# Evaluating the impact of an indication-based, patient-specific prescribing tool on prescribing errors in paediatrics: A non-randomised, before-and-after study

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**Background:** Children are often underserved by digital innovations in healthcare, including electronic prescribing systems. Many interventions, particularly those designed to support safe and efficient prescribing, are built primarily for adult populations and later adapted for paediatric use, frequently without full alignment to the unique complexities of paediatric care. These include weight-based dosing, age-specific formulations, and narrow therapeutic ranges, all of which heighten the risk of harm from prescribing errors (1-4). In contrast, the Touchdose intervention evaluated in this study was developed specifically with paediatric workflows, data, and safety needs at its core. It provides real-time, indication-based, patient-specific dosing support.

**Objectives:** This study aims to evaluate the impact of the Touchdose intervention on prescribing errors in the paediatric emergency and inpatient setting.

**Methods:** This non-randomised, before-and-after study was conducted at a London tertiary teaching hospital across two clinical settings: a paediatric emergency department (PED) and a general paediatric inpatient ward. Prescribing errors were identified through manual review of medication orders, based on criteria derived from the British National Formulary for Children and local prescribing guidelines. Dosing deviations of ±10% were considered errors, with ≥25% deviations classified as major. Data were analysed using descriptive statistics and logistic regression to evaluate the impact of the intervention.

**Results:** Across the study period, 1,808 medication orders were reviewed: 1,567 written using standard practice and 241 using the intervention. The prescribing error rate fell from 7.14% under standard practice to 1.2% with the intervention, reflecting an 83% reduction in the odds of an error (OR 0.17). On the general paediatric ward, error rates dropped from 9.1% to 1.1% (OR 0.11), and in PED from 4.9% to 1.4% (OR 0.27). Notably, all errors associated with intervention-supported orders resulted from prescriber deviation from system recommendations rather than inaccuracies within the tool itself.

**Conclusion:** This study demonstrates that an indication-based, paediatric-specific prescribing tool can significantly reduce medication errors in both emergency and inpatient paediatric settings. The findings underscore the value of designing digital tools specifically for paediatric use, rather than relying on adapted adult systems. Future research should examine how to optimise system uptake, deepen integration with clinical workflows, and assess economic and usability outcomes to further support safe, effective prescribing in paediatrics.

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NIHR SafetyNet Symposium 2025

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## Background

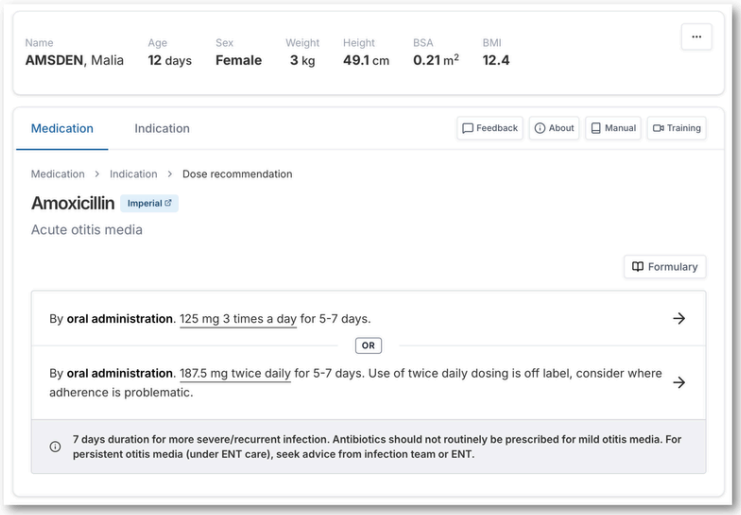
Children are often underserved by digital innovations in healthcare, including electronic prescribing systems. Many interventions, particularly those designed to support safe and efficient prescribing, are built primarily for adult populations and later adapted for paediatric use, frequently without full alignment to the unique complexities of paediatric care. These include weight-based dosing, age-specific formulations, and narrow therapeutic ranges, all of which heighten the risk of harm from prescribing errors (1-4). In contrast, the Touchdose intervention evaluated in this study was developed specifically with paediatric workflows, data, and safety needs at its core. It provides real-time, indication-based, patient-specific dosing support.

## Aim

This study aims to evaluate the impact of the Touchdose intervention on prescribing errors in the paediatric emergency and inpatient setting.

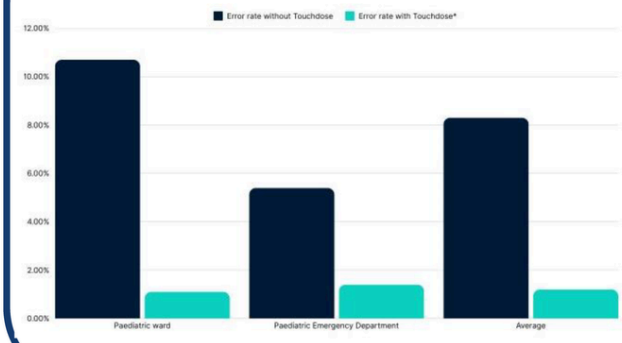
## Methods

This non-randomised, before-and-after study was conducted in a London tertiary teaching hospital across a paediatric emergency department (PED) and a general paediatric inpatient ward. Prescribing errors—the primary outcome—were identified via manual review of medication orders using criteria from the *British National Formulary for Children* and local guidelines. Dosing deviations of ±10% were classed as errors, and ≥25% as major. Data were analysed descriptively and with logistic regression to compare control and intervention-supported orders, adjusting for clinical setting (PED vs inpatient ward). Odds ratios with 95% confidence intervals and p-values were reported. An intention-to-treat analysis compared all prescribing events before and after implementation, regardless of system use.




Touchdose user interface- dose recommendations page

## Results




Across the study period, 1,808 medication orders were reviewed: 1,567 written using standard practice and 241 using the intervention.

The prescribing error rate fell from 7.14% under standard practice to 1.2% with the intervention, reflecting an 83% reduction in the odds of an error (OR 0.17). On the general paediatric ward, error rates dropped from 9.1% to 1.1% (OR 0.11), and in PED from 4.9% to 1.4% (OR 0.27).

ITT analysis comparing *all* prescribing events pre- and post-implementation, a statistically significant reduction in errors was observed in the post period (OR = 1.61; 95% CI 1.09–2.36; p = 0.02). In the PED, errors were 51% less likely (OR = 2.04; p = 0.05), while in the ward, a 31% reduction was seen (OR = 1.44; p = 0.13).

## Conclusions

This study demonstrates that an indication-based, paediatric-specific prescribing tool can significantly reduce medication errors in both emergency and inpatient paediatric settings. Future research should examine how to optimise system uptake, deepen integration with clinical workflows, and assess economic and usability outcomes to further support safe, effective prescribing in paediatrics.

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This study is supported by NHS Englands Digital Medicines First-of-type scheme and infrastructure support from National Institute for Health and Care Research (NIHR) North West London PSRC Patie: t Safety Research Collaboration. The views expressed are those of the author(s) and not necessarily those of the NIHR, NHS England or the Department of Health and Social Care.