



**TITLE: Estimated Glomerular Filtration Rate Calculations: Indications and Guidelines for Use**

**DATE:** 2 September 2010

**RESEARCH QUESTIONS:**

1. What is the evidence that a disclaimer for routine estimated glomerular filtration rate testing should be used for patients with compromised health?
2. What is the comparative reliability of the 24 hour creatinine and creatinine clearance tests versus estimated glomerular filtration rates?
3. What are the guidelines for the use of 24 hour creatinine and creatinine clearance tests versus estimated glomerular filtration rates?

**METHODS:**

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 8, 2010), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between January 1, 2005 and August 24, 2010. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, and guidelines. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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**RESULTS:**

HTIS reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and evidence-based guidelines.

Three evidence-based guidelines for the use of 24 hour creatinine and creatinine clearance tests versus estimated glomerular filtration rates were identified. No relevant health technology assessments, systematic reviews, meta-analyses, or randomized controlled trials were identified. Additional articles of potential interest can be found in the appendix.

**OVERALL SUMMARY OF FINDINGS:**

Glomerular filtration rate (GFR) can be accurately estimated by formulas using serum creatinine concentrations and patient variables.<sup>1</sup> These equations normally provide a more consistent estimation of GFR than creatinine clearance measurements.<sup>1</sup> Creatinine clearance and 24-hour urine creatinine tests do not improve the accuracy of estimation of GFR as compared to the prediction equations<sup>1</sup> and these tests are not required in most cases.<sup>2,3</sup> Some special populations (e.g., extremes of body size or age, high or low dietary creatinine or creatine intake, high or low muscle mass, ethnic groups in which the equations have not been validated) require GFR be measured by direct methods, such as creatinine clearance testing.<sup>1</sup> Direct GFR measurement should also be used when calculating the dose of some medications that are excreted renally and have high toxicity.<sup>1</sup>

**REFERENCES SUMMARIZED:**

**Health technology assessments**

No literature identified.

**Systematic reviews and meta-analyses**

No literature identified.

**Randomized controlled trials**

No literature identified.

**Guidelines and recommendations**

1. Use of estimated glomerular filtration rate to assess level of kidney function [Internet]. Westmead (Australia): Caring for Australians with Renal Impairment (CARI); 2005 Jul. [cited 2010 Sep 1]. Available from: [http://www.cari.org.au/CKD\\_evaluation\\_function\\_list\\_published/Use\\_of\\_estimated\\_glomerular\\_filtration\\_rate\\_to\\_assess.pdf](http://www.cari.org.au/CKD_evaluation_function_list_published/Use_of_estimated_glomerular_filtration_rate_to_assess.pdf)
2. Guidelines and Protocols Advisory Committee: chronic kidney disease - identification, evaluation and management of patients [Internet]. Victoria (BC): Guidelines and Protocols Advisory Committee; 2008 Sep 15. [cited 2010 Sep 1]. Available from: <http://www.bcguidelines.ca/gpac/pdf/ckd.pdf>  
*Note: see Investigational tests – “24-hour urine collections are not necessary in most cases.”*
3. Scottish Intercollegiate Guidelines Network. Diagnosis and management of chronic kidney disease: a national clinical guideline [Internet]. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2008. [cited 2010 Sep 1]. Available from: <http://www.sign.ac.uk/pdf/sign103.pdf>  
*Note: see 2.4.5 Summary, page 11*

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## APPENDIX – FURTHER INFORMATION:

### Non-randomized studies

4. El-Minshawy O, Saber RA, Osman A. 24-hour creatinine clearance reliability for estimation of glomerular filtration rate in different stages of chronic kidney disease. *Saudi J Kidney Dis Transpl* [Internet]. 2010 Jul;21(4):686-93. Available from: <http://www.sjkdt.org/text.asp?2010/21/4/686/64648> PubMed: PM20587873
5. Ravasi G, Lauriola M, Tinelli C, Brandolini M, Uglietti A, Maserati R. Comparison of glomerular filtration rate estimates vs. 24-h creatinine clearance in HIV-positive patients [Internet]. New York (NY): WebMD; 2010. [cited 2010 Sep 1]. Available from: <http://www.medscape.com/viewarticle/702896>

### Clinical practice guidance

6. College of Physicians & Surgeons of Saskatchewan Laboratory Quality Assurance Program. Guidelines for laboratory practice: general anatomical pathology chemistry hematology transfusion medicine [Internet]. Saskatoon (SK): Quadrant Newmedia; 2010. [cited 2010 Sep 1]. Available from: [http://www.quadrant.net/cps/pdfs/Lab\\_QA\\_Lab\\_Practice.pdf](http://www.quadrant.net/cps/pdfs/Lab_QA_Lab_Practice.pdf)  
*Note:* see Estimated Glomerular Filtration Rate – eGFR, page 15
7. Estimated glomerular filtration rate [Internet]. Surry Hills (Australia): The Royal College of Pathologists of Australasia; 2010 Mar 25. [cited 2010 Sep 1]. Available from: [http://www.rcpamanual.edu.au/index.php?option=com\\_pttests&task=show\\_test&id=844&Itemid=77](http://www.rcpamanual.edu.au/index.php?option=com_pttests&task=show_test&id=844&Itemid=77)  
*Note:* “If result is uncertain, formal GFR measurement or measured creatinine clearance may be indicated.”
8. Akbari A, Bell R, Karpinski J, Magner P. Estimated glomerular filtration rate (eGFR): TOH nephrology guidelines [Internet]. Ottawa (ON): The Ottawa Hospital; 2007 Nov. [cited 2010 Sep 1]. Available from: <http://www.ottawahospital.on.ca/hp/cpg/eGFR-e.pdf>