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Commentary

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Use of automated technology- based adherence aids to improve medication adherence for those in independent living

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It has been widely reported that medicines wastage and non-compliance are very costly to the NHS. Often reference to wastage and cost to the tax payer has been estimated c£300m per annum [1-3]. However, it is considered that this figure is at least c £500m per annum in 2018, coupled with the medication non-adherence [4], not an exclusive UK issue but a problem that resonates throughout the western world.

Over 1m [5] hospital admissions / readmissions are due to medication non-adherence at a staggering cost to the NHS in excess of £500m per annum and it is understood that half of these are easily avoidable. Based on the estimates in the fourth report from the Patient Safety Observatory (2007), avoidable medicines-related admissions to hospitals may equate to nearly 2 million bed days in England or 4,200 per hospital [6,7], with a median length of stay of 8 days for a medicines-related admission. EIA report: medicines optimisation draft v1.7 4 of 7 recent activity levels, this equates to 3 million bed days.

The value stated do not detail the cost to the NHS in Primary Care; visits to the GP and signposting the individual Secondary care; discharge process and time taken to support any rehabilitation back to community, community nursing, home visits and possible specialist care. I would imagine this cost to be phenomenal and probably unfathomable due to each person's response to the medication, attitude, overall health and specific condition.

On discharge from hospital some people receive a social care package. As time progresses and if a person's health declines further, the care package typically increases in effort and any associated costs. These rarely reduce and at varying periods this downwards spiral in wellbeing is likely to lead to full time care.

For some, general wellbeing declines as a result of un-intentional non-compliance to medication. The good news is that this is preventable, and technology related solutions are available to support and thereby increases or maintains people's health and wellbeing. Retaining a person's independence is of paramount importance, not only to the individual, but to necessitate the cost reductions required to the health and social care economy. These saving have been measured in different work-streams, but there is an opportunity to capture the overall saving with all the elements listed above factored in.

Background

Protomed® Ltd have a Monitored Dosage System (MDS) in place that is widely used within the UK's Care Homes and in 2017 released an Assistive Technology device that utilises this MDS for people living independently.

Protomeds' MDS, Biodose® is the third largest supplier of compliance aides in the UK (and now operate in Ireland, Germany, France, Austria, Belgium) via a nationwide network of over 750 pharmacy outlets. Our tray-based system holds 28 individual pods and was the first to print each of the contained medication onto each removable pod which can take up to 9 lines and 15 individual tablets. Biodose® is a leading compliance tray provider which can accommodate both liquid and solid medication. Biodose can only be filled by a pharmacist professional and so mitigates any error in filling by family members.

The new digital technology is called Biodose Connect™ by Vaica. It is a cradle that stays in the patients' home and connects to our servers via an internal GSM data sim. The tray is activated by the supplying Pharmacy at a local level and a Biodose® tray is simply slotted into the cradle. The Pharmacies set up the device in line with person's drug regime so that it will provide a visual alert as to which pod to take and when. Half way through an audible alert can also be added which the Pharmacy can configure as to its volume and frequency. There is an audible alert when a wrong pod is removed from the tray. Each event is reported back to our servers and a dashboard can be viewed by authorised family members and carers, but more importantly to prescribing clinicians. This will better inform the clinicians, allowing an informed review of compliance and the prescribed treatments together with the therapeutic effect. The clinician can review any non-adherence and implement the next therapeutic steps that may be required.

The information that is received from the Biodose Connect™ unit can be sent to a monitoring centre, who are experienced in supporting people in this way and they can follow up on alerts created when a person's dosage time is about to end, prompting a call to make sure they are OK and asking them to take their meds, thus keeping them compliant. Alerts can also be raised if a dosage time is missed, when a wrong pod is removed and if the battery level is low (mains powered, back up battery min 12 hrs). To enable family members to be involved in the support network for the person, alerts can also be sent to consented family members, allowing them to intervene and keep close to their loved one's wellbeing.

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Biodose Connect™ can support a persons' independence by a complimentary transportable medication device, HandyPak™. This allows for medication dosages for when the person is not at home. In addition, it allows for routine activities where the person knows they will be out at the same time each week, the pharmacy can set up SMS message reminders to the person on a dose by dose basis.

Biodose Connect™ is a Medical Device product with a technological solution to support medication management in the UK and European market. Feedback has led us to be bold enough to state that it is the most comprehensive solution available which is pharmacy led, delivers on safety, compliance and truly promotes independence.

Learns to date

Local Authorities have quoted that they are paying their Domiciliary Care suppliers anything from £9.00 to £18.00 per visit for a medication support home visit. This could be 3 or 4 times a day! In addition, an authority in North of England [5] paid on average £234 per week, per person for meds only visits for 196 people (Freedom of information provided in October 2016). Pro-rate – that's just under £2.4m per annum.

Not all Local Authorities provide specific meds visits, but some will only include it as part of a wider care package. If the DOM Care company are providing services in helping the person with meals etc. meds can be included as part of this visit.

The pre-pilot interviews have found several Local Authorities who have shared that in order for a person in one of these areas to receive the required medication home prompting visits, the social worker may signpost additional services, in order to get the medication prompting element included. In some pre- interview discussions with citizens/ users of the service, DOM care visits have been found to restrict their activity by the person having to be house-bound to be at home during the period of the anticipated DOM Care visit (which could be up to four times a day).

In summary, based on the information received by several local authorities "Biodose Connect™ is capable of reducing the burden on the local health & social economy by in excess of £1m, per 100 users, per annum against a domiciliary home care support service" [5].

Case study 1

Our first paying customer is Patient 001 in Kent. Patient 001 is in his early 40s and was a window cleaner. He fell off his ladder at work and suffered a stroke which left him completely blind in one eye and 95% blind in the other. He was unable to remain in his own home living independently and moved into a semi-independent supported living home.

Within a few months of Patient 001 moving in, he had suffered two exacerbations in this condition which required hospitalisation, both of these events were due to medication adherence problems. Patient 001 was unable to take his medication properly and was not taking the right doses at the right time. The organisation that operated the care informed him that should there be another incident he would need to be relocated to a full-time residential care scheme. Patient 001 was quite distressed by this as he did not want to move into what he deemed was an "old people's home". The carers asked to trial Biodose Connect™ for one month.

Patient 001 has since commissioned the use of Biodose Connect™ using a self-care model and has been successfully using it for nearly two years. He has been able to manage his own medication regime enabling him to retain his level of independence.

Case study 2

Earlier this year we undertook a six-month pilot with one of UK's largest housing providers within a scheme in Glasgow. The residents had a mixed range of conditions including brain acquired injuries, learning difficulties and cerebral palsy. There were varying degrees of success on an individual basis and a great amount of insight derived from the collaborative project. The overwhelming learn was the individual's desire for independence regardless of what is captured during a needs assessment.

In conclusion, the high level of care required for those with Learning and Disability who required a high level personal one to one care, benefited the least from some of the assistive technology. This was largely due to the additional careers present throughout the day, negating the need for supportive technology when personal care was present and required. The Housing Group were greatly impressed by the operation of the medication management solution, Biodose Connect™ and the service provided by the pharmacy partner (Scottish Award-Winning Pharmacy for Innovation). There is a proactive plan to review ways to deploy Biodose Connect™ across their services for their different contracts.

At Protomed® we are actively working with several local authorities around the UK to provide our solution for a trial period of up to 3 months for 20 users, supporting the strategic UK agenda to encourage wider adoption of Assistive Technology. The areas of interest from the authorities include Older People's Services, Learning Disabilities, Mental Health, Discharge Planning and more recently Children's Services.

We look forward to sharing our findings based on the data we will collect, financial savings to Social Care together with supporting a citizen to remain independence longer via self-care technology adoption.

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