

# Acute renal replacement therapy (RRT) in pediatric patients: A national survey assessing nursing structure and standards in RRT education



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## Introduction

Renal replacement therapy (RRT)

- Life saving treatment for critically ill children with acute kidney injury (AKI), fluid overload, other non-renal indications

RRT procedures are:

- Performed by nurses who need specific training and expertise
- Technically complex

Despite the intricacy of RRT, currently no standards for nursing education exist.

We sought to gather information regarding these variations via a national survey.

## Methods and Materials

What?

- A survey was created and dispersed by ASPN Acute Care Special Interest Group

Who?

- The top 50 pediatric nephrology programs from the US News & World Report 2023 ranking
- Eight Canadian centers

How?

- Questions included:
  - Assessment of procedure volume
  - Therapies provided
  - ICUs where therapies are provided
  - Programmatic structure
  - Data tracking
  - Nursing education
    - Initial education
    - Continuing education
    - Frequency of monitoring competency maintenance
    - Criteria for evaluating proficiencies

## Conclusions

Practice variation across institutions increases the complexity of delivering safe and effective therapy.

Collaboration across institutions can:

- Identify standardized nursing education for healthcare professionals providing RRT therapies
- Ensure safety
- Improve patient outcome
- Potentially benefit programs worldwide

## Results

49 centers responded to the survey.

Survey results:

- Significant practice variation including:
  - Multiple RNs and RTs who train to perform RRT
  - Multiple units
  - Multiple machines
  - Multiple anticoagulation strategies
  - Different education content and methods

Table 1. Acute Renal Replacement Therapy Nursing Structure and Education

Estimated patient volume	< 250	250-499	500-749	750-999	>1000	Unknown
Number of survey respondents by volume	9	14	10	4	8	4
Have an established acute care program	5 (55%)	9 (64%)	10 (100%)	4 (100%)	6 (75%)	4 (100%)
<b>CRRT is performed in:</b>						
*NICU	2 (16.7%)	10 (66.7%)	9 (90%)	3 (75%)	6 (75%)	2 (50%)
*PICU	12 (100%)	15 (100%)	10 (100%)	4 (100%)	8 (100%)	4 (100%)
*CICU	6 (50%)	14 (93.3%)	10 (100%)	4 (100%)	8 (100%)	4 (100%)
*Other		OR (1)	Neonatal CVICU (1)			
<b>Machines used:</b>						
*Prismax	4 (33.3%)	6 (40%)	4 (40%)	1 (25%)	3 (37.5%)	2 (50%)
*Prismaflex	10 (83.3%)	7 (46.7%)	7 (70%)	3 (75%)	6 (75%)	3 (75%)
*NxStage	3 (25%)	2 (13.3%)	1 (10%)	1 (25%)	0	1 (25%)
SCUF w/ Aquadex	0	5 (33.3%)	1 (10%)	3 (75%)	4 (50%)	2 (50%)
Modified Aqua	0	4 (26.7%)	1 (10%)	3 (75%)	4 (50%)	2 (50%)
*Carpdiem	4 (33.3%)	5 (33.3%)	4 (40%)	2 (50%)	5 (62.5%)	0
<b>CRRT initiation is performed by:</b>						
Acute/Chronic Dialysis RN	2 (12.7%)	4 (26.7%)	2 (20%)	1 (25%)	3 (37.5%)	1 (25%)
Acute Dialysis RN	2 (16.7%)	2 (13.3%)	1 (10%)	2 (50%)	3 (37.5%)	1 (25%)
ICU RN	6 (50%)	7 (46.7%)	2 (10%)	1 (25%)	2 (25%)	1 (25%)
Resource ICU RN	6 (50%)	7 (46.7%)	6 (60%)	1 (25%)	3 (37.5%)	1 (25%)
Resource RN	3 (25%)	1 (6.7%)	0	0	0	0
ECMO specialist	2 (16.7%)	3 (20%)	2 (20%)	0	2 (25%)	0
Respiratory Therapist			1 (10%)			
Other		5 (33.3%)		1 (25%)		2 (50%)
<b>QI program</b>	6 (50%)	6 (40%)	2 (20%)	2 (50%)	3 (37.5%)	2 (50%)
<b>Data tracking</b>	4 (33.3%)	6 (40%)	4 (40%)	1 (25%)	2 (25%)	1 (25%)
<b>Standardized initial education program for bedside nurses?</b>	12 (100%)	15 (100%)	9 (90%)	4 (100%)	7 (87.5%)	4 (100%)
<b>Initial Education</b>						
*Bedside orientation	9 (75%)	13 (86.7%)	10 (100%)	4 (100%)	6 (75%)	4 (100%)
*Didactics	8 (66.7%)	15 (100%)	9 (90%)	4 (100%)	6 (75%)	3 (75%)
*Hands-on	11 (91.7%)	14 (93.3%)	10 (100%)	4 (100%)	7 (87.5%)	4 (100%)
*High fidelity simulation	5 (41.7%)	4 (26.7%)	3 (30%)	2 (50%)	0	3 (75%)
*Other	2 (16.7%)	2 (13.3%)	1 (10%)	1 (25%)	1 (12.5%)	0
*Specific training is not provided	0	0	0	0	0	0
<b>Standardized continuing education program for bedside nurses?</b>	11 (91.7%)	14 (93.3%)	90 (90%)	4 (100%)	7 (87.5%)	3 (75%)
<b>Continuing Education</b>						
*Bedside orientation	7 (58.3%)	9 (60%)	6 (60%)	2 (50%)	5 (62.5%)	0
*Didactics	6 (50%)	11 (73.3%)	8 (80%)	3 (75%)	7 (87.5%)	1 (25%)
*Hands-on	11 (91.7%)	12 (80%)	10 (100%)	2 (50%)	6 (75%)	3 (75%)
*High fidelity simulation	3 (25%)	3 (20%)	4 (40%)	1 (25%)	1 (12.5%)	3 (75%)
*Other	1 (8.3%)	4 (26.7%)	1 (10%)	1 (25%)	2 (25%)	0
*Specific training is not provided	1 (8.3%)	1 (6.7%)	0	1 (25%)	0	0
<b>Frequency for maintaining CRRT competencies</b>						
*Yearly or more frequently	8 (66.7%)	12 (80%)	9 (90%)	3 (75%)	4 (50%)	1 (25%)
*Q2years		1 (6.7%)				
*PRN	3 (25%)	2 (13.3%)			2 (25%)	1 (25%)
*Not offered				1 (25%)		
*Other	1 (8.3%)		1 (10%)		2 (25%)	2 (50%)
<b>Minimal criteria for evaluating CRRT competencies?</b>	6 (50%)	11 (73.3%)	6 (60%)	2 (50%)	7 (87.5%)	2 (50%)



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