Supplementary Material

A validation study of administrative healthcare data to detect acute kidney injury in the pediatric intensive care unit

David D'Arienzo MD[1*], Erin Hessey MSc[2*], Rami Ali MD[3,4], Sylvie Perreault BPharm, PhD[5], Susan Samuel MD, MSc[6], Louise Roy MD[7], Jacques Lacroix MD[8], Philippe Jouvet MD, PhD[8], Genevieve Morissette MD[8], Marc Dorais MSc[9], Jean-Philippe Lafrance MD, MSc[7], Veronique Phan MD, MSc[10], Michael Pizzi BSc[11], Rahul Chanchlani MD, MSc[12], Michael Zappitelli MD, MSc[13]
*The first two authors contributed equally to this submission (co-first authors)

[1] Faculty of Medicine, McGill University, Montreal, Quebec, Canada
[2] Faculty of Medicine, University of Alberta, Edmonton, Alberta, Canada
[3] Department of Family Medicine, GMF Centre Medical Hochelaga, Montreal, Canada
[4] Department of Family-Emergency Medicine, Hôpital Général de Hawkesbury and District General Hospital Inc, Hawkesbury, Canada
[5] Faculty of Pharmacy, Université de Montréal, Montréal, Quebec, Canada
[6] Department of Pediatrics, Division of Nephrology, Faculty of Medicine, University of Calgary, Calgary, Canada
[7] Department of Medicine, Division of Nephrology, Université de Montréal, Montreal, Quebec, Canada
[8] Department of Pediatrics, Division of Intensive Care, Centre Hospitalier Universitaire Sainte-Justine, Université de Montréal, Montreal, Canada
[9] StatScience Inc, Notre-Dame-de-l'Île-Perrot, Canada
[10] Department of Pediatrics, Division of Nephrology, Centre Hospitalier Ste-Justine, Université de Montréal, Canada
[11] McGill University, Montreal, Quebec, Canada
[12] Department of Pediatrics, Division of Nephrology, McMaster University, Hamilton, Ontario, Canada
[13] Department of Pediatrics, Division of Nephrology, Toronto Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada

Corresponding author contact: M. Zappitelli, Toronto Hospital for Sick Children, Peter Gilgan Centre for Research and Learning, 686 Bay Street, Child Health Evaluative Services, Room 6th floor 6.9708, Toronto, Ontario, M5G 0A4
Tel: 416-813-7654, extension 304077; email: Michael.zappitelli@sickkids.ca

Running Title : Evaluation of Diagnostic codes for pediatric AKI

Supplementary Table 1. Chart-AKI definition, by the reference standard chart review

AKI Stage	Serum Creatinine	Urine output
Stage 1	≥1.5-1.9 times baseline in 7 days or 0.3 mg/dl (≥26.5 µmol/l) rise within 48 hours	< 0.5 ml/kg/h for 8 hours
Stage 2	≥2.0-2.9 times baseline	< 0.5 ml/kg/h for 16 hours
Stage 3	≥3.0 times baseline or ≥4 mg/dl (353.6 µmol/l) rise or eGFR < 35 ml/min/1.73 m^2 [if > 3 months old] or Dialysis treatment for AKI	< 0.3 ml/kg/h for 24 hours or Anuric for 12 hours

Abbreviations: *AKI*: acute kidney injury; *GFR*: glomerular filtration rate.

Supplementary Table 2. AKI defined using administrative health care data diagnostic and procedure codes (only ICD-9 codes used in this study).

Description	ICD-9 (used in this study)	ICD-10[£]	Notes
AKI codes			
AKI	584.5, 584.6, 584.7, 584.8, 584.9	N17.0, N17.1, N17.2, N17.8, N17.9	N/A
AKI unspecified	586.9	N19	N/A
Abnormal renal function	794.4	R94.4	N/A
Pregnancy AKI	634.3 (SUF 1, 2, 9), 635.3 (SUF 1, 2, 9), 636.3 (SUF 1, 2, 9), 637.9 ((SUF 1, 2, 9)), 638.3, 639.3, 669.3 (SUF 2, 4)	O904.0 (SUF 2, 4, 9)	No equivalent ICD-10 codes for the underlined codes.
GN	580.0, 580.4, 580.8, 580.9	N00.x	No equivalent ICD-10 code for the underlined code.
Dialysis codes			
Dialysis codes	V45.1 V56.0 V56.1 V56.2 V56.8	Z99.2 Z49.1 Z49.2	No equivalent ICD-10 codes for the underlined codes.
Procedural codes			
Description	**CCA (used in this study)**	**CCI[£]**	**Notes**
Hemodialysis	5195	1PZ21HQBS 1PZ21HQBR	N/A
Peritoneal dialysis	6698	1PZ21HPD4	
Administrative health data-defined AKI algorithms			
Admin-AKI	Any AKI code above		
Admin-AKI +D	Any AKI code plus any dialysis code above		
Admin-AKI (no pregnancy or GN)	Any AKI code above, but ignoring Pregnancy and GN codes		
Admin-AKI +D (no pregnancy or GN)	Any AKI code plus any dialysis code above, but ignoring Pregnancy and GN codes		

[£] ICD-10 and CCI codes were not included in the algorithms undergoing validation for the current study (study period was 2003-2005, when these codes were not being used). The ICD-10 and CCI codes listed are for use in future evaluation and research on AKI in children.

Abbreviations: *AKI*: Acute Kidney Injury; *ICD*: International Classification of Disease; *GN*: Glomerulonephritis; *D*: Dialysis; *CCA*: Certified Coding Associate; *CCI*: Canadian Classification of Health Interventions