

Medication adherence in children remains a challenge

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No matter how effective medication regimens are, if children and parents do not follow instructions then healthcare is compromised. Here we outline strategies to improve adherence.

Children and young people are often thought of as “little adults” within the context of medication administration; however, in reality children are a distinct and heterogeneous patient group whose bodies respond to medications differently from those of adults.^{1,2}

While the provision of safe and effective medicines for children should be imperative, it has lagged behind that available to adults since licensing was introduced in the 1960s. For many years children have been described as “therapeutic orphans” since availability of appropriately formulated medicines with information on their safe and effective use in children has been limited by the ethical and technical difficulties and small commercial benefit of conducting the studies required to obtain a paediatric licence.^{3,4} The development of age-appropriate paediatric formulations, particularly those suitable for young children, presents challenges with only limited knowledge available on the acceptability of different medicines and how this affects medication adherence.⁵

The term “medication compliance” is defined as the extent to which the patient’s action matches the recommendations of the prescriber.⁶ However the term’s use is declining as it implies lack of patient involvement. The term “medication adherence” is defined by NICE as the extent to which the patient’s action matches the agreed recommendations of



the prescriber.⁷ Adherence develops the definition of compliance by emphasising the need for agreement. The extent to which any patient adheres to a medication regimen is an essential determinant of clinical success.⁸ No matter how effective medication regimens are, if children and parents do not follow instructions adequately, then healthcare is compromised.⁹

An ideal formulation for children will: allow minimal dosage and frequency; have one dosage form to fit all or a full range; have minimal impact on lifestyle; contain non-toxic excipients; and have convenient, easy and reliable administration. It should also be easily produced, stable, cheap and commercially viable.¹⁰ Unfortunately in practice many existing medication formulations are not suitable for use in children, which often leads to the use of unlicensed medications and off-label use of adult medications.² Around 1 in 10 children seen in general practice is prescribed at least one unlicensed medication.¹¹ The use of inadequate drug formulations in children may pose problems such as difficulty in swallowing conventionally sized

tablets, safety issues with certain excipients, and adherence problems with unpalatable medications.²

Children take responsibility for their medications at different ages; this will often be earlier in a child with a chronic condition such as asthma. In contrast with the compliance of infants and toddlers, which is very much determined by parents and carers, older children may take complete responsibility for their own medications.¹² In addition to the many factors that influence adherence in adults, there are some unique challenges faced in the paediatric age group.

Approximately 30 to 70 per cent of patients with chronic illnesses have poor adherence because of extended treatment duration, multiple medications and periods of symptomatic remission.¹³⁻¹⁵ Non-adherence has been associated with unnecessary medication, toxicity, treatment failure, increased incidence of medical complications and increased morbidity, resulting in poorer quality of life and overuse of the healthcare system.^{16,17} One study looking at adherence and paediatric asthma identified an association between decreased medication adherence and readmission for acute exacerbation.¹⁸ Similarly another study looking at medication adherence among paediatric patients with sickle cell disease showed that non-adherence was associated with more vaso-occlusive crises and hospitalisations.¹⁹

Barriers to adherence

For parents and children, the daily hassles of living, stress and typical family conflict have been described as some of the biggest barriers to medication adherence.²⁰ Other reasons reported by parents for not being able to administer medications as prescribed include forgetting, discontinuing medication because symptoms have resolved, misunderstanding of instructions, resistance of child and apparent ineffectiveness or adverse effects of the medication.²¹

Formulation acceptability and preference facilitate medication adherence in children, and they are important factors in achieving the intended treatment outcomes. Formulation acceptability differs across age groups as children gradually develop their cognitive and motor skills and improve their ability to swallow

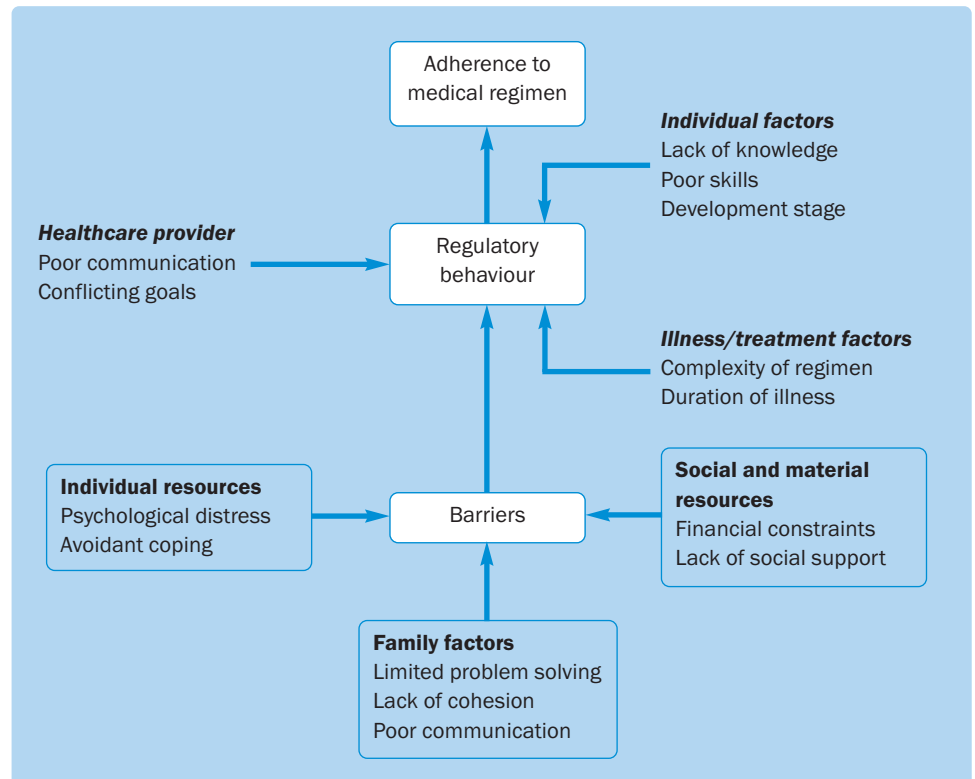


Figure 1. Factors affecting medication adherence⁹

medications.² The oral route is generally the most frequently used and preferred route of administration for children, but the development of palatable oral paediatric formulations that can be easily swallowed can be challenging. Children have a low tolerance for disagreeable taste, the use of tasteless or sweet tasting medications can minimise resistance and improve adherence.²

Liquid formulations are often seen as the most acceptable dosage form for children and have the advantage of dosage flexibility. However, often the volumes to be administered are so small they can be extremely difficult to measure accurately and can cause confusion for parents and carers. Since medications for children are often prescribed based on weight, prescribers should be prompted to avoid decimal places where appropriate and round doses to facilitate ease of administration.

Furthermore when a child is provided with a liquid medication, their parents or carers usually remember the dosage volume but not necessarily the dosage in units. If, therefore, following a transfer of

care, a different strength of medicine is supplied and parents or carers continue to administer the same volume, the dose administered may be up to 10-fold higher or lower than intended. This risk is highest for unlicensed medicines and those that come in a wide range of strengths; for example, unlicensed spironolactone suspension is commonly available from 5 to 50mg/5ml.

Solid oral formulations such as tablets are associated with the risk of choking and have limited dose flexibility; however, in the absence of a suitable liquid formulation often parents and carers will be asked to manipulate formulations, which can be difficult. For example crushing and dispersing a tablet in water prior to administration or dissolving the contents of a capsule in a specified volume of water and administering a proportion of the dose. Some tablets and capsule contents disperse rather than dissolve, making fractional dosing difficult.²² Occasionally the route of administration of medications may be modified, for example some parenteral formulations may be administered orally.² Not surprisingly, numerous studies

have shown that significant errors are often made by parents or children when carrying out complex treatment regimens.⁹

The use of the non-oral route of medication can be useful but poses other issues such as difficult administration/application, inadequate technique or local irritation. For inhaled medication, the use of compliance aids, such as spacer devices, can improve drug deposition to the lungs. Ensuring continued use of preventative medications, such as steroid inhalers, in children can be difficult as parents and carers often discontinue these medications when their child feels better thinking that this will prevent adverse effects associated with use of the medication.²³

Communication between the prescriber and parents or carers is paramount to ensure medications are administered correctly at home, particularly when unlicensed or off-label medications are supplied. Written information can be useful; the Medicines for Children website²⁴ provides practical and reliable information about giving medications to children.²⁴

Improving medication adherence

Strategies to improve adherence in children include: using simplified drugs regimens (ideally once-daily regimens are preferred); pleasant tasting medicines; liquid or other non-solid dosage formulations; regular phone contact between parents and physicians; provision of medicines information; and counselling.⁸ It is important to involve the child in decisions surrounding medication choice and regimen. Healthcare professionals must take into account the child's understanding and capacity to make independent decisions and the roles of their parents or carers in the therapeutic partnership.³

While traditional oral dosage forms will be suitable for the majority of patients, in some cases orodispersible or dispersible tablets, granules, mini-tablets, transdermal patches, and controlled-release preparations can offer opportunities that may be more acceptable.⁴

Prescribers can support medication adherence through a number of means such as dose rounding for ease of administration; selecting regimens that avoid the need for multiple daily dosing and

dosing at school; avoiding drugs with undesirable side-effects such as weight gain, which may be particularly distressing for adolescents; and tailoring information to the needs of the patient.

In 2007, the European Paediatric Regulation came into force with the aim of improving the availability of authorised medicines for children in suitable dosage forms. In the first five years following the regulations, 131 new paediatric licences were granted. The buccal midazolam formulation (Buccolam) was the first product to be launched having been granted a PUMA (paediatric use marketing authorisation) meeting specific clinical and safe usage requirements for parents or carers to administer to children with epilepsy.³

Conclusion

Poor medication adherence can have serious consequences for children. Despite recent advances in the development of paediatric medications, the new paediatric formulations are still only a small part of the full therapeutic arsenal needed to serve all paediatric patients and ensuring children get the most from their medications remains an ongoing challenge.²

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Declaration of interests

None to declare.

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