Reducing Order Friction in Pediatric EHR Systems: A Quality Improvement Initiative

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Introduction

- Order friction (OF) is an EHR vendor-derived metric describing how difficult it is for clinicians to enter orders
- Components of OF include:
  - Custom interruptive alerts
  - Procedure duplicate checks
  - Medication warnings
  - Changed fields within the order composer
- High OF is associated with:
  - Increased clinician stress
  - Burnout
  - Potential delays in patient care

Methods

Setting:

- Pediatric Hospital Medicine (PHM) division at a large pediatric health system in the southeastern US

Study Design:

- Baseline OF data collected from EPIC© (January - December 2024)
- Our multidisciplinary team, made up of informaticists and pediatric hospitalists, developed a framework to prioritize frequently used inpatient orders with the most changes per order (CPO)
- We focused on total order changes, or how many times a user must change a default, to prioritize orders with most OF and most volume
- Default values for dosing, frequency, and rationale for "as needed" administration were pre-populated and combined into a preference list for providers (PHM Preference List)
- 21 unique medications were included with a total of 40 different pre-configured orders
- Statistical analysis was completed on pre- and post-data

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Reduce "**order friction**" with pre-selected default values for medication ordering

Figure 1. Pareto chart illustrating the orders with the highest total order changes (changes per order (CPO) x volume of order). This highlights key targets for reducing order friction.

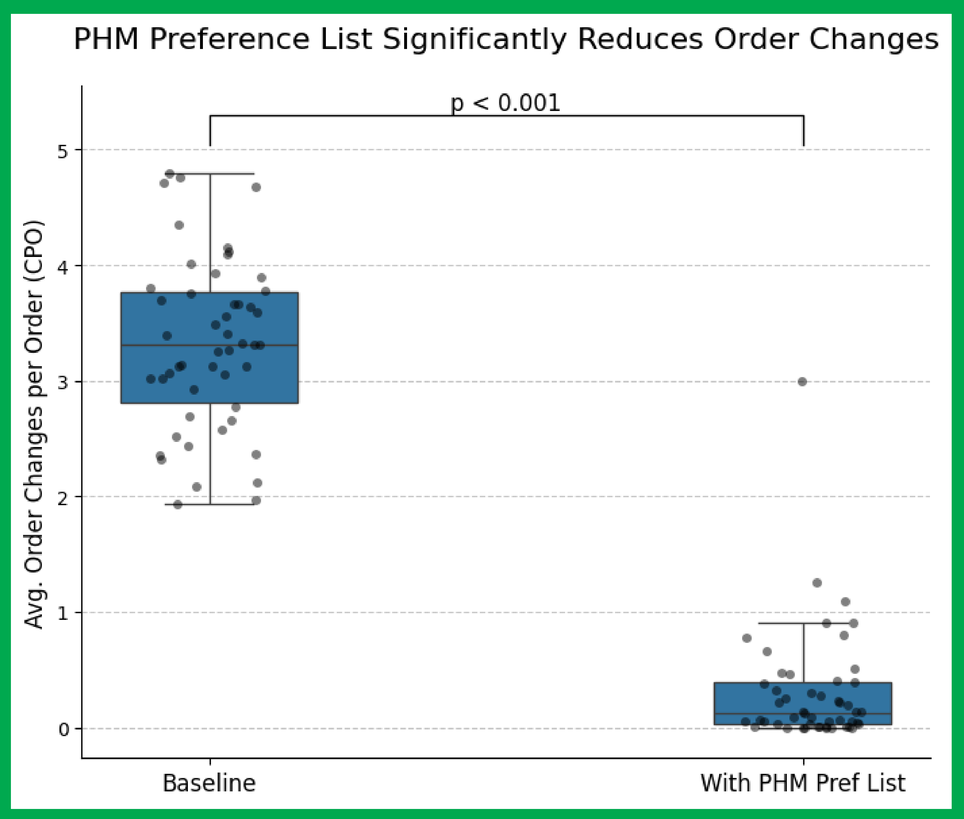

Figure 2. Box and whisker plot revealing the average order changes per order (average CPO) before and after implementation of the PHM preference list.

Results

- The Pareto chart (Figure 1) illustrates the inpatient orders with the highest total order changes
- Within the department of Pediatrics, medication orders with highest order friction originate from Antimicrobial, Gastroenterology, and Analgesia preference lists
- Oral solutions had significant OF due to weight-based dosing in pediatrics
- Reduced average CPO to 0.58
  - See table below for orders with most significant difference
- The box and whisker plot reveals decrease in average order changes per order after implementation of the PHM Preference List
- Wilcoxon signed-rank test confirmed significant reduction in CPO
  - $W = 0$
  - p-value < 0.001
  - $n = 40$

Medication	Average Order Changes	
	Baseline	PHM Pref List
ondansetron (IVPB)	3.21	0.00
ondansetron (ODT)	3.19	0.00
ceftriaxone (IVPB)	2.73	1.29
ibuprofen (tab)	3.21	2.00
amoxicillin (susp)	4.73	1.70
acetaminophen (susp)	3.18	0.18
ibuprofen (susp)	3.19	0.29

Conclusions

Setting default values for medication orders effectively streamlines order processes and reduces clinician workload--fewer clicks and manual adjustments

Next Steps

Expand preference list to include nursing communications and imaging orders

References

1. Ruan EL, Rossetti SC, Hsu H, Kim EY, Trepp RC. A practical approach to optimize computerized provider order entry systems and reduce clinician burden: pre-post evaluation of vendor-derived "order friction" Data. AMIA Annu Symp Proc. 2023;2023:1246-56.

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