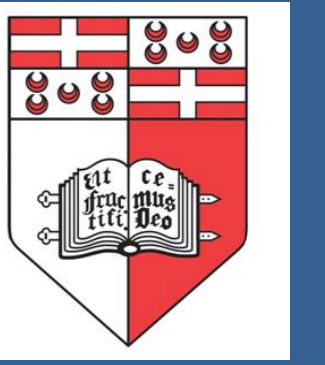


# Referral Practices of Chronic Kidney Disease Patients at Mater Dei Hospital



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## 1. Introduction and Aims

KDIGO 2012 clinical practice guidelines, strongly recommends that patients with progressive CKD, eGFR less than 30ml/min/1.73m<sup>2</sup> or patients with less severe CKD but with significant albuminuria should be considered for specialist referral in a timely fashion <sup>1</sup>.

We hereby present a study which investigates the referral practices, predictors of non-referral and the frequency of performing urine investigations amongst hospital based non-nephrologist specialist doctors in the CKD population.

## 2. Methods and Materials

All adult patients (≥16 years) admitted to MDH between 1<sup>st</sup> Jan and 29<sup>th</sup> Feb 2012, who satisfied the following inclusion and exclusion criteria were studied:

1. Patients admitted under the care of a consultant physician (including Cardiology and Neurology) or consultant surgeon (including Orthopaedics and Urology).
2. Patients who had an eGFR consistently <60mL/min/1.73m<sup>2</sup>.
3. Day cases and patients admitted directly under a consultant nephrologist were excluded.

Included patients were stratified using the KDIGO CKD staging system<sup>1</sup>:

1. CKD stage 3A: eGFR 45-59 mL/min/1.73m<sup>2</sup>
2. CKD stage 3B: eGFR 30-44 mL/min/1.73m<sup>2</sup>
3. CKD stage 4: eGFR 15-29mL/min/1.73m<sup>2</sup>
4. CKD stage 5: eGFR <15mL/min/1.73m<sup>2</sup>

## 3. Results

Diagram 1: Inclusion and exclusion criteria employed for patient selection. NT: Nephrology Team.

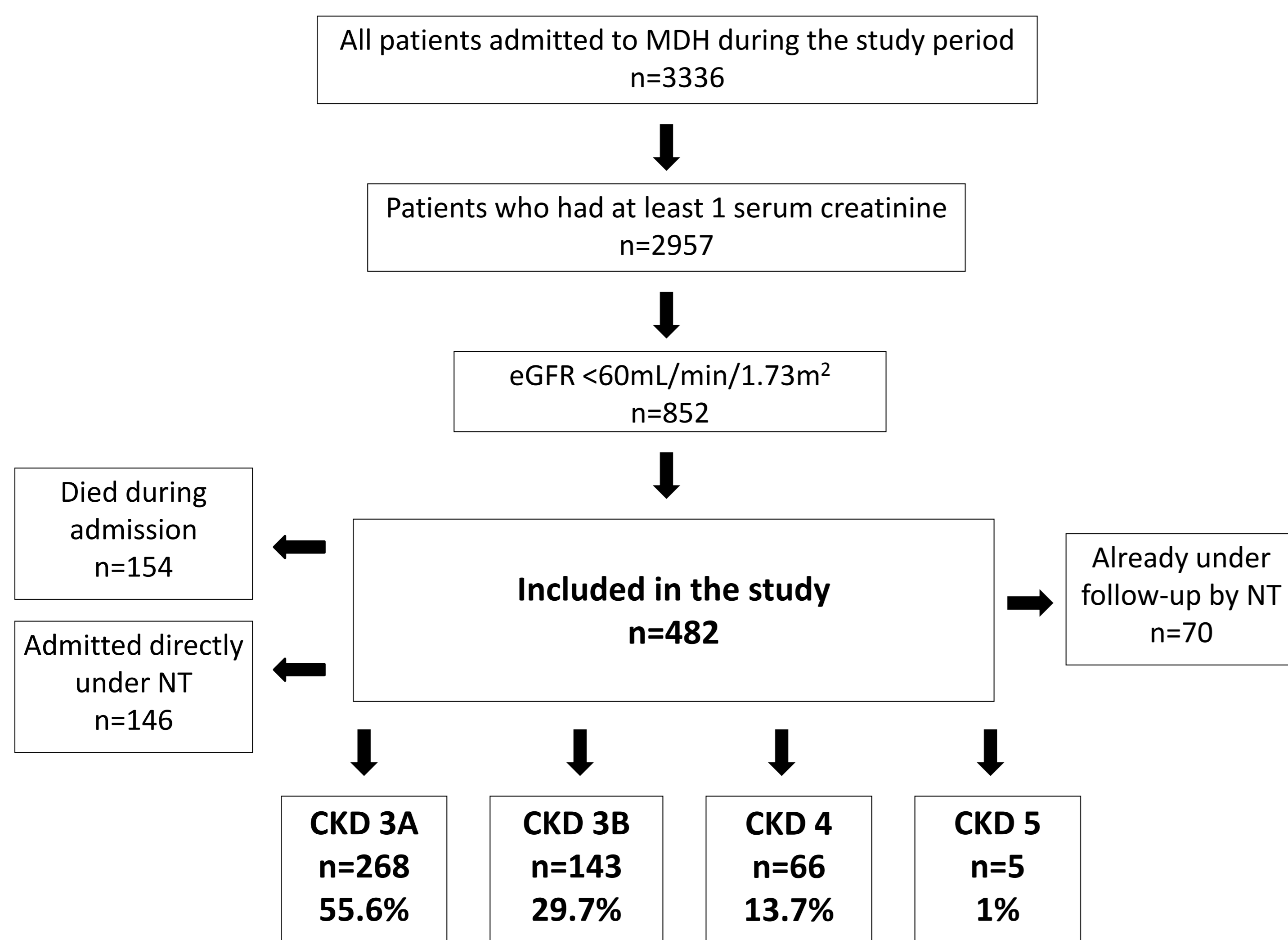


Table 1: Summary of baseline characteristics and outcomes according to CKD stages.

Variable	CKD3A eGFR 45-59 (mL/min/1.73 m <sup>2</sup> )	CKD3B eGFR 30-44 (mL/min/1.73 m <sup>2</sup> )	CKD4+5 eGFR <30 (mL/min/1.73 m <sup>2</sup> )	p-value
Median age (years) (IQR)	79 (14.75)	81 (12)	82 (11)	0.053
Gender: females (%)	54.3	51.7	56.3	0.80
Median creat (umol/L) (IQR)	106 (26)	148 (34)	209 (81)	*
Diabetes Mellitus (%)	40.9	46.1	41.7	0.35
Department: Medicine (%)	80.2	79.0	83.1	0.73
Urine investigations during admission episode (%)	22.8	32.2	25.4	0.26
Follow-up urine investigations (out-patient clinics) (%)	25.7 <sup>a</sup>	42.0 <sup>b</sup>	47.9 <sup>b</sup>	<0.0001
Referred to NT (%)	4.9 <sup>a</sup>	11.2 <sup>a,b</sup>	15.5 <sup>b</sup>	0.004

\*CKD stage is completely dependent on serum creatinine level.

<sup>a,b</sup> Same superscript letters denote CKD stage categories whose column proportions do not differ significantly from each other at the 0.05 level using Bonferroni correction.

NT: Nephrology Team, IQR: Interquartile range, Urine Investigations: Urinalysis and/or microalbumin estimation.

Figure 1. Percentage of patients referred to nephrology teams upon discharge according to the CKD stage.

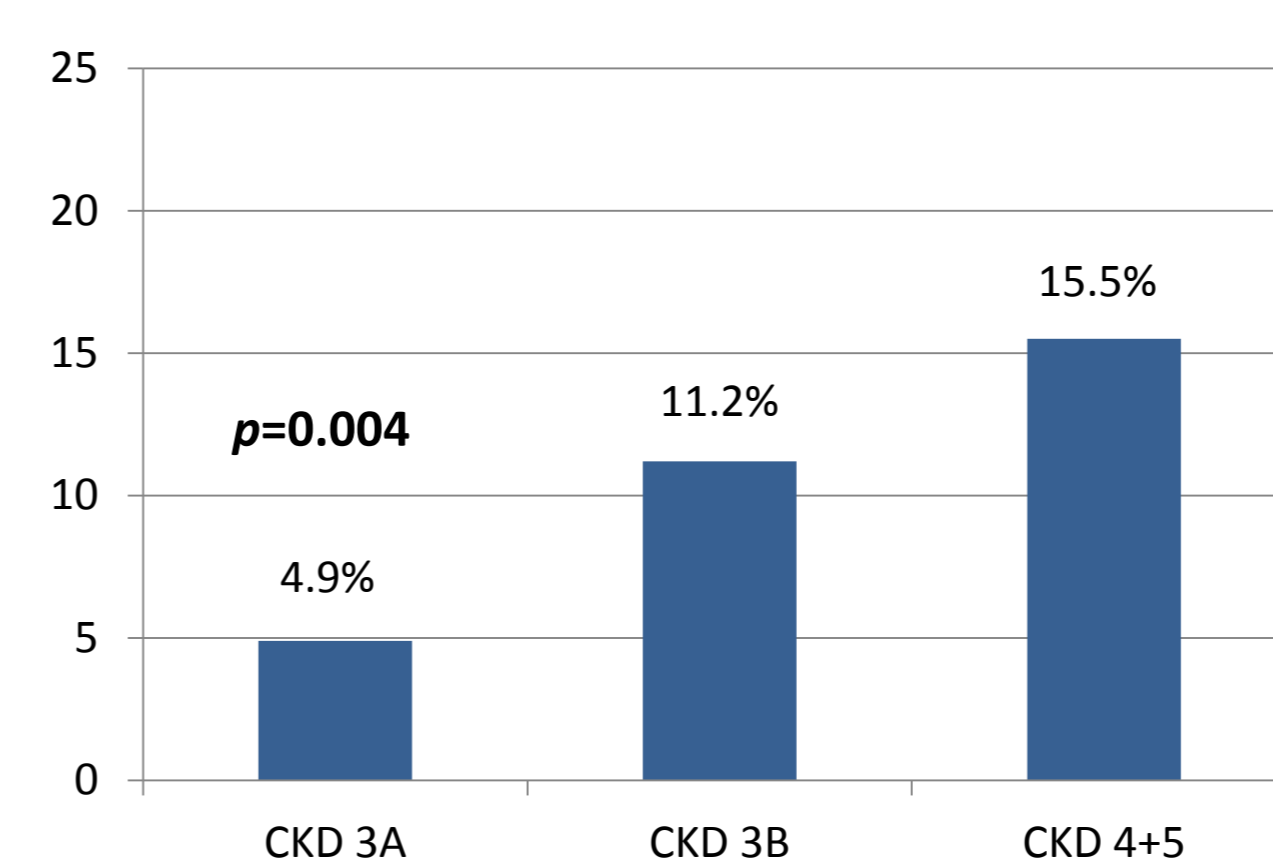


Figure 2. Percentage of patients followed up with urine investigations (urinalysis and/or albuminuria) at out-patient clinics according to CKD stage.

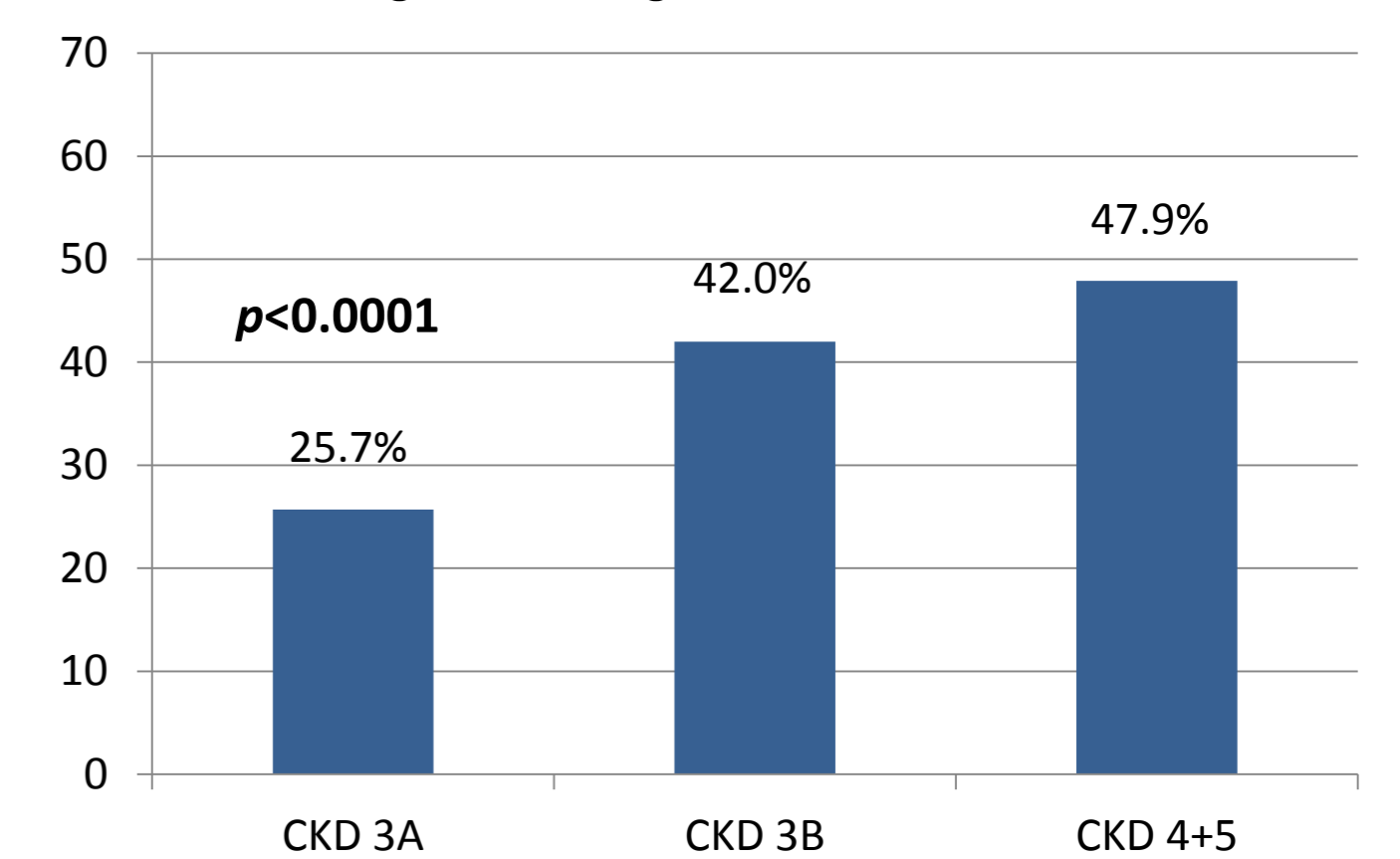


Table 2: Summary of characteristics in the referred and non-referred groups.

Variable	Referred	Not-referred	p-value
Median age (years) (IQR)	75.5 (19)	81 (12)	0.019
Creatinine (umol/L) (IQR)	147.5 (69.5)	123 (49.25)	<0.0001
Urine investigations during admission episode (%)	30.0	25.6	0.57
Follow up urine investigations (out-patient clinics) (%)	75.0	30.1	<0.0001
Gender: Females (%)	35.0	55.6	0.013
Diabetes Mellitus (%)	47.4	41.3	0.63
Department: Medicine (%)	82.5	80.1	0.84

Table 3: Logistic regression showing predictors of referral and follow-up with urine investigations in the out-patient clinics

Variable	Odds ratio	95% Confidence Interval		p-value
		Lower	Upper	
<b>Referral to Nephrology Teams</b>				
Increasing age	0.96	0.93	0.99	0.009
Male gender	2.10	1.05	4.22	0.036
Diabetes Mellitus	1.00	0.50	2.00	0.10
CKD 3B	2.64	1.21	5.57	0.014
CKD 4+5	4.35	1.81	10.49	0.001
<b>Follow-up of patients with urine investigations in the out-patient clinics</b>				
Increasing age	1.01	0.97	1.06	0.58
Male gender	1.55	0.66	3.66	0.32
Department (medicine)	1.80	0.64	5.03	0.26
Referred to NT	12.40	2.92	52.66	0.001
Diabetes Mellitus	4.23	1.81	9.88	0.001
CKD 3B	3.52	1.39	8.90	0.008
CKD 4+5	7.04	2.12	23.42	0.001

## 4. Conclusions

1. A quarter of all patients hospitalized at MDH have CKD.
2. Males, younger age groups and patients who have reached CKD stage 3B or worse, achieved the highest rate of referral.
3. Urine tests remain largely underutilised.
4. Only a minority (15.5%) of patients with an eGFR <30mL/min/1.73m<sup>2</sup> were referred to a Nephrology Team.

## Reference:

1. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kid Int suppl. 2013 Jan;3(1):1-163