Quarterly HOTLINE: Effective August 21, 2017

MEDICARE COVERAGE OF LABORATORY TESTING

Please remember when ordering laboratory tests that are billed to Medicare/Medicaid or other federally funded programs, the following requirements apply:

1. Only tests that are medically necessary for the diagnosis or treatment of the patient should be ordered. Medicare does not pay for screening tests except for certain specifically approved procedures and may not pay for non-FDA approved tests or those tests considered experimental.
2. If there is reason to believe that Medicare will not pay for a test, the patient should be informed. The patient should then sign an Advance Beneficiary Notice (ABN) to indicate that he or she is responsible for the cost of the test if Medicare denies payment.
3. The ordering physician must provide an ICD-10 diagnosis code or narrative description, if required by the fiscal intermediary or carrier.
4. Organ- or disease-related panels should be billed only when all components of the panel are medically necessary.
5. Both ARUP- and client-customized panels should be billed to Medicare only when every component of the customized panel is medically necessary.
6. Medicare National Limitation Amounts for CPT codes are available through the Centers for Medicare & Medicaid Services (CMS) or its intermediaries. Medicaid reimbursement will be equal to or less than the amount of Medicare reimbursement.

The CPT Code(s) for test(s) profiled in this bulletin are for informational purposes only. The codes reflect our interpretation of CPT coding requirements, based upon AMA guidelines published annually. CPT codes are provided only as guidance to assist you in billing. ARUP strongly recommends that clients reconfirm CPT code information with their local intermediary or carrier. CPT coding is the sole responsibility of the billing party.

The regulations described above are only guidelines. Additional procedures may be required by your fiscal intermediary or carrier.

Hotline Page #	Test Number	Summary of Changes by Test Name	Name Change	Methodology	Performed/Reported Schedule	Specimen Requirements	Reference Interval	Interpretive Data	Note	CPT Code	Component Change	Other Interface Change	New Test	Inactive
6	2014521	Acetaminophen Quantitative, Urine											x	
7	0090005	Acetone, Quantitative			x	x								
7	0090131	Alcohols			x	x								
7	0070016	Aldosterone 30 Minute				x			x					
7	0070017	Aldosterone 60 Minute				x			x					
8	2002582	Aldosterone and Renin, Direct with Ratio				x			x					
8	0070015	Aldosterone, Serum				x			x					
8	0070073	Aldosterone/Renin Activity Ratio				x			x					

Hotline Page #	Test Number	Summary of Changes by Test Name	Name Change	Methodology	Performed/Reported Schedule	Specimen Requirements	Reference Interval	Interpretive Data	Note	CPT Code	Component Change	Other Interface Change	New Test	Inactive
8	2008601	Allergen, Fungi and Molds, *Aspergillus fumigatus* IgG				x								
9	2014513	Alpha/Beta Double-Negative T-Cells for Autoimmune Lymphoproliferative Syndrome											x	
10	2014507	Alpha Fetoprotein, Body Fluid											x	
10	2013034	Alpha Subunit, Free, Pituitary Glycoprotein Hormones (PGH)	x											
10	0050005	Alpha-2-Macroglobulin				x								
39	0080276	Amniotic Bilirubin Scan												x
10	0050392	Ankylosing Spondylitis (HLA-B27) Genotyping			x	x								
11	2014277	Antimicrobial Susceptibility – Carbapenemase Gene Detection by PCR											x	
12	2014499	ATRX by Immunohistochemistry											x	
39	0095505	Autoimmune Lymphoproliferative Profile												x
12	2008665	*Babesia* Species by PCR								x				
12	2008420	*BCR-ABL1* Mutation Analysis for Tyrosine Kinase Inhibitor Resistance by Next Generation Sequencing								x				
12	0065080	*Bordetella pertussis*/*parapertussis* by PCR								x				
13	2014493	Bupivacaine Quantitative, Serum or Plasma											x	
13	0095200	*Candida albicans* Antibodies IgA, IgG, and IgM by ELISA					x							
13	0051769	*Candida albicans* IgA Antibody by ELISA					x							
13	0051770	*Candida albicans* IgG Antibody by ELISA					x							
14	0051771	*Candida albicans* IgM Antibody by ELISA					x							
14	2013798	*Candida* Species by PCR								x				
14	2013784	*Candida* Species by PCR with Reflex to *FKS* Drug Resistance by Sequencing								x				
14	2010179	CD4+ T-Cell Recent Thymic Emigrants (RTEs)				x								
14	2012151	Charcot-Marie-Tooth (CMT) and Related Hereditary Neuropathies Panel Sequencing								x				
15	2014505	Chromium, RBC											x	
15	2011157	Cobalamin/Propionate/Homocysteine Metabolism Related Disorders Panel, Sequencing (25 Genes) and Deletion/Duplication (24 Genes)								x				
15	0025032	Cobalt, Urine					x							
39	0051232	Cytochrome P450 2D6 (CYP2D6) 14 Variants and Gene Duplication												x
16	2014547	Cytochrome P450 2D6 (*CYP2D6*) 15 Variants and Gene Duplication											x	

Hotline Page #	Test Number	Summary of Changes by Test Name	Name Change	Methodology	Performed/Reported Schedule	Specimen Requirements	Reference Interval	Interpretive Data	Note	CPT Code	Component Change	Other Interface Change	New Test	Inactive
18	2013098	Cytochrome P450 Genotype Panel						x						
19	2013294	Dengue Virus (1-4) Subtype by PCR								x				
19	2011153	Duchenne/Becker Muscular Dystrophy (*DMD*) Sequencing								x				
19	2007862	*Ehrlichia* and *Anaplasma* Species by Real-Time PCR								x				
20	0090120	Ethanol, Serum or Plasma - Medical			x	x								
20	2008803	Expanded Hearing Loss Panel, Sequencing (56 Genes) and Deletion/Duplication (53 Genes)								x				
39	0020149	Gastric Analysis												x
20	2013449	Gastrointestinal Hereditary Cancer Panel, Sequencing and Deletion/Duplication, 16 Genes								x				
20	2011660	Gastrointestinal Parasite and Microsporidia by PCR								x				
20	2014459	Gaucher Disease (GBA), Enzyme Activity in Leukocytes											x	
21	2014285	Hepatitis B Virus (HBV) Perinatal Exposure Follow-up by CIA, Panel											x	
21	0020090	Hepatitis B Virus Surface Antibody						x						
22	2014598	Hepatitis C Virus (HCV) Genotype with Reflex to HCV NS5A Drug Resistance by Sequencing											x	
22	2010784	Hepatitis C Virus Antibody by CIA with Reflex to HCV by Quantitative PCR			x									
22	2012052	Hereditary Hemolytic Anemia Sequencing, 28 Genes								x				
22	2009337	Hereditary Hemorrhagic Telangiectasia (HHT) Panel, Sequencing and Deletion/Duplication, 5 Genes								x				
22	2011148	Herpes Simplex Virus (HSV) by PCR with Reflex to HSV (HSV-1/HSV-2) Subtype by PCR								x				
22	2010095	Herpes Simplex Virus (HSV-1/HSV-2) Subtype by PCR								x				
23	2008125	Hexosaminidase A Percent and Total Hexosaminidase in Leukocytes			x									
23	2008121	Hexosaminidase A Percent and Total Hexosaminidase, Plasma or Serum			x									
23	2007578	High Molecular Weight Kininogen (HMWK), Activity	x											
23	2008848	Holoprosencephaly Panel, Nonsyndromic, Sequencing and Deletion/Duplication, 11 Genes								x				
39	0080413	Homocystine Quantitative, Urine												x
39	2012175	*HRAS* Mutation Detection by Pyrosequencing												x

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39	0065999	Human Papillomavirus (HPV), High Risk by Hybrid Capture, Cervical Brush												x
39	2008404	Human Papillomavirus (HPV), High Risk by Hybrid Capture, ThinPrep												x
23	0040227	*IGHV* Mutation Analysis by Sequencing (Pricing Change Only)												
39	0080403	Indicans, Urine Qualitative												x
23	0070022	Insulin, Other				x								
23	2013599	Insulin-Like Growth Factor 2 (IGF-2)	x											
23	0098843	Insulin-Like Growth Factor Binding Protein 1 (IGFBP-1)	x		x									
23	0098842	Insulin-Like Growth Factor Binding Protein 2 (IGFBP-2)	x		x									
23	0070060	Insulin-Like Growth Factor Binding Protein 3 (IGFBP-3)	x											
24	0090144	Isopropanol (Includes Acetone)			x	x								
39	0080301	Leucine Aminopeptidase (LAP), Serum												x
39	0080467	Lipid Associated Sialic Acid												x
24	2013716	LipoFit by NMR											x	
25	2013715	LipoFit by NMR, Particle Count Only											x	
39	2012186	LipoProfile by Nuclear Magnetic Resonance (NMR)												x
39	2012200	LipoProfile by Nuclear Magnetic Resonance (NMR), Particle Analysis Only												x
25	0030181	Lupus Anticoagulant Reflexive Panel					x							
25	2004963	Malaria Detection and Speciation, Qualitative by Real-Time PCR								x				
26	0025070	Manganese, Urine					x	x				x		
26	0050375	Measles (Rubeola) Antibodies, IgG and IgM				x								
39	0020226	Melanin, Urine												x
26	0090165	Methanol			x	x								
26	2011626	Microsporidia by PCR								x				
27	2014510	Molybdenum Quantitative, Urine											x	
27	2012182	Myeloid Malignancies Somatic Mutation and Copy Number Analysis Panel								x				
27	0055506	Neutrophil-Associated Antibodies				x		x	x					
28	0025045	Nickel, Urine					x	x				x		
28	2007537	Non-Invasive Prenatal Testing for Fetal Aneuploidy								x				

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28	2010232	Non-Invasive Prenatal Testing for Fetal Aneuploidy (Panorama) with Microdeletions								x				
28	2013142	Non-Invasive Prenatal Testing for Fetal Aneuploidy with 22q11.2 Microdeletion (Panorama)								x				
39	0051281	Norovirus Group 1 and 2 by PCR												x
29	2014546	Norovirus, Groups 1 and 2 by PCR											x	
29	0049250	p53 with Interpretation by Immunohistochemistry									x			
30	2007479	Pain Management Drug Panel by High-Resolution Time-of-Flight or Tandem Mass Spectrometry and Enzyme Immunoassay, Urine	x	x			x	x						
31	2009288	Pain Management Drug Screen with Interpretation by High-Resolution Time-of-Flight or Tandem Mass Spectrometry and Enzyme Immunoassay, Urine	x	x			x	x						
39	2012603	*PAX8-PPARG* Translocations Detection by PCR												x
31	2007370	Periodic Fever Syndromes Panel, Sequencing (7 Genes) and Deletion/Duplication, (6 Genes)								x				
39	2004510	PIK3CA Mutation												x
39	2008103	Pipecolic Acid, CSF												x
39	0051718	Platelet Antibodies, Indirect with Reflex to Identification												x
32	2014463	Pompe Disease (GAA), Enzyme Activity in Leukocytes											x	
32	2011156	Primary Antibody Deficiency Panel, Sequencing (35 Genes) and Deletion/Duplication (26 Genes)								x				
33	2014318	Prolonged Clot Time Reflex Panel											x	
35	0056060	Prothrombin *(F2)* c.*97G>A (G20210A) Pathogenic Variant	x				x	x						
35	2009345	Pulmonary Arterial Hypertension (PAH) Panel, Sequencing and Deletion/Duplication, Multigene								x				
36	2014523	Purines and Pyrimidines Panel, Urine											x	
36	2014351	Rabies Antibody Screen (RFFIT)											x	
36	0070105	Renin Activity				x			x					
37	2001575	Renin, Direct				x			x					
39	2012605	*RET-CCDC6* and *RET-NCOA4* (*RET-PTC1* and *RET-PTC3*) Translocations Detection by PCR												x
39	0050698	Reticulin Antibody, IgA with Reflex to Titer												x
37	0040131	RNA Extraction and Storage											x	
37	0025067	Selenium, Urine					x							

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37	2012015	Skeletal Dysplasia Panel, Sequencing (39 Genes) and Deletion/Duplication (36 Genes)								x				
38	2012010	Skeletal Dysplasia Panel, Sequencing (39 Genes) and Deletion/Duplication (36 Genes), Fetal								x				
38	0070130	Testosterone, Adult Male				x								
39	0070132	Testosterone, Pooled Adult Male												x
38	0025019	Thallium, Urine					x							
38	0099610	Thallium, Whole Blood				x			x					
39	2012755	Thyroid Translocation and Mutation Panel												x
38	2008670	Tick-Borne Disease Panel by PCR, Blood								x				
38	2011172	Urogenital Ureaplasma and Mycoplasma Species by PCR								x				
39	2007384	Vascular Malformations Panel, Sequencing and Deletion/Duplication, 14 Genes								x				
39	2007136	von Willebrand Factor Collagen Binding								x				
39	2013701	Vulvovaginal *Candida* Species by PCR								x				
39	0020609	Xylose Absorption Test (Adult - 25g dose)												x
39	0020615	Xylose Absorption Test (Adult - 5g dose)												x
39	0020612	Xylose Absorption Test (Child)												x

New Test **2014521** **Acetaminophen Quantitative, Urine** **ACETA U**
Available Now

Methodology: Quantitative High Performance Liquid Chromatography
Performed: Varies
Reported: 3-10 days

Specimen Required: Collect: Random urine.
Specimen Preparation: Transfer 1 mL urine to an ARUP Standard Transport Tube. (Min: 0.24 mL)
Storage/Transport Temperature: Refrigerated. Also acceptable: Room temperature or frozen.
Stability (collection to initiation of testing): Ambient: 2 weeks; Refrigerated: 1 month; Frozen: 1 month

Reference Interval: By report

CPT Code(s): 80329 (Alt code: G0480)

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0090005 Acetone, Quantitative AC

Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Patient Prep: For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.
Collect: Plain Red. Also acceptable: Lavender (EDTA), Pink (K_2EDTA), Green (Sodium or Lithium Heparin), or Gray (Potassium Oxalate/Sodium Fluoride).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.2 mL) **Cap tube tightly to minimize alcohol loss.**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Whole blood. Plasma Separator Tubes (PST), Serum Separator Tubes (SST).
Stability (collection to initiation of testing): After separation from cells: Ambient: 5 days; Refrigerated: 1 week; Frozen: 1 month

0090131 Alcohols ALCT

Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Patient Prep: For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.
Collect: Plain Red. Also acceptable: Lavender (EDTA), Pink (K_2EDTA), or Gray (Potassium Oxalate/Sodium Fluoride).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL) **Cap tube tightly to minimize alcohol loss.**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Whole blood, Plasma Separator Tubes (PST), Serum Separator Tubes (SST).
Stability (collection to initiation of testing): After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

0070016 Aldosterone 30 Minute ALDO 30

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Serum Separator Tube (SST) or Plain Red.
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: EDTA plasma.
Stability (collection to initiation of testing): After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 1 month

Note: Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative aldosterone-renin ratio (ARR) results.

0070017 Aldosterone 60 Minute ALDO 60

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Serum Separator Tube (SST) or Plain Red
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: EDTA plasma.
Stability (collection to initiation of testing): After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 1 month

Note: Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative aldosterone-renin ratio (ARR) results.

2002582 Aldosterone and Renin, Direct with Ratio A/DR

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Serum Separator Tube (SST) **AND** Lavender (EDTA) or Pink (K_2EDTA). Do not collect in refrigerated tubes.
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection.
Serum: Transfer 1 mL serum to an ARUP Standard Transport Tube (Min: 0.5mL)
AND
Plasma: Transfer 2 mL EDTA plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 1 mL)
Storage/Transport Temperature: Both specimens should be submitted together for testing.
Serum: Frozen. Also acceptable: Refrigerated.
Plasma: CRITICAL FROZEN. Separate specimens must be submitted when additional tests are ordered.
Unacceptable Conditions: Plasma collected in citrate, heparin, or oxalate. Hemolyzed specimens.
Stability (collection to initiation of testing): **Serum:** Ambient: 8 hours; Refrigerated: 5 days; Frozen: 1 month
Plasma: Ambient: 4 hours; Refrigerated: Unacceptable; Frozen: 1 month

Note: Do not use this test for patients treated with Cathepsin B. Menstruating females and those taking estrogen containing medications may have lower renin direct concentrations, resulting in falsely high aldosterone-renin ratio (ARR). In these cases, order Aldosterone/Renin Activity Ratio (ARUP Test code 0070073). Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative ARR results.

0070015 Aldosterone, Serum ALDOST

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Serum Separator Tube (SST) or Plain Red.
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: EDTA plasma.
Stability (collection to initiation of testing): After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 1 month

Note: Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative aldosterone-renin ratio (ARR) results.

0070073 Aldosterone/Renin Activity Ratio A/RA

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing, or walking for at least 2 hours, and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Serum Separator Tube (SST) **AND** Lavender (EDTA) or Pink (K_2EDTA). Do not collect in refrigerated tubes.
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection.
Serum: Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
AND
Plasma: Transfer 2 mL EDTA plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 1.2 mL)
Storage/Transport Temperature: Both specimens should be submitted together for testing.
Serum: Frozen. Also acceptable: Refrigerated.
Plasma: CRITICAL FROZEN. Separate specimens must be submitted when additional tests are ordered.
Unacceptable Conditions: Plasma collected in citrate, heparin, or oxalate. Hemolyzed specimens.
Stability (collection to initiation of testing): **Serum:** Ambient: 8 hours; Refrigerated: 5 days; Frozen: 1 month
Plasma: Ambient: 6 hours; Refrigerated: Unacceptable; Frozen: 1 month

Note: Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative ARR results.

2008601 Allergen, Fungi and Molds, *Aspergillus fumigatus* IgG ASPER FUM

Specimen Required: Collect: Plain Red or Serum Separator Tube (SST).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum **plus** 0.1 mL for each additional allergen ordered to an ARUP Standard Transport Tube. (Min: 0.34 mL **plus** 0.04 mL for each allergen ordered)
Storage/Transport Temperature: Room temperature. Also acceptable: Refrigerated or frozen.
Unacceptable Conditions: Hemolyzed, icteric, or lipemic specimens.
Stability (collection to initiation of testing): Ambient: 1 week; Refrigerated: 1 month; Frozen: 1 year

New Test **2014513** **Alpha/Beta Double-Negative T-Cells for Autoimmune Lymphoproliferative Syndrome** **ALPS ABDNT**

Time Sensitive

Methodology: Quantitative Flow Cytometry
Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Collect: Green (Sodium or Lithium Heparin), Lavender (EDTA), or Pink (K_2EDTA).
Specimen Preparation: Transport 5 mL whole blood. (Min: 0.5 mL)
Storage/Transport Temperature: **CRITICAL ROOM TEMPERATURE.**
Remarks: Specimens must be analyzed within 48 hours of collection.
Unacceptable Conditions: Clotted or hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

Reference Interval: Reports include age appropriate reference intervals and interpretation.

Test Number	Components	Age: 2-18 years old	Age: 18-69 years old
	Absolute alpha/beta TCR+ DNT	0-46 (cells/uL)	0-32 (cells/uL)
	Absolute alpha/beta TCR+ DNT B220+	0-5 (cells/uL)	0-6 (cells/uL)
	% alpha/beta TCR+ DNT	0-3 (%CD3+)	0-2 (%CD3+)
	% alpha/beta TCR+ DNT B220+	0-0.3 (%CD3+)	0-0.4 (%CD3+)

Interpretive Data: The hallmark for a diagnosis of Autoimmune Lymphoproliferative Syndrome (ALPS) is an increased concentration of CD3+ T-cells negative for CD4 and CD8 (double-negative T-cells [DNT]) and positive for the alpha/beta T-cell receptor (TCR). B220 expression on alpha/beta TCR+DNT cells is a sensitive and specific marker for ALPS and is associated with mutations in the *FAS* gene.

Abnormal results should be correlated with clinical history and confirmed by additional testing for defective in vitro lymphocyte apoptosis and for mutations in the *FAS* gene.

See Compliance Statement A: www.aruplab.com/CS

CPT Code(s): 86356 x4

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

New Test **2014507** **Alpha Fetoprotein, Body Fluid** **AFP FL**

Methodology: Quantitative Chemiluminescent Immunoassay
Performed: Sun-Sat
Reported: Within 24 hours

Specimen Required: Collect: Pericardial, Peritoneal, or Pleural fluid.
Specimen Preparation: Centrifuge to remove cellular material. Transfer 1 mL body fluid to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Storage/Transport Temperature: Refrigerated.
Remarks: Specimen source required.
Unacceptable Conditions: Specimen types other than those listed. Specimens too viscous to be aspirated by instrument.
Stability (collection to initiation of testing): Ambient: 24 hours; Refrigerated: 1 week; Frozen: 1 year

Interpretive Data: This assay uses the Beckman Coulter Access DxI AFP methodology. Results obtained with different assay methods or kits cannot be used interchangeably. The AFP assay value, regardless of level, should not be interpreted as evidence for the presence or absence of malignant disease.

For information on body fluid reference ranges and/or interpretive guidance visit http://aruplab.com/bodyfluids/

See Compliance Statement B: www.aruplab.com/CS

Note: For cerebral spinal fluid, refer to Alpha Fetoprotein, CSF (ARUP test code 0020729).

CPT Code(s): 86316

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2013034 **Alpha Subunit, Free, Pituitary Glycoprotein Hormones (PGH)** **A SUB PGH**

HOTLINE NOTE: Name change only.

0050005 **Alpha-2-Macroglobulin** **A2M**

Specimen Required: Collect: Serum Separator Tube (SST).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.4 mL)
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: CSF. Hemolyzed specimens.
Stability (collection to initiation of testing): After separation from cells: Ambient: 8 hours; Refrigerated: 8 days; Frozen: 1 year (if frozen within 24 hours, avoid repeated freeze/thaw cycles)

0050392 **Ankylosing Spondylitis (HLA-B27) Genotyping** **HLAB27 PCR**

Performed: Sun-Sat
Reported: 3-7 days

Specimen Required: Collect: Lavender (EDTA), Pink (K_2EDTA), or Yellow (ACD Solution A or B).
Specimen Preparation: Do not freeze. Transport 3 mL whole blood. (Min: 1 mL)
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Plasma or serum; collection of specimen in sodium heparin tubes.
Stability (collection to initiation of testing): Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

New Test **2014277** **Antimicrobial Susceptibility – Carbapenemase Gene Detection by PCR** **CARBAR PCR**

Available Now

Methodology: Qualitative Polymerase Chain Reaction
Performed: Sun-Sat
Reported: 1-4 days

Specimen Required: Collect: Actively growing Enterobacteriaceae, *Pseudomonas aeruginosa*, or *Acinetobacter baumannii* in pure culture.
Specimen Preparation: Transport sealed container with pure culture on agar slant/bacterial transport media. Place each specimen in an individually sealed bag.
Storage/Transport Temperature: Room temperature.
Remarks: Isolate identification (for cultures) and specimen source required.
Unacceptable Conditions: Mixed cultures or non-viable organisms.
Stability (collection to initiation of testing): Ambient: 1 week; Refrigerated: 1 week; Frozen: Unacceptable

Reference Interval: Not Detected

Interpretive Data: This assay detects five carbapenemase gene families (*blaKPC, blaNDM, blaOXA-48, blaVIM, blaIMP*) encoding enzymes that may confer resistance to carbapenem and other beta-lactam antibiotics. This assay is intended for use as an aid to infection control in the detection of carbapenem-resistant bacteria and is not intended to guide or monitor treatment of infection. A negative result does not exclude the presence of other resistance mechanisms or assay-specific nucleic acid in concentrations below the level of detection.

Note: An additional processing fee will be billed for all isolates not submitted in pure culture, as indicated in the specimen requirements.

If species identification is not provided, identification will be performed at ARUP. Additional charges apply.

This assay will generate a negative IMP result when testing samples containing IMP-7, IMP-13 or IMP-14 gene sequences, and may detect IMP-4 at reduced sensitivity. False negative results may be encountered in rectal specimens with *Pseudomonas aeruginosa* containing the *blaVIM* gene and with *Acinetobacter baumanii* containing *blaIMP* gene.

CPT Code(s): 87150

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

New Test Available Now | **2014499** | **ATRX by Immunohistochemistry** | **ATRX IHC**

Methodology: Immunohistochemistry
Performed: Mon-Fri
Reported: 1-3 days

Specimen Required: Collect: Tissue.
Specimen Preparation: Formalin fix (10 percent neutral buffered formalin) and paraffin embed specimen (cells must be prepared into a cellblock). Protect paraffin block and/or slides from excessive heat. Transport tissue block or 5 unstained (3- to 5-micron thick sections), positively charged slides in a tissue transport kit (recommended but not required), (ARUP supply #47808) available online through eSupply using ARUP Connect or contact ARUP Client Services at (800) 522-2787. (Min: 2 slides) If sending precut slides, do not oven bake.
Storage/Transport Temperature: Room temperature. Also acceptable: Refrigerated. Ship in cooled container during summer months.
Unacceptable Conditions: Specimens submitted with non-representative tissue type. Depleted specimens.
Stability (collection to initiation of testing): Ambient: Indefinitely, Refrigerated: Indefinitely, Frozen: Unacceptable

Interpretive Data: See Compliance Statement B: www.aruplab.com/CS

Note: All stains will be handled as "Stain and Return" unless a consultation is requested. To request a consultation, submit the pathology report, all associated case materials (clinical history, blocks, slides, etc.), and the Anatomic Pathology requisition form (#32960) in place of the Immunohistochemistry Stain Form.

CPT Code(s): 88342

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2008665 | ***Babesia* Species by PCR** | **BABPCR**

CPT Code(s): 87798

2008420 | ***BCR-ABL1* Mutation Analysis for Tyrosine Kinase Inhibitor Resistance by Next Generation Sequencing** | **BCRABL NGS**

CPT Code(s): 81479

0065080 | ***Bordetella pertussis/parapertussis* by PCR** | **BORD PCR**

CPT Code(s): 87798

New Test Available Now — 2014493 Bupivacaine Quantitative, Serum or Plasma — BUPIVAC SP

Methodology: Quantitative Gas Chromatography
Performed: Varies
Reported: 3-10 days

Specimen Required: Collect: Plain Red, Lavender (EDTA), or Pink (K_2EDTA).
Specimen Preparation: Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.4 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: Separator tubes.
Stability (collection to initiation of testing): Ambient: Undefined; Refrigerated: Undefined; Frozen: 6 months

Reference Interval: By report

CPT Code(s): 80375 (Alt code: G0480)

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0095200 *Candida albicans* Antibodies IgA, IgG, and IgM by ELISA — CANDIDA AB

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval	
0051770	*Candida albicans* IgG Antibody by ELISA	0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
		0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
		1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.
0051771	*Candida albicans* IgM Antibody by ELISA	0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
		0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
		1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.
0051769	*Candida albicans* IgA Antibody by ELISA	0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
		0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
		1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.

0051769 *Candida albicans* IgA Antibody by ELISA — CANDI IGA

Reference Interval:
Effective August 21, 2017

0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.

0051770 *Candida albicans* IgG Antibody by ELISA — CANDI IGG

Reference Interval:
Effective August 21, 2017

0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.

0051771 ***Candida albicans* IgM Antibody by ELISA** **CANDI IGM**

Reference Interval:
Effective August 21, 2017

0.88 EV or less	Negative - No significant level of detectable *Candida albicans* antibody.
0.89-0.99 EV	Equivocal - Questionable presence of antibodies. Repeat testing in 10-14 days may be helpful.
1.00 EV or greater	Positive - Antibody to *Candida albicans* detected, which may indicate a current or past infection.

2013798 ***Candida* Species by PCR** **CANDPCR**

CPT Code(s): 87481

2013784 ***Candida* Species by PCR with Reflex to *FKS* Drug Resistance by Sequencing** **CAND RFX**

CPT Code(s): 87481 ; if reflexed, add 87900

2010179 **CD4+ T-Cell Recent Thymic Emigrants (RTEs)** **CD4 RTE**

Specimen Required: Collect: Lavender (EDTA) or Green (Sodium or Lithium Heparin).
New York State Clients: Lavender (EDTA).
Specimen Preparation: Transport 4 mL whole blood. (Min: 0.5 mL)
New York State Clients: Transport 3 mL whole blood in the original collection tube. (Min: 1.5 mL) Do not send to ARUP Laboratories. Specimen must be received at performing laboratory within 48 hours of collection. For specimen requirements and direct submission instructions please contact ARUP Referral Testing at (800) 242-2787, ext. 5145.
Storage/Transport Temperature: Refrigerated. Also acceptable: Room temperature.
New York State Clients: Room temperature.
Remarks: Specimens must be analyzed within 72 hours of collection.
New York State Clients: Specimens must be analyzed within 48 hours of collection.
Unacceptable Conditions: Cord blood. Specimens older than 72 hours. Clotted or hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: 72 hours; Refrigerated: 72 hours; Frozen: Unacceptable
New York State Clients: Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

2012151 **Charcot-Marie-Tooth (CMT) and Related Hereditary Neuropathies Panel Sequencing** **CMT SEQ**

CPT Code(s): 81479

New Test Available Now **2014505** **Chromium, RBC** **CR RBC**

Methodology: Inductively Coupled Plasma-Mass Spectrometry
Performed: Varies
Reported: 3-10 days

Specimen Required: Collect: Royal Blue (K_2EDTA).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transport 1 mL RBCs in the original collection tube. (Min: 0.4 mL)
Storage/Transport Temperature: Refrigerated. Also acceptable: Room temperature.
Stability (collection to initiation of testing): Ambient: 1 month; Refrigerated: 1 month; Frozen: Unacceptable

Reference Interval: By report

CPT Code(s): 82495

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2011157 **Cobalamin/Propionate/Homocysteine Metabolism Related Disorders Panel, Sequencing (25 Genes) and Deletion/Duplication (24 Genes)** **VB12 PANEL**

CPT Code(s): 81479

0025032 **Cobalt, Urine** **COBALT U**

Reference Interval:

Test Number	Components	Reference Interval		
	Cobalt, Urine - per volume	Effective August 21, 2017 0.0-1.2 µg/L		
	Cobalt, Urine - per 24h	Effective August 21, 2017 0.0-4.4 µg/d		
0020473	Creatinine, 24-Hour Urine	**Age**	**Male**	**Female**
		3-8 years	140-700 mg/d	140-700 mg/d
		9-12 years	300-1300 mg/d	300-1300 mg/d
		13-17 years	500-2300 mg/d	400-1600 mg/d
		18-50 years	1000-2500 mg/d	700-1600 mg/d
		51-80 years	800-2100 mg/d	500-1400 mg/d
		81 years and older	600-2000 mg/d	400-1300 mg/d
	Cobalt, Urine - ratio to CRT	Effective August 21, 2017 0.0-4.2 (µg/g CRT)		

New Test 2014547 **Cytochrome P450 2D6 (*CYP2D6*) 15 Variants and Gene Duplication** **CYP2D6**

Additional Technical Information

Supplemental Resources

Methodology: Polymerase Chain Reaction/Fluorescence Monitoring
Performed: Varies
Reported: 5-10 days

Specimen Required: Collect: **Whole Blood:** Lavender (EDTA), Pink (K_2EDTA), or Yellow (ACD Solution A or B).
Saliva: Collection Device by Spectrum Solutions, LLC (SS-SAL-1, ARUP Supply #52535) available online through eSupply using ARUP Connect™ or by contacting ARUP Client Services at (800) 522-2787.
Specimen Preparation: Transport 3 mL whole blood. (Min: 1 mL) OR Saliva Collection Device.
Storage/Transport Temperature: **Whole Blood:** Refrigerated.
Saliva: Room temperature.
Unacceptable Conditions: Plasma or serum. Specimens collected in sodium heparin or lithium heparin.
Stability (collection to initiation of testing): **Whole Blood:** Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month
Saliva: Ambient: 2 weeks; Refrigerated: Unacceptable; Frozen: Unacceptable

Reference Interval: By report

Interpretive Data:
Background Information for Cytochrome P450 2D6 (*CYP2D6*) 15 Variants and Gene Duplication:
Characteristics: The cytochrome P450 (CYP) isozyme 2D6 is involved in the metabolism of many drugs, such as antiestrogens (tamoxifen), alpha-blockers, analgesics, anticonvulsives, antidepressants, antidiabetics, antihypertensives, antipsychotics, antitussives, beta blockers, cardioactives, norepinephrine reuptake inhibitors, and stimulants. Variants of *CYP2D6* will influence pharmacokinetics of CYP2D6 substrates, and may predict non-standard dose requirements.
Inheritance: Autosomal co-dominant.
Cause: *CYP2D6* gene variants and copy number result in increased, decreased or complete deficiency in enzyme activity.
Variants Tested: (Variants are numbered according to M33388 sequence.)
Functional: *2 (2850C>T), *2A (-1584C>G; 2850C>T).
Decreased function: *9 (2613-5delAGA), *10 (100C>T), *17 (1023C>T; 2850C>T), *29 (1659G>A; 2850C>T) *41 (2988G>A; 2850C>T).
Non-functional: *3 (2549delA), *4 (100C>T; 1846G>A), *5 (gene deletion),*6 (1707delT), *7 (2935A>C), *8 (1758G>T; 2850C>T), *12 (124G>A; 2850C>T), *14 (1758G>A; 2850C>T), *36 (a *10 carrying a CYP2D7-derived exon 9 conversion).
Increased function: Duplicated functional alleles.
Negative: No variants detected is predictive of *1 functional alleles and normal enzymatic activity.
Allele frequencies:
*CYP2D6*2* or *CYP2D6*2A*: African-17.6 percent, Asian-21.2 percent, Caucasian-27.6 percent, Middle Eastern-21.7 percent, Oceanian-1.2 percent
*CYP2D6*3*: African-0.2 percent, Asian-0 percent, Caucasian-1.3 percent, Middle Eastern-0.1 percent, Oceanian-0.2 percent
*CYP2D6*4*: African-4.9 percent, Asian-4.6 percent, Caucasian-18.2 percent, Middle Eastern-7.8 percent, Oceanian-2.5 percent
*CYP2D6*5*: African-6.3 percent, Asian-4.3 percent, Caucasian-2.8 percent, Middle Eastern-2.3 percent, Oceanian-4.3 percent
*CYP2D6*6*: African-0.1 percent, Asian-0 percent, Caucasian-1.0 percent, Middle Eastern-0.6 percent, Oceanian-0 percent
*CYP2D6*7*: African-0 percent, Asian-0 percent, Caucasian-0.1 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*8*: African-0 percent, Asian-0 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*9*: African-0.3 percent, Asian-0.5 percent, Caucasian-2.1 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*10*: African-5.3 percent, Asian-30.2 percent, Caucasian-3.0 percent, Middle Eastern-3.5 percent, Oceanian- 2.5 percent
*CYP2D6*12:* African-0 percent, Asian-0 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*14*: African-0.1 percent, Asian-0.4 percent, Caucasian-0 percent, Middle Eastern-0.2 percent, Oceanian-0 percent
*CYP2D6*17*: African-19.0 percent, Asian-0.1 percent, Caucasian-0.4 percent, Middle Eastern-1.6 percent, Oceanian-0.1 percent
*CYP2D6*29*: African-7.7 percent, Asian-0 percent, Caucasian-0.1 percent, Middle Eastern-0.8 percent, Oceanian-0 percent
*CYP2D6*36*: African-0.3 percent, Asian-0.7 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*41*: African-9.2 percent, Asian-4.9 percent, Caucasian-7.9 percent, Middle Eastern-19.9 percent, Oceanian-0.9 percent
CYP2D6xN (gene duplication): African-4.7 percent, Asian-1.6 percent, Caucasian-2.6 percent, Middle Eastern-7.1 percent, Oceanian-11.8
Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted *CYP2D6* variants will be detected by this panel. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with CYP2D6 substrates may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

See Compliance Statement C: www.aruplab.com/CS

CPT Code(s): 81226

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2013098 **Cytochrome P450 Genotype Panel** **CYP PAN**

Interpretive Data:
Background Information for Cytochrome P450 2D6 (*CYP2D6*) 15 Variants and Gene Duplication:
Characteristics: The cytochrome P450 (CYP) isozyme 2D6 is involved in the metabolism of many drugs, such as antiestrogens (tamoxifen), alpha-blockers, analgesics, anticonvulsives, antidepressants, antidiabetics, antihypertensives, antipsychotics, antitussives, beta blockers, cardioactives, norepinephrine reuptake inhibitors, and stimulants. Variants of *CYP2D6* will influence pharmacokinetics of CYP2D6 substrates, and may predict non-standard dose requirements.
Inheritance: Autosomal co-dominant.
Cause: *CYP2D6* gene variants and copy number result in increased, decreased or complete deficiency in enzyme activity.
Variants Tested: (Variants are numbered according to M33388 sequence.)
Functional: *2 (2850C>T), *2A (-1584C>G; 2850C>T).
Decreased function: *9 (2613-5delAGA), *10 (100C>T), *17 (1023C>T; 2850C>T), *29 (1659G>A; 2850C>T) *41 (2988G>A; 2850C>T).
Non-functional: *3 (2549delA), *4 (100C>T; 1846G>A), *5 (gene deletion),*6 (1707delT), *7 (2935A>C), *8 (1758G>T; 2850C>T), *12 (124G>A; 2850C>T), *14 (1758G>A; 2850C>T), *36 (a *10 carrying a CYP2D7-derived exon 9 conversion).
Increased function: Duplicated functional alleles.
Negative: No variants detected is predictive of *1 functional alleles and normal enzymatic activity.
Allele frequencies:
*CYP2D6*2* or *CYP2D6*2A*: African-17.6 percent, Asian-21.2 percent, Caucasian-27.6 percent, Middle Eastern-21.7 percent, Oceanian-1.2 percent
*CYP2D6*3*: African-0.2 percent, Asian-0 percent, Caucasian-1.3 percent, Middle Eastern-0.1 percent, Oceanian-0.2 percent
*CYP2D6*4*: African-4.9 percent, Asian-4.6 percent, Caucasian-18.2 percent, Middle Eastern-7.8 percent, Oceanian-2.5 percent
*CYP2D6*5*: African-6.3 percent, Asian-4.3 percent, Caucasian-2.8 percent, Middle Eastern-2.3 percent, Oceanian-4.3 percent
*CYP2D6*6*: African-0.1 percent, Asian-0 percent, Caucasian-1.0 percent, Middle Eastern-0.6 percent, Oceanian-0 percent
*CYP2D6*7*: African-0 percent, Asian-0 percent, Caucasian-0.1 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*8*: African-0 percent, Asian-0 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*9*: African-0.3 percent, Asian-0.5 percent, Caucasian-2.1 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*10*: African-5.3 percent, Asian-30.2 percent, Caucasian-3.0 percent, Middle Eastern-3.5 percent, Oceanian- 2.5 percent
*CYP2D6*12:* African-0 percent, Asian-0 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*14*: African-0.1 percent, Asian-0.4 percent, Caucasian-0 percent, Middle Eastern-0.2 percent, Oceanian-0 percent
*CYP2D6*17*: African-19.0 percent, Asian-0.1 percent, Caucasian-0.4 percent, Middle Eastern-1.6 percent, Oceanian-0.1 percent
*CYP2D6*29*: African-7.7 percent, Asian-0 percent, Caucasian-0.1 percent, Middle Eastern-0.8 percent, Oceanian-0 percent
*CYP2D6*36*: African-0.3 percent, Asian-0.7 percent, Caucasian-0 percent, Middle Eastern-0 percent, Oceanian-0 percent
*CYP2D6*41*: African-9.2 percent, Asian-4.9 percent, Caucasian-7.9 percent, Middle Eastern-19.9 percent, Oceanian-0.9 percent
CYP2D6xN (gene duplication): African-4.7 percent, Asian-1.6 percent, Caucasian-2.6 percent, Middle Eastern-7.1 percent, Oceanian-11.8
Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted *CYP2D6* variants will be detected by this panel. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with CYP2D6 substrates may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

Background Information for Cytochrome P450 2C9, *CYP2C9*, 2 Variants:
Characteristics: The cytochrome P450 (CYP) isozyme 2C9 is involved in the metabolism of many drugs such as warfarin, phenytoin, tolbutamide, glipizide, ibuprofen, and phenobarbital. Variants of *CYP2C9* will influence pharmacokinetics of *CYP2C9* substrates, and may predict non-standard dose requirements.
Inheritance: Autosomal co-dominant.
Cause: *CYP2C9* gene variants result in decreased or complete deficiency in enzyme activity.
Variants Tested: (Variants are numbered according to NM_000771 transcript)
Decreased function: *2 (rs1799853, c.430C>T).
Non-functional: *3 (rs1057910, c.1075A>C).
Negative: No variants detected is predictive of *1 functional alleles and normal enzymatic activity.
Allele Frequencies:
CYP2C9 *2: Caucasians - 13 percent, Asians - less than 1 percent, African Americans - 3 percent.
CYP2C9 *3: Caucasians - 7 percent, Asians - 4 percent, African Americans - 2 percent.
Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted *CYP2C9* variants will be detected by this panel. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with *CYP2C9* substrates may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

Background Information for Cytochrome P450 2C19, *CYP2C19*, 9 Variants:
Characteristics: The cytochrome P450 (CYP) isozyme 2C19 is involved in the metabolism of many drugs such as clopidogrel, phenytoin, diazepam, R-warfarin, tamoxifen, some antidepressants, proton pump inhibitors, and antimalarials. Variants of *CYP2C19* will influence pharmacokinetics of *CYP2C19* substrates, and may predict non-standard dose requirements.
Inheritance: Autosomal co-dominant.
Cause: *CYP2C19* gene variants result in increased, decreased, or complete deficiency in enzyme activity.
Variants Tested: (Variants are numbered according to NM_000769 transcript).
Decreased function: *9 (rs17884712, c.431G>A); *10 (rs6413438, c.680C>T).

Non-functional: *2 (rs4244285, c.681G>A), *3 (rs4986893, c.636G>A), *4 (rs28399504, c.1A>G), *6 (rs72552267, c.395G>A), *7 (rs72558186, c.819+2T>A), *8 (rs41291556, c.358T>C).
Increased function: *17 (rs12248560, c.-806C>T).
Negative: No variants detected is predictive of *1 functional alleles and normal enzymatic activity.
Allele frequencies:
*CYP2C19**2: African American - 18.3 percent, Caucasian - 14.6 percent, Middle Eastern - 13.2 percent, Oceanian - 54.9 percent, South Asian - 34.4 percent.
*CYP2C19**3: African American - 0.3 percent, Caucasian - 0.6 percent, Middle Eastern - 2.6 percent, Oceanian - 13.9 percent, East Asian - 8.5 percent.
*CYP2C19**17: African American - 19.4 percent, Caucasian - 21.5 percent, Oceanian - 2.5 percent, South Asian - 16.5 percent.
Other alleles are rare, with allele frequencies of less than 1 percent in all populations studied.
Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted *CYP2C19* variants will be detected by this panel. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with *CYP2C19* substrates may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

Background Information for Cytochrome P450 3A5 Genotyping, *CYP3A5*, 2 Variants:
Characteristics: The cytochrome P450 (CYP) 3A subfamily of enzymes is involved in metabolism of many drugs such as immunosuppressants, antibiotics, antivirals, benzodiazepines, and steroids. Nonfunctional variants of *CYP3A5* are common in some populations, preventing expression and function of the CYP3A5 enzyme, which will influence pharmacokinetics of *CYP3A5* substrates, and may predict non-standard dose requirements.
Inheritance: Autosomal co-dominant.
Cause: *CYP3A5* gene variants result in enzyme deficiency.
Variants Tested: *CYP3A5* non-functional alleles: *3 (rs776746, c.6986A>G), *6 (rs10264272, c.14690G>A).
Negative: No variants detected is predictive of *1 functional alleles and normal CYP3A5 enzyme activity. **(**Variants are numbered according to NG_007938.1 transcript)
Allele Frequencies:
*CYP3A5**3: African - 29.8 percent, Asian - 74.2 percent, Caucasian - 92.1 percent, Latin American - 76.5 percent, Middle Eastern - 88.1 percent.
*CYP3A5**6: African - 17.2 percent, Asian - 0.1 percent, Caucasian - 0.1 percent, Latin American - 3.7 percent, Middle Eastern - 1.9 percent.
*CYP3A5**7: African - 7.7 percent, Asian - 0 percent, Caucasian - 0 percent, Latin American - 2.5 percent, Middle Eastern - 0.2 percent.
Clinical Sensitivity: drug-dependent
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted *CYP3A5* variants will be detected by this panel. Diagnostic errors can occur due to rare sequence variations. Many *CYP3A* substrates are also metabolized by *CYP3A4*, for which clinically relevant genetic variation is not recognized to be common. Risk of therapeutic failure or adverse reactions with *CYP3A5* substrates may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

See Compliance Statement C: www.aruplab.com/CS

2013294 **Dengue Virus (1-4) Subtype by PCR** **DENGUEPCR**

CPT Code(s): 87798

2011153 **Duchenne/Becker Muscular Dystrophy (*DMD*) Sequencing** **DMD SEQ**

CPT Code(s): 81479

2007862 ***Ehrlichia* and *Anaplasma* Species by Real-Time PCR** **EHR ANAPCR**

CPT Code(s): 87798

0090120 **Ethanol, Serum or Plasma - Medical** **ETOH**

Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Patient Prep: For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.
Collect: Plain Red or Gray (Potassium Oxalate/Sodium Fluoride). Also acceptable: Lavender (EDTA) or Green (Sodium or Lithium Heparin).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL) **Cap tube tightly to minimize alcohol loss.**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Whole blood. Plasma Separator Tubes (PST), Serum Separator Tubes (SST).
Stability (collection to initiation of testing): After separation from cells: Ambient: 4 hours; Refrigerated: 1 week; Frozen: 6 months

2008803 **Expanded Hearing Loss Panel, Sequencing (56 Genes) and Deletion/Duplication (53 Genes)** **EHL PANEL**

CPT Code(s): 81479

2013449 **Gastrointestinal Hereditary Cancer Panel, Sequencing and Deletion/Duplication, 16 Genes** **GICAN PAN**

CPT Code(s): 81435; 81436

2011660 **Gastrointestinal Parasite and Microsporidia by PCR** **PARAMICPCR**

CPT Code(s): 87505; 87798

New Test
Available Now

2014459 **Gaucher Disease (GBA), Enzyme Activity in Leukocytes** **GBA ENZYME**

Methodology: Quantitative Fluorometry
Performed: Varies
Reported: 3-10 days

Specimen Required: Collect: Yellow (ACD), Lavender (K_2EDTA), Lavender (K_3EDTA), or Green (Sodium Heparin).
Specimen Preparation: Transport 3 mL whole blood. (Min: 1 mL)
Storage/Transport Temperature: Refrigerated
Remarks: Additional information is required: Clinical Indication for testing.
Unacceptable Conditions: Grossly hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: Unacceptable; Refrigerated: 3 days; Frozen: Unacceptable

Reference Interval: 4.6 – 12.0 nmol hydrolyzed/hr/mg protein

Interpretive Data: Refer to report.

CPT Code(s): 82657

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

New Test 2014285 Hepatitis B Virus (HBV) Perinatal Exposure Follow-up by CIA, Panel HBV PAN PN

Available Now

Methodology: Qualitative Chemiluminescent Immunoassay/Quantitative Chemiluminescent Immunoassay
Performed: Sun-Sat
Reported: Within 24 hours

Specimen Required: Collect: Serum Separator Tube (SST). Also acceptable: Lavender (EDTA) or Pink (K_2EDTA).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 3 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 1.5 mL)
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Heparinized plasma. Specimens containing particulate material. Heat-inactivated, severely hemolyzed or lipemic specimens.
Stability (collection to initiation of testing): After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: Indefinitely (avoid repeated freeze/thaw cycles)

Reference Interval:

Test Number	Components	Reference Interval		
0020090	Hepatitis B Virus Surface Antibody	Less than 10.00 IU/L	Negative	
		Greater than or equal to 10.00 IU/L	Positive	
0020089	Hepatitis B Virus Surface Antigen with Reflex to Confirmation	**Test Number**	**Components**	**Reference Interval**
			Hepatitis B Virus Surface Antigen	Negative
		0020128	Hepatitis B Virus Surface Antigen, Confirmation	Refer to report

Interpretive Data: This panel of assays should not be used for blood donor screening, associated re-entry protocols, or for screening Human Cell, Tissues and Cellular and Tissue-Based Products (HCT/P).

Note: Performed and Reported times indicated are for screening of Hepatitis B Surface Ag w/ Reflex to Conf and Hepatitis B Virus Surface Antibody. If results for Hepatitis B Surface Ag w/ Reflex to Conf screen is repeatedly reactive with an index value between 1.00 and 50.00, then Hepatitis B Virus Surface Ag, Confirm will be added. Additional charges apply.

CPT Code(s): 86317; 87340; if reflexed, add 87341

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0020090 Hepatitis B Virus Surface Antibody HBSAB

Interpretive Data:
This assay should not be used for blood donor screening, associated re-entry protocols, or for screening Human Cell, Tissues and Cellular and Tissue-Based Products (HCT/P).

New Test **2014598** **Hepatitis C Virus (HCV) Genotype with Reflex to HCV NS5A Drug Resistance by Sequencing** **HCV RFX 5A**

Available Now

Methodology: Polymerase Chain Reaction/Sequencing
Performed: Sun-Sat
Reported: 13-19 days

Specimen Required: Collect: Lavender (EDTA), Pink (K_2EDTA), Plasma Preparation Tube (PPT), or Serum Separator Tube (SST).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 1.5 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: Heparinized specimens.
Stability (collection to initiation of testing): Ambient: Unacceptable; Refrigerated: 72 hours; Frozen: 4 months

Reference Interval: By report

Interpretive Data: Refer to report.

See Compliance Statement B: www.aruplab.com/CS

Note: This test may be unsuccessful if the HCV RNA viral load is less than log 3.6 or 4000 IU/mL. If initial result is Type "1a or 1b", then HCV NS5A Drug Resistance by Sequencing will be added. Additional charges apply.

CPT Code(s): 87902; if reflexed, add 87902

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2010784 **Hepatitis C Virus Antibody by CIA with Reflex to HCV by Quantitative PCR** **HCV AB QR**

Performed: Sun-Sat
Reported: Within 48 hours

2012052 **Hereditary Hemolytic Anemia Sequencing, 28 Genes** **HHA SEQ**

CPT Code(s): 81479

2009337 **Hereditary Hemorrhagic Telangiectasia (HHT) Panel, Sequencing and Deletion/Duplication, 5 Genes** **HHT PANEL**

CPT Code(s): 81479

2011148 **Herpes Simplex Virus (HSV) by PCR with Reflex to HSV (HSV-1/HSV-2) Subtype by PCR** **HSVPCR RFX**

CPT Code(s): 87529; if reflexed, add 87529

2010095 **Herpes Simplex Virus (HSV-1/HSV-2) Subtype by PCR** **HSVTYPEPCR**

CPT Code(s): 87529

2008125 **Hexosaminidase A Percent and Total Hexosaminidase in Leukocytes** **HEXOA LEUK**

Performed: Mon
Reported: 2-9 days

2008121 **Hexosaminidase A Percent and Total Hexosaminidase, Plasma or Serum** **HEXOS A P/S**

Performed: Mon
Reported: 2-9 days

2007578 **High Molecular Weight Kininogen (HMWK), Activity** **HIGH MOLE**

HOT LINE NOTE: Name change only.

2008848 **Holoprosencephaly Panel, Nonsyndromic, Sequencing and Deletion/Duplication, 11 Genes** **HPE PAN**

CPT Code(s): 81479

0040227 ***IGHV* Mutation Analysis by Sequencing** **IGHV MUT**

HOTLINE NOTE: There is a price change associated with this test. Please contact ARUP Client Services at (800) 522-2787 for additional information.

0070022 **Insulin, Other** **INSULINOTH**

Specimen Required: Collect: Serum Separator Tube (SST). Also acceptable: Lavender (EDTA).
Specimen Preparation: Allow sample to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.4 mL)
Storage/Transport Temperature: Frozen.
Unacceptable Conditions: Vitreous fluid. Gray (sodium fluoride/potassium oxalate) or heparinized plasma. Hemolyzed specimens.
Stability (collection to initiation of testing): After separation from cells: Ambient: 8 hours; Refrigerated: 1 week; Frozen: 1 month

2013599 **Insulin-Like Growth Factor 2 (IGF-2)** **IGF-2**

HOTLINE NOTE: Name change only.

0098843 **Insulin-Like Growth Factor Binding Protein 1 (IGFBP-1)** **IGFBP-1**

Performed: Varies
Reported: 3-16 days

0098842 **Insulin-Like Growth Factor Binding Protein 2 (IGFBP-2)** **IGFBP-2**

Performed: Varies
Reported: 4-11 days

0070060 **Insulin-Like Growth Factor Binding Protein 3 (IGFBP-3)** **IGFBP-3**

HOTLINE NOTE: Name change only.

0090144 **Isopropanol (Includes Acetone)** **ISOP**

Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Patient Prep: For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.
Collect: Plain Red or Gray (Potassium Oxalate/Sodium Fluoride).
Specimen Preparation: Separate from cells ASAP or within 2 hours. Transfer 3 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL) **Cap tube tightly to minimize alcohol loss.**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Whole blood. Plasma Separator Tubes (PST), Serum Separator Tubes (SST).
Stability (collection to initiation of testing): After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

New Test
Available Now

2013716 **LipoFit by NMR** **NMRLIPFIT**

Methodology: Quantitative Nuclear Magnetic Resonance Spectroscopy/ Quantitative Enzymatic/ Detergent Solubilization
Performed: Sun-Sat
Reported: 3-6 days

Specimen Required: Patient Prep: 12 hour fasting is preferred, but not required.
Collect: Greiner Bio-One Clot Activator Tube (ARUP supply #53483) available online through eSupply using ARUP Connect ™ or by contacting ARUP Client Services at (800) 522-2787. Also acceptable: Plain Red.
Specimen Preparation: Gently invert tube to mix contents; allow to clot at room temperature. Separate from cells within 8 hours. Transfer 4 mL serum to an ARUP Standard Transport Tube. (Min: 2 mL)
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Plasma. Serum separator tubes other than Greiner Bio-One.
Stability (collection to initiation of testing): Ambient: 24 hours; Refrigerated: 1 week; Frozen: Unacceptable

Reference Interval: By report

Interpretive Data: See Compliance Statement B: www.aruplab.com/CS

CPT Code(s): 83704; 80061

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

New Test Available Now **2013715** **LipoFit by NMR, Particle Count Only** **NMRLIPFITP**

Methodology: Quantitative Nuclear Magnetic Resonance Spectroscopy
Performed: Sun-Sat
Reported: 3-6 days

Specimen Required: Patient Prep: 12 hour fast is preferred but not required.
Collect: Greiner Bio-One Clot Activator Tube (ARUP supply #53483). Available online through eSupply using ARUP Connect ™ or by contacting ARUP Client Services at (800) 522-2787. Also acceptable: Plain red.
Specimen Preparation: Gently invert tube to mix contents and allow to clot at room temperature. Separate serum from cells within 8 hours. Transfer 2 mL serum to an ARUP Standard Transport Tube. (Min: 1 mL)
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Plasma. Serum separator tubes other than Greiner Bio-One.
Stability (collection to initiation of testing): Ambient: 2 days; Refrigerated: 1 month; Frozen: Unacceptable

Reference Interval: By Report

Interpretive Data: See Compliance Statement B: www.aruplab.com/CS

CPT Code(s): 83704

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0030181 **Lupus Anticoagulant Reflexive Panel** **LUPUS R**

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval
	Dilute Russell Viper Venom Time (dRVVT)	33-44 seconds
	Dilute Russell Viper Venom (dRVVT) 1:1 Mix **(performed if dRVVT > 44 seconds)**	33-44 seconds
	Dilute Russell Viper Venom Time (dRVVT) Confirmation Test **(performed if dRVVT 1:1 Mix > 44 seconds)**	Negative
	Prothrombin Time	12.0-15.5 seconds
	Partial Thromboplastin Time	32-48 seconds
	Thrombin Time	14.7-19.5 seconds
	Reptilase Time	Less than 22.0 seconds
	PTT Heparin Neutralized	32-48 seconds
	Partial Thromboplastin Time 1:1 Mix **(performed if PTT > 48 seconds)**	32-48 seconds
	Platelet Neutralization Procedure **(performed if PTT 1:1 Mix > 48 seconds)**	Negative
	Hexagonal Phospholipid Neutralization	Negative

2004963 **Malaria Detection and Speciation, Qualitative by Real-Time PCR** **MALARIAPCR**

CPT Code(s): 87798

0025070 Manganese, Urine — MANG U

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval		
	Manganese, Urine - per volume	0.0-0.9 µg/L		
	Manganese, Urine - per 24h	0.0-2.4 µg/d		
	Manganese, Urine - ratio to CRT	0.0-0.9 µg/g CRT		
	Creatinine, Urine - per 24h	**Age**	**Male**	**Female**
		3-8 years	140-700 mg/d	140-700 mg/d
		9-12 years	300-1300 mg/d	300-1300 mg/d
		13-17 years	500-2300 mg/d	400-1600 mg/d
		18-50 years	1000-2500 mg/d	700-1600 mg/d
		51-80 years	800-2100 mg/d	500-1400 mg/d
		81 years and older	600-2000 mg/d	400-1300 mg/d

Interpretive Data: This assay provides limited utility in determining manganese exposure. Whole blood measurements are recommended for determining recent or active exposure.

See Compliance Statement B: www.aruplab.com/CS

HOTLINE NOTE: There is a clinically significant charting name change associated with this test.
Change the charting name of component 0025043 from Manganese, Urine - ug/gCRT to Manganese, Urine - ratio to CRT
Change the charting name of component 0025071 from Manganese, Urine - ug/L to Manganese, Urine - per volume
Change the charting name of component 0025072 from Manganese, Urine - ug/day to Manganese, Urine - per 24h

0050375 Measles (Rubeola) Antibodies, IgG and IgM — MEASLE PAN

Specimen Required: Collect: Serum Separator Tube (SST).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL) Parallel testing is preferred and convalescent specimens **must** be received within 30 days from receipt of the acute specimens. **Mark specimens plainly as "acute" or "convalescent."**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Refer to individual components.
Stability (collection to initiation of testing): After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

0090165 Methanol — METHANOL

Performed: Sun-Sat
Reported: 1-3 days

Specimen Required: Patient Prep: For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.
Collect: Plain Red. Also acceptable: Lavender (EDTA), Pink (K_2EDTA), Green (Sodium or Lithium Heparin), Gray (Potassium Oxalate/Sodium Fluoride).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 3 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL) **Cap tube tightly to minimize alcohol loss.**
Storage/Transport Temperature: Refrigerated.
Unacceptable Conditions: Whole blood. Plasma Separator Tubes (PST), Serum Separator Tubes (SST).
Stability (collection to initiation of testing): After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

2011626 Microsporidia by PCR — MICROSPCR

CPT Code(s): 87798

New Test Available Now **2014510** **Molybdenum Quantitative, Urine** **MOLYBDENUR**

Methodology: Quantitative Colorimetry/Inductively Coupled Plasma-Mass Spectrometry
Performed: Varies
Reported: 3-6 days

Specimen Required: Collect: Urine.
Specimen Preparation: Transfer 3 mL urine to an ARUP Standard Transport Tube. (Min: 1.3 mL)
Storage/Transport Temperature: Refrigerated. Also acceptable: Frozen.
Stability (collection to initiation of testing): Ambient: 5 days; Refrigerated: 1 month; Frozen: 3 months

Reference Interval: By report

CPT Code(s): 82570; 83018

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2012182 **Myeloid Malignancies Somatic Mutation and Copy Number Analysis Panel** **MYE CMANGS**

CPT Code(s): 81455

0055506 **Neutrophil-Associated Antibodies** **ANTI-NEU**

Specimen Required: Collect: Plain Red or Serum Separator Tube (SST).
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 3 mL serum to an ARUP Standard Transport Tube and freeze. (Min: 0.5 mL)
Storage/Transport Temperature: CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.
Stability (collection to initiation of testing): After separation from cells: Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 1 month

Interpretive Data: Neutrophil-associated antibodies may cause neutropenia in various autoimmune disorders including Felty syndrome, SLE and drug-induced neutropenia. Febrile transfusion reactions and isoimmune neonatal neutropenia may also be caused by antibodies to neutrophil-specific antigens or HLA antigens.

A positive result is not definitive for specific anti-neutrophil antibodies. Anti-HLA antibodies and immune complexes may also cause a positive result. The results of this test should be correlated to clinical history and other data.

See Compliance Statement B: www.aruplab.com/CS

Note: Circulating antibodies in patient's serum are measured by flow cytometry after incubation with normal neutrophils. Values greater than 2 standard deviations of a normal control population are interpreted as "weakly positive" and greater than 3 standard deviations as "positive".

This test should not be confused with Anti-Neutrophil Cytoplasmic Antibody, IgG (ARUP test code 0050811).

0025045 **Nickel, Urine** **NICKEL U**

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval		
	Nickel, Urine - per volume	0.0-10.4 µg/L		
	Nickel, Urine - per24h	0.0-14.9 µg/d		
	Nickel, Urine - ratio to CRT	0.0-9.9 µg/g CRT		
	Creatinine, Urine - per 24h	**Age**	**Male**	**Female**
		3-8 years	140-700 mg/d	140-700 mg/d
		9-12 years	300-1300 mg/d	300-1300 mg/d
		13-17 years	500-2300 mg/d	400-1600 mg/d
		18-50 years	1000-2500 mg/d	700-1600 mg/d
		51-80 years	800-2100 mg/d	500-1400 mg/d
		81 years and older	600-2000 mg/d	400-1300 mg/d

Interpretive Data: Measurement of nickel is not recommended in asymptomatic individuals or in individuals with a low likelihood of exposure. Elevations in nickel urine should be interpreted with caution in individuals with no exposure risks, and may indicate contamination of the specimen.

See Compliance Statement B: www.aruplab.com/CS

HOTLINE NOTE: There is a clinically significant charting name change associated with this test.
Change the charting name of component 0025044 from Nickel, Urine - ug/gCRT to Nickel, Urine - ratio to CRT
Change the charting name of component 0025046 from Nickel, Urine - ug/L to Nickel, Urine - per volume
Change the charting name of component 0025047 from Nickel, Urine - ug/day to Nickel, Urine - per 24h

2007537 **Non-Invasive Prenatal Testing for Fetal Aneuploidy** **NIPT ANEU**

CPT Code(s): 81420

2010232 **Non-Invasive Prenatal Testing for Fetal Aneuploidy (Panorama) with Microdeletions** **NIPTANEUMD**

CPT Code(s): 81420; 81422

2013142 **Non-Invasive Prenatal Testing for Fetal Aneuploidy with 22q11.2 Microdeletion (Panorama)** **NIPTANEU22**

CPT Code(s): 81420; 81422

New Test **2014546** **Norovirus, Groups 1 and 2 by PCR** **NOROPCR**

Methodology: Qualitative Reverse Transcription Polymerase Chain Reaction
Performed: Mon, Wed, Fri
Reported: 1-5 days

Specimen Required: Collect: Stool.
Specimen Preparation: Transfer 1 mL stool to an unpreserved stool transport vial (ARUP Supply #40910) available online through eSupply using ARUP Connect™ or contact ARUP Client Services at (800) 522-2787. (Min: 0.5 mL)
Storage/Transport Temperature: Frozen.
Stability (collection to initiation of testing): Ambient: 8 hours; Refrigerated: 72 hours; Frozen: 1 month

Interpretive Data: A negative result does not rule out the presence of PCR inhibitors in the patient specimen or test-specific nucleic acid in concentrations below the level of detection by this test.

See Compliance Statement B: www.aruplab.com/CS

CPT Code(s): 87798

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0049250 **p53 with Interpretation by Immunohistochemistry** **P53 IP**

HOTLINE NOTE: There is a component change associated with this test.
Remove component 0049251, p53 Result.

2007479 **Pain Management Drug Panel by High-Resolution Time-of-Flight or Tandem Mass Spectrometry and Enzyme Immunoassay, Urine** **PAIN HYB U**

Methodology: Qualitative Liquid Chromatography/Time of Flight Mass Spectrometry or Tandem Mass Spectrometry/Enzyme Immunoassay/Quantitative Spectrophotometry

Reference Interval: Effective November 17, 2014

Drugs covered and range of cutoff concentrations.
Note: Some drugs are identified based on the presence of unique drug metabolites not listed below.

Drugs/Drug Classes	Range of Cutoff Concentrations
Barbiturates	200 ng/mL
Benzodiazepine-like: alprazolam, clonazepam, diazepam, lorazepam, midazolam, nordiazepam, oxazepam, temazepam, zolpidem	20 - 60 ng/mL
Cannabinoids (11-nor-9-carboxy-THC)	20 ng/mL
Ethyl Glucuronide	500 ng/mL
Muscle Relaxant(s): carisoprodol, meprobamate	100 ng/mL
Opiates/Opioids: buprenorphine, codeine, fentanyl, heroin, hydrocodone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, propoxyphene, tapentadol, tramadol	2-300 ng/mL
Phencyclidine (PCP)	25 ng/mL
Stimulants: amphetamine, cocaine, methamphetamine, methylphenidate, MDMA (Ecstasy), MDEA (Eve), MDA, phentermine	100-400 ng/mL

Interpretive Data:
Methodology: Qualitative Enzyme Immunoassay and Qualitative Liquid Chromatography-Time-of-Flight-Mass Spectrometry or Tandem Mass Spectrometry, Quantitative Spectrophotometry

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration must be greater than or equal to the cutoff concentration to be reported as present. If specific drug concentrations are required, contact the laboratory within two weeks of specimen collection to request confirmation and quantification by a second analytical technique. Interpretive questions should be directed to the laboratory.

Results based on immunoassay detection that do not match clinical expectations should be interpreted with caution. Confirmatory testing by mass spectrometry for immunoassay-based results is available, if ordered within two weeks of specimen collection. Additional charges apply.

For medical purposes only; not valid for forensic use.

2009288 Pain Management Drug Screen with Interpretation by High-Resolution Time-of-Flight or Tandem Mass Spectrometry and Enzyme Immunoassay, Urine — PAIN HYB 2

Methodology: Qualitative Liquid Chromatography/Time of Flight Mass Spectrometry or Tandem Mass Spectrometry/Enzyme Immunoassay/Quantitative Spectrophotometry

Reference Interval: Effective November 17, 2014

Drugs covered and range of cutoff concentrations.
Note: Some drugs are identified based on the presence of unique drug metabolites not listed below.

Drugs/Drug Classes	Range of Cutoff Concentrations
Barbiturates	200 ng/mL
Benzodiazepine-like: alprazolam, clonazepam, diazepam, lorazepam, midazolam, nordiazepam, oxazepam, temazepam, zolpidem	20 - 60 ng/mL
Cannabinoids (11-nor-9-carboxy-THC)	20 ng/mL
Ethyl Glucuronide	500 ng/mL
Muscle Relaxant(s): carisoprodol, meprobamate	100 ng/mL
Opiates/Opioids: buprenorphine, codeine, fentanyl, heroin, hydrocodone, hydromorphone, meperidine, methadone, morphine, oxycodone, oxymorphone, propoxyphene, tapentadol, tramadol	2-300 ng/mL
Phencyclidine (PCP)	25 ng/mL
Stimulants: amphetamine, cocaine, methamphetamine, methylphenidate, MDMA (Ecstasy), MDEA (Eve), MDA, phentermine	100-400 ng/mL

Interpretive Data:
Methodology: Qualitative Enzyme Immunoassay and Qualitative Liquid Chromatography-Time-of-Flight-Mass Spectrometry or Tandem Mass Spectrometry, Quantitative Spectrophotometry

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration must be greater than or equal to the cutoff concentration to be reported as present. If specific drug concentrations are required, contact the laboratory within two weeks of specimen collection to request confirmation and quantification by a second analytical technique. Interpretive questions should be directed to the laboratory.

Results based on immunoassay detection that do not match clinical expectations should be interpreted with caution. Confirmatory testing by mass spectrometry for immunoassay-based results is available if ordered within two weeks of specimen collection. Additional charges apply.

For medical purposes only; not valid for forensic use.

2007370 Periodic Fever Syndromes Panel, Sequencing (7 Genes) and Deletion/Duplication, (6 Genes) — PRFEVERPAN

CPT Code(s): 81479

New Test Available Now | **2014463** | **Pompe Disease (GAA), Enzyme Activity in Leukocytes** | **GAA ENZYME**

Methodology: Quantitative Fluorometry
Performed: Varies
Reported: 3-10 days

Specimen Required: Collect: Yellow (ACD), Lavender (K_2EDTA), Lavender (K_3EDTA), or Green (Sodium Heparin).
Specimen Preparation: Transport 3 mL whole blood. (Min: 1 mL)
Storage/Transport Temperature: Refrigerated
Remarks: Additional information is required: Clinical Indication for testing.
Unacceptable Conditions: Grossly hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: 3 days; Refrigerated: 3 days; Frozen: Unacceptable

Reference Interval: 5.5 – 25.0 nmol hydrolyzed/hr/mg protein

Interpretive Data: Refer to report.

CPT Code(s): 82657

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

2011156 | **Primary Antibody Deficiency Panel, Sequencing (35 Genes) and Deletion/Duplication (26 Genes)** | **PAD PANEL**

CPT Code(s): 81479

New Test Available Now **2014318** **Prolonged Clot Time Reflex Panel** **CLOT REF R**

Patient History Form for Prolonged Clot Reflex Panel

Methodology: Electromagnetic Mechanical Clot Detection/Qualitative Hemagglutination/Platelet Agglutination/Microlatex Particle-Mediated Immunoassay
Performed: Mon-Sun
Reported: 1-8 days

Specimen Required: Collect: At least five (5) Light Blue (Sodium Citrate) tubes. Refer to Specimen Handling at aruplab.com for hemostasis/thrombosis specimen handling guidelines.
Specimen Preparation: Transfer five 1 mL aliquots of platelet-poor plasma to five ARUP Standard Transport Tubes, label as sodium citrate. (Min: 1 mL/aliquot and 5 mL total)
Storage/Transport Temperature: **CRITICAL FROZEN. Separate specimens must be submitted when additional test codes are ordered.**
Remarks: Submit the Patient History Form for Prolonged Clot Reflex Panel.
Unacceptable Conditions: Serum or EDTA plasma. Specimens containing anticoagulant medications. Clotted or hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: at -20°C: 3 months; Frozen at -70°C: 6 months

Reference Interval:

Test Number	Components	Reference Interval
0030130	Fibrinogen	150-430 mg/dL
0030057	D-Dimer	0.0-0.4 µg/mL
0030181	Lupus Anticoagulant reflexive panel	

Test Number	Components	Reference Interval
	Dilute Russell Viper Venom Time (dRVVT)	33-44 seconds
	Dilute Russell Viper Venom (dRVVT) 1:1 Mix (performed if dRVVT > 44 seconds)	33-44 seconds
	Dilute Russell Viper Venom Time (dRVVT) Confirmation Test (performed if dRVVT 1:1 Mix > 44 seconds)	Negative
	Prothrombin Time	12.0-15.5 seconds
	Partial Thromboplastin Time	32-48 seconds
	Thrombin Time	14.7-19.5 seconds
	Reptilase Time	Less than 22.0 seconds
	PTT Heparin Neutralized	32-48 seconds
	Partial Thromboplastin Time 1:1 Mix (performed if PTT > 48 seconds)	32-48 seconds
	Platelet Neutralization Procedure (performed if PTT 1:1 Mix > 48 seconds)	Negative
	Hexagonal Phospholipid Neutralization	Negative

	PT, Inhibitor Screen, 1:1 Mix	12.0-15.5 seconds
0030126	Soluble Fibrin Monomer	Negative
0030007	Factor II, Activity (Prothrombin)	

Age	Reference Interval	Age	Reference Interval
1-4 days	26-70%	7-9 years	78-125%
5-29 days	33-93%	10-11 years	78-120%
30-89 day	34-102%	12-13 years	72-123%
90-179 days	45-105%	14-15 years	75-135%
180-364 days	60-116%	16-17 years	77-130%
1-5 years	71-116%	18 years and older	86-150%
6 years	67-107%		

0030075	Factor V, Activity	

Age	Reference Interval	Age	Reference Interval
1-4 days	36-108%	7-9 years	69-132%
5-29 days	45-145%	10-11 years	66-136%
30-89 days	62-134%	12-13 years	66-135%
90-179 days	48-132%	14-15 years	61-129%
180-364 days	55-127%	16-17 years	65-131%
1-5 years	79-127%	18 years and older	62-140%
6 years	63-116%		

0030080	Factor VII, Activity	

Age	Reference Interval	Age	Reference Interval
1-4 days	28-104%	7-9 years	67-145%
5-29 days	35-143%	10-11 years	71-163%
30-89 days	42-138%	12-13 years	78-160%
90-179 days	39-143%	14-15 years	74-180%

		180-364 days	47-127%	16-17 years	63-163%
		1-5 years	55-116%	18 years and older	80-181%
		6 years	52-120%		

0030026	Factor VIII Activity with Reflex to Bethesda Quantitative, Factor VIII	**Test Number**	**Components**	**Reference Interval**	
		0030095	Factor VIII, Activity	**Age**	**Reference Interval**
				0-6 years	56-191%
				7-9 years	76-199%
				10-11 years	80-209%
				12-13 years	72-198%
				14-15 years	69-237%
				16-17 years	63-221%
				18 years and older	56-191%
			Bethesda Quantitative, Factor VIII	Effective May 19, 2014 0.5 BU or less	

0030032	Factor IX Activity with Reflex to Bethesda Quantitative, Factor IX	**Test Number**	**Components**	**Reference Interval**			
		0030100	Factor IX, Activity	**Age**	**Reference Interval**	**Age**	**Reference Interval**
				1-4 days	15-91%	7-9 years	70-133%
				5-29 days	15-91%	10-11 years	72-149%
				30-89 days	21-81%	12-13 years	73-152%
				90-179 days	21-113%	14-15 years	80-161%
				180-364 days	36-136%	16-17 years	86-176%
				1-5 years	47-104%	18 years and older	78-184%
				6 years	63-89%		
			Bethesda Quantitative, Factor IX	Effective May 19, 2014 0.4 BU or less			

0030105	Factor X, Activity	**Age**	**Reference Interval**	**Age**	**Reference Interval**
		1-4 days	12-68%	7-9 years	74-130%
		5-29 days	19-79%	10-11 years	70-134%
		30-89 days	31-87%	12-13 years	69-133%
		90-179 days	35-107%	14-15 years	63-146%
		180-364 days	38-118%	16-17 years	74-146%
		1-5 years	58-116%	18 years and older	81-157%
		6 years	55-101%		

0030110	Factor XI, Activity	**Age**	**Reference Interval**	**Age**	**Reference Interval**
		1-4 days	10-66%	7-9 years	70-138%
		5-29 days	23-87%	10-11 years	66-137%
		30-89 days	27-79%	12-13 years	68-138%
		90-179 days	41-97%	14-15 years	57-129%
		180-364 days	38-134%	16-17 years	65-159%
		1-5 years	56-150%	18 years and older	56-153%
		6 years	52-120%		

0030115	Factor XII, Activity	58-166%

0030285	Von Willebrand Factor Antigen	**Age**	**Reference Interval**
		0-6 years	52-214%
		7-9 years	62-180%
		10-11 years	63-189%
		12-13 years	60-189%
		14-15 years	57-199%
		16-17 years	50-205%
		18 years and older	52-214%

0030250	Von Willebrand Factor Activity (Ristocetin Cofactor)	**Age**	**Reference Interval**
		0-6 years	51-215%
		7-9 years	52-176%
		10-11 years	60-195%
		12-13 years	50-184%
		14-15 years	50-203 %
		16-17 years	49-204%
		18 years and older	51-215%

Interpretive Data: Refer to report.

Note: Submission of a completed Patient History Form with test order will allow for optimal panel interpretation. The Patient History Form for Prolonged Clot Reflex Panel is available on the ARUP web site or by contacting ARUP Client Services at (800) 522-2787.

If D-Dimer is abnormal, Soluble Fibrin Monomer is added. If PT is abnormal PT, Inhibitor Screen, 1:1 Mix is added. If PTT is abnormal, Thrombin Time is added. If Thrombin Time is normal, PTT 1:1 mix is added. If Thrombin time is abnormal, Reptilase Time and PTT Heparin Neutralization is added. If PTT Heparin Neutralization is abnormal, PTT 1:1 mix is added. If PTT 1:1 mix is abnormal, Platelet Neutralization procedure is added. If dRVVT is abnormal, dRVVT 1:1 mix is added. If dRVVT 1:1 mix is abnormal, dRVVT confirmation is added. If Platelet Neutralization procedure and dRVVT confirmation are normal or if one is normal and the other not done, Hexagonal Phospholipid Neutralization is added. Depending on findings, one or more reflexive tests may be required in order to provide a clinical interpretation. Additional charges apply.

CPT Code(s): 85384, 85379, 85610, 85730, 85613; if reflexed, additional CPT codes may apply: 85670, 85635, 85730, 85525, 85732, 85597, 85613, 85598, 85611, 85366, 85210, 85220, 85230, 85240, 85335, 85250, 85260, 85270, 85280, 85246, 85245

New York DOH Approved.
HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0056060 **Prothrombin *(F2)* c.*97G>A *(*G20210A) Pathogenic Variant** **PT PCR**

Interpretive Data:
Background Information for Prothrombin (*F2*) c.*97G>A (G20210A) Pathogenic Variant:
Characteristics: The Factor II, c.*97G>A (G20210A) pathogenic variant is a common genetic risk factor for venous thrombosis associated with elevated prothrombin levels leading to increased rates of thrombin generation and excessive growth of fibrin clots. The expression of Factor II thrombophilia is impacted by coexisting genetic thrombophilic disorders, acquired thrombophilic disorders (eg, malignancy, hyperhomocysteinemia, high factor VIII levels), and circumstances including: pregnancy, oral contraceptive use, hormone replacement therapy, selective estrogen receptor modulators, travel, central venous catheters, surgery, and organ transplantation.
Incidence: Approximately 2 percent of Caucasians and 0.3 percent of African Americans are heterozygous; homozygosity occurs in 1 in 10,000 individuals.
Inheritance: Incomplete autosomal dominant.
Penetrance: The risk of thrombosis is increased 2-4 fold for heterozygotes and further increased for homozygotes.
Cause: Homozygosity or heterozygosity for *F2* c.*97G>A (G20210A).
Pathogenic Variant Tested: *F2* c.*97G>A (G20210A).
Clinical Sensitivity for Venous Thrombosis: Approximately 10 percent.
Methodology: Polymerase chain reaction and fluorescence monitoring.
Analytical Sensitivity and Specificity: 99 percent.
Limitations: Diagnostic errors can occur due to rare sequence variations. *F2* gene variants, other than c.*97G>A (G20210A), will not be detected.

See Compliance Statement C: www.aruplab.com/CS

HOTLINE NOTE: Remove information found in the Reference Interval field.

2009345 **Pulmonary Arterial Hypertension (PAH) Panel, Sequencing and Deletion/Duplication, Multigene** **PAH PANEL**

CPT Code(s): 81479

New Test Available Now **2014523** **Purines and Pyrimidines Panel, Urine** **PUPY URN**

Methodology: Quantitative Liquid Chromatography/Tandem Mass Spectrometry
Performed: Varies
Reported: 3-16 days

Specimen Required: Collect: Urine.
Specimen Preparation: Transfer 3 mL urine to an ARUP Standard Transport Tube. (Min: 2 mL)
Storage/Transport Temperature: **CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.**
Stability (collection to initiation of testing): Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 3 months

Reference Interval: By Report

CPT Code(s): 82542

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

New Test Available Now **2014351** **Rabies Antibody Screen (RFFIT)** **RABIES AB**

Methodology: Rapid Fluorescent Focus Inhibition
Performed: Varies
Reported: 21-31 days

Specimen Required: Collect: Plain Red, Serum Separator Tube (SST), or CSF.
Specimen Preparation: Transfer 2 mL serum or CSF to an ARUP Standard Transport Tube. (Min: 0.25 mL)
Storage/Transport Temperature: Refrigerated. Also acceptable: Room temperature or frozen.
Stability (collection to initiation of testing): Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month

Reference Interval: By report

CPT Code(s): 86382

New York DOH Approved.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0070105 **Renin Activity** **RENIN**

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing, or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Lavender (EDTA) or Pink (K_2EDTA). **Do not collect in refrigerated tubes.**
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 1.2 mL)
Storage/Transport Temperature: **CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.**
Unacceptable Conditions: Serum. Specimens collected in citrate, heparin, or oxalate. Hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: 6 hours; Refrigerated: Unacceptable; Frozen: 1 month

Note: Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative aldosterone-renin ratio (ARR) results.

2001575 Renin, Direct — RENIND

Specimen Required: Patient Prep: Collect midmorning after patient has been sitting, standing, or walking for at least 2 hours and seated for 5-15 minutes. Refer to the Additional Technical Information for specific patient preparation recommendations.
Collect: Lavender (EDTA) or Pink (K_2EDTA). Do not collect in refrigerated tubes.
Specimen Preparation: Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 1 mL)
Storage/Transport Temperature: **CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.**
Unacceptable Conditions: Serum. Specimens collected in citrate, heparin, or oxalate. Hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: 4 hours; Refrigerated: Unacceptable; Frozen: 4 weeks

Note: Do not use this test for patients treated with Cathepsin B. Menstruating females and those taking estrogen-containing medications may have lower renin direct concentrations, resulting in falsely high aldosterone-renin ratio (ARR). In these cases, order Aldosterone/Renin Activity Ratio (ARUP Test code 0070073). Refer to the Additional Technical Information for Endocrine Society recommendations for patient preparation, specimen collection, medications for hypertension control during confirmatory testing for primary aldosteronism, and factors that may lead to false-positive or false-negative ARR results.

New Test Available Now — 0040131 RNA Extraction and Storage — RNA EXT

Methodology: RNA Extraction
Performed: Sun-Sat
Reported: 1-7 days

Specimen Required: Collect: Lavender (EDTA), or bone marrow (EDTA).
Specimen Preparation: Do not freeze. Transport 5 mL whole blood. (Min: 1 mL) **OR** Transport 3 mL bone marrow. (Min: 1 mL)
Storage/Transport Temperature: Refrigerated.
Remarks: Specimens must be received within 48 hours of collection due to lability of RNA.
Stability (collection to initiation of testing): Ambient: 4 hours; Refrigerated: 72 hours; Frozen: Unacceptable

Note: RNA will be held for 6 months for possible add-on testing.

CPT Code(s): 81479

New York DOH approval pending. Call for status update.

HOTLINE NOTE: Refer to the Test Mix Addendum for interface build information.

0025067 Selenium, Urine — SE-U

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval		
	Selenium, Urine - per volume	12.0-40.0 µg/L		
	Selenium, Urine - per 24h	12.0-52.6 µg/d		
	Selenium Urine - ratio to CRT	10.0-35.0 µg/g CRT		
	Creatinine, Urine - per 24h	**Age**	**Male**	**Female**
		3-8 years	140-700 mg/d	140-700 mg/d
		9-12 years	300-1300 mg/d	300-1300 mg/d
		13-17 years	500-2300 mg/d	400-1600 mg/d
		18-50 years	1000-2500 mg/d	700-1600 mg/d
		51-80 years	800-2100 mg/d	500-1400 mg/d
		81 years and older	600-2000 mg/d	400-1300 mg/d

2012015 Skeletal Dysplasia Panel, Sequencing (39 Genes) and Deletion/Duplication (36 Genes) — SKEL PANEL

CPT Code(s): 81479

2012010 Skeletal Dysplasia Panel, Sequencing (39 Genes) and Deletion/Duplication (36 Genes), Fetal — SKEL FE

CPT Code(s): 81479

0070130 Testosterone, Adult Male — TESTOS

Specimen Required: Patient Prep: Collect specimen between 6-10 a.m.
Collect: Serum Separator Tube (SST) or Green (Lithium Heparin). Also acceptable: Lavender (K_2 EDTA) or Lavender (K_3 EDTA).
Pooled Specimens: Collect three samples, 20 minutes apart.
Specimen Preparation: Transport 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Pooled Specimens: Spin and pool equal amounts of serum or plasma. Transfer 1 mL of pooled specimen into an ARUP Standard Transport Tube. (Min: 0.5 mL)
Storage/Transport Temperature: Refrigerated. Also acceptable: Frozen.
Stability (collection to initiation of testing): After separation from cells: Ambient: 5 days; Refrigerated: 2 weeks; Frozen: 6 months

0025019 Thallium, Urine — THALU

Reference Interval:
Effective August 21, 2017

Test Number	Components	Reference Interval		
	Thallium, Urine - per volume	0.0-0.4 µg/L		
	Thallium, Urine - per 24h	0.0-0.4 µg/d		
	Thallium, Urine - ratio to CRT	0.0-0.4 µg/g CRT		
	Creatinine, Urine - per 24h	**Age**	**Male**	**Female**
		3-8 years	140-700 mg/d	140-700 mg/d
		9-12 years	300-1300 mg/d	300-1300 mg/d
		13-17 years	500-2300 mg/d	400-1600 mg/d
		18-50 years	1000-2500 mg/d	700-1600 mg/d
		51-80 years	800-2100 mg/d	500-1400 mg/d
		81 years and older	600-2000 mg/d	400-1300 mg/d

0099610 Thallium, Whole Blood — THALB

Specimen Required: Patient Prep: Diet, medication, and nutritional supplements may introduce interfering substances. Patients should be encouraged to discontinue nutritional supplements, vitamins, minerals, and non-essential over-the-counter medications (upon the advice of their physician).
Collect: Royal Blue (K_2EDTA or Na_2EDTA).
Specimen Preparation: Transport 7 mL whole blood in the original collection tube. (Min: 0.5 mL)
Storage/Transport Temperature: Room temperature. Also acceptable: Refrigerated.
Unacceptable Conditions: Heparin anticoagulant. Hemolyzed specimens.
Stability (collection to initiation of testing): Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable

Note: Elevated results from noncertified trace element-free collection tubes may be due to contamination. Elevated concentrations of trace elements in blood should be confirmed with a second specimen collected in a tube designed for trace element determinations, such as a royal blue (K_2EDTA) or (Na_2EDTA) tube. If the specimen is drawn and stored in the appropriate container, the trace element values do not change with time.

2008670 Tick-Borne Disease Panel by PCR, Blood — TICKPCR

CPT Code(s): 87798 x2

2011172 Urogenital Ureaplasma and Mycoplasma Species by PCR — UR MYCOPCR

CPT Code(s): 87798

2007384 **Vascular Malformations Panel, Sequencing and Deletion/Duplication, 14 Genes** **VASC PANEL**

CPT Code(s): 81479

2007136 **von Willebrand Factor Collagen Binding** **VWF C BIND**

CPT Code(s): 85246

2013701 **Vulvovaginal *Candida* Species by PCR** **VCANPCR**

CPT Code(s): 87481

The following will be discontinued from ARUP's test menu on August 21, 2017.
Replacement test options are supplied if applicable.

Test Number	Test Name	Refer To Replacement
0080276	Amniotic Bilirubin Scan	
0095505	Autoimmune Lymphoproliferative Profile	Alpha/Beta Double-Negative T-Cells for Autoimmune Lymphoproliferative Syndrome (2014513)
0051232	Cytochrome P450 2D6 (*CYP2D6*) 14 Variants and Gene Duplication	Cytochrome P450 2D6 (*CYP2D6*) 15 Variants and Gene Duplication (2014547)
0020149	Gastric Analysis	
0080413	Homocystine Quantitative, Urine	Amino Acids Quantitative by LC-MS/MS, Plasma (2009389) and Homocysteine, Total (0099869)
2012175	*HRAS* Mutation Detection by Pyrosequencing	
0065999	Human Papillomavirus (HPV), High Risk by Hybrid Capture, Cervical Brush	
2008404	Human Papillomavirus (HPV), High Risk by Hybrid Capture, ThinPrep	Human Papillomavirus (HPV), High Risk by Transcription-Mediated Amplification (TMA), ThinPrep (2007893) or Human Papillomavirus (HPV), High Risk by PCR, ThinPrep (2011947)
0080403	Indicans, Urine Qualitative	
0080301	Leucine Aminopeptidase (LAP), Serum	Gamma Glutamyl Transferase, Serum or Plasma (0020009) or 5'Nucleotidase (0080235)
0080467	Lipid Associated Sialic Acid	
2012186	LipoProfile by Nuclear Magnetic Resonance (NMR)	LipoFit by NMR (2013716)
2012200	LipoProfile by Nuclear Magnetic Resonance (NMR), Particle Analysis Only	LipoFit by NMR, Particle Count Only (2013715)
0020226	Melanin, Urine	
0051281	Norovirus Group 1 and 2 by PCR	Norovirus, Groups 1 and 2 by PCR (2014546)
2012603	*PAX8-PPARG* Translocations Detection by PCR	
2004510	*PIK3CA* Mutation	Colon Cancer Gene Panel, Somatic (2011616)
2008103	Pipecolic Acid, CSF	Pyridoxine-Dependent Epilepsy Panel, Serum or Plasma (2013352) and Pyridoxine-Dependent Epilepsy Panel, Urine (2013355)
0051718	Platelet Antibodies, Indirect with Reflex to Identification	Platelet Antibodies, Indirect (0051050)
2012605	*RET-CCDC6* and *RET-NCOA4* (*RET-PTC1* and *RET-PTC3*) Translocations Detection by PCR	
0050698	Reticulin Antibody, IgA with Reflex to Titer	Endomysial Antibody, IgA by IFA (0050736)
0070132	Testosterone, Pooled Adult Male	Testosterone, Adult Male (0070130)
2012755	Thyroid Translocation and Mutation Panel	
0020609	Xylose Absorption Test (Adult - 25g dose)	
0020615	Xylose Absorption Test (Adult - 5g dose)	
0020612	Xylose Absorption Test (Child)	