DANISH MEDICAL JOURNAL

Brief Research Report

Challenges and solutions across sectors in multi-dose drug dispensing

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Dan Med J 2026;73(4):A03250182. doi: 10.61409/A03250182

ABSTRACT

INTRODUCTION. Automated multi-dose drug dispensing (MDD) enhances patient safety and adherence and releases staff resources, but it also causes frustration among healthcare professionals during transitions between general practice and hospital admission. This study explored healthcare professionals' perspectives on the use of MDD during the transition from hospital to general practice.

METHODS. In April 2024, a focus group interview was conducted with four hospital-based physicians (HBPs), three general practitioners (GPs) and two clinical pharmacists at the University Hospital of Southern Denmark in Aabenraa, Denmark.

RESULTS. The GPs' attitudes towards MDD were generally more positive than those of HBPs, who found management of medication changes to MDD complex due to insufficient knowledge and lack of support for MDD in evenings and during weekends. Consequently, MDD was discontinued, which increased the workload of GPs after discharge. Proposed solutions included increased involvement of hospital pharmacy staff, the establishment of collaboration with community pharmacies, and regulatory amendments to transfer responsibility for MDD to community pharmacies.

CONCLUSIONS. The proposed initiatives to optimise the management of MDDs in hospitals involved pharmacy personnel. Enhanced collaboration and coordination among pharmacies and healthcare providers concerning MDD were essential to strengthening the primary healthcare sector.

FUNDING. None.

TRIAL REGISTRATION. NCT06451692.

In 2020, automated multi-dose drug dispensing (MDD) was integrated into the Shared Medication Record (SMR), the national registry of current medication use in Denmark, with varying success across municipalities [1]. MDD was reported to improve patient safety and medication adherence [2-4] while freeing staff resources for additional care tasks [5-7]. Therefore, increasing the number of patients using MDD is recommended [5-7].

However, changes to medication delivered as MDD frequently cause frustrations among healthcare professionals, as MDD is sometimes inappropriately discontinued during hospital admissions or visits to outpatient clinics [7-9]. Consequently, there is a need to understand the specific challenges related to MDD across care sectors and to propose collaborative solutions among healthcare professionals. Therefore, this study

aimed to explore healthcare professionals' perspectives on the use of MDD during the transition from hospital to general practice.

Methods

In April 2024, a qualitative focus group interview (FGI) was conducted at the University Hospital of Southern Denmark (SHS). FGIs are effective for exploring participants' experiences on specific topics and for facilitating group discussions, as open-ended questions allow participants to engage with one another [10, 11]. Purposive sampling was used to identify relevant participants from the hospital and general practice, reflecting the demographics of healthcare professionals within the SHS catchment area [11]. All participants received compensation for their time.

A semi-structured interview guide was developed to explore experiences with and communication between healthcare professionals when medical treatment involved MDD changes during hospitalisation. Reflexive thematic analysis was used to identify key elements, primarily derived from data-driven codes (induction) [12]. Two authors independently performed coding, and discrepancies were resolved through discussion until consensus was reached. Codes were combined into sub-themes and themes to ensure the analysis results were confirmable.

The FGI lasted 150 minutes, was audio-recorded and transcribed verbatim. This study is part of a randomised controlled trial registered with clinicaltrials.gov (NCT06451692) and approved via regional policy (24/12239). Informed consent was obtained, including permission for audio recording and anonymised publication of results.

Trial registration: NCT06451692.

Results

One FGI comprised nine participants, see **Table 1**.

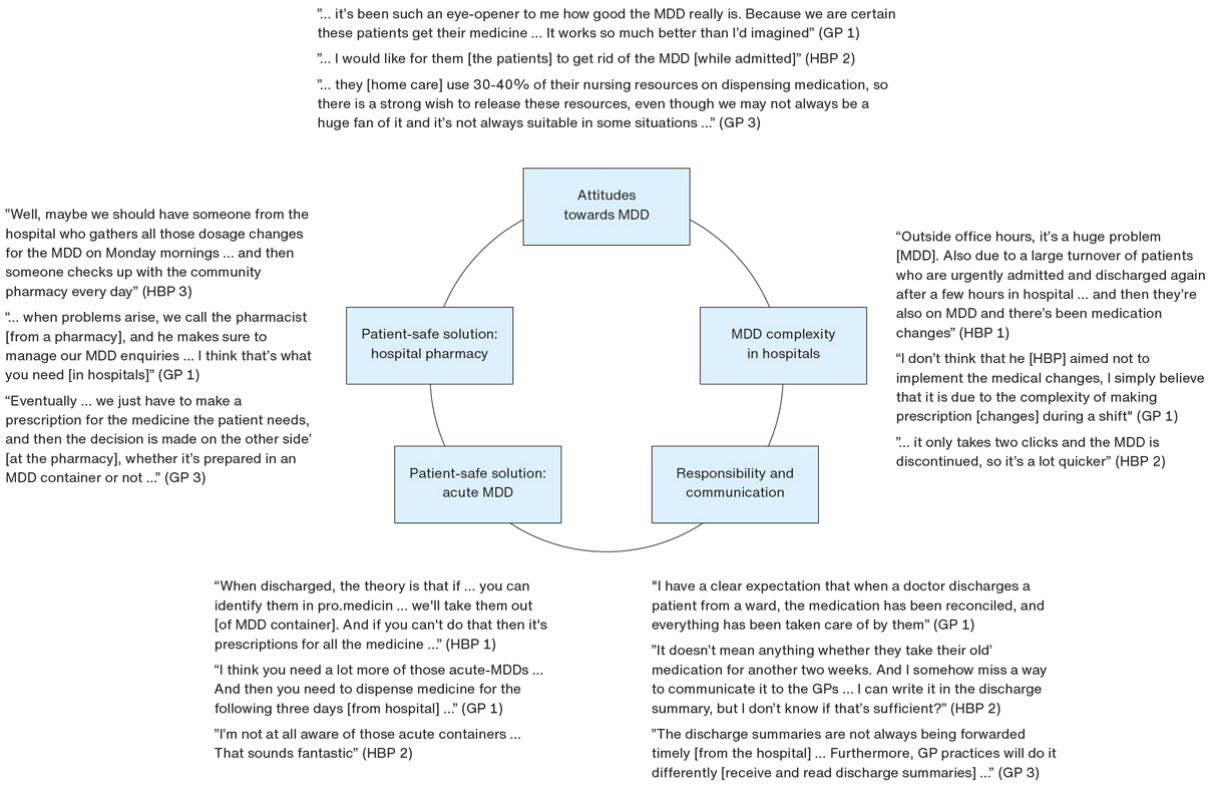
TABLE 1 Participant characteristics.

Participant	Specialisation/working area	Time of experience[a], yrs	Gender
General practitioner			
# 1	Single GP practice that collaborates with 4 other GP practices	0-4	M
# 2	GP partnership practice: 5 GPs	> 10	F
# 3	GP partnership practice: 3 GPs	5-10	F
# 4	Enrolled in main education: general practice	0-4	F
Hospital-based physician			
# 1	Acute medicine	> 10	M
# 2	Acute medicine	> 10	M
# 3	Clinical pharmacology	> 10	M
Clinical pharmacist			
# 1	Clinical ward-based pharmacy services	> 10	F
# 2	Clinical ward-based pharmacy services	5-10	F

F = female; GP = general practitioner; M = male.
a) 3 categories: 0-4 yrs, 5-10 yrs, > 10 yrs.

Five themes emerged from the thematic analysis. The themes and selected quotes are represented **Figure 1.** In the following, key elements from the participants are described.

FIGURE 1 Key elements and selected quotes for each theme from the focus group interview.



GP = general practitioner; HBP = hospital-based physician; MDD = multi-dose drug dispensing.

Attitudes towards multidose drug dispensing

Participants held various perspectives on MDD, but all acknowledged the municipalities' focus on implementing MDD to free up staff resources (Figure 1: Attitudes towards MDD).

MDD complexities in hospitals

Managing MDD in an acute hospital setting was considered a complex task, particularly during evenings or weekends, due to high patient turnover, involvement of various hospital-based physicians (HBPs) and limited opportunities to contact the local pharmacy. Notably, the HBPs could not modify medication changes in the SMR as easily and swiftly as they wished. As a result, discontinuing medication in the dose-dispensing module was often considered an easier option (Figure 1: MDD complexities in hospitals).

Responsibility and communication

Both GPs and HBPs agreed that medication changes from hospitals should be managed by the HBPs, and that the responsibility for communicating adjustments to patients' medication regimens across sectors lies with the prescribing physician. However, not all medication changes required immediate adjustments in MDD, and continuing with an existing MDD container until it was finished was sometimes acceptable. For that purpose, discharge summaries could be utilised, but the timely forwarding and receipt of these summaries were not guaranteed (Figure 1: Responsibility and communication).

Patient-safe solution: acute multidose drug dispensing

Potential patient-safe solutions for managing medication changes in MDD were discussed. The concept of "acute MDD" was mentioned, where a new MDD container could be available within 24-72 hours, of which the HBPs were unaware. However, until a new MDD container was ready, all medicine should be manually dispensed at discharge, or, in some cases, discontinued medicine in an existing MDD container could be physically removed

(Figure 1: Patient-safe solution: acute MDD).

Patient-safe solution: hospital pharmacy

Participants discussed the benefits of having a hospital pharmacy or an employee with specialised skills to handle adjustments to MDD to provide support during evening or night shifts in hospitals. Additionally, the GPs had established good collaboration with the local community pharmacies regarding support with MDD, which should eventually manage all aspects related to MDD (Figure 1: Patient-safe solution: hospital pharmacy).

Discussion

Based on a FGI with nine participants from a hospital, general practices and a hospital pharmacy, we established that HBPs found it difficult to manage MDDs, whereas GPs have, over time, become much more familiar with addressing MDDs in practice. A potential solution identified in the FGI was to equip hospital pharmacy staff with the necessary competencies to assist HBPs with MDD prescription changes. This solution seemed particularly interesting because the hospital pharmacy staff are often experienced users of the dose-dispensing module.

Although managing MDDs in the SMR has become simpler, HBPs remain frustrated by the difficulties in handling medication changes within existing processes and IT systems. Thus, with high patient turnover and limited support options, acute hospital settings do not always accommodate the additional time spent on MDD, leading to discontinuation. However, this increases GP workload as they must then assess the need for continuation of MDD after discharge [7-9]. Therefore, as the number of patients with MDD increases due to municipalities' greater implementation demands [4, 6], the need for HBPs to have sufficient knowledge in managing MDD prescription changes is clear. A prerequisite for the successful use and distribution of MDDs is seamless cross-sector collaboration [4, 5], and the responsibility concerning patients' medication regimen was clear among physicians. However, consistent with the literature [2, 9], participants reported that most medication changes did not require immediate MDD adjustments at discharge and agreed that discharge summaries could be used for communication. However, potential adjustments should be managed within hospitals to ensure medication implementation and prevent assigning responsibility to GPs [7-9]. This requires educating HBPs to become familiar with prescribing medication changes correctly in the dose-dispensing module. Hospital pharmacies could educate HBPs on the dose-dispensing module. Furthermore, hospital pharmacists could collaborate with community pharmacies regarding MDD, e.g., by outlining MDD procedures across care sectors (both in and outside pharmacy opening hours) and providing a direct phone number or contact person at local community pharmacies. By doing so, pharmacies both in and outside hospitals could offer the necessary MDD support, which would benefit both HBPs and GPs.

Finally, another supportive measure to reduce the GP workload for MDD is to transfer the responsibility for both managing and assessing patients' eligibility for MDD to community pharmacies [7, 13]. However, no reimbursement for medication is currently granted without GP initiation, and transferring MDD responsibility would require changes in regulations to equate the role of pharmacies with that of GPs. Specific suggestions to accomplish this should be outlined for future regulatory purposes.

Conclusions

In this study, healthcare professionals from different sectors discussed various challenges related to the use of MDD. As a result, several solutions involving pharmacy personnel were identified, and proposed initiatives aim to enhance collaboration among healthcare professionals, ultimately strengthening the primary healthcare sector. Enhanced supportive measures, education (particularly for HBPs) and follow-up research are needed.

Such efforts should involve cross-sectoral working groups with diverse participants to discuss and clarify roles, responsibilities and collaboration models for healthcare professionals involved in MDD, thereby ensuring patient safety and care across sectors.

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Accepted 9 January 2026

Published 19 March 2026

Conflicts of interest FB reports financial support from or interest in Novo Nordisk, Bavarian Nordic, Bayer and Eli Lilly. JS reports financial support from or interest in Boehringer Ingelheim, Abbott Rapid Diagnostics A/S, Astrazeneca A/S and Novo Nordisk. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. These are available together with the article at ugeskriftet.dk/dmj

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Cite this as Dan Med J 2026;73(4):A03250182

doi 10.61409/A03250182

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