

# Independently Implementing Slow Low Efficiency Dialysis (SLED) within a Critical Care Unit

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## Abstract

North York General Hospital (NYGH) Critical Care Unit (CrCU) has established a unique program in which CrCU nurses are successfully providing all aspects of dialytic care to critically ill patients that develop Acute Kidney Injury (AKI) without the support of a dialysis program. Given the comparable survival of our patient to that in the literature, our program demonstrates that ICU nurses are able to safely and independently provide intermittent dialysis to critically ill patient with AKI. This cost effective model should be considered in other hospitals that lack a chronic dialysis program.

## Introduction

Intensive Care Units (ICUs) across Ontario predominantly utilize a nursing partnership model to provide intermittent acute dialysis modalities such as Slow Low Efficiency Dialysis (SLED) to critically ill patients who develop AKI. This model requires a dialysis nurse to run the dialysis treatment and an ICU nurse to address all other aspects of care. The degree of involvement varies across units and organizations.

Prior to 2009, critically ill patients at NYGH, who developed AKI (1-2 per month) required transfer to an acute dialysis center resulting in:

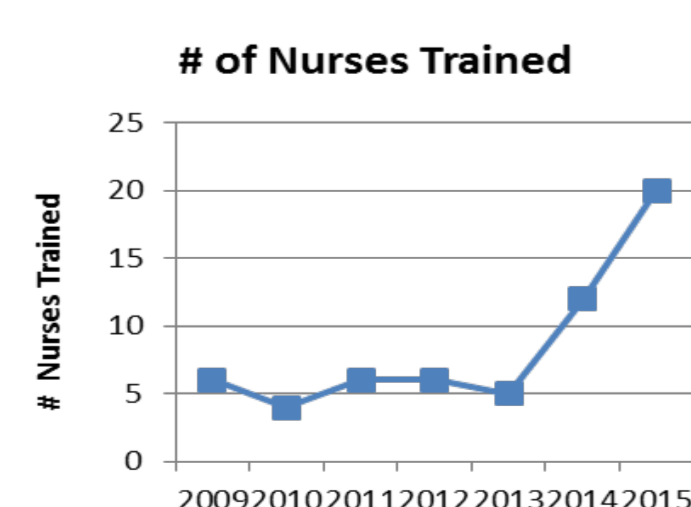
- Delays in initiation of treatments
- Adverse events associated with inter-hospital transport
- Family stress with patient displacement
- Interruptions in continuity of care

## Unique Partnership: Education and Training

Educational curriculum was created in partnership with Nephrologists, Intensivists Critical Care Educators and Clinical Industry experts.

Critical Care Nurse Training included:

- Didactic lecture
- Hands on Simulation
- 2-5 12-hour buddied shifts at bedside



- To maintain competency annual recertification sessions

- In 2016 new model of peer to peer mentorship is being developed.

## Chosen Modality: SLED

- SLED was chosen as the preferred modality to manage critically ill patients who may develop hemodynamic compromise with conventional hemodialysis.

- Allows for early & timely initiation of treatment
- Duration 4-8 hours allows for daily mobilization and patient activities
- Blood flow rate 200-400 mL/min
- Dialysis flow rate 300 - 500 mL/min
- Ultrafiltration goal rate is adjusted according to clinical status
- Runs with or without anticoagulation
- Prevents complications related to intra- or inter-hospital transfers

## Results

98 Patients

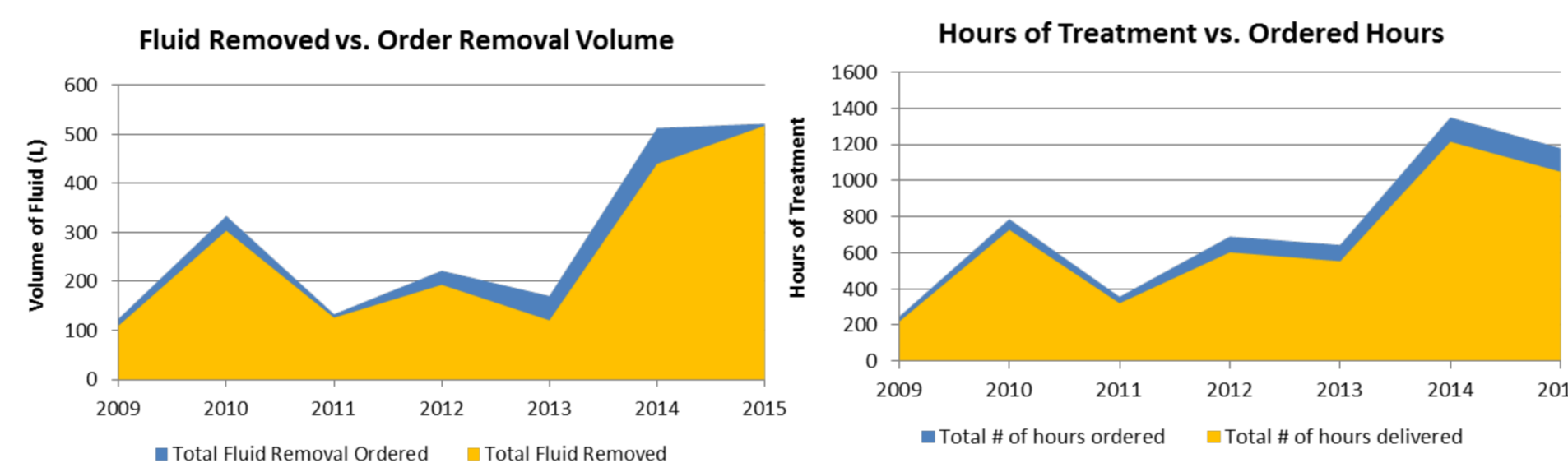
719 Treatments

52% Survival to Discharge

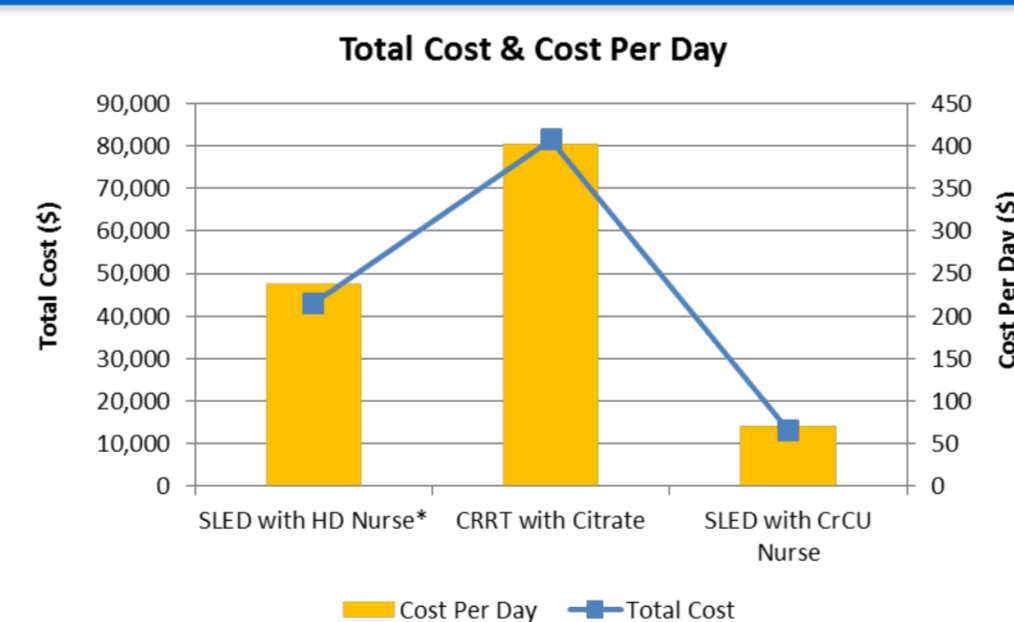
84% Runs Completed

16% transferred for Chronic Dialysis

7% Lost Circuits



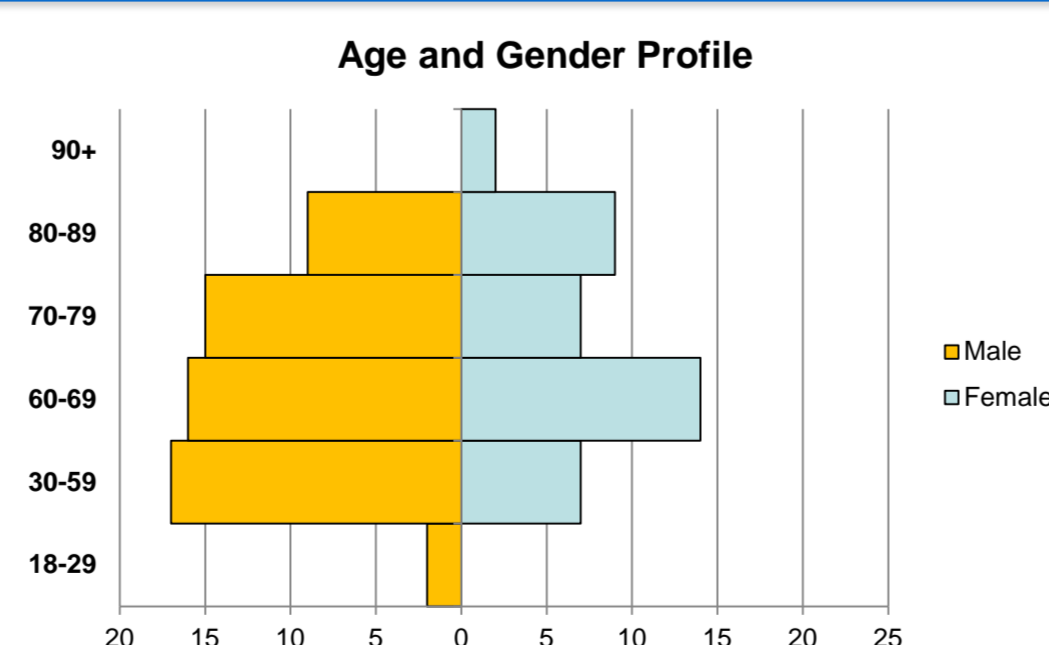
## Cost: SLED Vs. CRRT



\*Based on one HD nurse for two patients

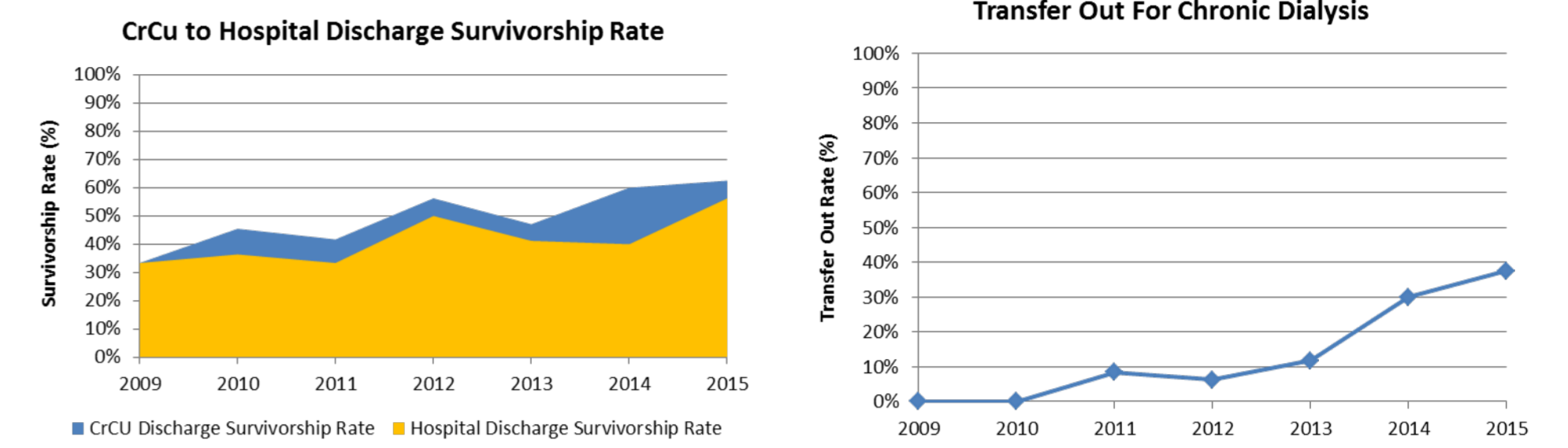
Source: Berbec, AN, & Richardson, RMA (2006). Sustained low Efficiency Dialysis in the ICU: Cost, Anticoagulation, & Solute Removal. *Kidney International*, 70, 963-968

## Patient Characteristics



- Average Creatinine @ start: 517 umol/L
- Average Urea @ start: 20 mmol/L
- Average Potassium @ start: 5 mmol/L
- Average U/O @ start: 450 mL
- Average MODS Score: 8
- # of Patients ventilated @ start: 62
- # of Patients on vasopressor support @ start: 38

## Patient Outcomes



## Challenges and Opportunities

### Challenges:

- Continued competency due to variable patient volumes
- Access to a chronic dialysis bed
- Limited capacity due to staffing and equipment resources

### Opportunities:

- Continue training staff to increase capacity
- Develop partnerships with chronic dialysis centers
- Join Ontario Renal Network - The Ontario Renal Network promotes partnerships between patients and their healthcare teams, among various healthcare professionals, between agencies/facilities, to ensure the key stakeholders work together and are all accountable to deliver quality care to support patients and their families achieve their treatment goals.

## Conclusions

- SLED can be safely provided to CrCU patients who develop AKI in centers that do not have the support of a formal dialysis program
- Annual competency review and education session are essential to maintenance of competency for centers with small volumes
- Our Acute Dialysis program demonstrates that through leadership (administrative, Physician and Nursing), we can accomplish anything!

## North York General Hospital

- Large community teaching hospital in Toronto, Canada
- Serves a population of over 400,000
- 400 in-patient beds
- 24 bed level 3 Intensivist led Critical Care Unit providing medical/surgical and cardiac care

