Local Coverage Determination (LCD): MolDX: Cystatin C Measurement (L37616)

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## Contractor Information

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## LCD Information

### Document Information

**LCD ID**

**Original Effective Date**

*Created on 02/06/2020. Page 1 of 10*
LCD Title
MolDX: Cystatin C Measurement

Proposed LCD in Comment Period
N/A

Source Proposed LCD
DL37616

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CMS National Coverage Policy
Title XVIII of the Social Security Act, §1862(a)(1)(A). Allows coverage and payment for only those services that are

Cystatin C is a low molecular weight protein produced by all nucleated cells in the body at a constant rate. Cystatin C is freely filtered by the renal glomerulus, completely reabsorbed by the proximal tubule, and then metabolized by the proximal tubule. It has been proposed and investigated as an improved marker of renal function and as a potential alternative to serum creatinine based estimated glomerular filtration rate (eGFR), as well as a biomarker for predicting cardiovascular risk.

Clinical assessment of kidney function is part of routine medical care for adults. GFR is the best overall index of kidney function. Normal GFR varies according to age, sex, and body size, and declines with age. Routinely, GFR is estimated from prediction equations which are based on endogenous serum markers like creatinine in addition to demographic variables such as age, sex and race. The National Kidney Foundation recommends using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) Creatinine Equation (2009) to estimate GFR.

Cystatin C is considered to be a potential alternative to serum creatinine for estimating GFR. GFR can be estimated (eGFR) from serum cystatin C utilizing an equation which includes the age and gender of the patient. Cystatin C eGFR may have advantages over creatinine eGFR in certain patient groups in whom muscle mass is abnormally high or low (e.g., individuals who are very elderly, malnourished, or have quadriplegia). Serum creatinine levels may also be influenced by diet (e.g., vegetarian or high protein diets) and medications that block distal tubule secretion of creatinine. Blood levels of cystatin C also equilibrate more quickly than creatinine. Therefore, serum cystatin C may be more accurate than serum creatinine when kidney function is rapidly changing (for example amongst hospitalized individuals).

Cystatin C levels have been reported to be abnormally elevated or decreased in some medical conditions (e.g., HIV disease and thyroid disease) and by some medications (e.g., corticosteroids). In clinical situations where confirmation of the eGFR by serum cystatin C is warranted, equations that combine serum cystatin C and serum creatinine provide a more precise eGFR than equations using serum cystatin C alone.

**Estimation of GFR from serum creatinine remains the clinical standard worldwide.**

**Covered Indications**

Cystatin C testing is medically reasonable and necessary when all of the following are met:
In adults with eGFRcreat 45–59 ml/min/1.73 m2 (CKD stage 3A mildly to moderately decreased GFR) who do not have markers of kidney damage; and

- If confirmation is warranted
  - When GFR estimates based on serum creatinine are thought to be inaccurate; and
  - When decisions depend on a more accurate knowledge of the GFR, such as confirming a diagnosis of chronic kidney disease (CKD), determining eligibility for kidney donation, or adjusting the dosage of toxic drugs that are excreted by the kidneys).

Limitations

The following are not reasonable and necessary and therefore will be denied:

- Measurement of cystatin C to assess cardiovascular risk is considered investigational in the risk assessment and management of cardiovascular disease. Cystatin C is not covered according to Title XVIII of the Social Security Act, Section 1861(xx)(1). Therefore, cystatin C measurement is considered not medically reasonable and necessary.
- Based on the Kidney Disease Outcomes Quality Initiative (KDOQI) US Commentary on the 2012 Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guideline for the Evaluation and Management of CKD, cystatin C testing is considered not medically reasonable and necessary for patients with following stages of CKD:
  - Stage 1 Kidney damage with normal or elevated GFR > 90 ml/min/1.73 m²
  - Stage 2 Kidney damage with mild decrease in GFR 60-89 ml/min/1.73 m²
  - Stage 3B Moderately to Severely decreased GFR 30-44 ml/min/1.73 m²
  - Stage 4 Severely decreased GFR 15-29 ml/min/1.73 m²
  - Stage 5 Kidney Failure GFR < 15 ml/min/1.73 m²

Summary of Evidence

Evidence-based clinical guidelines.

KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease

“The Kidney Disease: Improving Global Outcomes (KDIGO) 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (CKD) serves to update the 2002 KDOQI Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification following a decade of focused research and clinical practice in CKD. The document aims to provide state-of-the-art guidance on the evaluation, management and treatment for all patients with CKD. Specifically, the guideline retains the definition of CKD but presents an enhanced classification framework for CKD; elaborates on the identification and prognosis of CKD; discusses the management of progression and complications of CKD; and expands on the continuum of CKD care: timing of specialist referral, ongoing management of people with progressive CKD, timing of the initiation of dialysis, and finally the implementation of a treatment program which includes comprehensive conservative management. The development of the guideline followed an explicit process of evidence review and appraisal. Treatment approaches are addressed in each chapter and guideline recommendations are based on systematic reviews of relevant trials. Practical comments or statements which serve as educational purposes are ungraded, but included as important information for the readership. Appraisal of the quality of the evidence and the strength of recommendations followed the GRADE approach. Ongoing areas of controversies, limitations of the evidence, and international relevance are discussed and additional suggestions are provided for future research.”
The guideline recommends using serum creatinine and a GFR estimating equation for initial assessment of CKD. It suggests using additional tests (such as cystatin C or a clearance measurement) for confirmatory testing in specific circumstances when eGFR based on serum creatinine is less accurate. Confirmation of a decreased eGFR is warranted in specific circumstances where decisions depend on more accurate knowledge of the GFR, such as confirming a diagnosis of CKD, determining eligibility for kidney donation, or adjusting the dosage of toxic drugs that are excreted by the kidneys. It also suggests measuring cystatin C in adults with eGFRcreat 45–59 ml/min/1.73 m2 who do not have markers of kidney damage if confirmation of CKD is required. Another suggestion is measuring GFR using an exogenous filtration marker under circumstances where more accurate ascertainment of GFR will impact on treatment decisions.

**KDOQI US Commentary on the 2012 KDIGO Clinical Practice Guideline for the Evaluation and Management of CKD**

“The National Kidney Foundation–Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) guideline for evaluation, classification, and stratification of chronic kidney disease (CKD) was published in 2002. The KDOQI guideline was well accepted by the medical and public health communities, but concerns and criticisms arose as new evidence became available since the publication of the original guidelines. KDIGO (Kidney Disease: Improving Global Outcomes) recently published an updated guideline to clarify the definition and classification of CKD and to update recommendations for the evaluation and management of individuals with CKD based on new evidence published since 2002. The primary recommendations were to retain the current definition of CKD based on decreased glomerular filtration rate or markers of kidney damage for 3 months or more and to include the cause of kidney disease and level of albuminuria, as well as level of glomerular filtration rate, for CKD classification. NKF-KDOQI convened a work group to write a commentary on the KDIGO guideline in order to assist US practitioners in interpreting the KDIGO guideline and determining its applicability within their own practices. Overall, the commentary work group agreed with most of the recommendations contained in the KDIGO guidelines, particularly the recommendations regarding the definition and classification of CKD. However, there were some concerns about incorporating the cause of disease into CKD classification, in addition to certain recommendations for evaluation and management.”

The guideline states estimation of GFR from serum creatinine remains the clinical standard worldwide. It also recognizes the limitations of creatinine and recommends additional confirmatory tests, such as measurement of cystatin C or clearance, in situations when estimates of GFR from serum creatinine are less accurate. For the purposes of estimation of measured GFR, the combination of both markers (cystatin C and creatinine) provides a more precise estimate. The guideline agrees that GFR estimation using cystatin C alone or in combination with creatinine is useful as a confirmatory test of eGFR from creatinine, and that it improves risk stratification.

**National Academy of Clinical Biochemistry Laboratory Medicine Practice Guidelines: Emerging Biomarkers for Primary Prevention of Cardiovascular Disease**

The guidelines state cystatin C may be a more powerful predictor of cardiovascular events than eGFR calculation based on creatinine and recommends additional research to determine if interventions based on cystatin C measurements for risk stratification will provide added clinical benefit. Also, the guidelines state cystatin C has been proposed and investigated as an improved marker of renal function, a potential alternative to serum creatinine based estimated GFR, and the results of a meta-analysis support serum cystatin C as a promising, easily measured marker for detecting early kidney function impairment.

**2010 ACCF/AHA Guideline for Assessment of Cardiovascular Risk in Asymptomatic Adults: Executive Summary**
The American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) state “Global risk scores (such as the Framingham Risk Score [FRS]) that use multiple traditional cardiovascular risk factors should be obtained for risk assessment in all asymptomatic adults without a clinical history of CHD. These scores are useful for combining individual risk factor measurements into a single quantitative estimate of risk that can be used to target preventive interventions.”

Cystatin C is not referenced in the guideline. Therefore, there are no recommendations for cystatin C testing for cardiovascular risk assessment.

2013 ACC/AHA Cardiovascular Risk Assessment Guideline

Members of the American College of Cardiology (ACC) and the American Heart Association (AHA) Work Group proposed an initial list of novel risk markers for inclusion in critical question 1 (CQ1), which was then prioritized during several rounds of discussion. In selecting the final list, the Work Group gave priority to factors that have engendered substantial discussion in the scientific community and that could be reasonably considered as potentially feasible for widespread population use by primary care providers in routine clinical settings in the United States. In these deliberations, the Work Group considered availability, cost, assay reliability, and risks of the test or downstream testing. The final list of new risk markers to be evaluated included several blood and urine biomarkers (hs-CRP [high-sensitivity C-reactive protein], ApoB [Apolipoprotein B], creatinine [or eGFR], and microalbuminuria), several measures of subclinical cardiovascular disease (CAC [coronary artery calcium], CIMT [carotid intima-media thickness], and ABI [ankle brachial index]), family history, and cardiorespiratory fitness. It was noted that measurement of ApoB, albuminuria, GFR, or cardiorespiratory fitness is of uncertain value. The contribution of ApoB, CKD, albuminuria, and cardiorespiratory fitness to risk assessment for a first atherosclerotic cardiovascular disease (ASCVD) event is uncertain at present.

Cystatin C is not referenced in the guideline. Therefore, there are no recommendations for cystatin C testing for cardiovascular risk assessment.

Analysis of Evidence
(Rationale for Determination)

Analysis of Evidence
(Rationale for Determination)

Level of Evidence

Quality of Evidence-Moderate

Strength of Evidence-Moderate

Weight of Evidence-Moderate

The guideline from the National Kidney Foundation supports that estimation of GFR from serum creatinine remains
the clinical standard worldwide. However, it acknowledges the limitations of serum creatinine and agrees with the KDIGO 2012 Clinical Practice Guideline suggestions for use of serum cystatin C as a confirmatory test for eGFR when estimates of GFR from serum creatinine are less accurate in adults with eGFR$_{\text{creat}}$ 45–59 ml/min/1.73 m$^2$ who do not have markers of kidney damage and if confirmation is warranted.

Title XVIII of the Social Security Act, Section 1861(xx)(1) Cardiovascular Screening Blood Test does not include Cystatin C measurement as a covered service. The American College of Cardiology Foundation (ACCF), American College of Cardiology (ACC) and the American Heart Association (AHA) guidelines do not support serum cystatin C testing for cardiovascular risk assessment.

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**General Information**

**Associated Information**

**Documentation Requirements**

1. All documentation must be maintained in the patient's medical record and made available to the contractor upon request.
2. Every page of the record must be legible and include appropriate patient identification information (e.g., complete name, dates of service(s)). The documentation must include the legible signature of the physician or non-physician practitioner responsible for and providing the care to the patient.
3. The submitted medical record must support the use of the selected ICD-10-CM code(s). The submitted CPT/HCPCS code must describe the service performed.
4. The medical record documentation must support the medical necessity of the services as directed in this policy.
5. The laboratory or billing provider must have on file the physician requisition which sets forth the diagnosis or condition (ICD-10-CM code) that warrants the test(s).
6. Examples of documentation requirements of the ordering physician/non-physician practitioner (NPP) include, but are not limited to, history and physical or exam findings that support the decision making, problems/diagnoses, relevant data (e.g., lab testing).
7. Medical record documentation must support cystatin C test was performed on an adult patient with creatinine based eGFR 45–59 ml/min/1.73 m$^2$ who does not have markers of kidney damage.
8. Medical record documentation must clearly indicate the rationale which supports the medical necessity for performing eGFR by measurement of cystatin C (i.e. support GFR estimates based on serum creatinine are thought to be inaccurate and what decisions depend on more accurate knowledge of the GFR) and must reflect how the test result were used in the patient’s plan of care.

**Utilization Guidelines**

In accordance with CMS Ruling 95-1 (V), utilization of these services should be consistent with locally acceptable standards of practice.

Cystatin C testing will be considered medically reasonable and necessary when furnished as a confirmatory test in specific circumstances when eGFR based on serum creatinine is less accurate (e.g. muscle mass is abnormally high or low, dietary intake, medications that block distal tubule secretion of creatinine) and when more accurate knowledge of the eGFR will impact decisions, such as confirming a diagnosis of CKD, determining eligibility for kidney donation, or adjusting the dosage of toxic drugs that are excreted by the kidneys.
Repetitive use of cystatin C testing without documented evidence supporting the medical necessity would not be expected.

When services are performed in excess of established parameters, they may be subject to prepayment review for medical necessity.

Sources of Information

N/A

Bibliography


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