

## DIFFERENCES IN IMPORTANT RISK FACTORS SUPPORT THE DIVISION OF CKD STAGE 3 INTO A AND B

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**INTRODUCTION AND AIMS:** Evidence suggests that the risk of cardiovascular events, mortality and complications related to CKD increase significantly when the GFR falls below 45 mLs/min. In England, recent guidance from the National Institute for Health and Clinical Excellence (NICE) for the management of early CKD recommended the sub-classification of CKD stage 3 into 3A (45-59 mL/min/1.73m<sup>2</sup>) and 3B (30-44 mL/min/1.73m<sup>2</sup>).

**METHODS:** We studied 300 patients, recruited from primary care practices, to evaluate differences with respect to risk factors and clinical variables. Each participant underwent clinical assessment and serum as well as urine tests were performed. Albumin to creatinine ratio (ACR) and protein to creatinine ratio (PCR) were measured on three consecutive early morning urine specimens. Carotid to femoral arterial pulse wave velocity (PWV) was measured with a Vicorder™ device. Skin autofluorescence (AF), a measure of skin Advanced Glycation Endproduct (AGE) deposition that has been identified as a marker of cumulative metabolic stress, was assessed using the left forearm. Participants were divided into stages 3A (N=204) or 3B (N=57) for analysis.

### RESULTS:

Comparison of clinical variables in stages 3A and 3B							
	3A Median	IQ Range	3B Median	IQ Range	All Stage 3 Median	IQ Range	P value*
Risk Factor							
Urine ACR (mg/mmol)	0.2	0.00-0.16	0.8	0.13-0.83	0.3	0.00-1.38	<0.000
eGFR mL/min/1.73m <sup>2</sup>	56	50-60	40	37-42	53	46-59	<0.000
Uric Acid (mmol/L)	366	301-432	431	380-497	383	324-445	<0.000
Age (years)	73	67-78	78	72-82	74	67-79	0.001
Potassium (mmol/L)	4.4	4.2-4.7	4.6	4.3-4.8	4.4	4.2-4.7	0.017
Urine PCR (mg/mg)	0.09	0.06-0.11	0.1	0.06-0.22	0.09	0.06-0.12	0.017
Skin AF	2.5	2.1-2.9	2.8	2.3-3.1	2.6	2.1-3.0	0.017
Bicarbonate (mmol/L)	26	24-28	25	23-27	26	24-27	0.018
Hb (g/dL)	13.5	12.5-14.3	12.9	11.7-14.3	13.4	12.4-14.3	0.019
Albumin (g/L)	41	39-43	40	38-42	41	39-43	0.052

### \*Mann Whitney Test for 3A versus 3B

Significant differences were observed between the groups with respect to urine ACR, urine PCR, uric acid, age, skin AF, serum potassium, bicarbonate and haemoglobin. No significant differences were seen in blood pressure (diastolic or systolic), pulse wave velocity, deprivation score, waist to hip ratio, BMI, glucose, calcium phosphate or cholesterol. A small difference in albumin was of borderline significance.

**CONCLUSIONS:** Our results show significant differences in many of the risk factors associated with CKD complications, between CKD stage 3A and B. This confirms that division of stage 3 into A and B is clinically useful for identifying higher risk patients who may benefit from interventions to reduce renal and cardiovascular risk.