

Problem

Children who have had bone marrow transplants (BMT) need dangerous infusions everyday. It is too easy to make fatal prescribing mistakes and children could die.

- Electrolyte infusions are needed daily, both during the day (54%) and out of hours (46%)
- Potassium, Magnesium, Bicarbonate, Phosphate & Calcium are prescribed
- **42% of prescriptions had an error**
- Majority of errors due to the wrong diluent/volume prescribed (57%)

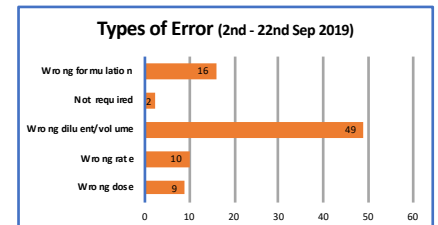
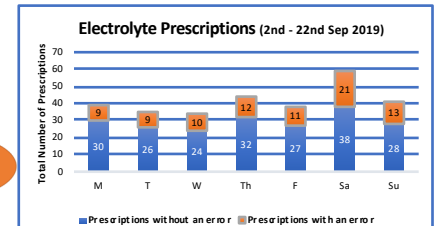
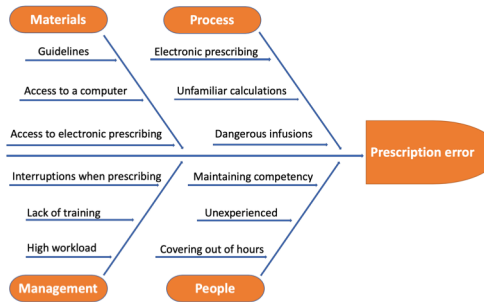
Diagnostics



Prescribers

- 14 Paediatric Senior Trainees (ST4 – ST8)
- 8 Paediatric Junior Trainees (ST1 – ST3)
- 5 GP Trainees (GPST1 – GPST3)
- 1 Foundation Year 2 (FY2)

- Wide range of experience
- Only 6 Paediatric Junior Trainees work on the BMT ward
- Majority of prescribers cover out of hours and do not usually work on the BMT ward
- Paediatric, GP and FY2 doctors changeover at different times
- 6 separate induction periods in 12 months



Aim

Reduce the percentage of errors in electrolyte prescriptions by 50% by February 2020

Change Ideas

1. Creating an electrolyte calculator
2. Educational sessions for prescribers
3. Improving electronic prescribing system (Cerner)
4. Training nurses to be able to prescribe

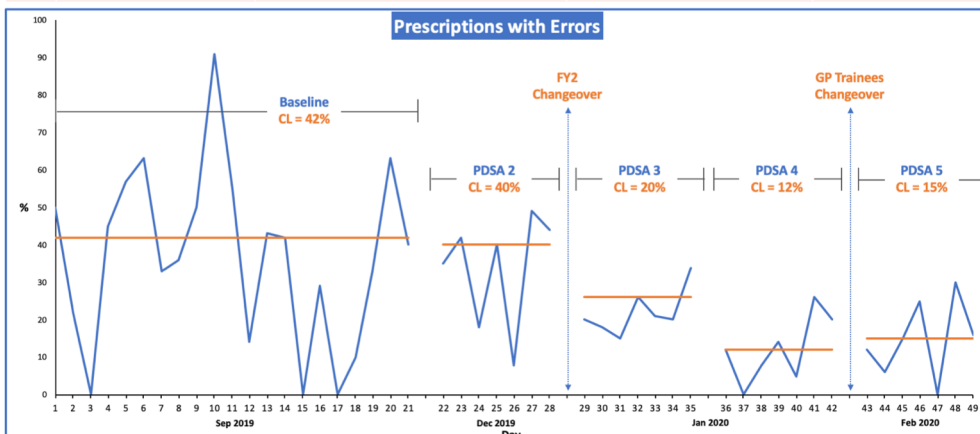
PDSA Test #	PLAN	DO	STUDY	ACT
1	Reduce prescription errors	Create electrolyte calculator v1.0 and share with 4 prescribers	Feedback: Would you use it? – Yes/No and optional free-text comments	100% would use. Make amendments from feedback
1.1	Refine electrolyte calculator v1.1	Include formulation of electrolytes and visual guide to prescribing on Cerner and share with 4 prescribers	Feedback: Would you use it? – Yes/No and optional free-text comments	100% would use. Get input from pharmacist
1.2	Refine electrolyte calculator v1.2	Share calculator with lead bone marrow transplant pharmacist	Feedback	Make amendments from pharmacist feedback
1.3	Refine electrolyte calculator v1.3	Include link to local trust electrolyte prescribing guideline and share with 4 prescribers	Feedback: Would you use it? – Yes/No and optional free-text comments	100% would use. Share calculator with all prescribers
2	Share calculator	Share electrolyte calculator v1.3 via departmental weekly teaching email	Percent of prescriptions with errors each day over 7 days	Reduction in errors to 40%. Improve use of calculator
3	Improve use of calculator	Share electrolyte calculator v1.3 via departmental text messaging group	Percent of prescriptions with errors each day over 7 days	Reduction in errors to 20%. Maintain improvement
4	Maintain reduction in prescription errors	Include electrolyte calculator v1.3 icon on desktop of all computers on Paediatric wards	Percent of prescriptions with errors each day over 7 days	Reduction in errors to 12%. Maintain improvement
5	Maintain reduction in prescription errors	Include electrolyte calculator v1.3 in pharmacy teaching session at GP induction programme	Percent of prescriptions with errors each day over 7 days at changeover week	Reduction in errors to 15%. Test at next changeover

Electrolyte Calculator v1.3

Use "Electrolyte Supplements for Acute Depletion in Paediatrics Careset"

Correct if K < 3.5mmol/L

Weight	12 kg
Dose Strength	6 mmol K, 12 mmol K
	0.5mmol/kg, 1mmol/kg
Infuse Over	
Recommended Rate	3 - 5 hours
Max. Rate	0.2mmol/kg/hr, 0.5mmol/kg/hr
Route - IV/Central Line	
Diluent and Volume	40mmol Potassium Chloride in 100mL 0.9% NaCl pre-made bag
Max. Concentration	40mmol/100mL (0.4mmol/mL)
IV Preparation	Potassium Chloride 40mmol in NaCl 0.9% 100mL (0.4mmol/mL)



Summary

- Introducing a simple calculator has **reduced electrolyte prescription errors from 42% to 15%**
- This was maintained through 2 changeover periods
- Embedding the calculator into Cerner would further simplify the process. Currently this is not feasible