



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Digital Transformation in the Health and Care Professions (BMHP6026)

Component 1: Written Report

Student name: Maria Elisa Jose Dos Santos

Student number: 2327313

Lecturer's name: Muhammed Khan

Table of contents

- 1- Introduction**
- 2- Impact of workplace**
- 3- Impact on service delivery**
- 4- Impact on patient's service users**
- 5- Impact on the community**
- 6- Conclusion**
- 7- References**

Introduction

Medication management has become one of the most pressing operational challenges facing healthcare systems worldwide. Despite significant investment in treatment and prescribing, ensuring that patients take their medications correctly stills an unresolved problem at scale. The consequences of poor adherence are well documented: worsening of chronic conditions, preventable hospital admissions, and substantial costs to health services (Department of Health and Social Care, 2019). Smart pill dispensers have appeared as a practical, technology-driven response to this issue, and their growing adoption across the United Kingdom is reshaping how medication management is understood and delivered.

Smart pill dispensers are programmable electronic devices designed to hold a patient's medication and release the correct dose at the correct time. They typically include audible and visual alerts to prompt the user, a locking mechanism to prevent access outside scheduled times, and digital logging of each dispensing event. More advanced models incorporate cellular or internet connectivity, allowing real-time adherence data to be transmitted to pharmacists, carers, or family members (Pivotell Ltd., 2023). The Pivotell Advance, for example, can be programmed to dispense doses up to 24 times per day. At each scheduled time, the device rotates to the correct compartment, sounds an alarm, and opens a shutter to present the dose. If the dose is not taken within a set period, an alert is sent to designated contacts, enabling prompt follow-up.

The World Health Organization (2003) estimated that in developed countries adherence to long-term treatment regimens averages only around 50% among patients with chronic conditions. This figure has changed little in the decades since, and non-adherence continues to drive avoidable harm across health systems. Smart dispensers stand for a direct and practical response to this problem. This report examines their impact across four key dimensions: the healthcare workforce, service delivery, patients and service users, and the wider community.

Impact on the Healthcare Workforce

The introduction of smart pill dispensers has prompted considerable change in the roles, responsibilities, and needed skills of healthcare staff—particularly pharmacy technicians and pharmacists working in community and clinical settings across the United Kingdom. Understanding these changes is important for workforce planning, professional development, and the safe integration of modern technologies into established care pathways.

Pharmacy technicians have traditionally spent a considerable time, working on the manual preparation of checked dosage systems (MDS)—commonly known as blister packs or dosette boxes. These weekly medication trays are filled by hand for patients who require support managing their medicines, and the process is time-consuming, detail-dependent, and difficult to scale (Royal Pharmaceutical Society, 2022). As smart dispensers take over the function of presenting doses at the correct time, the need for manual MDS preparation is reduced, and the technician role shifts accordingly.

In practice, this means technicians are increasingly expected to program and support dispensing devices, interpret adherence data from connected platforms, and manage communication with patients and carers about the device performance. This requires a higher level of digital literacy than many technicians were originally trained with, and healthcare organizations must respond by investing in structured training and ongoing support (Health Education England, 2020). Without this investment, there is a genuine risk of creating an uneven workforce—one where more digitally confident staff progress while others feel marginalized or left behind.

For pharmacists, smart dispensers offer the opportunity to redirect professional time away from supervising routine dispensing tasks towards higher-value clinical activities. With automated systems managing the mechanics of dose delivery, pharmacists can devote greater attention to medicines optimization,

patient counseling, therapeutic reviews, and active participation within primary care networks—a direction strongly supported by the NHS Long Term Plan (NHS England, 2019). This is a meaningful professional development, positioning pharmacists as clinical contributors rather than dispensing supervisors.

The impact on domiciliary care workers also deserves attention. In home care settings, staff have routinely visited patients at scheduled times to prompt or administer medication. Smart dispensers reduce the need for such visits, freeing care workers to focus on other aspects of personal care (Age UK, 2019). This shift requires carers to move from a hands-on administration role to a supervisory and monitoring function—a transition that, again, calls for proper training and clear guidance from care providers and commissioners.

Impact on Service Delivery

Beyond changes to individual roles, smart dispensers are transforming how medication management services are organized and delivered across primary care, community pharmacy, and social care. The operational logic of medication administration has traditionally been structured around human availability—a carer visits, a family member prompts, a nurse checks. Smart dispensers disrupt this model by making the device itself responsible for starting each dosing episode, fundamentally altering the rhythm of service delivery.

In community pharmacy, the weekly preparation of MDS blister packs has long been one of the most resource-intensive tasks. Moving to a smart dispenser model means pharmacists instead programmed and periodically review dispensing schedules via digital platforms. Remote adherence monitoring enables pharmacists to track patient behaviour across a caseload and intervene proactively when missed doses shows—a shift from reactive problem-solving to continuous, data-informed care (Nieuwlaat *et al.*, 2014). This model is more consistent with the broader ambitions of integrated, preventative healthcare that underpin current national policy (NHS England, 2019).

The audit trail generated by smart dispensers adds considerable value to service governance. Every dispensing event is electronically recorded, producing a goal and time-stamped record of medication-taking behavior. This information can inform clinical decision-making during medication reviews, support documentation needed for care planning and provide evidence that care has been appropriately delivered—an important consideration for providers working under Care Quality Commission oversight (Care Quality Commission, 2021).

In social care settings, the reduction in medication-related home visits has practical implications for both capacity and cost. If a care worker no longer needs to visit solely to prompt medication at multiple points in the day, their time can be redistributed to more complex personal care needs. This efficiency gain is meaningful in a sector that is consistently under-resourced; however, care providers must establish robust protocols for responding to missed-dose alerts and ensuring that reduced visit frequency does not compromise the quality of relationship-based care (National Institute for Health and Care Excellence, 2015).

Impact on Patients and Service Users

The patient experience of smart pill dispensers is done by a complex combination of practical utility, individual capability, psychological response, and personal preference. For many patients—particularly older adults managing several long-term conditions simultaneously—these devices offer a meaningful reduction in the daily cognitive burden of medication management. Keeping track of what to take, when to take it, and whether it has already been taken is a source of genuine anxiety for many people, and removing this burden can have a direct positive impact on wellbeing (National Institute for Health and Care Excellence, 2015).

Patients living with dementia or other forms of cognitive impairment stand to benefit particularly from the structured and reliable prompting that smart dispensers provide. Alzheimer’s Society (2022) has highlighted the value of assistive technology in enabling people with dementia to keep daily routines with less dependence on others, and smart dispensers are a concrete application of this principle. For family members and carers, remote alert systems provide reassurance that a loved one has taken their medication without requiring them to be physically present at every dosing time—a meaningful reduction in the emotional and logistical burden of informal caring.

Evidence gathered through UK-based evaluations of smart dispenser programmed points to improved adherence rates and greater patient confidence in managing their own health among those who engage successfully with the technology (Royal Pharmaceutical Society, 2022). Improved adherence, in turn, leads to better control of chronic conditions, fewer acute episodes, and longer periods of maintained independence—outcomes that matter both to patients and to the health services that support them (Patel *et al.*, 2022).

Some patients respond negatively to smart dispensers, particularly when checking features feel intrusive or when the device is perceived as diminishing personal agency over their own treatment. Patients who have managed their

medications independently for many years may find the introduction of an automated system patronizing, and clinicians must be sensitive to this when making recommendations. Person-centred decision-making and genuine patient consent are not optional additions—they are prerequisites for successful adoption (National Institute for Health and Care Excellence, 2015).

Practical accessibility barriers must be considered. Patients with visual impairments, limited manual dexterity, or low confidence with technology may struggle to interact with device interfaces. Device design and procurement decisions should take these needs into account. Additionally, connectivity-dependent features—such as missed-dose alerts transmitted to family members—require reliable internet or mobile coverage, which cannot be taken for granted in rural or deprived areas of the UK (Health Education England, 2020).

Impact on the Wider Community

The effects of smart pill dispensers extend beyond individual patients to shape the experiences of families, unpaid carers, local health economies, and population health outcomes. At the community level, one of the most significant contributions of these devices is their support for independent living—enabling older and disabled individuals to remain at home for longer by managing their own medications safely and reliably (National Institute for Health and Care Excellence, 2015). This aligns with both patient preference and national policy goals around ageing in place and reducing preventable admissions to residential care.

For the considerable number of people in the UK who provide unpaid care to family members or friends, smart dispensers can ease one of the most frequent and stressful aspects of the caring role. Research by Thielemans *et al.* (2023) found that informal carers consistently showed medication management as among the most burdensome of their responsibilities, and that tools enabling remote oversight significantly reduced anxiety without requiring constant physical presence.

At the population level, the relationship between medication adherence and chronic disease outcomes is well established. The World Health Organization (2003) found poor adherence as a primary driver of inadequate disease control in conditions including hypertension, diabetes, asthma, and heart failure. Where smart dispensers improve adherence at scale, the downstream effects on population health could be substantial, with reductions in avoidable hospital admissions freeing NHS capacity.

A six-month prospective observational study by Patel *et al.* (2022) found that community-dwelling adults using an in-home smart dispensing system achieved average monthly medication adherence rates of 98%, with most participants reporting high satisfaction. These findings provide important evidence that, when implemented effectively, smart dispensers can deliver clinically meaningful improvements in adherence across a diverse population.

Equity considerations must, however, form part of any serious assessment of the technology's community-level impact. The benefits of smart dispensers are easily realized where digital infrastructure is reliable, and users are confident with technology. Communities lacking these conditions risk being left behind, meaning that adoption could inadvertently widen existing health inequalities unless deliberate action is taken to ensure inclusive access (Health Education England, 2020).

Conclusion

Smart pill dispensers are a substantive and well-evidenced innovation within medication management. Their impact spans workforce roles, service delivery models, patient outcomes, and community health. The shift they enable—from manual, visit-dependent systems to automated, data-informed care—is consistent with national policy direction towards integrated and preventative healthcare.

For the workforce, the key challenge lies in managing this transition effectively through training, support, and clear role development. For pharmacists, the opportunity to expand clinical practice is particularly significant.

For patients, the benefits are clear but not universal. Successful implementation depends on person-centred approaches, accessibility, and informed choice.

At the community level, the potential to support independent living and reduce avoidable hospital admissions is large. However, fair implementation stays essential. When delivered inclusively, smart pill dispensers prove how well-designed technology can meaningfully improve the quality, safety, and efficiency of healthcare.

References

Age UK (2019) *Later life in the United Kingdom 2019*. London: Age UK.
Available at: https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/later_life_uk_factsheet.pdf
(Accessed: 3rd March 2026).

Alzheimer's Society (2022) *Technology and dementia: using technology to support people living with dementia*. London: Alzheimer's Society.
Available at: <https://www.alzheimers.org.uk/about-dementia/treatments/technology>
(Accessed: 3rd March 2026).

Thielemans, L. *et al.* (2023) 'Carer involvement in medication adherence...', *Age and Ageing*, 52(10), afad169.
Available at: <https://www.academic.oup.com/ageing/article/52/10/afad169>
(Accessed: 5th March 2026).

Nieuwlaat, R. *et al.* (2014) 'Interventions for enhancing medication adherence', *Cochrane Database of Systematic Reviews*, (11).
Available at:
<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000011.pub4/full>
(Accessed: 5th March 2026).

Care Quality Commission (2021) *Medicines in health and adult social care*. Newcastle upon Tyne: CQC.
Available at: <https://www.cqc.org.uk/guidance-providers/adult-social-care/medicines-management>
(Accessed: 5th March 2026).

Patel, T. *et al.* (2022) 'An in-home medication dispensing system...', *JMIR Formative Research*, 6(5), e34906.
Available at: <https://www.formative.jmir.org/2022/5/e34906>
(Accessed: 7th March 2026).

Department of Health and Social Care (2019) *The NHS Long Term Plan*. London: DHSC.
Available at: <https://www.longtermplan.nhs.uk>
(Accessed: 7th March 2026).

National Institute for Health and Care Excellence (2015) *Medicines optimization: the safe and effective use of medicines to enable the best possible outcomes (NG5)*. London: NICE.
Available at: <https://www.nice.org.uk/guidance/ng5>
(Accessed: 10th March 2026).

Pivotell Ltd. (2023) *Pivotell Advance Automatic Pill Dispenser*.
Available at: <https://www.pivotell.co.uk>
(Accessed: 10th March 2026).

Royal Pharmaceutical Society (2022) *Medicines optimization: helping patients to make the most of medicines*. London: RPS.
Available at: <https://www.rpharms.com/resources/reports/medicines-optimisation>
(Accessed: 12th March 2026).

Manage@Home (2025) *Pivotell* Available at: <https://www.manageathome.co.uk>
(Accessed: 12th March 2026)

Health Education England (2020) *The Topol Review: preparing the healthcare workforce to deliver the digital future*. London: HEE.
Available at: <https://www.topol.hee.nhs.uk>
(Accessed: 15th March 2026).

World Health Organization (2003) *Adherence to long-term therapies: evidence for action*. Geneva: WHO.
Available at: <https://www.who.int/publications/i/item/9241545992>
(Accessed: 15th March 2026)

