Medicines adherence: medicines problems associated with use of multi-compartment compliance aids in a UK community setting

A cross-sectional study conducted in Aberdeen found potentially harmful medication issues in 58% of 2,060 users of multi-compartment compliance aids (MCAs). Potentially clinically significant drug-drug interactions were found in 43% of users. The study authors had no access to individual clinical information and it is not possible to know if the pattern of prescribing seen in this study is typical of other areas of the UK, or how it compares to that for people not using MCAs. However, the study highlights potential problems with MCAs. The authors of the study suggest that use of an MCA may lead to less intensive medication review that involves the patient in discussions. NICE guidance on medicines optimisation recommends that a person-centred approach and shared-decision making are important in supporting adherence and the management of long-term conditions, multimorbidities and polypharmacy.

Overview and current advice

People may need support to help them make the most effective use of their medicines – according to the World Health Organisation up to half of medicines prescribed for long-term conditions are not taken as intended¹. This support may take the form of further information and discussion, or involve practical changes to the type of medicine or the regimen. The NICE guideline on medicines adherence advises that interventions to support adherence should address the concerns and needs of individual patients. Evidence supporting interventions to increase adherence is inconclusive, so the guideline recommends using interventions to overcome practical problems associated with non-adherence only if a specific need is identified, targeting the intervention to the need. Examples include people recording their medicine-taking and monitoring their condition, simplifying the dosing regimen, using alternative packaging for the medicine or using a multi-compartment medicines system (also known as a compliance aid).

Multi-compartment compliance aids (MCAs) are devices divided into compartments, each one denoting a single dosing occasion. They are suitable only for solid dosage form medicines, such as tablets and capsules, and they do not easily support ‘when required’ dosing. Dispensing into an MCA requires the medicines to be taken out of the manufacturer’s original packaging. MCAs are intended to support medication adherence, optimising treatment benefits and minimising waste. However there is limited evidence to support their use². In 2013, the Royal Pharmaceutical Society (RPS) stated that using MCAs has become regarded as a panacea for all problems or difficulties in use of medicines and their use is often integrated into practice and service policy without giving due consideration to the
alternatives available. Anecdotal evidence suggests that MCAs are particularly commonly used when people are receiving social care. The NICE guideline on managing medicines for adults receiving social care in the community recommends considering the use of an MCA only when an assessment by a health professional (for example, a pharmacist) has been carried out and a specific need has been identified.

**New evidence**

A cross-sectional study assessed the prevalence of potentially inappropriate medicines use in a population of community-based MCA users in north-east Scotland. Data were collected from 48 of the 50 community pharmacies in Aberdeen city for all people who had medicines dispensed into MCAs between 1 June and 31 October 2014 (n=2060). Of these people, 59% were female, the median age was 82 years (interquartile range 70–87 years, range 12 to 105 years) and more than 60% had above-average socioeconomic status (as defined by deprivation index score and based on the supplying pharmacy’s postcode). For each person, data were recorded on the frequency of MCA dispensing, the medicines dispensed into an MCA (name, formulation and strength) and the number of medicines that were dispensed other than into the MCA (such as inhalers, topical medicines, and liquid formulations).

Individual clinical data were not available, so criteria such as the STOPP/START criteria could not be used to determine the appropriateness of treatments. Instead, prescribing quality indicators based on those used by the Swedish National Board of Health and Welfare were applied. These were:

- Polypharmacy (being prescribed 10 or more distinct medicines)
- Being prescribed long-acting benzodiazepines (diazepam or nitrazepam)
- Being prescribed drugs with anticholinergic effects
- Being prescribed 3 or more psychotropic medicines (antidepressants, antipsychotics, anxiolytics, hypnotics or sedatives)
- The presence of potentially clinically significant drug interactions.

Associations with demographic variables were assessed using binary logistic regression analysis.

Most people (72%) had their MCA dispensed weekly but only 14% collected their prescriptions in person. The average total number of medicines per person per dispensing was 7.4 (range 1 to 23), and 25% of people were prescribed 10 or more medicines. Almost half of participants (48%) had at least 1 medicine dispensed outside of the MCA, with a number of people (8%) dispensed 5 or more medicines outside of the MCA; 21% of people had more than a quarter of their prescribed medicines dispensed outside of the MCA.

A total of 1977 potentially harmful medication issues were identified as being associated with dispensing in an MCA, with at least 1 issue occurring in 58% of participants; 1 person had 21 issues associated with 12 prescribed medicines. Clinically significant drug-drug interactions were the most frequent issues, and were seen in 43% of people in the study. The 10 drug groups accounting for 73% of these interactions were antidepressants (14%), calcium supplements (9%), statins (9%), antiplatelets (8%), proton-pump inhibitors (7%), anticonvulsants (6%), antihypertensive agents (6%), antipsychotics (6%), levothyroxine (5%) and neuropathic analgesics (4%). Other potentially harmful medication issues were less common: receiving an anticholinergic drug (17%), a long-acting benzodiazepine (4%) or 3 or more psychotropic medicines (4%).

Adjusted odds ratios (OR) for prescribing quality indicators suggested that lower than average socioeconomic status was statistically significantly associated with the presence of a potential medication issue of any type (OR: 1.3, 95% confidence interval [CI] 1.06 to 1.58) compared with higher socioeconomic status; specifically polypharmacy (OR: 1.43, 95% CI: 1.16 to 1.78), and prescription for a long-acting benzodiazepine (OR: 1.84, 95% CI: 1.14 to 2.98). After adjusting for age and social status, women were more likely to have potential medication issues (other than
polypharmacy) than men. People aged less than 65 years were more likely to have potential medication issues of all types than people aged older than 80 years.

The authors of the study discuss several limitations. These include the absence of patient-specific clinical data in the assessment of prescribing quality, and that socioeconomic status was assigned on the basis of the supplying pharmacy postcode, making the assumption that the participant lived in the same geographical area.

**Commentary**

**Commentary provided by NICE**

Although MCAs may help improve some people’s medicines adherence there are documented risks associated with their use. These include increased opportunity for dispensing errors and evidence that MCA use is associated with reduced quality of prescribing – specifically, potentially inappropriate medicines and clinically significant drug-drug interactions. Most studies previously assessing prescribing quality among MCA users have been conducted in continental Europe. In this UK study prescribing quality was determined using data indicators rather than a validated intervention tool such as STOPP/START criteria, which significantly improves medication appropriateness and reduces the incidence of adverse events in older people in hospital but requires patient specific clinical information. Assessing prescribing quality using an indicative tool may have led to inaccuracies and introduced bias. Similarly, it is not possible to know if the pattern of prescribing seen in this study is typical of other areas of the UK, or how it compares to that for people not using MCAs. However, the results do support the general picture that use of an MCA is associated with poorer prescribing quality. It is not possible to ascribe causality, but the authors of the study suggest that use of an MCA may lead to less intensive medication review that involves the patient in discussions.

Of particular note is that more than half the people in the study had at least 1 potential medication issue and 43% of people had a medication regimen that included potentially clinically significant drug-drug interactions. The findings also highlight the limitations of MCAs since nearly half of all people had medicines dispensed concurrently outside of the MCA. The authors had no access to prescription recommendations so it is not possible to know the proportion of medicines dispensed into and outside of the MCA were intended to be used ‘when required’.

The findings may provide some insight in terms of which people using an MCA are more at risk of potentially inappropriate prescribing. For example, more than 80% of people included in the study relied on a third-party to collect their prescription on their behalf, suggesting possible vulnerability or frailty. Unsurprisingly, in this study people taking more medicines were at increased risk of drug-drug interactions, which is consistent with evidence reviewed for the NICE guidance on multimorbidity. It is well established that people on multiple medicines are at higher risk of adverse events. Consequently the guideline recommends reviewing medicines and other treatments taking into account evidence of likely benefits and harms for the individual patient and outcomes important to the person. Similarly NICE guidance on medicines optimisation recommends that a person-centred approach and shared-decision making are important in support adherence and the management of long-term conditions, multimorbidities and polypharmacy.

In summary, it is important for all people who are taking medicines to be reviewed regularly and that medicines adherence is monitored. No single intervention is recommended to address problems with medicines adherence but NICE recommends that an MCA may be an option. All medicines should be reviewed regularly and where there are concerns about non-adherence, possible causes should be identified and any action should be discussed with the person.
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References


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