**Testing Updates Newsletter – February 2022**

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| **SUMMARY OF CHANGES** | | | |
| **ORDER CODE** | **TEST NAME** | **CHANGE TYPE** | **DATE EFFECTIVE** |
| *[ALD](#Anchor4)* | Aldolase, Serum | Reference Interval | February 22, 2022 |
| *[ANEMP](#Anchor1b)* | Anemia Panel | Reference Interval | February 21, 2022 |
| *[BETA2](#Anchor5)* | Beta-2 Microglobulin, Serum or Plasma | Specimen Requirements, Reference Interval | February 22, 2022 |
| *[CA199](#Anchor6)* | Cancer Ag 19-9, Serum or Plasma | Reference Interval | February 22, 2022 |
| *[CBC\_MD](#Anchor4b)* | CBC With Manual Differential | Reference Interval | February 21, 2022 |
| *[CBC\_NOD](#Anchor4c)* | CBC Without Differential (Hemogram) | Reference Interval | February 21, 2022 |
| *[CERULO](#Anchor7)* | Ceruloplasmin, Serum or Plasma | Specimen Requirements, Reference Interval | February 22, 2022 |
| *[CINTEC](#Anchor3b)* | CINtec Plus Cytology | New Test | February 17, 2022 |
| *[CBC](#Anchor6b)* | Complete Blood Count (CBC) w/Automated Diff | Reference Interval | February 21, 2022 |
| *[UDRUG7](#Anchor3c)* | Drugs of Abuse Screen Panel 7, with reflex to Confirmation/Quantitation, Urine | Methodology, Performing Laboratory, Panel Components, Reference Interval, Specimen Requirements, Test Name | February 7, 2022 |
| *[UDRUGSR](#Anchor3d)* | Drugs of Abuse Screen Panel 9, with reflex to Confirmation/Quantitation, Urine | Methodology, Performing Laboratory, Panel Components, Reference Interval, Specimen Requirements, Test Name | February 7, 2022 |
| *[UDRUG13](#Anchor3e)* | Drugs of Abuse Screen Panel 13, Urine w/reflex to Confirmation/Quantitation, Urine | New Test | February 7, 2022 |
| *[UDRUG13A](#Anchor3f)* | Drugs of Abuse Screen Panel 13A, Urine w/reflex to Conf | Inactive | February 7, 2022 |
| *[ENA\_AB](#Anchor8)* | Extractable Nuclear Antigen Antibodies (Smith/RNP, Smith, SSA 52, SSA 60, and SSB) | Specimen Requirements | February 22, 2022 |
| *[GEN\_H](#Anchor8b)* | General Health Panel (CMP, CBC, TSH) | Reference Interval | February 21, 2022 |
| *[HAPTO](#Anchor9)* | Haptoglobin, Serum or Plasma | Specimen Requirements | February 22, 2022 |
| *[H\_H](#Anchor9d)* | Hemoglobin and Hematocrit | Reference Interval | February 21, 2022 |
| *[HEP\_BCHR](#Anchor1)* | Hepatitis B Virus Panel, Chronic with Reflex to HBsAg Confirmation | Methodology, Specimen Requirements, CPT Code(s) | February 7, 2022 |
| *[HBEAGAB](#Anchor3)* | Hepatitis Be Virus Antigen and Antibody Panel | Methodology, Specimen Requirements, Interpretive Data | February 7, 2022 |
| *[HBEAG](#Anchor2)* | Hepatitis Be Virus Antigen, Serum or Plasma | Methodology, Specimen Requirements, Interpretive Data | February 7, 2022 |
| *[HGB](#Anchor9b)* | HGB (Hemoglobin, Whole Blood) | Reference Interval | February 21, 2022 |
| *[HYP\_COAG](#Anchor9c)* | Hypercoagulation Panel | Reference Interval | February 21, 2022 |
| *[JAK2](#Anchor10)* | JAK2 (V617F) Mutation by ddPCR, Quant | Specimen Requirements | February 22, 2022 |
| *[JAK2\_E12](#Anchor11)* | JAK2 Exon 12 Mutation Analysis by PCR | Specimen Requirements | February 22, 2022 |
| *[KEPPRA](#Anchor12)* | Keppra (Levetiracetam), Serum or Plasma | Reference Interval | February 22, 2022 |
| *[LAMO](#Anchor13)* | Lamotrigine, Serum or Plasma | Reference Interval | February 22, 2022 |
| *[LEISH](#Anchor14)* | Leishmania Antibody, IgG (Visceral Leishmaniasis), Serum | Specimen Requirements | February 22, 2022 |
| *[LIPA](#Anchor15)* | Lipoprotein (a), Serum or Plasma | Specimen Requirements | February 22, 2022 |
| *[MYO](#LIPA)* | Myoglobin, Serum or Plasma | Reference Interval, Specimen Requirements | February 22, 2022 |
| *[OBS\_PRO](#Anchor15b)* | Obstetric Panel (ABORH, RCB AB, HEP B, RUB, CBC, TREP) | Reference Interval | February 21, 2022 |
| *[OSTEO](#Anchor16)* | Osteocalcin, Serum or Plasma | Reference Interval, Specimen Requirements | February 22, 2022 |
| *[RBC](#Anchor16b)* | RBC (Red Blood Cell Count) | Reference Interval | February 21, 2022 |
| *[ANT\_GENO](#Anchor17)* | RhD Antigen (RhD) Copy Number | Specimen Requirements | February 22, 2022 |
| *[SCHISTO](#Anchor18)* | Schistosoma Antibody, IgG, Serum | Methodology, Specimen Requirements | February 22, 2022 |
| *[TEST\_BIO\_F](#Anchor19)* | Testosterone by Mass Spec., Bioavailable and SHBG, Females or Children | Interpretive Data, Panel Components, Reference Interval, Test Name | February 22, 2022 |
| *[TEST\_LC](#Anchor20)* | Testosterone Free and Total (includes SHBG), by Mass Spec., Females or Children | Panel Components, Reference Interval, Test Name | February 22, 2022 |
| *[TESTMALE](#Anchor21)* | Testosterone Free and Total, by ED/LC-MS/MS (Free) and LC-MS/MS (Total), Adult Males | Panel Components, Test Name | February 22, 2022 |
| *[WBC](#Anchor21b)* | WBC (White Blood Cell Count) | Reference Interval | February 21, 2022 |

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| **TEST DETAILS** |

*[ALD](#TA4)*  **Aldolase, Serum**

**Reference Interval:**

0-30 days 6.0-32.0 U/L

1-5 months 3.0-12.0 U/L

6-35 months 3.5-10.0 U/L

3-6 years 2.7-8.8 U/L

7-17 years 3.3-9.7 U/L

18 years and older 1.2-7.6 U/L

*[ANEMP](#TA1b)* **Anemia Panel**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[BETA2](#TA5)*  **Beta-2 Microglobulin, Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow specimen to clot completely at room temperature. Separate serum or plasma from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.3 mL)

**Unacceptable:** CSF (refer to Beta-2 Microglobulin, CSF, ARUP test code 0080054)

**Stability**: After separation from cells: Ambient: 72 hours; Refrigerated: 72 hours; Frozen: 6 months

**Reference Interval:**

<60 years 0.8 – 2.4 mg/L

>60 years ≤3.0 mg/L

*[CA199](#TA6)*  **Cancer Ag 19-9, Serum or Plasma**

**Reference Interval:**

Less than or equal to 35 U/mL

*[CBC\_MD](#TA4b)* **CBC With Manual Differential**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[CBC\_NOD](#TA4c)* **CBC Without Differential (Hemogram)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[CERULO](#TA7)* **Ceruloplasmin, Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow serum specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.5 mL)

**Unacceptable:** EDTA plasma or hemolyzed specimens.

**Stability**: After separation from cells: Ambient: 8 days; Refrigerated: 2 weeks; Frozen: 1 year

**Reference Interval:**

6 months-6 years 18-37 mg/dL

7-17 years 20-43 mg/dL

18 years and older Male 15-30 mg/dL

18 years and older Female 16-45 mg/dL

*[CINTEC](#TA3b)* **CINtec Plus Cytology**

NEW TEST

**Result Codes**:

47528-5 CINtec Plus Cytology

**Performing Laboratory**: Cole Diagnostics

**Ordering Recommendation:** Recommended for women 30-65 years old with a NILM (Negative for Intraepithelial Lesion or Malignancy) pap result and who are positive for high-risk HPV, or for women 25-65 old who are positive for high risk-HPV in the absence of pap testing.

**Methodology:** Qualitative Immunocytochemistry

**Specimen Requirements:**

**Preferred Container:** ThinPrep Vial or SurePath Vial

**Specimen Preparation:**  SurePath: Collect specimen using either a Broom-type Device, or the Combination Brush/plastic Spatula Device. Break the lower portion of the collection device into the SurePath preservative collection vial; ThinPrep: Collect specimen using either a broom, or a brush and plastic spatula. Rinse the broom or brush/spatula in the solution 10 times and discard the brush.

**Unacceptable:** SurePath specimens not including the detachable head. Frozen specimens.

**Stability**: A: 21 days; R: 21 days; F: Unacceptable

**CPT Code(s):** 88344

*[CBC](#TA6b)* **Complete Blood Count (CBC) w/Automated Diff**

**Reference Interval:**

|  |  |  |  |  |  |
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| **CBC Updated Adult Reference Ranges** | | | | | |
| **Analyte** | **Current** | **Revised** | **Analyte** | **Current** | **Revised** |
| **WBC** | M: 4.23-9.07 | 4.0-11.3 | **Lymph (%)** | M: 21.8-53.1 | 17.6-50.0 |
| F: 3.98-10.04 | F: 19.3-51.7 |
| **RBC** | M: 4.63-6.08 | M: 4.24-6.20 | **Lymph (#)** | M: 1.32-3.57 | 1.0-3.5 |
| F: 3.93-5.22 | F: 3.66-5.42 | F: 1.18-3.74 |
| **HGB** | M: 13.7-17.5 | M: 13.0-17.6 | **Mono (%)** | M: 5.3-12.2 | 4-12 |
| F: 11.2-15.7 | F: 11.0-16.0 | F: 4.7-12.5 |
| **HCT** | M: 40.1-51.0 | M: 39.6-54.4 | **Mono (#)** | M: 0.30-0.82 | 0.2-0.9 |
| F: 34.1-44.9 | F: 34.0-48.5 | F: 0.24-0.36 |
| **MCV** | M: 79.0-92.2 | 80-99 | **Neut (%)** | M: 34.0-67.9 | 39.4-80.0 |
| F: 79.4-94.8 | F: 34.0-71.1 |
| **MCH** | M: 25.7-32.2 | 26-33 | **Neut (#)** | M: 1.78-5.38 | 1.5-8.0 |
| F: 25.6-32.2 | F: 1.56-6.13 |
| **MCHC** | M: 32.3-36.5 | 31.5-36.5 | **Eos (%)** | M: 0.8-7.0 | 0-6 |
| F: 32.2-35.5 | F: 0.7-5.8 |
| **RDW-CV (%)** | M: 11.6-14.4 | 11.0-14.50 | **Eos (#)** | M: 0.04-0.54 | 0-0.40 |
| F: 11.7-14.4 | F: 0.04-0.36 |
| **RDW-SD (fL)** | M: 35.1-43.9 | M: 35.1-43.9 | **Baso (%)** | 0.2-1.2 | 0-1.0 |
| F: 36.4-46.3 | F: 36.4-46.3 |
| **PLT** | M: 163-337 | 140-400 | **Baso (#)** | 0.01-0.08 | 0-0.07 |
| F: 182-369 |
| **MPV** | M: 9.4-12.4 | 9.0-12.5 | **IG (%)** | 0.19-0.24 | 0-0.8 |
| F: 9.4-12.3 |
|  | | | **IG (#)** | 0-0.02 | 0-0.07 |

*[UDRUG7](#TA3c)* **Drugs of Abuse Screen 7 Panel w/reflex to Confirmation/Quantitation in Urine**

**Result Codes**:

3349-8 Amphetamine Screen, Urine, with reflex Result Name Updated

19554-5 Methamphetamine, Urine, with reflex New Component

3377-9 Barbiturates Screen, Urine, with reflex

3390-2 Benzodiazepines Screen, Urine, with reflex

3397-7 Cocaine Screen, Urine, with reflex

3879-4 Opiates Screen, Urine, with reflex Delete Component

19597-4 Morphine Screen, Urine, with reflex New Component

19659-2 Phencyclidine Screen, Urine, with reflex

18282-4 THC Screen, Urine, with reflex

2161-8 Creatinine, Urine

54247-2 Interpretive Comments Result Name Updated

**Reference Interval**:

Amphetamine Screen, Urine, with reflex Cutoff 1000 ng/mL

Methamphetamine, Urine, with reflex Cutoff 1000 ng/mL

Barbiturates Screen, Urine, with reflex Cutoff 300 ng/mL

Benzodiazepines Screen, Urine, with reflex Cutoff 300 ng/mL

Cocaine Screen, Urine, with reflex Cutoff 300 ng/mL

Morphine Screen, Urine, with reflex Cutoff 300 ng/mL

Phencyclidine Screen, Urine, with reflex Cutoff 25 ng/mL

THC Screen, Urine, with reflex Cutoff 50 ng/mL

Creatinine, Urine Females: 47.0-110.0 mg/dL

Males: 63.0-166.0 mg/dL

**Performing Laboratory**: Cole Diagnostics

**Methodology:** Lateral Flow Chromatographic Immunoassay

**Specimen Requirements:**

**Patient Preparation:** Collect sample 2-7 hours after suspected drug use.

**Preferred Container:** Sterile Urine Container

**Specimen Preparation:** Collect a clean catch urine sample.

**Unacceptable:** Leaking Specimens

**Stability**: A: Unacceptable; R: 48 hours; F: Indefinitely

**CPT Code(s):** 80307; If reflexed add 80325; 80345; 80346; 80349; 80353; 80359; 80361; 80365; 83992 (Reflexed Alt Code: G0480)

*[UDRUGSR](#TA3d)* **Drugs of Abuse Screen Panel 9, With reflex to confirmation/quantitation, Urine**

**Result Codes**:

3349-8 Amphetamine Screen, Urine, with reflex Name Updated

19554-5 Methamphetamine, Urine, with reflex New Component

3377-9 Barbiturates Screen, Urine, with reflex

3390-2 Benzodiazepines Screen, Urine, with reflex

3397-7 Cocaine Screen, Urine, with reflex

19568-5 MDMA (Ecstasy) Screen, Urine, with reflex New Component

3773-9 Methadone Screen, Urine with reflex

93495-0 EDDP (Methadone Metabolites) Screen, Urine with reflex New Component

3879-4 Opiates Screen, Urine, with reflex Delete Component

19597-4 Morphine Screen, Urine, with reflex New Component

10998-3 Oxycodone Screen, Urine, with reflex New Component

19659-2 Phencyclidine Screen, Urine, with reflex

19141-1 Propoxyphene Screen, Urine, with reflex

18282-4 THC Screen, Urine, with reflex

2161-8 Creatinine, Urine

54247-2 Interpretive Comments Name Updated

**Reference Interval**:

Amphetamine Screen, Urine, with reflex Cutoff 1000 ng/mL

Methamphetamine, Urine, with reflex Cutoff 1000 ng/mL

Barbiturates Screen, Urine, with reflex Cutoff 300 ng/mL

Benzodiazepines Screen, Urine, with reflex Cutoff 300 ng/mL

Cocaine Screen, Urine, with reflex Cutoff 300 ng/mL

MDMA (Ecstasy) Cutoff 500 ng/mL

Methadone Screen, Urine with reflex Cutoff 300 ng/mL

EDDP (Methadone Metabolites) Screen, Urine with reflex Cutoff 300 ng/mL

Morphine Screen, Urine, with reflex Cutoff 300 ng/mL

Oxycodone Cutoff 100 ng/mL

Phencyclidine Screen, Urine, with reflex Cutoff 25 ng/mL

Propoxyphene Screen, Urine, with reflex Cutoff 300 ng/mL

THC Screen, Urine, with reflex Cutoff 50 ng/mL

Creatinine, Urine Females: 47.0-110.0 mg/dL

Males: 63.0-166.0 mg/dL

**Performing Laboratory**: Cole Diagnostics

**Methodology:** Lateral Flow Chromatographic Immunoassay

**Specimen Requirements:**

**Patient Preparation:** Collect sample 2-7 hours after suspected drug use.

**Preferred Container:** Sterile Urine Container

**Specimen Preparation:** Collect a clean catch urine sample.

**Unacceptable:** Leaking Specimens

**Stability**: A: Unacceptable; R: 48 hours; F: Indefinitely

**CPT Code(s):** 80307; if reflexed, add 80325; 80345; 80346; 80349; 80353; 80358; 80359; 80361; 80365; 80367; 83992 (Reflexed Alt Code: G0480)

*[UDRUG13](#TA3e)* **Drugs of Abuse Screen Panel 13, with Reflex to Confirmation/Quantitation, Urine**

**Result Codes**:

3349-8 Amphetamine Screen, Urine, with reflex

19554-5 Methamphetamine, Urine, with reflex

3377-9 Barbiturates Screen, Urine, with reflex

3390-2 Benzodiazepines Screen, Urine, with reflex

3414-0 Buprenorphine Screen, Urine, with reflex

3397-7 Cocaine Screen, Urine, with reflex

19568-5 MDMA (Ecstasy) Screen, Urine, with reflex

3773-9 Methadone Screen, Urine with reflex

93495-0 EDDP (Methadone Metabolites) Screen, Urine with reflex

19597-4 Morphine Screen, Urine, with reflex

10998-3 Oxycodone Screen, Urine, with reflex

19659-2 Phencyclidine Screen, Urine, with reflex

19141-1 Propoxyphene Screen, Urine, with reflex

18282-4 THC Screen, Urine, with reflex

19312-8 Tricyclic Antidepressants Screen, Urine, with reflex

2161-8 Creatinine, Urine

54247-2 Interpretive Comments

**Reference Interval**:

Amphetamine Screen, Urine, with reflex Cutoff 1000 ng/mL

Methamphetamine, Urine, with reflex Cutoff 1000 ng/mL

Barbiturates Screen, Urine, with reflex Cutoff 300 ng/mL

Benzodiazepines Screen, Urine, with reflex Cutoff 300 ng/mL

Buprenorphine Screen, Urine, with reflex Cutoff 10 ng/mL

Cocaine Screen, Urine, with reflex Cutoff 300 ng/mL

MDMA (Ecstasy) Screen, Urine, with reflex Cutoff 500 ng/mL

Methadone Screen, Urine with reflex Cutoff 300 ng/mL

EDDP (Methadone Metabolites) Screen, Urine with reflex Cutoff 300 ng/mL

Morphine Screen, Urine, with reflex Cutoff 300 ng/mL

Oxycodone Screen, Urine, with reflex Cutoff 100 ng/mL

Phencyclidine Screen, Urine, with reflex Cutoff 25 ng/mL

Propoxyphene Screen, Urine, with reflex Cutoff 300 ng/mL

THC Screen, Urine, with reflex Cutoff 50 ng/mL

Tricyclic Antidepressants Screen, Urine, with reflex Cutoff 1000 ng/mL

Creatinine, Urine Females: 47.0-110.0 mg/dL

Males: 63.0-166.0 mg/dL

**Performing Laboratory**: Cole Diagnostics

**Methodology:** Lateral Flow Chromatographic Immunoassay

**Specimen Requirements:**

**Patient Preparation:** Collect sample 2-7 hours after suspected drug use.

**Preferred Container:** Sterile Urine Container

**Specimen Preparation:** Collect a clean catch urine sample.

**Unacceptable:** Leaking Specimens

**Stability**: A: Unacceptable; R: 48 hours; F: Indefinitely

**CPT Code(s):** 80307; if reflexed, add 80325; 80337; 80345; 80346; 80348; 80349; 80353; 80358; 80359; 80361; 80365; 80367; 83992 (Reflexed Alt Code: G0480)

*[UDRUG13A](#TA3f)***Drugs of Abuse Screen Panel 13A, Urine w/reflex to Conf**

INACTIVE – Refer *to Drugs of Abuse Screen Panel 13, Urine w/reflex to Conf* (UDRUG13).

*[ENA\_AB](#TA8)* **Extractable Nuclear Antigen Antibodies (Smith/RNP, Smith, SSA 52, SSA 60, and SSB)**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.3 mL)

**Unacceptable:** Plasma or other body fluids. Bacterially contaminated or severely lipemic specimens. **Stability**: After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 month

(avoid repeated freeze/thaw cycles)

*[GEN\_H](#TA8b)*  **General Health Panel (CMP, CBC, TSH)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[HAPTO](#TA9)*  **Haptoglobin, Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Alternative Container(s):** Green (lithium heparin), or pink (K2EDTA)

**Specimen Preparation:**  Allow serum specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.5 mL)

**Unacceptable:** Grossly hemolyzed specimens.

**Stability**: After separation from cells: Ambient: 3 months; Refrigerated: 8 months; Frozen: 1 month

*[H\_H](#TA9d)*  **Hemoglobin and Hematocrit**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

[*HEP\_BCHR*](#TA1) **Hepatitis B Virus Panel, Chronic with Reflex to HBsAg Confirmation**

**Methodology:** Qualitative Chemiluminescent Immunoassay/ Qualitative Enzyme Immunoassay

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow serum specimens to clot completely at room temperature. Separate serum or plasma from cells ASAP or within 2 hours of collection.

**Volume Requirements:** 3.5 mL (Min: 2.5 mL)

**Unacceptable:** Heparinized plasma, specimens containing particulate material, heat-inactivated, severely hemolyzed, or severely icteric specimens.

**Stability**: After separation from cells: Ambient: Unacceptable; Refrigerated: 7 days; Frozen: 30 days

(avoid repeated freeze/thaw cycles).

**CPT Code(s):** 86706; 86707; 87340; 87350; if reflexed, add 87341

*[HBEAGAB](#TA3)* **Hepatitis Be Virus Antigen and Antibody Panel**

**Methodology:** Qualitative Chemiluminescent Immunoassay/ Qualitative Enzyme Immunoassay

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Separate serum or plasma from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.5 mL (Min: 1.0 mL)

**Unacceptable:** Specimens containing particulate material. Heat-inactivated, severely hemolyzed, or severely icteric.

**Stability**: After separation from cells: Ambient: Unacceptable; Refrigerated: 7 days; Frozen: 30 days

(avoid repeated freeze/thaw cycles).

**Interpretive Data:** This assay should not be used for blood donor screening, associated reentry protocols, or for screening human cell, tissues, and cellular and tissue-based products (HCT/P).

*[HBEAG](#TA2)*  **Hepatitis Be Virus Antigen, Serum or Plasma**

**Methodology:** Qualitative Chemiluminescent Immunoassay

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Separate serum or plasma from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.6 mL)

**Unacceptable:** Heat-inactivated, severely hemolyzed, lipemic specimens, or specimens containing particulate material

**Stability**: After separation from cells: Ambient: Unacceptable; Refrigerated: 7 days; Frozen: 30 days

(avoid repeated freeze/thaw cycles).

**Interpretive Data:** This assay should not be used for blood donor screening, associated reentry protocols, or for screening human cell, tissues, and cellular and tissue-based products (HCT/P).

*[HGB](#TA9b)*  **HGB (Hemoglobin, Whole Blood)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[HYP\_COAG](#TA9c)* **Hypercoagulation Panel**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[JAK2](#TA10)*  **JAK2 (V617F) Mutation by ddPCR, Qualitative**

**Specimen Requirements:**

**Preferred Container:** Lavender Top (EDTA)

**Specimen Preparation:**  Collect Lavender (EDTA) OR bone marrow (EDTA).

**Volume Requirements:** Whole Blood: 5 mL (1 mL); Bone Marrow: 3 mL (1 mL)

**Unacceptable:** Plasma, serum, FFPE tissue blocks/slides, or frozen tissue. Specimens collected in anticoagulants other than EDTA. Clotted or grossly hemolyzed specimens.

**Stability**: Refrigerated: 7 days; Frozen: Unacceptable

*[JAK2\_E12](#TA11)* **JAK2 Exon 12 Mutation Analysis by PCR**

**Specimen Requirements:**

**Preferred Container:** Lavender Top (EDTA)

**Specimen Preparation:**  Collect Lavender (EDTA) OR bone marrow (EDTA). Also acceptable: DNA extracted by CLIA-certified Lab. Transport DNA in a tissue transport kit.

**Volume Requirements:** Whole Blood: 5 mL (1 mL); Bone Marrow: 3 mL (1 mL); Extracted DNA: 40 uL DNA with at least 50 ng/uL concentration.

**Unacceptable:** Plasma, serum, FFPE tissue blocks/slides, or frozen tissue. Specimens collected in anticoagulants other than EDTA. Clotted or grossly hemolyzed specimens.

**Stability**: Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Extracted DNA:** Ambient: 1 month; Refrigerate: Indefinitely; Frozen: Indefinitely

*[KEPPRA](#TA12)* **Keppra (Levetiracetam), Serum or Plasma**

**Reference Interval:**

Therapeutic range: 10-40 µg/mL

Toxic: Not well established

*[LAMO](#TA13)*  **Lamotrigine, Serum or Plasma**

**Reference Interval:**

Therapeutic Range: 3-15.0 µg/mL

Toxic: Greater than or equal to 20 µg/mL

*[LEISH](#TA14)*  **Leishmania Antibody, IgG (Visceral Leishmaniasis), Serum**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum to an ARUP Standard Transport Tube.

**Volume Requirements:** 0.5 mL (Min: 0.1 mL)

**Unacceptable:** Serum or plasma containing glycerol or other viscous materials. Hemolyzed specimens.

**Stability**: After separation from cells: Ambient: 48 hours; Refrigerated: 3 days; Frozen: 1 year

*[LIPA](#TA15)* **Lipoprotein (a), Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Alternative Container(s):** Plasma Separator Tube (PST), Green (Lithium Heparin), Lavender (EDTA),

or Pink (K2EDTA).

**Specimen Preparation:**  Allow serum specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.5 mL)

**Unacceptable:** Body Fluids

**Stability**: After separation from cells: Ambient: 8 hours; Refrigerated: 14 days; Frozen: 1 month

*[MYO](#LIPA_TA)*  **Myoglobin, Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Alternative Container(s):** Plain Red Tube, Green (lithium heparin), lavender (K3EDTA or K2EDTA) or pink

(K2EDTA).

**Specimen Preparation:**  Allow serum specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Required:** 1 mL (Min: 0.2 mL)

**Unacceptable:** Grossly hemolyzed specimens

**Stability**: After separation from cells: Ambient: 8 days; Refrigerated: 2 weeks; Frozen: 1 year

**Reference Interval:**

Male: less than or equal to 72 ng/mL

Female: less than or equal to 58 ng/mL

*[OBS\_PRO](#TA15b)* **Obstetric Panel (ABORH, RCB AB, HEP B, RUB, CBC, TREP)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[OSTEO](#TA16)*  **Osteocalcin, Serum or Plasma**

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Alternative Container(s):** Lavender (K2 EDTA or K3 EDTA), pink (K2EDTA), or green (lithium heparin).

**Specimen Preparation:**  Allow serum specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum or plasma to an ARUP Standard Transport Tube.

**Volume Required:** 0.5 mL (Min: 0.3 mL)

**Unacceptable:** Hemolyzed specimens

**Stability**: After separation from cells: Ambient: 8 hours; Refrigerated: 72 hours; Frozen: 3 months

**Reference Interval:**

**Age Male Female**

6 months-6 years 39-121 ng/mL 44-130 ng/mL

7-9 years 66-182 ng/mL 73-206 ng/mL

10-12 years 85-232 ng/mL 77-262 ng/mL

13-15 years 70-336 ng/mL 33-222 ng/mL

16-17 years 43-237 ng/mL 24-99 ng/mL

18 years and older 8-36 ng/mL 8-36 ng/mL

*[RBC](#TA16b)* **RBC (Red Blood Cell Count)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**

*[ANT\_GENO](#TA17)* **RhD Antigen (RhD) Copy Number**

**Specimen Requirements:**

**Preferred Container:**

**Parental genotyping**: Lavender (EDTA), pink (K2EDTA), or yellow (ACD Solution A or B).

**Fetal genotyping**: Refer to ARUP at <https://ltd.aruplab.com/Tests/Pub/0051368>.

**Specimen Preparation**:

**Whole blood (parental genotyping)**: Transport 3 mL whole blood. (Min: 1 mL)

**Fetal Genotyping** Refer to ARUP at <https://ltd.aruplab.com/Tests/Pub/0051368>.

**Unacceptable:** Frozen specimens in glass collection tubes

**Stability**:

**Cultured amniocytes and cultured CVS Fetal Specimen:** Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable; **Whole blood or maternal cell contamination specimen**: Ambient: 72 hours; Refrigerated: 1 week; Frozen: 1 month

*[SCHISTO](#TA18)* **Schistosoma Antibody, IgG, Serum**

**Methodology:** Semi-Quantitative Enzyme-Linked Immunosorbent Assay

**Specimen Requirements:**

**Preferred Container:** Serum Separator Tube (SST)

**Specimen Preparation:**  Allow specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer serum to an ARUP Standard Transport Tube.

**Volume Requirements:** 1.0 mL (Min: 0.5 mL)

**Unacceptable:** Contaminated, heat-inactivated, grossly hemolyzed, or lipemic specimens.

**Stability**: After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 month

[*TEST\_BIO\_F*](#TA19) **Testosterone by Mass Spec., Bioavailable and SHBG, Females or Children**

TEST NAME UPDATED – Previously*Testosterone LC-MS, Bioavailable w/SHBG, Female/Child*

**Sex Hormone-Binding Globulin**

**Age Male Female**

1-30 days 13-85 nmol/L 14-60 nmol/L

31-364 days 70-250 nmol/L 60-215 nmol/L

1-3 years 50-180 nmol/L 60-190 nmol/L

4-6 years 45-175 nmol/L 55-170 nmol/L

7-9 years 28-190 nmol/L 35-170 nmol/L

10-12 years 23-160 nmol/L 17-155 nmol/L

13-15 years 13-140 nmol/L 11-120 nmol/L

16-17 years 10-60 nmol/L 19-145 nmol/L

18-49 years 17-56 nmol/L 25-122 nmol/L

50 years and older 19-76 nmol/L 17-125 nmol/L

Tanner Stage I 26-186 nmol/L 30-173 nmol/L

Tanner Stage II 22-169 nmol/L 16-127 nmol/L

Tanner Stage III 13-104 nmol/L 12-98 nmol/L

Tanner Stage IV 11-60 nmol/L 14-151 nmol/L

Tanner Stage V 11-71 nmol/L 23-165 nmol/L

**Interpretive Data:**

Bioavailable testosterone concentration is calculated using total testosterone (measured by mass spectrometry) and the binding constant of testosterone and sex hormone-binding globulin (SHBG) and/or albumin.

For individuals on testosterone-suppressing hormone therapies (e.g., antiandrogens or estrogens), refer to cisgender female reference intervals. For a complete set of all established reference intervals, refer to ltd.aruplab.com/Tests/Pub/0081057.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

*[TEST\_LC](#TA20)* **Testosterone Free and Total (includes SHBG), by Mass Spec., Females or Children**

TEST NAME UPDATED – Previously*Testosterone Free and Total Panel by Mass Spec, Females and Children*

**Reference Interval:**

**Sex Hormone-Binding Globulin**

**Age Male Female**

1-30 days 13-85 nmol/L 14-60 nmol/L

31-364 days 70-250 nmol/L 60-215 nmol/L

1-3 years 50-180 nmol/L 60-190 nmol/L

4-6 years 45-175 nmol/L 55-170 nmol/L

7-9 years 28-190 nmol/L 35-170 nmol/L

10-12 years 23-160 nmol/L 17-155 nmol/L

13-15 years 13-140 nmol/L 11-120 nmol/L

16-17 years 10-60 nmol/L 19-145 nmol/L

18-49 years 17-56 nmol/L 25-122 nmol/L

50 years and older 19-76 nmol/L 17-125 nmol/L

Tanner Stage I 26-186 nmol/L 30-173 nmol/L

Tanner Stage II 22-169 nmol/L 16-127 nmol/L

Tanner Stage III 13-104 nmol/L 12-98 nmol/L

Tanner Stage IV 11-60 nmol/L 14-151 nmol/L

Tanner Stage V 11-71 nmol/L 23-165 nmol/L

**Interpretive Data:**

Bioavailable testosterone concentration is calculated using total testosterone (measured by mass spectrometry) and the binding constant of testosterone and sex hormone-binding globulin (SHBG) and/or albumin.

For individuals on testosterone-suppressing hormone therapies (e.g., antiandrogens or estrogens), refer to cisgender female reference intervals. For a complete set of all established reference intervals, refer to ltd.aruplab.com/Tests/Pub/0081057.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

*[TESTMALE](#TA21)* **Testosterone Free and Total, by ED/LC-MS/MS (Free) and LC-MS/MS (Total), Adult Males**

TEST NAME UPDATED – Previously*Testosterone Free and Total Panel, by ED/LC-MS/MS (Free) and LC-MS/MS (Total), Adult Males*

**Reference Interval:**

**Sex Hormone-Binding Globulin**

**Age Male Female**

1-30 days 13-85 nmol/L 14-60 nmol/L

31-364 days 70-250 nmol/L 60-215 nmol/L

1-3 years 50-180 nmol/L 60-190 nmol/L

4-6 years 45-175 nmol/L 55-170 nmol/L

7-9 years 28-190 nmol/L 35-170 nmol/L

10-12 years 23-160 nmol/L 17-155 nmol/L

13-15 years 13-140 nmol/L 11-120 nmol/L

16-17 years 10-60 nmol/L 19-145 nmol/L

18-49 years 17-56 nmol/L 25-122 nmol/L

50 years and older 19-76 nmol/L 17-125 nmol/L

Tanner Stage I 26-186 nmol/L 30-173 nmol/L

Tanner Stage II 22-169 nmol/L 16-127 nmol/L

Tanner Stage III 13-104 nmol/L 12-98 nmol/L

Tanner Stage IV 11-60 nmol/L 14-151 nmol/L

Tanner Stage V 11-71 nmol/L 23-165 nmol/L

**Interpretive Data:**

Bioavailable testosterone concentration is calculated using total testosterone (measured by mass spectrometry) and the binding constant of testosterone and sex hormone-binding globulin (SHBG) and/or albumin.

For individuals on testosterone-suppressing hormone therapies (e.g., antiandrogens or estrogens), refer to cisgender female reference intervals. For a complete set of all established reference intervals, refer to ltd.aruplab.com/Tests/Pub/0081057.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

*[WBC](#TA21b)* **WBC (White Blood Cell Count)**

**Reference Interval:** Refer to Complete Blood Count (CBC) w/Automated Diff **(CBC)**