

Dialyzing Wisely: An Implementation Science Program to Improve the Performance and Delivery of Acute Dialysis to Critically Ill Patients in Alberta



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Themes: Individual and team improvement, Partnered system improvement activities, Application of research to practice, Audit and feedback, Data access and data harms, Human-centred design, Implementation science, Knowledge translation, Quality improvement

What you need to know

10% of ICU patients in Alberta will need dialysis, which can cost up to nearly \$1,000 per day. Exposure to renal replacement therapy in the ICU can lead to lifelong dialysis treatments, costing up to \$100,000 per patient per year. Dialyzing Wisely aims to standardize practices for acute dialysis in Alberta ICUs, reduce healthcare costs, improve patient outcomes and avoid admission into the chronic dialysis program.

What is this project about?

Providing acute renal replacement therapy (RRT) in intensive care units (ICUs) is costly and requires a specialized team to ensure it is safely and effectively prescribed and delivered. Opportunity was identified to standardize RRT practices across Alberta ICUs, including decisions on timing of dialysis initiation and improving the quality of dialysis. Supported by the Physician Learning Program, this Critical Care Strategic Clinical Network led initiative to standardize practice is expected to improve the performance of RRT, benefit patients and save healthcare dollars.

What did the team do?

- Conducted a stepped-wedge, interrupted time series evaluation of the implementation of a standardized, stakeholder-informed and evidence-based acute RRT pathway in Alberta ICUs
- Implemented a program that monitors and reports on initiations and quality indications of RRT implemented at **19 of 21 ICUs across Alberta**
- Leveraged provincial electronic health record (EHR) for implementation and data collection
- Provided education in multiple modalities
- Created quarterly, unit-specific reports and conducted audit and feedback sessions; future prescriber-specific reports and a dashboard are in development

Project Challenges

- Variation in practice
- EHR roll out
- Nephrology engagement
- Data complexity

Quality Indications of RRT

Initiation	Acute RRT initiations that meet at least one indication of appropriate starts
Time to Initiation	Time from order until therapy started
Filter Life	Average filter life
Downtime	Time dialysis is running per day
Prescribed Dose	Prescribed dose within 25-30 mL/kg/hr
CRRT Ultrafiltration Realized	Actual fluid removed/prescribed fluid removed
Hemodynamic Stability	Runs that avoid hypertension
IRRT Treatment Time	Runs complete within 10% of prescribed time
IRRT Ultrafiltration Realized	Actual fluid removed/prescribed fluid removed

Results

	Baseline	Current	Benefit
Provincial adherence to evidence-based acute RRT initiations	40%	52%	Improved patient outcomes
CRRT days/year	4,700	3,373	~\$1.2M savings
Avg. CRRT days/patient	6.4	5.4	
# of patients who received CRRT	734	625	~1.1M cost avoidance of chronic dialysis
Filter life hours	30	34	\$70,000 savings

Conclusion

Avoiding or delaying the use of dialysis in the ICU can improve the quality of life for ICU survivors and reduce long-term chronic dialysis therapy. Estimated cost avoidance attributable to the Dialyzing Wisely program in 2023 is approximately \$2.4 million to the healthcare system.

Planned monitoring of patient outcomes post ICU admission is to come. Implementation challenges include engagement from nephrology stakeholders and data complexity, such as establishing baseline performance, due to the timing of the EHR rollout. Lessons learned include understanding that data development is an iterative process and that quality metrics take time to develop; without sufficient evidence, they are difficult to implement and standardize.

Acknowledgments

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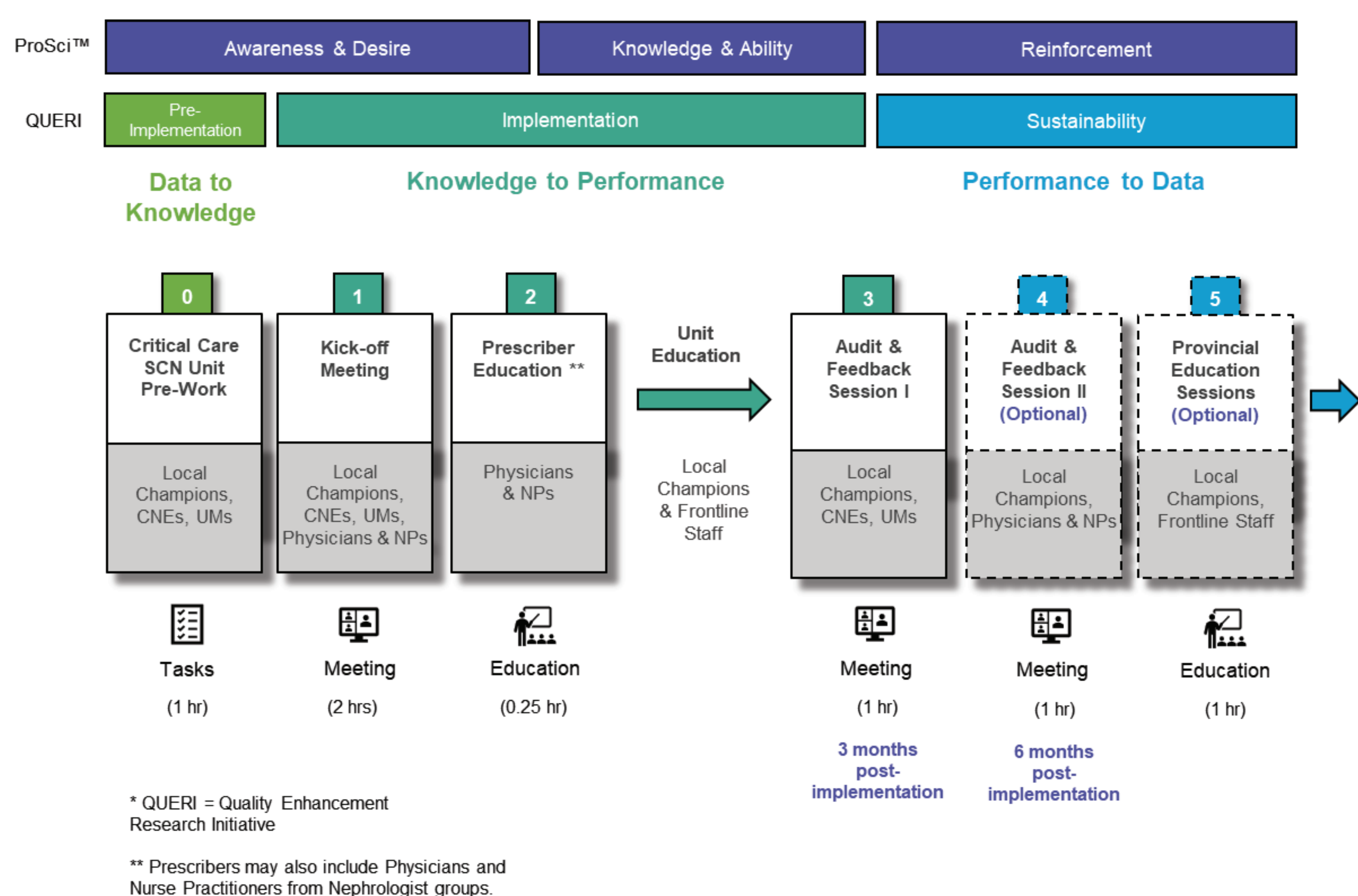


Figure 1 Unit Implementation Steps

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