

# CAN WE TRUST IN ESTIMATED GFR DECLINE IN RENAL TRANSPLANTATION? THE NEPHROLOGIST IN THE MIST.

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## Background

Renal transplant patients have a high rate of graft loss (4% per year). Therefore, a reliable evaluation of graft function is crucial. Estimated GFR (eGFR) is neither accurate nor precise in the prediction of real GFR. Whether this error masks the loss of renal function in this population is not clear.

## Methods

We measured GFR in 67 renal transplant patients with the plasma clearance of iohexol annually during 3 years. Patients had at least three measurements of GFR. eGFR was evaluated by 52 creatinine and/or cystatin-c formulas. The agreement GFR decline based on mGFR and eGFR was analyzed with the Concordance Correlation Coefficient (CCC).

## Results

Table 1 shows the results of mGFR and eGFR decline for a representative group of 10 formulas (similar results were observed for the remaining equations). Mean GFR decline (mGFR) was  $0.89 \pm 5.89$  ml/min/year; 21 (31%) patients showed fast ( $< -3$  ml/min/y), 28 (42%) slow or stable renal decline ( $-3$  ml/min/y to  $3$  ml/min/y) and 18 (27%) increased mGFR decline ( $>3$ ml/min/yr). The agreement analysis showed poor accuracy and precision combined, which lead to a low concordance: CCC ranged from 26.08 to 47.84 (average  $\sim 37.3\%$ ) between real and estimated GFR decline. Accordingly, formulas showed either over or underestimation of real GFR decline.

	Accuracy	Precision	CCC
<b>Creatinine-based</b>			
aMDRD	0.94 (0.82 )	0.44 (0.26)	0.42 (0.24)
CKD_EPI	0.91 (0.79)	0.43 (0.25)	0.39 (0.22)
Effersoe	0.95 (0.83)	0.45 (0.28)	0.43 (0.26)
Rule-MC	0.87 (0.74)	0.39 (0.20)	0.33 (0.17)
<b>Cystatin-c-based</b>			
Hoek	0.85 (0.71)	0.32 (0.12)	0.27 (0.10)
Rule_cc	0.84 (0.70)	0.31 (0.11)	0.26 (0.09)
CKD_EPI_cc	0.84 (0.70)	0.29 (0.09)	0.24 (0.07)
<b>Creatinine + cystatin-c</b>			
Stevens	0.96 (0.87)	0.49 (0.32)	0.47 (0.31)
Ma	0.98 (0.87)	0.48 (0.31)	0.47 (0.31)
CKD_EPI_cr_cc	0.97 (0.86)	0.41 (0.2)	0.39 (0.22)

	eGFR decline ml/min/y	mGFR decline ml/min/y
aMDRD	-2.78	-10.35
CKD_EPI	0.09	-8.78
Effersoe	10.28	-2.44
Rule-MC	12.77	-0.09
Hoek	7.50	-1.08
Rule_cc	13.79	1.01
CKD_EPI_cc	-0.22	8.98
Stevens	-3.31	5.31
Ma	-4.34	8.53
CKD_EPI_cr_cc	-0.31	-12.18

## Conclusion

Renal function decline cannot be evaluated by estimation formulas in renal transplant patients. This can have important consequences in clinical trials and in day-to-day clinical practice.