A Web-App for Weight-Adjusted Red Cell Dosing: Post-Development Implementation and Effectiveness

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Background

The empiric nature of red cell dosing can lead to over or under-transfusion when aiming to meet a post-transfusion haemoglobin target, especially if the patient's body weight is not accounted for. It is always important to clinically re-evaluate the patient after a single unit of red cells regardless of the total number administered. Repeat haemoglobin testing between units has a time and resource impact. This could be avoided if the volume required to meet the target haemoglobin value could be reliably predicted in the context of body weight. A web-app was developed, technically validated (Grey *et al*, 2016), CE marked as a class 1 medical device in 2016 by Bolton NHS Foundation Trust, and clinically implemented in 2017.

Figure 1: web app page 1 (exclusion of non-appropriate patients)

Figure 2: web app page 2 (example data entry and calculated dose) .

Method

Implementation strategy: executive-level organisational support, App hosted on intranet and or personal desk-top access, clinical and laboratory education and awareness, embedded in transfusion policy, re-design of red cell requesting process, monthly quality impact assessment with staff support and feedback.

Post-implementation data analysis: nine months' post implementation data were analysed to determine the level to which App was being used in clinical practice, clinical effectiveness was evaluated by audit of post-transfusion haemoglobin outcome , and impact on red cell usage.

Results

Use in Clinical Practice

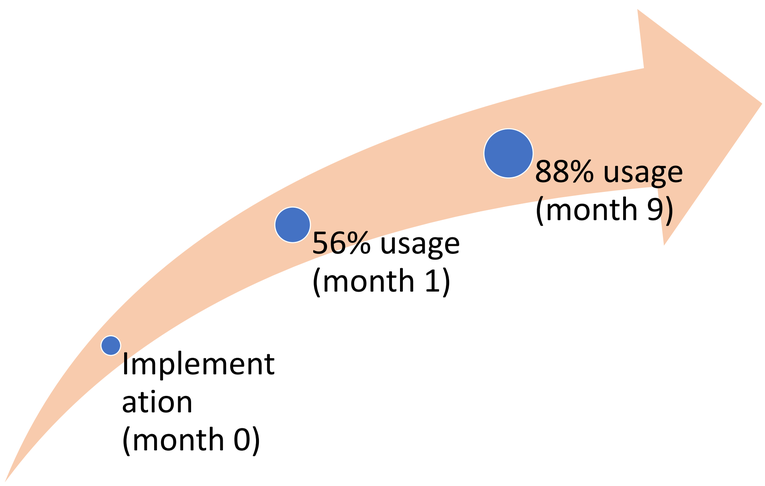

Figure 3: App use in clinical practice post-implementation.

Clinical Effectiveness

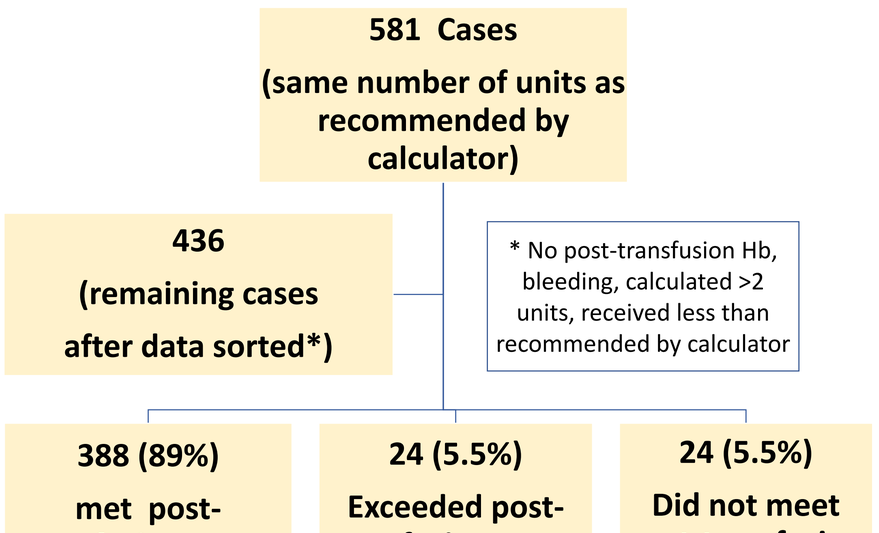

Figure 4: clinical effectiveness (post –transfusion Hb target)

Impact on Red Cell Usage

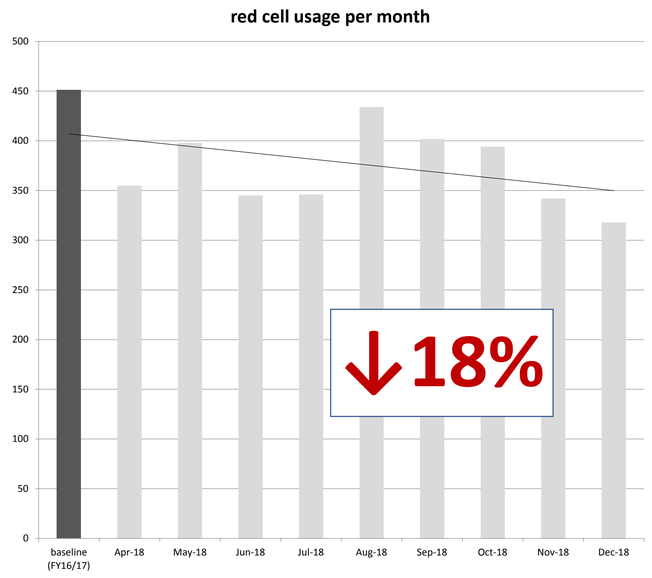

Figure 5: projected 18% reduction in red cell usage at 2017/18 financial year end

Discussion

The data suggest that the use of a web-app for weight –adjusted red cell dosing is effective in predicting the volume of red cells required to meet a target post-transfusion haemoglobin level in non-bleeding adult patients with normovolaemic anaemia. It has the advantage of limiting the need for repeat haemoglobin testing while continuing to clinically re-evaluate the patient after each unit, providing a more personalised approach to patient blood management. The data predicts a significant reduction in red cell usage and therefore a useful adjunct to other appropriate use of blood strategies. The app can be successfully implemented with high uptake in a committed organisation with a flexible and well supported approach.

A web-App for weight-adjusted red cell dosing: post-development implementation and clinical effectiveness. (2018). S. Grey, K. Farrar, P. Kinsella, S. Roberts, C. Patalappa, S. Davies, Z. Illyas, K. Littler Adamson. B J Haem, 181, (suppl. 1), p. 146

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