

Introducing the 3rd Era of Care, and 7 Waves of TLC Applications

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Introduction

The need to support people to live life to the full has become increasingly important over the past 25 years or so. It applies to everyone in society from young children through to the oldest old, and includes those with any form of disability, long term health condition or mental health issue. It leads quickly to a realisation that the needs of individuals are both personal and complex. Maslow's hierarchy of needs (see Figure 1) adequately describes how people need to climb a pyramid to fulfil their ambitions and achieve a high quality of life. It also indicates how support can be aimed at helping people to reach their personal goals; it is thus consistent with policy described in new but separate and distinct legislation for Social Care in England and in Wales.

Unfortunately, both the NHS and local authorities face austerity and unparalleled pressures due to an ageing population, with higher expectations and an increasing prevalence of chronic conditions such as obesity. It means that interventions can generally be offered only to support the lower levels of the Maslow pyramid. Thus, services that might have a genuine preventive role, and which might have the potential to address some of the root causes of ill-health, inequality and poor lifestyle choices, are neglected so that basic unmet needs and risks to independence can be addressed. The result is that most vulnerable people receive little or no help to improve their Quality of Life. It is now a struggle for statutory authorities to provide support for the most basic levels of need.

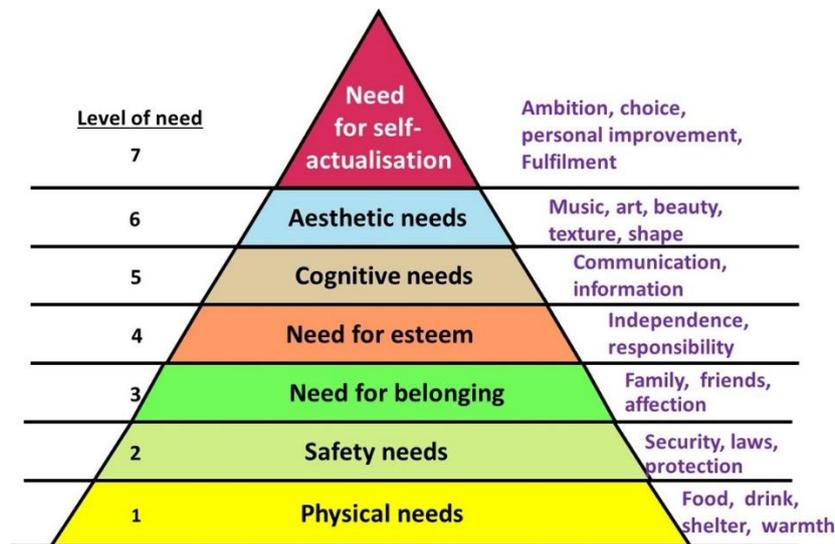


Figure 1: Levels of Need Based on Maslow's Hierarchy

The above also applies to interventions that offer people assistive and connected technologies to support them in helping people to cope and to do more for themselves. Technology Enabled Care services have the potential to offer a reactive response to emergency situations, but increasingly are being developed so that they can manage situations and lives so that people can be empowered to take charge of their own care. The information that can be shared can then be mined to identify emerging problems, predict future issues, and enable interventions that will ultimately allow actions that can prevent threats to well-being from developing.

Three Eras of Care for Older People

The shift of resources from secondary care (i.e. hospitals) to primary care and the community has been taking place over the past quarter of a century in all developed economies. Moving care “closer to home” is an admirable concept. In the UK, care of older people moved from the workhouse and geriatric hospitals during the 20th Century and this led to the development of thousands of sheltered housing schemes, often with a resident warden and an alarm scheme which allowed people who couldn’t afford a telephone to ask for help at any time. This signalled an end to the old (first) era of care focused on institutions.

The Care in the Community Act (1991) heralded major changes in long term care for both people with disabilities and for older people generally. It encouraged the growth of private sector nursing homes and residential care homes and led to a rapid expansion of provision for a decade. However, it became increasingly clear that few people would choose to move from their own homes into residential care unless it became impossible to live safely without 24/7 access to care and support. The cost of this form of care also increased as minimum staffing levels were mandated and conditions improved. Many more people began to appreciate the importance of independence in maintaining choice and Quality of Life (c.f. levels 4 to 7 in Maslow’s hierarchy in Figure 1). Home Help services offered by local authorities developed into Home Care propositions where generic help and support, such as assistance with shopping and cleaning, matured into personal care, replicating the support provided in care homes with services delivered into people’s own homes. This was the second era of long term care (see Figure 2) with a focus on carers, trained personnel who could provide formal personal and/or nursing support for older or disabled people either in their own homes or in community care homes. This era is dependent on a growing workforce of care assistants who need to be trained within organisations that provide appropriate rostering and mechanisms to identify declining conditions and the need for increasing levels of support.

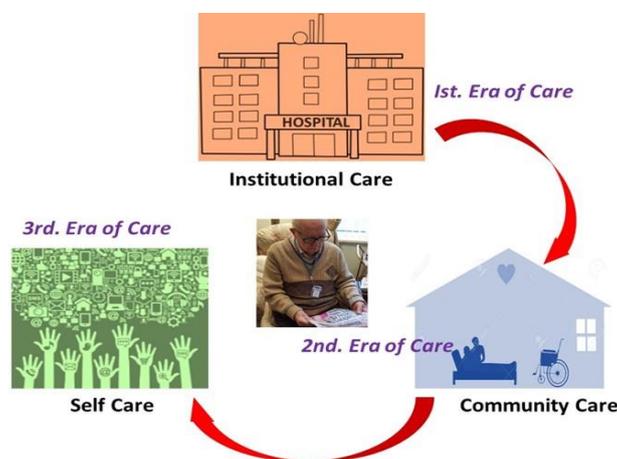


Figure 2: The Three Eras of Care

The problems with the second era of care are fundamentally about managing multiple short care episodes at times that suit people’s needs when the population in need of this care is likely to be geographically dispersed. Carers may spend more than half their time travelling to and from the homes of people in need of services. More significantly, many service users will require similar sorts of help to perform Activities of Daily Living, and at the same times. For example, a great number of older people will need help to get up and out of bed (transfer) and then dressing in the morning, and might require a service during a relatively narrow window of perhaps 7:30am to 9:30am. One carer might therefore be able to support perhaps a maximum of 5 service users. A similar problem exists in

the evening when they need to be helped to undress and get into bed. For safety and recruitment reasons, the latest that carers can be expected to be out working alone is 9 or 10pm. This means that some people have to be put to bed as early as 7:30pm, and may then be expected to remain there for upwards of 12 hours if they are unable to get into and out of bed on their own during the night. Although some care agencies will provide scheduled visits during the night, on-demand support for personal care such as toileting is not generally available.



Figure 3: A Possible On-demand Community Care System

An “uber-style” care service would be needed to enable people in need of this level of personal care outside of a care home, or without moving into (or close to) an Extracare scheme where 24 hour care staff are already available. Figure 3 shows how such a scheme might operate using a smartphone and app or by pressing a telecare alarm button and using a telecare monitoring centre as the facilitator. It may be apparent that the arrangement described above would empower people to manage their own care arrangements, giving them the choices that we have come to expect today. This lies behind the inevitable shift to self-care, which some people will treat as Do-It-Yourself (DIY) care – and the next era of care, which will be dependent on information, communication and an increasing use of technologies that support self-care – all very consistent with personal budgets and direct payments.

Technology Enabled Community Care

When England’s Department of Health introduced the term Technology Enabled Care (TEC), it was an important step in overcoming problems associated with historically poor definitions of terms such as telecare, telehealth, and telemedicine that had plagued the care and support industry for decades. However, TEC is itself a generic term that must include the whole spectrum of technologies that are relevant to care. These can be described under the four headings shown in Figure 4.



Figure 4: The Four Pillars of Technology Enabled Care (TEC)

MedTech is itself a generic term for a wide range of systems and devices that include MRI scanners, surgical robots, radiotherapy devices and other expensive items that are essential for acute hospitals and treatment centres but which currently have little place in people’s homes. Pharmaceutical technologies play an important role in treating illness, and research into new drug treatments are so expensive and sophisticated that they are usually the subject of quite separate budgets both for research and as approaches that help to manage conditions of ill-health.

On the other hand, Health Informatics lies at the heart of shared information and decision making, whether through providing emergency clinicians and paramedics with the data that they need to provide efficient response or through electronic prescriptions and scheduling or Artificial Intelligence. Personal health records will increasingly be at the core of treatment choices and self-management of our health and well-being. The use of this information will enable people to make decisions on how best to cope with the challenges of old age including long term conditions and disabilities, and to select either personal care (2nd era of care) or, increasingly, the assistive technologies that can help them to do things for themselves more easily, relying less on carers. This is likely to be the driver for independence that provides the motivation to move more quickly into the 3rd era of care.

Thus, Health Informatics and Assistive Technologies will combine as **Technology Enabled Community Care (TECC)** and will include connected and standalone technology applications. TECC applications are themselves enabled by informatics infrastructures at a national level. Local TECC provision should focus on personal items of TECC that can be worn on the person (or carried by them at all time) or which can be installed in the home. In some respects, these applications, and the services that provide them, are not **Technology Enabled** but **Technology Led Care** opportunities - TLCs.

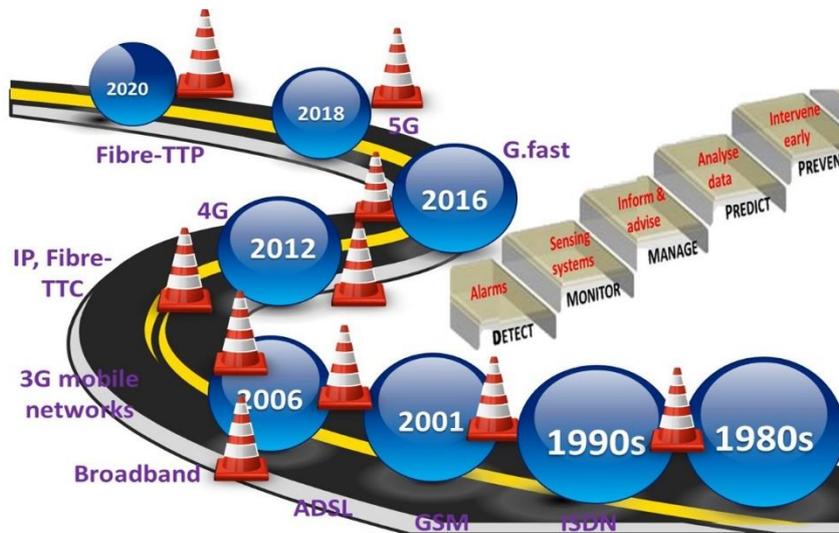


Figure 5: Telecommunication Developments that Have Enabled TLC Service Development

Basic TLCs have been available for the past 50 years. But progress in their use has been slow, in part because of the need for telecommunications developed to be readily available to support their connected nature, and partly because other areas of technology including miniature sensors and processors, data storage and battery improvements were also needed. Figure 5 shows an extended time-line for telecommunication speed and access that have provided the options for TLC applications that will extend provision from alarm notification and detection, through to monitoring, prediction and, ultimately, prevention. There remains, however, a significant lag between the availability of the telecommunications infrastructure and the maturing of TLC applications.

Seven Waves of Technology Led Care

Ensuring people receive the highest possible quality of care has been a major concern to families, clinicians and governments for many years. Yet there remains a reluctance for many people to accept the importance of independence, and the role of self-care in giving people control and choice – especially when it involves alternative approaches that do not rely on increasing interventions from an army of carers. This is one of a number of reasons that have slowed down the adoption and utility of technologies, whether they are assistive or connective in nature. It may be apparent that new applications need to be proved before some people will accept their role in supporting older and vulnerable people. There is no process for gathering such evidence, at least not at the level required for new drugs for example, so manufacturers of equipment and suppliers of service have faced unprecedented challenges to introduce innovation, despite the benefits being blindingly obvious in many cases.

Figure 6 shows the Seven Waves of TLCs against a time-line with the first wave having arrived before 2000 while the 7th wave, which according to folklore is going to be the biggest, arriving within the next 5 years. Associated with each wave are different types of application, each enabled by improved telecommunications (see Figure 5) and by advances in sensors and in system developments. These allow the collection and merging of several data feeds, the storage and analysis of bigger data sets, often in real-time, and the displaying of dash-boards, alerts and trending information.

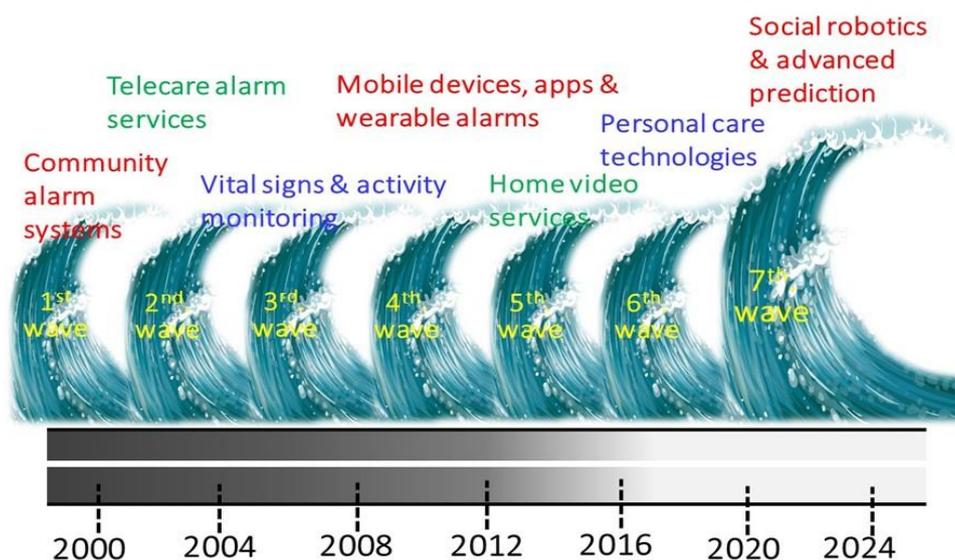


Figure 6: The 7 Waves of Technology Led Care or Technology Enabled Community Care

It may be significant to note that over three-quarters of current TLC service users have no more equipment than a button and a box i.e. a community alarm system. Some will have simple items of assistive technology such as grab rails, automatic lighting and walking aids, but are unlikely to have benefited from an integrated approach to managing their risks and unmet needs. Many will live in sheltered housing schemes; their TLC system might therefore be associated with where they live rather than with their own preferences and issues.

The second wave of TLCs matured in time to benefit from the Preventative Technology Grant (and similar capital schemes in the devolved nations). It was associated with more robust profiling of individuals and the management of risks to independence through the early detection and response to incidents using smart sensors linked to a monitoring centre that operated person-centred protocols. These ensured that responses were timely and appropriate, thus avoiding potentially life-changing long-lies whilst also demonstrating a practical means of helping people to delay the need to enter long term care and extended hospitalisation.

The 3rd wave of TLCs had two parts, the remote collection and analysis of vital signs information, and the pseudo-continuous recording of movements (i.e. activity) in and between rooms in the home. The former had the potential to play an important role in managing long term conditions, especially chronic heart disease (CHF) and chronic obstructive pulmonary disease (COPD) by enabling clinical staff to review patient data. Significant savings can be realised but the benefits may only outweigh the investment in technology if equipment is made less intrusive and costs are reduced considerably; further buy-in from GPs and community health groups will also be required.

Activity monitoring has yet to fully mature despite devices in the home being smaller, easier to install and connect, and systems having the sophistication to not only deal with information display but also providing trends and dashboards. Figure 7 shows information available through Lively (left) and through Mother and Sense (right), two systems that use small sensor devices discreetly attached to relevant objects. Their use can support early discharge from hospital and may form a new and important element of Digital Reablement packages that benefit both local authorities and the NHS.



Figure 7: Continual Activity Monitoring Systems for Demonstrating Capability and Performance

The 4th wave of applications makes use of mobile devices, including miniature GPS trackers and impact detectors, but also includes hundreds of thousands of apps that can be used with a smartphone. They allow support to be provided both inside and outside the home, giving otherwise housebound individuals the opportunity to go out more and exercise without the same anxieties that they might be taken ill away from home. The technology has the potential to commit the first two waves of TLCs to the history books, but the jump to all-digital solutions has yet to happen. The 5th wave brings video applications and the prospect of virtual visits and remote therapy and consultations using call handlers for teleconciere and to help overcome issues of social isolation.

The arrival of the 6th and 7th waves is imminent. The new systems will utilise a combination of personal devices and information using the potential of Big Data, Artificial Intelligence and advanced mechatronic devices to help us overcome cognitive impairments, failing senses and loss of muscle strength. They will also include a raft of new devices, appliances and items of furniture in the home, all of which will communicate with the rest of the world through the Internet of Everything. The challenge of the 6th and 7th wave will be to choose the best applications to fit with our lifestyle.

Beyond the 7th Wave

The emergence of social robots, digital assistants and electronic goffers can extend the DIY care revolution into another dimension, bringing Cyber Care – the 4th era of care – to the masses, overcoming the shortage of carers with machines and exoskeleton devices to overcome frailty. It may be consistent with the 4th Industrial Revolution which involves Cyber Physical Systems linking networks of machines to move beyond automation into personalised production.

iCUHTec COURSES TO GUIDE TLC SERVICE PROVIDERS IN PREPARING FOR THE 7 WAVES AND BEYOND WILL BE AVAILABLE IN LATE 2016 OR EARLY 2017.