

## Appendix I – Economic evidence tables

### National Clinical Guideline Centre 2014

Study	National Clinical Guideline Centre. Chronic kidney disease (partial update). Assessed at: <a href="https://www.nice.org.uk/guidance/cg182/evidence/appendices-a-r-pdf-191905166">https://www.nice.org.uk/guidance/cg182/evidence/appendices-a-r-pdf-191905166</a>			
Study details	Population & interventions	Costs	Outcome (percentage)	Percentage correct
<p><b>Economic analysis:</b> Cost consequence analysis</p> <p><b>Study design:</b> Decision tree</p> <p><b>Approach to analysis:</b> Simple decision tree according to diagnostic outcomes (True positive, False positive, True negative, False negative)</p> <p><b>Perspective:</b> NHS perspective</p> <p><b>Time horizon:</b> 1 year</p> <p><b>Intervention effect duration:</b> 1 year</p> <p><b>Discounting:</b> No discounting as time horizon is 1 year</p>	<p><b>Population:</b> People with suspected CKD categorised into</p> <ul style="list-style-type: none"> <li>Adults 75+</li> <li>Adults under 75 with hypertension</li> <li>Adults under 75 without hypertension</li> </ul> <p><b>Interventions</b> CKD-EPI<sub>Cys</sub>: eGFR is re-calculated using serum cystatin C and the CKD-EPI<sub>Cys</sub> equation</p> <p>CKD-EPI<sub>Create-cys</sub>: eGFR is re-calculated using serum cystatin C and serum creatinine and the combined CKD-EPI equation</p> <p><b>Comparator</b></p>	<p><u>Age 75+</u> CKD-EPI<sub>Create</sub>: £51.75 CKD-EPI<sub>Cys</sub>: £42.63 CKD-EPI<sub>Create-cys</sub>: £46.35</p> <p><u>Age&lt;75 No hypertension</u> CKD-EPI<sub>Create</sub>: £51.75 CKD-EPI<sub>Cys</sub>: £38.11 CKD-EPI<sub>Create-cys</sub>: £44.30</p> <p><u>Age&lt;75 hypertension</u> CKD-EPI<sub>Create</sub>: £58.75 CKD-EPI<sub>Cys</sub>: £39.80 CKD-EPI<sub>Create-cys</sub>: £43.97</p>	<p><b>False Positive</b></p> <p><u>Age 75+</u> CKD-EPI<sub>Create</sub>: 20.2 CKD-EPI<sub>Cys</sub>: 10.6 CKD-EPI<sub>Create-cys</sub>: 12.2</p> <p><u>Age&lt;75 No hypertension</u> CKD-EPI<sub>Create</sub>: 33 CKD-EPI<sub>Cys</sub>: 13 CKD-EPI<sub>Create-cys</sub>: 17</p> <p><u>Age&lt;75 hypertension</u> CKD-EPI<sub>Create</sub>: 30 CKD-EPI<sub>Cys</sub>: 7 CKD-EPI<sub>Create-cys</sub>: 11</p> <p><b>False Negative</b></p> <p><u>Age 75+</u> CKD-EPI<sub>Create</sub>: 0 CKD-EPI<sub>Cys</sub>: 12.9 CKD-EPI<sub>Create-cys</sub>: 7.3</p>	<p><u>Age 75+</u> CKD-EPI<sub>Create</sub>: 79.8 CKD-EPI<sub>Cys</sub>: 76.6 CKD-EPI<sub>Create-cys</sub>: 80.5</p> <p><u>Age&lt;75 No hypertension</u> CKD-EPI<sub>Create</sub>: 67 CKD-EPI<sub>Cys</sub>: 75 CKD-EPI<sub>Create-cys</sub>: 81</p> <p><u>Age&lt;75 hypertension</u> CKD-EPI<sub>Create</sub>: 70 CKD-EPI<sub>Cys</sub>: 79 CKD-EPI<sub>Create-cys</sub>: 79</p>

	CKD-EPI <sub>create</sub> : no further testing, the person is diagnosed as having CKD stage 3a		<u>Age&lt;75 No hypertension</u> CKD-EPI <sub>create</sub> : 0 CKD-EPI <sub>cys</sub> : 12 CKD-EPI <sub>create-cys</sub> : 3  <u>Age&lt;75 hypertension</u> CKD-EPI <sub>create</sub> : 0 CKD-EPI <sub>cys</sub> : 14 CKD-EPI <sub>create-cys</sub> : 11	
<b>Data sources</b>				
<b>Outcomes:</b>				
Proportion of patients falsely diagnosed as having CKD (False positive - FP), Proportion of patients falsely diagnosed as not having CKD (False Negative - FN), NHS cost at 1 year				
<b>Costs:</b> All costs were obtained from standard UK sources. The cost of drugs used data the National Drug Tariff and Prescription Cost Analysis England. The cost of CKD management were from PSSRU and NHS Reference costs. Costs included in the model were visits to the GP and nurse, biochemistry, haematology tests. Drug costs included were angiotensin-converting enzyme inhibitor, diuretic, calcium channel blocker, beta blocker, alpha blocker and angiotensin receptor blocker. A weighted drug use was used in the model.				
<b>Comments</b>				
Model from 2014 NICE guideline. This review question was not prioritised for modelling in the 2020 update of the guideline, so this analysis has not been updated.				
<b>Overall applicability:</b> Partially applicable				
Conducted from an NHS perspective but no health-related outcomes as it is a cost consequence analysis				
<b>Overall quality:</b> Minor limitations				
Data from the best available sources and time horizon sufficient				
<sup>1</sup> Costs as reported, costs were inflated in the evidence profiles to 2020 prices				

**Shardlow 2017**

<b>Study</b>	Shardlow A, McIntyre NJ, Fraser SDS, Roderick P, Raftery J, Fluck RJ, et al. (2017) The clinical utility and cost impact of cystatin C measurement in the diagnosis and management of chronic kidney disease: A primary care cohort study. PLoS Med 14(10): e1002400. <a href="https://doi.org/10.1371/journal.pmed.1002400">https://doi.org/10.1371/journal.pmed.1002400</a>
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Study details	Population & interventions	Costs <sup>1</sup>	Outcomes	Total increase per patient
<p><b>Economic analysis:</b> Cost consequence analysis</p> <p><b>Study design:</b> Cohort study</p> <p><b>Perspective:</b> NHS perspective</p> <p><b>Time horizon:</b> 5 years</p> <p><b>Discounting:</b> None</p>	<p><b>Population:</b> Adults over 18 years with eGFR result consistent with two CKD stage 3 values at least 90 days apart. People were excluded if they were judged to have less than a year to live, unable to visit their primary care surgery or previously received a solid organ transplant. 1,741 people were included in the study, 653 had CKD G3a using eGFR<sub>creat</sub></p> <p><b>Interventions</b> Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>cystatin C</sub></p> <p>Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>creatinine and cystatin C</sub></p> <p><b>Comparator</b> eGFR<sub>creat</sub>: standard care</p>	<p><b>Cost differences:</b> Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>cystatin C</sub> compared with eGFR<sub>creat</sub>: £12,843</p> <p>Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>creatinine and ystatin C</sub> compared with eGFR<sub>creat</sub>: £3,226</p> <p><b>Currency &amp; cost year:</b> Sterling 2015</p> <p><b>Cost components incorporated:</b> Monitoring, removing eGFR and uACR (urine albumin to creatinine ratio) from annual review, biannual assessment of eGFR and uACR, nephrology</p>	N/A	<p>Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>cystatin C</sub>: £23</p> <p>Implementing cystatin C testing and 12 months of monitoring using eGFR<sub>creatinine and ystatin C</sub>: £8</p> <p><b>Analysis of uncertainty:</b> None</p>
<b>Data sources</b>				
Quality of life weights: None				

**Costs:** All costs were obtained from standard UK sources and used due to patients being reclassified with different tests. The cost of drugs used data from Prescription Cost Analysis 2010. The price and unit costs for screening and appointments were sourced from the Unit Costs of Health and Social Care 2010 (Curtis 2010) and from the CKD Costing Report 2008 (NICE 2008).

#### Comments

**Source of funding:** Research Project Grant from the Dunhill Medical Trust. Previous funding from British Renal Society and Kidney Research UK. Unrestricted educational grant from Roche Products Ltd

**Overall applicability:** Partially applicable

Conducted from an NHS perspective but no health-related outcomes as it is a cost consequence analysis

**Overall quality:** Minor limitations

Data from the best available sources with sufficient time horizon

<sup>1</sup> Costs as reported, costs were inflated in the evidence profiles to 2020 prices

#### Economic evaluation checklist [National Clinical Guideline Centre 2014]

**National Clinical Guideline Centre. Chronic kidney disease (partial update). Assessed at:**  
<https://www.nice.org.uk/guidance/cg182/evidence/appendices-a-r-pdf-191905166>

Category	Rating	Comments
<b>Applicability</b>		
1.1 Is the study population appropriate for the review question?	Yes	
1.2 Are the interventions appropriate for the review question?	Yes	
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Yes	
1.4 Is the perspective for costs appropriate for the review question?	Yes	
1.5 Is the perspective for outcomes appropriate for the review question?	No	No QALYs are included in the analysis
1.6 Are all future costs and outcomes discounted appropriately?	NA	Only 1 year time horizon
1.7 Are QALYs, derived using NICE's preferred methods, or an appropriate social care-related equivalent used as an outcome? If not, describe	No	No QALYs are included in the analysis, cost consequence analysis

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Category	Rating	Comments
rationale and outcomes used in line with analytical perspectives taken (item 1.5 above).		
<b>1.8 OVERALL JUDGEMENT</b>	<b>PARTIALLY APPLICABLE</b>	
<b>Limitations</b>		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	Yes	
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Yes	
2.3 Are all important and relevant outcomes included?	Partly	Quality of life not included
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	
2.5 Are the estimates of relative intervention effects from the best available source?	No	The input studies were excluded in this evidence review
2.6 Are all important and relevant costs included?	Yes	
2.7 Are the estimates of resource use from the best available source?	Yes	
2.8 Are the unit costs of resources from the best available source?	Yes	
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	No	QALYs not included in the analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	
2.11 Has no potential financial conflict of interest been declared?	Yes	
<b>2.12 OVERALL ASSESSMENT</b>	<b>POTENTIALLY SERIOUS LIMITATIONS</b>	

**Economic evaluation checklist [Shardlow 2017]**

**Shardlow A, McIntyre NJ, Fraser SDS, Roderick P, Raftery J, Fluck RJ, et al. (2017) The clinical utility and cost impact of cystatin C measurement in the diagnosis and management of chronic kidney disease: A primary care cohort study. PLoS Med 14(10): e1002400. <https://doi.org/10.1371/journal.pmed.1002400>**

Category	Rating	Comments
<b>Applicability</b>		
1.1 Is the study population appropriate for the review question?	Yes	
1.2 Are the interventions appropriate for the review question?	Yes	
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Yes	
1.4 Is the perspective for costs appropriate for the review question?	Yes	
1.5 Is the perspective for outcomes appropriate for the review question?	No	No QALYs were included in the analysis
1.6 Are all future costs and outcomes discounted appropriately?	No	No discounting done
1.7 Are QALYs, derived using NICE's preferred methods, or an appropriate social care-related equivalent used as an outcome? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.5 above).	No	No QALYs included in this analysis, cost consequence analysis
<b>1.8 OVERALL JUDGEMENT</b>	<b>PARTIALLY APPLICABLE</b>	
<b>Limitations</b>		
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	Yes	
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Yes	
2.3 Are all important and relevant outcomes included?	Partly	Quality of life not included
2.4 Are the estimates of baseline outcomes from the best available source?	Yes	

**Shardlow A, McIntyre NJ, Fraser SDS, Roderick P, Raftery J, Fluck RJ, et al. (2017) The clinical utility and cost impact of cystatin C measurement in the diagnosis and management of chronic kidney disease: A primary care cohort study. PLoS Med 14(10): e1002400. <https://doi.org/10.1371/journal.pmed.1002400>**

Category	Rating	Comments
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	
2.6 Are all important and relevant costs included?	Yes	
2.7 Are the estimates of resource use from the best available source?	Yes	
2.8 Are the unit costs of resources from the best available source?	Yes	
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	No	QALYs not included in the analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	No sensitivity analysis done
2.11 Has no potential financial conflict of interest been declared?	Yes	Other conflicts of interest have been declared
<b>2.12 OVERALL ASSESSMENT</b>	<b>POTENTIALLY SERIOUS LIMITATIONS</b>	