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UNLOCKING INSIGHT FOR PATIENT SUPPORT PROGRAMMES WITH CONNECTED DRUG DELIVERY

Neil Williams, Director of Front-End Innovation and Head of Connected Health, and Andrew Tubb, PhD, Director, Connected Health, both of Phillips-Medisize, discuss how insights delivered by a cloud-based connected health system help patient support programmes to monitor and improve medication adherence.

Patient care continues to move out of the hospital and doctor's office and into the home. This trend has rapidly accelerated with the COVID-19 crisis, as more clinicians have begun offering remote online and telemedicine care. In recent examples, a virtual care provider experienced a 900% increase in patients using telehealth services earlier this year, while one hospital reported that its video visits went from 200 a week to more than 12,000.[1]

This "new normal" places even greater emphasis on the ability to remotely monitor a patient's treatment regimen and effectiveness outside the four walls of a healthcare facility. A connected health system offers tremendous potential to capture timely, accurate data on a patient's at-home medication usage and health status – and quickly intervene as necessary.

Connectivity is already available in select home health sensor-based monitoring products, such as wearable blood pressure monitors and glucose meters designed to collect digital data. Alongside this, a rapidly growing field is emerging – connectivity in drug delivery solutions like inhalers, injectors, patch pumps and infusion devices. Data from these devices give new insights into actual device and medication usage and behaviour that help healthcare providers (HCPs) and patient support programmes (PSPs) to monitor and assist patients in correct device use and management of medication and dosage. The latest technology incorporates connectivity in legacy mechanical drug delivery devices (i.e. injection pens and inhalers) in a cost-effective manner, while newer electromechanical devices offer embedded connectivity capabilities.

> "Connected health systems offer an opportunity to amplify the value of patient support programmes."

A comprehensive, connected health system typically consists of three main components: a connected patient drug delivery device; digital interfaces for patients (i.e. engagement app on a smartphone) and PSPs/HCPs (web-based portal or dashboard); and a secure cloud platform that facilitates the transmission of digital patient data, so that it can be readily viewed and acted upon (Figure 1).

ENABLING PSPS TO BE EVEN MORE PROACTIVE

Connected health systems offer an opportunity to amplify the value of PSPs. These are generally third-party programmes, sponsored by a pharmaceutical company and

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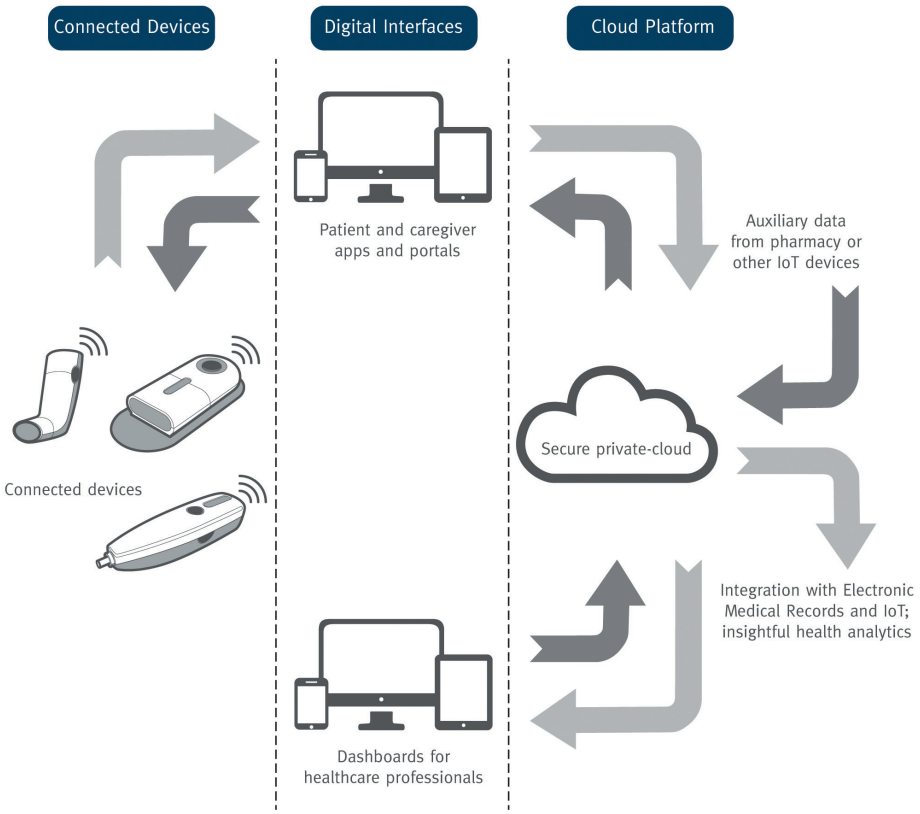

Figure 1: The Phillips-Medisize Connected Health Platform is designed to advance the digital health ecosystem and better support patients and healthcare professionals.

functioning separately from the commercial team. Typically, core staffing includes nurses and other clinicians with specific responsibilities to educate and support patients in self-managing their condition and adhering to their prescription treatment.

Poor adherence continues to be a widespread healthcare challenge. Up to 50% of medications are not taken as prescribed[2] and 33% of US hospital admissions are due to poor medication adherence.[2] This not only has a negative impact on patient outcomes but it also results in a large cost burden on the healthcare system overall.

HCPs and PSPs alike lack the objective, real-time or detailed visibility into a patient's health behaviours and status that would enable the most effective interventions. Whether care is delivered face to face or remotely, much time is spent trying to establish the patient's health behaviour and status in order to guide decision making and next interventions accurately. In many cases, PSPs follow standard scripts and pathways when communicating with patients but without sufficient health data insight to tailor support to the individual. As a result, a patient's behaviour, medication use or health status may change without the PSP or provider being aware – thus missing the most optimal points to intervene and make a more meaningful impact on the patient's health.

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Today's advanced connected health systems support PSPs by bringing together data from drug delivery devices, patient-reported outcomes (e.g. from apps) and other sources such as home monitors and patient wearables. The different sources of patient information, along with records of the PSP follow-up and intervention, are protected in a secure cloud platform. They are presented to PSP clinicians in customised web portals and dashboards that help to pinpoint and prioritise patients based on their adherence behaviour and health status, such as patient-reported outcomes. As a result, PSP staff can more readily identify outliers, intervene earlier and steer patients toward behavioural changes with personalised and targeted supportive interventions.

FUTURE TRENDS DRIVING CONNECTED HEALTH SYSTEMS

There are four main trends shaping the future of successful medication adherence with connected drug delivery:

1. **Behavioural insights** – we'll see a greater shift towards understanding more about what motivates patients, so that we can define and implement successful interventions.
2. **Scalability** – there will be a movement from small pilot studies to large global programmes and shared infrastructure where we can start to benefit from economies of scale. This will help implement connected health solutions at a lower cost base, so that they can be used more broadly in the market.
3. **Integration** – as healthcare continues down the path of digital, medication adherence data will be shared from proprietary systems to leading electronic medical record systems, allowing HCPs to view this data from anywhere.
4. **Analytics** – this is going to be a key driver for connected health systems going forward. We'll see a trend in how patient data is used more effectively to understand patient behaviours tied to drug performance and even the relationship between taking medication and improved health outcomes. This will guide more tailored and personalised care delivery at both the individual and patient population levels.

TARGETING HIGH-RISK AND CHRONIC CONDITIONS

A connected health system facilitates personalised care by unlocking data that alerts PSPs to changes in individual patient behaviour that warrant action. At a more abstract level, analysis and learning from pooled/population data can deliver valuable insights that can then be turned into new decision and intervention points, on an individual patient level as well as for specific patient populations.

"Connected health systems enable PSPs to target care, to focus attention on the patients who need it most with the right intervention at the right time, ultimately streamlining costs and improving the effectiveness of care protocols."

For example, at a population or sub-group level, are changes in treatment adherence correlated with the appearance or worsening of medication side effects? Or are such changes linked with not seeing expected outcomes within a certain time period? From such insights, flags for intervention can be hypothesised and then tested – e.g. to trigger behavioural nudges or other interventions when patients in certain stages of therapy miss treatment by a pre-specified number of days or if the time at which medication is taken becomes variable or strays outside defined limits. This data can also be used to pinpoint which patient groups are at a lower risk and which are at a higher risk, and direct them down different care pathways.

Overall, connected health systems enable PSPs to target care, to focus attention on the patients who need it most with the right intervention at the right time, ultimately streamlining costs and improving the effectiveness of care protocols. Individuals who suffer from chronic conditions are prime candidates for PSP support enabled by connected health. Medication adherence and persistence play an essential role in the long-term management of chronic and often debilitating diseases such as asthma, diabetes, multiple sclerosis (MS) and many others. Data captured from connected drug delivery devices gives the PSP a window onto actual patient health behaviour to guide their interventions.

As a case in point, Phillips-Medisize collaborated with Bayer to develop a connected system for patients with MS, where adherence to long-term disease-modifying drug treatment is especially challenging. This is an example of how a user-friendly, connected drug delivery device and system can enable a PSP to support patients and manage medication adherence. In light of the telehealth trend, today's PSPs and HCPs in general have a timely opportunity to leverage digital data to monitor and measure patient behavioural changes remotely. This, in turn, can guide PSPs with measurable insight that advances more accurate patient risk identification, recommended changes to a prescription drug regimen, a higher level of personalised care and, ultimately, healthier outcomes (Figure 2).

Figure 2: Phillips-Medisize collaborated with Bayer to help bring medicine into the digital age with the BETACONNECT solution.

ABOUT THE COMPANY

Phillips-Medisize, a Molex company, is an end-to-end provider of innovation, development and manufacturing solutions to the pharmaceutical, diagnostics, and medical device market segments. Backed by the combined global resources of Molex and its parent company Koch Industries, Phillips-Medisize's core advantage is the knowledge of its people to integrate design, moulding, electronics and automation, providing innovative, high-quality manufacturing solutions.

ABOUT THE AUTHORS

Neil Williams is Director of Front-End Innovation and Head of Connected Health at Phillips-Medisize. Previously he was with Medicom Innovation Partner, which he joined in 2015 and which was acquired by Phillips-Medisize in 2016. One of his key roles is to evolve the company's third-generation connected health software platform. Having started his career in the clinical setting, working in the critical care faculty with a leading NHS University Hospital, Mr Williams moved into industry where he has focused for many years on healthcare IT including medical devices, clinical decisions support, health analytics and care pathway design.

Andrew Tubb, PhD, is Director, Connected Health, at Phillips-Medisize. His main focus is developing innovative connected health strategies and solutions for customers, to improve patient outcomes and strengthen competitiveness. Dr Tubb's background prior to Phillips-Medisize includes 13 years in global marketing with Sanofi and seven years consulting in pharma and medical technology. He is particularly interested in integrated care products and services that bring together medication, drug delivery technology, connectivity, services and behaviour change.

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