

# Local Coverage Determination (LCD): MolDX: Oncotype DX AR-V7 Nucleus Detect for Men with Metastatic Castrate Resistant Prostate Cancer (MCRPC) (L37744)

Links in PDF documents are not guaranteed to work. To follow a web link, please use the MCD Website.

## Contractor Information

CONTRACTOR NAME	CONTRACT TYPE	CONTRACT NUMBER	JURISDICTION	STATE(S)
Noridian Healthcare Solutions, LLC	A and B MAC	02101 - MAC A	J - F	Alaska
Noridian Healthcare Solutions, LLC	A and B MAC	02102 - MAC B	J - F	Alaska
Noridian Healthcare Solutions, LLC	A and B MAC	02201 - MAC A	J - F	Idaho
Noridian Healthcare Solutions, LLC	A and B MAC	02202 - MAC B	J - F	Idaho
Noridian Healthcare Solutions, LLC	A and B MAC	02301 - MAC A	J - F	Oregon
Noridian Healthcare Solutions, LLC	A and B MAC	02302 - MAC B	J - F	Oregon
Noridian Healthcare Solutions, LLC	A and B MAC	02401 - MAC A	J - F	Washington
Noridian Healthcare Solutions, LLC	A and B MAC	02402 - MAC B	J - F	Washington
Noridian Healthcare Solutions, LLC	A and B MAC	03101 - MAC A	J - F	Arizona
Noridian Healthcare Solutions, LLC	A and B MAC	03102 - MAC B	J - F	Arizona
Noridian Healthcare Solutions, LLC	A and B MAC	03201 - MAC A	J - F	Montana
Noridian Healthcare Solutions, LLC	A and B MAC	03202 - MAC B	J - F	Montana
Noridian Healthcare Solutions, LLC	A and B MAC	03301 - MAC A	J - F	North Dakota
Noridian Healthcare Solutions, LLC	A and B MAC	03302 - MAC B	J - F	North Dakota
Noridian Healthcare Solutions, LLC	A and B MAC	03401 - MAC A	J - F	South Dakota
Noridian Healthcare Solutions, LLC	A and B MAC	03402 - MAC B	J - F	South Dakota
Noridian Healthcare Solutions, LLC	A and B MAC	03501 - MAC A	J - F	Utah
Noridian Healthcare Solutions, LLC	A and B MAC	03502 - MAC B	J - F	Utah
Noridian Healthcare Solutions, LLC	A and B MAC	03601 - MAC A	J - F	Wyoming
Noridian Healthcare Solutions, LLC	A and B MAC	03602 - MAC B	J - F	Wyoming

## LCD Information

### Document Information

**LCD ID**

L37744

**Original Effective Date**

For services performed on or after 03/02/2019

**LCD Title**

MoIDX: Oncotype DX AR-V7 Nucleus Detect for Men with Metastatic Castrate Resistant Prostate Cancer (MCRPC)

**Proposed LCD in Comment Period**

N/A

**Source Proposed LCD**

DL37744

**AMA CPT / ADA CDT / AHA NUBC Copyright Statement**

CPT codes, descriptions and other data only are copyright 2018 American Medical Association. All Rights Reserved. Applicable FARS/HHSARS apply.

Current Dental Terminology © 2018 American Dental Association. All rights reserved.

Copyright © 2018, the American Hospital Association, Chicago, Illinois. Reproduced with permission. No portion of the AHA copyrighted materials contained within this publication may be copied without the express written consent of the AHA. AHA copyrighted materials including the UB-04 codes and descriptions may not be removed, copied, or utilized within any software, product, service, solution or derivative work without the written consent of the AHA. If an entity wishes to utilize any AHA materials, please contact the AHA at 312-893-6816. Making copies or utilizing the content of the UB-04 Manual, including the codes and/or descriptions, for internal purposes, resale and/or to be used in any product or publication; creating any modified or derivative work of the UB-04 Manual and/or codes and descriptions; and/or making any commercial use of UB-04 Manual or any portion thereof, including the codes and/or descriptions, is only authorized with an express license from the American Hospital Association. To license the electronic data file of UB-04 Data Specifications, contact Tim Carlson at (312) 893-6816 or Laryssa Marshall at (312) 893-6814. You may also contact us at [ub04@healthforum.com](mailto:ub04@healthforum.com).

**Revision Effective Date**

N/A

**Revision Ending Date**

N/A

**Retirement Date**

N/A

**Notice Period Start Date**

01/15/2019

**Notice Period End Date**

03/01/2019

**CMS National Coverage Policy**

Title XVIII of the Social Security Act (SSA), §1862(a)(1)(A), states that no Medicare payment shall be made for items or services that "are not reasonable and necessary for the diagnosis or treatment of illness or injury or to

improve the functioning of a malformed body member.”

Title XVIII of the Social Security Act, §1833(e), prohibits Medicare payment for any claim lacking the necessary documentation to process the claim.

42 Code of Federal Regulations (CFR) §410.32 Diagnostic x-ray tests, diagnostic laboratory tests, and other diagnostic tests: Conditions.

CMS Internet Online Manual Pub. 100-02 (Medicare Benefit Policy Manual), Chapter 15, Section 80, “Requirements for Diagnostic X-Ray, Diagnostic Laboratory, and Other Diagnostic Tests”

CMS Internet-Only Manuals, Publication 100-04, Medicare Claims Processing Manual, Chapter 16, §50.5 Jurisdiction of Laboratory Claims, 60.12 Independent Laboratory Specimen Drawing, 60.2. Travel Allowance.

CMS Internet Online Manual Pub. 100-04 (Medicare Claims Processing Manual), Chapter 23 (Section 10) “Reporting ICD Diagnosis and Procedure Codes”

## **Coverage Guidance**

### **Coverage Indications, Limitations, and/or Medical Necessity**

This contractor will provide limited coverage for the Oncotype DX AR-V7 Nucleus Detect to help determine which patients with metastatic castrate resistant prostate cancer may benefit from androgen receptor signaling inhibitor therapy and which may benefit from chemotherapy.

## **Summary of Evidence**

Men with metastatic castration resistant prostate cancer (mCRPC) have multiple life extending, FDA- approved therapeutics options. However, there is no clear consensus on the therapeutic sequencing after initial exposure to an androgen receptor signaling inhibitor (ARSi), such as apalutamide, abiraterone or enzalutamide. The response rate for a second ARSi, Abiraterone after Enzalutamide, or Enzalutamide after Abiraterone is lower than the initial exposure. Therefore, the most common clinical decision focuses on whether to start a second ARSi or taxane chemotherapy. It is therefore important to identify patients who will not respond to a 2<sup>nd</sup> ARSi in order to 1) avoid giving an ineffective therapy, and 2) delaying giving a more effective therapy, such as taxane chemotherapy, taxane combination therapies, Radium-223, PARP inhibitors, and platinum chemotherapy.

AR-V7 protein results from alternative androgen receptor (AR) mRNA splicing, which produces a constitutively active receptor that is associated with resistance to ARSi such as abiraterone and enzalutamide.<sup>1,2</sup> A growing body of evidence suggests that patients with AR-V7 positive mCRPC do not benefit from ARSi therapy but may respond to taxanes, such as docetaxel.<sup>3-5</sup> Supporting observations include that 1) AR-V7 positivity is associated with resistance to androgen receptor-targeted therapies<sup>4</sup>; 2) taxanes are equally effective in AR-V7–positive and AR-V7–negative mCRPC patients<sup>3,5</sup> ; and 3) AR-V7 status may change during therapy.<sup>6</sup> For these reasons, the National Comprehensive Cancer Network (NCCN) suggests that AR-V7 is a biomarker that may help guide therapy in mCRPC.

7

AR signaling requires that the AR transcriptional elements bind to DNA within the nucleus of the cancer

cell. Therefore, the nuclear localization of the AR-V7 truncated protein may improve the clinical specificity of predicting ARSi resistance.<sup>8</sup> Analysis of AR-V7 localization scoring guides has demonstrated that only nuclear AR-V7 protein expression improves the clinical specificity of predicting ARSi resistance, and importantly, is associated with improved overall survival with taxane chemotherapy.<sup>9</sup>

## **Oncotype DX<sup>®</sup> AR-V7 Nuclear Detect**

### **Test Description and Intended Use**

The *Oncotype* DX AR-V7 Nuclear Detect test is a commercially available, circulating tumor cell (CTC) based, liquid biopsy test. The test detects patients with CTCs who have nuclear expression of the AR-V7 truncated protein and provides information that can help guide treatment selection in patients with mCRPC.

### **Test Performance**

The AR-V7 assay is run on the Epic CTC platform (Figure 2). The procedures used for the AR-V7 assay and Epic CTC platform, including pre-analytical and analytical processes, have been in place since 2008 in our research laboratory and since 2015 in our clinical laboratory. As required by US federal (Clinical Laboratory Improvement Amendments [CLIA]) and state laboratory regulations, alternative proficiency testing (a blinded assessment of assay performance), consistent with CLIA regulations is regularly performed by our laboratory and has documented the consistency and reproducibility of the assay. The methodology for the AR-V7 assay yields precise and highly reproducible results.

### **Clinical Validation**

The *Oncotype* DX AR-V7 Nuclear Detect test has been clinically validated with 191 mCRPC samples representing 161 unique patients. Patients whose samples had nuclear AR-V7 positive CTCs before ARSi therapy had resistant post-therapy PSA changes, shorter rPFS (median, 2.3 vs 14.5 months;  $P < .001$ ), shorter time on therapy (median, 2.1 vs 6.8 months;  $P < .001$ ), and shorter OS (median, 4.6 months vs. not reached;  $P < .001$ ) than those without nuclear AR-V7 positive CTCs. A multivariable analysis adjusting for baseline factors associated with survival showed superior OS with taxanes relative to ARS inhibitors when AR-V7 positive CTCs were detected pre-therapy (hazard ratio, 0.24; 95% CI, 0.10-0.57;  $P = 0.035$ ).

## **Summary of Analytical and Clinical Performance**

### **General**

#### Intended Use

1. Patients with progressive, metastatic castration-resistant prostate cancer, (mCRPC) as defined by the Prostate Cancer Working Group 2 guidelines (a minimum of 2 rising prostate-specific antigen (PSA) levels 1 or more weeks apart, new lesions by bone

scintigraphy, and/or new or enlarging soft tissue lesions by computed tomography (CT) or magnetic resonance imaging (MRI))

2. Patients who have failed one androgen receptor signaling (ARS) inhibitor, specifically Enzalutamide (Xtandi) or Abiraterone (Zytiga)
3. Patients who are considered appropriate for treatment by their treating physician for the alternative ARS inhibitor (ARSi), specifically Enzalutamide (Xtandi) or Abiraterone (Zytiga), as a single agent.

Validated Specimen Type(s)

Peripheral blood collected in Streck Cell-Free DNA BCT tubes

## Analytical Performance

Description	Results (with 95% Confidence Intervals if applicable) <sup>1</sup>
Intermediate precision	
36 slides total: 12 slides (6 positive and 6 negative) on 3 non-consecutive days, by 3 different operators, using a different combination of critical AR-V7 detection reagents (i.e., three combinations of primary, Rabbit Anti-AR-V7 and secondary, Goat-Anti-Rabbit Horse Radish Peroxidase; 2 manufacturing lots each). One batch of test slides was scanned on two different imaging instruments.	100% (36/36; 90.3-100.0%)
Reproducibility (between sites)	N/A. All tests will be performed at a single site.
Minimum input quantity	1.7 mL whole blood collected in Streck Cell-Free DNA BCT tubes
Limit of blank (LOB)	DU145 control slides monitor background staining: Mean AR-V7 ratio (i.e., the intensity of AR-V7 signal in control cells divided by the background signal intensity across a slide) must be < 13 and no nuclear AR-V7+ cells should be observed.

Limit of detection (LOD)	<p><b>AR-V7 signal ratio:</b> An AR-V7 positive cell must have an AR-V7 ratio <math>\geq 3.2</math> in order for it to be distinguished as positive.</p>
Limits of quantitation (LOQ)	<p><b>AR-V7 positive cells:</b> Each AR-V7 test analyzes at least 1.7 mL of blood, enabling the detection of two positive cells per mL of blood with over 95% confidence.</p> <p>N/A. The AR-V7 test is a qualitative test reported as positive or negative.</p> <p>Total positive cell numbers are not reported in test results. The test result is binary, reporting negative, if no positive cells are found; and, positive, if one or more positive cell(s) is/are found.</p>
Linearity	<p>The presence of endothelial cells and lipids, to a concentration of 2.6% v/v (equivalent to blood triglyceride level of over 1000 mg/dL) were demonstrated to have no effect on assay performance. Gross hemolysis of blood specimen can impact clinical sensitivity of the test and is a criterion for not processing a sample.</p>
Interfering substances	<p>The stability of whole blood in the collection tube was evaluated positive and negative laboratory derived, tested over six time points (0, 8, 24, 48, 72, 96 h). The test results were analyzed for a negative and positive result. Additional acceptance criteria for positive samples included maintaining targeted cell spike-in number and incidence of nuclear localized AR-V7 signal (&gt;81%). All results demonstrated acceptable primary sample stability up to the 72hr timepoint. Samples older than 72h will not be processed.</p>
Specimen stability, primary	<p>N/A; samples are lysed upon receipt and immediately fixed prior to staining</p>
Specimen stability, intermediate	<p>Critical reagents include Pan CK (C-11+PCK-26+CY-90+KS-1A3+M20+A53-B/A2); CK19 (RCK108); CD45:Alexa647 (F10-89-4); AR-V7 antibody (EPR15656); Goat <math>\alpha</math>-Mouse-IgG1/CF555-conjugated; GARHRP; and 488-Tyramide and AMP buffer. Shelf-life stability determined by manufacturer.</p>
Critical reagent closed/shelf-life stability	<p>All critical reagents are single use only. Testing demonstrates on-board stability over ~5-hour run.</p>
Critical reagent open/in use stability	

<sup>1</sup> Using Clopper-Pearson method

## Clinical Performance: Validity (Scher et al. 2016 JAMA Oncology)

Prognostic value of AR-V7 positivity on ARSi therapy by endpoint:

Endpoint	Hazard Ratio: AR-V7(+) vs. (-)	p-value
Time on ARSi	4.13	< 0.0001
rPFS	3.7	0.0002
Overall Survival	11.45 (5.67-23.82)	< 0.001

### AR-V7: Therapy Interaction: Multivariable Cox PH Model

Comparison	Hazard Ratio (95% CI)
AR-V7(+): Taxane vs AR	0.242 (0.103 to 0.569)
AR-V7(-): Taxane vs AR	0.924 (0.440 to 1.946)

## Analysis of Evidence (Rationale for Determination)

### Level of Evidence

Quality of Evidence: Moderate  
Strength of Evidence: Moderate  
Weight of Evidence: Limited

## Criteria for Coverage

Oncotype DX AR-V7 Nuclear Detect assay is covered as follows:

1. Patients will have progressive mCRPC as defined by the Prostate Cancer Working Group 2 guidelines (a minimum of 2 rising prostate-specific antigen (PSA) levels 1 or more weeks apart, new lesions by bone scintigraphy, and/or new or enlarging soft tissue lesions by computed tomography (CT) or magnetic resonance imaging (MRI)).
2. Patients will have failed one ARSi, specifically Enzalutamide (Xtandi), Apalutamide (Erleada), or Abiraterone (Zytiga).
3. Patients will be considered appropriate for treatment by their treating physician for the alternative ARSi as a single agent.
4. Circulating tumor cells (CTC) with nuclear expression of AR-V7 protein will be assessed prior to initiation of therapy.
5. Decision impact analysis: We expect that < 15% of nuclear AR-V7-positive patients will receive an ARSi.
6. Efficacy analysis: Nuclear AR-V7-negative patients who receive an ARSi will have similar or better time on therapy than untested mCRPC patients (meeting above criteria) receiving ARSi.

---

## Coding Information

### Bill Type Codes:

Contractors may specify Bill Types to help providers identify those Bill Types typically used to report this service. Absence of a Bill Type does not guarantee that the policy does not apply to that Bill Type. Complete absence of all Bill Types indicates that coverage is not influenced by Bill Type and the policy should be assumed to apply equally to all claims.

N/A

### Revenue Codes:

Contractors may specify Revenue Codes to help providers identify those Revenue Codes typically used to report this service. In most instances Revenue Codes are purely advisory. Unless specified in the policy, services reported under other Revenue Codes are equally subject to this coverage determination. Complete absence of all Revenue Codes indicates that coverage is not influenced by Revenue Code and the policy should be assumed to apply equally to all Revenue Codes.



N/A

**CPT/HCPCS Codes**

**Group 1 Paragraph:**

N/A

**Group 1 Codes:**

CODE	DESCRIPTION
81479	UNLISTED MOLECULAR PATHOLOGY PROCEDURE

**ICD-10 Codes that Support Medical Necessity**

**Group 1 Paragraph:**

N/A

**Group 1 Codes:**

ICD-10 CODE	DESCRIPTION
C61	Malignant neoplasm of prostate
C77.8	Secondary and unspecified malignant neoplasm of lymph nodes of multiple regions
C77.9	Secondary and unspecified malignant neoplasm of lymph node, unspecified
C78.00	Secondary malignant neoplasm of unspecified lung
C78.1	Secondary malignant neoplasm of mediastinum
C78.2	Secondary malignant neoplasm of pleura
C78.30	Secondary malignant neoplasm of unspecified respiratory organ
C78.4	Secondary malignant neoplasm of small intestine
C78.5	Secondary malignant neoplasm of large intestine and rectum
C78.6	Secondary malignant neoplasm of retroperitoneum and peritoneum
C78.7	Secondary malignant neoplasm of liver and intrahepatic bile duct
C78.80	Secondary malignant neoplasm of unspecified digestive organ
C78.89	Secondary malignant neoplasm of other digestive organs
C79.10	Secondary malignant neoplasm of unspecified urinary organs
C79.11	Secondary malignant neoplasm of bladder
C79.19	Secondary malignant neoplasm of other urinary organs
C79.31	Secondary malignant neoplasm of brain
C79.32	Secondary malignant neoplasm of cerebral meninges
C79.40	Secondary malignant neoplasm of unspecified part of nervous system

ICD-10 CODE	DESCRIPTION
C79.49	Secondary malignant neoplasm of other parts of nervous system
C79.51	Secondary malignant neoplasm of bone
C79.52	Secondary malignant neoplasm of bone marrow
C79.60	Secondary malignant neoplasm of unspecified ovary
C79.61	Secondary malignant neoplasm of right ovary
C79.62	Secondary malignant neoplasm of left ovary
C79.70	Secondary malignant neoplasm of unspecified adrenal gland
C79.71	Secondary malignant neoplasm of right adrenal gland
C79.72	Secondary malignant neoplasm of left adrenal gland
C79.81	Secondary malignant neoplasm of breast
C79.82	Secondary malignant neoplasm of genital organs
C79.89	Secondary malignant neoplasm of other specified sites
C79.9	Secondary malignant neoplasm of unspecified site
Z19.2	Hormone resistant malignancy status
Z85.46	Personal history of malignant neoplasm of prostate

#### ICD-10 Codes that DO NOT Support Medical Necessity

N/A

#### Additional ICD-10 Information

N/A

## General Information

#### Associated Information

N/A

#### Sources of Information

N/A

#### Bibliography

1. Li Y, Chan SC, Brand LJ, Hwang TH, Silverstein KA, Dehm SM. Androgen receptor splice variants mediate enzalutamide resistance in castration-resistant prostate cancer cell lines. *Cancer Res.* 2013;73(2):483-489.
2. Ware KE, Garcia-Blanco MA, Armstrong AJ, Dehm SM. Biologic and clinical significance of androgen receptor variants in castration resistant prostate cancer. *Endocr Relat Cancer.* 2014;21(4):T87-T103.
3. Antonarakis ES, Lu C, Luber B, et al. Androgen Receptor Splice Variant 7 and Efficacy of Taxane Chemotherapy in Patients With Metastatic Castration-Resistant Prostate Cancer. *JAMA Oncol.* 2015;1(5):582-591.

4. Antonarakis ES, Lu C, Wang H, et al. AR-V7 and resistance to enzalutamide and abiraterone in prostate cancer. *N Engl J Med*. 2014;371(11):1028-1038.
5. Onstenk W, Sieuwerts AM, Kraan J, et al. Efficacy of Cabazitaxel in Castration-resistant Prostate Cancer Is Independent of the Presence of AR-V7 in Circulating Tumor Cells. *Eur Urol*. 2015;68(6):939-945.
6. Nakazawa M, Lu C, Chen Y, et al. Serial blood-based analysis of AR-V7 in men with advanced prostate cancer. *Ann Oncol*. 2015;26(9):1859-1865.
7. NCCN Clinical Practice Guidelines in Oncology- Prostate Cancer Version 2.2017
8. Welti J, Rodrigues DN, Sharp A, Sun S, Lorente D, Riisnaes R, et al. Analytical Validation and Clinical Qualification of a New Immunohistochemical Assay for Androgen Receptor Splice Variant-7 Protein Expression in Metastatic Castration-resistant Prostate Cancer. *European urology*. 2016.
9. Scher HI, Graf RP, Schreiber NA, McLaughlin B, Lu D, Louw J, Danila DC, Dugan L, Johnson A, Heller G, Fleisher M. Nuclear-specific AR-V7 protein localization is necessary to guide treatment selection in metastatic castration-resistant prostate cancer. *European urology*. 2017 Jun 30;71(6):874-82.
10. Scher HI, Lu D, Schreiber NA, et al. Association of AR-V7 on Circulating Tumor Cells as a Treatment-Specific Biomarker With Outcomes and Survival in Castration-Resistant Prostate Cancer. *JAMA Oncol*. 2016;2(11):1441-1449.

---

## Revision History Information

N/A

---

## Associated Documents

### Attachments

N/A

### Related Local Coverage Documents

Article(s)

A56257 - Response to Comments: MoIDX: Oncotype DX AR-V7 Nucleus Detect for Men with Metastatic Castrate Resistant Prostate Cancer (MCRPC)

LCD(s)

DL37744 - MoIDX: Oncotype DX AR-V7 Nucleus Detect for Men with Metastatic Castrate Resistant Prostate Cancer (MCRPC)

### Related National Coverage Documents

N/A

### Public Version(s)

Updated on 01/03/2019 with effective dates 03/02/2019 - N/A

---

## Keywords

- Oncotype
- DX
- AR-V7
- Nucleus

- MoIDX
- prostate
- CTC
- 81479