnosis and with managing the necessary care tasks for survival and good health [16,15,17]. Education is essential for optimising the ability to maintain self-care, and the IDF 2014 Global Guideline recommends that it be provided to both the older person with diabetes and their caregiver, with a focus on safety, risk management and complication prevention [2].

### Complications

Older adults living at home have a high prevalence of uncorrected visual impairment. Diabetes itself can cause visual impairment, with increased cataract formation and the development of diabetic eye disease (retinopathy), which, if untreated can lead to blindness and is linked to adverse health-related quality of life [18]. Some evidence suggests that, in addition to regular screening for eye disease, maintaining good blood glucose control through dietary modification and regular exercise can contain or even reverse diabetic retinopathy [19]. The use of a foot risk assessment tool improves outcomes in diabetes foot disease. The importance of avoiding or managing at an early stage diabetes foot disease needs to be emphasised in terms of limiting poor mobility and maintaining quality of life.

### Frailty

Longer-term diabetes increases the risk of frailty through sarcopaenia and lower limb functional impairment, in addition to nutritional imbalance and risk of disability caused by undetected eye, skin tissue and kidney disorders [10]. These factors increase physical risks such as falling and other injury events which are prevalent in older people with diabetes, who have close to a three-fold increased risk of falling and a two-fold increase in injury resulting from a fall [4,20,21, 22, 23]. Reablement-like interventions to reduce these risks reveal some positive outcome indicators. Strength training is shown to protect against age-related muscle decline in older adults, and randomised trials of exercise programs for older adults with diabetes demonstrate clear evidence of increased strength and mobility [22,24].

### Dementia

Diabetes mellitus is a risk factor for the development of both neurodegenerative and vascular dementia. Diabetes accelerates the progression from mild cognitive impairment (MCI) to frank dementia. Repeated hypoglycaemia can increase the risk for dementia syndromes. Obesity can increase the risk of dementia.

### Medicines management

Diabetes-related treatments can often cause unwanted major side-effects and adverse events. These include hypoglycaemia, falls, and physical injury. Sound medicines management lessen risks and enhances patient safety.

### Palliative care

Palliative care can be integrated into a reablement model at any point on the trajectory to improve function, comfort and quality of life. End of life care usually refers to the last 12 months of life.

**Question 2: Why should a reablement approach be used by stakeholders (government, funders, individual and carers)?**

The following table delineates arguments that are tailored to the specific stakeholder groups for a reablement approach:

*Box 3*

Stakeholder	Argument
Individual	<p>Quality of life argument</p> <ul style="list-style-type: none"> <li>• Reablement interventions may enhance one's quality of life through reducing the incidence of falls, slowing age-related mobility loss and promoting both physical and emotional well-being [20,25,26].</li> <li>• Reablement interventions improve the control of diabetes and its associated risk factors and reduce the risk of complications.</li> <li>• Reablement interventions help to maintain independence and autonomy.</li> </ul>
Caregivers (formal and informal)	<p>Well-being argument</p> <ul style="list-style-type: none"> <li>• Education and support of carer is critical for reablement interventions in older people with diabetes.</li> <li>• Caregiving can impose a significant burden on individuals and families which can threaten their health and social well-being. When caregivers are educated and consulted in care planning, implementation and evaluation of progress, their levels of stress and anxiety is reduced. The health and well-being of both older person and caregiver improve along with their increased engagement with the reablement program [27,28].</li> </ul>
Clinicians	<p>Integrated care argument</p> <ul style="list-style-type: none"> <li>• Reablement intervention leads to better patient-centered care, which can be aligned with the IDF [2], EDWPOP and AGS guidelines [39,39].</li> <li>• Reablement interventions enhance self-care skills, facilitate achievement of treatment goals, and optimise clinicians' time.</li> </ul>
Government and funders	<p>Population health argument</p> <ul style="list-style-type: none"> <li>• Reablement helps reduced disability, maintain functional ability and avoid hospitalisation, emergency care, and institutionalisation – all of which are costly [6,7].</li> <li>• Reablement achievement may lead to cost-savings and stabilisation of public health expenditure by addressing the issues stated previously.</li> <li>• Reablement in older people with diabetes could reduce frailty and functional disability, which currently costs up to 5000 euros/year per person.</li> </ul>

**Question 3: What are the gaps in knowledge and practice that need to be addressed for reablement to be considered a viable policy strategy?**

There is limited research evidence regarding reablement of older people with diabetes. Only 1% of intervention studies related to diabetes are carried out in people aged 70 years and older. The common practice of extrapolating results from younger populations is problematic due to

differences in age-related physiologic changes and comorbidities and different responses to stressors and altered mechanisms of disease. There is a need to understand the perspectives and values of older people by engaging them in research. There is also a need to develop reablement models with older people and their carers and demonstrate their cost- and clinical effectiveness. There is a need to identify outcomes that are relevant to older people and should include functional status and quality of life measures. In order to address these important questions, we need to embrace multiple different research designs.

#### **Question 4: What are the implementation challenges pertaining to diabetes?**

Challenges to implementing a diabetes reablement model include the following:

- Acknowledging the conceptual and practical differences between the reablement approach and rehabilitation.
- Changing clinicians' beliefs, habits and behaviour through education and training and clinically relevant useful practice guidelines.
- Highlighting the importance of a diabetes reablement approach to all stakeholders through national and regional campaigns.
- Understanding the individual and combined importance of diabetes, frailty and dementia on the relationship to disability and the health of older people.
- Implementing a diabetes reablement model in different cultural settings and adapting the model to the capacity of developing under-resourced countries as well as well-resourced wealthy nations.
- Presence of limited evidence to support some recommendations of any particular model.
- Generating new research and evidence for change: Health economic models, models of care, triangulated methods.
- To define the duration of interventions for particular reablement approaches.
- To define the most relevant outcomes of the diabetes reablement approach.

#### What can enable implementation?

- Using case studies (stories/narratives) to illustrate and influence policy makers and media.
- Linking the new information to existing information in clinical guidelines and the internet when educating health and social care professionals.
- Increasing the public and health professional awareness of the importance of maintaining good functional status early in life to avoid frailty in later life.
- Generating quality evidence to support the clinical- and cost-effective benefits of a diabetes reablement approach.
- The recognition of the challenge of inequitable service provision, both regionally and nationally: at the level of the individual older person with diabetes and at the level of health care pathways or systems and transitions of care among services/systems, which would include the reablement model [10].



## **Question 5: What are the societal and individual implications of the reablement approach globally?**

### Societal implications:

- Cost savings and contributing to sustainable health and social systems.
- Maintains older people's ability to participate, contribute to and be productive members of society.

### Individual implications:

- Engaging the individual to identify their strengths/capacity when planning care goals and targets e.g. ask the individual what can you do (safely) instead of focusing on things that people cannot do anymore?
- Prevents or slows down the downhill health trajectory, which can enable them to 'complete unfinished business' and plan for palliative/end of life care so they end their lives in the manner and place they prefer.

## **Role of Technology in the Diabetes Reablement Model**

Technological interventions that promote better diabetes self-management and assist older people to maintain or enhance physical performance can offer a new level of support for clinician decision-making. The model will require data management of clinical variables, visualisation and behaviour reminders to each person and assist the caregiver in their supportive role. Smart phone technology for self-management and communication, wrist-watch type accelerometers that record physical activity and falls information, and alert sensors could enable an effective and efficient reablement approach. However, safety and confidentiality issues of the technology will need to be addressed.

## **Conclusions and Summary of Recommendations**

Whilst the concept of reablement is not new its applicability in diabetes care is not proven. There are clear and important gaps in our knowledge of this approach and a need for wider discussion of its roles and uses among the diabetes care community. We are confident that we can move forward if we can take on board some or all of the following key recommendations:

- A model of reablement in diabetes care should be safe and culturally-sensitive with wide application among different healthcare systems and be adaptable to varying states of the disease and associated functional levels.
- A diabetes reablement model should enable individualised care approaches, incorporate assistive technology, and allow the assessment of clinically meaningful outcomes such as changes in functional status and level of frailty, metabolic parameters such as HbA1c and blood pressure, and the cost-effectiveness of the reablement interventions.
- There should be wider use of illness trajectories among the diabetes care teams as they will allow a greater understanding of how reablement can be employed to alter the functional status of individuals with diabetes during both the acute and longer term phases of the condition to enhance health outcomes and maintain autonomy.
- Reablement interventions should where possible be aligned with current clinical guidelines and policies of diabetes care (such as the IDF Global Guidance in Managing Diabetes in Older People<sup>2</sup> or the EDWPOP and AGS guidelines [38,39] as this will enable the focus of care to remain patient-centred, and maintain quality of life, well-being and patient-safety as important indicators of clinical effectiveness.
- There is an urgent need to highlight the importance of diabetes reablement approaches to all key stakeholders by representation to national and international diabetes societies and ageing

organisations through a series of campaigns, media involvement, and health professional webinars.

- There is a mandatory requirement to develop high quality research into the clinical and cost-effectiveness of diabetes reablement interventions which will require both observational research methods but also well designed randomised controlled clinical trials.

We feel that this 'Position Statement' should have real value in establishing the platform for the promotion of reablement initiatives in diabetes care. We also recognise the importance of robust research to demonstrate the clinical utility of diabetes reablement and have listed a summary of key research areas in box 4.

*Box 4*

**A Way Forward – The need for high-quality research**

High quality, robust research is needed to enable better standardised care and to support the individualised approach to management. Recommended priority areas for intervention trials are: examining the benefits of optimising blood pressure and glycaemic control using a range of outcome measures such as quality of life, frailty, dementia, mood level, pre-disability and disability and hospital admission; feasibility/pilot assessment of assistive technologies as treatment aids and decision support tools; and the cost-effectiveness of reablement interventions [3]. A thread of evaluating the 'experiences' of those participating in reablement is crucial to each research investigation and lessons learnt will ensure an optimum care pathway for reablement is adopted by healthcare systems.

Some of these research issues are being addressed by the MID-Frail Study, a European Union-funded randomised controlled clinical trial currently underway in seven countries comprising a multi-modal intervention assessing the functional outcomes of treatment, exercise and education programs in 1800 frail or pre-frail people with type 2 diabetes over the age of 70 [3]. Other important gaps in the research are pre-study assessments of cognition, low mood states, ability to self-manage and the involvement of informal caregivers [29].

Further research is also needed into community health strategies that can prevent older people with impaired glucose tolerance from developing diabetes. Up to 80% of type 2 diabetes is preventable through strategies that reablement currently employs in the care of older people, such as changes in lifestyle, nutrition, exercise and activity and the individual's environment [15,30]. Evidence from 21 randomised controlled trials indicates that lifestyle interventions and medical treatments can reduce the number of people who progress from impaired glucose tolerance to diabetes [31]. It is suggested that lifestyle interventions are more effective than drug treatments in achieving this goal [32], indicating that reablement in older people can make a substantially positive contribution to halting the ever-increasing global prevalence of type 2 diabetes.

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## **Reablement and Frailty Discussion Paper**

Expert Working Group on Frailty  
IFA Global Think Tank on Ageing 2015

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### **Reablement - 'Simply the Right Thing to Do'**

#### **Background and Introduction**

*Frailty* is considered to be highly prevalent with increasing age and to confer high risk for adverse health outcomes, including mortality, institutionalization, falls, and hospitalization. It is recognized that frailty has a biologic basis and the question is whether it is a *clinical syndrome* different from the *ageing process* itself. The biological definition of ageing is defined as an increase in the immediate probability of system failure and fatal outcome when time goes by. These adverse outcomes result from a gradual accumulation of molecular and cellular faults, leading to functional decline, disease, disability and handicap, and ultimately death.

Numerous geriatric interventions have been developed to improve clinical outcomes for frail older adults. A major obstacle to the success of such interventions has been the absence of a standardized and *valid method for screening* of those who are 'truly' frail so as to effectively target care. Not unexpectedly, demographic variables are shown to have the strongest power to predict adverse outcomes and provide arguments for medical decision-making based on age only. Many studies have been conducted to find a powerful screening tool to identify older patients at an increased risk for frailty above age and sex. The predictive performances of these tools have been reviewed and compared, concluding that none of the instruments investigated had a strong predictive power and could be considered a 'gold standard'.

Irrespective of the difficulty to identify those who are frail and would benefit most from intervention, *reablement* has emerged (often very quickly) as a key aspect of government reforms in an attempt to improve outcome of their citizens. Despite a limited evidence base, reablement is increasingly being seen as a solution to a number of longstanding challenges and problems in health care and social care for older people, including the cost pressures of an ageing population, the impact of new technology, rising public expectations and changing family and social structures.

At first glance, this consensus around the potential of reablement is remarkable in terms of the pace and scale at which this concept has penetrated policy locally, nationally and internationally (see below for further discussion of the global implications of this agenda). For us, this may be because of a number of separate but potentially inter-related trends over time, with the current focus on reablement emerging through a desire to reconcile a number of potentially different agendas:

1. The desire to create more person-centred approaches in which older people are seen as full citizens with the same rights and responsibilities as other groups (a *citizen-centred, human rights approach*, in which the aim is for individual older people to be able to lead chosen lifestyles).

2. Ongoing debates about the nature of expertise, in which services increasingly look to build a partnership of equals between the professional, who may have technical expertise and knowledge about how formal service structures operate, and the person, who is an expert in their own life and what works for them (this is a more *philosophical issue about empowerment, the nature of expertise and who knows best*).
3. Recognition that older people are a major social and economic resource, which we fail to harness if we are unable to maximise older people's contribution to society (a *sustainable development* argument). There is also a potential loss to the economy if people of working age leave employment to take on informal caring responsibilities for frail older family members and friends who, without this, would be insufficiently supported.
4. A strong sense from front-line practitioners that organising services on the basis of professional silos leads to poor outcomes, fails to make the best use of the skills of the multi-disciplinary team and is also demotivating for staff (an *intuitive belief in the benefits of integrated care*, and a desire to create greater job satisfaction and improve recruitment and retention by enabling professionals to deliver the kind of inter-disciplinary support they believe older people deserve).
5. Recognition that health and social services too often fail to intervene early enough to prevent ill health and a loss of independence and can sometimes make overly rapid decisions about older people's long-term destinations (assuming that residential care is the only option and 'writing older people off' prematurely). In contrast, reablement aims to invest time and expertise in helping older people to be the best they can be before making future decisions (a *moral argument* that this is just the right thing to do).
6. An aspiration from budget holders to make best use of scarce resources, either to get the best outcomes from existing funding, or possibly even to save money (an *economic argument* that makes sense intuitively). However, the evidence base to support (or, indeed, refute) this is still at an early stage— see below for further discussion.

At present, there is growing experience of trying to deliver these different aims in practice, and there are some promising signs from the emerging evidence base. However, some of the individual arguments and motives above may sometimes be in conflict with each other. Thus, a series of key questions remain for national policy makers, local leaders, front-line practitioners and older people themselves.

Against this background, this paper begins with a summary of terminology and the key features of emerging service models, before focusing in more detail on the nature of the evidence base and a number of key success factors/potential barriers when implementing policy to address.

### **Definitions and Service Models**

Reablement services are defined differently in different national contexts (and between areas within countries) but typically aim to 'help the person to help themselves': doing things 'with' people to help them maximise their independence rather than doing things 'for' them or 'to' them. This usually involves *focused, time-limited* (typically 6 to 12 weeks) interventions provided in *people's homes* or in community settings, often *multi-disciplinary* in nature, that aim to help people regain as much functional independence as possible following a period of ill health, an admission to hospital or a decline in function. Services tend to focus on supporting people to regain skills around daily activities and should *be goal-orientated, holistic and person-centred - working to achieve outcomes that matter to the individual, supporting them to lead chosen lifestyles and working with them in their family and local context*. Although time-limited, reablement requires working at the pace of the individual and variation to input depending on the capacity and needs of the individual (particularly since reablement is an *inclusive approach* that seeks to work with all people who could benefit from this kind of support, irrespective of diagnosis and capacity).

To have maximum impact, reablement services may also seek to have a broader impact on mainstream health and social services more generally (see below for further discussion of reablement as a 'service' and reablement as a broader 'philosophy' influencing all services). Crucially, this way of working requires *skilled workers* practising in potentially very new ways, as well as a *changed mind set* from older people, families and care staff (see below for discussion of training and cultural change).

Part of the difficulty here is that many services and professions would already claim to do this – but arguably do not really deliver reablement in practice. Thus, it is easy for existing services to rebrand themselves as delivering reablement (often to attract new funding), or for individual professions to claim that they are the true guardians of this agenda. However, our experience is that many services which claim to offer 'reablement' do not offer the quintessential elements of reablement set out above. Thus, ensuring that services are genuinely 'reabling' in ethos is a key policy challenge.

Although this is a broader debate, we distinguish reablement as defined above from the concepts of 'health promotion' and 'prevention', which seek to promote positive health and well-being, prevent initial ill health and delay subsequent functional decline and/or complications. These are all crucial – but are different to the current focus on reablement.

### **The Nature of the Evidence**

At present, there are a limited number of studies of reablement (see Box 1 below). In brief:

- Reablement can improve independence with regards to daily activities, but studies are inconclusive when it comes to other individual outcomes.
- There is little evidence concerning which components of the intervention are most beneficial and who benefits most.
- Reablement may reduce the need for home care services and other health and social care services.
- Only two studies focus on cost-effectiveness, but these suggest that reablement was more cost-effective than providing conventional home care.

**Box 1: The evidence to date**

The outcomes regarding effects of reablement are fourfold: individual outcomes; effects for service providers; effects on service utilization; and cost-effectiveness. At the heart of this discussion is an on-going debate about which components of this intervention are most beneficial and who receives the greatest benefit.

Individual outcomes: the effects of reablement on performance of personal activities of daily living (PADL) have been summarised in two systematic reviews [1,2]. While the authors of the first review found no studies to include, the authors of the second review concluded that there is limited evidence that reablement can reduce dependency in terms of PADL amongst home care users. When it comes to functional status, studies show that reablement improves activity performance and satisfaction with performance [3] and ADL (PADL and IADL) [4-6]. However, one study found no significant improvements in ADL [7]. In addition, reablement has been shown to improve safety [4], physical function [8], level of physical activity [9], and health related quality of life [10]. However, no significant improvements were found in safety [7], social support [8], physical function [3,7,11], or health related quality of life [3,4,7] in other studies. Hence, the results from primary studies are inconsistent.

One study has examined which people have the most to gain by reablement [5]. This found that positive benefits were experienced by all, that there were no effects related to age and no differences as to whether older people had previously received traditional home care services. Another study found that receiving traditional home care did not predict physical activity levels in the long-term and that the current exercise component in reablement did not have a sustained impact [9]. The same study found that younger people who were in better physical condition, with good mobility and no diagnosis of depression were more likely to be physically active in the long run. Nevertheless, little is known about how the intervention is configured, the optimal timing and intensity [12,13].

Several countries use unskilled home care assistants in their reablement teams. In a mixed methods study [14] following an RCT study [11], home care assistants working with participants in the reablement group were found to have increased job satisfaction and significantly reduced turnover compared to those working with participants in the usual care group. The study emphasised the value of enhanced coordinator support and supervision, as well as improved training and flexibility, which resulted in increased job satisfaction.

Concerning health care service utilization, the results in an Australian randomised controlled trial with 750 participants showed that participants in the reablement group required fewer home care hours, were less likely to be in need of nursing homes, and were less likely to be in need of emergency department treatment compared to participants in the control group [15]. The latter finding has also been shown in another study [6]. It has also been shown that persons who received reablement were less likely to need personal care service [7,16], and to be readmitted to hospital [17]. The results thereby indicate that reablement may reduce the need for homecare services, as well as for other healthcare services.

With regards to the cost-effectiveness of reablement, the results in the two existing studies showed that health and homecare costs of reablement were lower than the costs of the conventional home care [15,16]. The aggregated health and home care costs of the reablement group were lower by a factor of 0.83 over the 2-year follow-up in the aforementioned large Australian RCT [15].

The overall evidence base is much more ‘patchy’ than is often imagined by policy makers and practitioners. This is partly because reablement is relatively new in a number of countries, but also because:

- Different countries and localities can adopt very different service models, so larger studies may rarely be comparing like with like;
- The pace of the policy process can be such that new ways of working are implemented so rapidly that it proves difficult to rigorously evaluate effectiveness;
- It is proven to be difficult to establish causality, especially given the range of other interventions and policies at work at the same time;
- In some countries, evaluations are based primarily on small-scale experiments and/or can be of limited scientific quality;
- Older people and staff volunteering to take part in such pilots may not be representative of older people and staff more generally;
- There is often a focus on physical health conditions as selection criteria and as an outcome, and we know less about other groups for example, the experience of people with cognitive impairments;
- Aside from the available evidence, most research focuses on fairly small timeframes, so we still know relatively little about longer-term impact.

### **What Constitutes Valid Evidence?**

Underpinning all this is a broader debate about what constitutes valid evidence in the first place and how much evidence we need before we make changes to our services. Often, health care in particular is focused on a form of ‘*evidence-based policy and practice*’ (focusing on formal evidence of what might work and often relying primarily on particular forms of research – such as systematic reviews and randomised controlled trials). However, policy and practice in this area is typically a long way ahead of the formal evidence and is waiting impatiently for the research to catch up. In such a situation, we cannot always wait for evidence of what works before we do something new. Instead we have to look for evidence of what is not currently working, then thinking through new ways of doing things and learning by doing and reflecting as we go along (a form of ‘*knowledge-based practice*’).

In the case of reablement, we are firmly in the realm of ‘knowledge-based practice’, with different local and national services trying to pioneer new and better responses to longstanding policy challenges. In the process, they are having to draw on the emerging research evidence, but are also having to make decisions about future services based on intuition, professional experience and the lived experience of older people. This is often contested and ‘messy’ – and there is a strong sense of having to learn as we go along. Mirroring the nature of this evidence base, we have tried to incorporate the complexity and messiness of current knowledge in the success factors and barriers identified below.

### **Implementation: Key success factors, potential barriers and questions**

1. *Whose outcomes does reablement prioritise?* As suggested in the introduction to this paper, reablement has emerged as a key policy priority for a number of different reasons. While many of these drivers and aspirations overlap, there may be situations where these different motives may diverge and where different stakeholders might want different outcomes from each other. Although it may be possible to focus on goals identified by the individual older person *and* to try to reduce future service use, there might also be situations where these two aims are in conflict. If so, our experience to date is that the outcomes prioritised by the health and social care system



(reduced future service use) can easily trump the individual outcomes identified by older people using services. As a result, policy makers need to be clear what success would look like for reablement services in their national context, and whose outcomes are most important if there is a conflict. This is important not only philosophically, but also in terms of deciding how best to monitor outcomes (and hold providers to account for their performance).

2. *Cultural change:* Although many services would claim to having a 'reabling' ethos, working 'with' people rather than doing 'for' them represents a significant change and, for some people, may be very counter-cultural:
  - For some older people, being supported to become more independent might feel different to being 'cared for' via traditional care services (and this might feel uncomfortable and disorientating) [21];
  - For some informal carers and volunteers, reablement might sometimes feel less safe than traditional services, and may need carers/volunteers to support people in different ways. Support for informal carers and volunteers to rethink traditional roles may therefore also be needed if they are to be full partners in the reablement process;
  - For some care staff, it can be harder and more time consuming to work in a 'reabling' manner, rather than simply doing tasks for people. As an extreme example, a worker might say 'I became a home carer to look after older people, not to bully them' (personal communication). Expecting existing staff to work in very different ways without sufficient support to reflect upon previous practice and test out new approaches is unlikely to be effective;
  - For some providers, reablement represents a significant challenge to existing business models. For example, a commercial provider might need different and enhanced financial incentives (perhaps based on a system of 'payment by results'), given that they are being asked to work in a more intensive way with the individual with a view to them not needing on-going services thereafter;
  - For policy makers and local leaders, it is crucial that reablement is person-centred and works with the older person in the context of their family and community. Any intervention therefore needs to be fully tailored to the capacity and needs of the individual - a standardised or homogeneous response simply will not work.

In our experience, attempts to develop new service models pay insufficient attention to training and organisational development, running the risk that set older people and front-line services up to fail by not appreciating the profound nature of the changes needed to traditional practice if reablement is to genuinely to be embedded. Reablement involves a fundamental change in culture – and only a genuinely whole system approach is likely to be sufficient to support the necessary shifts in mind set and ways of working.

3. *Does reablement save money or do we need to invest to save?* It is no accident that official interest in reablement has increased as the population has aged and following the global economic crisis. In several countries, the aspiration seems to be that reablement will be actively cheaper than current approaches, leading to premature budget cuts in anticipation of rapid and significant savings. In practice, it remains unclear as to whether the promising outcomes from the evidence to date can be achieved when reablement is rolled out from initial experiments across the system as a whole. Moreover, high quality reablement with well-trained, skilled practitioners is unlikely to be a cheap option – and it may be that we have to invest upfront to save further down the line. Thus, policy makers seeking instant returns may be disappointed.

4. *What about dementia?* Many existing services focus on people with physical health problems, and can often exclude people with dementia and other people with cognitive impairments. This can sometimes be because of the time-limited nature of reablement services (with some staff mistakenly believing that it is not possible to reable someone with dementia in six weeks' (personal communication). In our view, this is inherently discriminatory and is also self-defeating – given the prevalence of dementia, any service aimed at older people without addressing the needs of people with dementia simply is not credible.
5. *How does reablement link to broader services (including assistive technology)?* In many countries, reablement has been established as a specific 'service' in addition to the current system. This can mean that there is significant focus and momentum, but also runs the risk of creating something of an 'add on' (and can also be perceived as removing the need for other services to work in a 'reabling' way). In a worst case scenario, this could lead to reablement services supporting a significant improvement in independence, with these gains then being lost if the person has some ongoing needs and moves on to long-term services. At the heart of this dilemma is a question about whether reablement is a 'service' or a broader 'philosophy'. In practice, this probably needs to be a case of 'both/and' rather than 'either/or', with a combination of specialist services alongside broader cultural change in mainstream services.

In particular, there may be a key role for technology, whether to help with the process of goal-setting, monitoring and evaluating progress, improving communication, supporting self-management, encouraging online interaction with others, and so on. As part of this process, there may be scope to use the time-limited reablement intervention as a key window for older people, informal carers and/or care staff to begin acquiring new skills in situations where technology can help meet ongoing needs or connect people more fully with others. However, remaining person-centred will be key – and there are a series of practical and ethical dilemmas to explore so that the older person remains in control and is not dominated by technology.

### **Global Implications**

To date, the reablement literature tends to draw on western/developed health and social care systems. However, it is possible that other systems are delivering genuine reablement in practice without necessarily calling this 'reablement' or identifying specific services. In different cultures, notions of 'independence', goal-setting and being an active participant in service delivery may also be less familiar/more challenging, and there may be a stronger emphasis on inter-dependence. There are also very different accountabilities, different assumptions regarding the respective roles of the individual, the family, the state, the market and civil society, different attitudes to professional expertise, and different service delivery models – all of which may impact on reablement. However, investing time, resource and expertise in helping people to be the best they can be instinctively feels like a laudable goal (albeit that the concepts explored in this paper will need to be implemented differently in different contexts).

### **Summary**

Reablement has a positive role to play and needs to be a core part of the spectrum of services available to older people. Although the evidence is still emerging, reablement is simply 'the right thing to do' – not trying to support people back to optimal independence would be bad for the individual as well as a poor use of scarce resources. However, effective reablement is unlikely to be cheap or easy to implement – and so policy makers expecting rapid cost savings and instant results are likely to be disappointed. While one option might be to wait for a more convincing evidence base to emerge, the fact remains that the pressures facing health and social care are such that doing nothing is not an option. Against this background, reablement seems a promising part of a broader solution – albeit this paper identifies a number of challenges and potential success factors that policy makers will need to reflect upon in order to give themselves maximum chances of success.

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## **Reablement and Technology Discussion Paper**

Expert Working Group on Technology

IFA Global Think Tank on Ageing 2015

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Chair: Dr Alex Mihailidis (University of Toronto, Canada)

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### **Introduction**

The number of people aged 65 or older is projected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with most of this increase occurring in developing countries [1]. As people live longer, there is an increase incidence of diseases and impairments such as cognitive decline, chronic age-related diseases, and limitations in physical activity, vision, and hearing. In addition, there is a growing shortage of working age adults trained to work with an ageing population, which means more family members have informal caregiving roles. However, we are starting to see a decreasing number of family carers who are able to provide care, due to their own health complications and “burnout” [2], as well as increasing geographic dispersion of families. As a result of these factors, in developed countries, where acute care and institutional long-term care services are widely available, the use of medical care services by adults rises with age, and per capita expenditures on health care are relatively high among older age groups [1].

Recently we have seen a plethora of solutions and models being proposed in order to support the ageing population and to overcome the above challenges. These models have ranged from concepts related to ageing-in-place, new service delivery models, to the use of technology across these and other approaches. New service delivery approaches include the emergence of a model called *reablement* as an alternative to traditional approaches of providing support and care to older adults in their own environments, whether that is in their homes, communities, or care facilities. This differs from rehabilitation, which is generally seen as being a high intensity therapy, medically directed intervention delivered within a hospital or outpatient setting, with formal assessment of function and outcomes.

As detailed in the International Federation on Ageing’s Global Think Tank on Ageing “Context and Background” paper [3], *reablement* refers to tertiary level interventions that are short term, targeted, and generally low in cost and intensity. Reablement services are used to ‘assist people to maximize their independence, choice and quality of life; appropriately minimize support required; thereby maximize the cost effectiveness of care and ensure people continue to actively participate and remain engaged in their local communities’ [4]. Health professionals such as physical and occupational therapists, and also vocationally qualified workers often lead the programs. The goals of the programs are user identified and programs take a client/person centered approach to enable increased engagement and motivation [5]. Using an intensive empowerment model, the long-term goal of reablement is to reduce the need for home care in the future [6].

Assistive technology (AT) has significant potential to support these new approaches in delivering care to older adults. AT is defined as ‘any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities’ [7]. AT includes traditional devices for example shower chairs and walking aids and expands beyond this to include digitally enabled devices

that advance mobile devices, telecoms network and software applications. Over the last 10 years we have seen significant expansion in the range of AT available, especially in the support of older adults. This growth is being driven not only by the aforementioned changing demographics, but also by the changing demands and expectations of older adults that technology will play a key role in helping them to remain in their own homes and communities.

There are many different ways to categorize and describe the various types of AT used by and with older adults. In this paper we have chosen to use a model based on function, and those needs related to ensure that function can be maintained. These span six primary domains: 1) mobility; 2) safety and security; 3) cognition; 4) health monitoring; 5) support in activities of daily living; and 6) leisure (where technologies for ADL support and leisure are not as prevalent as commercially available products). The most common commercially available ATs include mobility devices, such as wheelchairs, walkers, and environmental supports (e.g. grab bars). In recent years, there has been an influx of electronic technologies that help with cognition sensory loss and frailty. These solutions have included systems that can support older adults with dementia during self-care activities through the use of prompts [8], [9], technologies to support safety in the home such as monitoring falls and other potential accidents [10], and the use of robotics for cognitive support and training [11], [12].

In the recent WHO World Report on Ageing and Health [1], a model of healthy ageing is outlined that consists of two primary factors – an individual's: 1) *intrinsic capacity*; and 2) *functional ability*. This model outlines that even if an individual's intrinsic capacity has fallen below its peak, the person may still be able to do the things that matter to them if they live in a supportive environment [1]. This reflects the concept of maximizing functional ability, which according to WHO is the ultimate goal of healthy ageing. Furthermore, the WHO model assumes that the environment always enables functional ability to be greater than might be possible through intrinsic capacity alone [1]. As such, as a person's intrinsic capacity decreases with age, the environment will continue to support the functional ability of the older adult. In this context, the environment may include policies that affect health, service delivery models, and new approaches and tools, including reablement and AT.

This paper builds upon the concepts outlined by the WHO in order to present the argument for, and evidence of AT use in reablement to support older adults and healthy ageing. Section 2 will present the case of using AT in the reablement process and how technology can be used to deliver reablement in a more effective manner. Section 3 will provide specific case studies of how AT has been used in reablement across three different conditions: 1) dementia; 2) frailty; and 3) diabetes. This section will also provide examples of future AT that is currently being developed and researched. Section 4 will present a discussion of the key issues that need to be considered in moving the fields of AT and reablement forward. The paper concludes with Section 5 outlining the key societal and individual implications of using AT in reablement.

## **The Role of AT in Reablement**

Reablement has emerged in recent years as both a philosophical, strategic and operational approach to home based care, most often for elders. Whilst an international consensus on the definition of Reablement is absent, it has been described as "services for people with poor physical or mental health to help them accommodate their illness by learning or re-learning the skills necessary for daily living" within the UK [13], and the term 'restorative care' has been applied in the US [14], and Australia [15]. The core essence of Reablement is preventative healthcare, delivered via a range of services that foster independence, prevent or delay deterioration of wellbeing resulting from ageing, illness or disability and ideally delay the need for more costly and intensive services [16].

Reablement services are generally designed to help people learn or relearn the skills that ill health has caused to decline with subsequent impact on a person's functional ability. Assistive technology can play a significant role within this, providing support of older adults to maintain independence,



and thus to age-in-place. The reablement process with respect to assistive technology includes: 1) the use of the assistive technology; and 2) the training on how to use the technology.

Table 1 shows key areas and phases of reablement where technology can play a significant role. Across these areas AT applied in reablement can support behaviour change through personalized and adaptive interventions to maximize function. The goal of any technology in reablement should be to support and enhance existing skills and function of an older adult, rather than replacing the individual's capacity.

*Table 1. Areas of application for Assistive Technology (AT) in reablement*

Area of application	Description
Assessment	AT can be used to determine the status of an older adult in multiple domains (e.g. physical, cognitive or affective status, level of disability, function or participation in different environments). Perhaps more importantly, technology can be used to determine an older adult's capabilities that could be used to support the reablement process.
Goal setting and sharing	AT can be used to help older adults set specific goals in reablement and to share these goals with others within their care circles. AT can then be used to monitor the completion of these goals.
Implementation	AT can be used to implement the proposed intervention, such as the use of a technological solution to support an older adult to complete their individualized goals (AT as a means of carrying out the intervention) or support activities of daily living (AT as the intervention).
Evaluation	AT can be used to evaluate the effectiveness and efficacy of the reablement process and intervention. Technology may allow for data to be collected that typically would not be possible through "traditional" measurement options (e.g. rather than periodic evaluation, measures can be made over the course of reablement to inform outcomes).
Ongoing monitoring	AT can be used to monitor the progress of an older adult even after reablement is completed and detect changes early, thereby pre-empting adverse incidents. Longitudinal data can easily be collected using technology.
Decision making	AT and the data that technologies collect can be used to help older adults, clinicians and other carers to make more informed decisions throughout the reablement process, including the types of interventions to be used and when to remove the intervention. This may include using technology to predict the trajectory of a person over time to help inform key decisions.

At a higher level, AT in reablement can:

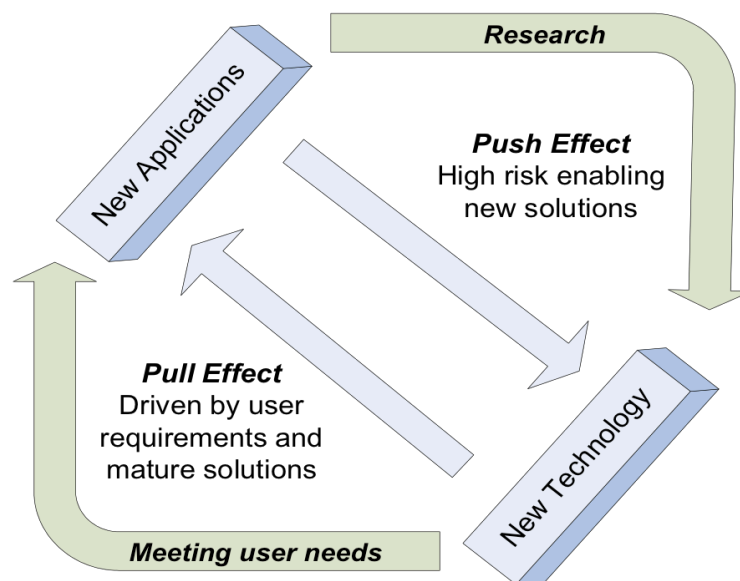
- Support reablement across different types of users who may have multiple co-morbidities
- Play a role from prevention to support, including understanding when services could be withdrawn/reduced/modified
- Collect data on parameters that are difficult to measure and provide novel ways to present or interpret the data that might offer insights which otherwise may not be detected
- Predict trajectories to help with decision making within the reablement process
- Provide new mechanisms to increase motivation and adherence to the reablement process
- Underpin interagency collaboration within reablement.

The case studies in Section 3 provide a more detailed description of the different ways that AT can be used in reablement.

Training an older adult (and their carers) on how to use a technological solution is critical in this process. In fact, the reablement process may focus primarily on the selection, implementation, and training for the use of an off-the-shelf AT that allows the older adult to achieve his/her set reablement goals.

The way in which reablement is delivered and the role of technology are critical factors to effective provision. Specifically, AT can be used to deliver reablement in a multitude of ways depending on the type of intervention being delivered, the needs of the older adult (and carers if involved), and other important contextual factors, such as the environment (e.g. at home or within an institution). In addition, technology can be used to better motivate an older adult through the reablement process, for example, by using different modalities to connect older adults with therapists, through peer-to-peer models (thus providing an element of cooperation or competition), or using advanced user interfaces and gaming engines to “mask” the treatment being provided to a more engaging environment for the user. We should also consider the “business model” for the delivery of the technology. While many ATs are currently considered to be medical devices and provided through existing healthcare models, many technologies useful in reablement can be considered to be “classic” consumer products and/or electronics that can be readily purchased. The consumer approach can provide technologies that are more readily available at a more affordable cost. However, typically they do not include the supports and formal training that would be provided for medical devices or through government funding schemes. The challenge for many healthcare and government providers is how to integrate personalised devices into public and private healthcare provision – can a person use their own device?

Finally, it is important to discuss the process of how to best determine which type of AT(s) may benefit older adults the most through reablement. The process of designing, selecting, and deploying new technological solutions must be a collaborative effort between a multidisciplinary team of experts, including clinicians and practitioners (including personal support workers, nurses, physicians, etc.), therapists, carers, technology designers, and most importantly the older adult. This process is illustrated in Figure 1 and must include users (including therapists and carers) informing designers about the types of technological solutions that may be of interest and importance to them (the “pull effect”), and the designers informing users about the types of technological solutions that are possible (the “push effect”). This iterative process of research, development, and design of solutions that is a combination of existing and new applications, is critical to ensure that effective and proper solutions are developed with a focus on genuine individual needs, goals and function in everyday life.



*Figure 1 – The push and pull effects to develop effective technological solutions*

### **Case Studies – Using AT to Support Reablement**

This section provides an overview of how AT can play a role in reablement across three cases: 1) dementia; 2) diabetes; and 3) supporting reablement in frailty. We will present examples of older adult personas for each of these areas with current and future ATs that can support each persona. The goal is not to provide an exhaustive discussion but to provide an overview of key evidence that might support the role of AT in reablement in each situation.

Before providing case studies and examples of how technology can play a role for each of the above areas, it should be noted that while there have been technologies developed and tested with these user populations, there is still a lack of evidence or weak evidence for many of these interventions with respect to improving specific health, well-being or participation outcomes [17]. While many technologies are commercially available (e.g. activity tracking devices and apps), clinically relevant and meaningful interpretations of the data and efficacy and effectiveness studies of technological interventions are still needed [18]. As such, this field has suffered from weak evidence for their adoption. As a result, many technological interventions are often not evidence-based for rehabilitation (and reablement) applications, so health care providers are more often than not left to weigh the pros and cons of recommending these tools.

#### AT to support reablement in a case of dementia

The use of technology, from a dementia perspective in reablement, has potential application across the spectrum of stakeholders ranging from healthcare professionals, carers and the person with dementia. Although each stakeholder has different requirements, it is interesting to note the applicability and the benefits that technology can offer to each of them.

The following vignette explores the potential applications of current and future technology in the context of reablement for persons with dementia and their carers.



*Mervyn is a 64-year-old man who lives in the countryside with his wife Susan. Mervyn took early retirement at the age of 58 following a successful career as an aeronautical engineer. At the age of 62 he was diagnosed at his local memory clinic as having dementia and two months ago was assessed as having a composite score of 1 (score range 0 to 3) according to the Clinical Dementia Rating indicating mild symptoms. After having a successful career Mervyn now finds it frustrating that he experiences*

*problems with his memory and forgets many basic tasks throughout the day. He is finding that he relies on his wife Susan to prompt him for many activities throughout the day, especially remembering to take his medication.*

*Following a consultation with his doctor, it was recommended that Mervyn use a form of memory aid and have an accompanying reablement service to assist in training Mervyn to use the memory aid (in this case a reminding app installed on a tablet computer). Mervyn and Susan's reablement goal is to be able to carry out basic activities throughout the day independent, with less prompting from his wife. Within this goal he has three objectives. Firstly, Susan learned how to use a tablet computer and the apps installed on the device. This requirement was to help provide Mervyn with any support he may require with using the AT, following reablement. Secondly, Mervyn learned how to use a tablet computer and the installed apps. Finally, by the end of the reablement period Mervyn was able to use the tablet computer independently and set a range of reminders for tasks he required support with on a daily basis.*

Table 2 shows the technology applications that can help Mervyn and his wife in addition to the reablement team in the assessment, goal setting and service provision.

*Table 2. Technology applications in dementia*

Reablement Process	Activities	Supporting Technologies	
		Current	Future
Assessment (Assessment, evaluation, ongoing monitoring)	Can help to screen and contribute to diagnosis	Digital tools are used to record neuropsychological assessments, which are used as the basis for recommendations of enablement services.	Digital tools are used to capture activities of daily living and performance over time. Automatic analysis of these data are used to assess the person with dementia's requirements, recommendations of reablement services are automatically made.

Goal setting	Assist in developing and managing goals, and updating progress	Goal setting and management app (e.g. <a href="http://www.coach.me">www.coach.me</a> )	Intelligence introduced into the goal setting process, whereby based on the profile of both person with dementia and their carer, a personalised set of goals will be recommended.
Implementation  1. To ensure ability to use tablet computer and apps  2. To train use of tablet computer and apps for Mervyn.  3. To allow Mervyn to complete one or two daily activities	Establish training program to be delivered on a staged basis for both person with dementia and carer in terms of level of support being offered by reablement services team and tasks being asked to being completed.  Basic usage of tablet computer to complete daily living or leisure activities.	Usage of reminder setting apps [19]	Deployment of app within a smart home environment to automatically monitor responses to reminders, such as kitchen or outdoor leisure activities
Decision-making			Remote tracking of daily activities and reminders to provide automated prompts for re-engagement when required.

#### AT to support reablement in a case of frailty

The use of technology to support reablement in those individuals who are considered to be frail may be one of the strongest examples of where technological solutions can have the greatest benefit. AT has a long history and strong evidence in supporting frail older adults to continue to live as independently as possible in their own homes and communities.

The following vignette explores the potential applications of current and future technology in the context of reablement.

*Mrs. Jacobson is a 78-year-old woman living alone in a 2-storey house. Her husband passed away 3 years ago. Her daughter and her family live within a 3-hour drive and phone regularly. She has a neighbour, May, who visits her once a week for social visits and to “check in on her”. Her neighbour has noticed Mrs. Jacobson’s weight loss in the past six months. Her mobility has slowed down and she is using furniture to support her walking more frequently. May notices bruises on Mrs. Jacobson’s face and arms and noted a smell of urine around the house for the past two visits. May is concerned that Mrs. Jacobson’s health is declining and fears that she may have fallen, though she denies it. After asking Mrs. Jacobson for permission, May contacts Mrs. Jacobson’s daughter who arranges an appointment for her to see the doctor. The doctor recommends to Mrs. Jacobson and her daughter that Mrs. Jacobson receives reablement services. Following assessment by the reablement team, Mrs. Jacobson defines the following goals: 1. To ensure face-to-face contact with her family who lives far away, 2. To improve her walking tolerance and minimize the risk for falls, 3. To be able to purchase groceries regularly, and 4. To manage her occasional urinary incontinence.*



Table 3 shows the technology applications that can help Mrs. Jacobson and her health and social care team to achieve her reablement goals, and technology applications that can assist with care delivery and systems goals.

*Table 3. Technology applications in frailty*

Reablement Process	Activities	Supporting Technologies	
		Current	Future
Assessment (Assessment, evaluation, ongoing monitoring)	Can help to screen and contribute to diagnosis  Communicate assessment results between Mrs. Jacobson and her health and social care team and others in her circle of care	Wearable monitors that track heart rate and daily activity levels (e.g., <a href="http://www.polar.com">www.polar.com</a> , <a href="http://www.mylively.com">www.mylively.com</a> ) are available, but may not be acceptable.  Apps or digital tools can enable self-report or carer/health care provider to record/administer assessment tools for fatigue, perceived effort, and exercise engagement (e.g. Multimorbidity GEMS app) [20]	Ambient or wearable activity monitors can track walking speed, signs of fatigue and low energy levels or other physiological and health data  Movement sensors + algorithms can detect changing activity patterns and recognise falls via (in)activity monitoring  App that allows health information sharing between individual, care providers, informal carers for progress monitoring

Goal setting	<p>Assist in developing and managing goals, and updating progress</p> <p>Communicating goals, plans and progress between Mrs. Jacobson and her health and social care team and circle of care</p>	<p>Goal setting</p> <p>apps and tools can help with documenting and tracking progress on self-identified goals (e.g. <a href="http://www.coach.me">www.coach.me</a>)</p>	<p>Interfaces can be engaging/interactive to assist with motivation and adherence to therapy programs</p>
<p>Implementation</p> <p>Mrs. Jacobson's goals:</p> <ol style="list-style-type: none"> <li>1. To ensure face to face contact with her family who lives far away</li> <li>2. To improve her walking tolerance and minimize the risk for falls</li> <li>3. To be able to purchase groceries regularly</li> <li>4. To manage her occasional urinary incontinence.</li> </ol>	<p>Determine means to facilitate face-to-face communication with her family on a regular basis.</p> <p>Balance and mobility training with therapist and support worker</p> <p>Education on falls</p> <p>Select, procure and educate on mobility and transfer aids and incontinence products</p> <p>Determine means to facilitate purchasing of groceries</p>	<p>Teleconferencing or video phoning apps through computers, tablets, smartphones (e.g. Skype)</p> <p>Apps with self-directed exercises and education modules (e.g. <a href="http://respondwell.com">http://respondwell.com</a>)</p> <p>Telehealth care – e.g. virtual group exercise and education programs [21] [22]</p> <p>Activity and exercise monitoring tools to track progress and motivate with feedback</p> <p>Mobility aids such as wheeled walkers, grab bars, bathtub transfer devices, etc.</p> <p>Apps that facilitate selection of suitable mobility aids and incontinence products</p> <p>Personal emergency response systems (e.g. <a href="http://www.mylively.com">www.mylively.com</a>, <a href="http://www.lifeline.ca">www.lifeline.ca</a>, [23], [10])</p> <p>Online grocery shopping and delivery services</p> <p>Incontinence products</p>	<p>Interactive, haptics for exercises and training</p>



Decision-making			Activity monitoring and machine learning algorithms can help to detect changes in activity or function that can predict health events and alert the older person or their carers about the need to see a health provider or directly alert a health provider
Care Delivery and Systems Goals		Cross discipline-communication for coordination, scheduling, sharing information, within professional groups, assist with communication with care workers	

#### Support reablement in a case of diabetes

We finally consider an individual going from healthy, pre-diabetes, development of full diabetes to the onset of complications and disability. Reablement can prevent progression down this pathway. The case study and table below gives some examples of how this might be achieved with the assistance of AT.

*Alex's story begins when he was 55 years old. He has been working as a taxi driver for the last 10 years, after being made redundant from the local steel plant. Alex has been diagnosed with high blood pressure and is significantly overweight. The doctor noted that Alex gave up smoking some years ago, but he gets very little exercise and has a diet high in carbohydrates and saturated fats. His blood test show elevated fasting blood glucose levels and cholesterol. Follow up investigations show impaired glucose tolerance, indicating pre-diabetic syndrome. At follow up, he is prescribed anti-hypertensive and cholesterol lowering medication. The doctor outlines the consequences of lifestyle choices that Alex has made and recommends that he increases his physical activity and modifies his diet. Twelve months later, Alex has not increased his physical activity and has developed full Type 2 diabetes; he is prescribed an oral hypoglycaemic agent. Over the next few years, Alex struggles to manage his condition and loses his taxi license due to recurrent hypoglycaemic episodes. He has multiple medications for his high blood pressure, hyperlipidemia and diabetes, and his blood glucose control is poor. He develops an ulcer on his heel. Tests show that he has impaired sensation and reduced muscle mass, and he has signs of peripheral neuropathy. Blood tests show raised creatinine, suggesting early signs of renal failure, and further evidence of the onset of vascular complications.*

From the Alex's case above, there are three opportunities where a reablement approach can modify his disease progression. Once the pre-diabetic condition was identified (impaired glucose tolerance), structured diet and exercise programmes can be recommended by his health care team, as they have shown effectiveness in reducing the incidence of diabetes. In individuals with Type 2

diabetes, structured educational programmes, physical activity and intensive blood glucose monitoring, can enable individuals to manage their condition more effectively and reduce the risk factors for diabetic complications. These interventions can still be effective in managing or preventing further complications. In this case, AT can have multiple applications, supporting goal setting, improving glycaemic control and monitoring symptoms.

Table 4 below shows examples of how AT can assist in Alex's reablement program.

*Table 4. Technology application in diabetes*

Reablement Process	Activities	Supporting Technologies	
		Current	Future
<b>Assessment</b> (Assessment, evaluation, ongoing monitoring)	Monitoring of weight, physical activity, blood pressure, blood glucose, sensory testing	Population screening, Health and Wellbeing, Diabetes Clinics. Regular checks, diaries and record sheets.  Telemedicine (remote monitoring, video-conferencing) applications for glucose control and blood pressure [24]	Smart phone App identifies individual with low levels or physical activity.  Pharmacies and Leisure Centres routinely offer non-invasive health screening.  Data from the grocery store for food purchases is used to help maintain recommend lifestyle choices.
<b>Goal setting</b>	Weight, Physical Activity, Nutrition, Blood Pressure, Blood Glucose, Leisure Pursuits	Targets based on population data.  Reviewed monthly in clinic or via telephone consultation.	Initial goals based on individual biopsychosocial profile.  Smart (adaptive, multi-parametric) goals which respond in real time and are displayed on a smart phone or tablet i.e. balancing diet and exercise, allowing for daily variability.
<b>Implementation</b>  Educational programme	Pre-diabetes, Lifestyle modification, Newly Diagnosed, Glycaemic control, Supervised programmes.	Time limited programmes, delivered by health professional.  Self-reports. Pedometer or smart physical activity monitor linked to smart phone. (e.g. <a href="http://www.fitbit.com">www.fitbit.com</a> , <a href="http://www.glucosebuddy.com">www.glucosebuddy.com</a> )	Programmes for patient and partner. Delivery supported by expert patients, and social media, with video on demand to smart phone or tablet, based on goal achievement. Smart phone and tablet based Apps monitor levels of engagement and cognitive function.
Increase physical activity (PA) and leisure pursuits	Structured programme	Telehealth care  Virtual group exercise and education programs [21] [22]	Smart watch and phone based measurement of PA and leisure activities. Shared record with health professional, expert patients and peer support groups.

Improved nutrition	Structured programme  Weight and body composition measurement	Diaries supported by smart phone Apps. Body weight recorded on smart phone. Users supported by education programme. [25]	Smart phone or tablet recommendations based on grocery purchasing data. Data from scales and body composition on smart phone  Information available to peer support group.
Good glycaemic control with regular monitoring	Blood glucose monitoring	Finger prick test strip monitor, linked to smart phone.	Continuous blood glucose monitor linked to insulin infusion pump and smart phone.
Practice good foot care (regular inspections, in shoe pressure relief)	Foot inspection, identification of high risk pressure areas.	Diabetes clinics providing screening. Specialist foot clinics, podiatry and orthotics.  Measurement of at risk areas of high pressure	In shoe pressure relief and measurement. Smart phone photographs, prompts and reminders.
<b>Decision-making</b>	Optimisation hypoglycaemic agents. Referral to specialist services.	Regular clinic reviews supported by telephone advice services. Remote monitoring of blood glucose readings.	Remote monitoring of blood glucose and other physiological parameters. Cloud based data storage and processing with intelligent processing. Data used to inform clinical service delivery and peer-support networks. Notifications sent to Smart phone or tablet.
<b>Care Delivery and Systems Goals</b>	Identification of at risk patients. Optimize service delivery and identify best practice.	Benchmarking services based on level of glycaemic control and incidence of complications	Real time measurement of process and identification of high-risk patients aids. Dynamic case load management.  Feedback to expert patients and peer support groups.

### Key Issues to Consider with AT

While there is evidence to support the use of AT in the reablement process, there are still several issues that need to be considered moving forward. These issues must consider several factors, including those related to the person, the intervention to be delivered, and the context within which reablement will be delivered. Some of the key issues include the following:

- *General use vs. tailored for the individual* – Technology can be developed as a tailored solution for an individual and that person's specific needs. This personalization may be critical in the reablement process. However, as a technology is more personalized it may be more expensive and less useful in other contexts. In addition, it may require the expert carer who can personalize the set up. As such, it is important to determine if a technological solution/intervention needs to be personalized and how much customization is required. It

should be noted that the use of new advanced techniques, such as artificial intelligence, might enable AT to automatically learn and customize to a user.

- *Acceptance (usability, accessibility, and appropriateness)* – At present, around 70% of all AT's are abandoned and never used [26]. As such, it is critical to ensure that any solution provided as part of the reablement process will be actually used by the older adult, and adopted as part of this process. Key issues such as usability, where usability is determined by its effectiveness, its efficacy, and user satisfaction [27] must be taken into account during the development, selection, and implementation of any technological approach. So in the first instance what will motivate an older person to adopt a technology, integrate it into their lifestyle and sustain usage.
- *Affordability and Cost Benefit* – Any solution being developed and implemented during reablement must be affordable not only for the individual, but also for the agency that might be providing (and paying for) the solution. Cost and affordability are important to consider especially due to the short-term nature of reablement, and thus of the potential solution.
- *Interoperability* – As more and more technologies are being developed and used in reablement, it is critical that these technologies can work together (communication and data sharing). In addition, it is important that these solutions can also operate seamlessly with other types of “everyday” technologies that the older adult (and his/her carers) may already be using, such as cellular/smart phones, smart home systems, etc.
- *Training* – As previously described, training to use a technological solution is key to effective use of technology in reablement. The issue about how to best train a user is even more important if the user has a disability that may affect his/her ability to learn and retain new information (e.g. dementia). We should recognize that health and social care professionals might also have training needs.
- *Outcome measures and assessment* – Measuring the impact of the new technological solutions being used in reablement is very important in order to determine the efficacy of this approach, and to support the ongoing development and use of new technologies. The concept of measurement becomes even more important as new technologies are emerging that traditionally have not been used in reablement or healthcare in general (e.g. robotics, smart homes).
- *Implementation and maintenance* – It is important to consider how to best implement a new technology. In particular, it is critical to consider the context and environment within which the solution will be used, the duration of its use, and the work plan associated with how to maintain the technology once implemented. Support from an informal carer is often a prerequisite for effective deployment. Complex digital devices may require maintenance and update, how will this be managed and funded within healthcare systems that may have to contemplate expensive ongoing maintenance contracts?
- *Internationally appropriateness of technology* – With the growing number of older adults worldwide, it is becoming ever more important to consider the international aspects of assistive technology and reablement. This is especially important in the consideration of how technological solutions may be used in under-resourced regions and countries, and how these populations will be able to benefit from new approaches.
- *Stigma of Use* – Even if a technology has been designed to meet the goals and needs of an individual, and it has been shown to be usable (according to the dimensions described previously), a person still may not want to use it due to the stigma of doing so. Other factors

need to be taken into consideration, such as the social acceptability, when designing and implementing a technology or device to assist an individual.

### **Societal and Individual Implications of Using AT in Reablement**

Current and future use of technology will have significant effects on society and individuals. On a socio-economic level, new technologies and services will create new jobs in different sectors in addition to how we experience care and provide care. For implementation, additional skills are needed and training will be developed. With the new technologies and combined services, new service models will be created. Those models will be citizen centric, based on empowerment and co-creation with service providers. New models of revenue streams will be generated next to or replacing existing ones. In this regard, public discussions on public reimbursement versus private pay will need to take place.

New technologies, in particular those that are based on information and communication technologies (ICT), will create new ways of communication within the circle of care. However, those citizens who are digitally illiterate, such as the majority of older persons who have not learned and have no access to ICT in general, may further be excluded from basic participation in society – the so called ‘digital divide’.

With the advancement of technologies, each citizen will become automatically part of various ICT ecosystems. The collected data will be used for analytics on outcome measures for different disabilities to optimize personalised services and generate preventative interventions. This will also enable us to develop cost-efficiency and effectiveness models on trends and interventions for reablement. However, as citizens’ data are generated, collected, stored and shared, adequate privacy, safety and security measures need to be in place. Authentication, authorisation and consent become more important. As such, significant work is required to create awareness and education of citizens on the benefits and potential risks, of being part of such ecosystems and the ethical and cultural aspects of it.

On an individual level, mastering new technologies by persons with diverse educational backgrounds and experiences and persons with disabilities (e.g. dementia) may be a challenge and therefore subjects of ethical discussions. Furthermore, unconditional reliance and dependency on these new technologies will have far-reaching ethical and legal implications.

Policy makers are expected to connect, stimulate usage and (sub) finance solutions on the social, economic and legal aspects. They must start the dialogue within the penta-helix of government, knowledge institutes, non-profit organisations, private sector and citizens.

Sharing internationally developed best-practices focused on the Reablement model in which functioning in activities of daily living (ADL) is improved with lower costs, sustainability of the chosen solutions, the business cases underneath and implementation challenges should be part of the dialogue.

Whilst there are many factors to consider in the development, uptake and integration of technologies within healthcare systems a grounded reality is the need to accept that the devices, software and networks remain dynamic and change in an ongoing way. For this reason it is critical to 1) accept this and 2) appreciate that key to success is understanding what are the healthcare requirements, how can AT inform healthcare decision making and 3) operation systems and governance remain flexible to adapt to the new while sustaining the older models.

### **In Closing**

It is realistic to envision a world within which digitalised healthcare interventions will be pervasive and immersive for all citizens. Within this information, flows and subsequent healthcare decisions will be automated and personalised. Now, our challenge and opportunity is to explore and exploit the technologies with current older people within healthcare services. It is by pushing these boundaries that our knowledge about the potential and emergent pitfalls comes to the fore.

It is critical, for example, that thoughtful approaches are taken to consider aspects of personal and institutional privacy, security and safety of both device use and personal data as devices are integrated into systems and rolled out within services. Rights and choices of individuals, technology is not the only answer, mutual support is also important or we risk isolating individuals.

There is no doubt that ethical issues abound in the adoption of new technologies within healthcare, and maybe be more salient as the support of frail, vulnerable older people with cognitive impairment becomes a priority. However, the presence of such issues does not mean avoidance of use – that in itself would also be unethical as we should strive to do our best.

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# IFA



INTERNATIONAL FEDERATION ON AGEING  
Global Connections

The International Federation on Ageing (IFA) is an international not-for-profit membership organization founded in 1973. IFAs members are government, NGOs, industry, academia and individuals. The goal of IFA is to be the global point of connection and networks experts and expertise to influence and shape age-related policy.

The IFA has General Consultative Status at the United Nations and its agencies and formal working relations with the World Health Organization. Our membership extends to over 70 countries with a constituency representing over 60 million people.

## Ældre Sagen

DaneAge

DaneAge Association (Ældre Sagen) is a national, not-for-profit membership organisation founded in 1986. DaneAge has 700,000 members and is open to all adults (age 18+). The mission of DaneAge is to fight for a society in which: all can live long and good lives, the person is more important than their age, it is possible to live and flourish on their own terms, and support and care is available for those who need it.

DaneAge is independent, non-partisan and neutral regarding party politics, religion, and ethnic origins. DaneAge has 217 local chapters across Denmark with 16,114 volunteers working in the local chapters, doing voluntary social work, providing local membership activities, local advocacy, etc. DaneAge's headquarters in Copenhagen has a staff of approximately 100 (FTE).