|  |  |  |
| --- | --- | --- |
| **A****‘Wrong’ errors** | 1 | Prescribing a dose that is calculated based on an out of date body weight1 |
| 2 | Prescribing to a patient a dose that is not within ±25% of the recommended dose1a |
| 3 | Prescribing a drug with a narrow therapeutic index in a dose predicted to give serum levels above the desired therapeutic range1 |
| 4 | Prescription of a drug in a potentially subtherapeutic dose1 |
| 5 | Writing a prescription for a drug with a narrow therapeutic index in a dose predicted to give serum levels below the desired therapeutic range1 |
| 6 |  Prescribing a dose regimen (dose/frequency) that is not that recommended for the  formulation prescribed 1 |
| 7 |  Prescribing a drug to a patient without adjusting for age 1 |
| 8 | Prescribing a drug to a patient without adjusting for body size1 |
| 9 | Prescribing a drug based on the weight of the patient and not writing the final calculated dose in the prescription sheet based on that weight 1b |
| 10 | Prescribing a drug at a frequency which is not recommended |
| 11 | Drug prescribed via incorrect route |
| 12 | Prescribing a drug that should be given at specific times in relation to meals without specifying this information on the prescription1 |
| 13 | Prescribing a drug to a child without documenting the weight of the child on the prescription sheet1 |
| 14 | Other |
| **B****Technical** | 1 | Writing illegibly1 |
| 2 | Omission of the prescriber’s signature1 |
| 3 |   Writing an ambiguous medication order 1 |
| 4 | Misspelling a drug name1 |
| 5 |  Writing a drug’s name using abbreviations or other non- standard nomenclature1 |
| 6 | Not rewriting a prescription in full if a change has been made to it (e.g. dosage increase or change in frequency)1 |
| 7 | Other |
| **C****Allergies and interactions** | 1 |  Prescribing a drug to a patient while the patient has a known allergy to that drug1 |
| 2 | Prescribing a drug to a patient without adjusting for renal insufficiency 1 |
| 3 | Continuing a drug in the event of a clinically significant adverse drug reaction 1 |
| 4 |  Prescribing a drug without taking into account a potentially significant drug interaction1 |
| 5 | Prescribing a drug for a patient who has a specific contraindication to its use 1 |
| 6 | Other |
| **D****Infusions** | 1 | Prescribing a drug to be given by intermittent intravenous infusion without specifying the duration over which it is to be infused 1 |
| 2 | Prescribing a drug to be given by intermittent intravenous infusion in a diluent that is incompatible with the drug prescribed 1 |
| 3 | Prescribing an infusion with an incorrect rate |
| 4 | Prescribing an infusion which contains inappropriate electrolytes/volume |
| 5 | Other |
| **E****Other** | 1 | Prescribing a drug to be taken when required, without specifying the maximum daily dose of the drug prescribed in the prescription1 |
| 2 | Continuing  a prescription for a longer duration than necessary1 |
| 3 |  Unintentionally not prescribing a drug for a clinical condition for which medication is indicated1c |
| 4 | Other |

**A Classification of Paediatric Prescribing Error**

This tool is designed to provide an evidence-based and clinically useful classification of paediatric prescribing error. The error types are largely based on an agreed, published definition of paediatric prescribing error by Ghaleb et al. They used a Delphi technique to seek the views of a panel of experts on whether a range of potential clinical situations should be defined as prescribing errors. We used the errors agreed upon to form the basis of the classification. We have supplemented the classification with other types of errors that we felt were relevant for our practice area. The advantage of this approach is that errors that fall under this classification have been agreed as clinically important prescribing errors, and this would provide a way to standardize the process of auditing prescriptions in paediatric quality improvement work.

We produced a discretionary categorization of the errors; this was not based on the study by Ghaleb et al:

* A – ‘Wrong errors’ – this involves errors which involve wrong dosing, drugs prescribed via the wrong route or frequency etc.
* B – ‘Technical’ errors – this involves errors which occur in the process of prescribing, such as writing illegibly, omitting a signature etc.
* C – Allergies and Interactions – this involves errors that relate to patient allergies, interactions with existing medications etc.
* D – Infusions – errors specifically relating to the use of intravenous infusions
* E – Other – errors that were not readily categorized elsewhere

We feel that dividing the errors into these categories makes the data easier to manage and present. We also consider that the categories may correspond to some of the underlying factors which lead to errors and the types of intervention which may ameliorate them. For instance, ‘B’ errors may relate to violations on the part of the prescriber – for instance, amending a prescription instead of rewriting it to save time – or to a deficiency in induction processes – such as using abbreviations without realizing they are not acceptable. Errors such as these may be amenable to feedback – individual or group – and education/induction. On the other hand ‘A’ type errors may relate to problems with calculations or not looking up a drug when prescribing it. We speculated that these type of errors may be made worse by distracting factors, such as trying to prescribe during ward rounds, attempting difficult calculations while very busy etc. Interventions such as banning prescribing during ward rounds may help. While we believe this categorization to be useful, we recognize that these categories are arbitrary, and there is not evidence to demonstrate that they relate to particular causes of error. Additionally, we have not demonstrated reductions in error to justify our suggested interventions at this stage.

Based on this classification of error, we produced an audit tool, designed to enable detection of the errors listed. Each row of the table is intended to apply to a single prescription. Multiple errors can occur within a single prescription; details of these can be recorded. We have applied this within our own neonatal unit, and found it to be a useful way of establishing the incidence and type of error which occur, and our findings are consistent with the incidence of error reported in the literature.2

Both the classification of error and the audit tool are open to modification to make them appropriate for use in specific areas of practice. We hope that these will form a helpful basis for others to undertake quality improvement work in paediatric prescribing, and welcome any feedback about the tools and their usefulness.

*Notes*

a‘Prescribing to a patient a dose that is not within ±25% of the recommended dose’ corresponds to the situation agreed as an error in Ghaleb et al. However, practitioners may wish to use a different range for acceptable dosing. For instance, in the NICU population, we considered that a dose ±10% of the recommended dose was more appropriate.

b’Prescribing a drug to a child without documenting the weight of the child on the prescription sheet’ - this may not be applicable if the prescription sheet does not specify that the child’s weight should be recorded. For instance, in our NICU, there is no requirement to document weight on the prescription sheet, given the rapid changes in weight within that population. Of course, it remains essential that prescribers check for, and use, the most up-to-date weight when writing prescriptions.

cIt is noted that some of the errors will not necessarily be detected by looking at the prescription sheet in isolation, and knowledge of the clinical background and status of the patient is needed - for instance ‘Unintentionally not prescribing a drug for a clinical condition for which medication is indicated’ requires the person auditing to consider the clinical situation. We recognise that finding errors of this type can be difficult, and sometimes controversial, if it is unclear whether a particular medication is clinically indicated or not. However, errors like this can be picked up during auditing, and are often clinically important eg. a preterm neonate with apneas who has not been prescribed caffeine, a newborn who has not been prescribed Vitamin K despite parental consent for this etc.

*References*

1. Ghaleb MA, Barber N, Franklin BD, Wong ICK. What constitutes a prescribing error in paediatrics? *Qual Saf Health Care* 2005; **14**: 352-357.
2. Ghaleb MA, Barber N, Franklin BD, Wong ICK. The incidence and nature of prescribing and medication administration errors in paediatric inpatients. *Arch Dis Child* 2010; **95**:113–8.