Author's response to reviews

Title: Using a computerized provider order entry system to meet the unique prescribing needs of children: description of an advanced dosing model

Authors:

Jeffrey M. Ferranti (ferra007@mc.duke.edu)
Monica M. Horvath (monica.horvath@duke.edu)
Jeanette Jansen (jeanette.jansen@duke.edu)
Patricia Schellenberger (tricia.schellenberger@duke.edu)
Tres Brown (brown109@mc.duke.edu)
Christopher M. DeRienzo (chris.derienzo@duke.edu)
Asif Ahmad (asif.ahmad@duke.edu)

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Author's response to reviews: see over
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Diana Marshall, PhD
Senior Executive Editor
BioMed Central
Floor 6, 236 Gray's Inn Road
London, WC1X 8HL

Dear Dr. Marshall:

Thank you for considering our manuscript. We are heartened that Reviewer 1 requested no changes and Reviewer 3 brings forward several minor good points that we have addressed.

While we have addressed most of Reviewer 2’s concerns, we are concerned that overly defensive feelings regarding Vanderbilt’s WizOrder system are a component of Dr. Waitman’s objections—objections that the other reviewers do not offer. We hold Vanderbilt’s work in pediatric CPOE development in the highest regard and remain very impressed at what they were able to accomplish using their version of the system that was sold to McKesson. However, the fact remains that the product available as vended is very different from what Dr. Waitman may have had at his institution, and he admits that he arrived at Vanderbilt after the sale.

We feel our work is important to share for two key reasons: 1) reports of this nature that describe CPOE implementation challenges are underrepresented in the literature, and 2) the pediatrics community should know how to manage their expectations when they buy a vended system. Functionality is never “plug and play,” and it’s possible that much customization is needed to ensure a vended product puts safety first.

We address all concerns point by point below.

Sincerely,

Jeffrey M. Ferranti, MD
Duke Health Technology Solutions
Reviewer #1

No revisions necessary per Reviewer 1.

Reviewer #2

1) Novelty is called into question and the Reviewer defers to the judgment of other Reviewers and Editors.

   Based on the other reviews received, we are optimistic this manuscript brings a novel HIT implementation case study to the literature.

2) The Reviewer contends that Wizorder possessed advanced therapeutic dosing functionality upon sale to McKesson.

   In our response, we meant to state “WizOrder, as sold to McKesson, does not support advanced therapeutic dosing functionality in pediatrics.” As the topic was pediatric dosing, we thought the preposition was assumed. The reviewer indicates that he personally was not present at the point of sale, which suggests that there may be some misunderstanding regarding what McKesson ultimately chose to sell to its customers. The reviewer goes on to note aspects of adult advanced dosing functionality sold to McKesson, and we are pleased to say that we have received and implemented these modules and are grateful to the pioneering work done at Vanderbilt to make inpatient adult care safer.

3) The Reviewer contends that Horizon Expert Orders uses First Databank for medication decision support.

   As emphasized under “Comparison to other pediatric dosing models,” First Databank provides static dosing advice, which we have enabled via the Horizon Medication Manager project as the reviewer suggests, but First Databank does not provide active dosing assistance. We note that HEO uses First Databank out of fairness to the vendor as requested.

Reviewer #3

1) In the text, explain the logic of item ordering in Table 1

   Changes made as requested.
2) The acronym ‘on call PRN to OR’ should be explained

Changes made as requested.

3) Explain why typing a dose twice is preferable to entering a reason for the over/under-dosed drug

It is possible that the provider may wish to over- or under-dose a drug but still enter an unintended value. Reentering the same value requires the provider to verify the dosage and maintains our ability to capture discrete data. This point is added to the text. We agree that it may be useful if the provider was asked for a reason for over- or under-dosing in a separate free text field, but we have not deployed this feature as it would slow the ordering process. Additionally, free text data are difficult to analyze in aggregate. We will consider this suggestion for future enhancements.

4) Clarify how often weights are updated.

It is our expectation that actual weights are updated daily, and dosing weights are updated based on the unit protocol and clinical condition. We have added this to the “Error prevention measures” section.

5) Clarify renal impairment decision support

A selection of renal impairment by the ordering provider causes the ADM to present a different drug dosage. Clinical pediatric pharmacists review these cases as well once the order is sent to pharmacy. We have added this to the text.
6) **Table 2 ordering issue**

We sorted the dosing region table as follows: Indication alphabetically, Care Area alphabetically, Age in ascending order, and then Weight in ascending order. “Bone marrow transplant” comes before “NICU,” and thus the sorting by age only occurs after Care Area sorting.

7) **Use of gm versus g to denote grams.**

We agree that “g” is the preferred abbreviation for gram, and it is important that “gm” not be transposed to “mg” and denote milligram. We have changed our abbreviation to “g” in all cases. Thank you for bringing this to our attention.