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A Quality Improvement Initiative: Matching Hemodialysis Patients Potassium Bath with Potassium Blood Values

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Background: Hypokalemia can occur in hemodialysis patients post dialysis treatment and is a life threatening condition as it may cause ventricular dysarrhythmias. Dialysis prescriptions include a potassium dialysate bath. However, without correct adjustments in potassium baths, potassium levels may drop too low and may result in sudden death. At our dialysis unit, there was no standard process to detect potential mismatches between serum potassium and dialysate potassium or to make recommendations for potassium bath adjustments.

Goals of Project: To establish a standard process for potassium bath adjustment based on pre and post dialysis potassium values to eliminate post dialysis hypokalemia.

Interventions: Six Sigma Quality Improvement methodology was used to identify root causes contributing to post dialysis hypokalemia and to test appropriate interventions. Baseline data was collected. Using Cause and Effect Analysis, four root causes were identified as contributing to mismatch of potassium bath with pre dialysis potassium values. The laboratory was informed to add post dialysis electrolytes to monthly bloodwork with exclusion criteria. Inservices were provided to staff to ensure correct practice to collect post dialysis bloodwork. A potassium bath policy was developed in consultation with the Chief of Nephrology of the program and approved by all the nephrologists.

Outcomes: Pre and post potassium results were collected over a six month period and adjustments to potassium bath was made based on the potassium bath policy. Baseline data showed no correlation between pre potassium values and potassium bath. Upon implementation of the potassium bath policy, 64/306 (21%) baths for conventional and daily hemodialysis needed adjustment to the potassium prescription. At the end of the six month period, the number of bath changes decreased to 9/306 (3%) using the potassium bath policy. The number of bath changes for conventional and daily hemodialysis patients declined over the six month period as a new equilibrium state was reached.

Figure 1: potassium bath changes

	Baseline	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Conventional	56	13	52	13	5	2	8
Daily	8	2	2	0	7	9	1
Total	64	15	54	13	12	11	9

Application to Clinical Practice: In conclusion, preliminary results indicate that the use of a standardized potassium bath policy in making adjustments to a patient's potassium bath markedly reduces mismatches between pre dialysis potassium and dialysate potassium and reduces the risk of hypokalemia.

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