

Point-of-care creatinine tests to assess kidney function before administering intravenous contrast for CT imaging

Addendum to the EAG Report

Produced by Centre for Reviews and Dissemination (CRD) and Centre for Health Economics (CHE)

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Additional analysis requested by the NICE technical team

This addendum reports the results of one additional analysis requested by the NICE technical team prior to the first Diagnostic Advisory Committee meeting for point-of-care creatinine tests to assess kidney function before administering intravenous contrast for CT imaging.

The NICE technical team requested a scenario analysis assuming an increased risk of PC-AKI following contrast for patients with $eGFR < 30 \text{ ml/min/1.73m}^2$. In the model the risk of PC-AKI without prior IV hydration is derived from the observed risk of PC-AKI with IV hydration in patients with $eGFR < 30 \text{ ml/min/1.73m}^2$ [1] and the effect of IV hydration on PC-AKI [2] for the same group of patients. Therefore, the EAG varied these two parameters to the extreme values of their 95% confidence intervals, effectively assuming a risk of PC-AKI with IV hydration of 14.9% (10.8% in the base case analysis) and a relative risk of IV hydration of 0.52 (0.97 in the base case analysis). These two combined assumptions resulted in a risk of PC-AKI without IV hydration of 25.2% (11.1% in the base case), and an absolute risk difference with and without hydration of 10.3% (0.3% in the base case). Deterministic results for this scenario analysis are presented in Table 1. For completeness, the ‘No testing - IV contrast media for all’ strategy is also included.

Table 1 Cost effectiveness results – Increased risk of PC-AKI and effectiveness of IV hydration

	Identification	Management	Total costs	Total QALYs	NHB*** (QALYs)	NMB***	INHB*** (QALYs)	INMB***	NB rank
1	Lab	Test negative* - Contrast enhanced CT scan	£363.50	9.991370331	9.97320	£199,463.90	0.00000	£0.00	15
2	RF+ i-STAT		£278.35	9.991370061	9.97745	£199,549.05	0.00426	£85.15	5
3	RF + ABL800FLEX		£286.19	9.991370095	9.97706	£199,541.21	0.00387	£77.31	10
4	RF + StatSensor		£278.23	9.991369888	9.97746	£199,549.17	0.00426	£85.26	4
5	RF + Lab		£304.30	9.991370331	9.97616	£199,523.10	0.00296	£59.20	14
6	RF + i-STAT + Lab		£276.18	9.991370061	9.97756	£199,551.22	0.00437	£87.32	2
7	RF + ABL800FLEX + Lab		£284.71	9.991370095	9.97713	£199,542.69	0.00394	£78.78	9
8	RF + StatSensor + Lab	Test positive* - IVH + Contrast enhanced CT scan	£276.55	9.991369888	9.97754	£199,550.85	0.00435	£86.95	3
9	i-STAT		£286.69	9.991370061	9.97704	£199,540.71	0.00384	£76.81	11
10	ABL800FLEX		£291.31	9.991370095	9.97680	£199,536.09	0.00361	£72.19	13
11	StatSensor		£284.36	9.991369888	9.97715	£199,543.04	0.00396	£79.14	8
12	i-STAT+ Lab		£280.41	9.991370061	9.97735	£199,546.99	0.00415	£83.09	7
13	ABL800FLEX+ Lab		£287.03	9.991370095	9.97702	£199,540.37	0.00382	£76.47	12
14	StatSensor + Lab		£279.49	9.991369888	9.97740	£199,547.91	0.00420	£84.01	6
15	No testing	Contrast enhanced CT	£267.59	9.991368636	9.97799	£199,559.78	0.00479	£95.88	1

*According to any test in the testing sequence **According to last test in the testing sequence ***At £20,000 per QALY; INHB, incremental net health benefit; INMB, incremental net monetary benefit; NB, net benefit; NHB, net health benefit; INMB, net monetary benefit.

The results of the scenario analysis are consistent with those of the base case analysis and scenario 11.1 (where an additional ‘No testing - IV contrast media for all’ strategy is considered).

References

1. Park, S., et al., *Contrast-Induced Nephropathy After Computed Tomography in Stable CKD Patients With Proper Prophylaxis: 8-Year Experience of Outpatient Prophylaxis Program*. *Medicine*, 2016. **95**(18): p. e3560.
2. Ahmed, K., et al., *Effectiveness of contrast-associated acute kidney injury prevention methods; a systematic review and network meta-analysis*. *BMC Nephrol*, 2018. **19**(1): p. 323.