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Current Trends and Opportunities in Telehealth and Telecare Systems and Services

and their Relationship to Developments in the Pharmaceutical Market

Abstract

The pharmaceutical industry needs to reinvent itself, to adapt to a rapid changing healthcare market, with high pressure on the healthcare economy, increase in competition and a dramatic change in the way healthcare will be delivered in the future. Unlocking the untapped resources of patients and carers through empowerment and active involvement in managing a variety of conditions, provide a great opportunity to cope with a problem that is high on the agenda in all countries in the western world.

This White Paper tests how telecare, with 5 million connected users of today (of which 50% is served by Tunstall) and which almost by definition live with a long term condition, and telehealth; with fewer but with a rapid growth in patients being monitored at home, can act as components in new innovative eHealth programs with the pharmaceutical industry. Intelligent and integrated drug delivery and follow-up programmes can increase the adherence and efficiency of the treatment of patients. This paper captures the key elements of this evolution and tests these against the emergent needs of the pharmaceutical industry, where disciplines of remote monitoring have now evolved beyond simplistic technology supply to concepts of managed services, which in turn implies a more holistic approach to care.

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The pharmaceutical industry

The pharmaceutical industry is challenged with the decline in the discovery, approval and marketing of new chemical entities, with fewer and fewer blockbuster drugs making it to the market, competition from generics drugs, regulatory pressures, weak growth in global economy and dramatic change in the way healthcare will be delivered in the future.

> The pharmaceutical industry needs to reinvent itself to cope with changes in the healthcare industry and competition from new players in the market

Therefore the pharmaceutical industry is forced to reinvent itself, find a new place in a complex value chain of care provision, and only the companies that are willing to change or modify their strategies and follow that with excellent execution of these strategies will have long-term success.

The healthcare market is changing

Another trend with significant impact to the pharmaceutical industry is the changes the healthcare industry is undergoing. An ageing population combined with a steadily increasing prevalence of chronic conditions puts the established healthcare systems under severe pressure. For many years the healthcare budgets have been increased year on year to cope with the increase in demand, but the financial crisis and lack of resources has forced a rethinking on how health services are delivered and a call for change.

The Chronic Care Model is now an integral part of the new healthcare strategies in most countries.
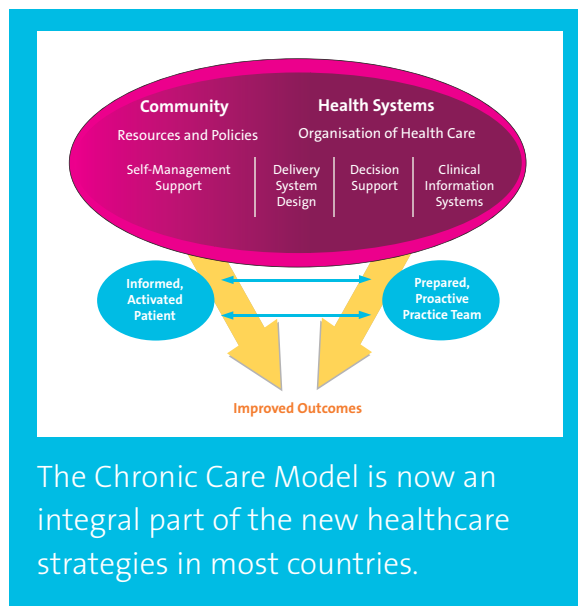
New healthcare strategies have been developed and are now being implemented in all western countries. One of the key elements of the new strategy is to exploit the untapped resources of patients with families and friends far more effectively than has been the case previously. It's about "Do More with Less", through patient empowerment and a more holistic approach to integrated systems.

> In this paper we examine the key elements of the technology and services behind telecare and telehealth, and we test these against the emergent needs of the pharmaceutical industry, and provide prime examples service innovation

But it does not stop here, for it is well known that social and health care are closely linked and that demand seems unlikely to be met by incremental changes in current models of healthcare. Instead a more radical approach to the healthcare environment is needed. One aspect of this is that basic economics and consumer choice is demanding the option of care closer to the citizen, making use of technology to enable connectivity and sharing of information between the citizen and their network of carers.

5 million telecare users

Telecare is already well-established world-wide, with 5 million connected end users. The users of telecare and assisted living systems are generally living with long-term health conditions or with other social or health vulnerabilities. These users often imply in long-term condition management programmes with overlapping medication. As a result they are already major consumers within the healthcare economy, and have a significant impact on the pharmaceuticals market.

To date the primary driver for telecare has been the provision of 'independent living', where care is brought closer to the person in need. Over the last four decades this has encouraged the creation of an infrastructure to support vulnerable people, helping to manage their risks of daily living, and thereby helping them to stay in a home setting of their choice rather than an enforced move to a more institutional setting. In the UK for example it is reported that around 1.7 million people are supported by over 240 community-based monitoring centres.

Telehealth extends the delivery of healthcare into homes

Telehealth is a more recent concept, and has extended these initiatives to the remote support for health conditions through the monitoring and exchange of medical information including patient feedback loops, to ensure patient involvement, education and empowerment. In this form, telehealth is a more recent initiative than telecare, with perhaps 2% of the installed base, but it is maturing quickly (Tunstall recently supplied their 60,000th telehealth 'hub' making Tunstall a leading provider).

Both disciplines of remote support have now evolved beyond simplistic technology supply to concepts of managed services, which in turn implies a more holistic approach to care.

Why telecare and telehealth matters for the pharmaceutical industry

According to a recent report by Capgemini Consulting, titled "Patient Adherence: The Next Frontier in Patient Care," only 69% of patients fill their first prescription. Only 43% of patients that start a prescription therapy are continuing that therapy 6 months later. This has a profound impact on current and future healthcare costs as these patients typically have additional healthcare issues in the future related to earlier episodes of non-compliance to treatment. Healthcare payers and providers are looking for ways how to measure the effectiveness of a treatment. In the future healthcare market, supplying treatment without the ability to document the outcomes and effectiveness will be increasingly difficult. New business models will be introduced by the competition and the industry players will have to diversify their propositions through new innovation.

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Typical telehealth programmes today

Today there's a number of programmes utilising telehealth and proven through a number of international pilots and large scale programmes:

- **Acute Hospital Discharge Monitoring:** Short team intensive home monitoring programmes are used in several occasions to reduce the number of early re-admissions after hospital discharge. Examples are the 30-90 days programmes running in the USA and reimbursed through Medicare

- **Long-term Condition Management:** These programmes are typically of 6-12 month duration, longer, or to end-of-life. These programmes aim to change patient behaviour towards a lifestyle that enables a longer and more independent life with a condition

- **Medication Adherence Programmes**: Several programmes address the need to support patients to comply with their medication programmes. Reasons for non-compliance vary from "I forget" to "I am not sick anymore" etc. Patient education programmes can address the root-cause of non-compliance and support better adherence

- **Mental care programmes:** Many patients with mental health illnesses suffer from social isolation and are difficult to communicate with at a distance. Telehealth and telecare opens a new way of communication

The most common diseases where telehealth has proven outcomes include: CHF, CAD, COPD and Complex Diabetes, but new and innovative programmes will support also specialty treatment programmes.

Optimising drug trials

Every year the pharmaceutical industry performs multiple studies and trials to monitor and create evidence of efficacy of drugs. Telehealth and telecare can accelerate data generation from the trials and allow day-on-day monitoring, early detection of trial failures and more. Telecare monitoring has the capability of monitoring behaviour changes.

The Tunstall systems (ADLife) can, for example, track changes in mobility, social interaction, nutritional behaviour and night-time behaviour, any of which may be useful markers in trials or adherence programmes.

> Tunstall is a world leading provider of telecare and telehealth products, solutions and managed services with intensive experience and millions of user in multiple geographies

Case Study, UK: 3 major programmes "WSD", "3ML" and "RTNI"

Tunstall is playing a key role in the transition of the UK healthcare system through contributions to several major programmes including:

- "WSD", Whole Systems Demonstrator

- "3ML", Three Million Lives , and

- "RTNI", Remote Telemonitoring Northern Ireland

With a market share of 70% in both telecare and telehealth, Tunstall has been a leading contributor of technology and services to the WSD and 3ML programmes.

Tunstall is contracted with RTNI to provide telehealth equipment and services to five trusts in Northern Ireland. The programme went live in December 2011, ramping to 10,000 patients over 5 years. The service provides management of all service requests, equipment logistics, patient support and technical and clinical triaging. Managed infrastructure service, extends to single sign-on for professional users.

www.tunstallwsd.com
www.3millionlives.co.uk
www.telemonitoringni.info

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Case Study, Spain: Using telecare infrastructure to implement large scale Social Care programmes

Telecare is a widespread service in Spain, with more than 770,000 users of the service of which more than 530,000 users are using Tunstall technology and services. The objective of the telecare service is to support the end users to live independently, staying safely at their home longer with a high quality of life. Telecare achieves this by not only providing an alarm service (triggered by the user or by automatic sensors), but also by supporting social inclusion and health services. The technology has proven to delay the need to move elderly people to residential homes, allowing them to stay closer to their friends and family.

> As a partner, Tunstall can support the pharmaceutical industry to innovate, implement and deploy eHealth programmes across continents

Particularly in Spain, telecare has a strong focus on social inclusion and gradually moving to include health services. An evidence of this is the fact that outbound calls (where the monitoring centre calls the user) represent 80% of the calls handled by the monitiring centre, and only 20% is inbound calls triggered by the users. These outbound calls can be reminders to the users, simply calling them to talk or the day of their birthday.

New innovative programmes are now being tested including medication compliance, acute services such as for heat waves, but also telehealth programmes for chronic disease management. These programmes are supported by the Tunstall Integrated Care Platform.

Case Study, USA: Pharmaceutical monitoring centres empower patient and caregiver support programmes

Tunstall delivers patient adherence programmes to support patients with disease-state and treatment education and on-going encouragement. They offer customised solutions including:

- Patient outreach
- Providing educational materials
- Offering 24/7/365 live operator support
- Remote nursing support for patient consultations
- Patient follow-up calls to support continued treatment, assess compliance and address concerns
- Customised reporting to HCPs

Tunstall have seen adherence rates increase by 10% to 15% after a patient support program is implemented and maintained for approximately one year.

Solutions from Tunstall Healthcare

Tunstall has developed a portfolio of home solutions for telecare and telehealth. The portfolio is optimised to be the most cost effective and appropriate solution for purpose on the market.

In addition Tunstall has developed a highly advanced Integrated Care Platform of enterprise software components, to capture data, store them securely and present them in an intelligent way based on intensive experience on how to deploy and run large scale programmes the most effective way. An architectural drawing can be seen on page 7, in this White Paper or on tunstall.com

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QA and regulatory compliance

Tunstall's telehealth products are designed under a quality system designed to meet the:

- US requirements: FDA 21 CFR part 820

- Canadian requirements: SOR/98-282

- Australian Therapeutic Goods (Medical Devices) Regulations 2002

- EU Directive 93/42/EEC

which are all transposed into legislation in the respective country.

As a mean to comply with the Regulatory requirements, the CoE site has developed and maintains an ISO 13485 certified QA system with a scope of "Design, Development, Production and Servicing of Equipment for Remote Monitoring of Patients".

The Service delivery model complies with a Tunstall Group Quality Policy based on accepted standards for IT Service Management (ISO 20000) and Information Security and Data Privacy standards (ISO 27001).

International footprint ensures uniformed service model across continents

Tunstall operates in 40 countries and with own subsidiaries in more than 15 countries.

Through their international footprint, Tunstall is able to service customers directly in the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Holland, Ireland, New Zealand, Scotland, Spain, Sweden, Switzerland, United Kingdom and United States. Countries not listed above can be serviced through operations in other countries, through Tunstall's network of established business partners, or through other means.
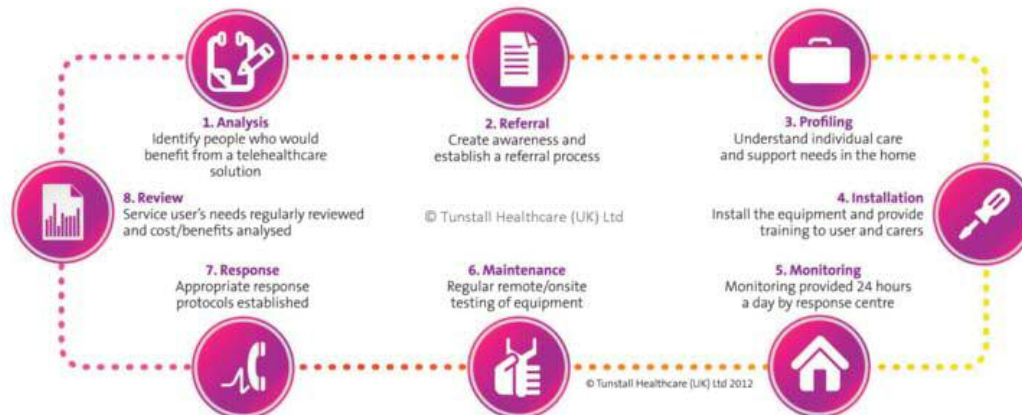
Closing thoughts

Telecare and telehealth already connects to millions of people with long-term conditions and the potential for cost and efficiency improvements are enormous. Polypharmacy with overlapping medication programmes and the associated confusion is a big issue for the users, where non adherence levels are known and cause to inefficiency and waste. Telecare has the capability of monitoring behaviour changes. The Tunstall "ADLife" system can for example track changes in mobility, social interaction, nutritional behaviour, night-time behaviour and some telecare devices can track or alert medication events e.g. missed doses and gas supply. Telecare systems are used to track home care delivery, with overlaps on medication supply, reminders and encouragement provided by such staff. The potential for new and innovative programmes are just enormous and are waiting to be explored and exploited.

Tunstall Technology Facts: LifeCare™ model is enabled by the Integrated Care Platform

The benefits of telecare and telehealth have been now been proven, but in the past, many telecare and telehealth services have been delivered as pilots, working in isolation from connect care and mainstream pathways. The evidence now shows that in order to maximise the outcomes, services need to move to mainstream, large-scale delivery. This is what is driving Tunstall's LifeCare approach. However, this requires a radically different approach, challenging traditional boundaries in health and social care and re-envisioning the service user and professional experience. Tunstall has structured its business functionality around helping customers to deliver a fully integrated approach, effectively embedding telehealthcare into the organisation's culture. Tunstall works in partnership to redesign service delivery and care pathways in order to achieve broader strategic goals and generate financial efficiencies.

1. Analysis
Identify people who would benefit from a telehealthcare solution

2. Referral
Create awareness and establish a referral process

3. Profiling
Understand individual care and support needs in the home

8. Review
Service user's needs regularly reviewed and cost/benefits analysed

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4. Installation
Install the equipment and provide training to user and carers

7. Response
Appropriate response protocols established

6. Maintenance
Regular remote/onsite testing of equipment

5. Monitoring
Monitoring provided 24 hours a day by response centre
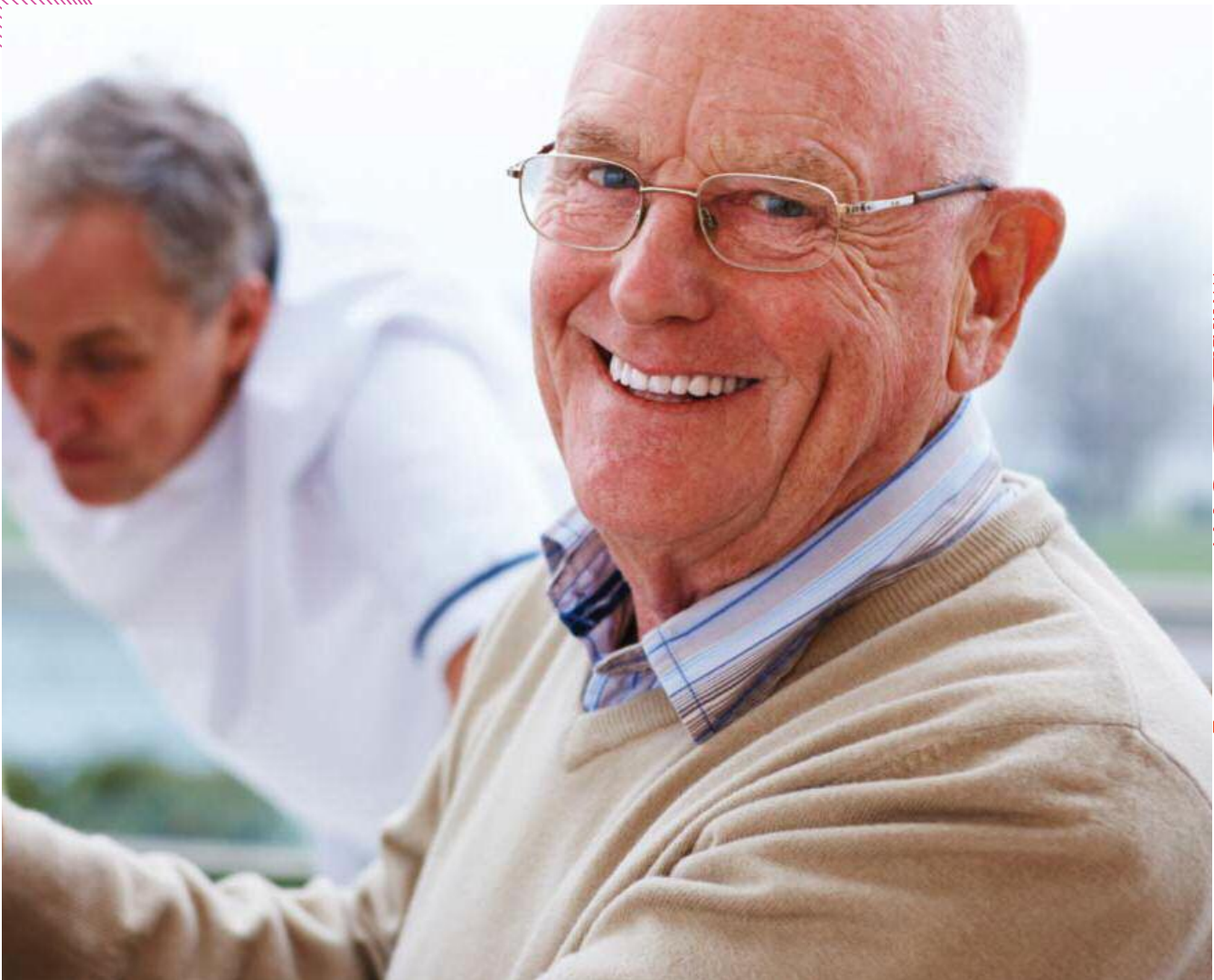
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The **icp triagemanager** is a backbone application in the icp suite to support the LifeCare model, specifically for telehealth. It is designed for remote patient monitoring and to support clinical decision making. The triagemanager receives vital sign data from patients and presents this on the triagemanager dashboard to give an overview of the patient's current status. Furthermore, the triagemanager supports patient interviews, in which the patient, on a regular basis, answers questions related to their monitored condition. If vital sign monitoring or patient interview replies are outside the predefined limits, or if readings have not been received on the expected time and date, an alert will be triggered in the triagemanager for the triage team to take appropriate action. The triagemanager is a medical device software application.

Another backbone application is the **PNC call monitoring and management system** from Tunstall, with the addition of a valuable new and unique Case Manager tool along with improved reporting functions. The PNC platform has proven to be the best in class platform for telecare service provision including the Case Manager feature - a facility to link all the activities and events relating to a single case.

This enables operators to ensure all activities are followed through and completed. Milestones are created along the route and reporting can provide management information to ensure adherence to SLA relating to cases.

The **Integrated Care Platform** also consists of a suite of supporting applications to enable large scale, efficient and high quality service deployment. The **icp gateway** provides single sign-on access to any and all icp suite services. The **icp online forms** are a collection of easy to use, online accessible forms, to be filled out by authorised users in order to seamless initiate work orders. The **icp service desk** offers the icp suite user functionality to effectively manage service requests entered into the system, either through the online forms or directly in the service desk, as well as monitoring case status or through direct integration with 3rd party systems. Other icp components include intelligent reporting tools based Business Intelligence platforms, document sharing and data integration engines based on open architecture industry standards including HL7 and PHMR.

About Tunstall

Tunstall Healthcare is the world's leading provider of telehealthcare solutions, operating in almost 50 countries and supporting more than 2.5 million people worldwide. Our technology and services play a key role in helping older people and those with long-term needs to stay out of hospital and residential care and live independently. We began as a small television and radio shop in Yorkshire, and just over 50 years later we have grown to telehealthcare solutions global market leader, pioneering new products and services and developing innovative approaches to help people manage their own health conditions and remain independent and safe wherever they choose to call home.