CANN·NET
Canadian Kidney Knowledge Translation and Generation Network

Variation in eGFR at dialysis initiation across Canadian centers: 2001 - 2010

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Funded by The Kidney Foundation of Canada and the Canadian Institutes of Health Research
in partnership with the Canadian Society of Nephrology

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The Kidney Foundation of Canada — The foundation of kidney care.
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eGFR at dialysis initiation

- When to start a non-urgent dialysis patient?
- Numerous studies have demonstrated earlier dialysis initiation associated with increased mortality
- IDEAL RCT: 828 pts, 10-14 vs. 5-7 mls/min/m^2 (75% started early); no mort difference.
- Concern: Are patients being started too early inappropriately (misconceptions, profit)
- Canadian health care system: ideal to study(?)

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The purpose of this study is to determine the variation in eGFR at dialysis initiation across dialysis facilities and geographic regions in Canada after accounting for patient level factors (case-mix).

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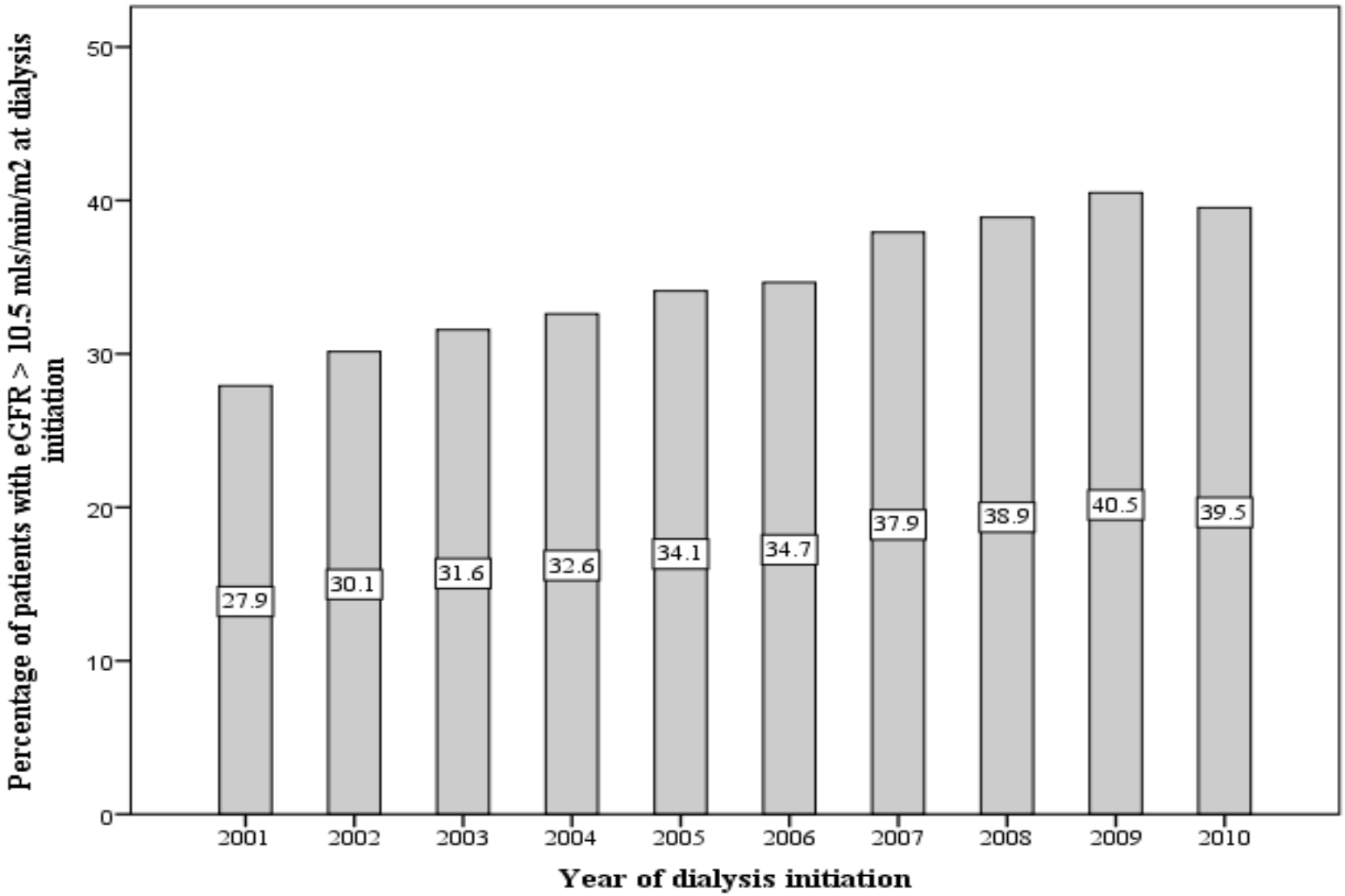
Methods

- CORR data: 33, 263 pts, 63 facilities, 12 geographic regions from Jan 2001 to Dec 2010
- Patients included if they had a eGFR measure (79% by MDRD) at dialysis initiation
- Early defined as eGFR > 10.5 mls/min/m^2
- Multi-level models: level 1 patients, level 2 facility, level 3 geographic region
- Sensitivity analyses: eGFR continuous, eGFR>12, analyses repeated in those with pre-dialysis care > 120 days

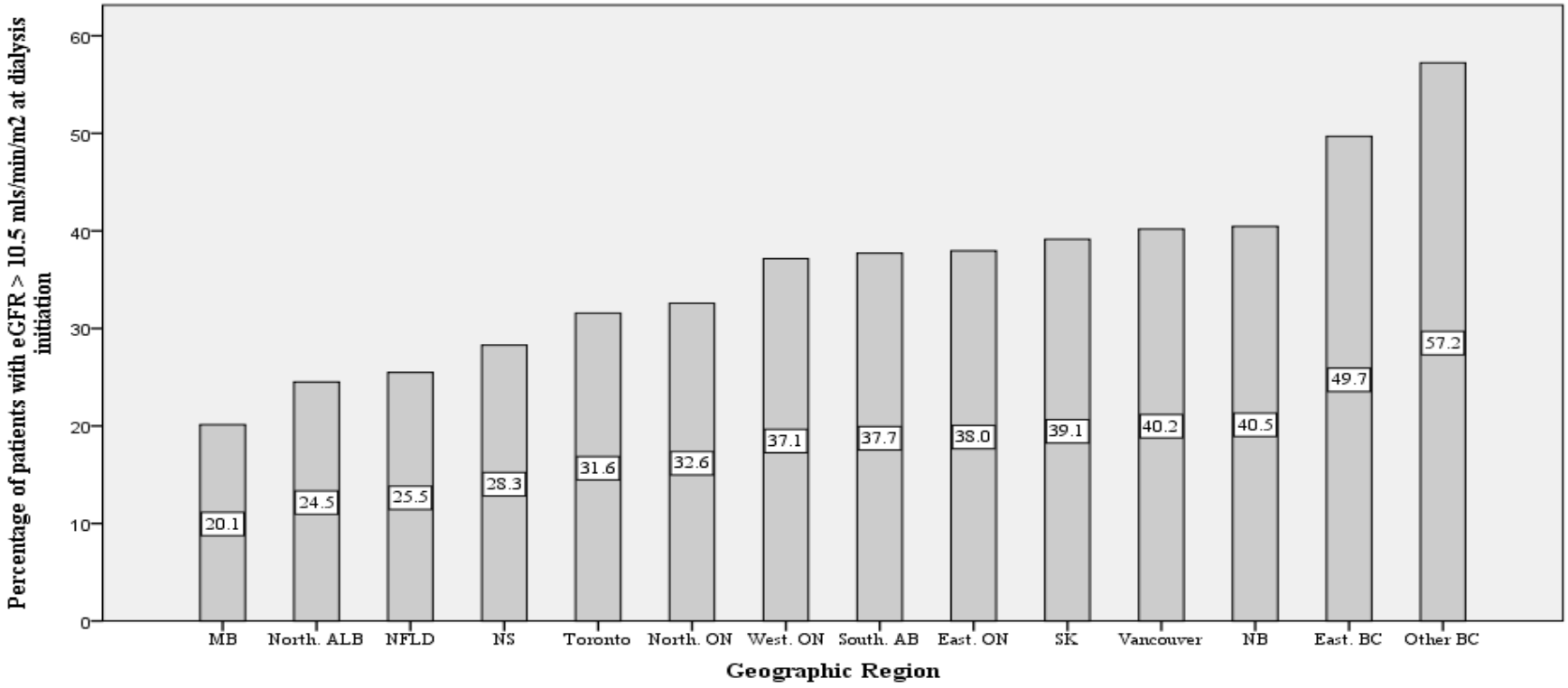
Methods

- Level 1 adjusted for patient case-mix: age, sex, BMI, race, co-morbidities (CAD, ACS, CHF, lung disease, CABG, DM, serious illness, HTN, malignancy, stroke), pre-dialysis care, distance to facility, serum phosphate, albumin, calcium, hemoglobin, PD, cause of ESRD
- Level 2 adjusted for facility % CVC, transplant facility, PD facility, average distance, Aver age, Hg & phos, centre size

Trends over time



Regional variation in eGFR at start of dialysis



Characteristic			
	eGFR<10.5	**eGFR≥10.5**	**P Value**
N	21, 533(64.7)	11, 730 (35.3)	
Median eGFR (IQR)	7.4 (5.8-8.8)	13.2 (11.7-15.9)	<0.0001
Patient Characteristics:			
Age (SD)	62.9 15.2	66.6 14.5	<0.0001
Sex % male	60.4	39.6	<0.0001
Pre-dialysis care > 30 days % (N)	28.0	37.2	<0.0001
Number of Co-morbidities (SD)	2.9 1.8	3.5 2.0	<0.0001
Geographic Regions			<0.0001
Atlantic	68.6	31.4	
Ontario	64.5	35.5	
Prairies	70.9	29.1	
Pacific	54.7	45.3	

Multilevel model variation for eGFR > 10.5 mls/min

Model	Regional-level variation	Facility-level variation	Patient-level variation
Unadjusted	2.6	8.2	89.2
Fully adjusted	0.2	4.5	95.3
Reduced	0.6	4.3	95.1

+Geographic regions: 12, Facilities 63, Patients 33, 263

Selected factors associated with initiation of dialysis with an eGFR > 10.5

Variable	Reduced Model		
	Odds Ratio	95% Confidence Interval	P-Value
Patient-level			
Male	1.78	(1.69 - 1.88)	<0.0001
Body mass index	0.99	(0.99 - 1.00)	0.0028
Hemoglobin (per 1g/L increase)	1.01	(1.01 - 1.01)	<0.0001
Phosphate (per 0.5 mmol/L increase)	0.45	(0.43 - 0.46)	<0.0001
Peripheral vascular disease	1.22	(1.14 - 1.30)	<0.0001
Acute coronary syndrome	1.14	(1.07 - 1.22)	0.0001
Pulmonary Edema	1.48	(1.39 - 1.58)	<0.0001
Chronic obstructive pulmonary disease	1.17	(1.08 - 1.26)	0.0002
Diabetes	1.47	(1.35 - 1.61)	<0.0001
Hypertension	0.82	(0.75 - 0.88)	<0.0001
Serious Illness	1.34	(1.24 - 1.45)	<0.0001
Coronary artery bypass graft	1.31	(1.21 - 1.42)	<0.0001
Peritoneal Dialysis	1.15	(1.07 - 1.23)	0.0001
Pre Dialysis Care > 30 Days	1.30	(1.21 - 1.39)	<0.0001
Distance From Facility			
< 50 km (referent)			
50 to 150 km	0.90	(0.83 - 0.97)	0.0138
> 150 km	0.88	(0.79 - 0.98)	0.0247

Discussion

- Significant variation in eGFR at dialysis initiation across Canada
- Explained by case-mix/patient level variation
- eGFR as a measure in late CKD
- Variability would be low if ALL practices similar
- Quantification of uremic symptoms

Discussion

- Is facility level variation significant (3-4.5%)?
- YES: small improvements may lead to large cumulative reductions
- NO: practice patterns are very similar; not a significant concern
- National survey of Nephrologists may provide insight

Discussion: Limitations

- Data quality
- statistical noise
- missing indication for starting dialysis, rate of decline, measure of functionality/frailty, emergent vs. elective

Conclusions

- The eGFR at dialysis initiation varies across Canada
- Case-mix explains the majority of variation in timing of dialysis initiation
- Interventions to reduce variation may lead to improvements in care

Acknowledgements

- Collaborators: N Tangri, P Komenda, C Rigatto, A Dart, B Hiebert, D Naimark, S Nessim, A Molzahn, S Soroka, M Zappitelli, S Allu
- CANN-NET: J Kappel, B Manns, Selina Allu, Sarah Gill
- Bob Williams, Frank Ivis, Louise Moist, CORR